ASSESSMENT OF NORTH CAROLINA COMMERCIAL FINFISHERIES, 2007-2012

By

North Carolina Division of Marine Fisheries

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ASSESSMENT OF NORTH CAROLINA COMMERCIAL FINFISHERIES

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Fishery Section 1

LONG HAUL SEINE FISHERY ASSESSMENT

JOB 1

by

Garry Wright

ABSTRACT

The long haul seine fishery is a multi-species fishery that is active in the estuarine waters of Core and Pamlico Sounds and their tributaries. A swipe or long haul net is when a seine is pulled between one or two boats, depending on the crew's preference. Atlantic croaker (*Micropogonias undulatus*), bluefish (*Pomatomus saltatrix*), spot (*Leiostomus xanthurus*), spotted seatrout (*Cynoscion nebulosus*), and weakfish (*Cynoscion regalis*) were the dominant target species both in catches sampled and in reported landings from the trip ticket program. A total of 46 (2007), 45 (2008), 32 (2009), 40 (2010), and 22 (2011) long haul graded catches were sampled at fish houses during the study period. Long haul trips were made throughout the year with the majority of trips taking place April through October, coinciding with the traditional long haul fishery. The long haul seine fishery contributed 1.0% to the states marketable finfish landings from 2007 through 2011. Catches sampled showed average landings of 5,069 lb per trip, while the commercial trip ticket program reported averaged landings of 1,303 lb per trip. Average pounds per trip (by year) from long haul seine catches sampled were 5,165 lb (2007), 5,851 lb (2008), 4,955 lb (2009), 4,514 lb (2010), and 4,440 lb (2011). Scrap fish (bait) comprised on average 42% (2007), 30% (2008), 28% (2009), 34% (2010), and 38% (2011) of all the sampled catches (average includes zero bait trips). The high percentage of scrap fish landings in the long haul fishery is a continued management concern.

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INTRODUCTION

In 1982, the North Carolina Division of Marine Fisheries (NCDMF) initiated a statewide sampling program for the dominant commercial finfish fisheries. The objective was to obtain biological and fisheries data on economically important fishes for use in management evaluations. This report, covering the 2007 to 2011 long haul seine fishing seasons, is a component of the statewide program. Landings (pounds), mean catch weights (pounds), species composition, and bycatch quantities are presented. Species-specific information, such as size and pounds per trip (Catch per unit effort or CPUE) trends, are presented in the Species Section of this report.

The North Carolina long haul seine fishery (including swipe nets) operates throughout much of North Carolina mainly from Core Sound through northern Pamlico Sound and their tributaries (Figure 1.1). The long haul seine is a net constructed of multifilament webbing (~1,000-1,500 yd) and is towed between two boats. After pulling a distance, the boats come together to circle the net. The net is enclosed (bunted) and the fish removed. The whole operation of setting, pulling, and bunting the net often takes a full day, with fishing usually beginning before sunrise; rarely are two hauls made on one day. A swipe net is a multifilament seine net which is staked or anchored at one end and attached to the boat at the other. The boat then circles or swipes an area subsequently retrieving the anchored or staked end of the net, entrapping the fish. Like the long haul seine the net is bunted and fish are removed. Guthrie et al. (1973) and Cunningham et al. (1992) describe the long haul operation in detail. A change in fishing gear was observed as early as 1992 in which fisherman used monofilament gill net as a swipe net. In a swipe gill net fish are encircled and the net is constricted to the point that the fish become gilled in the net. Once the fish are gilled the net is removed from the water and the fish are picked from the gill net. This is not a traditional haul seine but data from these swipe gill nets appear in the commercial landings data with the same code as traditional long hauls. This trend is most apparent in the northern area of the state during the winter (December to February) and is used to take anadromous species as well as perch (*Perca flavescens* and *Morone Americana*) and catfish (Ictaluridae). It is most likely a response to attendance and mesh size restrictions for gill nets in that area. These catches may occur during other times of the year (spring/summer) in other state waters.

The fishing season is March-April through early November, and the principal target species are Atlantic croaker (*Micropogonias undulatus*), spot (*Leiostomus xanthurus*), weakfish (*Cynoscion regalis*), and occasionally bluefish (*Pomatomus saltatrix*) and spotted sea trout (*Cynoscion nebulosus*). The long haul fishery operating in Pamlico Sound has two major areas of activity, one in northern and one in southern Pamlico Sound. These areas are divided geographically by Bluff Shoal, a 9 ft to 11 ft deep shoal that bisects the Sound north to south and is surrounded by water 17 ft to 21 ft deep (Figure 1.1). These two basins of Pamlico Sound have differences in species and size composition of their fish populations (Ross and Moye 1989).

The greatest concentration of fishing crews occurs in northern Pamlico Sound, behind the Outer Banks from Hatteras to Oregon Inlet and Roanoke Sound. During 2007 to 2011, three to four

crews worked from April to September in this area. A second center of long hauling activity is in southern Pamlico Sound and Core Sound. One to three crews based in eastern Carteret County (ports of Atlantic, Sea Level, Davis, and Cedar Island) fish this area from April through early November. Historically, a crew worked out of Hobucken, NC (Pamlico County), but ceased fishing in 2003 due principally to net damage caused by cownose rays (*Rhinoptera bonasus*) and difficulties in securing reliable crew members. The number of crews participating at any given time depends on the availability of finfish and market conditions. During 2007 to 2011 seven unique "traditional" crews participated. There has been a marked decline in the number of crews during the entire period (10 to 23 crews from 1988 to 1990, 5 to 15 crews from 1990 to 1993, 2 to 7 crews from 2000 to 2002, and 3 to 5 crews from 2004 to 2007; NCDMF 1992; NCDMF 1993; NCDMF 2004; and NCDMF 2007).

METHODS AND MATERIALS

During the fishing season, long haul catches were sampled at the fish house where the catch was landed. Samples may be either graded or ungraded catches (sorted by market category), but only graded samples were taken during this report period. For each economically important (marketable) species, as many random samples (usually 50 lb cartons) as possible were obtained from each market category. More cartons of the larger grades were sampled since they contained fewer fish. All fishes in a sample were identified and measured to the nearest millimeter (mm) fork length (FL) or total length (TL). Additional organisms in the catch were noted. Total sample weight (kg) and individual species component weights (kg), were recorded. The total weights of the sampled catches and component species were obtained from commercial fishermen or fish dealers, usually from the trip ticket data. Information on area fished and gear type used was provided by the vessels captain or crew.

Sampling of bait or scrap fish was initiated in 1986. Scrap fish was defined as those species not marketed for human consumption and that are either sold for bait or discarded. Scrap fish were sampled by taking at least one-half fish basket samples (~25 lb) of the scrap fish from each catch. Samples of scrap fish were sorted and weighed (kg) by species, and all individuals measured to the nearest mm FL or TL. Samples weighed in kilograms (kg) were converted to pounds (lb) in this report for uniformity with commercial trip ticket data at a rate of 1 kg = 2.204623 lb.

If a particular species was too numerous, a random subsample of at least 30 individuals was measured, and the remaining fish counted. The total weight of the scrap fish was obtained, preferably from the trip ticket, and if not, it was estimated. Regulatory discards (sizes that must be discarded, whether dead or alive, because of legal restrictions) were also sampled according to these basic scrap fish sampling procedures.

Landings refer to commercial landings (lb) data collected through the NCDMF trip ticket reporting program (NCTTP) implemented in 1994. All landings and value estimates reported in 2012 from the NCTTP are considered preliminary and subject to change.

Average catches and landings are discussed throughout the report. Average catch per trip (CPUE; lb/trip) is defined as the mean total catch or total catch per species of a trip. A trip consists of one haul made during a one-day trip.

The quantity (weight or numbers) and percentage of scrap fish (total or by species) landed by the fishery was determined by applying the seasonal (6 month periods) weight ratio of marketable fish to scrap fish in the fish house samples to the reported seasonal marketable landings from the NCTTP. The estimated scrap fish quantity is for landed scrap fish and does not account for discards at sea. The reported commercial landings of scrap fish (unclassified for bait or industrial purposes) from the NCTTP were not used because of inconsistencies in dealer reporting. This ratio method of estimating scrap fish assumes marketable fish are accurately collected by the NCTTP. The percent scrap fish reported was computed on a per sampled trip basis, i.e. the percent scrap fish for each sampled trip was determined and the mean was taken across all trips, thereby accounting for sampled trips with no scrap fish. Each sampled catch was viewed as an independent estimate of scrap fish.

The sampling map (Figure 1.1) was created using dealer codes, water body codes, dealer addresses, trip ticket landings, and fishery-dependent fish house sampling data. Addresses were created with a georeferencing tool within ArcMap 10 software using dealer address records associated with dealer codes contained in the NCTTP database. Each unique dealer address was run through the georeferencing tool, and placed on the map as accurately as possible. If there was no match for the address using ArcMap georeferencing, it was located on Google Maps, and interactively created and accurately placed by the GIS analyst. Trip ticket landings data were compiled from records collected by the NCTTP. The data were summarized by dealer, fishery gear, and the sum of trips by dealers from years 2007 to 2011. The fish house sampling data shown on the maps were created using records contained in the NCDMF biological database. These data reflect the sum of fish house samples taken from 2007 to June 2012, separated by fishery, gear, and dealer. The results were then joined and displayed in ArcMap to the proper dealer address location using the dealer code and\or product number. Fish houses where trip tickets were processed are represented by a circle. Fish house samples are represented by a star. Trip tickets and samples are displayed independently for each location. Shaded areas identified the general area where the fishery occurred. The shaded areas were created by using water body codes in which long haul gear use was reported and were compiled from trip ticket landings data from the NCTTP. The compiled water body codes and their corresponding coordinates were overlaid onto the map

RESULTS AND DISCUSSION

SEASONALITY AND TOTAL CATCH

Results are presented using data from January through December for 2007 to 2011 and January to June 2012. During this period 187 long haul seine catches were sampled at fish

houses where fisherman consistently land their catches including such ports as Atlantic, Avon, and Wanchese. Only data 2007 through 2011 are presented below due to only two samples being collected during January through June 2012 (Table 1.1). The “traditional” long haul fishery occurs from April through November in North Carolina. A total of 1,936 were reported by the NCTTP during 2007 to 2011 (Figure 1.1), it is highly unlikely all of these trips were using the traditional long haul method since some catches are relatively small. The traditional long haul method which uses a net towed between two boats requires a great deal of effort and usually results in large catches. Total catch weight (sampled trips) ranged from 20 to 49,347 lb per trip with annual mean catch weights per trip of 5,165 lb (2007), 5,851 lb (2008), 4,995 lb (2009), 4,514 lb (2010), and 4,440 lb (2011). The report period (2007 to 2011) for sampled trips had an overall mean of 5,069 lb per trip (Table 1.1). The mean commercial trip ticket landings (1,303 lb per trip) are less than the sampled trips mean (5,069 lb per trip) for the same period. The average landings from sampled trips were, on average, 3.9 times larger than the average NCTTP reported landings. This discrepancy could be largely due to scrap fish not consistently being reported on commercial trip tickets or fish house sampling bias. Only 10% of long haul seine trips were sampled which may be insufficient for a fishery with large fluctuations in catch on any given day. Trips that were not sampled may be smaller directed trips that do not harvest a large percentage of scrap fish.

Over the five year period the long haul seine fishery contributed 1.0% to the states edible finfish landings by weight. The annual landings contribution (weight) of the long haul seine fishery was 1.3% (2007), 0.9% (2008), 1.0% (2009), 0.9% (2010), and 0.7% (2011). Annual landings have gradually declined over the years due to a decreasing number of trips and participants. Factors contributing to the decline are more restrictive regulations on species such as weakfish and spotted seatrout and the increased abundance of species like cownose rays. Fishermen have exited the fishery due to the large amount of net damage caused by the bycatch of cownose rays and difficulties in securing reliable crew members.

COMMERCIAL TRIP TICKET LANDINGS

Atlantic croaker, black drum (*Pogonias cromis*), bluefish, kingfishes (*Menticirrhus* spp.), southern flounder (*Paralichthys lethostigma*), spot, spotted seatrout, and weakfish accounted for 77.8% of the marketable finfish landings in the long haul seine fishery from 2007 to 2011. Spot made the largest contribution by weight (45.7%) to the landings for the 2007 to 2011 period (Table 1.2).

In 2007, 28 participants made 434 trips, 10.6% of the annual reported long haul seine fishery trips were sampled. Trips ranged from 7 to 13,646 lb with a mean trip weight of 1,363 lb (Table1.1).

In 2008, 30 participants made 381 trips (Table 1.2), 11.8% of the annual reported long haul seine fishery trips were sampled. Trips ranged from 1 to 17,027 lb with a mean trip weight of 1,066 lb (Table 1.1).

In 2009, 22 participants made 380 trips (Table 1.2), 8.4% of the annual reported long haul seine fishery trips were sampled. Trips ranged from 12 to 26,177 lb with a mean of 1,240 lb (Table 1.1).

In 2010, 29 participants made 372 trips (Table 1.2), 10.8% of the annual reported long haul seine fishery trips were sampled. Trips ranged from 30 to 33,760 lb with a mean of 1,475 lb (Table 1.1).

In 2011, 27 participants made 369 trips (Table 1.2), 6.0% of the annual reported long haul seine fishery trips were sampled. Trips ranged from 7 to 14,331 lb with a mean of 1,377 lb (Table 1.1).

In 2007 to 2011, participants made 1,936 trips, landing 3,222,550 lb of finfish in the North Carolina long haul fishery (Table 1.3). Landings ranged from 1 to just under 34,000 lb, with 60.4% of the landings from trips harvesting 1,001 to 5,000 lb per trip. Trips landing 1,000 lb or less accounted for 48.0% of trips, 46% of trips landed between 1,001 lb and 5,000 lb, and trips landing between 5,001 to 40,000 lb accounted for 6.0% of trips (Table 1.3).

SPECIES COMPOSITION (SAMPLED CATCHES)

Five species, Atlantic croaker (15.1%), bluefish (18.6%), spot (39.3%), spotted seatrout (4.5%), and weakfish (4.4%), accounted for 81.8% of sampled catches for 2007 through 2011. Species composition of sampled catches by year is shown in Tables 1.4a -1.4e. Long haul seine sampling shows a decline in the percentage of pounds harvested for some target species. Spotted seatrout and weakfish both showed a decline; spotted seatrout declined from a high of 11.6% in 2007 to a low of 1.3% in 2010 and 2011, weakfish also followed this pattern decreasing from a high of 8.1% in 2007 to a low of 2.3% in 2009 for the five year time series. Weakfish remained low with 2.5% and 2.6% contribution in 2010 and 2011 (Tables 1.4d - 1.4e).

Atlantic croaker represented 2.7% to 35.7% (mean = 15.1%) by weight of the annual long haul seine sampled trips in North Carolina from 2007 to 2011 (Tables 1.4a – 1.4e). Atlantic croaker ranked third by weight in marketable species landed in sampled long haul trips from 2007 to 2011.

Black drum represented 0.5% to 2.4% (mean = 1.8%) by weight of the annual long haul seine sampled trips in North Carolina from 2007 to 2011 (Tables 1.4a – 1.4e).

Bluefish represented 8.8% to 49.1% (mean = 18.6%) by weight of the annual long haul seine landings in North Carolina from 2007 to 2011 (Tables 1.4a – 1.4e). Bluefish ranked second in marketable species in long haul sampled trips in North Carolina for the five year period.

Spot ranked first by weight in landings from sampled catches in 2007 to 2011. Landings ranged from a high in 2007 (49.8%) to a low in 2009 (27.2%) with a mean of 39.3% for the five year period (Tables 1.4a – 1.4e).

Spotted seatrout comprised on average 4.5% of the catches and ranged from 1.3% to 11.6% for sampled long haul seine catches. In 2011 spotted seatrout were ranked tenth in marketable species in the long haul seine landings (Tables 1.4a – 1.4e).

Weakfish represented 2.3% to 8.1% (mean = 4.4%) by weight of the annual long haul seine landings in North Carolina from 2007 to 2011. Weakfish stocks are in decline coast wide and only comprised 2.36% of the marketable species in sampled catches (Tables 1.4a – 1.4e).

SCRAP FISH

The percentage of scrap fish in long haul seine samples ranged from 0% to 96.4%, with annual mean percentages by weight of 41.6% (2007), 30.2% (2008), 28.3% (2009), 34.3% (2010), and 37.9% (2011) (Table 1.5). These values are consistent with results from previous years.

The reported scrap fish landings from the NCTTP remain under-reported when compared to the fish house sampling estimates. Commercial trip tickets reported a five year average percentage of 3.4% (Table 1.2), which is ~11 times less than what is observed in fish house samples. Scrap fish is not always reported on trip tickets due to it being discarded or not sold (traded for ice, “shack”, etc.).

The scrap fish component of the long haul seine fishery is largely comprised of five species (89.9%); Atlantic croaker (31.7%), Atlantic menhaden (*Brevoortia tyrannus*) (8.6%), bluefish (4.7%), pinfish (22.6%), and spot (22.3%). The annual percent contribution by weight to the scrap fish component of these five species varied: Atlantic croaker ranged from 17.9% to 54.2%; Atlantic menhaden ranged from 1.9% to 15.3%; bluefish ranged from 0.4% to 16.2%; pinfish ranged from 12.6% to 32.3%; and spot ranged from 11.0% to 39.7% during the five year time series (Table 1.6a - 1.6e).

MANAGEMENT ISSUES

The number of crews participating in the traditional long haul fishery has been in decline since 1990. The effort and number of participants has recently been declining due to new regulations on target species and the increased abundance of cownose rays. Difficulty securing reliable crew members and the ageing of traditional long haul fisherman has also contributed to the downward trend in the number of crews participating in the fishery. The limited scope of the fishery should be considered when assessing the management implications indicated below.

The scrap fish harvest is 3.4% (22,652 lb) of the combined annual long haul reported trip ticket landings (Table 1.2). Commercial fish house sampling indicates a higher percentage of scrap fish (34.5%) in the combined catch (Table 1.5). The sampled total catches CPUE (mean = 5,069 lb) was ~4 times higher than trip tickets CPUE (mean = 1,303 lb) (Table 1.1). This discrepancy in scrap fish percent contributions to a trip may be attributed to under reporting or

smaller non-traditional swipe gill nets being recorded as long haul landings by the fish houses. During 2005 through 2008 ~16% of these swipe gill net trips were incorrectly coded as long haul trips in NCTTP reporting. It has been suggested that these smaller directed swipe gill net trips do not catch as many scrap fish as larger traditional long haul operations. NCMFC (North Carolina Marine Fisheries Commission) rule 15A NCAC 03M.0102 limits the amount of scrap fish that can be taken. It is unlawful to land finfish that are unmarketable as individual finfish by reason of size, not to exceed 5,000 lb per vessel per day which may be sold to a licensed dealer. Atlantic menhaden, pinfish, gizzard shad (*Dorosoma cepedianum*), and Atlantic thread herring (*Opisthonema oglinum*) are exempt and not included within the 5,000 lb limit. In 2007 to 2011 Atlantic menhaden, pinfish, and Atlantic thread herring accounted for 31.3% of the scrap fish portion of the fishery. This 31.3% is exempt from the 5,000 lb daily bait limit.

Cooperative work between NCDMF and Pamlico and Core Sounds long haul crews to evaluate and reduce the harvest of recreational and commercially valuable species harvested in the scrap fish component of the fishery resulted in implementation of escape panels in the gear by rule. Field testing showed the following configuration effectively allows escapement of varying proportions (up to 60%) of unmarketable fish (by size). The long haul net must contain two panels four feet deep and six feet long and installed within 10 feet of the staff on the bunt end in which fish are being bailed. One panel must be installed within 12 to 24 inches of the float line and the other within 12 to 24 inches of the lead line. Escape panels must remain in the water while fish are harvested. Escape panels are constructed of unobstructed trawl rings with an inside diameter of no less than one and nine-sixteenth inches (1 9/16”) in which the rings may be fastened together at no more than four points per ring. Nets constructed entirely of monofilament and having a stretched mesh length greater than three inches are excluded from the escape panel rule, including swipe gill nets. Despite the use of escape panels, scrap fish presence in sampled catches remains high. It is hypothesized that fish may be removed too quickly from the bunt end during the operation and thus not allowing sufficient time for the small fish to escape out the required panels.

Weakfish and spotted seatrout during portions of this report period were managed as bycatch only fisheries. Weakfish were only to be landed if the weight of the weakfish didn’t exceed 10% of the weight of all other finfish landed on any trip, with a maximum amount of up to 1,000 lb (as of November 2012 restrictions changed in proclamation to weakfish weight can’t exceed 100 lb, (eliminated the percent option) and spotted seatrout have a maximum possession limit of 75 fish per day in the commercial fisheries (also by proclamation). In recent years both spotted sea trout and weakfish to a greater extent have been in decline. Discards of weakfish and spotted seatrout resulting from these proclamations could become a management concern.

Long hauling is prohibited in primary nursery areas which are protected from “bottom disturbing” gear. Much of the long haul seine fishing area is located in shallow water bays and along shoals near the back side of the Outer Banks of North Carolina. This area also contains submerged aquatic vegetation (SAV) grass beds, which is important fish habitat. The Coastal Habitat Protection Plan (CHPP) lists SAV as one of the six important fish habitats that require protection and enhancement (Deaton et al. 2010). Because of their prohibition from nursery

areas some have argued long hauls should also not be allowed in SAV beds. However, long haul seines are reported to cause little or no damage to SAV as they are dragged along the bottom. Sadzinski et al. (1996) found no negative effect on brackish SAV from long haul seines in the Chesapeake Bay.

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Table 1.1. Monthly summary of long haul seine fish house sampling and commercial trip ticket landings for 2007 through June 2012.

		Fish house sampling					Commercial trip ticket landings		
Year	Month	Number of trips sampled	Mean weight of trips sampled (lb/trip)	Weight range of trips sampled (lb)	Mean sample weight (lb/sample)	Weight range of samples (lb)	Total number of trips	Mean weight of all trips (lb/trip)	Weight range of all trips (lb)
2007	Jan	0	-	-	-	-	5	69	15 -154
	Feb	0	-	-	-	-	13	171	34 - 1,241
	Mar	0	-	-	-	-	15	130	24 - 318
	Apr	2	7,907	4,702 - 11,112	209	140 - 277	25	879	38 - 8,604
	May	5	7,232	4,132 - 12,059	317	258 - 395	23	2,191	25 - 12,956
	Jun	5	5,422	1,502 - 10,827	196	112 - 264	34	1,651	7 - 9,355
	Jul	7	3,536	677 - 6,393	212	70 - 321	78	1,966	20 - 10,999
	Aug	8	2,880	800 - 5,723	231	107 - 339	91	2,189	34 - 12,936
	Sep	8	6,667	1,350 - 18,569	246	111 - 391	58	2,143	117 - 6,911
	Oct	7	7,164	1,304 - 16,870	298	86 - 622	67	3,168	9 - 12,936
	Nov	3	802	598 - 1,050	265	113 - 429	16	785	88 - 1,638
	Dec	1	4,839	-	605	-	9	1,021	124 - 4,839
	All	46	5,165	598 - 18,587	256	70 - 622	434	1,363	7 - 13,646
2008	Jan	0	-	-	-	-	0	-	-
	Feb	0	-	-	-	-	3	*	43 - 152
	Mar	0	-	-	-	-	9	103	4 - 303
	Apr	0	-	-	-	-	10	400	54 - 2,320
	May	1	21,421	21,421 - 21,421	267	267 - 267	12	1,118	38 - 2,835
	Jun	6	3,161	875 - 11,513	171	77 - 282	37	1,592	40 - 5,460
	Jul	12	4,467	182 - 20,027	183	50 - 340	85	2,055	23 - 17,027
	Aug	15	6,937	20 - 28,075	219	19 - 945	68	2,123	17 - 10,558
	Sep	6	5,847	2,249 - 15,993	248	42 - 400	55	2,067	58 - 5,859
	Oct	4	7,446	729 - 19,367	265	171 - 402	76	1,884	1 - 10,574
	Nov	1	390	-	111	-	24	247	1 - 1,402
	Dec	0	-	-	-	-	2	*	*
	All	45	5,851	20 - 28,075	210	19 - 945	381	1,066	1 - 17,027
2009	Jan	0	-	-	-	-	1	*	*
	Feb	0	-	-	-	-	5	*	*
	Mar	0	-	-	-	-	2	*	*

Table 1.1 (Continued)

Year	Month	Fish house sampling: Number of trips sampled	Mean weight of trips sampled (lb/trip)	Weight range of trips sampled (lb)	Mean sample weight (lb/sample)	Weight range of samples (lb)	Commercial trip ticket landings: Total number of trips	Mean weight of all trips (lb/trip)	Weight range of all trips (lb)
	Apr	0	-	-	-	-	23	407	52 - 1,078
	May	0	-	-	-	-	10	1,654	318 - 6,404
	Jun	6	4,634	651 - 15,630	219	44 - 494	57	1,537	12 - 7,458
	Jul	11	2,156	568 - 3,242	179	75 - 327	85	1,429	49 - 8,005
	Aug	10	8,312	116 - 49,347	175	52 - 309	81	2,190	53 - 26,177
	Sep	2	4,447	1,154 - 7,739	165	140 - 190	63	2,154	87 - 9,272
	Oct	2	7,411	23,589 - 12,462	195	150 - 239	41	2,482	21 - 9,774
	Nov	1	205	-	74	-	10	1,528	20 - 7,451
	Dec	0	-	-	-	-	2	*	*
	All	32	4,955	116 - 49,347	182	44 - 494	380	1,240	12 - 26,177
2010	Jan	0	-	-	-	-	1	*	*
	Feb	0	-	-	-	-	0	-	-
	Mar	0	-	-	-	-	8	330	125 - 691
	Apr	0	-	-	-	-	7	954	77 - 1,721
	May	3	9,064	227 - 19,833	276	96 - 393	17	2,265	107 - 9,018
	Jun	8	4,693	2,047 - 7,821	252	195 - 433	41	2,940	40 - 8,408
	Jul	10	2,876	178 - 9,877	174	65 - 318	64	1,456	112 - 18,117
	Aug	10	2,547	502 - 5,611	180	76 - 370	84	1,455	105 - 33,760
	Sep	5	4,246	1,763 - 8,661	259	124 - 462	57	1,724	68 - 5,970
	Oct	3	13,410	1,154 - 35,220	262	203 - 335	55	2,898	109 - 20,564
	Nov	1	151	-	76	-	23	734	30 - 1,815
	Dec	0	-	-	-	-	15	*	*
	All	40	4,514	151 - 35,220	214	65 - 462	372	1,475	30 - 33,760
2011	Jan	0	-	-	-	-	0	-	-
	Feb	0	-	-	-	-	0	-	-
	Mar	0	-	-	-	-	9	*	*
	Apr	1	802	-	220	-	9	517	59 - 1,056
	May	3	15,273	1,091 - 38,888	219	120 - 396	25	1,812	27 - 4,834
	Jun	5	1,342	236 - 3,329	133	66 - 239	83	995	21 - 5,927

Table 1.1 (Continued)

Year	Month	Fish house sampling: Number of trips sampled	Mean weight of trips sampled (lb/trip)	Weight range of trips sampled (lb)	Mean sample weight (lb/sample)	Weight range of samples (lb)	Commercial trip ticket landings: Total number of trips	Mean weight of all trips (lb/trip)	Weight range of all trips (lb)
	Jul	4	3,528	2,214 - 4,847	208	137 - 336	72	964	28 - 8,320
	Aug	3	806	417 - 1,008	67	58 - 84	53	860	59 - 2,605
	Sep	3	4,904	2,013 -6,888	261	117 - 422	47	1,345	17 - 6,430
	Oct	3	4,370	454 - 10,051	125	76 - 218	33	2,535	85 - 14,331
	Nov	0	-	-	-	-	20	*	*
	Dec	0	-	-	-	-	18	*	*
	All	22	4,440	236 - 38,888	170	58 - 422	369	1,377	7 - 14,331
2012	Jan	0	-	-	-	-	NA	NA	NA
	Feb	0	-	-	-	-	NA	NA	NA
	Mar	0	-	-	-	-	NA	NA	NA
	Apr	0	-	-	-	-	NA	NA	NA
	May	0	-	-	-	-	NA	NA	NA
	Jun	2	948	586 - 1,310	173	153 - 193	NA	NA	NA
	All	2	948	586 - 1,310	173	153 - 193	NA	NA	NA
2007-2011	Jan	0	-	-	-	-	7	133	15 - 211
	Feb	0	-	-	-	-	21	128	34 -1,241
	Mar	0	-	-	-	-	43	802	4 - 5,775
	Apr	3	5,539	802 - 11,112	212	140 - 277	74	631	38 - 8,604
	May	12	10,883	227 - 38,888	278	96 - 396	87	1,808	25 - 12,956
	Jun	30	3,938	236 -15,631	200	44 - 494	252	1,743	7 - 9,355
	Jul	44	3,294	178 - 20,027	187	50 - 340	384	1,574	20 - 18,117
	Aug	46	5,176	20 - 49,347	193	19 - 945	377	1,763	17 - 33,760
	Sep	24	5,552	1,154 - 18,587	244	42 - 462	280	1,887	17 - 9,272
	Oct	19	7,794	454 - 35,220	247	76 - 622	272	2,593	1 - 20,564
	Nov	6	525	151 - 1,050	176	74 - 429	93	822	1 - 7,451
	Dec	1	4,839	-	605	-	46	812	1 - 4,839
	All	185	5,069	20 - 49,347	212	19 - 945	1,936	1,303	1 - 33,760

* Denotes confidential data.

