9.0 DESCRIPTION OF THE SOCIOECONOMIC CHARACTERISTICS OF THE FISHERY

9.1 DEFINITIONS

Commercial Fishing – Fishing in which fish harvested, either in whole or in part, are intended to enter commerce or enter commerce through sale, barter or trade. In North Carolina, a commercial fisherman is required to have a commercial license issued by the NCDMF and is allowed only to sell to a licensed dealer.

Confidential data – Direct or indirect identity of a fisherman and/or dealer (i.e., licensee) is considered confidential according to G.S. 113-170.3. Long-standing NCDMF policy (standard supported by all Atlantic coast fisheries agencies) identifies confidential data as data derived from fewer than three fishermen or dealers (termed the 'Rule of Three'). Confidential data can only be released in a summarized format that does not allow the user to track landings or purchases to any individual unless by direct court order.
Ex-vessel price and value – The total landed dollar amount of a given species (or species landing condition and market category). Example: 100 lbs of striped bass at a PRICE of $1.50 per pound will have a VALUE of $150.

Fishing Trip – A period of time over which fishing occurs. The time spent fishing includes configuring, deploying, and retrieving gear, clearing animals from the gear, and storing, releasing or discarding catch. When watercraft are used, a fishing trip also includes the time spent traveling to and from fishing areas or locales and ends when the vessel offloads product at sea or returns to the shore. When fishing from shore or man-made structures, a fishing trip may include travel between different fishing sites within a 24-hour period.

Inflation-adjusted values – Inflation is overall general upward price movement of goods and services in an economy, usually as measured by the Consumer Price Index (CPI). Ex-vessel prices and values can be adjusted according to the CPI to remove the effects of inflation so that the value of a dollar remains the same across years. Inflation adjusted values allow for easier understanding and analysis of changes in values.

Recreational Fishing – Any trip for the purpose of recreation from which none of the catch is sold or bartered. This includes trips with effort but no catch. An inland recreational fishing license is required for those who fish in inland waters under the jurisdiction of the NCWRC. A coastal recreational license is also required for anglers fishing in coastal and joint waters under jurisdiction of the NCDMF. Anglers who wish to use limited amounts of commercial fishing gear in coastal waters under the jurisdiction of the NCDMF are also required to have a RCGL license.

Management Units – The Fisheries Reform act calls for this Section of an FMP to describe the social and economic impact of the fishery to the State. The fishery covered in this plan is the North Carolina estuarine striped bass fishery consisting of the A/R and CSMA stocks, exclusive of the Atlantic Ocean migratory stock. However, information regarding the Atlantic Ocean migratory stock is provided herein for comparative purposes, and in some cases socioeconomic data sources do not allow for reporting at the finer individual stock level.

9.2 COMMERCIAL FISHING

9.2.1 Ex-vessel value and price

Value records are available beginning in 1972 and were provided voluntarily by cooperating dealers. The trip ticket program began in 1994 and it was mandated that all commercial landings be reported to NCDMF. Reporting the value of the landing continues to remain optional; however, the values of landings are reliable estimates. Considering that there is nearly thirty-five years of data to compare, it is useful not only to report the actual dollars paid for the seafood, but also to tie the value of annual landings back to an established baseline to control for the effects of inflation. In this way changes in landings values since 1972 can be more clearly understood.

ASMA. From 1972 through 1978 there was a general trend for increased landings value from the ASMA that is associated with increases in landings. From 1978 through 1997 the overall trend is towards decreasing value. As is typical, the inflation adjusted figures show less volatility, nonetheless, the 1978 high of $272,335 (inflation adjusted) is eight to nine times greater than the lows of approximately $30,000 - $40,000 from 1988 through 1998. From 1999 through 2007 the value of the landings increased, but were still lower than the pre-1988 values (inflation adjusted). Much of the reduction in value observed from the late 1980s through the late 1990s is due to the lower total allowable catch (TAC) during these years. The most recent inflation-adjusted values in 2008 and 2009 were similar to those of the mid 1990s when landings were at their lowest. The value (inflation adjusted) over the last 10 years has averaged around $70,000 (Figure 9.1).

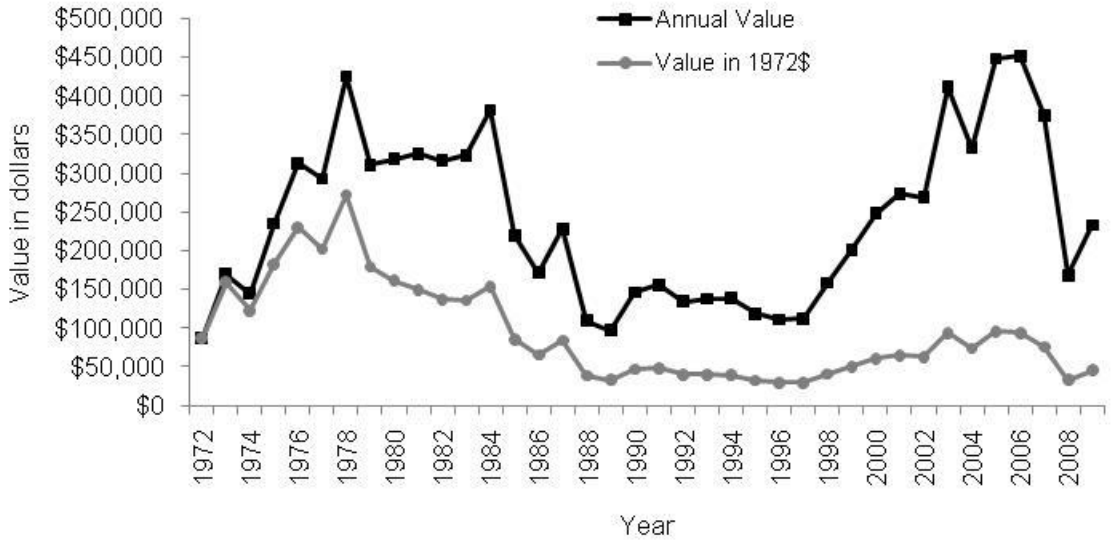

Figure 9.1 Value of ASMA striped bass landings, 1972 – 2009 (NCDMF Trip Ticket Program).

CSMA. Striped bass TAC in the CSMA was set to 25,000 lbs in 1994. Consequently, the value of landings is also lower. Controlling for inflation, 1980 saw landings with the highest value ($38,358). The value (inflation adjusted) over the last 10 years has averaged around $9,000 (Figure 9.2).

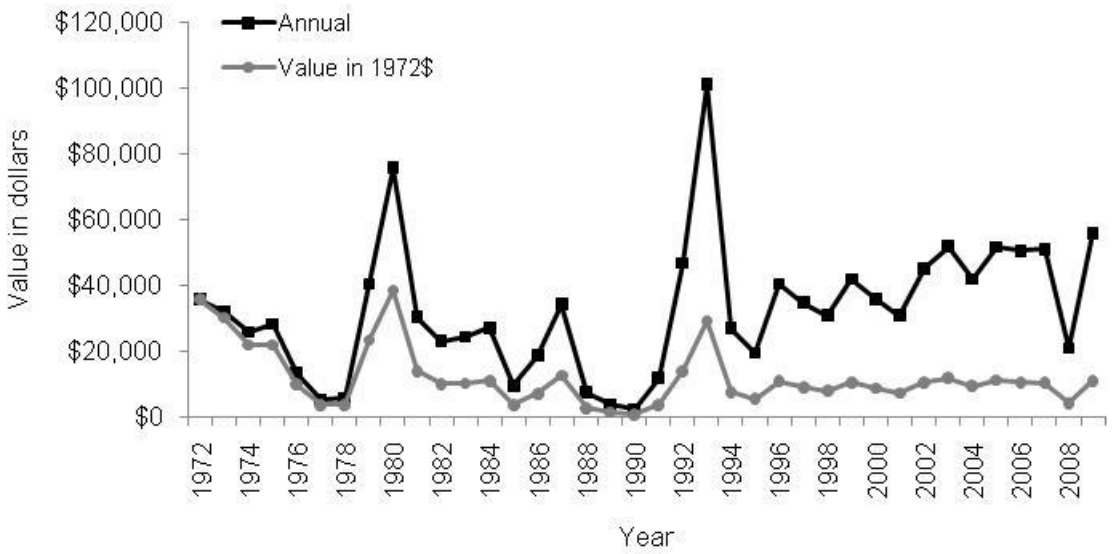

Figure 9.2 Value of CSMA striped bass landings, 1972 – 2009 (NCDMF Trip Ticket Program).

Atlantic Ocean. Presenting socioeconomic data from the Atlantic Ocean fishery within the N.C. Estuarine Striped Bass FMP was the best way to store this information for long term utility. The early trend in striped bass landings from the ocean decreased from a high of $367,655 (adjusted for inflation) in 1973 to a low of $17,529 in 1984 (Figure 9.3). From 1985 through 1989 the ocean was closed to harvesting of striped bass as mandated by the ASMFC Interstate FMP. Landings of striped bass from the ocean began to increase significantly in the mid 1990s with the recovery of the Atlantic striped bass stock. Landings values have increased somewhat in recent years, but they have not recovered to a level much higher than the 1976 inflation-adjusted values. The value (inflation adjusted) over the last 10 years has averaged around $118,000.

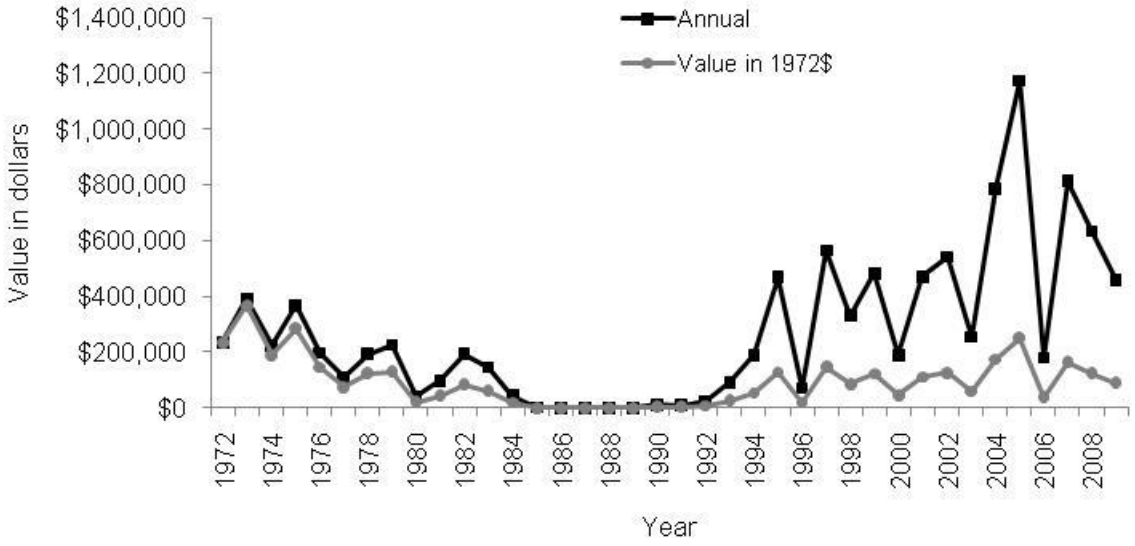

Figure 9.3 Value of Atlantic Ocean striped bass landings, 1972 – 2009 (NCDMF Trip Ticket Program).

All combined. Figure 9.4 shows the 1972 inflation-adjusted values of the landings for all water bodies combined for each year from 1972 through 2009. As can be seen, the majority of the value for any given year can be accounted for in the landings from the ASMA and the ocean, except for the years 1984 through 1992 when ocean harvesting was closed or extremely limited.

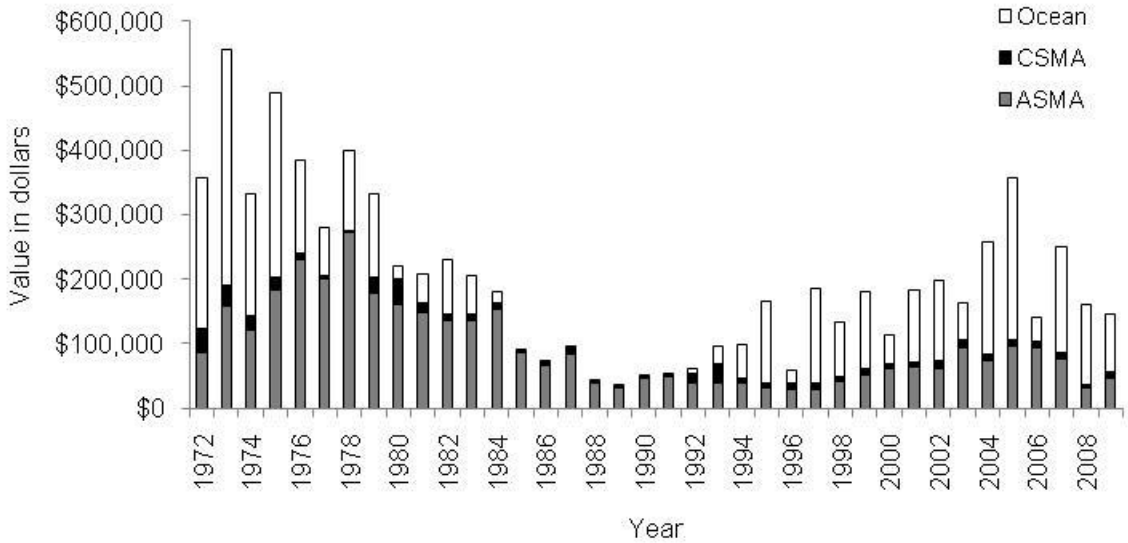

Figure 9.4 Total value of striped bass landed by management unit (adjusted for inflation), 1972 – 2009 (NCDMF Trip Ticket Program).

As shown in Figure 9.5, the total number of pounds landed diminished steadily from a high of 1.75 million pounds in 1973 to a low of just over 100,000 lbs in 1989. Much of the decrease in harvest can be attributed to the moratorium and changes in the TAC in the different water bodies during this period. The average number of pounds has been increasing since the early 1990s with 2004 showing the largest annual landings of approximately 900,000 lbs.

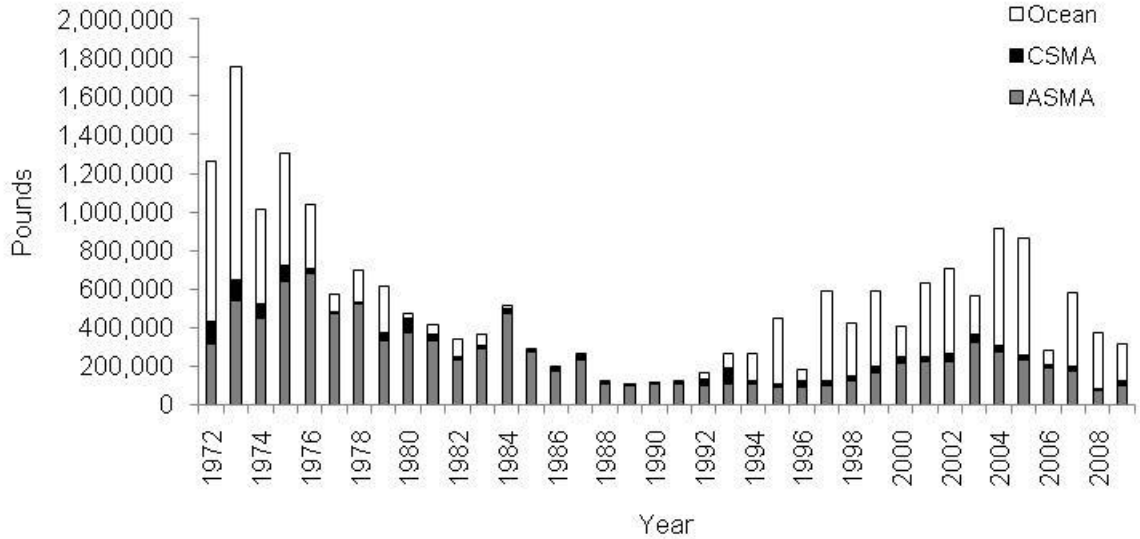

Figure 9.5 Number of pounds of striped bass landed by management unit, 1972 – 2009 (NCDMF Trip Ticket Program).

In the early 1970s the largest portion of striped bass were caught in the ocean. By the mid-1970s the majority of landings were coming from the ASMA. From the mid-1980s to the early 1990s landings from the ocean were extremely limited or nonexistent due to closures or limited fishing opportunities. From the mid-1990s on, with the exception of 1996, 2000, 2003, and 2006, ocean landings accounted for at least 50% of the total annual landings.

The trend in average price per pound (unadjusted value) paid to the fisherman tends to be very similar for fish caught in the ASMA or in CSMA (Figures 9.6 and 9.7). Price per pound in both these management units increased steadily from $0.28 in 1972 to an early period high of around $1.45 in 1982. There was a slight decline from 1982 through 1989. In 1990 the price per pound rose back to approximately $1.40, and for the next 15 years averaged $1.28 in both the ASMA and CSMA. In 2005 the price per pound increased significantly, and from 2006 through 2009 the average price per pound for both management units has been $2.25. When controlling for inflation, the price per pound reached a high of about $0.60 in 1982 and declined until 2004, with some recovery since. The price per pound of striped bass landed from the ocean was more volatile from 1972 through 1987 (Figure 9.8), from a low of $0.28 per pound in 1972 to a high of $3.00 per pound in 1984. Like estuarine striped bass, there was a decline in price until recent years.

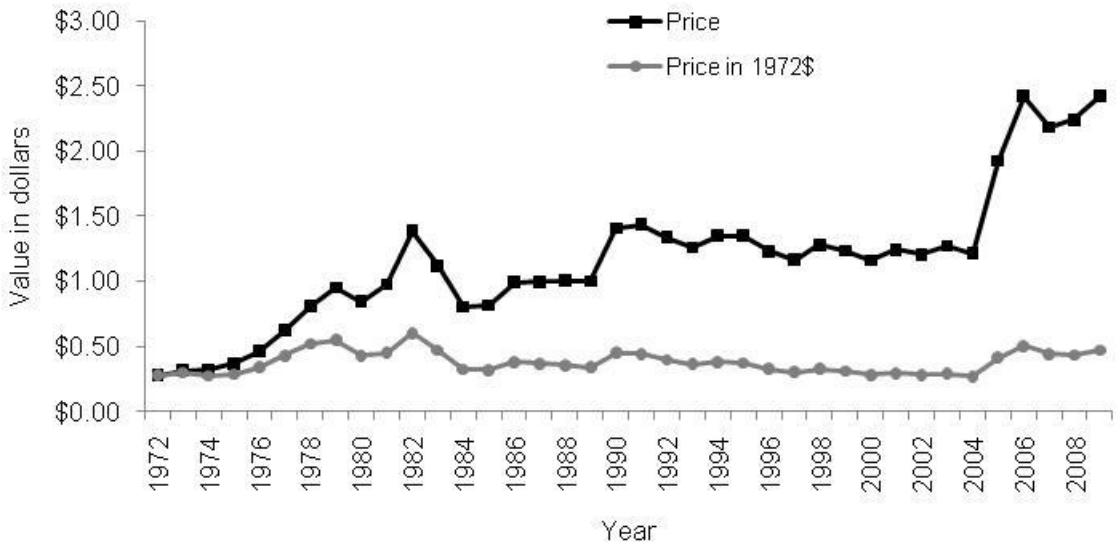

Figure 9.6 Price per pound by year for striped bass caught in ASMA, 1972 – 2009 (NCDMF Trip Ticket Program).

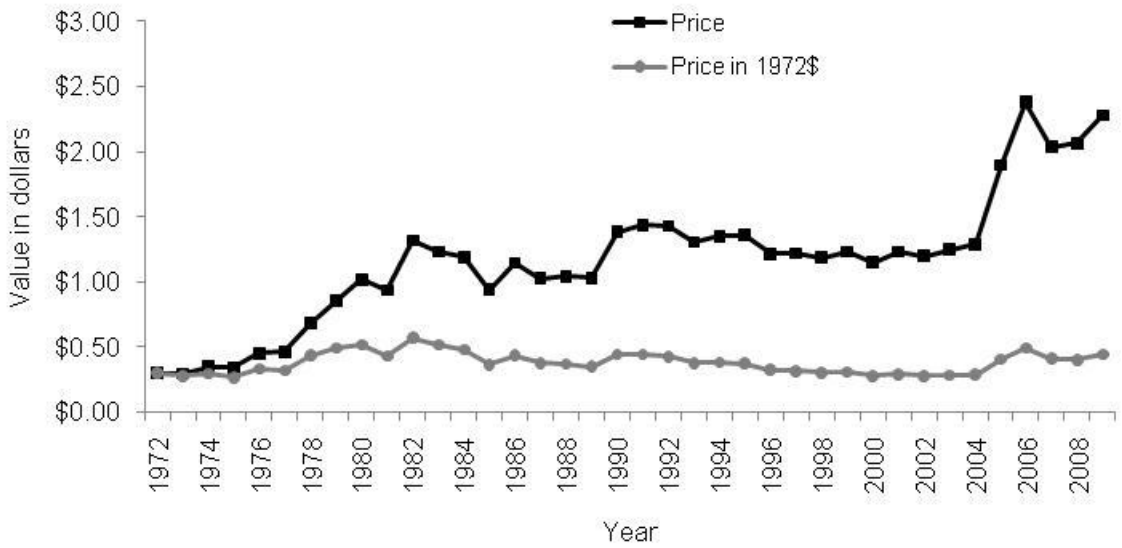

Figure 9.7 Price per pound by year for striped bass caught in CSMA, 1972 – 2009 (NCDMF Trip Ticket Program).

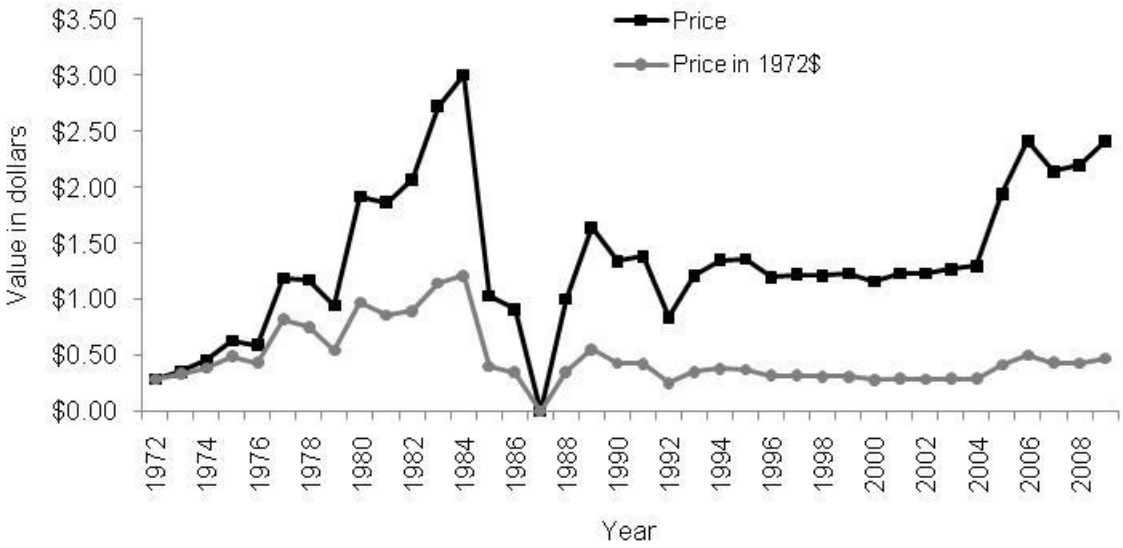

Figure 9.8 Price per pound by year for striped bass caught in the Atlantic Ocean, 1972 – 2009 (courtesy of the NCDMF Trip Ticket Program).