Table 1.2. North Carolina long haul seine reported commercial landings (pounds) and value (dollars) for selected species, 2007 to 2011, including number of participants, trips, and relative contributions of the species to the fishery.

	2007				2008				2009			
Species	Pounds	% of pounds	Value ($)	% Value	Pounds	% of pounds	Value ($)	% Value	Pounds	% of pounds	Value ($)	% Value
Atlantic croaker	17,999	2.1	$4,995	1.0	11,789	1.8	$3,850	0.9	33,251	5.0	$10,741	2.7
Black drum	12,207	1.4	$4,155	0.8	8,493	1.3	$2,971	0.7	7,465	1.1	$3,266	0.8
Bluefish	107,327	12.7	$28,322	5.5	53,678	8.1	$15,430	3.7	110,718	16.6	$26,523	6.6
Kingfishes	20,682	2.5	$20,129	3.9	39,008	5.9	$34,578	8.4	20,898	3.1	$22,860	5.7
Southern flounder	1,443	0.2	$3,391	0.7	4,327	0.7	$9,427	2.3	1,169	0.2	$2,185	0.5
Spot	396,109	46.9	$276,682	53.9	311,765	47.3	$192,863	46.7	317,899	47.6	$190,164	47.6
Spotted seatrout	54,404	6.4	$76,252	14.8	34,144	5.2	$52,429	12.7	24,521	3.7	$39,865	10.0
Weakfish	49,361	5.8	$37,883	7.4	53,554	8.1	$44,223	10.7	57,008	8.5	$54,970	13.8
Scrap fish (bait)	51,289	6.1	$5,933	1.2	13,384	2.0	$1,636	0.4	25,685	3.8	$2,940	0.7
All others	132,968	15.8	$55,871	10.9	129,246	19.6	$55,599	13.5	69,697	10.4	$45,734	11.5
Total	843,788	100.0	$513,612	100.0	659,388	100.0	$413,007	100.0	668,311	100.0	$399,248	100.0
Total participants		28				30				22		
Total trips		434				381				380		

	2010				2011				2007 - 2011			
Species	Pounds	% of pounds	Value ($)	% Value	Pounds	% of pounds	Value ($)	% Value	Pounds	% of pounds	Value ($)	% Value
Atlantic croaker	171,746	25.4	$80,687	18.8	80,810	17.8	$44,947	14.7	63,119	9.6	$29,044	7.0
Black drum	2,767	0.4	$1,319	0.3	1,612	0.4	$763	0.2	6,509	1.0	$2,495	0.6
Bluefish	45,240	6.7	$12,289	2.9	32,078	7.1	$11,139	3.6	69,808	10.6	$18,741	4.5
Kingfishes	45,913	6.8	$49,795	11.6	25,256	5.6	$27,019	8.8	30,351	4.6	$30,876	7.5
Southern flounder	581	0.1	$1,244	0.3	333	0.1	$687	0.2	1,571	0.2	$3,387	0.8
Spot	274,747	40.6	$185,238	43.2	207,675	45.7	$161,931	53.0	301,639	45.7	$201,376	48.9
Spotted seatrout	8,880	1.3	$15,604	3.6	4,517	1.0	$7,566	2.5	25,293	3.8	$38,343	9.3
Weakfish	27,313	4.0	$25,038	5.8	10,686	2.4	$11,077	3.6	39,584	6.0	$34,638	8.4
Scrap fish (bait)	4,963	0.7	$520	0.1	17,938	3.9	$1,700	0.6	22,652	3.4	$2,546	0.6
All others	95,196	14.1	$57,256	13.3	73,314	16.1	$38,692	12.7	100,084	15.2	$50,630	12.3
Total	677,346	100.0	$428,989	100.0	454,218	100.0	$305,521	100.0	660,611	100.0	$305,521	100.0
Total participants		29				27				*		
Total trips		372				369				1,936		

* Denotes confidential data.

Table 1.3. Long haul landings (pounds), number of trips, and number of dealers for landings by trip category for 2007 to 2011 combined. Source: NC Trip Ticket Program

Landings range (lb)	Total landings (lb)	Percent landings	Number of trips	Percent trips	Number of dealers
1-100	8,088	0.2	149	7.7	19
101-200	22,935	0.7	158	8.2	16
201-300	25,795	0.8	108	5.6	12
301-400	36,527	1.1	104	5.4	13
401-500	40,820	1.2	90	4.6	12
501-600	43,115	1.3	78	4.0	12
601-700	47,563	1.4	73	3.8	11
701-800	46,273	1.4	62	3.2	10
801-900	44,248	1.3	52	2.7	12
901-1,000	52,258	1.6	55	2.8	10
1,001-2,000	635,759	19.2	442	22.8	15
2,001-3,000	634,055	19.2	260	13.4	13
3,001-4,000	398,713	12.1	116	6.0	10
4,001-5,000	327,839	9.9	74	3.8	6
5,001-6,000	212,269	6.4	38	2.0	5
6,001-7,000	175,377	5.3	27	1.4	6
7,001-8,000	75,284	2.3	10	0.5	4
8,001-9,000	125,070	3.8	15	0.8	4
9,001-10,000	55,908	1.7	6	0.3	3
10,001-20,000	214,655	6.5	16	0.8	4
20,001-30,000	*	*	2	0.1	*
30,001-40,000	*	*	1	0.1	*
Total	3,222,550		1,936		

* Denotes confidential data.

Table 1.4a. Marketable species composition of long haul seine catches (N=46), Pamlico Sound area, 2007.

	Weight (lb)		Number			
Species	Mean	Percent	Mean	Percent	Mean fish weight (lb)	Percent occurrence
Spot	1,148.4	49.8	4,090	68.4	0.3	91.3
Spotted seatrout	267.3	11.6	136	2.3	2.0	82.6
Bluefish	203.7	8.8	184	3.1	1.1	91.3
Weakfish	188.0	8.1	440	7.3	0.4	73.9
Pinfish	154.4	6.7	468	7.8	0.3	50.0
Pigfish	69.2	3.0	189	3.2	0.4	67.4
Atlantic croaker	61.6	2.7	150	2.5	0.4	45.7
Southern kingfish	57.7	2.5	150	2.5	0.4	54.3
Black drum	56.3	2.4	30	0.5	1.9	41.3
Sheepshead	34.7	1.5	9	0.2	3.7	56.5
Harvestfish	25.8	1.1	104	1.7	0.2	21.7
Houndfish	24.6	1.1	11	0.2	2.1	19.6
Spanish mackerel	3.5	0.2	3	<0.1	1.3	26.1
Blue crab	3.3	0.1	8	0.1	0.4	2.2
Red drum	3.2	0.1	1	<0.1	3.6	28.3
Florida pompano	1.4	0.1	2	<0.1	0.6	32.6
Observed Species*						
Atlantic cutlassfish	Gulf flounder		Southern flounder			
Atlantic spadefish	Kingfishes		Striped mullet			
Butterfish	Northern kingfish		Summer flounder			
Crevalle jack	Northern puffer					

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 1.4b. Marketable species composition of long haul seine catches (N=45), Pamlico Sound area, 2008.

	Weight (lb)		Number			
Species	Mean	Percent	Mean	Percent	Mean fish weight (lb)	Percent occurrence
Spot	1,386.4	50.9	4,501	68.7	0.3	88.9
Bluefish	366.0	13.4	230	3.5	1.6	91.1
Pinfish	224.8	8.2	510	7.8	0.4	46.7
Weakfish	172.2	6.3	389	5.9	0.4	60.0
Spotted seatrout	132.2	4.9	70	1.1	1.9	91.1
Atlantic croaker	128.2	4.7	315	4.8	0.4	55.6
Southern kingfish	104.5	3.8	217	3.3	0.5	55.6
Pigfish	76.6	2.8	210	3.2	0.4	66.7
Black drum	58.3	2.1	33	0.5	1.8	31.1
Sheepshead	38.3	1.4	17	0.3	2.2	57.8
Houndfish	15.1	0.6	9	0.1	1.7	17.8
Harvestfish	8.3	0.3	37	0.6	0.2	22.2
Mullets	3.2	0.1	2	<0.1	1.7	6.7
Spanish mackerel	3.0	0.1	4	0.1	0.8	37.8
Florida pompano	1.8	0.1	5	0.1	0.4	26.7
Cobia	1.7	0.1	0	<0.1	14.9	4.4
Observed Species*						
Atlantic spadefish	Northern kingfish		Southern flounder			
Blue runner	Paralichthid flounders		Striped mullet			
Butterfish	Silver seatrout		Summer flounder			

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 1.4c. Marketable species composition of long haul seine catches (N=32), Pamlico Sound area, 2009.

	Weight (lb)		Number			
Species	Mean	Percent	Mean	Percent	Mean fish weight (lb)	Percent occurrence
Bluefish	1,685.2	49.1	1,261	20.8	1.3	96.9
Spot	933.6	27.2	3,454	56.9	0.3	90.6
Atlantic croaker	178.1	5.2	379	6.2	0.5	68.8
Spotted seatrout	111.1	3.2	70	1.2	1.6	93.8
Sheepshead	84.3	2.5	60	1.0	1.4	71.9
Black drum	83.6	2.4	17	0.3	5.0	37.5
Weakfish	78.3	2.3	173	2.9	0.5	37.5
Pinfish	74.0	2.2	202	3.3	0.4	50.0
Pigfish	64.1	1.9	208	3.4	0.3	71.9
Southern kingfish	62.2	1.8	154	2.5	0.4	40.6
Spanish mackerel	21.6	0.6	23	0.4	0.9	68.8
Florida pompano	19.1	0.6	11	0.2	1.7	21.9
Red drum	12.5	0.4	4	0.1	3.5	62.5
Mullets	5.9	0.2	5	0.1	1.1	3.1
Bull shark	4.7	0.1	0	<0.1	149.9	3.1
Atlantic spadefish	3.8	0.1	7	0.1	0.5	9.4
Harvestfish	3.2	0.1	20	0.3	0.2	15.6
Striped mullet	2.8	0.1	3	<0.1	1.1	12.5
Houndfish	2.2	0.1	1	<0.1	3.1	12.5
Observed Species*						
Atlantic spadefish	Kingfishes		Southern flounder			
Blue runner	Northern puffer		Summer flounder			
Butterfish	Paralichthid flounders					
Crevalle jack	Silver seatrout					

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 1.4d. Marketable species composition of long haul seine catches (N=40), Pamlico Sound area, 2010.

	Weight (lb)		Number			
Species	Mean	Percent	Mean	Percent	Mean fish weight (lb)	Percent occurrence
Spot	1,102.7	40.9	3,512	56.6	0.3	97.5
Atlantic croaker	729.3	27.1	1,351	21.8	0.5	82.5
Bluefish	290.8	10.8	205	3.3	1.4	92.5
Sheepshead	192.4	7.1	95	1.5	2.0	87.5
Pinfish	104.1	3.9	492	7.9	0.2	52.5
Pigfish	97.7	3.6	296	4.8	0.3	65
Weakfish	67.4	2.5	156	2.5	0.4	75
Spotted seatrout	34.4	1.3	22	0.3	1.6	87.5
Southern kingfish	21.0	0.8	34	0.5	0.6	45
Houndfish	15.8	0.6	6	0.1	2.7	12.5
Spanish mackerel	12.7	0.5	14	0.2	0.9	35
Black drum	12.5	0.5	5	0.1	2.7	52.5
Northern puffer	3.8	0.1	6	0.1	0.7	32.5
Red drum	2.5	0.1	1	<0.1	4.4	12.5
Southern flounder	2.4	0.1	1	<0.1	2.0	35
Harvestfish	1.4	0.1	4	0.1	0.4	10
Observed Species*						
Atlantic cutlassfish	Florida pompano		Paralichthid flounders			
Atlantic spadefish	Kingfishes		Striped mullet			
Blue crab	Mullets					
Butterfish	Northern kingfish					

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 1.4e. Marketable species composition of long haul seine catches (N=22), Pamlico Sound area, 2011.

	Weight (lb)		Number			
Species	Mean	Percent	Mean	Percent	Mean fish weight (lb)	Percent occurrence
Atlantic croaker	683.7	35.7	2,215	41.0	0.3	72.7
Spot	528.0	27.6	2,044	37.9	0.3	100
Bluefish	208.8	10.9	187	3.5	1.1	90.9
Sheepshead	130.4	6.8	49	0.9	2.7	63.6
Pigfish	87.7	4.6	284	5.3	0.3	81.8
Weakfish	49.8	2.6	94	1.7	0.5	45.5
Harvestfish	37.1	1.9	165	3.1	0.2	18.2
Black drum	35.0	1.8	11	0.2	3.2	45.5
Southern kingfish	32.1	1.7	52	1.0	0.6	40.9
Spotted seatrout	25.7	1.3	21	0.4	1.2	86.4
White catfish	25.7	1.3	59	1.1	0.4	4.5
Silver perch	16.2	0.8	147	2.7	0.1	4.5
Houndfish	16.2	0.8	10	0.2	1.7	22.7
Spanish mackerel	10.6	0.6	9	0.2	1.2	45.5
Striped bass	8.1	0.4	1	0.0	13.8	4.5
Pinfish	7.5	0.4	23	0.4	0.3	9.1
Florida pompano	4.0	0.2	4	0.1	1.1	31.8
Butterfish	1.6	0.1	12	0.2	0.1	13.6
Kingfishes	1.3	0.1	2	0.0	0.6	18.2
Striped mullet	1.0	0.1	5	0.1	0.2	13.6
Observed Species*						
Atlantic spadefish	Northern puffer		Summer flounder			
Gulf kingfish	Red drum		White mullet			
Mullets	Southern flounder		White perch			

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 1.5. Monthly, yearly, and overall mean weights for total catch, marketable, scrap fish, and discard portions; mean and range of percent scrap fish in the long haul seine fishery catches (N = number of catches sampled) from 2007 through 2011.

				Mean weight (lb)			Percent scrap	
Year	Month	N	Mean catch weight (lb)	Marketable	Scrap	Discard	Mean	Range
2007	Apr	2	7,907.00	906.9	7,000.00	136.1	85.1	76.6 - 93.6
	May	5	7,232.30	1,996.30	5,236.00	8.4	61.7	33.6 - 90.4
	Jun	5	5,421.90	2,601.90	2,820.00	46.4	52.9	46.2 - 59.5
	Jul	7	3,536.20	2,422.70	1,113.60	42.5	27.4	11.1 - 57.5
	Aug	8	2,880.40	1,569.10	1,311.20	1.8	38.8	13.9 - 61.9
	Sep	8	6,666.90	2,095.60	4,571.30	44.2	49.8	12.5 - 92.7
	Oct	7	7,163.90	3,996.80	3,167.20	5.5	38.3	3.8 - 78.0
	Nov	3	801.7	801.7	-	-	-	-
	Dec	1	4,839.10	4,839.10	-	-	-	-
	All	46	5,165.40	2,310.90	2,854.50	27.2	41.6	0.0 - 93.6
2008	May	1	21,421.40	781.3	20,640.10	11.3	96.4	96.4 - 96.4
	Jun	6	3,161.10	1,779.40	1,381.70	-	31.7	1.0 - 58.4
	Jul	12	4,466.70	2,866.80	1,600.00	1.5	31.7	0.0 - 82.2
	Aug	15	6,937.20	3,054.30	3,882.90	0.1	25	0.0 - 93.6
	Sep	6	5,846.60	2,836.60	3,010.00	9.1	32.2	3.3 - 84.0
	Oct	4	7,446.30	3,366.30	4,080.00	18.1	31.3	0.0 - 70.4
	Nov	1	390	390	-	-	-	-
	All	45	5,851.10	2,723.30	3,127.80	3.5	30.2	0.0 - 96.4
2009	Jun	6	4,634.10	2,419.50	2,214.60	-	33.5	19.0 - 64.2
	Jul	11	2,156.40	1,530.90	625.4	-	28.9	0.0 - 93.8
	Aug	10	8,312.20	7,005.20	1,307.00	-	27.9	0.0 - 53.2
	Sep	2	4,446.70	3,946.70	500	-	6.5	0.0 - 12.9
	Oct	2	7,410.50	2,835.40	4,575.10	61.3	47	25.4 - 68.6
	Nov	1	205	205	-	-	-	-
	All	32	4,955.20	3,599.30	1,355.90	3.8	28.3	0.0- 93.8
2010	May	3	9,064.00	3,924.10	5,140.00	-	56.8	52.8 - 63.1

Table 1.5. (Continued)

Year	Month	N	Mean catch weight (lb)	Mean weight (lb)			Percent scrap	
				Marketable	Scrap	Discard	Mean	Range
	Jun	8	4,692.70	3,367.70	1,325.00	-	28.6	0.0 - 53.9
	Jul	10	2,875.80	1,945.80	930	-	23.9	0.0 - 54.4
	Aug	10	2,546.50	1,374.50	1,172.00	-	43.5	6.3 - 83.0
	Sep	5	4,246.40	2,036.40	2,210.00	9.1	46.8	29.6 - 69.3
	Oct	3	13,409.70	8,284.70	5,125.00	-	21.8	2.2 - 41.2
	Nov	1	151.2	151.2	-	-	-	-
	All	40	4,514.20	2,677.60	1,836.60	1.1	34.3	0.0 - 83.0
2011	Apr	1	801.8	801.8	-	-	-	-
	May	3	15,272.90	4,789.50	10,483.40	-	45.2	17.1 - 77.1
	Jun	5	1,342.20	867.8	474.4	-	40.5	6.6 - 68.5
	Jul	4	3,528.00	2,890.50	637.5	-	20.6	7.8 - 45.2
	Aug	3	806.1	522.7	283.4	-	37.6	29.8 - 47.9
	Sep	3	4,904.30	1,624.30	3,280.00	22.7	59.2	32.3 - 76.4
	Oct	3	4,370.30	1,405.40	2,965.00	-	40.9	0.0 - 76.6
	All	22	4,440.20	1,896.70	2,543.50	3.1	37.9	0.0 - 77.1
All	Apr	3	5,538.60	871.9	4,666.70	90.7	56.7	0.0 - 93.6
	May	12	10,882.80	3,075.30	7,807.50	4.5	59.2	17.1 - 96.4
	Jun	30	3,937.80	2,316.10	1,621.70	7.7	36.3	0.0 - 68.5
	Jul	44	3,294.20	2,255	1,039.20	7.2	27.5	0.0 - 93.8
	Aug	46	5,176.20	3,124.60	2,051.60	0.4	32.9	0.0 - 93.6
	Sep	24	5,552.20	2,363.90	3,188.30	21.7	42.4	0.0 - 92.7
	Oct	19	7,794.40	4,009.70	3,784.80	12.3	35.5	0.0 - 78.0
	Nov	6	525.2	525.2	-	-	-	-
	Dec	1	4,839.10	4,839.10	-	-	-	-
	All	185	5,068.80	2,664.10	2,404.70	8.9	34.5	0.0 - 96.4

Percent bait reported was computed on a per sampled trip basis. The percent bait for each sampled trip was determined and the mean was taken across trips, thereby accounting for sampled trips with no bait.

Table 1.6a. Species composition of scrap fish in long haul seine catches (N=46), Pamlico Sound Area, 2007.

Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean fish weight (lb)
Spot	931.5	29.8	9,248	35.4	0.1
Pinfish	877.1	28.1	8,449	32.4	0.1
Atlantic croaker	560.7	17.9	5,020	19.2	0.1
Atlantic menhaden	478.2	15.3	1,958	7.5	0.2
Bluefish	79.2	2.5	218	0.8	0.4
Southern kingfish	54.3	1.7	268	1.0	0.2
Pigfish	51.0	1.6	291	1.1	0.2
Silver perch	43.0	1.4	310	1.2	0.1
Harvestfish	14.2	0.5	115	0.4	0.1
Weakfish	14.0	0.4	76	0.3	0.2
Striped searobin	4.9	0.2	14	0.1	0.3
Atlantic thread herring	3.4	0.1	32	0.1	0.1
Spanish mackerel	2.7	0.1	10	<0.1	0.3
Lookdown	2.5	0.1	40	0.2	0.1
Observed Species*					
Alewife	Crevalle jack		Southern stingray		
Atlantic spadefish	Gulf flounder		Spotfin mojarra		
Atlantic stingray	Longspine porgy		Stingrays		
Bar jack	Northern searobin		Striped burrfish		
Blue crab	Planehead filefish		Summer flounder		
Butterfish	Sheepshead				

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 1.6b. Species composition of scrap fish in long haul seine catches (N=45), Pamlico Sound area, 2008.

	Weight (lb)		Number		Mean fish weight
Species	Mean	Percent	Mean	Percent	(lb)
Spot	1,547.7	39.7	13,014	40.1	0.1
Atlantic croaker	1,117.6	28.7	9,613	29.6	0.1
Pinfish	622.0	16.0	6,390	19.7	0.1
Atlantic menhaden	276.9	7.1	1,322	4.1	0.2
Pigfish	76.7	2.0	605	1.9	0.1
Bluefish	67.6	1.7	214	0.7	0.3
Southern kingfish	56.4	1.4	287	0.9	0.2
Weakfish	40.4	1.0	239	0.7	0.2
Silver perch	30.9	0.8	212	0.7	0.1
Harvestfish	25.9	0.7	273	0.8	0.1
Striped searobin	5.3	0.1	85	0.3	0.1
Spanish mackerel	4.8	0.1	17	0.1	0.3
Striped burrfish	3.5	0.1	5	<0.1	0.7
Ocellated flounder	3.2	0.1	12	<0.1	0.3
Atlantic thread herring	2.9	0.1	50	0.2	0.1
Stingrays	2.3	0.1	13	<0.1	0.2
Observed Species*					
Atlantic moonfish	Crevalle jack		Planehead filefish		
Atlantic spadefish	Stingrays		Sheepshead		
Atlantic stingray	Mojarras		Southern Flounder		
Black sea bass	Little tunny		Spider crabs		
Blue crab	Lookdown		Spotted seatrout		
Brown shrimp	Northern searobin		Summer flounder		
Butterfish	Oyster toadfish				

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 1.6c. Species composition of scrap fish in long haul seine catches (N=32), Pamlico Sound area, 2009.