Table 9.1 shows the number of participants in the fishery by year, management unit, and the value of their annual landings from 2001 through 2009. In those years, the ASMA averaged 356 fishermen reporting landings of striped bass. Of those, 57% had annual landings with values less than $500. In the CSMA, there is an average of 160 fishermen reporting landings in a given year. Eighty-three percent reported annual landings valued less than $500.

Table 9.1 Number of participants in the striped bass fishery by year, management unit, and value of annual landings, 2001 - 2009 (NCDMF Trip Ticket Program).

Management Unit	Income Level	Year 2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
ASMA	<= $100.00	124	122	86	53	82	82	80	98	93	91
	$100.01 - $500.00	137	139	126	99	133	96	92	92	84	111
	$500.01 - $1,000.00	75	57	74	66	51	43	53	32	31	54
	> $1,000	93	90	117	107	128	130	108	56	72	100
	Total	429	408	403	325	394	351	333	278	280	356
CSMA	<= $100.00	108	93	113	61	86	68	49	66	32	75
	$100.01 - $500.00	78	72	80	58	70	43	52	31	37	58
	$500.01 - $1,000.00	10	23	23	17	18	20	13	10	18	17
	> $1,000	1	7	10	9	12	13	21	3	16	10
	Total	197	195	226	145	186	144	135	110	103	160
Ocean	<= $100.00	20	11	18	17	6	8	11	8	9	12
	$100.01 - $500.00	88	116	154	178	182	54	122	60	37	110
	$500.01 - $1,000.00	52	55	79	128	178	80	143	96	40	95
	> $1,000	115	213	46	231	364	59	261	206	78	175
	Total	275	395	297	554	730	201	537	370	164	391

9.2.2 Gear and Price

From 1972 through 2009, 59% of all striped bass were caught using gill nets. An additional 21% were caught using beach seines, 9% in flounder trawls and 4% in pound nets. The remaining 7% were caught as bycatch using other gears such as haul seines, other kinds of nets, pots, or trolling (Figure 9.9).

Figure 9.9 Percent of landings by gear used to harvest striped bass in all North Carolina waters, 1972 – 2009 (NCDMF Trip Ticket Program).

Table 9.2 shows by year from 1994 through 2009 the number of trips made by each of the gears listed in Figure 9.9. The table also shows the number of pounds landed, the total value and the price per pound. In each case it can be seen that flounder trawls and beach seines have a much greater CPUE than do gill nets. Overall, there is very little difference in terms of the gear used on the average price per pound. Table 9.2 does not show inflation-adjusted amounts, but as can be seen in a comparison with Figures 9.6 – 9.8, the average price per pound has followed a general downward trend.

Table 9.2 The average price per pound for striped bass (unadjusted for inflation) using different gears for the years 1994 – 2009 (NCDMF Trip Ticket Program).

Year	Category	Beach Seine	Flounder trawl	Gill Net	Haul Seine	Pound Net	All Other Gears	Total
1994	Trips	74	9	2,836	68	297	62	3,346
	Pounds	60,693	16,485	139,800	2,290	12,800	29,832	261,900
	Ave. pounds/trip	820	1,832	49	34	43	481	543
	Value	$ 81,936	$ 22,255	$188,730	$ 3,092	$ 17,279	$ 40,273	$ 353,565
	Price/pound	1.35	1.36	1.35	1.35	1.35	1.35	1.35
1995	Trips	244	34	5,648	152	321	141	6,540
	Pounds	169,201	16,184	232,768	3,195	4,277	20,534	446,159
	Ave. pounds/trip	693	495	41	21	13	146	235
	Value	$229,943	$ 22,867	$315,741	$ 4,372	$ 5,706	$ 27,899	$ 606,528
	Price/pound	1.36	1.41	1.36	1.37	1.33	1.36	1.37
1996	Trips	87	*	6,030	91	344	86	6,638
	Pounds	39,607	*	130,086	1,820	4,990	5,096	181,599
	Ave. pounds/trip	455	*	22	20	15	59	114
	Value	$ 47,127	*	$159,323	$ 2,200	$ 6,097	$ 6,196	$ 220,943
	Price/pound	1.19	*	1.22	1.21	1.22	1.22	1.21
1997	Trips	349	15	7,295	46	671	339	8,715
	Pounds	185,890	5,145	201,330	773	14,007	180,640	587,785
	Ave. pounds/trip	533	343	28	17	21	533	246
	Value	$244,619	$ 6,377	$242,605	$ 921	$ 15,654	$220,914	$ 731,090
	Price/pound	1.21	1.24	1.21	1.19	1.12	1.22	1.20
1998	Trips	147	34	5,783	98	421	219	6,702
	Pounds	75,004	22,607	237,427	1,890	14,735	71,205	422,868
	Ave. pounds/trip	510	665	41	19	35	325	266
	Value	$ 93,980	$ 26,725	$293,087	$ 2,309	$ 18,829	$ 85,110	$ 520,040
	Price/pound	1.25	1.18	1.23	1.22	1.28	1.20	1.23
1999	Trips	98	0	8,276	114	462	148	9,098
	Pounds	61,774	0	509,465	2,100	12,820	2,153	588,312
	Ave. pounds/trip	630	0	62	18	28	15	126
	Value	$ 76,394	$ -	$627,337	$ 2,590	$ 15,866	$ 2,657	$ 724,844
	Price/pound	1.24	0.00	1.23	1.23	1.24	1.23	1.03

Table 9.2 (continued)

Year	Category	Beach Seine	Flounder trawl	Gill Net	Haul Seine	Pound Net	All Other Gears	Total
2000	Trips	102	62	10,599	21	677	274	11,735
	Pounds	58,147	46,169	226,243	369	17,590	58,987	407,505
	Ave. pounds/trip	570	745	21	18	26	215	266
	Value	$ 67,218	$ 52,867	$261,766	$ 418	$ 20,667	$ 68,979	$ 471,915
	Price/pound	1.16	1.15	1.16	1.13	1.17	1.17	1.16
2001	Trips	184	41	10,986	*	504	359	12,074
	Pounds	93,580	37,301	348,415	*	12,761	134,001	626,058
	Ave. pounds/trip	509	910	32	*	25	373	370
	Value	$120,402	$ 43,788	$430,210	*	$ 15,749	$162,930	$ 773,079
	Price/pound	1.29	1.17	1.23	*	1.23	1.22	1.23
2002	Trips	332	22	9,795	67	846	218	11,280
	Pounds	237,983	36,090	347,046	8,267	19,790	52,284	701,460
	Ave. pounds/trip	717	1,031	35	123	23	240	362
	Value	$295,006	$ 43,374	$419,145	$ 9,912	$ 23,781	$ 64,240	$ 855,458
	Price/pound	1.24	1.20	1.21	1.20	1.20	1.23	1.21
2003	Trips	0	22	10,455	85	584	341	11,487
	Pounds	0	25,929	432,621	3,040	17,586	86,744	565,919
	Ave. pounds/trip	0	1,179	41	36	30	254	257
	Value	$ -	$ 32,099	$548,004	$ 3,886	$ 22,362	$111,629	$ 717,981
	Price/pound	0.00	1.24	1.27	1.28	1.27	1.29	1.06
2004	Trips	230	60	8,398	39	260	385	9,372
	Pounds	180,640	90,765	499,473	1,234	4,689	134,672	911,473
	Ave. pounds/trip	785	1,513	59	32	18	350	460
	Value	$234,154	$119,808	$624,719	$ 1,574	$ 5,993	$174,382	$1,160,631
	Price/pound	1.30	1.32	1.25	1.28	1.28	1.29	1.29
2005	Trips	456	4	9,477	114	634	211	10,896
	Pounds	331,341	2,906	469,658	2,931	16,146	41,307	864,289
	Ave. pounds/trip	727	727	50	26	25	196	292
	Value	$650,713	$ 5,447	$900,976	$ 5,651	$ 31,255	$ 79,027	$1,673,068
	Price/pound	1.96	1.87	1.92	1.93	1.94	1.91	1.92
2006	Trips	0	16	7,098	74	621	158	7,967
	Pounds	0	6,217	241,525	1,903	17,652	14,440	281,736
	Ave. pounds/trip	0	389	34	26	28	91	95
	Value	$ -	$ 14,520	$584,390	$ 4,453	$ 41,365	$ 36,174	$ 680,902
	Price/pound	0.00	2.34	2.42	2.34	2.34	2.51	1.99

Table 9.2 (continued).

Year	Category	Beach Seine	Flounder trawl	Gill Net	Haul Seine	Pound Net	All Other Gears	Total
2007	Trips	46	74	7,386	37	571	135	8,249
	Pounds	10,471	76,644	446,742	1,333	17,189	24,006	576,384
	Ave. pounds/trip	228	1,036	60	36	30	178	261
	Value	$ 21,400	$157,573	$971,915	$ 2,863	$ 34,480	$ 50,724	$1,238,956
	Price/pound	2.04	2.06	2.18	2.15	2.01	2.11	2.09
2008	Trips	186	25	3,628	9	422	130	4,400
	Pounds	75,711	17,637	208,938	282	12,440	58,442	373,450
	Ave. pounds/trip	407	705	58	31	29	450	280
	Value	$171,613	$ 38,403	$467,214	$ 600	$ 25,678	$119,058	$ 822,566
	Price/pound	2.27	2.18	2.24	2.13	2.06	2.04	2.15
2009	Trips	6	28	4,044	19	513	180	4,790
	Pounds	4,856	39,083	153,736	437	16,664	95,828	310,604
	Ave. pounds/trip	809	1,396	38	23	32	532	472
	Value	$ 12,484	$ 94,334	$372,235	$ 1,061	$ 37,385	$229,810	$ 747,308
	Price/pound	2.57	2.41	2.42	2.43	2.24	2.40	2.41

**** denotes confidential information*

Tables 9.3 to 9.5 show the gears that were used to land striped bass in the ASMA, CSMA, and Atlantic Ocean from 1996 through 2009. Gill nets accounted for the majority of landings in all water bodies for these years. The only other gear with significant landings was the use of beach seines in the Atlantic Ocean.

Table 9.3 Striped bass landings and value by gears for the ASMA, 1997 – 2009 (NCDMF Trip Ticket Program).

	1997						1998				
Gear	Value ($)	Pounds	Price/lb. $	Value in 1972 ($)	Price/lb. in 1972 ($)	Gear	Value ($)	Pounds	Price/lb. $	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab pot	660	549	1.20	172	0.31	Crab pot	255	216	1.18	65	0.30
Fyke net	495	440	1.12	129	0.29	Fyke net	628	517	1.22	161	0.31
Gill net (runaround)	249	201	1.24	65	0.32	Gill net (runaround)	1,610	1,363	1.18	413	0.30
Gill net (anchored)	94,513	80,645	1.17	24,611	0.31	Gill net (anchored)	134,980	105,430	1.28	34,609	0.33
Haul seine	609	522	1.17	158	0.30	Haul seine	2,309	1,890	1.22	592	0.31
Pound net	14,851	13,359	1.11	3,867	0.29	Pound net	18,139	14,151	1.28	4,651	0.33
Other & Conf.	471	406	1.16	123	0.30	Other & Conf.	454	360	1.26	116	0.32
Total or Average*	111,847	96,122	1.16	29,125	0.26	Total or Average*	158,376	123,927	1.28	40,608	0.33

	1999						2000				
Gear	Value ($)	Pounds	Price/lb. $	Value in 1972 ($)	Price/lb. in 1972 ($)	Gear	Value ($)	Pounds	Price/lb. $	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab pot	181	147	1.23	45	0.31	Crab pot	401	352	1.14	97	0.28
Fyke net	873	705	1.24	219	0.31	Fyke net	1,589	1,343	1.18	386	0.29
Gill net (anchored)	181,158	146,781	1.23	45,452	0.31	Gill net (runaround)	373	328	1.14	91	0.28
Haul seine	2,556	2,072	1.23	641	0.31	Gill net (anchored)	224,348	193,687	1.16	54,449	0.28
Pound net	15,858	12,813	1.24	3,979	0.31	Pound net	20,588	17,520	1.18	4,997	0.29
Other & Conf.	436	352	1.23	109	0.31	Other & Conf.	910	799	1.14	221	0.28
Total or Average*	201,061	162,870	1.23	50,446	0.31	Total or Average*	248,209	214,029	1.15	60,241	0.28

	2001						2002				
Gear	Value ($)	Pounds	Price/lb. $	Value in 1972 ($)	Price/lb. in 1972 ($)	Gear	Value ($)	Pounds	Price/lb. $	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab Pot	673	530	1.27	159	0.30	Crab Pot	139	127	1.09	32	0.25
Fyke Net	3,260	2,648	1.23	769	0.29	Fyke Net	1,661	1,459	1.14	386	0.26
Gill net (runaround)	1,293	1,107	1.17	305	0.28	Gill net (runaround)	870	728	1.20	202	0.28
Gill net (anchored)	251,504	202,598	1.24	59,355	0.29	Gill net (anchored)	239,339	198,312	1.21	55,622	0.28
Pound Net	15,265	12,341	1.24	3,602	0.29	Pound Net	23,025	19,161	1.20	5,351	0.28
Other & Conf.	1,294	1,009	1.28	305	0.30	Other & Conf.	3,767	3,070	1.23	875	0.29
Total or Average	272,289	220,233	1.24	64,425	0.29	Total or Average	268,801	222,857	1.21	62,469	0.28

Table 9.3 (continued).

Gear	2003 Value ($)	Pounds	Price/lb. $	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab Pot	882	824	1.07	200	0.24
Fyke Net	4,384	3,455	1.27	996	0.29
Gill net (runaround)	287	259	1.11	65	0.25
Gill net (anchored)	381,121	299,279	1.27	86,591	0.29
Pound Net	20,902	16,396	1.27	4,749	0.29
Other & Conf.	3,994	3,125	1.28	907	0.29
Total or Average	411,570	323,337	1.27	93,509	0.29

Gear	2004 Value ($)	Pounds	Price/lb. $	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab Pot	128	108	1.19	28	0.26
Fyke Net	5,472	4,383	1.25	1,211	0.28
Haul seine	1,574	1,234	1.28	348	0.28
Gill net (anchored)	319,373	263,150	1.21	70,677	0.27
Pound Net	5,993	4,689	1.28	1,326	0.28
Other & Conf.	94	72	1.31	21	0.29
Total or Average	332,634	273,636	1.22	73,612	0.27

Gear	2005 Value ($)	Pounds	Price/lb. $	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab Pot	35	18	1.92	7	0.41
Fyke Net	4,037	2,000	2.02	864	0.43
Gill net (runaround)	3,355	1,762	1.90	718	0.41
Gill net (anchored)	401,831	208,779	1.92	85,992	0.41
Haul Seine	5,651	2,931	1.93	1,209	0.41
Pound Net	31,255	16,146	1.94	6,688	0.41
Other & Conf.	2,024	1,057	1.91	433	0.41
Total or Average	448,186	232,693	1.93	95,912	0.41

Gear	2006 Value ($)	Pounds	Price/lb. $	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab Pot	167	73	2.29	35	0.47
Fyke Net	5,962	2,331	2.56	1,252	0.53
Gill net (runaround)	1,450	768	1.89	301	0.39
Gill net (anchored)	397,780	163,543	2.43	82,460	0.50
Pound Net	41,061	17,522	2.34	8,512	0.49
Other & Conf.	5,176	2,162	2.39	1,073	0.50
Total or Average	451,596	186,399	2.42	93,633	0.50

Table 9.3 (continued).

	2007				
Gear	Value ($)	Pounds	Price/lb. $	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab Pot	183	92	1.99	37	0.40
Fyke Net	4,334	2,111	2.05	874	0.41
Gill net (runaround)	862	411	2.10	174	0.42
Gill net (anchored)	332,227	150,644	2.21	66,977	0.44
Haul Seine	2,609	1,214	2.15	526	0.43
Pound Net	34,414	17,156	2.01	6,938	0.40
Other & Conf.	132	55	2.39	27	0.48
Total or Average	374,761	171,682	2.18	75,552	0.44

	2008				
Gear	Value ($)	Pounds	Price/lb. $	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab Pot	44	21	2.12	9	0.41
Fyke Net	3,471	1,639	2.12	674	0.41
Gill net (runaround)	792	410	1.93	154	0.37
Gill net (anchored)	137,101	60,125	2.28	26,611	0.44
Pound Net	25,467	12,328	2.07	4,943	0.40
Other & Conf.	885	403	2.20	172	0.43
Total or Average	167,760	74,926	2.24	32,562	0.43

	2009				
Gear	Value ($)	Pounds	Price/lb. $	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab Pot	88	39	2.25	17	0.44
Fyke Net	3,128	1,396	2.24	609	0.44
Gill net (runaround)	251	123	2.04	49	0.40
Gill net (anchored)	190,786	77,475	2.46	37,184	0.48
Pound Net	37,385	16,664	2.24	7,286	0.44
Other & Conf.	1,061	437	2.43	207	0.47
Total or Average	232,699	96,134	2.42	45,330	0.47

Table 9.4 Striped bass landings and value by gears for CSMA, 1977 – 2009 (NCDMF Trip Ticket Program).

1997					
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab pot	303	245	1.24	79	0.32
Crab Trawl	58	47	1.24	15	0.32
Gill net (drift)	127	103	1.23	33	0.32
Gill net (runaround)	1,362	1,099	1.24	355	0.32
Gill net (anchored)	31,679	26,065	1.22	8,249	0.32
Haul seine	380	307	1.24	99	0.32
Pound net	803	648	1.24	209	0.32
Other & Conf.	9	7	1.24	2	0.32
Total or Average*	34,721	28,521	1.22	9,042	0.32

1998					
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab pot	405	343	1.18	104	0.30
Crab Trawl	72	61	1.18	18	0.30
Gill net (drift)	94	80	1.18	24	0.30
Gill net (runaround)	153	130	1.18	39	0.30
Gill net (anchored)	29,410	24,777	1.19	7,541	0.30
Pound net	690	584	1.18	177	0.30
Total or Average*	30,823	25,973	1.19	7,904	0.30

1999					
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab pot	832	677	1.23	209	0.31
Gill net (runaround)	267	217	1.23	67	0.31
Gill net (anchored)	40,257	32,710	1.23	10,101	0.31
Other & Conf.	438	356	1.23	110	0.31
Total or Average*	41,794	33,960	1.23	10,486	0.31

2000					
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab pot	974	854	1.14	236	0.28
Gill net (runaround)	176	148	1.20	43	0.29
Gill net (anchored)	34,439	29,953	1.15	8,358	0.28
Other & Conf.	144	126	1.14	35	0.28
Total or Average*	35,733	31,081	1.15	8,673	0.28

Table 9.4 (continued).

Gear	2001 Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab Pot	484	389	1.25	115	0.29
Gill net (runaround)	309	269	1.15	73	0.27
Gill net (anchored)	29,320	23,774	1.23	6,919	0.29
Pound net	485	420	1.15	114	0.27
Other & Conf.	89	65	1.38	22	0.32
Total or Average*	30,687	24,917	1.23	7,243	0.29

Gear	2002 Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Gill net (runaround)	5,893	4,904	1.20	1,370	0.28
Gill net (anchored)	34,066	28,393	1.20	7,917	0.28
Pound net	755	629	1.20	176	0.28
Other & Conf.	4,395	3,660	1.20	1,021	0.28
Total or Average*	45,109	37,586	1.20	10,484	0.28

Gear	2003 Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Gill net (runaround)	169	138	1.23	38	0.28
Gill net (anchored)	49,676	39,778	1.25	11,286	0.28
Other & Conf.	1,802	1,468	1.23	409	0.28
Total or Average	51,647	41,384	1.25	11,734	0.28

Gear	2004 Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab Pot	235	190	1.23	52	0.27
Gill net (runaround)	254	194	1.31	56	0.29
Gill net (anchored)	41,183	31,992	1.29	9,114	0.28
Other & Conf.	137	104	1.32	30	0.29
Total or Average	41,808	32,480	1.29	9,252	0.28

Gear	2005 Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Gill net (runaround)	54	29	1.87	12	0.40
Gill net (anchored)	51,114	26,929	1.90	10,938	0.41
Other & Conf.	327	174	1.88	70	0.40
Total or Average	51,495	27,132	1.90	11,020	0.41

Gear	2006 Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab Pot	323	139	2.34	67	0.48
Gill net (runaround)	236	107	2.21	49	0.46
Gill net (anchored)	49,394	20,724	2.38	10,239	0.49
Other & Conf.	420	180	2.33	88	0.49
Total or Average	50,374	21,149	2.38	10,444	0.49

Table 9.4 (continued).

x	2007				
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Crab Pot	32	16	2.00	6	0.40
Gill net (runaround)	505	252.5	2.00	102	0.40
Gill net (anchored)	50,023	24,561	2.04	10,085	0.41
Other & Conf.	372	178	2.09	75	0.42
Total or Average	50,933	25,008	2.04	10,268	0.41

	2008				
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Gill net (runaround)	50	24.5	2.03	10	0.39
Gill net (anchored)	20,171	9,754	2.07	3,915	0.40
Other & Conf.	685	336	2.04	133	0.40
Total or Average	20,906	10,115	2.07	4,058	0.40

	2009				
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Gill net (runaround)	298	130	2.30	58	0.45
Gill net (anchored)	55,425	24,331	2.28	10,802	0.44
Other & Conf.	107	46	2.33	21	0.45
Total or Average	55,830	24,507	2.28	10,881	0.44

Table 9.5 Striped bass landings and value by gears for the Atlantic Ocean, 1997 – 2009 (NCDMF Trip Ticket Program).