	Weight (lb)		Number		Mean fish weight (lb)
Species	Mean	Percent	Mean	Percent	
Pinfish	484.3	24.0	4,576	33.9	0.1
Atlantic croaker	425.9	21.1	3,924	29	0.1
Bluefish	326.9	16.2	704	5.2	0.5
Spot	253.3	12.6	1,751	13	0.1
Atlantic menhaden	225.7	11.2	1,078	8	0.2
Pigfish	94.2	4.7	495	3.7	0.2
Weakfish	67.9	3.4	296	2.2	0.2
Southern kingfish	43.3	2.1	230	1.7	0.2
Harvestfish	28.9	1.4	158	1.2	0.2
Silver Perch	24.5	1.2	125	0.9	0.2
Houndfish	9.1	0.5	8	0.1	1.2
Atlantic thread herring	6.1	0.3	56	0.4	0.1
Florida pompano	5.7	0.3	18	0.1	0.3
Northern puffer	4.1	0.2	9	0.1	0.4
Striped burrfish	4.0	0.2	7	<0.1	0.6
Northern searobin	3.7	0.2	18	0.1	0.2
Butterfish	1.8	0.1	11	0.1	0.2
Crevalle jack	1.3	0.1	9	0.1	0.1
Atlantic spadefish	1.0	0.1	2	<0.1	0.4
Observed Species*					
Lookdown	Planehead filefish		Spotted seatrout		
Oyster toadfish	Sheepshead		Summer flounder		

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 1.6d. Species composition of scrap fish in long haul seine catches (N=40), Pamlico Sound area, 2010.

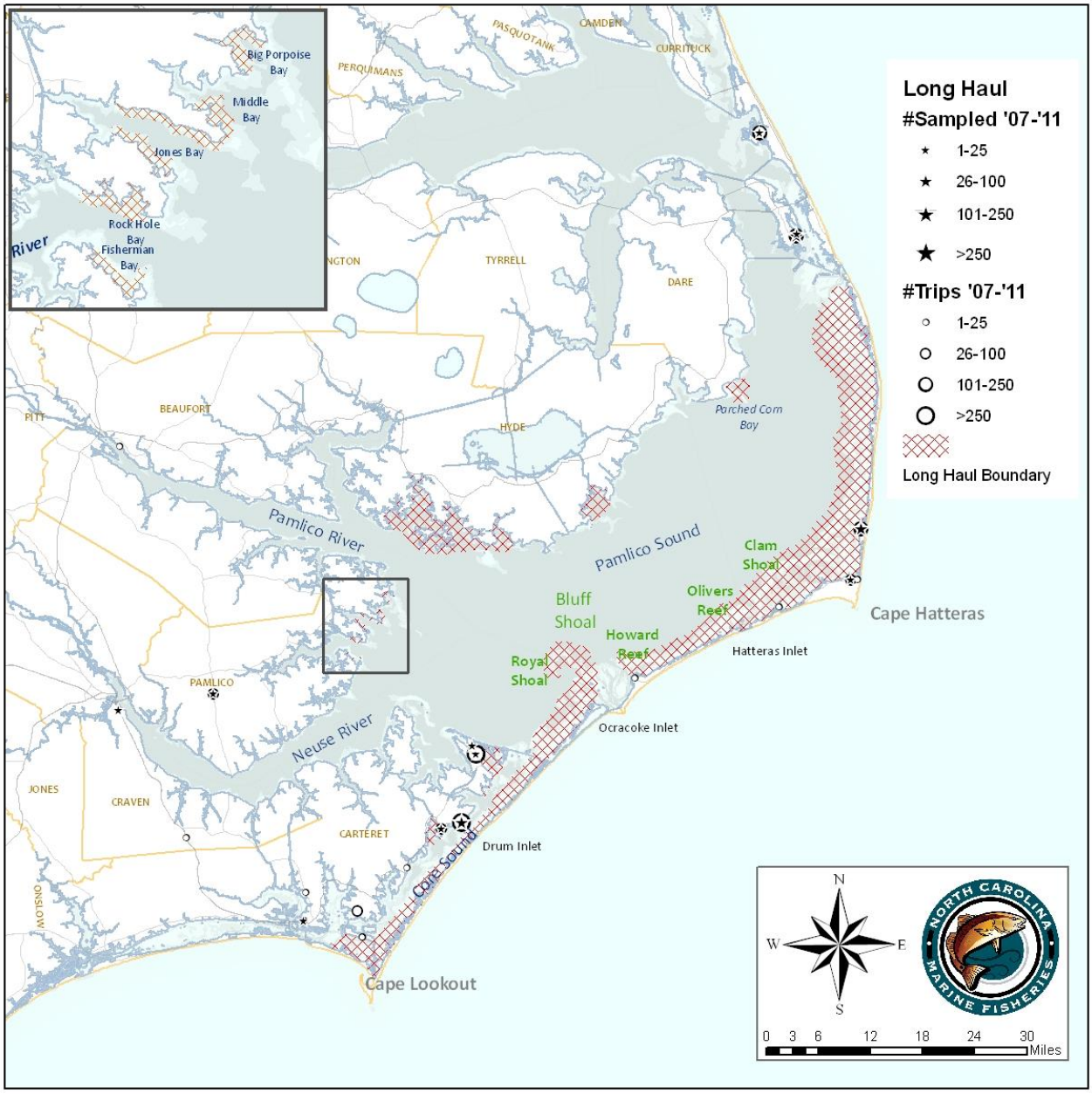
	Weight (lb)		Number		Mean fish weight
Species	Mean	Percent	Mean	Percent	(lb)
Atlantic croaker	760.7	36.7	4,469	32.1	0.2
Pinfish	668.1	32.3	5,488	39.5	0.1
Spot	228.0	11.0	2,026	14.6	0.1
Atlantic menhaden	152.9	7.4	653	4.7	0.2
Pigfish	92.5	4.5	595	4.3	0.2
Bluefish	59.7	2.9	131	0.9	0.5
Weakfish	52.3	2.5	207	1.5	0.3
Silver perch	33.3	1.6	212	1.5	0.2
Striped searobin	4.8	0.2	20	0.1	0.2
Crevalle jack	3.6	0.2	27	0.2	0.1
Striped burrfish	3.3	0.2	5	<0.1	0.6
Northern puffer	2.8	0.1	5	<0.1	0.6
Atlantic thread herring	2.4	0.1	23	0.2	0.1
Atlantic spadefish	1.8	0.1	27	0.2	0.1
Oyster toadfish	1.1	0.1	3	<0.1	0.4
Observed Species*					
Atlantic stingray	Blue crab		Southern stingray		
Black drum	Planehead filefish		Spottail pinfish		

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 1.6e. Species composition of scrap fish in long haul seine catches (N=22), Pamlico Sound area, 2011.

	Weight (lb)		Number		Mean fish weight
Species	Mean	Percent	Mean	Percent	(lb)
Atlantic croaker	1,659.3	54.2	9,368	48.9	0.2
Spot	559.9	18.3	3,632	19.0	0.2
Pinfish	385.4	12.6	3,217	16.8	0.1
Silver perch	183.0	6.0	993	5.2	0.2
Harvestfish	91.4	3.0	622	3.2	0.1
Atlantic menhaden	59.0	1.9	370	1.9	0.2
Pigfish	50.5	1.6	405	2.1	0.1
Sheepshead	31.7	1.0	270	1.4	0.1
Bluefish	12.6	0.4	47	0.2	0.3
Striped burrfish	6.4	0.2	13	0.1	0.5
Weakfish	6.2	0.2	37	0.2	0.2
Northern searobin	4.5	0.1	19	0.1	0.2
Bar jack	4.1	0.1	37	0.2	0.1
Atlantic thread herring	2.5	0.1	67	0.3	0.0
Northern puffer	1.8	0.1	2	<0.1	0.7
Observed Species*					
Atlantic bumper	Southern flounder				
Atlantic spadefish	Striped mullet				

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.



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ASSESSMENT OF NORTH CAROLINA COMMERCIAL FINFISHERIES

Final Performance Report for Award Number NA07NMF4070047

November 2012
FISHERY SECTION 2

WINTER TRAWL FISHERY ASSESSMENT

JOB 2

by

Chris Batsavage, Tina Moore and Tom Wadsworth

ABSTRACT

The North Carolina winter trawl fishery is an important multi-species, multi-gear fishery prosecuted in the Atlantic Ocean from southeast New England to Cape Lookout, North Carolina. The fishery has historically consisted of three components: the flynet fishery, which employs a two-seam otter trawl used to catch sciaenids and other non-demersal species; the nearshore flounder trawl fishery, which targets summer flounder (*Paralichthys dentatus*); and the deepwater trawl fishery, which targets summer flounder, black sea bass (*Centropristis striata*), and scup (*Stenotomus chrysops*). The fishery was divided into these three components for analytical purposes. The winter trawl fishery was sampled during the 2007-2008 to 2011-2012 fishing seasons to determine species composition, scrap composition, seasonality, and the fishery's contribution to the landings of economically important finfishes. The winter trawl fishery contributed 7-26% to the state's edible finfish landings by weight and 1-29% of the ex-vessel value of North Carolina's edible landings from 2007-2008 to 2011-12 fishing seasons. Landings from 2012 are still preliminary and subject to change. A total of 522 catches were sampled during the study period, November 2007 to April 2012. Atlantic croaker (*Micropogonias undulatus*) dominated sampled flynet catches, summer flounder comprised the majority of the sampled nearshore and deepwater flounder trawl catches while black sea bass, scup and Atlantic croaker comprised the majority of the deepwater flynet and combination net catches sampled. The scrap component of the winter trawl fishery comprised 3.3%-20.7% of the landings from sampled catches. Changing coastwide commercial quotas for targeted species and future gear restrictions to reduce sea turtle bycatch are management issues affecting the winter trawl fishery in North Carolina.

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INTRODUCTION

The North Carolina winter trawl fishery is a multi-species, multi-gear fishery that generally operates from October into May. Fishing effort shifts to one of several target species depending on seasonal and geographic distribution, catchability, fishery regulations and marketability. Target species include summer flounder (*Paralichthys dentatus*), Atlantic croaker (*Micropogonias undulatus*), weakfish (*Cynoscion regalis*), bluefish (*Pomatomus saltatrix*), black sea bass (*Centropristis striata*), scup (*Stenotomus chrysops*), striped bass (*Morone saxatilis*), kingfishes (*Menticirrhus* spp.) and recently Atlantic menhaden (*Brevoortia tyrannus*). Most of the target species in this fishery are managed under coastwide quotas with set trip limits. Fishing grounds include canyon areas extending from southeast New England to the Hudson Canyon (off New York and New Jersey) and south to Cape Lookout, NC and from the beach to beyond the 50 fathom curve (Figure 2.1). Depths fished range from nine to 50 fathoms. A trawl fishery that targets short finned squid (*Ilex illecebrosus*) occurs off North Carolina in the summer and fall but information from this fishery is not collected or included in this report, since only fishing in September through May are reported here.

Winter trawl catches are landed at North Carolina ports from Wanchese to Morehead City/Beaufort. The number of ports and fish houses offloading vessels in the winter trawl fishery has declined considerably in recent years (Ross 1991; Monaghan and Francesconi 1997; Monaghan 2001). For this report period (2007-2012), the greatest number of trips for the winter trawl fishery landed in Wanchese, followed by Engelhard and Morehead City/Beaufort (Figure 2.2). There are also eight fish houses on the western shore of Pamlico Sound (Grantsboro, Lowland, Hobucken, Oriental, and Swan Quarter) where fish were landed. The average number of trawlers involved in the winter trawl fishery during 2007-2011 (86) was lower than 2001-2006 (100) (Burns 2004a; Burns 2004b; Batsavage 2007). Additionally, many of the trawlers that landed in North Carolina were from outside the state. Due to the extensive geographic range of fishing grounds used by the North Carolina winter trawl fleet, catches were landed at ports in other states, particularly Hampton, VA, Cape May, NJ and New Bedford, MA. Quotas and permitting requirements forced the fleet to primarily land at North Carolina ports since the 1990s. However, boats offloading in Virginia ports for safe harbor purposes occurred more frequently in the 2011-2012 fishing season.

The shallow water flynet fishery is comprised of North Carolina trawlers that fish for weakfish, Atlantic croaker, bluefish, striped bass and kingfishes. The fishery targeted Atlantic menhaden more frequently in the last few years. Fishing generally takes place in depths less than 20 fathoms from north of Oregon Inlet to Cape Hatteras from October through April. Flynets are high profile trawls used for fish that school higher in the water column than typical groundfish. Flynets are bottom tending, range from 80 to120 ft across, with wing stretched mesh sizes of 16-64 inches and openings approximately 25 ft high. Tailbag stretched mesh sizes used in flynets are 3.5 inches square hung or 3.75 inches diamond hung. High volume catches are not uncommon in this fishery with 30 minute tows yielding up to 100,000 lb.

The nearshore flounder fishery is the southern segment of the mid-Atlantic summer flounder trawl fishery that takes place in less than 20 fathoms of water. Many of the vessels that enter the North Carolina winter trawl fishery participate in this component. Vessels begin landing in North Carolina ports with fish caught off the Delmarva Peninsula by November and off the Outer Banks by December. Effort in the nearshore flounder trawl fishery has declined in recent years, with much of the effort shifted to the deepwater component of the fishery. The predominant gear used in the nearshore flounder fishery is the flounder trawl, constructed with a 50-65 ft headrope with 5.5-6.0 inches stretched mesh (ISM) in the wings and body and 5.5-6.5 inches stretched mesh in the tailbag. Ground lines - including up to 300 ft of stranded-wire cable with cookies (rubber discs), 75 ft of chain, and 100 ft of cable - act as leads directing fish into the relatively small net.

The deepwater component of the winter trawl fishery was traditionally conducted primarily by vessels from Wanchese when nearshore flounder fishing declined due to flounder moving into deeper water areas in late-December or early-January. Vessels from all the ports offloading winter trawlers now participate in this fishery with some effort occurring in November and December. Fishing occurs from Kitty Hawk, NC to Norfolk Canyon and north along the Continental shelf edge from Virginia to southern New England for summer flounder, scup, and black sea bass (Figure 2.1). Different trawl gear is used depending on the species targeted: deepwater flounder trawls target summer flounder that have migrated offshore; deepwater flynets target Atlantic croaker, bluefish, black sea bass or scup in deeper waters (>20 fathoms) and combination nets (higher profile nets, with 8-10 inches mesh in the wings tapering to 5.5-6.0 inches mesh in the tailbags) or “roller rigs” are used to target scup and black sea bass in rocky canyons.

Multiple gears are often used on a single 1-10 day fishing “trip”, fishing in deep water as well as shallower areas. It is not uncommon in a trip for a crew to use a flounder trawl to target summer flounder for the majority of a trip, a flynet to target bluefish, croaker, or striped bass, and/or a combination net to target scup or black sea. The minimum mesh size restrictions for the different species targeted by the winter trawl fishery make the use of multiple trawls a necessity. Therefore, biological samples are described by gear and not fishing trip.

The North Carolina Division of Marine Fisheries (NCDMF) initiated a comprehensive sampling program of the winter trawl fishery in 1982. The objective was to obtain biological and fisheries data on economically important fishes for use in reaching management decisions. Species composition, relative abundance, distribution, and seasonality are presented here for the winter trawl fishery for 2007-2008 to 2011-2012.

METHODS AND MATERIALS

Winter trawl catches were sampled at fish houses in Wanchese, Morehead City/Beaufort, Oriental, Lowland, Hobucken and Engelhard (Figure 2.2). When available, the vessel's captain or a crew member was interviewed to obtain information on area and depth fished, number and duration of tows, days on the fishing grounds, and gear(s) used (including head rope length, body mesh size, and tail bag mesh size). Numbers of catches sampled varied by month and year due to availability, but when possible eight or more catches from each gear type were sampled per month during the fishing season.

To ensure adequate coverage of all sizes and species in the catches, and since some culling already has taken place at sea, stratified random samples of the graded catch were taken. We randomly sampled one or more 50 lb carton of each species market category or grade (small, medium, large, jumbo, etc.). More cartons of the larger grades were sampled since they contained fewer fish. Each sample was weighed to the nearest 0.1 kg, individual fish were measured to the nearest millimeter (FL or TL) and the total number of individuals was recorded. Weights and lengths were converted to standard units for this report. If the individuals in a carton were too numerous to measure, at least 30 were measured and the remainder counted. The total catch weight of each market category for each species was obtained from the fish dealer's records. If a particular species' market grade was included on the trip ticket, but the species was not sampled, an estimate of the number of fish landed for the grade was made using mean weight per individual from a sample of that species/grade from a recent sampled catch (usually from the same area). These data were recorded as calculated estimates of numbers by staff.

Scrap fish is the portion of the catch not marketed for human consumption, instead sold for crab or fish pot bait, industrial uses or discarded. All observed species in the scrap fish category were recorded whether they were marketable or discarded at the fish house. A 25 to 50 lb basket of scrap fish was sampled by staff if scrap fish were a significant (>100 lb) portion of a catch. Generally, small amounts of scrap fish (<100 lb) were considered negligible and not measured, weighed or counted, but recorded as observed species. Scrap fish were sorted and weighed by species, and all individuals measured to the nearest millimeter (TL or FL). Weights and lengths were converted to standard units for this report. If a particular species was too numerous, a random subsample of at least 30 individuals was measured, and the remaining fish counted. However, if a species had two or more distinct size classes, then each size class was treated as a separate sub-sample. The total weight of the scrap was obtained from the trip ticket if possible, or estimated by counting cartons of scrap or by subtracting the weight of marketable fish from the captain's estimate of the entire catch. The quantity (weight or numbers) of scrap fish (total or by species) landed by the fishery was determined by applying the monthly ratio of marketable fish to scrap fish from fish house samples to the reported monthly marketable landings from the Cooperative Fisheries Statistics Program (CFSP) and the North Carolina Trip Ticket Program (NCTTP). The estimated scrap fish (bait) quantity is for

landed scrap fish and does not account for discards at sea. The reported commercial landings of scrap fish (unclassified for bait or industrial purposes) from the CFSP were not used because of non-reporting of these landings by fish dealers. This ratio method of estimating scrap fish assumes that marketable fish landings are accurately compiled by the CFSP and/or the NCTTP.

Landed catches from the winter trawl fishery were analyzed by fishing season, the season occurred from October through April from 2007-2008 through 2011-2012. Federal budget constraints limiting dredging of inlets reduced the landings from the 2011-2012 winter trawl fishing season because many trawlers could not travel through Oregon Inlet to the main port of Wanchese to offload the catch. Sampling for the 2011-2012 fishing season only occurred from January to April 2012 with a total of 45 samples collected. Transfers for quota managed species (i.e. summer flounder) occurred between North Carolina and Virginia to allow North Carolina vessels to offload their catch at Virginia ports. Analyses of catches and trends in the winter trawl fishery were partitioned into the three component fisheries described by Ross et al. (1986): nearshore (shallow) flounder, shallow flynet and deepwater.

Landings reported refer to commercial landings data derived from the North Carolina General Canvas Data (1978-1993) and the North Carolina Trip Ticket Program (NCTTP) (1994-present) compiled through the NCDMF and the National Marine Fisheries Service Cooperative Fisheries Statistics Program. Fishing seasons are defined as the landings caught from October through May. Landings from the 2007-08 though 2011-2012 seasons are presented and compared to landings reported throughout the 1982-1983 to 2006-2007 report periods. All landings and value estimates reported in 2012 from the NCTTP are considered preliminary and subject to change, therefore all data reported for the 2011-2012 fishing season should not be considered final.

Sampling maps (Figures 2.1 and 2.2) were created using dealer addresses, trip ticket landings and independent fish house sampling data. The addresses were created with a georeferencing tool within ArcMap 10 software using the Dealer address records contained in the trip ticket database. Each unique dealer address was run through the georeferencing tool, and placed on the map as accurately as possible. If there was no match for the address using ArcMap georeferencing, it was searched on Google Maps, and interactively created and accurately placed by the GIS analyst. Trip ticket landing data were compiled from records that the NCDMF trip ticket program manages on their database. The data were summarized by dealer, fishery gear and the sum of trips by dealers from years 2007-2011. The independent fish house sampling data shown on the maps were created using records contained in the Biological Database. These data reflect the sum of fish house samples that were taken from 2007 to 2011, separated by fishery, gear and dealer. The results were then joined and displayed in ArcMap to the proper dealer address location using the dealer code and\or product number. Shaded areas identified the general area where the fishery occurred.

RESULTS AND DISCUSSION

The winter trawl fishery contributed to the State's edible finfish landings by weight: 26% for the 2007-2008 through 2009-2010 seasons, 20% for the 2010-2011 season and 7%[1] for the 2011-2012 season. By ex-vessel value, winter trawl 2007-2008 to 2011-2012 landings represented: 23%, 26%, 29%, 27%, and 1%[1] of the ex-vessel value of North Carolina's edible landings for the respective seasons. All of the flynet landings and most of the flounder trawl landings are from north of Cape Hatteras due to the flynet closure south of Cape Hatteras, effective April 1, 1995. The density of summer flounder, scup and black sea bass during the winter trawl season also are greater north of Cape Hatteras. The contribution of winter trawl catches to edible finfish landings were less for the 2007-2008 to 2011-2012 seasons when compared to the 2004-2005 to 2006-2007 seasons that ranged from 34% to 37% (Batsavage 2007). This is partially due to lower quotas for summer flounder and black sea bass since 2007, as well as lower landings of Atlantic croaker. However 2007-2008 through 2011-2012 landings contributions were higher than 1994 to 2000 levels that ranged from 16% to 24% of the State's edible finfish by weight except in 2011-2012 (Monaghan and Francesconi 1997; Monaghan 2001). This change is likely due to the decline in landings of other fisheries in North Carolina since 2000 (ocean and estuarine gill nets and pound nets).

The port with the greatest landings and most trips in 2007-2011 was in Wanchese, where 10-25 vessels landed winter trawl catches (Figure 2.2). Engelhard had the second largest landings and total number of trips. Oriental was third in landings but fourth in trips while Morehead City/Beaufort was fourth in landings but third in trips. These four areas offloaded 38.8 million pounds in nearly 2,500 trips from winter trawls catches during the 2007-2008 to 2011 fishing seasons (Figure 2.2). Other ports on the western shore of Pamlico Sound had much lower landings and trips for this fishery. The largest number of samples collected from the winter trawl fishery in 2007-2011 came from Wanchese fish houses (187) where 1402 trips offloaded. There were 114 samples collected in Beaufort compared to 346 trips. In Oriental, 98 samples were taken and 291 trips landed. Only 22 samples were collected in Engelhard where 454 trips landed. The remaining 25 samples were distributed among other fish houses where 170 trips occurred.

Eighty-two percent of the trips comprising 43% of the total harvest in 2007-2011 landed 20,000 lb or less (Table 2.1). The greatest percentage of the harvest for 2007-2011, 31.8% (12,883,180 lb), came from trips landing over 50,000 lb. The greatest percentage of trips, 34% (907 trips), landed 10,000-20,000 lb per trip.

Atlantic croaker was the most prominent species in winter trawls from the 2007-2008 through 2009-2010 fishing seasons, contributing 50%, 44% and 50% respectively to the overall landing weights (Table 2.2). In the 2010-2011 fishing season, Atlantic croaker had the third highest landing weight (17% of total landings). Landings of Atlantic croaker ranged from 391,774 lb in

[1] 2011-12 landings and value data are considered preliminary and subject to change

2011-2012 to 4,276,859 lb in 2009-2010 (Table 2.2). Landings of Atlantic croaker from the winter trawl fishery in 2007-2008 to 2011-2012 were the lowest since 1995-96 and especially low compared to 2004-05 to 2006-07 seasons (Monaghan and Francesconi 1997; Burns 2004b; Batsavage 2007). Atlantic croaker landings were especially low in 2011-12. Flounder (primarily summer flounder) had the second highest landings by weight in 2007-2008 to 2009-2010 and the highest in the 2010-2011 and 2011-2012 fishing seasons, contributing 30%-60% to winter trawl landings for the 2007-2008 to 2011-2012 seasons (Table 2.2). Winter trawl flounder landings in 2007-2008 to 2011-2012 were lower than 2001-2002 to 2005-2006 but similar to pre-2001 levels (Monaghan and Francesconi 1997; Monaghan 2001; Burns 2004a,b; Batsavage 2007). Atlantic menhaden catches in winter trawls increased significantly in the 2008-2009 and 2010-2011 fishing seasons, with the third highest (18%) and second highest (35%) landings by weight, respectively (Table 2.2). The proportion of winter trawl landings composed of bluefish declined from a high of 17% in 1982-1983 to 3%-9% during 1983-1984 to 1992-1993, and further declined since 1992-1993 (0.4%-3%) (Monaghan and Francesconi 1997; Monaghan 2001; Burns 2004a). The more recent landings for bluefish accounted for between 0.4% (5,599 lb) to 4.6% (322,876 lb) during the 2011-2012 and 2007-2008 fishing seasons (Table 2.2). Weakfish contributions to winter trawl landings have decreased greatly since peak catches in 1982-83, and the decline continued in recent years. Weakfish contributed less than 1% to the overall winter trawl landings for each fishing year from 2007-2008 through 2011-2012 (Monaghan and Francesconi 1997) (Table 2.2).

Striped bass landings in the winter trawl fishery ranged from 2,181 lb in 2011-2012 to 196,954 lb in 2009-10 fishing seasons, representing <1%-2% of landing by weight (Table 2.2). Striped bass landings were constrained by striped bass availability in NC waters, season windows and trip limits implemented by the NCDMF in order to allocate the striped bass quota. Boats fishing in the deepwater fishery would often target striped bass en route home through inshore waters, either with a flynet or flounder trawl.

FLYNET FISHERY

Catch Rates and Landings

From November 2007 to March 2008, 21 shallow water flynet catches were sampled with catches ranging from 812 to 64,512 lb/trip and averaged 21,017 lb/trip (Table 2.3a). From November 2008 to March 2009, 42 shallow water flynet catches were sampled with catches ranging from 86 to 103,861 lb/trip and averaged 25,092 lb/trip (Table 2.3b). From November 2009 to April 2010, 28 shallow water flynet catches were sampled with catches ranging from 1,542 to 109,871 lb/trip and averaged 29,590 lb/trip (Table 2.3c). From November 2010 to March 2011, 26 shallow water flynet catches were sampled with catches ranging from 562 to 107,825 lb/trip and averaged 28,522 lb/trip (Table 2.3d). From January 2012 to April 2012, 5 shallow water flynet catches were sampled with catches ranging from 10,508 to 69,279 lb/trip and averaged 30,590 lb/trip (Table 2.3e). Due to the flynet closure area, all samples for 2007-2008 to 2011-2012 were caught north of Cape Hatteras.