	1997						1998				
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)	Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Beach seine	224,619	185,890	1.21	58,491	0.31	Beach seine	93,980	75,004	1.25	24,096	0.32
Fish Trawl	224,150	183,169	1.22	58,369	0.32	Fish Trawl	109,935	92,244	1.19	28,187	0.31
Gill net (anchored)	114,658	93,201	1.23	29,857	0.32	Gill net (anchored)	126,840	105,649	1.20	32,522	0.31
Other & Conf.	1,096	884	1.24	285	0.32	Other & Conf.	86	72	1.19	22	0.31
Total or Average*	564,523	463,144	$1.22	147,002	$0.32	Total or Average*	330,841	272,969	1.21	84,827	0.31

	1999						2000				
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)	Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Beach seine	76,394	61,774	1.24	19,167	0.31	Beach seine	67,218	58,147	1.16	16,314	0.28
Gill net (anchored)	405,566	329,685	1.23	101,757	0.31	Fish Trawl	118,379	102,167	1.16	28,730	0.28
Other & Conf.	28	23	1.23	7	0.31	Gill net (anchored)	2,366	2,072	1.14	574	0.28
Total or Average*	481,988	391,482	1.23	120,931	0.31	Other & Conf.	11	10	1.14	3	0.28
						Total or Average*	187,974	162,396	1.16	45,622	0.28

	2001						2002				
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)	Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Beach Seine	120,037	93,580	1.28	28,415	0.30	Beach Seine	295,006	237,983	1.24	68,559	0.29
Fish Trawl	201,591	167,199	1.21	47,575	0.28	Fish Trawl	103,302	84,795	1.22	24,007	0.28
Gill net (anchored)	146,266	119,353	1.23	34,519	0.29	Gill net (anchored)	132,486	109,308	1.21	30,790	0.28
Other & Conf.	1,516	1,314	1.15	358	0.27	Other & Conf.	10,754	8,932	1.20	2,499	0.28
Total or Average*	468,293	381,446	1.23	110,517	0.29	Total or Average*	541,547	441,018	1.23	125,855	0.29

Table 9.5 (continued).

2003					
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Fish Trawl	138,148	108,141	1.28	31,387	0.29
Gill net (anchored)	116,443	92,917	1.25	26,456	0.28
Other & Conf.	173	142	1.22	39	0.28
Total or Average	254,764	201,199	1.27	57,882	0.29

2004					
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Beach Seine	234,154	180,640	1.30	51,818	0.29
Fish Trawl	287,577	220,166	1.31	63,641	0.29
Gill net (anchored)	260,474	201,534	1.29	57,643	0.29
Other & Conf.	3,984	3,018	1.32	882	0.29
Total or Average	786,189	605,358	1.30	173,984	0.29

2005					
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Beach Seine	650,713	331,341	1.96	139,253	0.42
Fish Trawl	70,658	37,598	1.88	15,121	0.40
Gill net (anchored)	441,259	230,360	1.92	94,429	0.41
Other & Conf.	10,758	5,166	2.08	2,302	0.45
Total or Average	1,173,387	604,464	1.94	251,105	0.42

2006					
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Fish Trawl	43,384	17,797	2.44	8,994	0.51
Gill net (anchored)	126,755	52,627	2.41	26,276	0.50
Other & Conf.	8,794	3,765	2.34	1,823	0.48
Total or Average	178,933	74,189	2.41	37,093	0.50

2007					
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Beach Seine	21,400	10,471	2.04	4,314	0.41
Fish Trawl	203,558	98,344	2.07	41,037	0.42
Gill net (anchored)	585,327	269,389	2.17	118,002	0.44
Other & Conf.	2,978	1,491	2.00	600	0.40
Total or Average	813,262	379,694	2.14	163,954	0.43

2008					
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Beach Seine	171,613	75,711	2.27	33,310	0.44
Fish Trawl	153,276	74,118	2.07	29,751	0.40
Gill net (anchored)	308,269	138,216	2.23	59,835	0.43
Other & Conf.	742	365	2.03	144	0.39
Total or Average	633,900	288,410	2.20	123,040	0.43

Table 9.5 (continued).

	2009				
Gear	Value ($)	Pounds	Price/lb. ($)	Value in 1972 ($)	Price/lb. in 1972 ($)
Beach Seine	12,484	4,856	2.57	2,432	0.50
Fish Trawl	320,820	133,430	2.40	62,528	0.47
Gill net (anchored)	125,474	51,677	2.43	24,455	0.47
Total or Average	458,779	189,963	2.42	89,370	0.47

9.2.3 Marketing, Distribution, and Processing

Striped bass purchased by licensed dealers generally is sold fresh. By the time it gets to the consumer the vast majority of the fish have been processed into fillets. A few fish are sold whole, but as many of the individual fish are quite large, processing the fish into fillets is a matter of practicality as much as preference. A large percentage of the striped bass landed in North Carolina are destined for markets in the Northeast or Midwest US. In the past striped bass were frequently sold to consumers labeled as other kinds of fish. In recent years there has been a change towards selling striped bass under its own name, or simply as “rock fish”.

9.2.4 Economic Impact of Commercial Fishing

The NCDMF collects commercial fishing landings and effort data through its trip ticket program. Among many other functions, this data is used to estimate the economic impact of the commercial fishing industry on a statewide as well as species specific basis. The trip ticket program provides data that allows several methods to be employed when estimating the economic impacts of commercial fishing.

The best information available to estimate recreational economic impacts is the number of trips taken and average trip expenditures. While this data is available for commercial fishing as well, it is somewhat rudimentary to use when examining economic impacts on a species specific level. When utilizing this methodology, all trip expenditures are assigned to one species, even when several species may be landed in a single trip. This often leads to overly inflated economic impacts. Due to the more detailed data available for commercial fishing, it is possible to have a more sophisticated approach to estimate the economic impact of a single species by using the ex-vessel value of the catch. Data of this specificity is not available for recreational fishing, therefore it is important to also calculate commercial economic impacts in a similar manner to recreational economic impacts. This is accomplished by using the number of trips landing a given species to provide a more equitable comparison. For this reason commercial economic impacts are included based on all commercial trips landing striped bass (Table 9.6) as well as the ex-vessel value of all striped bass landed commercially (Table 9.7).

The economic impact to the North Carolina economy of commercial trips landing striped bass in 2009 is shown in Table 9.6. These impacts are based on the estimated expenditures and income from all commercial trips where striped bass was landed. The calculations were made using IMPLAN, an economic modeling software. IMPLAN estimates economic impacts by modeling how money is spent and re-spent in an economy. For example, the purchase of insurance for a fisherman’s boat helps employ an insurance agency, which then must purchase business supplies from another store and pays its employees. IMPLAN tracks these expenditures as money is spent and re-spent until it leaves the state’s borders. Commercial fishermen in North Carolina operate almost exclusively as independent businessmen; because of this, the commercial fishing model native to IMPLAN is somewhat imprecise. Using recent expenditure data gathered from commercial fishermen in the inshore fisheries, total expenditures for striped bass-landing commercial trips for 2009 are as follows:

Total commercial expenditures = (t*Ẽ) + (n*(t/tall)*Ỹ) + (n*(t/tall)*Ĩ)

where t = number of striped bass-landing trips, $\tilde{E}$=median per-trip expenditures, n = number of striped bass-landing fishermen, tall = total trips taken by striped bass-landing fishermen throughout the year, $\tilde{Y}$=median yearly fixed expenditures, and $\tilde{I}$=median proprietary income.

Analysis using the IMPLAN model for North Carolina estimated the total economic impact of commercial striped bass landing trips to be $3.97 million. Economic inputs are the costs associated with the fishing trips (such as fuel, insurance, and net purchases); proprietary income is the profit margin for the fishermen's businesses. The sum of these two factors is equal to the trip ticket value for those trips:

Table 9.6 Economic impact of commercial trips landing striped bass in North Carolina, 2009. IMPLAN 2.0.

Category	Dollar amount or N
Economic inputs (costs)	$2,284,578
Proprietary income (profits)	$189,089
Additional economic activity generated	$1,493,027
Additional jobs supported	49
Total economic Impact	**$3,966,694**

The economic impact of commercial striped bass landings to the North Carolina economy in 2009 is shown in Table 9.7. These impacts are based on the ex-vessel value ($747,308) for all reported commercial landings of striped bass in 2009. The calculations were also made using IMPLAN economic modeling software. To obtain these calculations, the commercial fishing model native to IMPLAN was modified to more accurately reflect the expenditures and participation of the North Carolina commercial fishery. Using 2009 data, the economic impacts of commercial striped bass landings in North Carolina were $1.3 million. With this method, it is assumed that the ex-vessel value (economic inputs) is equal to the expenditures (costs) as well as the proprietary income (profits) resulting from a given species. If this were not the case, the fishermen would not be making a profit and like any business would cease to operation.

Table 9.7 Economic impact of commercial striped bass landings in North Carolina, 2009. IMPLAN Pro 3.0.

Category	Dollar Amount or N
Economic inputs (costs+profits)	$747,308
Additional economic activity generated	$557,449
Additional jobs supported	59
Total economic impact	**$1,304,757**

The economic sectors most affected by commercial catch of the fishery are wholesale trade, oil and gas sales, domestic trade, home work and repair, government spending, boat building/repair, realty, medical services, food services, and international trade. It is very important to note that both models for estimating the commercial economic impacts do not include the post-landings economic effects of striped bass, only the business inputs from the commercial fishermen. The economic effects of striped bass landings on dealers, seafood markets, restaurants, and shipping interests requires data that is not currently available. The economic impacts from these additional sectors is substantial. The NCDMF is currently working to estimate expenditures of licensed seafood dealers in North Carolina to add to the IMPLAN model, further improving the estimates for the economic impact of the striped bass commercial sector.

9.3 RECREATIONAL FISHING

Annually, there are four survey programs in North Carolina that collect data from recreational striped bass anglers. Figure 9.10 shows the areas covered by these surveys. The Marine Recreational Information Program (MRIP) collects data from the ocean and portions of inside waters in the ASMA and CSMA. Data are also collected up into the major river systems, but not far enough to cover the entire range where striped bass are caught. The NCDMF conducts the ASMA striped bass creel survey to estimate angler effort, catch, and harvest during the spring and fall harvest seasons. In the CSMA the survey is conducted year-round. The MRIP survey overlaps coverage in parts of the ASMA and CSMA with regard to internal waters. The NCWRC conducts the RRMA striped bass creel survey to estimate angler effort, catch, and harvest during the spring harvest season. In some years estimates of angler effort and catch and release of striped bass after the harvest season closes are also made (depending upon available funding). Unlike the MRIP survey which is designed to make estimates on all fishing trips and species landed, the ASMA and RRMA striped bass creel surveys are designed specifically to generate the various estimates associated with striped bass trips only.