Species Composition

Atlantic croaker dominated the flynet fishery landings, by weight and number, for four of the five sampling seasons. They composed 42% (2010-2011) to 95% (2011-2012) of the total flynet catches sampled, by weight (Tables 2.4a-e). During the 2010-2011 fishing season, Atlantic menhaden exceeded Atlantic croaker as the dominant catch, accounting for 55% of the total catch by weight (Table 2.4d). Bluefish ranged from 0.5%, by weight, of the catch in 2008-2009 to 5.5% of the catch in 2009-2010. Striped bass accounted from only 0.9% of the catch in 2007-2008 to 2.5% of the catch in 2009-2010, no samples of striped bass were collected in 2011-2012 from flynets. In 2008-2009 fishing season Atlantic menhaden (18% by weight) and blueback herring (*Alosa aestivalis*) (3% by weight) were the second and third dominant species in the measured catch, respectively (Table 2.4b). Weakfish comprised only 0.1%-1.2%, by weight, of the sampled flynet catches (Tables 2.4a-c) and was similar to the 0.3% low reported for 2004-05 (Batsavage 2007). This continued lack of abundance of weakfish in the sampled catches paralleled the decrease in winter trawl landings of weakfish (Table 2.2). This finding is partially due to the closure of the flynet fishery south of Hatteras, where weakfish had been targeted historically. Additionally, varying minimum size limits among the east coast states resulted in decreased marketability of weakfish, contributing to ongoing low landings. The dominance of Atlantic croaker in the flynet catch composition 2007-2008 to 2011-2012 was a result of the reduced availability of weakfish, coupled with good catches and market demand for Atlantic croaker. Other species of importance (>1% by weight of the sampled catches from any year) in the flynet fishery included: southern kingfish (*Menticirrhus americanus*) and butterfish (*Preprilus triacanthus*).

Scrap Fish

Shallow and deepwater flynets targeting Atlantic croaker accounted for all of the scrap fish sampled from the winter trawl fishery in 2007-2008 through 2011-2012 fishing seasons. The mean scrap catch per sampled trip in 2007-2008 was 1,059 lb/trip, and comprised 3.1% of the landings from sampled flynet catches (Table 2.5). The mean scrap catch per sampled trip in 2008-09 was 2,517 lb/trip, and comprised 7.3% of the landings from sampled flynet catches. In 2009-10, the mean scrap catch per sampled trip was 10,782 lb/trip, and comprised 22.6% of the landings from sampled flynet catches. In 2010-2011, the mean scrap catch per sampled trip was 1,609 lb/trip, and comprised 6.8% of the landings from sampled flynet catches. During the 2011-12 season, the mean scrap catch per sampled trip was 2,000 lb/trip, and comprised 10.9% of the landings from sampled flynet catches. Scrap estimates for 2008-2009 and 2010-2011 were consistent with scrap estimates since 1997-98 (4.0%-7.7%) (Monaghan 2001; Burns 2004a; Burns 2004b). Recent estimates of scrap north of Cape Hatteras were much lower than historical scrap estimates, which were as high as 24%-44% during 1988-1989 to 1991-1992 (Ross 1992). In 1991, a scrap catch maximum was established at 5,000 lb per vessel per day, reducing scrap landings.

Species composition of the scrap in flynets was dominated by Atlantic croaker. Their contribution to sampled catches by weight ranged from 52% (2011-2012) to 84% (2009-2010) (Tables 3.6a-e). Spot (*Leiostomus xanthurus*) ranged from 1% (2011-2012) to 19% (2008-2009) of sampled scrap catches. Scrap landings of weakfish ranged from 3% (2010-2011) to 9% (2009-2010 and 2011-2012). Other notable species in the scrap component (>1% by weight of the sampled scrap catches from any year) included: Atlantic menhaden, smooth dogfish (*Mustelus canis*), butterfish, southern kingfish, longspine porgies (*Stenotomus caprinus*), sea robins (*Prionotus* spp.) and bluefish (Table 2.6a-e).

Management Issues

Several management issues have historically been associated with the flynet fishery. These were detailed in a previous report (Monaghan and Francesconi 1997). The most significant issue was the historical catch of sub-adult sciaenids by flynets. This problem was addressed by the closure of the flynet fishery south of Cape Hatteras in 1995. In addition, increased minimum fish size and flynet mesh size also assisted in decreasing the catch of sub-adult fish.

Reported scrap fish landings declined from the 1988-1989 fishing season until the 1993-1994 season. This recent increase can be attributed to the increased targeting of Atlantic croaker, which has no minimum size, to compensate for the lack of weakfish available for harvest (Ross et al. 1987). Though the targeting of Atlantic croaker has continued markedly since the decline of weakfish availability, a good market for Atlantic croaker and the 5,000 lb scrap trip limit have kept the scrap component of the Atlantic croaker fishery from returning to historical highs (e.g. 1994-1995 through 1996-1997 seasons had an average scrap weight of approximately 39,000 lb in winter trawls).

The National Marine Fisheries Service has identified trawl gear as a priority for reducing sea turtle bycatch. NMFS published a proposed rule on February 15, 2007 that considers requiring the use of turtle excluder devices (TEDs) in flynets (DOC 2007). There have been no released developments on this proposal as of October 2012. Since 1992, TEDs have been required for bottom trawls targeting summer flounder in Virginia and North Carolina. Observer data from flounder trawl and flynet trips in the Mid-Atlantic region from 1994 to 2004 reported 66 interactions with loggerhead sea turtles (*Caretta caretta*). A large number of these were near the Outer Banks. Fifty percent of interactions were observed in trips targeting summer flounder while 35% were in flynets targeting Atlantic croaker and weakfish (Murray 2006). Ninety-seven percent of interactions occurred in depths less than 31 m. The area, depth and timing of interactions coincides with operations of the inshore flynet fishery. Murray (2006) found no interactions in trawls equipped with TEDs after 1999. TEDs for the flynet fishery have been in design since 1999 but are not required (DOC 2007). Because a final rule on flynet TED requirements has not been published, it is currently unknown to what degree these proposed sea turtle conservation requirements will ultimately impact the inshore flynet fishery

NEARSHORE FLOUNDER FISHERY

Catch Rates and Landings

In December 2007 to February 2008, 28 nearshore flounder trawl catches were sampled, ranging from 81 to 9,904 lb/trip and averaging 3,635 lb/trip (Table 2.3a). In December 2008 to February 2009, 17 near shore flounder trawl catches were sampled, ranging from 1,118 to 15,492 lb/trip and averaging 7,596 lb/trip (Table 2.3b). In December 2009 to February 2010, 13 near shore flounder trawl catches were sampled, ranging from 928 to 10,086 lb/trip and averaging 7,789 lb/trip (Table 2.3c). In November 2010 to February 2011, 7 nearshore flounder trawl catches were sampled, ranging from 642 to 15,389 lb/trip and averaging 9,033 lb/trip (Table 2.3d). In January 2012 to March 2012, 5 nearshore flounder trawl catches were sampled, ranging from 943 to 9,980 lb/trip and averaging 3,628 lb/trip (Table 2.3e). Catches and therefore sampling were constrained by flounder seasons, landings windows and trip limits implemented by the NCDMF to avoid exceeding the summer flounder annual quota. Catches were also limited in 2011-12 due to excessive shoaling in Oregon Inlet that prevented trawlers from safely accessing fishing ports where many of the winter trawl catches are usually landed within North Carolina. Considerable landings by North Carolina vessels were made in Virginia due to this inlet hazard.

Historically, December was the peak sampling month for the nearshore flounder trawl fishery, and this was the case during the 2007-2008, 2009-2010, and 2010-2011 seasons (Table 2.3a,c,d). However, the majority of the nearshore flounder trawl samples during the 2008-2009 and 2011-2012 seasons were collected in January (Table 2.3b,e). An unusually warm winter in 2008-09 may have contributed to more summer flounder being available in the nearshore waters from the NC/VA line south to Kitty Hawk, NC. The number of nearshore flounder catches sampled has decreased considerably in the last several years, as a result of flounder trawlers shifting their effort to the deepwater component of this fishery (Monaghan 2001; Burns 2004a; Burns 2004b; Batsavage 2007). The number of samples collected in 2011-12 was down drastically compared to previous years due to limited access of vessels through Oregon Inlet (Table 2.3e).

Species Composition

Summer flounder comprised 90% in 2007-2008, 96% in 2008-2009, 99.5% in 2009-2010, 93% in 2010-2011, 83% in 2011-2012 of the weight of the shallow water flounder trawl catches sampled each year (Tables 3.7a-e). Other notable species in 2007-2008 to 2010-2011 catches (>1% by weight of the sampled catches from any year) included: bluefish, striped bass, Atlantic croaker, spiny dogfish (*Squalus acanthias*) and longfin squid (*Doryteuthis pealeii)*. While summer flounder dominated catches by weight and number in all years, in 2011-2012 spiny dogfish made up 12.5% of the shallow water flounder trawl catch by weight (4% by number). This is noteworthy since they composed less than 1% of catches in the previous four seasons catches.

Scrap Fish

The scrap component was very minimal in this fishery and no samples of scrap fish were obtained during the 2007-2008 to 2011-2012 fishing seasons.

Management Issues

Summer flounder are managed by a joint Mid-Atlantic Fishery Management Council (MAFMC) and Atlantic States Marine Fisheries Commission (ASMFC) Fisheries Management Plan (FMP). The flounder component of both the deepwater and nearshore flounder fisheries is managed by a series of rules including quotas, minimum net mesh size, minimum fish length, a moratorium on new fishery entrants and permit requirements under the summer flounder FMP. The summer flounder quota, first implemented in 1993, is a coastwide commercial quota allocated to the states from Maine to North Carolina based on each state's 1980-1989 landings of summer flounder. The North Carolina share is 27.44% of the coastwide commercial quota, the largest of the state allocations. North Carolina manages its summer flounder quota by trip limits, seasonal allocations and a permitting system.

The federal Magnuson-Stevens Fishery Conservation and Management Act, amended in 2006, required the coastwide stock of summer flounder to be rebuilt by January 1, 2013. The total allowable landings (TAL) of summer flounder have decreased every year since 2005 to achieve the stock rebuilding target and to offset the persistent overfishing by the commercial and recreational fisheries. The summer flounder stock was considered to have reached the biomass target in 2010 therefore the stock is considered rebuilt ahead of the deadline of January 1, 2013.

Incidental catches of endangered and threatened sea turtles prompted joint action by the NMFS and NCDMF in 1990. Cooperative research between the two agencies resulted in the development of TEDs for use in the trawl fishery for summer flounder. Since 1992, TEDs have been required in the trawl fishery for summer flounder south of Cape Charles, VA year round (Summer Flounder Fishery-Sea Turtle Protection Area), except for trawlers north of 35º 46.1 N lat. (Oregon Inlet), which are exempt from this requirement from January 15 through March 15 each year (DOC 1996).

NMFS published a proposed rule on February 15, 2007 that considered moving the northern boundary of the Summer Flounder Fishery-Sea Turtle Protection Area to north of Cape Charles, VA and requiring a larger escape opening for sea turtles in the TEDs (DOC 2007). Observers have documented sea turtle interactions in flounder trawls in locations and times when TEDs are not required (Murray 2006). NMFS has determined that the escape opening for flounder trawl TEDs is too small to allow the escapement of larger loggerhead, green sea turtles (*Chelonia mydas*) and leatherback sea turtles (*Dermochelys coriacea*). Many fishermen who participate in the summer flounder trawl fishery dislike the TEDs currently required for flounder trawls because they believe catches of summer flounder are reduced. As a result, some

fishermen trawl north of Cape Charles, VA or north of Oregon Inlet during the exempted period to avoid using TEDs. A final rule has not been published, so it is currently unknown how these proposed sea turtle conservation requirements will impact the nearshore flounder trawl fishery. On September 21, 2012 a NMFS rule approved a modified flounder TED for use in the summer flounder bottom trawl fishery.

DEEPWATER FISHERY

Catch Rates and Landings

In December 2007 to April 2008, 94 deepwater trawl catches were sampled with catches ranging from 26 to 54,021 lb/trip and averaging 11,663 lb/trip (Table 2.3a). In December 2008 to February 2009, 57 deepwater trawl catches were sampled with catches ranging from 2,858 to 45,418 lb/trip and averaging 12,856 lb/trip (Table 2.3b). From November 2009 to April 2010, 77 deepwater trawl catches were sampled with catches ranging from 3,761 to 43,102 lb/trip and averaging 12,094 lb/trip (Table 2.3c). From October 2010 to April 2011, 77 deepwater trawl catches were sampled with catches ranging from 3,546 to 40,151 lb/trip and averaging 12,207 lb/trip (Table 2.3d). From January 2012 to April 2012, 25 deepwater trawl catches were sampled with catches ranging from 956 to 27,965 lb/trip and averaged 14,992 lb/trip (Table 2.3e). Deepwater trawls have historically been a deepwater canyon fishery targeting summer flounder, bluefish, black sea bass and scup in January to April. However, the fishery has recently changed such that summer flounder and Atlantic croaker are targeted in November to April and black sea bass, scup and bluefish are targeted from January to April. Landings from the late-winter fishery declined from the late 1990s to 2001 due to reduced abundance of scup and black sea bass, and restrictive quotas and trip limits for these species and summer flounder. Trip limits implemented by NCDMF for summer flounder, black sea bass and scup allowed the fleet to follow the fish into the offshore portion of the fishery later in the season by delaying completion of quotas. Trip limits have fluctuated from year to year based on the quotas and percent allocated to North Carolina.

Species Composition

The majority of the deepwater fishing effort, as well as samples, were from catches that targeted summer flounder. Summer flounder ranged from 93% (2010-2011) to 98% (2008-2009) by weight of the total deepwater trawl catches sampled (Tables 2.8a-e). Other notable species from the deepwater trawl samples (>1% of sampled catches in any year) included: black sea bass, monkfish, southern flounder (*Paralichthys lethostigma)* and scup (Tables 2.8a-e).

Most of the catches sampled that targeted black sea bass and scup used deepwater flynets instead of combination nets, so the species compositions were combined for these two gears. Overall, species composition was more evenly distributed in deepwater flynet and combination net catches than other winter trawl gears. Scup was the most common species in samples of deepwater flynet and combination net catches by weight for 2007-2008 (27%) and 2008-2009

(57%) (Tables 2.9a-b), while Atlantic croaker comprised the majority of catches sampled in 2009-2010 (58%), 2010-2011 (74%), and 2011-2012 (82%) (Tables 2.9c-e). This was a major switch in species landed for these gears, as scup declined to 10% of landings in 2009-2010, 11% in 2010-2011 and were not seen in sampled catches for 2011-12 (mean sampled trip weights for scup declined correspondingly). Black sea bass comprised 10%-15% of catches in all years except 2008-09, where this species was 40% of the catch. Bluefish composed 27% of sampled catches for these gears in 2007-2008 but declined to less than 1% in the last two seasons. Summer flounder was less than 1% of sampled catches each year, except 2009-2010 where this species was 5% of the sampled catch. Weakfish were less than 1% of sampled catches most years but in 2009-2010 and 2011-2012 they composed 4% and 5%, respectively. Other notable species from the deepwater flynet and combination net samples (>1% of sampled catches in any year) included: longfin squid and smooth dogfish.

Scrap Fish

The scrap component from trips targeting summer flounder, scup, and black sea bass was very minimal in this fishery and no samples were obtained during the 2007-2008 to 2011-2012 fishing seasons. The scrap component from trips targeting Atlantic croaker is included in the shallow water flynet scrap component.

Management Issues

The deepwater trawl fishery operates in the Exclusive Economic Zone (EEZ), targeting species such as summer flounder, black sea bass, scup and bluefish that are under the jurisdiction of MAFMC and ASMFC FMPs. The deepwater component of the summer flounder trawl fishery falls under the same management as the near shore flounder fishery. The fishery also harvests Atlantic mackerel (*Scomber scombrus*), squid and butterfish, which are managed by a MAFMC FMP. Since the deepwater trawl component of the winter trawl fishery captures fish outside of North Carolina waters, management issues are mainly related to compliance with regional and federal FMPs.

Black sea bass are managed by a joint MAFMC and ASMFC FMP. The black sea bass component of the winter trawl fishery is managed by rules implemented to meet FMP requirements, including: an annual quota, minimum fish sizes, minimum tailbag mesh size and possession limits. Amendment 13 to the ASMFC Summer Flounder, Scup and Black Sea Bass FMP implemented a federal coastwide, annual quota to be managed using a state-by-state allocation system through 2007 (MAMFC and ASMFC 2002). Addendum XIX extended this management strategy (ASMFC 2007). The quota varies from year to year based on results of annual stock assessments. In North Carolina the quota applies north of Cape Hatteras, and the state receives 11% of the annual commercial quota. Allocation by state, rather than a coastwide quota, insures that all states with a stake in the fishery retain a portion of the quota. Addendum XX made an allowance for the transfer of commercial allocations for black sea bass among states (ASMFC 2009). The 2012 NMFS Northeast Fisheries Science Center (NEFSC)

updated assessment indicates that the current population size is above the biomass goal and overfishing is not occurring through 2011; therefore, the stock is considered rebuilt. However, uncertainty in the stock status has resulted in conservative management of this stock.

Scup are managed by a joint MAFMC and ASMFC FMP. The scup component of the winter trawl fishery is managed by rules implemented to meet FMP requirements, including: an annual coastwide quota divided into four month seasons, minimum fish sizes, a minimum tailbag mesh size and possession limits. Addendum XX (2009) made an allowance for the transfer of commercial allocations for the Summer Period (May 1-October 31) among states. The latest stock assessment for scup in 2012 indicates that the stock is not overfished and overfishing is not occurring relative through 2011. In August 2012 the commercial quota and possession limit for the Winter II period have been increased. The ASMFC and MAFMC also initiated development of a draft amendment to the Scup FMP to consider revisions to seasonal and sector allocations with options to modify the commercial/recreational allocations (currently 78%/22%) and move a portion of the Winter I and II Period allocations to the Summer Period (currently at 38.95% of the quota).

Summer flounder are managed by a joint MAFMC and ASMFC FMP. The summer flounder component of the winter trawl fishery is managed by rules implemented to meet FMP requirements, including: an annual coastwide quota, minimum fish sizes, minimum tailbag mesh size, and possession limits. The North Carolina commercial summer flounder fishery receives 27% of the annual commercial quota. The 2012 NMFS Northeast Fisheries Science Center (NEFSC) updated assessment indicates that the current population size is above the biomass goal and overfishing is not occurring through 2013; therefore, the stock is considered rebuilt (NEFSC 2012). However, uncertainty in the stock status has continued conservative management of this stock.

Although a minor component of the deepwater fishery, bluefish are managed under a federal FMP. Amendment 1 of the FMP established a state-by-state quota system where each state is required to close its waters to fishing when its share of the commercial quota is landed (MAFMC and ASMFC 1998). Management Plans for squid, Atlantic mackerel and butterfish have little effect on the North Carolina deepwater trawl fishery.

There have been no new protected species regulations impacting the winter trawl fishery. The deepwater component of the winter trawl fishery is prosecuted in water depths deeper than where most of the sea turtle interactions occurred and further north than the high bycatch rates of sea turtles.

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Table 2.1. Winter trawl landings (pounds), number of trips, and number of dealers for landings by trip category for 2007 to 2011 combined.

Landings range (lb)*	Total landings (lb)	Percent landings	Number of trips	Percent trips	Number of dealers
1-100	896	<0.1	15	0.6	7
101-200	1,960	<0.1	13	0.5	6
201-300	4,303	<0.1	17	0.6	9
301-400	5,133	<0.1	14	0.5	10
401-500	8,997	<0.1	20	0.8	10
501-600	4,987	<0.1	9	0.3	7
601-700	13,105	<0.1	20	0.8	8
701-800	17,547	<0.1	23	0.9	10
801-900	18,850	<0.1	22	0.8	8
901-1,000	19,126	<0.1	20	0.8	10
1,001-2,000	310,537	0.8	200	7.5	18
2,001-3,000	331,650	0.8	136	5.1	18
3,001-4,000	230,300	0.6	67	2.5	18
4,001-5000	352,669	0.9	78	2.9	15
5,001-6,000	467,529	1.2	84	3.2	15
6,001-7,000	618,384	1.5	95	3.6	16
7,001-8,000	590,955	1.5	79	3.0	15
8,001-9,000	594,664	1.5	70	2.6	16
9,001-10,000	2,815,199	7.0	289	10.8	18
10,001-20,000	10,979,903	27.1	907	34.0	19
20,001-30,000	3,197,331	7.9	129	4.8	9
30,001-40,000	3,872,640	9.6	110	4.1	11
40,001-50,000	3,126,043	7.7	69	2.6	7
>50,000	12,883,160	31.8	178	6.7	5
Total	40,465,865	100.0	2,664	100.0	

* Some species landings are controlled by quotas with specific trip limits.
Source: NC Trip Ticket Program

Table 2.2. North Carolina winter trawl (all gears) reported commercial landings (pounds) and value ($) for selected species of the fishery for fishing years 2007-2008 to 2011-2012

	2007-08				2008-09				2009-10			
Species	Pounds	% Pounds of fishery	Value ($)	% Value of fishery	Pounds	% Pounds of fishery	Value ($)	% Value of fishery	Pounds	% Pounds of fishery	Value ($)	% Value of fishery
Atlantic croaker	3,553,786	50.5	1,512,355	20.1	4,013,011	43.4	1,851,817	21.5	4,276,859	50.5	2,143,594	21.4
Atlantic mackerel	705	0.0	356	0.0	537	0.0	209	0.0	44,831	0.5	1,759	0.0
Atlantic menhaden	219,100	3.1	22,816	0.3	1,633,855	17.7	160,173	1.9	190,045	2.2	17,526	0.2
Bluefish	322,876	4.6	111,168	1.5	91,362	1.0	27,830	0.3	190,921	2.3	90,736	0.9
Butterfish	24,172	0.3	13,191	0.2	2,473	0.0	1,264	0.0	4,648	0.1	2,308	0.0
Flounder	2,218,227	31.5	4,876,037	65.0	2,783,429	30.1	5,465,033	63.4	3,198,209	37.7	6,767,573	67.6
Harvestfish	544	0.0	584	0.0	-	-	-	-	-	-	-	-
Kingfishes	43,703	0.6	38,465	0.5	38,704	0.4	36,586	0.4	35,035	0.4	36,562	0.4
Red drum	185	0.0	270	0.0	-	-	-	-	-	-	-	-
Scup	209,572	3.0	166,909	2.2	244,020	2.6	100,835	1.2	97,484	1.2	45,588	0.5
Sea basses	170,131	2.4	463,432	6.2	189,376	2.0	578,148	6.7	95,920	1.1	260,519	2.6
Spot	153	0.0	89	0.0	402	0.0	248	0.0	2,518	0.0	953	0.0
Spotted sea trout	1,756	0.0	2,665	0.0	5,400	0.1	9,042	0.1	-	-	-	-
Squids	26,233	0.4	16,493	0.2	16,243	0.2	10,739	0.1	33,687	0.4	25,080	0.3
Striped bass	74,118	1.1	153,276	2.0	133,052	1.4	319,903	3.7	196,954	2.3	539,219	5.4
Weakfish	8,660	0.1	7,774	0.1	10,147	0.1	9,236	0.1	24,383	0.3	24,252	0.2
Scrapfish (bait)	-	-	-	-	-	-	-	-	-	-	-	-
All other	168,336	2.4	120,667	1.6	82,286	0.9	55,059	0.6	83,677	1.0	61,828	0.6
Total fish	7,042,256	100.0	7,506,546	100.0	9,244,297	100.0	8,626,121	100.0	8,475,171	100.0	10,017,498	100.0
Total participants	86				80				89			
Total trips	493				528				633			

Note: (-) denotes no landings reported; landings and values are listed by seasons, September through May.

Table 2.2. (Continued)

	2010-11				2011-12*				2007-12* Mean			
Species	Pounds	% Pounds of fishery	Value ($)	% Value of fishery	Pounds	% Pounds of fishery	Value ($)	% Value of fishery	Pounds	% Pounds of fishery	Value ($)	% Value of fishery
Atlantic croaker	1,422,643	16.5	719,312	7.9	391,774	25.8	50,718	29.4	2,731,615	37.8	1,255,559	17.5
Atlantic mackerel	4,202	0.0	2,121	0.0	-	-	-	-	12,569	0.2	1,111	0.0
Atlantic menhaden	2,965,056	34.5	273,417	3.0	-	-	-	-	1,252,014	17.3	118,483	1.6
Bluefish	69,242	0.8	29,161	0.3	5,599	0.4	524	0.3	136,000	1.9	51,884	0.7
Butterfish	3,128	0.0	1,626	0.0	2,050	0.1	202	0.1	7,294	0.1	3,718	0.1
Flounder	3,385,074	39.4	7,271,558	79.4	905,866	59.8	67,991	39.4	2,498,161	34.6	4,889,638	68.0
Harvestfish	-	-	-	-	-	-	-	-	544	0.0	584	0.0
Kingfishes	2,056	0.0	2,172	0.0	3,509	0.2	142	0.1	24,601	0.3	22,785	0.3
Red drum	-	-	-	-	-	-	-	-	185	0.0	270	0.0
Scup	313,719	3.6	129,469	1.4	4,271	0.3	197	0.1	173,813	2.4	88,600	1.2
Sea basses	87,718	1.0	247,859	2.7	23,419	1.5	108	0.1	113,313	1.6	310,013	4.3
Spot	-	-	-	-	-	-	-	-	1,024	0.0	430	0.0
Spotted sea trout	47	0.0	97	0.0	-	-	-	-	2,401	0.0	3,934	0.1
Squids	148,494	1.7	90,854	1.0	157,617	10.4	42,133	24.4	76,455	1.1	37,060	0.5
Striped bass	104,441	1.2	298,401	3.3	2,181	0.1	-	-	102,149	1.4	327,700	4.6
Weakfish	4,814	0.1	4,997	0.1	1,828	0.1	91	0.1	9,966	0.1	9,270	0.1
Scrapfish (bait)	-	-	-	-	-	-	-	-	-	-	-	-
All other	87,235	1.0	85,774	0.9	17,683	1.2	10,244	5.9	87,843	1.2	66,715	0.9
Total fish	8,597,869	100.0	9,156,817	100.0	1,515,797	100.0	172,350	100.0	7,229,948	100.0	7,187,754	100.0
Total participants	87				54				79			
Total trips	579				124				471			

Note: (-) denotes no landings reported; landings and values are listed by seasons, September through May.
* Landings and value are preliminary for 2012 and subject to change.