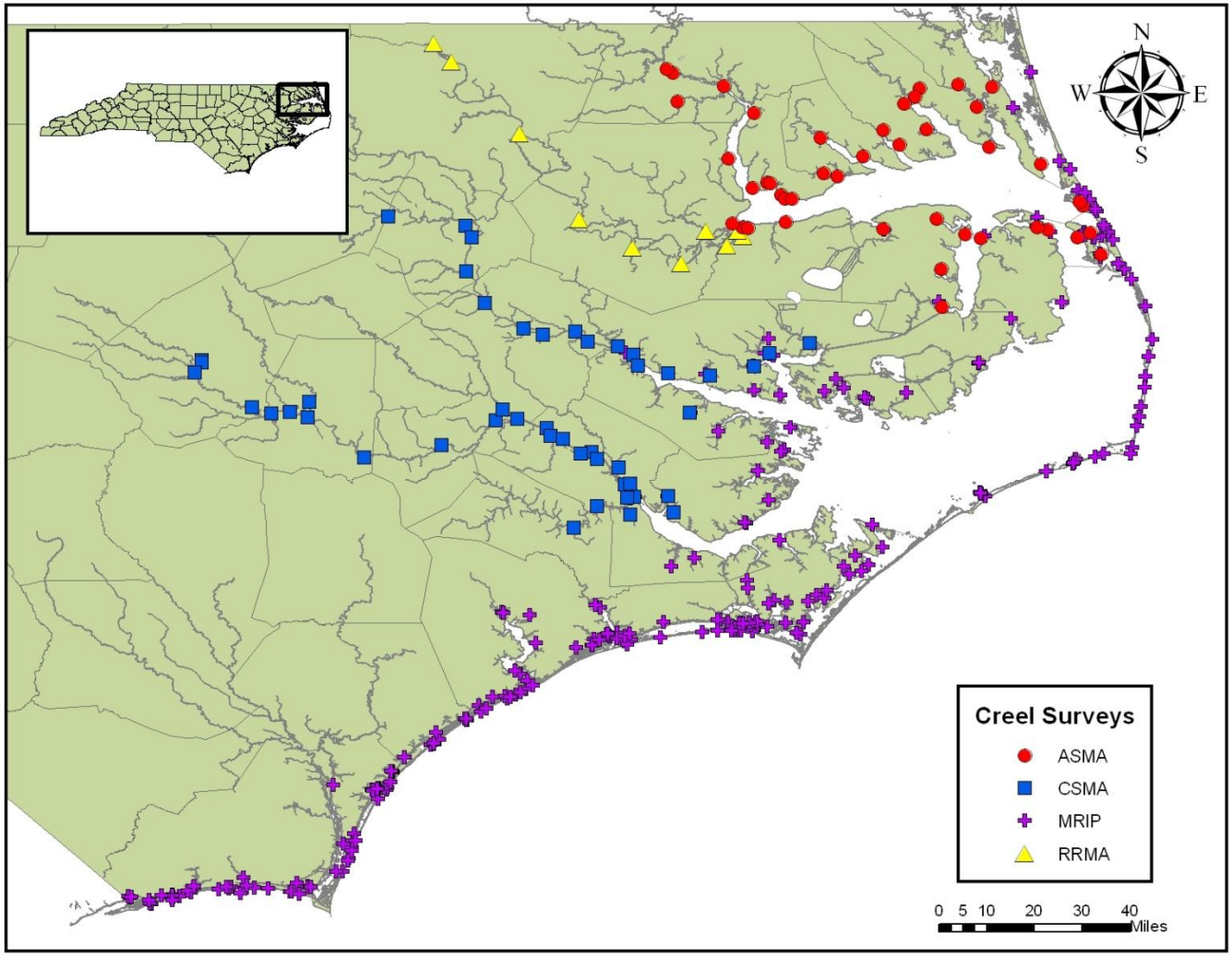

Figure 9.10 Map of annual recreational fishing surveys conducted in North Carolina.

9.3.1 Historical Trends in Landings

ASMA Creel Survey. Since 1991 the NCDMF has conducted a recreational creel survey in the ASMA. The survey samples fishermen throughout the ASMA each season and then estimates angler hours, the number of fish harvested, pounds harvested, and the number of fish released. In the fall of 2005 the Northern District of the NCDMF changed the design of its striped bass creel survey to more accurately reflect fishing pressure estimates and harvest estimates. This new design was the same design as used by NCDMF personnel for striped bass creel surveys in the CSMA, and NCWRC personnel for striped bass creel surveys in the RRMA, allowing for a more statistically valid comparison of effort and harvest data between the various management areas.

Catch and effort data were collected through on-site interviews at boat ramps during allowed harvest days for each of four ASMA sampling zones. Statistics were calculated through a non-uniform probability access-point creel survey (Pollock et al. 1994). Site probabilities were set in proportion to the likely use of a site according to time of day, day of week, and season. Probabilities for this survey were assigned based on seasonal striped bass fishing pressure observed during past surveys, in addition to anecdotal information (personal communication NCDMF Sara Winslow and Kathy Rawls). Probabilities can be adjusted during the survey period according to angler counts to provide more accurate estimates. Morning and afternoon periods were assigned unequal probabilities of conducting interviews, with each period representing half a fishing day. A fishing day was defined as 1.5 hours after sunrise until 1.0 hour after sunset. These values varied among sites within zones due to differing fishing pressure.

In the early years of the survey length of harvest days varied considerably. During the late 1980s and early 1990s overall striped bass abundance was very low. Due to very successful spawning in 1988 and 1989, stock abundance began to increase. Record high juvenile production in the early 1990s meant that by 1994 the A/R striped bass stock had increased significantly in abundance, and recreational interest in striped bass fishing was increasing as well. Even with strict regulations allowing harvest on only three days during the week, between 1994 and 1998 the seasons were open an average of only 14 days before the TAC was reached (Table 9.6).

In recent years angler hours have decreased slightly. During the period 2000 – 2004 angler hours averaged 49,739 per year. From 2005 – 2009 yearly angler hours averaged 35,907 (Table 9.7).

Table 9.8 NCDMF ASMA striped bass creel survey, 1991 – 2009 (NCDMF).

Season		Length in days	Angler hours	Number of fish harvested	Average number of fish harvested per day	Average weight of each fish harvested	Total pounds harvested	Average number of pounds harvested per day	Number of fish released	Average number of fish released per day	Number of fish measured by creel clerks
1991	Spring	113		9,978	88	2.5	24,561	217	11,701	104	
	Fall	30		4,417	147	2.4	10,783	359	11,839	395	
1992	Spring	120		8,034	67	2.9	23,582	197	13,167	110	
	Fall	30		2,508	84	2.9	7,176	239	6,814	227	
1993	Spring	77		11,404	148	3.2	36,049	468	13,241	172	
	Fall	No fall season		--	--	--	--	--	--	--	--
1994	Spring	12		4,005	334	3.5	14,087	1,174	no data	no data	495
	Fall	7		4,586	655	3.5	16,130	2,304	no data	no data	684
1995	Spring	9		4,240	471	4.1	17,355	1,928	no data	no data	452
	Fall	15		3,103	207	4.3	13,209	881	no data	no data	502
1996	Spring	8		4,374	547	3.4	14,851	1,856	no data	no data	469
	Fall	14	6,349	3,059	219	4.7	14,335	1,024	no data	no data	487
1997	Spring	5	4,332	4,941	988	3.5	17,315	3,463	6,111	1,222	620
	Fall	21	9,324	1,960	93	4.8	9,409	448	24,660	1,174	468
1998	Spring	18	38,760	9,310	517	3.3	30,709	1,706	25,060	1,392	1,276
	Fall	28	52,060	10,256	366	3.3	34,052	1,216	66,828	2,387	1,963
1999	Spring	37	36,477	10,137	274	3.6	36,970	999	32,742	885	1,722
	Fall	24	27,965	6,830	285	3.6	24,477	1,020	7,579	316	695
2000	Spring	67	53,957	13,993	209	3.7	51,428	768	23,205	346	1,410
	Fall	32	46,468	24,092	753	2.7	64,986	2,031	55,736	1,742	1,746
2001	Spring	53	49,307	17,582	332	2.7	47,448	895	16,737	316	1,783
	Fall	24	60,380	22,545	939	3.2	71,197	2,967	44,681	1,862	2,581
2002	Spring	52	57,549	17,989	346	3.3	59,297	1,140	20,502	394	2,274
	Fall	32	39,931	9,907	310	3.4	33,352	1,042	31,053	970	899
2003	Spring	61	44,588	8,937	147	3.4	30,141	494	14,283	234	724
	Fall	64	42,704	6,187	1,086	0.3	21,653	338	10,998	172	682
2004	Spring	62	53,794	13,728	221	3.5	48,577	784	22,346	360	1,028
	Fall	58	48,711	14,276	246	3.4	48,520	837	18,695	322	1,826
2005	Spring	79	25,397	6,133	78	3.4	21,117	267	4,396	56	826
	Fall *	92	61,546	11,821	128	3.6	42,360	460	16,824	183	809
2006	Spring	120	27,380	3,967	33	3.6	14,354	120	2,482	21	180
	Fall	92	38,377	6,744	73	3.2	21,631	235	6,973	76	558
2007	Spring	126	29,715	4,569	36	3.6	16,410	130	5,537	44	204
	Fall	92	31,964	2,574	28	4.0	10,223	111	8,062	88	226
2008	Spring	121	30,538	3,227	27	3.8	12,140	100	19,375	160	254
	Fall	92	42,135	6,821	74	2.9	19,488	212	17,084	186	379
2009	Spring	120	39,631	8,164	68	2.8	22,904	191	30,896	257	296
	Fall	92	32,390	3,905	42	3.7	14,409	157	9,647	105	253

CSMA Creel Survey. The 2004 North Carolina Estuarine Striped Bass Fishery Management Plan addressed having no creel survey to represent the CSMA as an issue for evaluating striped bass stocks of North Carolina. A comprehensive creel survey was initiated in January 2004 to identify the recreational component of striped bass harvests in the CSMA.

The CSMA survey area includes the Neuse, Tar/Pamlico, and Pungo rivers. A non-uniform probability stratified access-point survey (Pollock et al. 1994) was utilized for site selections as well as effort and catch estimation. Returning fishing parties were interviewed to obtain information regarding the trip, catch (harvest and discard), and socioeconomic attributes of striped bass anglers.

Recreational catch and effort of striped bass within the CSMA were highest in the first year of the survey with 22,959 lbs landed from 12,780 striped bass fishing trips. Catch and effort declined throughout the reported time period with a low of 3,062 lbs harvested during 3,013 trips in 2009 (Table 9.8). Management strategies to reduce recreational harvest and effort became effective in 2008 and appear to have had the desired result.

Table 9.9 CSMA recreational striped bass catch and effort estimates, 2004 through 2009.

Year	Striped Bass Trips	Striped Bass Hours Fished	Number Landed	Pounds Landed	Number Released
2004	12,780	63,791	6,142	22,959	13,555
2005	9,608	44,313	3,909	15,299	16,763
2006	6,055	30,889	2,483	7,355	14,898
2007	6,321	37,088	3,599	10,796	23,528
2008*	3,931	21,296	842	2,991	17,873
2009*	3,013	20,696	896	3,062	6,246

*

Restriction went in place 1 July 2008 (closing CSMA seasonally and total closure on Cape Fear). Striped bass season is October 1 through April 30th.

MRIP. In response to the reauthorization of the Magnuson Stevens Fisheries Conservation and Management Act (MSA), the National Marine Fisheries Service (NMFS) initiated steps to improve data collection from recreational fishing through the development of the Marine Recreational Information Program (MRIP).

MRIP has replaced the Marine Recreational Fisheries Statistics Survey (MRFSS) as the primary source of catch and effort data from the recreational fishery. MRIP consists of several surveys to provide coverage of saltwater sport fishing (including estuarine and brackish water) from private/rental boats, charter and headboats, manmade structures, and the shore throughout North Carolina.

Within MRIP, there are several complimentary surveys used to produce estimates of catch and effort for the striped bass recreational fishery. These surveys include the Access-Point Angler Intercept Survey (APAIS), Coastal Household Telephone Survey (CHTS), and the For-Hire Survey (FHS). The CHTS utilizes a random digit dialing telephone survey approach to collect marine recreational fishing effort information from residential households located in coastal counties to determine fishing effort (trips) from the man-made, beach/bank, and private boat modes. Estimates of charterboat, guideboat, and headboat fishing effort are produced through

the FHS. Individual catch and discard data for calculation of catch rate at the species level are collected through APAIS, an onsite intercept survey conducted at fishing access-sites. Creel clerks collect intercept data year-round (in two-month waves) by interviewing anglers completing fishing trips in one of four fishing modes (man-made structures, beaches, private boats, and for-hire vessels). Results from the complimentary surveys are combined at the state, area, fishing mode and wave level to provide estimates of the total number of fish caught, released, and harvested; the weight of the harvest; the total number of trips; and total participation in marine recreational fishing.