Table 2.3a. Monthly summary of sampling of the winter trawl fishery for the 2007-2008 fishing season, by gear (Shallow flynets were fished in areas <20 fathoms; Shallow flounder were trawls fished in areas <20 fathoms; Deepwater were flounder trawls, flynets and combination nets fished in areas >20 fathoms).

		Fish house sampling					
Year	Month	Gear	Number of trips sampled	Mean weight of trips sampled (lb/trip)	Weight range of trips sampled (lb)	Mean sample weight (lb/sample)	Weight range of samples (lb)
2007	Nov.	Shallow flynet	3	37,881	27,996-47,137	238.8	155-392
	Dec.	Shallow flynet	6	18,010	1,060-44,229	263.5	220-392
		Shallow flounder	15	3,635	1,117-5,822	676.7	150-1,331
		Deepwater	2	28	26-30	28.2	26-30
2008	Jan.	Shallow flynet	1	42,773		315.8	
		Shallow flounder	8	4,805	158-9,904	613.9	158-1,131
		Deepwater	41	12,063	6,193-42,798	1,170.6	293-2,055
	Feb.	Shallow flynet	4	22,943	2,078-43,848	248.1	160-368
		Shallow flounder	5	1,763	81-7,987	553.7	81-2,189
		Deepwater	24	13,546	4,765-39,959	1,167.3	550-2,677
	Mar.	Shallow flynet	7	12,158	812-64,512	575.7	10-1,864
		Deepwater	24	9,910	4,211-54,021	996.2	300-2,697
	Apr.	Deepwater	3	12,914	5,446-27,844	1,340.6	178-3,145
2007-08		Shallow flynet	21	21,017	812-64,512	363.6	10-1,864
Overall		Shallow flounder	28	3,635	81-9,904	635.3	81-2,189
		Deepwater	94	11,663	26-54,021	1,106.2	26-3,145

Table 2.3b. Monthly summary of sampling of the winter trawl fishery for the 2008-2009 fishing season, by gear (Shallow flynets were fished in areas <20 fathoms; Shallow flounder were trawls fished in areas <20 fathoms; Deepwater were flounder trawls, flynets and combination nets fished in areas >20 fathoms).

		Fish house sampling					
Year	Month	Gear	Number of trips sampled	Mean weight of trips sampled (lb/trip)	Weight range of trips sampled (lb)	Mean sample weight (lb/sample)	Weight range of samples (lb)
2008	Nov.	Shallow flynet	3	29,575	22,079-33,519	223.1	161-280
	Dec.	Shallow flynet	7	22,540	285-39,946	182.8	60-282
		Shallow flounder	1	3,898		832.1	
		Deepwater	12	7,452	5,945-11,548	879.1	200-1,663
2009	Jan.	Shallow flynet	13	8,443	1,086-30,355	645.4	38-1,336
		Shallow flounder	15	7,316	1,118-10,525	790.3	500-1,305
		Deepwater	27	14,428	2,858-45,418	1195.6	150-2,154
	Feb.	Shallow flynet	12	31,368	86-84,016	188.7	19-352
		Shallow flounder	1	15,492		1273.4	
		Deepwater	18	14,508	10,913-15,302	975.5	250-1,972
	Mar.	Shallow flynet	7	45,884	14,064-103,861	259.3	61-475
2008-09		Shallow flynet	42	25,092	86-103,861	347.1	19-1,336
Overall		Shallow flounder	17	7,596	1,118-15,492	823.1	500-1,305
		Deepwater	57	12,856	2,858-45,418	1032.2	150-2,154

Table 2.3c. Monthly summary of sampling of the winter trawl fishery for the 2009-2010 fishing season, by gear (Shallow flynets were fished in areas <20 fathoms; Shallow flounder were trawls fished in areas <20 fathoms; Deepwater were flounder trawls, flynets and combination nets fished in areas >20 fathoms).

		Fish house sampling					
Year	Month	Gear	Number of trips sampled	Mean weight of trips sampled (lb/trip)	Weight range of trips sampled (lb)	Mean sample weight (lb/sample)	Weight range of samples (lb)
2009	Nov.	Shallow flynet	4	25,434	1,927-48,998	221.6	195-236
		Deepwater	4	8,882	3,761-11,035	601.1	454-900
	Dec.	Shallow flynet	3	30,582	5,517-43,468	296.8	163-390
		Shallow flounder	9	8,699	5,981-10,086	776.6	350-958
		Deepwater	4	26,059	5,778-43,102	354.1	100-572
2010	Jan.	Shallow flynet	11	34,593	1,542-109,871	497.0	289-1,177
		Shallow flounder	3	4,754	928-10,001	860.0	163-1,811
		Deepwater	26	11,440	4,676-36,010	1017.6	300-1,991
	Feb.	Shallow flynet	7	16,433	1,652-70,483	1050.7	351-1,942
		Shallow flounder	1	8,702		750.1	
		Deepwater	16	9,650	5,669-10,521	878.9	118-1,151
	Mar.	Shallow flynet	2	64,416	43,696-85,135	280.3	250-310
		Deepwater	12	11,449	10,812-12,990	893.7	150-1,401
	Apr.	Shallow flynet	1	10,652		250.0	
		Deepwater	15	13,483	10,992-18,392	1292.4	350-2,302
2009-10 Overall		Shallow flynet	28	29,590	1,542-109,871	562.5	163-1,942
		Shallow flounder	13	7,789	928-10,086	793.8	163-1,811
		Deepwater	77	12,094	3,761-43,102	966.9	100-2,302

Table 2.3d. Monthly summary of sampling of the winter trawl fishery for the 2010-2011 fishing season, by gear (Shallow flynets were fished in areas <20 fathoms; Shallow flounder were trawls fished in areas <20 fathoms; Deepwater were flounder trawls, flynets and combination nets fished in areas >20 fathoms).

		Fish house sampling					
Year	Month	Gear	Number of trips sampled	Mean weight of trips sampled (lb/trip)	Weight range of trips sampled (lb)	Mean sample weight (lb/sample)	Weight range of samples (lb)
2010	Oct.	Deepwater	2	21,848	3,546-40,151	231.5	221-241
	Nov.	Shallow flynet	7	16,082	4,910-29,688	353.5	61-729
		Shallow flounder	1	15,389		433.9	
		Deepwater	4	20,460	12,724-36,214	564.0	300-844
	Dec.	Shallow flynet	1	27,344		185.2	
		Shallow flounder	4	11,424	9,114-13,161	677.8	598-751
		Deepwater	4	12,152	7,985-14,040	727.4	600-951
2011	Jan.	Shallow flynet	11	20,329	562-88,015	259.3	61-562
		Shallow flounder	1	642		270.1	
		Deepwater	32	9,845	4,173-12,009	853.1	170-1,835
	Feb.	Shallow flynet	3	65,335	25,171-107,825	203.7	104-269
		Shallow flounder	1	1,505		1505.4	
		Deepwater	27	13,139	9,124-34,255	906.9	120-1,489
	Mar.	Shallow flynet	4	45,505	22,395-58,320	241.9	200-271
		Deepwater	6	12,640	9,902-15,408	919.5	206-1,251
	Apr.	Deepwater	2	10,088	4,920-15,256	675.4	400-950
2010-11		Shallow flynet	26	28,522	562-107,825	272.8	61-729
Overall		Shallow flounder	7	9,033	642-15,389	703.0	270-1,505
		Deepwater	77	12,207	3,546-40,151	833.9	120-1,835

Table 2.3e. Monthly summary of sampling of the winter trawl fishery for the 2011-2012 fishing season, by gear (Shallow flynets were fished in areas <20 fathoms; Shallow flounder were trawls fished in areas <20 fathoms; Deepwater were flounder trawls, flynets and combination nets fished in areas >20 fathoms).

		Fish house sampling					
Year	Month	Gear	Number of trips sampled	Mean weight of trips sampled (lb/trip)	Weight range of trips sampled (lb)	Mean sample weight (lb/sample)	Weight range of samples (lb)
2012	Jan.	Shallow flynet	2	11,470	10,508-12,432	292.7	234-352
		Shallow flounder	5	3,319	943-9,980	273.6	150-618
		Deepwater	2	5,784	1,355-10,212	685.8	250-1,121
	Feb.	Shallow flynet	2	55,117	40,954-69,279	390.7	381-401
		Deepwater	1	27,965		328.1	
	Mar.	Shallow flynet	1	19,779		217.1	
		Deepwater	21	15,920	7,801-18,808	933.8	200-1,488
	Apr.	Deepwater	1	956		102.8	
2011-12		Shallow flynet	5	30,590	10,508-69,279	316.8	217-401
Overall		Shallow flounder	5	3,628	943-9,980	280.9	150-618
		Deepwater	25	14,992	956-27,965	856.7	103-1,488

Table 2.4a. Overall species composition and mean catch per trip of North Carolina flynet catches (N=21) sampled during the 2007-2008 fishing season.

	Weight (lb)		Number		Mean fish	Frequency of
Species	Mean	Percent	Mean	Percent	weight (lb)	occurrence (%)
Atlantic croaker	17,007.2	81.0	33,054	75.3	0.5	76.2
Atlantic menhaden	2,054.0	9.8	6,417	14.6	0.3	38.1
Southern kingfish	456.4	2.2	862	2.0	0.5	42.9
Butterfish	285.1	1.4	2,063	4.7	0.1	61.9
Bluefish	222.7	1.1	125	0.3	1.8	47.6
Striped bass	193.8	0.9	12	0.0	15.9	19.0
Sheepshead	177.7	0.8	24	0.1	7.5	23.8
Weakfish	173.8	0.8	300	0.7	0.6	71.4
Longfin squid	76.7	0.4	274	0.6	0.3	38.1
Sharks	60.0	0.3	16	0.0	3.7	9.5
Spot	58.2	0.3	378	0.9	0.2	23.8
Atlantic spadefish	55.3	0.3	90	0.2	0.6	19.0
Northern kingfish	32.2	0.2	86	0.2	0.4	28.6
Smooth dogfish	29.1	0.1	12	0.0	2.5	14.3
Unclassified fish	28.7	0.1	-	-	-	4.8
Kingfishes	17.6	0.1	22	0.1	0.8	14.3

Observed Species*

Longspine porgy	American shad	Gray triggerfish
Summer flounder	Pigfish	Atlantic cutlassfish
Paralichthid flounders	Northern puffer	Atlantic brief squid
Clearnose skate	Red drum	Pink shrimp
Cobia	Round herring	White shrimp
Black drum	Northern searobin	Spiny dogfish
Thresher shark	Inshore lizardfish	Monkfish
Striped searobin	Little tunny	Atlantic mackerel
Spotted hake	Tautog	
Whelks	Blueback herring	

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.4b. Overall species composition and mean catch per trip of North Carolina flynet catches (N=42) sampled during the 2008-2009 fishing season.

	Weight (lb)		Number		Mean fish	Frequency of
Species	Mean	Percent	Mean	Percent	weight (lb)	occurrence (%)
Atlantic croaker	18,138.3	72.3	36,770	67.2	0.5	64.3
Atlantic menhaden	4,627.0	18.4	10,971	20.1	0.4	38.1
Blueback herring	839.4	3.3	3,725	6.8	0.2	14.3
Striped bass	477.6	1.9	20	0.0	24.5	31.0
Spot	275.8	1.1	1,943	3.6	0.1	47.6
Black drum	178.2	0.7	17	0.0	10.3	14.3
Southern kingfish	147.1	0.6	317	0.6	0.5	42.9
Weakfish	136.7	0.5	438	0.8	0.3	50.0
Bluefish	124.8	0.5	94	0.2	1.3	28.6
Striped searobin	30.0	0.1	20	0.0	1.5	9.5
Butterfish	22.9	0.1	159	0.3	0.1	35.7
Longfin squid	17.0	0.1	50	0.1	0.3	40.5
Northern kingfish	13.9	0.1	27	0.0	0.5	23.8

Observed Species*		
Thresher shark	Pigfish	Blueline tilefish
Kingfishes	Atlantic herring	Altantic spadefish
Skates	Pinfish	Triggerfish
Longspine porgy	Sliver perch	Atlantic mackerel
Atlantic cutlassfish	Smooth dogfish	Pink shrimp
Summer flounder	Monkfish	Spiny dogfish
Southern hake	Gray triggerfish	Clearnose skate
Amberjacks	Alewife	Atlantic stingray
Hakes	Sheepshead	Butterfly ray
Spotted hake	Northern puffer	Northern searobin
Paralichthid flounders	Scup	Striped burrfish

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.4c. Overall species composition and mean catch per trip of North Carolina flynet catches (N=28) sampled during the 2009-2010 fishing season.

	Weight (lb)		Number		Mean fish	Frequency of
Species	Mean	Percent	Mean	Percent	weight (lb)	occurrence (%)
Atlantic croaker	26,265.5	88.8	63,914	94.5	0.4	64.3
Bluefish	1,634.1	5.5	201	0.3	8.1	25.0
Striped bass	727.4	2.5	33	0.0	22.1	39.3
Weakfish	358.1	1.2	1,218	1.8	0.3	39.2
Spot	179.3	0.6	1,062	1.6	0.2	32.1
Southern kingfish	123.3	0.4	315	0.5	0.4	21.4
Longfin squid	74.7	0.3	257	0.4	0.3	14.3
Smooth dogfish	72.5	0.2	19	0.0	3.9	14.3
Atlantic menhaden	38.8	0.1	76	0.1	0.5	17.9
Butterfish	15.9	0.1	81	0.1	0.2	28.6
Kingfishes	15.9	0.1	22	0.0	0.7	17.9
Searobins	15.0	0.1	114	0.2	0.1	3.6

Observed Species*

Northern searobin	Striped searobin	Northern kingfish
Southern hake	Atlantic spadefish	Horseshoe crab
Atlantic cutlassfish	Spotted hake	Stingrays
Banded drum	Sheepshead	Blueback herring
Summer flounder	Spiny dogfish	Red cornetfish
Silver perch	Black drum	Pinfish
Cobia	Triggerfishes	
Amberjacks	Gray triggerfish	

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.4d. Overall species composition and mean catch per trip of North Carolina flynet catches (N=26) sampled during the 2010-2011 fishing season.

	Weight (lb)		Number		Mean fish	Frequency of
Species	Mean	Percent	Mean	Percent	weight (lb)	occurrence (%)
Atlantic menhaden	15,535.8	54.5	38,172	55.2	0.4	46.2
Atlantic croaker	11,934.3	41.9	29,527	42.7	0.4	53.8
Striped bass	308.9	1.1	20	0.0	15.7	38.5
Bluefish	207.9	0.7	69	0.1	3.0	30.8
Longfin squid	185.7	0.7	479	0.7	0.4	34.6
Summer flounder	165.4	0.6	89	0.1	1.9	23.1
Spot	41.7	0.1	473	0.7	0.1	15.4
Smooth dogfish	27.3	0.1	12	0.0	2.2	11.5
Weakfish	19.4	0.1	31	0.0	0.6	34.6
Butterfish	15.4	0.1	74	0.1	0.2	26.9

Observed Species*

Black drum	Striped searobin	Triggerfishes
Atlantic cutlassfish	King mackerel	Black sea bass
Northern searobin	Horseshoe crab	Spanish mackerel
Blueline tilefish	Kingfishes	Spiny dogfish
Northern kingfish	Gray triggerfish	Clearnose skate
Southern kingfish	Blacktip shark	Rosette skate
Cobia	Monkfish	Inshore lizardfish
Northern puffer	Atlantic spadefish	Hakes
Longspine porgy	Pinfish	Searobins
Sheepshead	Skipjack tuna	Windowpane flounder

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.4e. Overall species composition and mean catch per trip of North Carolina flynet catches (N=5) sampled during the 2011-2012 fishing season.

	Weight (lb)		Number		Mean fish	Frequency of
Species	Mean	Percent	Mean	Percent	weight (lb)	occurrence (%)
Atlantic croaker	28,912.0	94.5	70,227	94.3	0.4	100.0
Atlantic menhaden	592.7	1.9	1,099	1.5	0.5	60.0
Southern kingfish	372.6	1.2	1,000	1.3	0.4	60.0
Bluefish	279.6	0.9	310	0.4	0.9	80.0
Weakfish	130.1	0.4	395	0.5	0.3	100.0
Butterfish	100.3	0.3	714	1.0	0.1	80.0
Striped searobin	65.5	0.2	315	0.4	0.2	40.0
Northern kingfish	48.3	0.2	104	0.1	0.5	60.0
Thresher shark	31.3	0.1	1	0.0	52.3	20.0
Spot	23.8	0.1	208	0.3	0.1	60.0
Longfin squid	22.1	0.1	61	0.1	0.4	60.0
	0.0	0.0				
Observed species*						
Northern puffer	Monkfish					
Summer flounder	Southern hake					
Silver perch	Kingfishes					

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.5. Scrap component of winter trawl catches sampled from 2007-2008 to 2011-2012 fishing seasons including: number of catches in which scrap weight was obtained (N), mean total trip weight (mean total weight), mean weight of marketed fish (mean market weight), mean total weight of scrap (mean scrap weight) and percent of scrap in these catches. All weights are in pounds.

Season	N	Mean total weight (lb)	Mean market weight (lb)	Mean scrap weight (lb)	Percent scrap
2007-08	12	34,475	33,417	1,059	3.1
2008-09	24	34,545	32,029	2,517	7.3
2009-10	17	47,788	37,006	10,782	22.6
2010-11	7	23,780	22,171	1,609	6.8
2011-12	4	18,273	16,273	2,000	10.9

Table 2.6a. Overall species composition (top 99%) and mean catch per trip of scrap sampled from North Carolina flynet catches during the 2007-2008 fishing season. All catches were caught north of Cape Hatteras.

	Weight (lb)		Number		Mean fish weight	Frequency of Occurrence
Species	Mean	Percent	Mean	Percent	(lb)	(%)
2007-2008 (n=12)						
Atlantic croaker	579.9	54.8	1,940	44.8	0.3	100.0
Spot	193.2	18.3	1,116	25.7	0.2	66.7
Weakfish	78.1	7.4	254	5.9	0.3	83.3
Smooth dogfish	51.8	4.9	21	0.5	2.4	25.0
Butterfish	46.5	4.4	530	12.2	0.1	33.3
Southern kingfish	20.7	2.0	83	1.9	0.2	41.7
Longspine porgy	16.1	1.5	113	2.6	0.2	16.7
Atlantic menhaden	14.8	1.4	31	0.7	0.5	41.7
Northern kingfish	13.9	1.3	57	1.3	0.2	25.0
Clearnose skate	9.7	0.9	8	0.2	1.2	16.7
Striped searobin	7.5	0.7	51	1.2	0.1	33.3
Bluefish	7.3	0.7	10	0.2	0.7	16.7
Longfin squid	3.7	0.4	17	0.4	0.2	25.0
Amercian shad	3.7	0.3	2	0.0	2.2	8.3
Pigfish	3.3	0.3	17	0.4	0.2	8.3
Spotted hake	3.1	0.3	11	0.3	0.3	8.3
Northern puffer	1.5	0.1	9	0.2	0.2	8.3
Round herring	0.9	0.1	13	0.3	0.1	16.7
Northern searobin	0.9	0.1	34	0.8	<0.1	16.7
Inshore lizardfish	0.7	0.1	1	0.0	0.5	8.3
Observed Species*						
Blueback herring	Leopard searobin					
Gray triggerfish	Pink shrimp					
Summer flounder	Atlantic spadefish					

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch

Table 2.6b. Overall species composition (top 99%) and mean catch per trip of scrap sampled from North Carolina flynet catches during the 2008-2009 fishing season. All catches were caught north of Cape Hatteras.

	Weight (lb)		Number		Mean fish weight	Frequency of Occurrence
Species	Mean	Percent	Mean	Percent	(lb)	(%)
2008-2009 (n=24)						
Atlantic croaker	1,720.6	67.9	7,027	59.8	0.2	91.7
Spot	482.0	19.0	3,400	28.9	0.1	79.2
Weakfish	198.2	7.8	718	6.1	0.3	70.8
Atlantic menhaden	62.8	2.5	144	1.2	0.4	37.5
Southern kingfish	15.7	0.6	44	0.4	0.4	8.3
Butterfish	13.5	0.5	165	1.4	0.1	33.3
Longspine porgy	11.7	0.5	89	0.8	0.1	4.2
Blueback herring	6.0	0.2	24	0.2	0.2	16.7
Hakes	4.2	0.2	20	0.2	0.2	8.3
Northern kingfish	4.2	0.2	19	0.2	0.2	8.3
Spotted hake	3.1	0.1	14	0.1	0.2	4.2
Pigfish	1.8	0.1	8	0.1	0.2	4.2
Atlantic herring	1.8	0.1	37	0.3	<0.1	4.2
Summer flounder	1.5	0.1	4	0	0.4	4.2
Pinfish	1.5	0.1	13	0.1	0.1	4.2
Observed Species*						
Silver perch	Striped searobin					
Alewife	Loligo squid					
Northern puffer	Bluefish					
Scup	Longfin squid					

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch

Table 2.6c. Overall species composition (top 99%) and mean catch per trip of scrap sampled from North Carolina flynet catches during the 2009-2010 fishing season. All catches were caught north of Cape Hatteras.

	Weight (lb)		Number		Mean fish weight	Frequency of Occurrence
Species	Mean	Percent	Mean	Percent	(lb)	(%)
2009-2010 (n=16)						
Atlantic croaker	7,769.8	83.8	31,219	82.3	0.2	100.0
Weakfish	858.8	9.3	2,947	7.8	0.3	81.3
Spot	297.2	3.2	1,805	4.8	0.2	56.3
Atlantic menhaden	67.9	0.7	132	0.3	0.5	31.3
Searobins	59.5	0.6	662	1.7	0.1	12.5
Butterfish	34.2	0.4	231	0.6	0.2	12.5
Northern searobin	28.4	0.3	236	0.6	0.1	25.0
Banded drum	24.9	0.3	113	0.3	0.2	12.5
Northern kingfish	22.7	0.2	60	0.2	0.4	18.8
Southern kingfish	21.4	0.2	145	0.4	0.2	6.3
Bluefish	21.2	0.2	27	0.1	0.8	6.3
Southern hake	17.6	0.2	40	0.1	0.4	6.3
Atlantic cutlassfish	16.8	0.2	76	0.2	0.2	6.3
Silver perch	7.3	0.1	98	0.3	0.1	12.5
Striped searobin	6.2	0.1	71	0.2	0.1	6.3
Harvestfish	6.0	0.1	14	0.0	0.4	6.3
Observed Species*						
Atlantic spadefish	Spotted hake					
Spiny dogfish						

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch

Table 2.6d. Overall species composition (top 99%) and mean catch per trip of scrap sampled from North Carolina flynet catches during the 2010-2011 fishing season. All catches were caught north of Cape Hatteras.

	Weight (lb)		Number		Mean fish weight	Frequency of Occurrence
Species	Mean	Percent	Mean	Percent	(lb)	(%)
2010-2011 (n=7)						
Atlantic croaker	1,267.7	78.8	5,299	70.2	0.2	100.0
Spot	104.7	6.5	1,243	16.5	0.1	57.1
Atlantic cutlassfish	72.8	4.5	91	1.2	0.8	42.9
Weakfish	44.3	2.8	88	1.2	0.5	42.9
Atlantic menhaden	23.6	1.5	322	4.3	0.1	14.3
Smooth dogfish	22.9	1.4	24	0.3	0.9	14.3
Longspine porgy	20.7	1.3	282	3.7	0.1	28.6
Atlantic spadefish	14.8	0.9	17	0.2	0.9	14.3
Northern searobin	10.1	0.6	63	0.8	0.2	28.6
Northern puffer	7.7	0.5	44	0.6	0.2	57.1
Striped searobin	6.8	0.4	26	0.3	0.3	28.6
Spotted hake	4.9	0.3	28	0.4	0.2	14.3
Summer flounder	3.7	0.2	6	0.1	0.7	14.3
Southern kingfish	2.6	0.2	6	0.1	0.4	28.6
Bank sea bass	1.3	0.1	6	0.1	0.2	14.3
Pinfish	0.9	0.1	4	0.1	0.2	14.3

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch

Table 2.6e. Overall species composition (top 99%) and mean catch per trip of scrap sampled from North Carolina flynet catches during the 2011-2012 fishing season. All catches were caught north of Cape Hatteras.

	Weight (lb)		Number		Mean fish weight	Frequency of Occurrence
Species	Mean	Percent	Mean	Percent	(lb)	(%)
2011-2012 (n=4)						
Atlantic croaker	1,034.4	51.7	4,781	63.3	0.2	100.0
Atlantic menhaden	615.9	30.8	1,185	15.7	0.5	50.0
Weakfish	179.9	9.0	398	5.3	0.5	75.0
Striped searobin	79.6	4.0	373	4.9	0.2	25.0
Butterfish	52.7	2.6	477	6.3	0.1	75.0
Spot	20.1	1.0	196	2.6	0.1	75.0
Northern puffer	7.9	0.4	48	0.6	0.2	25.0
Planehead filefish	3.7	0.2	26	0.3	0.1	25.0
Bluefish	2.4	0.1	11	0.1	0.2	25.0
Silver perch	1.8	0.1	21	0.3	0.1	25.0
Observed Species*						
Southern hake						
Northern kingfish						
Pinfish						

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch

Table 2.7a. Overall species composition and mean catch per trip of the North Carolina near shore (shallow) flounder trawl catches (N=28) sampled during the 2007-2008 fishing season.