All estimates generated through MRIP include the proportional standard error (PSE), which is a measure of the precision of the estimate. The PSE is calculated by dividing the standard error of the estimate by the estimate to express the standard error as a percentage allowing the reader to make quick comparisons of precision among surveys. Small PSEs (less that 20%) indicate precise estimates while high PSEs (greater than 20%) are less reliable.

In North Carolina, access sites surveyed through the APAIS are recognized as any site where the likelihood of encountering marine species may exist. These sites do not extend much farther inland than the boundaries established for the coastal zone. Therefore, portions of the state coastal area sampled through MRIP overlap with the more specialized ASMA and CSMA striped bass surveys.

Only sites located in the eastern portion of the ASMA are covered through MRIP sampling. These sites are located at Mann's Harbor, Manteo, Wanchese, Oregon Inlet, Kill Devil Hills, Kitty Hawk, and Southern Shores. Anglers intercepted at these sites fish primarily in Croatan, Roanoke, and Pamlico Sounds. Occasionally, anglers fishing in the most eastern section of Albemarle Sound near Mashoes Light are also intercepted. Additionally, MRIP does not collect landings for striped bass in the Tar, upper Pamlico, upper Neuse, Trent, or Cape Fear rivers where there are known landings.

Table 9.9 shows landings estimates from MRIP for the Atlantic Ocean by mode of fishing, and year.

Table 9.10 Landings of striped bass from the Atlantic Ocean, by mode, 1988 through 2009. (NC MRIP).

Year	Mode of fishing	Number landed	Pounds landed	Average fish weight (lbs)	Year	Mode of fishing	Number landed	Pounds landed	Average fish weight (lbs)
1988	Private/Rental	367	972	2.6	2001	Manmade	4,404	10,276	2.3
	Total	367	972	2.6		Beach/Bank	7,317	130,437	17.8
1991	Beach/Bank	391	3,882	9.9		Charter	2,671	47,077	17.6
	Total	391	3,882	9.9		Private/Rental	25,623	420,827	16.4
1992	Beach/Bank	967	16,197	16.7		Total	40,015	608,617	15.2
	Total	967	16,197	16.7	2002	Manmade	1,493	24,447	16.4
1993	Beach/Bank	264	3,029	11.5		Beach/Bank	3,820	62,697	16.4
	Total	264	3,029	11.5		Charter	2,900	54,363	18.7
1994	Beach/Bank	3,758	53,739	14.3		Private/Rental	25,397	461,079	18.2
	Private/Rental	3,667	17,456	4.8		Total	33,610	602,586	18.0
	Total	7,425	71,195	9.6	2003	Beach/Bank	5,823	105,404	18.1
1995	Manmade	507	6,665	13.1		Charter	4,649	77,661	16.8
	Beach/Bank	3,590	49,024	13.7		Private/Rental	38,042	665,353	17.4
	Charter	654	9,183	14.0		Total	48,514	848,418	17.4
	Private/Rental	6,699	93,226	13.9	2004	Manmade	3,343	64,328	19.2
	Total	11,450	158,098	13.8		Beach/Bank	4,096	75,093	18.3
1996	Manmade	1,908	17,630	9.2		Charter	21,727	449,663	20.7
	Beach/Bank	6,970	84,258	12.1		Private/Rental	249,103	4,985,703	20.1
	Charter	3,061	39,936	13.0		Total	278,269	5,574,787	20.1
	Private/Rental	5,196	57,853	11.1	2005	Beach/Bank	239	5,276	22.0
	Total	17,135	199,677	11.6		Charter	8,474	170,083	20.1
1997	Manmade	3,034	41,149	13.6		Private/Rental	96,284	2,019,685	20.9
	Beach/Bank	11,451	133,261	11.6		Total	104,997	2,195,044	20.9
	Charter	5,385	84,412	15.7	2006	Beach/Bank	2,792	57,670	20.7
	Private/Rental	27,282	349,156	12.8		Charter	2,524	48,296	19.2
	Total	47,152	607,978	12.9		Private/Rental	85,438	2,047,262	24.0
1998	Manmade	1,105	16,076	14.5		Total	90,754	2,153,228	23.8
	Beach/Bank	7,113	108,440	15.2	2007	Beach/Bank	2,325	60,549	26.0
	Charter	5,364	90,678	16.9		Charter	4,718	96,440	20.5
	Private/Rental	17,098	200,392	11.7		Private/Rental	38,460	891,591	23.1
	Total	30,680	415,586	13.5		Total	45,503	1,048,580	23.0
1999	Manmade	302	3,272	10.8	2008	Manmade	3,180	64,579	20.3
	Beach/Bank	4,623	54,996	11.9		Charter	3,914	87,626	22.5
	Charter	5,201	60,968	11.7		Private/Rental	37,795	786,498	20.7
	Private/Rental	36,672	437,686	11.9		Total	44,889	938,703	20.8
	Total	46,798	556,922	11.9	2009	Charter	3,623	104,401	28.9
2000	Manmade	1,004	6,863	6.8		Private/Rental	3,752	105,455	28.2
	Beach/Bank	1,865	23,886	13.4		Total	7,375	209,856	28.5
	Charter	4,675	94,879	20.3		**Grand Total**	**869,462**	**16,400,627**	**18.9**
	Private/Rental	5,363	60,649	13.7					
	Total	12,907	186,277	15.5					

MRIP collection of striped bass landings began in 1988 when overall landings were low. Landings in these early years varied greatly from estimates of 264 fish in 1993 to 48,513 in 2003. The availability of striped bass in the Atlantic Ocean off of North Carolina increased substantially in the early 2000's. Prior to 2004, MRIP did not survey during wave 1 (January/February), however the increased abundance of striped bass prompted NCDMF to initiate wave 1 sampling in 2004. As a result, landing dramatically increased from 848,416 lbs in 2003 to a record high of 5,574,787 lbs in 2004. Landings remained relatively high until 2007 before falling below a million pounds. Environmental conditions influencing the southern migration of striped bass during winter likely resulted in both reduced effort and catch.

Table 9.11 shows landings estimated by MRIP for Atlantic Ocean waters. Fish harvested from the ocean averaged 18.9 lbs

Table 9.11 Striped bass landings from the Atlantic Ocean, 1988 through 2009. (MRIP)

Year	Number landed	Pounds landed	Year	Number landed	Pounds landed
1988	367	972	2000	12,908	187,276
1989			2001	40,016	608,617
1990			2002	33,610	602,586
1991	391	3,882	2003	48,513	848,416
1992	967	16,197	2004	278,270	5,574,787
1993	264	3,029	2005	104,997	2,195,043
1994	7,426	71,195	2006	90,753	2,153,231
1995	11,450	158,096	2007	45,502	1,048,581
1996	17,136	199,675	2008	44,890	938,703
1997	47,152	607,978	2009	7,375	209,856
1998	30,680	415,585	**Total**	**869,462**	**16,400,627**
1999	46,798	556,922			

RRMA Creel Survey. The NCWRC estimates striped bass harvest from the RRMA using an intensive creel survey when the spring harvest season is open (2009 harvest season: March 1 through April 30 for the entire river). The NCWRC allocates the entire allowable harvest (137,500 lbs. in 2009) for the RRMA during the spring season whereas NCDMF allots half their allowable harvest (137,500 lbs. in 2009) in the ASMA during the spring and half during the fall. Besides harvest estimates, the NCWRC estimates the total number of striped bass caught and released during the harvest season (Table 9.11). In some years, the NCWRC also monitored catch & release of striped bass after the harvest season closed, termed the post-harvest period.

Table 9.12 Recreational fishing trips landing striped bass from the RRMA. The number of striped bass harvested excludes numbers of striped bass caught and released during the harvest season. (NCWRC).

	Open Season (Harvest estimates)				Post-Harvest Period (Catch and Release Only)			
Year	Number of striped bass	Weight (lbs)	Effort (angler-hours)	Number of trips**	Number of striped bass	Weight (lbs)	Effort (angler-hours)	Number of trips**
1989	153,185	32,107	46,566	9,803	*	*	*	*
1990	106,073	42,204	56,169	11,825	*	*	*	*
1991	26,934	72,529	74,596	15,704	*	*	*	*
1992	13,372	36,016	49,277	10,374	*	*	*	*
1993	14,325	45,145	52,932	11,144	*	*	*	*
1994	8,284	28,089	44,693	9,409	*	*	*	*
1995	7,471	28,883	56,456	11,885	52,698	*	20,639	4,345
1996	8,367	28,178	46,164	9,719	148,222	*	32,743	6,893
1997	9,364	29,997	23,139	4,871	271,328	*	47,001	9,895
1998	23,109	73,541	72,410	15,244	102,299	*	26,367	5,551
1999	22,479	72,967	72,717	15,309	113,394	*	30,633	6,449
2000	38,206	120,091	95,622	20,131	*	*	*	*
2001	35,231	112,805	100,119	21,078	*	*	*	*
2002	36,422	112,698	122,584	25,807	*	*	*	*
2003	11,157	39,170	77,863	16,392	*	*	*	*
2004	26,506	90,191	145,782	30,691	*	*	*	*
2005	34,122	107,530	130,755	27,527	68,147	*	24,146	5,083
2006	25,355	84,521	120,621	25,394	24,719	*	15,235	3,207
2007‡	19,305	62,492	141,874	29,868	11,622	*	9,254	1,948
2008‡	10,541	32,725	110,608	23,286	47,992	*	17,764	3,740
2009	23,248	69,581	120,675	25,405	*	*	*	*

9.3.2 Recreational Fishing Activity

The NCDMF creel survey estimates anglers targeted striped bass for approximately 72,021 hours during the spring and fall seasons of 2009. This is down from the high in the series in which anglers targeted striped bass for 108,687 hours in the spring and fall of 2001 (Table 9.7). The majority of fishermen interviewed lived in the county where they were fishing. Nearly all the other fishermen were from surrounding counties. Counties closer to the Virginia border were more likely to have fishermen who traveled from there to fish.

The number of Atlantic Ocean directed striped bass trips fluctuated while exhibiting an increase as fish became more abundant. The number of directed trips (those targeting or catching striped bass) was greatest in 2004 with 398,151 trips but has since declined to 100,034 trips in 2009. Directed trips are calculated by applying the ratio of samples where anglers target striped bass or had striped bass in their catch to the overall estimate of angler trips (Table 9.12).

Table 9.13 Directed Atlantic Ocean striped bass recreational fishing trips, 1988 through 2009. (NC MRIP).

Year	Fishing Mode	Directed Trips	Year	Mode	Directed Trips
1988	Private/Rental boat	1,333	2001	Beach/bank	48,549
	Total	**1,333**		Charter boat	2,945
1989	Private/Rental boat	0		Man-made shore	9,051
	Total	**0**		Private/Rental boat	39,491
1991	Beach/bank	18,396		**Total**	**100,036**
	Man-made shore	230	2002	Beach/bank	45,934
	Private/Rental boat	256		Charter boat	2,241
	Total	**18,882**		Man-made shore	9,242
1992	Beach/bank	3,604		Private/Rental boat	74,335
	Private/Rental boat	1,541		**Total**	**131,752**
	Total	**5,145**	2003	Beach/bank	38,999
1993	Beach/bank	11,717		Charter boat	3,776
	Man-made shore	1,163		Man-made shore	6,028
	Private/Rental boat	341		Private/Rental boat	71,453
	Total	**13,221**		**Total**	**120,256**
1994	Beach/bank	52,509	2004	Beach/bank	53,158
	Man-made shore	2,501		Charter boat	13,587
	Private/Rental boat	6,144		Man-made shore	25,418
	Total	**61,154**		Private/Rental boat	305,988
				Total	**398,151**

Table 9.13 (continued).

Year	Fishing Mode	Directed Trips	Year	Mode	Directed Trips
1995	Beach/bank	41,679			
	Charter boat	1,049	2005	Beach/bank	52,071
	Man-made shore	3,818		Charter boat	5,466
	Private/Rental boat	15,923		Man-made shore	4,969
	Total	**62,469**		Private/Rental boat	145,665
1996	Beach/bank	89,915		**Total**	**208,171**
	Charter boat	3,260	2006	Beach/bank	103,037
	Man-made shore	29,802		Charter boat	4,172
	Private/Rental boat	21,292		Man-made shore	1,170
	Total	**144,269**		Private/Rental boat	119,588
1997	Beach/bank	122,897		**Total**	**227,967**
	Charter boat	6,200	2007	Beach/bank	71,621
	Man-made shore	22,087		Charter boat	4,063
	Private/Rental boat	42,065		Man-made shore	5,530
	Total	**193,249**		Private/Rental boat	96,192
1998	Beach/bank	96,229		**Total**	**177,406**
	Charter boat	5,679	2008	Beach/bank	72,867
	Man-made shore	24,364		Charter boat	2,527
	Private/Rental boat	44,942		Man-made shore	13,941
	Total	**171,214**		Private/Rental boat	136,119
1999	Beach/bank	41,714		**Total**	**225,454**
	Charter boat	9,084	2009	Beach/bank	29,054
	Man-made shore	6,148		Charter boat	2,858
	Private/Rental boat	66,492		Man-made shore	5,187
	Total	**123,438**		Private/Rental boat	62,935
2000	Beach/bank	90,883		**Total**	**100,034**
	Charter boat	2,451			
	Man-made shore	14,444		**Grand Total**	**2,616,116**
	Private/Rental boat	24,737			
	Total	**132,515**			

The NCWRC collects angler effort data on the number of hours anglers fish for striped bass in the RRMA. Angler effort is divided by an estimated average of 4.75 hours per fishing trip to determine the number of trips taken to harvest striped bass during the open season and in some years, post-harvest season (Table 9.11). "Number of striped bass," is the number of striped bass harvested during the harvest season each year and does not include the total number of striped bass caught and released during the harvest season. Harvest and trip estimates are available in 1989 and 1990, although striped bass were not managed with a TAC in the RRMA until 1991. From 1991 through 1996, the number of trips taken by anglers to reach the quota of striped bass (TAC = 29,400 lbs between 1991 and 1996) ranged between 9,400 and 15,700 trips. In 1997, striped bass anglers reached the quota of 29,400 lbs in 4,900 trips, the fewest estimated trips; likely related to a relatively short harvest season (15 days). In 1998 and 1999, the TAC in the RRMA was increased to 62,700 and 68,970, respectively; the quota was exceeded in an estimated 15,000 fishing trips each year. From 2000 to 2003, the quota was increased to 112,500 lbs and exceeded in each year, except for 2003 when higher flows and cooler water temperatures likely contributed to a decline in angling effort and subsequent harvest. Following a TAC increase to 137,500 lbs of striped bass in 2004 and continuing through 2009, the number of striped bass fishing trips ranged from 23,286 to 30,691 trips with annual harvest estimates well below the quota during those years, especially in 2008. Although harvest estimates were relatively low in 2008, nearly 23,286 angler trips were expended for an estimated catch of 141,646 striped bass, comprised mostly of sub-legal male striped bass from the strong 2006 cohort (age-2) (Thomas et al. 2009).

9.3.3 Economic Value of the Recreational Fishery

NCWRC. During the 2006 striped bass creel survey on the RRMA, NCWRC staff estimated expenditures by striped bass angler trips. Following questions related to angler effort and striped bass catch and harvest, creel clerks inquired the associated expenditures (bait, lodging, fuel, food, guide fees and other expenses) to participating angling parties. An estimate of the economic value of the 2006 Roanoke River recreational striped bass fishery was determined as the product of the total estimated angler-hours and the overall mean expense per angler-hour (Malvestuto 1983). Standard error for the economic value was approximated using the Taylor Expansion Series (Sheps and Menken 1973). Mean total expenditures for striped bass anglers during the 2006 season in the RRMA was $1,546,332 (SE = $80,659; McCargo et al. 2007). Mean expenditures per trip were calculated for striped bass anglers during the allowed harvest periods (1 March to 22 April below Hwy 258 in Zone 2, 15 March to 30 April in Zone 1) and post-harvest period (May 1 to May 31 in Zone 1) on the Roanoke River (Table 9.13). Anglers fishing during the harvest season spent an estimated $87.60 per fishing trip whereas anglers fishing during the catch and release season spent $200.76 per fishing trip, more than twice as much per fishing trip.

Table 9.14 Mean expenditures (US$) by recreational striped bass angler trip by season (harvest or catch and release only) in the RRMA, 2006 (McCargo et al., 2007). Sample size is the number of angler parties interviewed for expenditure information of total number of striped bass parties interviewed during the creel survey.

	Catch and release ($) (N=96 of 120)	**Catch and Keep ($) (N=456 of 630)**
Lodging	40.63	7.65
Bait	25.95	9.25
Fuel	71.07	38.11
Food	37.18	16.23
Other‡	25.94	16.35
Total	**200.76**	**87.60**

‡ Includes guide fees

Table 9.15 Expenditures by recreational striped bass anglers in the RRMA, 1998 (Schuman, 1999).

	Catch and release ($) (N=146)	**Catch and keep ($) (N=213)**
Lodging	8.83	1.08
Bait	7.37	5.65
Fuel	5.03	4.08
Guide	38.77	3.02
Other	9.55	7.00
Total	**69.55**	**20.83**

Prior to the 2006 study, Schuhmann (1999) measured the economic value of the recreational fishery in the Roanoke River areas covered by the 1998 NCWRC creel survey. Economic value was determined using a willingness to pay analysis and a measurement of actual expenditures. Anglers were separated into two groups: catch and release vs. catch and keep. The economic value of the fishery was determined as "the benefits realized by the recreational anglers over and above the actual expenditures" (Schuhmann, 1999). Overall willingness to pay to catch a fish ranged from $796,500 to $814,000 (in 1998 dollars), with 95% of that amount coming from the striped bass catch and release fishery. Anglers who participated in catch and release incurred approximately $70 in expenses per trip while the average catch and keep angler incurred $22 in additional expenses. Average additional expenses are shown in Table 9.14. When the data are aggregated across all anglers, these expenditures amounted to approximately $918,000 in revenues that may have been realized by local businesses (Schuhmann 1999).

Comparing these two studies, expenditures between the season appear similar with anglers fishing during the catch and release season spending more money than those fishing during the harvest season. Although reasons for differences in expenditures are difficult to relate directly to each fishery, a mail survey of striped bass anglers on the Roanoke River in 2007 indicated that catching fish is more important than keeping fish (Linehan 2008). Adjusting the Schuhmann (1999) estimate for inflation may allow for a closer comparison for the two estimates. Calculated in 2006 dollars with an inflation calculator (U.S. Bureau of Labor Statistics 2010), the 1998 estimate is $1,135,391 and about $400,000 less than the estimate by McCargo et al. (2007). The economic growth potentially realized is likely related to the continued expansion of the A/R striped bass stock on the spawning grounds near Weldon each year.

NCDMF. The NCDMF collects data about saltwater recreational fishing in conjunction with MRIP. Combining the most recent trip estimates with the average estimated expenditures per inshore saltwater recreational trips in 2009, the total expenditures are as follows:

Total recreational expenditures = $(t*\bar{E})$

where t = number of striped bass-targeting and -landing trips and $\bar{E}$=mean per-trip expenditures.

As with the commercial analysis, an input-output model was generated using IMPLAN. The economic sectors most affected by efforts in the recreational fishery are food stores, wholesale trade, oil and gas sales, domestic trade, ice manufacture, hotels, charter fees, realty, home work and repair, business management, food services, and medical services. The estimated combined impact of striped bass-related saltwater trips in North Carolina was $38,255,800 in 2009 across all modes (beach, charter, private boat, and piers) (Table 9.15).

Table 9.16 Economic impact of the striped bass related saltwater angling trips in North Carolina, 2009. IMPLAN 2.0.

Category	Dollar amount or N
Direct expenditures	$26,695,260
Additional economic activity generated	$14,560,540
Additional jobs generated	477
Total economic Impact	**$41,255,800**

Dumas (2009) studied the commercial charter fleet and estimated the impact of striped bass-related charter trips at $7,735,246.

9.4 DEMOGRAPHIC CHARACTERISTICS

9.4.1 Commercial Fishermen

The socioeconomic program at the NCDMF has been conducting a series of in-depth interview-style surveys with commercial fishermen along the coast since 2001. Data from these interviews is added to a growing database and used for fishery management plans, among other uses. A total of 58 of the fishermen in the database reported commercial landings of striped bass. This is about 6% of the total commercial fleet. That group is used to provide a snapshot of North Carolina fishermen who catch striped bass.

The demographic characteristics of the striped bass-reporting fishermen surveyed by the Socioeconomic Program over the past five years are shown in Table 9.7. Nearly all were white males, with an average age of 51 and over 28 years of commercial fishing experience. Three quarters of them had a high school diploma and 31% had at least some college education. Over half exceeded $30,000 in household income when surveyed, with 29% bringing in $50,000 or more. Only 10% had less than $15,000 in annual household income (Table 9.16).

Fishing accounted for almost two-thirds (65%) of the household income from these fishermen. They are least likely to fish from December through February, which is the slowest time of the year for most fishermen.

Table 9.17 Demographic characteristics of striped bass commercial fishermen.

	N = 58	Average or %
Years Fishing		28
Age		51
Gender		
	Male	97%
	Female	3%
Race		
	White	98%
	Black	2%
	other	1%
Education Level		
	Less than High School	28%
	High School Graduate	41%
	Some College	21%
	College Graduate	10%
Marital Status		
	Married	83%
	Divorced	10%
	Widowed	
	Never Married	
	Separated	7%
Total Household Income		
	Less than $15,000	10%
	$15,001 - $30,000	28%
	$30,001 - $50,000	22%
	$50,001 - $75,000	24%
	More than $75,000	5%

9.4.2 Recreational Fishermen

Beginning in 2007, North Carolina required coastal recreational anglers to purchase a Coastal Recreational Fishing License (CRFL). One of the stated reasons for the creation of the CRFL was to enable more complete surveying of recreational anglers than are allowed by the MRFSS. Accordingly, the NCDMF began gathering socioeconomic information on hook-and-line recreational fishermen in 2009. In a study of 610 CRFL holders, 265 (43%) reported that they fish for striped bass. Like commercial fishermen, CRFL holders are primarily white males with an average age close to 50, but the recreational anglers have generally higher education and household incomes (Table 9.17).

Table 9.18. Demographic characteristics of recreational striped bass anglers.

Variable	N = 265	Average or %
Years Fishing		28
Age		48
Gender		
	Male	93%
	Female	7%
Race		
	White	93%
	Black	3%
	Other	4%
Education Level		
	High School Grad or less	26%
	Some College	34%
	College Graduate	26%
	Graduate School	13%
Marital Status		
	Married	80%
	Divorced	6%
	Widowed	1%
	Never Married	9%
	Separated	2%
Total Household Income		
	Less than $15,000	1%
	$15,001 - $30,000	8%
	$30,001 - $50,000	17%
	$50,001 - $75,000	19%
	More than $75,000	35%
	Prefer not to answer	19%