	Weight (lb)		Number		Mean fish	Percent
Species	Mean	Percent	Mean	Percent	weight (lb)	freq. occur.
Summer flounder	3,285.0	90.4	1,613	92.4	2.04	75.0
Bluefish	180.8	5.0	22	1.3	8.06	21.4
Striped bass	40.1	1.1	3	0.2	15.22	14.3
Atlantic croaker	29.8	0.8	36	2.0	0.84	42.9
Spotted sea trout	18.3	0.5	5	0.3	3.41	21.4
Monkfish	17.9	0.5	9	0.5	1.95	21.4
Knobbed whelk	14.1	0.4	6	0.3	2.45	7.1
Longfin squid	10.6	0.3	37	2.1	0.28	28.6
Horseshoe crab	9.9	0.3	3	0.2	3.00	3.6
Whelks	7.9	0.2	-	-	-	10.7
Black drum	6.2	0.2	0	0.0	13.10	17.9
Octopi	2.4	0.1	2	0.1	1.07	3.6
Weakfish	2.0	0.1	1	0.0	2.79	28.6
Channeled whelk	2.0	0.1	3	0.2	0.57	7.1
Tautog	2.0	0.1	0	0.0	5.29	14.3

Observed Species*

Sea scallops	Atlantic cod	Southern hake
Gray triggerfish	Sheepshead	Leopard searobin
Southern flounder	Common octopus	Longspine porgy
Black sea bass	Pink shrimp	Spot
Red drum	Calico box shrimp	Banded drum
Northern kingfish	Lady crab	Kingfishes
Southern kingfish	Clearnose skate	Witch flounder
Atlantic spadefish	Thorny skate	Blackcheek tonguefish
Butterfish	Atlantic menhaden	Northern puffer

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.7b. Overall species composition and mean catch per trip of the North Carolina near shore (shallow) flounder trawl catches (N=17) sampled during the 2008-2009 fishing season.

	Weight (lb)		Number		Mean fish	Percent
Species	Mean	Percent	Mean	Percent	weight (lb)	freq. occur.
Summer flounder	7,297.7	96.1	3,911	98.3	1.87	88.2
Striped bass	194.7	2.6	10	0.2	20.30	17.6
Monkfish	33.3	0.4	15	0.4	2.18	41.2
Smooth dogfish	30.9	0.4	8	0.2	3.86	11.8
Bluefish	14.1	0.2	2	0.0	8.32	5.9
Whelks	8.6	0.1	-	-	-	5.9
Longfin squid	7.7	0.1	29	0.7	0.26	17.6

Observed Species*	
Weakfish	Northern kingfish
Black sea bass	Clearnose skate
Octopi	Thorny skate
Common octopus	Leopard searobin
Butterfish	Atlantic croaker

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch

Table 2.7c. Overall species composition and mean catch per trip of the North Carolina near shore (shallow) flounder trawl catches (N=13) sampled during the 2009-2010 fishing season.

	Weight (lb)		Number		Mean fish	Percent
Species	Mean	Percent	Mean	Percent	weight (lb)	freq. occur.
Summer flounder	7,748.6	99.5	4,146	99.0	1.87	100.0
Monkfish	15.4	0.2	7	0.2	2.36	30.8
Atlantic croaker	14.8	0.2	26	0.6	0.57	23.1

Observed Species*		
Bluefish	Northern kingfish	Striped searobin
Gulf flounder	Common octopus	Leopard searobin
Black sea bass	Spiny dogfish	Sheepshead
Longfin squid	Clearnose skate	Kingfishes
Weakfish	Rosette skate	Black drum
Southern kingfish	Northern searobin	Witch flounder

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.7d. Overall species composition and mean catch per trip of the North Carolina near shore (shallow) flounder trawl catches (N=7) sampled during the 2010-2011 fishing season.

	Weight (lb)		Number		Mean fish	Percent
Species	Mean	Percent	Mean	Percent	weight (lb)	freq. occur.
Summer flounder	8,409.9	93.1	4,334	91.2	1.94	71.4
Striped bass	306.7	3.4	23	0.5	13.34	28.6
Skates	68.4	0.8	-	-	-	14.3
Longfin squid	55.1	0.6	141	3.0	0.39	28.6
Scup	52.5	0.6	42	0.9	1.26	14.3
Butterfish	35.7	0.4	149	3.1	0.24	14.3
Bluefish	30.2	0.3	5	0.1	5.86	42.9
Horseshoe crab	23.2	0.3	8	0.2	3.00	14.3
Kingfishes	18.5	0.2	23	0.5	0.81	14.3
Atlantic croaker	12.1	0.1	25	0.5	0.48	14.3
Whelks	7.1	0.1	-	-	-	14.3
Black drum	6.8	0.1	0	0.0	48.07	14.3
Smooth dogfish	6.0	0.1	2	0.0	3.51	14.3

Observed Species*	
Weakfish	Leopard searobin
Clearnose skate	Southern flounder
Little skate	Windowpane flounder
Thorny skate	

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.7e. Overall species composition and mean catch per trip of the North Carolina near shore (shallow) flounder trawl catches (N=5) sampled during the 2011-2012 fishing season.

	Weight (lb)		Number		Mean fish	Percent
Species	Mean	Percent	Mean	Percent	weight (lb)	freq. occur.
Summer flounder	2,766.4	83.4	1,315	81.2	2.10	80.0
Spiny dogfish	416.3	12.5	64	4.0	6.46	20.0
Atlantic croaker	68.6	2.1	138	8.5	0.50	40.0
Longfin squid	33.7	1.0	78	4.8	0.43	60.0
Monkfish	30.0	0.9	18	1.1	1.69	80.0
Northern kingfish	3.5	0.1	5	0.3	0.67	20.0

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.8a. Overall species composition and mean catch per trip of North Carolina deepwater flounder trawl catches sampled (N=87) during the 2007-2008 fishing season.

	Weight (lb)		Number		Mean fish	Percent
Species	Mean	Percent	Mean	Percent	weight (lb)	freq. occur.
Summer flounder	8,298.7	95.9	3,693	93.0	2.25	97.7
Monkfish	116.0	1.3	67	1.7	1.74	75.9
Bluefish	81.4	0.9	13	0.3	6.16	28.7
Black sea bass	60.4	0.7	42	1.1	1.44	59.8
Scup	41.0	0.5	47	1.2	0.88	25.3
Longfin squid	39.5	0.5	102	2.6	0.39	35.6
Sea scallops	10.8	0.1	-	-	-	25.3

Observed Species*		
Horseshoe crab	Atlantic cod	American eel
Witch flounder	Southern kingfish	American shad
Weakfish	Fourspot flounder	Alewife
Tautog	Jonah crab	Atlantic herring
Striped bass	Atlantic rock crab	Red hake
Whelks	Coarshand lady crab	Spotted hake
Octopi	Spiny dogfish	Northern searobin
Sheepshead	Clearnose skate	Striped searobin
Silver hake	Little skate	Leopard searobin
Blueline tilefish	Winter skate	Atlantic mackerel
Atlantic croaker	Rosette skate	Butterfish
Northern kingfish	Throny skate	Windowpane flounder

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.8b. Overall species composition and mean catch per trip of North Carolina deepwater flounder trawl catches sampled (N=54) during the 2008-2009 fishing season.

	Weight (lb)		Number		Mean fish	Percent
Species	Mean	Percent	Mean	Percent	weight (lb)	freq. occur.
Summer flounder	10,591.5	97.9	4,901	96.1	2.16	100.0
Monkfish	78.9	0.7	42	0.8	1.86	75.9
Black sea bass	47.2	0.4	32	0.6	1.48	25.9
Bluefish	43.2	0.4	9	0.2	5.02	33.3
Scup	24.9	0.2	31	0.6	0.81	18.5
Longfin squid	24.0	0.2	81	1.6	0.30	42.6

Observed Species*		
Witch flounder	American lobster	Northern searobin
Whelks	Jonah crab	Striped searobin
Weakfish	Skates	Leopard searobin
Atlantic croaker	Clearnose skate	Spotted seatrout
Blueline tilefish	Little skate	Northern kingfish
Common octopus	Rosette skate	Atlantic mackerel
Kingfishes	Thorny skate	Butterfish
Smooth dogfish	Spotted hake	Fourspot flounder
Tilefishes	Silver hake	Windowpane flounder
Sea scallop	Searobins	

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.8c. Overall species composition and mean catch per trip of North Carolina deepwater flounder trawl catches sampled (N=70) during the 2009-2010 fishing season.

	Weight (lb)		Number		Mean fish	Percent
Species	Mean	Percent	Mean	Percent	weight (lb)	freq. occur.
Summer flounder	9,923.8	96.9	4,773	95.6	2.08	100.0
Black sea bass	154.6	1.5	117	2.3	1.32	55.7
Monkfish	59.5	0.6	34	0.7	1.75	62.9
Bluefish	25.8	0.3	4	0.1	6.99	20.0
Scup	22.5	0.2	26	0.5	0.85	18.6
Paralichthid flounders	20.7	0.2	-	-	-	10.0
Searobins	6.4	0.1	7	0.1	0.88	4.3
Longfin squid	6.2	0.1	19	0.4	0.34	30.0

Observed Species*		
Atlantic mackerel	Butterfish	Rosette skate
Blueline tilefish	Buckler dory	Thorny skate
Atlantic croaker	Weakfish	Atlantic menhaden
Hakes	Fourspot flounder	Spotted hake
Tilefishes	Jonah crab	Northern searobin
Sea scallops	Spiny dogfish	Striped searobin
Silver hake	Skates	Leopard searobin
Triggerfishes	Clearnose skate	Witch flounder
Striped bass	Winter skate	Ocean triggerfish

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.8d. Overall species composition and mean catch per trip of North Carolina deepwater flounder trawl catches sampled (N=74) during the 2010-2011 fishing season.

	Weight (lb)		Number		Mean fish	Percent
Species	Mean	Percent	Mean	Percent	weight (lb)	freq. occur.
Summer flounder	9,966.4	93.3	4,784	90.1	2.08	98.6
Black sea bass	192.3	1.8	131	2.5	1.46	63.5
Paralichthid flounders	166.0	1.6	69	1.3	2.41	6.8
Scup	141.3	1.3	162	3.1	0.87	31.1
Monkfish	55.3	0.5	26	0.5	2.15	66.2
Bluefish	44.8	0.4	12	0.2	3.80	28.4
Atlantic mackerel	39.0	0.4	22	0.4	1.75	2.7
Longfin squid	35.5	0.3	90	1.7	0.40	41.9
Searobins	11.5	0.1	13	0.2	0.88	1.4
Skates	9.0	0.1	-	-	-	6.8
Sea scallops	6.0	0.1	-	-	-	4.1

Observed Species*

Tilefishes	Kingfishes	Rosette skate
Silver hake	Triggerfishes	Thorny skate
Sheepshead	Buckler dory	Atlantic stingray
Witch flounder	Fourspot flounder	Atlantic herring
Atlantic croaker	Spotted hake	Atlantic menhaden
Black drum	Common octopus	Hakes
American shad	Horseshoe crab	Northern searobin
Blueline tilefish	Chain dogfish	Striped searobin
American eel	Spiny dogfish	Leopard searobin
Weakfish	Clearnose skate	Pinfish
Striped bass	Little skate	Horned whiff flounder

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.8e. Overall species composition and mean catch per trip of North Carolina deepwater flounder trawl catches sampled (N=24) during the 2011-2012 fishing season.

	Weight (lb)		Number		Mean fish	Percent
Species	Mean	Percent	Mean	Percent	weight (lb)	freq. occur.
Summer flounder	13,842.5	96.9	6,110	94.8	2.26	95.8
Southern flounder	149.9	1.1	98	1.5	1.53	4.2
Black sea bass	133.6	0.9	91	1.4	1.47	29.2
Monkfish	70.1	0.5	44	0.7	1.59	50.0
Bluefish	40.6	0.3	20	0.3	2.07	29.2
Longfin squid	30.4	0.2	77	1.2	0.40	37.5
Blueline tilefish	13.9	0.1	5	0.1	2.56	16.7

Observed Species*		
Scup	Tilefish	Sheepshead
Hakes	Little skate	Fourspot flounder
Buckler dory	Barndoor skate	Witch flounder
Weakfish	Leopard searobin	

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.9a. Overall species composition and mean catch per trip of North Carolina deepwater flynets and combination net catches sampled (N=25) for the 2007-2008 fishing season.

	Weight (lb)		Number		Mean fish	Percent
Species	Mean	Percent	Mean	Percent	weight (lb)	freq. occur.
Scup	3,370.1	27.4	3,225	27.6	1.05	56.0
Bluefish	3,341.5	27.2	1,013	8.7	3.30	44.0
Atlantic croaker	2,626.6	21.4	4,798	41.1	0.55	12.0
Black sea bass	1,829.9	14.9	1,499	12.8	1.22	80.0
Smooth dogfish	694.8	5.7	190	1.6	3.65	8.0
Longfin squid	238.6	1.9	637	5.5	0.37	36.0
Striped bass	46.7	0.4	2	0.0	22.00	4.0
Spot	43.9	0.4	218	1.9	0.20	12.0
Blueline tilefish	26.7	0.2	6	0.1	4.27	12.0
Atlantic mackerel	20.9	0.2	30	0.3	0.71	4.0
Summer flounder	11.9	0.1	7	0.1	1.61	8.0
Monkfish	10.6	0.1	5	0.0	2.08	20.0
Horseshoe crab	9.3	0.1	3	0.0	3.00	4.0
Weakfish	8.8	0.1	10	0.1	0.89	36.0
Butterfish	7.5	0.1	23	0.2	0.28	36.0

Observed Species*		
Sea scallop	Silver hake	Conger eel
Witch flounder	Striped searobin	Spiny dogfish
Southern kingfish	Buckler dory	Blueback herring
Kingfishes	Leopard searobin	Northern searobin

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.9b. Overall species composition and mean catch per trip of North Carolina deepwater flynets and combination net catches sampled (N=15) for the 2008-2009 fishing season.

	Weight (lb)		Number		Mean fish	Percent
Species	Mean	Percent	Mean	Percent	weight (lb)	freq. occur.
Scup	5,267.3	56.5	5,919	67.4	0.89	40.0
Black sea bass	3,731.1	40.0	2,387	27.2	1.56	100.0
Bluefish	195.6	2.1	46	0.5	4.27	66.7
Longfin squid	121.3	1.3	427	4.9	0.28	60.0
Monkfish	15.0	0.2	7	0.1	2.21	6.7
Observed Species*						
Buckler dory						

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.9c. Overall species composition and mean catch per trip of North Carolina deepwater flynets and combination net catches sampled (N=20) for the 2009-2010 fishing season.

	Weight (lb)		Number		Mean fish	Percent
Species	Mean	Percent	Mean	Percent	weight (lb)	freq. occur.
Atlantic croaker	6,139.8	58.3	11,650	71.7	0.53	25.0
Black sea bass	1,022.0	9.7	745	4.6	1.37	60.0
Scup	1,003.7	9.5	1,014	6.2	0.99	40.0
Bluefish	988.7	9.4	153	0.9	6.47	45.0
Summer flounder	532.3	5.1	240	1.5	2.22	15.0
Weakfish	363.4	3.5	883	5.4	0.41	35.0
Smooth dogfish	106.1	1.0	28	0.2	3.85	5.0
Silver hake	69.0	0.7	124	0.8	0.56	10.0
Longfin squid	62.4	0.6	305	1.9	0.21	25.0
Southern kingfish	58.9	0.6	98	0.6	0.60	10.0
Butterfish	42.3	0.4	281	1.7	0.15	25.0
Searobins	26.5	0.3	370	2.3	0.07	5.0
Northern kingfish	25.6	0.2	60	0.4	0.42	20.0
Spot	25.1	0.2	132	0.8	0.19	10.0
Atlantic mackerel	23.2	0.2	57	0.3	0.41	10.0
Kingfishes	12.6	0.1	16	0.1	0.81	15.0
Banded drum	7.9	0.1	36	0.2	0.22	5.0

Observed Species*		
Atlantic cutlassfish	Hakes	Atlantic spadefish
Harvestfish	Cobia	Gray triggerfish
Northern searobin	Monkfish	Stingrays
Amberjacks	Eels	Striped searobin

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.9d. Overall species composition and mean catch per trip of North Carolina deepwater flynets and combination net catches sampled (N=15) for the 2010-2011 fishing season.

	Weight (lb)		Number		Mean fish	Percent
Species	Mean	Percent	Mean	Percent	weight (lb)	freq. occur.
Atlantic croaker	4,985.3	74.0	10,810	84.6	0.46	20.0
Scup	712.9	10.6	694	5.4	1.03	33.3
Black sea bass	690.4	10.2	409	3.2	1.69	80.0
Longfin squid	124.6	1.8	416	3.3	0.30	20.0
Weakfish	82.5	1.2	129	1.0	0.64	20.0
Atlantic cutlassfish	58.4	0.9	74	0.6	0.79	13.3
Bluefish	34.0	0.5	19	0.1	1.79	26.7
Longspine porgy	9.7	0.1	132	1.0	0.07	13.3
Cobia	7.3	0.1	0	0.0	21.56	13.3
Atlantic spadefish	7.1	0.1	8	0.1	0.89	6.7
Spot	4.6	0.1	29	0.2	0.16	20.0
Kingfishes	4.4	0.1	5	0.0	0.81	13.3
Northern searobin	3.5	0.1	23	0.2	0.15	6.7

Observed species*		
Sharks	King mackerel	Southern kingfish
Witch Flounder	Lookdown	Mantis shrimp
Northern puffer	Bank sea bass	Pigfish
Spotted hake	Eels	Windowpane flounder
Summer flounder	Blueline tilefish	

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 2.9e. Overall species composition and mean catch per trip of North Carolina deepwater flynets and combination net catches sampled (N=5) for the 2011-2012 fishing season.

	Weight (lb)		Number		Mean fish	Percent
Species	Mean	Percent	Mean	Percent	weight (lb)	freq. occur.
Atlantic croaker	5,221.2	81.7	9,161	89.0	0.57	20.0
Black sea bass	794.0	12.4	505	4.9	1.57	80.0
Weakfish	340.2	5.3	559	5.4	0.61	20.0
Bluefish	20.5	0.3	17	0.2	1.20	80.0
Monkfish	4.6	0.1	3	0.0	1.43	20.0
Longfin squid	4.0	0.1	9	0.1	0.43	20.0

Observed Species*

Spot	Summer flounder
Planehead filefish	Pinfish

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

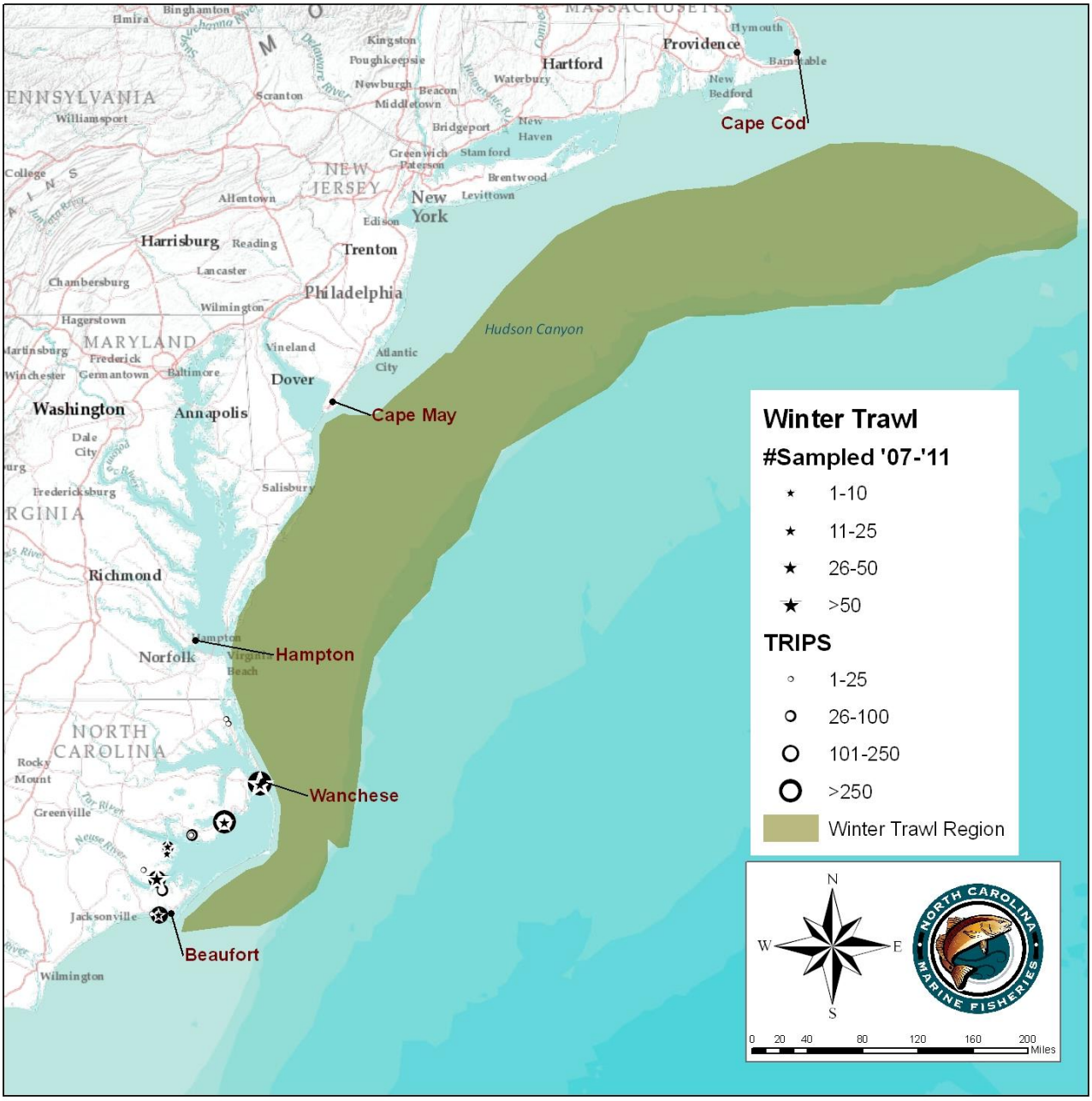

Figure 2.1. Primary fishing grounds (shaded areas) and fish house locations showing the number of biological samples collected and total number of trips taken in North Carolina's winter trawl fishery from 2007-2008 to 2011 fishing seasons. Fishing depths range from 5 to 90 fathoms.

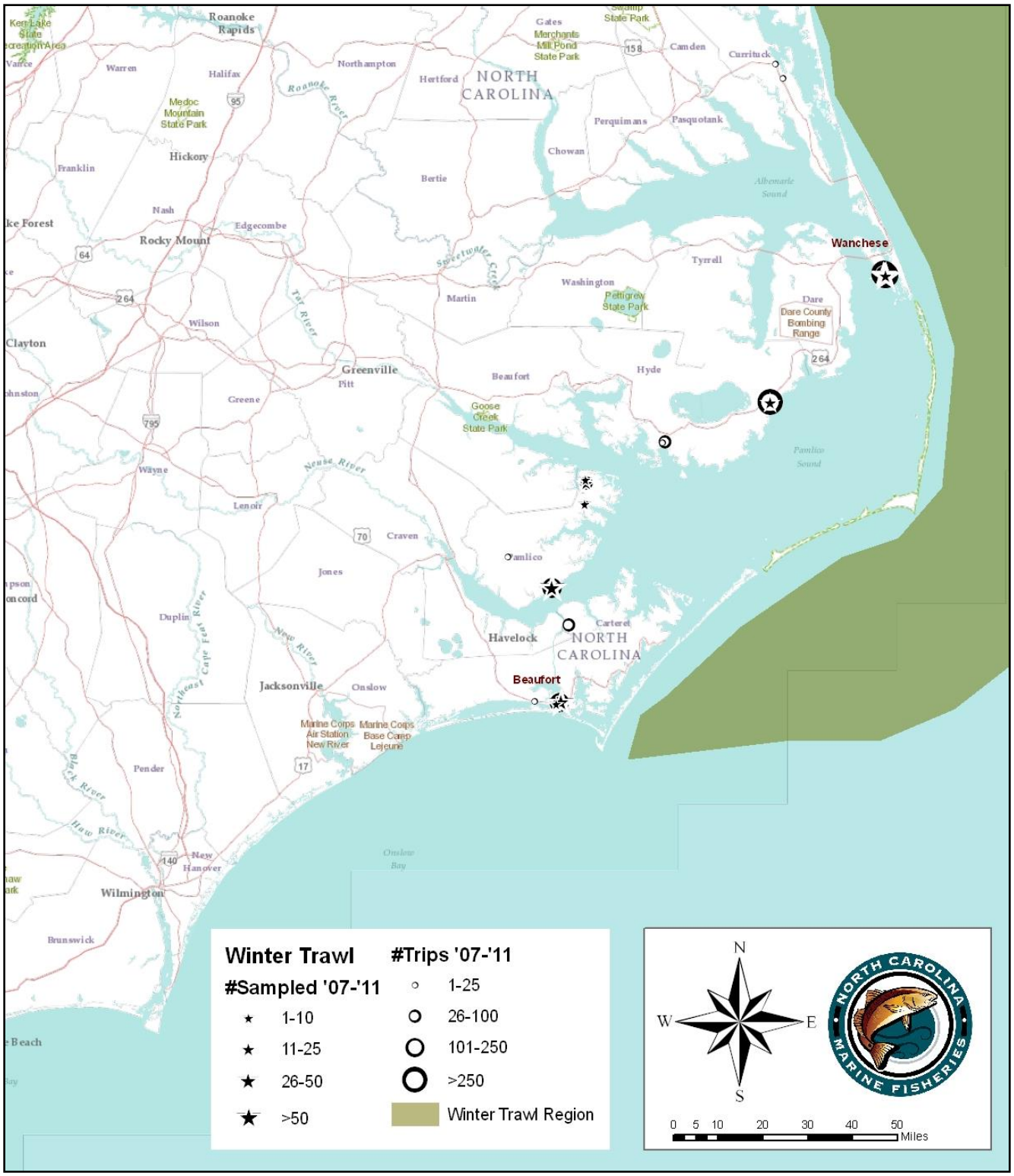

Figure 2.2. The number and location of biological samples collected and trips landed at fish houses in North Carolina's winter trawl fishery from 2007-2008 to 2011 fishing seasons.

ASSESSMENT OF NORTH CAROLINA COMMERCIAL FINFISHERIES

Final Performance Report for Award Number NA07NMF4070047

November 2012
FISHERY SECTION 3

OCEAN GILL NET FISHERY ASSESSMENT

Job 3

by

Holly White

ABSTRACT

The ocean gill net fishery is a multi-species fishery that harvests fish year-round off North Carolina. Available species distribution and marketability limits fishing effort. Traditionally, the primary target species are weakfish (*Cynoscion regalis*), bluefish (*Pomatomus saltatrix*) and Atlantic croaker (*Micropogonias undulates*). Effort shifted from weakfish in 2009 after the most recent stock assessment declared the stock depleted and strict trip limits were implemented. Spiny dogfish (*Squalus acanthias*) and monkfish (*Lophius americanus*) were also traditionally targeted but fishing effort was reduced due to strict regulations to help protect those stocks and to minimize protected species interactions (MAFMC and NEFMC 1998, ASMFC 2002, ASMFC 2008, Department of Commerce (DOC) 1998, DOC 2002). However, in 2008 the spiny dogfish stock was declared rebuilt which has resulted in increases in the quota and subsequently increases in landings. The ocean gill net fishery is broken down into several subfisheries: traditional winter and summer, anchored (small and large mesh) and run-around ocean gill net fisheries. Traditional winter ocean gill nets target weakfish, bluefish and Atlantic croaker during the fall and winter months. Traditional summer ocean gill nets target Spanish mackerel (*Scomberomorus maculatus*). Small mesh anchored gill nets target kingfish (*Menticirrhus* spp.), spot (*Leiostomus xanthurus*), weakfish, bluefish and Spanish mackerel with large mesh anchored gill nets targeting monkfish. Runaround gill nets target striped mullet (*Mugil cephalus*). Ocean gill net catches were sampled throughout the fishing season 2007-2008 (2008), 2008-2009 (2009), 2009-2010 (2010), 2010-2011 (2011), and 2011-2012 (2012) from the Virginia border to the South Carolina border. Catches were analyzed by gear types, areas fished, species compositions, and fishing seasons to characterize the catch. Mean catch weights of traditional winter ocean gill net samples averaged 2,845 lb/trip. Atlantic croaker and bluefish were the dominant species in the catches sampled. Mean catch weights of traditional summer ocean gill nets samples averaged 367 lb/trip and were primarily composed of Spanish mackerel. Mean catch weights of anchored ocean gill net samples averaged 951 lb/trip. Monkfish were the dominant species in the large mesh anchored ocean gill net fishery with kingfish and spot dominating the small mesh fishery. Mean catch weights of runaround gill net samples averaged 1,804 lb/trip and striped mullet were the dominant species landed. Mean total landings by ocean gill nets increased gradually from 2007 through 2011 then decreased in 2012.

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INTRODUCTION

The “traditional” ocean gill net fishery is a multi-species gill net fishery that harvests fish in the ocean off North Carolina, year-round, with effort shifting depending on species availability and marketability (NCDMF 2007). The primary species traditionally targeted by this fishery during the fall and winter months are weakfish, bluefish and Atlantic croaker. During the summer this fishery traditionally targets Spanish mackerel. Currently, the primary species being targeted in the fall and winter months include Atlantic croaker, bluefish and spiny dogfish with Spanish mackerel still targeted during the summer months. Weakfish are no longer a dominant species in the fishery due to a decline in stock abundance (ASMFC 2009). The 2009 ASMFC stock assessment determined that the weakfish stock is severely depleted and along the Atlantic coast commercial landings have been declining. The assessment also determined that weakfish stocks are declining due to natural mortality rather than fishing mortality. The Atlantic States Marine Fisheries Commission (ASMFC) implemented strict regulations on both recreational and commercial fishermen instead of placing a moratorium on weakfish.

“Traditional” ocean gill nets are heavily-weighted monofilament gill nets designed to fish just above the bottom (NCDMF 2007). Most nets are 12-15 ft deep. Large buoys or “high flyers” are attached to both ends of the net by enough line to allow the net to sink freely. Anchors are not generally employed, as vessels remain in the general vicinity while the nets are fishing, and the nets are retrieved at the end of the day (Ross 1989). The use of anchored gill nets became more prevalent in the 1990s, representing a necessary change in fishing techniques when nets are required to fish overnight or under rough weather conditions for spiny dogfish, monkfish and in the near shore anchored gill net fishery (NCDMF 2007).

Fishing grounds extend from the Virginia/North Carolina border to the North Carolina/South Carolina border with the primary fishing areas form Oregon Inlet to Drum Inlet (Figure 3.1). The duration and extent of the traditional winter ocean gill net fishing season is weather dependent with warm winters resulting in smaller catches and a shorter fishing season due to fish remaining north of the fishing grounds. Warmer falls coupled with species availability has extended the summer fishing season with many fishermen targeting Spanish mackerel through the month of September, with most of the effort occurring from Cape Hatteras to Southport.

The ocean gill net fleet lands their catches in ports from Wanchese to Southport. The fleet historically was concentrated in Wanchese and Hatteras from December through April (NCDMF 2007). Depending on climatic conditions and species distribution the fleet could fish predominantly out of one port. Throughout the season, additional vessels out of Ocracoke use Ocracoke Inlet, and boats from Swan Quarter and Engelhard use either Ocracoke or Hatteras Inlets. The central and southern fleets extend from Cape Lookout to Southport. Boats from Morehead City, Beaufort and Harkers Island fish in the Cape Lookout area, and boats from the southern Counties (Onslow, Pender, New Hanover, and Brunswick) fish from Sneads Ferry to the South Carolina border (Figure 3.1).

Vessels fishing out of Oregon Inlet targeting Atlantic croaker and weakfish primarily fish from Oregon Inlet north to the Virginia/North Carolina state line and secondarily from Oregon Inlet south to Wimble Shoals in depths ranging from 18 to 288 feet. Vessels that target bluefish cover a much broader area, from the Virginia/North Carolina state line to just off of the Hatteras Island beaches to Wimble Shoals to more than 30 miles offshore of Oregon Inlet, in depths of 18 to 400 feet. Vessels out of Hatteras Inlet fish for Atlantic croaker, bluefish and kingfish from north of Hatteras Inlet to Wimble Shoals and also south to Ocracoke Inlet, in depths ranging from 15 to 400 feet. Vessels fishing from Morehead City, Beaufort and Harkers Island fish from Drum Inlet south to Cape Lookout shoals to Beaufort Inlet, in depths ranging from 6 to 39 feet. Target species for the central Counties include striped mullet, kingfish, spot, bluefish and Spanish mackerel. Vessels from the southern Counties fish from Topsail inlet to the South Carolina border, targeting kingfish and spot in depths ranging from the surf zone to 54 feet.

Net sizes most prevalent in traditional ocean gill net samples are 2.6 to 3.5 inches stretched mesh (ISM) for spot and kingfish, 2.6 to 4.75 ISM for medium bluefish, 3.26 to 3.76 ISM for Atlantic croaker and 4.78 to 5.76 ISM for large bluefish. The mesh sizes for Atlantic croaker have increased to the current range due to the fact that a larger fish yields more profit and is less labor intensive to pick from the net.

From 2003 to 2008 spiny dogfish quotas were based on a fishing mortality rate in order to rebuild the stock (MAFMC and NEFMC 1998, ASMFC 2002, Department of Commerce (DOC) 1998, DOC 2002). In 2008, updates to the 2006 spiny dogfish stock assessment indicated that the stocks were no longer overfished and overfishing was not occurring (ASMFC 2008). Since 2008, North Carolina's quota for spiny dogfish has increased from 12 million pounds for the 2009/2010 season to 20 million pounds for the 2011/2012 season. The fishery is active from November through April with peak catches occurring in February and March or when the fishery is open by proclamation. Net sizes ranging from 5 to 6.5 ISM are used to meet the market demand for large fish. The fishery primarily occurs from Oregon Inlet to Ocracoke Inlet and secondarily from Cape Lookout to Bogue Inlet.

The monkfish fishery uses large mesh anchored gill nets that are predominantly 12 ISM from the North Carolina/Virginia state line to Wimble Shoals. Vessels targeting monkfish historically fished from offshore Oregon Inlet to offshore of the North Carolina/Virginia state line in depths up to 210 feet (NCDMF 2007). However large mesh gill net restrictions in federal waters restricted fishing to near shore waters from March 15 to April 15 in depths from 45 to 60 feet (DOC 2002). During this time, fishermen harvesting monkfish in state waters using gill nets greater than seven ISM must hold a valid North Carolina Monkfish Large Mesh Gill Net Permit and limit fishing activity to a mile-wide area extending two miles seaward of the coastline from the North Carolina/Virginia state line southward to Wimble Shoals. This fishery is opened and closed by the director of NCDMF proclamation authority. These restrictions are in place to minimize sea turtle interactions and have resulted in significant decreases in monkfish landings.

The small mesh anchored gill net fishery uses 2.5 to 3 ISM gill nets that are left overnight and fished daily for a variety of species. Dominant species sampled in this fishery include kingfish,

spot, Spanish mackerel, weakfish, Atlantic croaker, bluefish and striped mullet. Small mesh anchored gill net fishing occurs from Oregon Inlet to Ocracoke Inlet and southwest of Morehead City to the South Carolina border, with the majority of the effort occurring in the central and southern areas. Anchored ocean gill net catches have a diverse catch composition compared to traditional ocean gill nets. Fishing effort for anchored ocean gill nets is highest during the earliest and latest months of the traditional sink net season, but does not occur year-round (NCDMF 2007).

Runaround gill nets, also referred to as strike nets, are set to encircle or "wrap up" a school of fish (NCDMF 2007). Runaround nets are primarily used to target striped mullet during fall and winter months. Net sizes range from 3.5 to 4.26 inches stretched mesh. Fishing occurs in the southern region from Onslow Bay to Cape Lookout Shoals.

NCDMF initiated a statewide sampling program covering the dominant commercial finfish fisheries in 1982. The objective was to obtain biological and fisheries data on economically important finfish for use in reaching management decisions. The objectives of this report are to present the species composition, relative abundance, distribution and seasonal variations of the 2007/2008 to 2011/2012 ocean gill net catches. Catch-per-unit effort and landings data are presented and compared with species and fishery specific data from the 2007 to 2011 fishing seasons.

METHODS AND MATERIALS

Traditional, anchored, and runaround ocean gill net catches were sampled as they were prosecuted and analyzed on a seasonal basis from 2007 to 2012. Samples were taken at fish packing houses while the catches were being offloaded or catches from the weekend/late night when the fish house was closed. For all gear types, the captain or crew members were interviewed, when available, to obtain information including area and depth fished, days at sea, gear(s) used including mesh size and length of gill nets. Catches were sampled weekly when available in the three regions along the coast: northern (Virginia border to Cape Hatteras), central (Cape Hatteras to Cape Lookout) and southern (Cape Lookout to South Carolina border). The number of samples collected in each region depended on fishing activity. A minimum of two catches per month for each region was sampled when fishing activity took place.

Random samples of culled catches were taken to ensure adequate coverage of all species in the catches. Samples were collected and recorded in metric units (kilograms and millimeters) but for this report we are converting measurements to US customary units (pounds and inches) for consistency and ease of use. This process involved randomly sampling one or more 22.7 kg (50 lb) cartons of each species' market category or grade (small, medium, large, jumbo, etc.). More cartons of larger grades were sampled since they contain fewer fish. Each sample was weighed to the nearest 0.1 kg (0.2 lb), individual fish measured to the nearest millimeter (FL or TL) and weighed to the nearest 0.1 kg (0.2 lb), and the total number of fish recorded. If the

individuals in the carton were too numerous to measure, at least 30 were measured and the remainder counted. Market categories of species totaling less than 22.7 kg (50 lb) were also weighed and measured to get a representative sample of the entire catch. The total catch weight of each market category for each species was obtained from the fish house dealer's records. In cases where the weight of particular species' market grades were included on the trip ticket but were not sampled, an estimate of the number of fish landed for the grade was made by using the mean weight per individual from samples of that species and grade from the same month from the same area. Species numerical abundance was calculated by determining the number of individuals/market grade and then summing all the market grades for each species. Catches were analyzed by gear type (traditional, anchored and runaround ocean gill nets), by region (Northern, Central and Southern) and by "fishing season", i.e. June 2007-May 2008 (2008).

Landings refer to the commercial landings in pounds (lb) derived from the NCDMF mandatory dealer trip ticket reporting program, which was implemented in 1994.

The sampling map (Figure 3.1) was created using dealer addresses, trip ticket landings and independent fish house sampling data. The addresses were created with a georeferencing tool within ArcMap 10 software using the Dealer address records contained in NCDMF Fisheries Information Network (FIN). Each unique dealer address was run through the georeferencing tool, and placed on the map as accurately as possible. If there was no match for the address using ArcMap georeferencing, it was searched on Google Maps, and interactively created and accurately placed by the GIS analyst. Trip ticket landing data was compiled from records that the NCDMF trip ticket program manages on their database. The data were summarized by dealer, fishery gear and the sum of trips by dealers from years 2007 to 2011. The independent fish house sampling data shown on the maps were created using records contained in the Biological Database. These data reflect the sum of fish house samples that were taken from years 2007to2011, separated by fishery, gear and dealer. The results were then joined and displayed in ArcMap to the proper dealer address location using the dealer code and\or product number.

RESULTS AND DISCUSSION

Four percent (980) of the ocean gill net catches was sampled from 2007 through 2012 out of 25,124 trips (Table 3.1). The total number of trips taken increases from October to April corresponding with the higher number of samples collected. The mean weight of trips sampled from 2007 to 2012 averaged 1,922.6 lb/trip, higher than the mean weight of all trips (1,752 lb/trip). For the five year sampling period the mean weight of trips sampled was higher than the mean weight of all trips. Approximately 61.0% of all gill net trips landed less than 1,000 lb and 92% landed less than 5,000 lb (Table 3.2).

TRADITIONAL OCEAN GILL NET CATCH RATES

Winter Ocean Gill Nets

Seventy-five winter ocean gill net catches were sampled in the 2008 season, of which 72.0% (N= 54) were from north of Cape Hatteras (Table 3.3a). Catches ranged from 35 to 14,667 lb/trip and averaged 3,294.7 lb/trip. One hundred and twenty four gill net catches were sampled during the 2009 season, of which 79.0% (N= 98) were from north of Cape Hatteras (Table 3.3b). Catches ranged from 21 to 20,648 lb/trip and averaged 3,238.3 lb/trip. During 2010, 92 gill net catches were sampled, of which 53.3% (N= 49) of the catches were from north of Cape Hatteras, and 46.7% (N=43) were from Cape Hatteras-Cape Lookout (Table 3.3c). Catches ranged from 68 to 14,093 lb/trip and averaged 2,828.5 lb/trip. In 2011, 103 gill net catches were sampled, of which 56.3% (N=58) were from Cape Hatteras-Cape Lookout (Table 3.3d). Catches ranged from 17 to 14,005 lb/trip and averaged 2,706.0 lb/trip. For 2012, 111 gill net catches were sampled, of which 66.7% (N=74) were from Cape Hatteras-Cape Lookout (Table 3.3e). Catches ranged from 10 to 9,987.0 lb/trip and averaged 2,152.2 lb/trip. Mean catch rates for the traditional winter sink net fishery have shown a slight decrease from 2008 (3,294.7 lb/trip) to the 2012 (2,152.2 lb/trip) fishing season.

Average individual catches sampled north of Cape Hatteras are fairly similar across the five year sampling period with the high mean catch weight of 3,882.2 lb/trip in 2009 to the lowest 3,059.7 lb/trip in 2011(Tables 3.3a-e). Catch weights ranged from 20 to 20,648 lb. Average individual catches sampled between Cape Hatteras and Cape Lookout fluctuated from a high of 2,601.3 lb/trip in 2011 to a low of 819.1 lb/trip in 2009. Catch weights ranged from 10 to 7,886 lb (Tables 3.3a-e). Average individual catches sampled west of Cape Lookout were minimal and fluctuated from 131.0 lb/trip in 2008, 614.2 lb/trip in 2009 and 598.3 lb/trip in 2011 with no catches sampled in 2010 or 2012. Catch weights ranged from 75 to 986 lb (Tables 3.3a-e).

Summer Ocean Gill Nets

Nineteen summer ocean gill nets were sampled from 2007 to 2012 (Table 3.4). Catch weights ranged from 17 lb to 1,436 lb. Individual catches sampled averaged 360.2 lb. The majority of the samples were collected from Cape Hatteras to Cape Lookout in the central coastal area. Catch weights in the central region ranged from 17 lb to 513 lb with an average of 202.6 lb/trip. North of Cape Hatteras catch weights ranged from 196 lb to 1,436 lb and an average of 642.0 lb/trip. The southern region catch weights ranged from 115 lb to 277 lb averaging 196.0 lb/trip.

ANCHORED OCEAN GILL NET CATCH RATES

During the 2008 season, 143 anchored ocean gill net catches were sampled, of which 86.7% (N=124) were from west of Cape Lookout (Table 3.5a). Catches ranged from 15 to 5,159 lb/trip and averaged 604 lb/trip. In 2009, 101 anchored ocean gill net catches were sampled, of which 72.3% (N=73) were from west of Cape Lookout (Table 3.5b). Catches west of Cape Lookout ranged from 27 to 4,274 lb/trip and averaged 615 lb/trip. Forty-eight anchored ocean gill net

catches were sampled in the 2010 season, of which 83.3% (N=40) were from west of Cape Lookout (Table 3.5c). Catches ranged from 24 to 3,175 lb/trip and averaged 1,024 lb/trip. Forty anchored ocean gill net catches were sampled in the 2011 season, of which 40% (N=16) were from Cape Hatteras to Cape Lookout and 37.5% (N=15) were from west of Cape Lookout (Table 3.5d). Catches ranged from 41 to 3,000 lb/trip and averaged 1,172.8 lb/trip. Eighty-eight anchored ocean gill net catches were sampled in the 2012 season, of which 77.3% were from west of Cape Lookout (Table 3.5e). Catches ranged from 47 to 4,249 lb/trip and averaged 1,528.8 lb/trip.

Mean individual catch weights north of Cape Hatteras seasonally fluctuated from 908.5 lb/trip in the 2008 season to a high of 1,391.1 lb/trip in the 2009 season and a low of 688.9 lb/trip in the 2012 season. Catch weights ranged from 41 to 3,888 lb (Table 3.5a-e). Mean individual catch weights from Cape Hatteras to Cape Lookout steadily increased from 667.3 lb/trip in the 2008 season to 1,735.3 lb/trip in the 2011 season with a small drop in the 2012 season. Catch weights ranged from 15 to 4,249 lb/trip (Table 3.5a-e). Mean individual catch weights the southern region increased from a low of 576.7 lb/trip in the 2008 season to 1,589.4 lb/trip in the 2012 season. Catch weights ranged from 17 to 5,159 lb/trip (Table 3.5a-e).

RUNAROUND OCEAN GILL NET CATCH RATES

Twenty-six runaround ocean gill net catches were sampled during the five year period; all samples were collected west of Cape Lookout (Table 3.6). Catches ranged from 49 to 6,941 lb/trip and the average mean catch weight for the reporting period was 1,804.2 lb/trip. Mean catch weights were the highest in October and November.

TRENDS IN TOTAL LANDINGS

Total finfish landings by North Carolina ocean gill nets steadily increased from the 2008 to the 2011 season from 5,955,653 lb in 2008 to 10,960,271 lb in 2011 (Table 3.7). For the 2008 through 2012 seasons, Dare and Hyde Counties combined contributed from 89.8% in the 2009 season to a low of 82.1% in the 2012 season of the total finfish landings. Carteret County contributed from 3.1% to 9.9% and the southern region west of Cape Lookout contributed from a high of 8.8% in the 2008 season to a low of 6.2% in the 2010 season of the total finfish landings. Other landings accounted for less than 2% of the total finfish landings.

Total bluefish landings increased from 1,451,096 lb in the 2008 season to 1,751,586 lb in the 2010 season, 2011 season showed a 60,800 lb decrease in landings. Preliminary landings from the 2012 season show that there was not a significant ocean gill net fishery for bluefish with landings less than 150,000 lb. Dare and Hyde Counties combined landed over 90% of bluefish from ocean gill nets for 2008 through 2012 fishing seasons. Total landings of Atlantic croaker increased from 1,813,731 lb in the 2008 season to 3,936,628 lb in the 2011 season and decreased slightly in the 2012 season. Dare and Hyde Counties combined landed over 98% of Atlantic croaker from ocean gill net for 2008 through 2012 fishing seasons. Total landings of dogfish [smooth (*Mustelus canis*) and spiny dogfish] increased from 804,464 lb in 2008 to

3,850,987 lb in 2011 with about the same amount landed for the 2012 season. Increases in dogfish landings are a reflection of increases in spiny dogfish quota with the stock declared rebuilt in 2008. Dare and Hyde Counties contributed close to 90% of the landings from 2008 to 2010 and 80% of the landings in 2011 and 2012 because of increased landings from Carteret County. Total landings of kingfish increased from 451,302 lb in 2008 to 660,046 lb in 2010, declined to 362,890 in 2011 and increased to 482,892 lb in the 2012 season. The southern region west of Cape Lookout contributed from 41.1% to 63.1% of the landings across the 2008 to 2012 seasons. Total landings of weakfish for the 2008 season were 30,757 lb and peaked at 54,399 lb for the 2009 season. Strict management restrictions were put in place after the 2009 ASMFC stock assessment on weakfish and landings were 40,819 lb for the 2010 season, 38,919 lb for the 2011 season and 14,761 lb for the 2012 season. Even with minimal landings of weakfish the southern region west of Cape Lookout contributed from 68.8% to 76.5% of the total landings for the 2008 through 2010 season. Dare and Hyde counties landed 51.9% to 65% of weakfish for the 2011 and 2012 seasons.

TRADITIONAL OCEAN GILL NET SPECIES COMPOSITION

Winter Ocean Gill Nets

Bluefish and Atlantic croaker were the dominant species by weight followed by spiny dogfish in the traditional winter ocean gill net catches for most of 2008 to 2012 fishing season (Table 3.8a-e). For the 2008 fishing season, Atlantic croaker accounted for 42.4% of the weight and 73% of the number of fish in the catches sampled. Bluefish accounted for 40.5% of the weight and 12.1% of the number of fish in the catches sampled. Spiny dogfish accounted for 12.8% of the weight and 5.8% of the number of fish in the catches sampled. Together these species accounted for 95.7% of the weight and 90.9% of the total fish in the catches sampled (Table 3.8a). For the 2009 fishing season, bluefish accounted for 57.0% of the weight and 19.9% of the number of fish in the catches sampled. Atlantic croaker accounted for 27.9% of the weight and 65.7% of the total fish in the catches sampled. Spiny dogfish accounted for 11.5% of the weight and 3.6% of the total fish in the catches sampled. Together these species accounted for 96.4% of the weight and 89.2% of the total fish in the catches sampled (Table 3.8b). For the 2010 fishing season, bluefish accounted for 42.9% of the weight and 11.9% of the total fish in the catches sampled. Atlantic croaker accounted for 39.0% of the weight and 77.6% of the total fish in the catches sampled. Spiny dogfish accounted for 15.7% of the weight and 4.2% of the total fish in the catches sampled. Together these species accounted for 97.6% of the weight and 93.7% of the total fish in the catches sampled (Table 3.8c). For the 2011 fishing season, Atlantic croaker accounted for 54.4% of the weight and 86.7% of the total fish in the catches sampled. Bluefish accounted for 30.4% of the weight and 8.5% of the total fish in the catches sampled. Spiny dogfish accounted for 13.8% of the weight and 2.9% of the total fish in the catches sampled. Together these species accounted for 98.6% of the weight and 98.1% of the total fish in the catches sampled (Table 3.8d). For the 2012 fishing season, Atlantic croaker accounted for 51.0% of the weight and 81.9% of the total fish in the catches sampled. Spiny dogfish accounted for 45.6% of the weight and 9.7% of the total fish in the catches sampled.

Together these species accounted for 96.6% of the weight and 91.6% of the total fish in the catches sampled (Table 3.8e).

Weakfish landings comprise an even smaller component of the winter ocean gill net catch than in the past, as they contributed less than 0.1% to both the weight and the total fish in catches sampled. With reductions in the availability of weakfish combined with management regulations after the 2009 stock assessment the ocean gill net fleet continues increased effort on Atlantic croaker, bluefish, spiny dogfish and kingfish.

Traditional winter ocean gill net catches north of Cape Hatteras during the 2008 season were dominated by Atlantic croaker and bluefish contributing to 99% of the weight of the catches sampled (Table 3.9). The 2009 season was more diverse with 99% of the weight of the catches sampled coming from bluefish, Atlantic croaker, spiny dogfish and southern kingfish. For the 2010 season, 99% of the weight of the catches sampled came from bluefish, Atlantic croaker, spiny dogfish and striped bass. For the 2011 season, 99% of the weight of the catches sampled came from bluefish, Atlantic croaker, spiny dogfish, Spanish mackerel and striped bass (*Morone saxatilis*). For the 2012 season 99% of the weight of the catches sampled came from Atlantic croaker, spiny dogfish, bluefish and Spanish mackerel.

Traditional winter ocean gill net catches from Cape Hatteras to Cape Lookout during the 2008 season were varied; spiny dogfish, southern kingfish (*Menticirrhus americanus*), bluefish and smooth dogfish comprised 99% of the weight of the catches sampled (Table 3.9). For the 2009 season 99% of the weight of the catches sampled was from spiny dogfish, Atlantic croaker, Spanish mackerel, kingfish species and bluefish. For the 2010 season, 99% of the weight of the catches sampled was from Atlantic croaker, spiny dogfish, Southern kingfish and butterfish (*Peprilus triacanthus*). For the 2011 season, 99% of the weight of the catches sampled was from Atlantic croaker, spiny dogfish, bluefish and southern kingfish. For the 2012 season, 99% of the weight of the catches sampled was from spiny dogfish, Atlantic croaker, southern kingfish, butterfish and Atlantic sharpnose shark (*Rizoprionodon terraenovae*).

Fewer traditional ocean gill nets were sampled in the southern region west of Cape Lookout with no samples being collected for the 2010 or 2012 season (Table 3.8). Of the catches sampled for the 2008 season 99% of the weight of the catches sampled were from southern kingfish, butterfish, weakfish and little tunny (*Euthyrinus alletteratus*). For the 2009 season only one sample was collected and the majority of that sample was southern kingfish. For the 2011 season, 99% of the weight of the catches sampled was from Southern kingfish, Spanish mackerel, bluefish, spot, harvest fish (*P. alepidotus*), smooth dogfish and butterfish.

Summer Ocean Gill Nets

The traditional summer ocean gill net fishery specifically targets Spanish mackerel in the ocean during the summer months. Spanish mackerel accounted for 67.6% to 93.3% of the catches sampled (Tables 3.10a-e). Mean catch weights for Spanish mackerel increased from 2,243.2 lb/trip in the 2008 season to 10,108.6 lb/trip in the 2011 season. The 2012 season mean catch

weight decreased to 5,181.2 lb/trip. Bluefish was the second most important species caught, by weight, as they comprised 5.9% to 31.2% of the catches sampled (Tables 3.10a-e). Mean catch weights for bluefish ranged from 478.5 lb/trip to 2,100.8 lb/trip.

ANCHORED OCEAN GILL NET SPECIES COMPOSITION

Anchored ocean gill net catches sampled during from the 2008 through 2012 fishing seasons included both large mesh (12 in) and small mesh (≤3 in) trips. Monkfish, caught in large mesh gill nets from the 2008 to 2012 fishing seasons accounted for 0.1% to 12.9% of the catch weights and <0.1% to 1.0% of the total number of fish in catches sampled (Tables 3.11a-e). Mean catch weights of monkfish have fluctuated dramatically due to the strict regulations on the large mesh fishery and the short season allotment for large mesh gill nets in the ocean. Southern kingfish comprised 8.4% to 59.3% of the catch weight and 21.3% to 64.6% of the total fish in catches sampled from the 2008 to 2012 fishing season (Table 3.12). Southern kingfish was the dominant species, but northern (*M. saxatilis*) and Gulf kingfish (*M. littoralis*) also contributed to the catch weights. The second dominant species moved from spot comprising 16.3% of the catch weight in the 2008 season, to 16.1% of the catch weight from Spanish mackerel in 2009, to 25.9% of the catch weight from spiny dogfish in 2010, to 29.8% of the catch weight from spiny dogfish in 2011, to 8.4% of the catch weight from southern kingfish in 2012.

Both large and small mesh anchored gill net catches were sampled north of Cape Hatteras, but only small mesh catches were sampled south of Cape Hatteras because no trips targeting monkfish occurred south of Wimble Shoals.

RUNAROUND OCEAN GILL NET COMPOSITION

Runaround ocean gill nets are specifically utilized in the ocean during the fall and winter months to target striped mullet in areas south and west of Cape Lookout. For the 2008 though 2012 seasons striped mullet comprised 68.5% to 96.7% of the catch weight and 27.6% to 96.1% of the total number of fish in the sampled catch (Table 3.13a-e). Mean catch weights ranged from 26,384.3 lb/trip to 165,001.1 lb/trip. The number of samples obtained from this fishery are minimal, but were included to help characterize another type of ocean gill net fishery that is prosecuted along the coast of North Carolina.

SCRAP FISH

The amount of unmarketable finfish landed by ocean gill nets was negligible. The size selectivity of gill nets and the targeting of key market species prevent an abundance of undersized and unmarketable fish. Scrap fish landing contributed approximately 60,000 lb to the total finfish landings each year except for the 2009 fishing season where scrap fish contributed less. The southern region along with Dare and Hyde counties landed the largest percentage of bait across the five year period (Table 3.7).

MANAGEMENT ISSUES

The ocean gill net fishery has historically produced minimal discards or scrap fish compared to other North Carolina fisheries. Mesh size restrictions or gear modifications may be necessary for some fisheries to ensure the escapement of undersized fish before they are landed, but mostly are not necessary for the ocean gill net fishery. Ocean gill net fishermen select mesh sizes that target marketable sized fish and some already having specified size limits. Regulatory discards of protected species such as sturgeons (*Acipenser* spp.) and quota managed species such as striped bass or spiny dogfish has increased as more regulations are initiated.

The spiny dogfish fishery, initially unregulated and developed in the New England states during the late 1980s, is under strict management measures. The directed fishery of the 1990s resulted in very low mature female biomass and continued poor pup production (ASMFC 2002). Regulations were put in place in 2000 establishing a 4 million pound coastwide quota and eliminating the directed fishery by establishing low trip limits. The quota from 2000 forward has increased gradually. North Carolina did not have significant spiny dogfish landings until the 2009 fishing season when the quota was increased and North Carolina was allotted a 16% of the quota (ASMFC 2008). Spiny dogfish are a common bycatch in sink net trips that target Atlantic croaker, bluefish and kingfish in areas north of Cape Hatteras. The short soak time of the gill nets combined with the low water temperatures result in low levels of discard mortality.

The federal monkfish fishery management plan established annual quotas, limited entry into the directed fishery, days at sea allocations and trip limits, but still allows the traditional incidental catch to occur (NEFMC and MAFMC 1998). State regulations prohibit the use of large mesh gill nets greater than 7 in stretched mesh from April 15 to December 15 (Rule 15A NCAC 3J.0202 (7)) (NCMFC 2003). Large mesh gill net restrictions to protect harbor porpoise in state and federal waters and sea turtles in federal waters has limited the directed monkfish gill net fishery to a one month period (March 15 to April 15) in state waters only (DOC 1998, DOC 2002). The federal Bottlenose Dolphin Take Reduction Plan resulted in final rules that ended the directed monkfish fishery in North Carolina (FR Vol. 71, No. 80, 4/26/06), but a very limited fishery has been allowed to occur in state waters through a North Carolina Monkfish Large Mesh Gill Net Permit system implemented and enforced by NCDMF.

Effort by the ocean gill net fleet shifts depending on species availability and regulations. Current target species include bluefish, Atlantic croaker, spiny dogfish kingfish, spot, monkfish and Spanish mackerel. Spreading the fishing effort over a number of species is a way to alleviate saturating markets with just a few species of fish, which reduces the price to the fishermen for their catch. Past regulations limited the harvest of spiny dogfish and monkfish when this happened effort reverted back to the traditional three target species (Atlantic croaker, bluefish and weakfish). However, severe reductions in weakfish availability have resulted in a shift in effort to two target species, bluefish and Atlantic croaker. A portion of the ocean gill net fleet invested in long line gear to target coastal sharks and tilefish, but these fisheries are regulated by a strict quota system that often severely limits the fishery due to closures.

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Table 3.1. Monthly summary by grant award year of fish house sampling, mean trip ticket weight (lb), and total number of trips in the ocean gill net fishery.

		Fish house sampling					Commercial trip ticket landings		
Year	Month	Number of trips sampled	Mean weight of trips sampled (lb/trip)	Weight range of trips sampled (lb)	Mean sample weight (lb/sample)	Weight range of samples (lb)	Total number of trips	Mean weight of all trips (lb/trip)	Weight range of all trips (lb)
2007	Jul.	*	*	*	*	*	166	441	14-3,005
	Aug.	2	160.6	91-230.2	75.1	50-100.1	135	241	6-1,888
	Sep.	9	243.0	45.9-722.0	72.3	29.1-175.3	321	464	3-3,975
	Oct.	25	1,275.4	141.1-6,278.4	160.8	50-550	695	695	3-6,807.5
	Nov.	26	715.5	15.2-2,160.1	84.6	15.2-281.3	611	863	1-8,500
	Dec.	24	955.8	49.4-5,158.5	89.2	44.8-241.3	342	1,722	1-28,120
2008	Jan.	37	1,392.7	50-6,454	193.9	21.2-753.5	965	915	1-17,545
	Feb.	31	2,525.2	140.4-14,667	210.7	30.2-904.4	480	2,673	3-23,621
	Mar.	39	2,271.8	31.1-10,929.7	248.4	20.9-922.8	351	3,048	3-26,180
	Apr.	31	1,675.2	53.1-14,057	169.2	17.2-1,512.8	391	2,084	1-25,962
	May	7	973.3	17.4-4,329.2	63.9	17.4-185.6	210	606	2-4,413
	Jun.	*	*	*	*	*	166	364	1-2,384.4
	All	231	1,528.5	15.2-14,667	166.0	15.2-1,512.8	4,833	1,267	1-28,120
2008	Jul.	3	901.4	119.5-2,223.8	122.0	68.1-192.7	137	477	2-3,190
	Aug.	5	294.3	17-915.1	143.2	17-328	148	418	5-2,617.5
	Sep.	5	1,054.2	529.1-2,061.7	188.5	59.3-395.3	130	513	1-6,103.3
	Oct.	19	1,311.4	89.9-6,941	154.9	15-394.1	657	869	1-14,887
	Nov.	28	713.5	108.2-4,435.9	81.2	25.1-300.3	481	1,002	2-7,606
	Dec.	20	1,750.5	172.1-6,969	106.0	47-252.9	390	1,748	2-13,783
2009	Jan.	39	3,194.2	27.1-14,004.7	212.3	27.1-861.8	1,090	2,051	14-17,159
	Feb.	41	3,134.4	46.1-10,521.9	283.3	7.5-3,337.3	484	3,280	2-18,672
	Mar.	36	2,572.6	126.1-20,647.6	266.8	13.2-1,040.8	314	3,485	9-24,092
	Apr.	30	1,934.5	20.7-12,583.9	256.7	16.1-1,381	431	2,496	10-32,093
	May	11	962.8	224-2,367.5	181.0	50-652.6	180	604	18-2,921
	Jun.	2	228.0	210.8-245.2	49.6	27.1-72.1	166	458	8-2,413
	All	239	2,109.3	17-20,647.6	203.6	7.5-2,337.3	4,608	1,761	1-32,093

3.1 continued

		Fish house sampling					Commercial trip ticket landings		
Year	Month	Number of trips sampled	Mean weight of trips sampled (lb/trip)	Weight range of trips sampled (lb)	Mean sample weight (lb/sample)	Weight range of samples (lb)	Total number of trips	Mean weight of all trips (lb/trip)	Weight range of all trips (lb)
2009	Jul.	*	*	*	*	*	78	954	17-7,953.5
	Aug.	*	*	*	*	*	91	600	8-3,856.8
	Sep.	3	1,007.1	706.1-1,436.3	120.7	68.1-154.1	404	950	8.9-6,093.6
	Oct.	7	1,203.5	206.1-2,969	98.9	25.1-207.3	652	722	7-4,867.8
	Nov.	12	956.0	26-2,407.2	88.1	25.1-244.4	472	1,303	1-12,964.6
	Dec.	22	1,316.3	67.9-4,369.3	107.7	19.2-472	348	1,237	1-10,209
2010	Jan.	38	2,352.9	24-9,346	214.1	24-927	1,151	2,561	6-29,112
	Feb.	27	3,922.4	115.1-14,093.3	308.4	50-1,200	549	3,134	11-26,187
	Mar.	18	2,371.2	53.4-8,607	203.8	30.2-675	523	3,524	6-49,322
	Apr.	15	1,582.8	119-6,141.8	218.0	45-1,211.9	478	3,061	19-43,967
	May	4	434.7	132.3-1,179	50.3	24.3-78	252	1,402	0.9-39,088.8
	Jun.	*	*	*	*	*	100	631	19-10,570
	All	146	2,159.9	24-14,093.3	192.3	19.2-1,211.9	5,098	2,063	1-49,322
2010	Jul.	*	*	*	*	*	98	553	4.2-5,385
	Aug.	1	907.9		50.0		74	531	17-2,735
	Sep.	1	72.1		72.1		150	562	6-3,537
	Oct.	6	1,229.0	267.1-2,412.5	181.5	18.9-589.5	433	627	1-5,949
	Nov.	5	848.6	87.1-1,676.3	98.7	18.8-324.2	487	1,330	6-10,642.4
	Dec.	16	2,428.6	17-9,661.9	142.5	11.9-560.2	275	2,991	8-20,121
2011	Jan.	43	2,402.0	162-5,938.8	177.5	38-395.1	1,898	2,391	12-19,686
	Feb.	20	4,787.7	245.2-14,004.9	230.8	50-1,160.5	515	3,925	24-30,835
	Mar.	21	2,384.6	264.1-5,506	308.4	50-1,106	400	3,262	6-31,914
	Apr.	25	1,002.6	40.6-7,403.9	108.6	5.5-615.1	434	2,083	11.8-30,206
	May	10	439.5	92.2-1,753.3	126.3	33.1-254.9	311	1,220	4-33,059.8
	Jun.	4	484.1	238.8-600.3	154.7	22.7-265	134	337	4-1,965
	All	152	2,184.0	17-14,004.9	179.5	5.5-1,160.5	5,209	2,133	1-33,059.8

3.1 continued

		Fish house sampling						Commercial trip ticket landings		
Year	Month	Number of trips sampled	Mean weight of trips sampled (lb/trip)	Weight range of trips sampled (lb)	Mean sample weight (lb/sample)	Weight range of samples (lb)		Total number of trips	Mean weight of all trips (lb/trip)	Weight range of all trips (lb)
2011	Jul.	*	*	*	*	*		116	710	4-4,107
	Aug.	1	130.1		7.5			81	720	6-2,719
	Sep.	2	585.1	556-614.2	119.0	58.2-179.9		223	556	3-5,587
	Oct.	18	646.7	103.2-1,678.5	174.3	82-414.6		472	668	8-4,214.1
	Nov.	9	1,302.0	68.1-3,582	141.3	13.7-369.1		397	1,413	5-8,284
	Dec.	32	853.2	47-2,995.8	105.7	29.3-550		382	1,408	9-8,514.4
2012	Jan.	87	2,657.8	20.1-4,666	197.9	16.5-507.9		1,176*	2,509*	1-8,958*
	Feb.	22	1,370.4	32.2-5,707	107.9	21.8-293.2		527*	2,152*	1-39,865*
	Mar.	20	2,702.1	9.9-9,986.8	379.3	7.5-1,160.1		572*	3,249*	8-74,985*
	Apr.	10	700.3	86.2-1,558	65.5	26.5-137.9		355*	1,434*	5-12,862*
	May	5	800.8	178.6-1,406.7	192.0	110.6-273.8		262*	633*	13-6,561*
	Jun.	6	211.2	45.9-358.9	81.7	28.9-176.8		180*	470*	6-5,717*
	All	212	1,790.8	9.9-9,986.8	176.0	7.5-1,160.1		4,743*	1,781*	1-74,985*
All 2007-2012		980	1,922.5	9.9-20,647.6	183.4	5.5-2,337.3	All 2007-2012	25,124*	1,809*	1-74,985*

*Fish House: denotes no data collected
*Commercial: denotes preliminary landing data

Table 3.2. Ocean gill net fishery landings (pounds), number of trips, and number of dealers for landings by trip category for 2007-2011 combined. Source: NC Trip Ticket Program

Landings Range (lbs)	Total Landings (lbs)	Percent Landings	Number of Trips	Percent Trips	Number of Dealers
1-100	151,612	0.4	2,884	11.5	131
101-200	454,040	1.1	2,944	11.7	128
201-300	740,140	1.7	3,030	12.1	117
301-400	509,372	1.2	1,454	5.8	96
401-500	568,727	1.3	1,258	5.0	75
501-600	508,758	1.2	925	3.7	71
601-700	523,448	1.2	806	3.2	56
701-800	515,087	1.2	685	2.7	64
801-900	563,880	1.3	662	2.6	56
901-1000	568,061	1.3	596	2.4	56
1001-2000	4,785,456	11.2	3,350	13.3	80
2001-3000	7,208,946	16.9	2,723	10.8	50
3001-4000	3,677,904	8.6	1,081	4.3	38
4001-5000	2,921,552	6.9	654	2.6	27
5001-6000	2,619,190	6.2	477	1.9	23
6001-7000	2,279,646	5.4	351	1.4	16
7001-8000	2,082,725	4.9	279	1.1	14
8001-9000	1,703,273	4	200	0.8	11
9001-10000	1,513,995	3.6	160	0.6	11
10001-20000	7,058,677	16.6	542	2.2	14
20001-30000	1,215,394	2.9	52	0.2	8
30001-40000	298,133	0.7	9	0.0	2
40001-50000	93,289	0.2	2	0.0	2
Total	42,561,304		25,124		

Table 3.3a. Monthly summary of sampling of traditional winter ocean gill nets during October 2007 through May 2008 by area fished (N (Northern) = north of Cape Hatteras; C (Central) = Cape Hatteras to Cape Lookout; S (Southern) = west of Cape Lookout); N = number of catches sampled + catches for which only trip tickets were obtained; n = number of catches sampled.

				Catch weight (lb)			Sample weight (lb)	
Year	Month	Area	N	Mean	Range	n	Mean	Range
2007	Oct.	N	3	1,436.6	903-2,316	3	213.6	152-288
	Dec.	C	4	1,935.5	397-3,852	4	158.0	113-241
2008	Jan.	N	10	1,750.1	83-6,454	10	284.9	83-525
		C	8	2,637.5	500-3,000	8	320.5	83-754
		S	2	131.0	75-187	2	76.1	75-77
	Feb.	N	24	3,087.8	462-14,667	24	219.7	50-904
	Mar.	N	15	5,406.4	945-10,930	15	430.9	50-923
		C	2	67.0	35-99	2	60.0	21-99
	Apr.	N	2	11,505.7	8,954-14,057	2	327.9	109-547
		C	4	3,378.4	736-5,180	4	817.5	348-1,513
	May	C	1	4,329.2	4,329	0	0.0	0
	Total	N	54	3,704.2	83-14,667	54	294.1	50-923
			(72.0%)			(72.0%)		
		C	19	2,464.1	35-5,180	18	365.9	21-1,513
			(25.3%)			(25.3%)		
		S	2	131.0	75-187	2	76.1	75-77
			(2.7%)			(2.7%)		
	Overall		75	3,294.7	35-14,667	74	305.7	21-1,513

Table 3.3b. Monthly summary of sampling of traditional winter ocean gill nets during October 2008 through May 2009 by area fished (N (Northern) = north of Cape Hatteras; C (Central) = Cape Hatteras to Cape Lookout; S (Southern) = west of Cape Lookout); N = number of catches sampled + catches for which only trip tickets were obtained; n = number of catches sampled.

				Catch weight (lb)			Sample weight (lb)	
Year	Month	Area	N	Mean	Range	n	Mean	Range
2008	Oct.	N	2	628.9	466-792	2	142.2	54-230
		C	1	1,314.8		1	277.1	
	Nov.	C	1	305.6		1	83.4	
	Dec.	N	13	2,339.6	259-6,969	13	125.4	47-253
		C	3	1,027.3	448-1,663	3	69.2	60-84
		S	1	614.2		1	50.0	
2009	Jan.	N	31	3,714.1	110-14,005	31	211.6	72-438
		C	4	1,649.5	596-3,041	4	278.8	69-862
	Feb.	N	19	5,991.7	326-10,522	19	564.1	50-2,337
		C	1	69.9		1	69.9	
	Mar.	N	23	3,722.5	280-20,648	23	376.3	50-1,041
		C	8	610.2	222-1,155	8	64.7	13-104
	Apr.	N	9	3,747.1	826-12,584	9	520.6	187-1,381
		C	1	20.7		1	16.1	
	May	N	1	460.1		1	50.0	
		C	6	700.9	224-1,063	6	100.9	50-174
	Total	N	98	3,882.2	110-20,648	98	332.5	47-2,338
			(79.0%)			(79.0%)		
		C	25	819.1	21-3,041	25	116.2	13-862
			(20.2%)			(20.2%)		
		S	1	614.2		1	50.0	
			(0.8%)			(0.8%)		
	Overall		124	3,238.3	21-20,648	124	286.5	13-2,337

Table 3.3c. Monthly summary of sampling of traditional winter ocean gill nets during October 2009 through April 2010 by area fished (N (Northern) = north of Cape Hatteras; C (Central) = Cape Hatteras to Cape Lookout; S (Southern) = west of Cape Lookout); N = number of catches sampled + catches for which only trip tickets were obtained; n = number of catches sampled.

				Catch weight (lb)			Sample weight (lb)	
Year	Month	Area	N	Mean	Range	n	Mean	Range
2009	Oct.	C	1	804.9		1	86.4	
	Dec.	N	11	1,944.5	678-4,369	11	97.7	41-173
		C	4	222.9	68-541	4	55.3	19-100
2010	Jan.	N	10	3,694.7	112-9,346	10	397.8	112-927
		C	20	1,922.2	68-3,043	20	150.2	42-443
	Feb.	N	22	4,237.8	115-14,093	22	348.9	50-1200
		C	5	2,534.4	1,199-5,452	5	129.9	85-250
	Mar.	N	4	5,416.7	3,300-8,607	4	166.8	117-250
		C	12	1,740.1	392-5,388	12	243.3	50-675
	Apr.	N	2	3,574.2	3,514-3,635	2	429.2	346-512
		C	1	6,141.8		1	1211.9	
	Total	N	49	3,681.3	112-14,093	49	290.9	41-1,200
			(53.3%)			(53.3%)		
		C	43	1,856.7	68-6,142	43	188.2	19-1,212
			(46.7%)			(46.7%)		
	Overall		92	2,828.5	68-14,093	92	242.9	19-1,212

Table 3.3d. Monthly summary of sampling of traditional winter ocean gill nets during October 2010 through May 2011 by area fished (N (Northern) = north of Cape Hatteras; C (Central) = Cape Hatteras to Cape Lookout; S (Southern) = west of Cape Lookout); N = number of catches sampled + catches for which only trip tickets were obtained; n = number of catches sampled.

				Catch weight (lb)			Sample weight (lb)	
Year	Month	Area	N	Mean	Range	n	Mean	Range
2010	Nov.	C	1	87.1		1	25.4	
		S	2	862.7	740-986	2	24.0	19-29
	Dec.	N	5	6,897.3	4,342-9,662	5	336.6	149-560
		C	7	55.7	17-122	7	22.0	12-40
2011	Jan.	N	9	745.3	162-2,846	9	204.3	38-341
		C	26	2,954.0	399-5,939	26	183.7	42-395
	Feb.	N	5	7,712.5	3,665-14,005	5	420.2	200-1,161
		C	14	4,067.6	609-7,886	14	175.1	50-350
	Mar.	N	11	2,891.1	264-5,506	11	467.8	74-1106
		C	6	2,616	884-5,317	6	144.8	100-200
	Apr.	N	7	1,579.9	48-7,404	7	151.6	48-615
		S	1	405.0		1	47.0	
	May	N	4	707.0	211-1,753	4	147.4	38-255
		C	4	238.4	92-478	4	86.4	33-130
		S	1	263.0		1	155.9	
	Total	N	41	3,059.7	48-14,005	41	302.9	38-1,161
			(39.8%)			(39.8%)		
		C	58	2,601.3	17-7,886	58	148.6	12-395
			(56.3%)			(56.3%)		
		S	4	598.3	263-986	4	62.7	19-156
			(3.9%)			(3.9%)		
	Overall		103	2,706.0	17-14,005	103	206.7	12-1161

Table 3.3e. Monthly summary of sampling of traditional winter ocean gill nets during October 2011 through March 2012 by area fished (N (Northern) = north of Cape Hatteras; C (Central) = Cape Hatteras to Cape Lookout; S (Southern) = west of Cape Lookout); N = number of catches sampled + catches for which only trip tickets were obtained; n = number of catches sampled.

				Catch weight (lb)			Sample weight (lb)	
Year	Month	Area	N	Mean	Range	n	Mean	Range
	Oct.	N	2	591.7	480-703	2	131.2	101-161
2011	Nov.	C	2	3,246.4	2,911-3,582	2	217.6	210-225
	Dec.	N	1	266.8		1	29.3	
		C	16	1,144.6	197-2,996	16	131.9	50-550
2012	Jan.	N	19	3,010.9	20-4,666	18	267.5	17-508
		C	37	2,177.0	58-4,012	37	117.8	32-279
	Feb.	N	9	2,920.7	1,159-5,707	9	188.6	125-293
		C	13	297.1	32-618	13	52	22-156
	Mar.	N	6	6,908.6	2,940-9,987	6	255.0	170-352
		C	6	547.2	10-833	6	292.3	8-583
	Total	N	37	3,416.1	20-9,987	36	232.5	17-508
			(33.3%)			(32.7%)		
		C	74	1,520.3	10-4,012	74	126.1	8-583
			(66.7%)			(67.3%)		
	Overall		111	2,152.2	10-9,987	110	161.6	8-583

Table 3.4. Monthly summary of sampling of summer ocean gill nets during June through September 2007 through 2012 by area fished (N (Northern) = north of Cape Hatteras; C (Central) = Cape Hatteras to Cape Lookout; S (Southern) = west of Cape Lookout); N = number of catches sampled + catches for which only trip tickets were obtained; n = number of catches sampled.

				Catch weight (lb)			Sample weight (lb)	
Year	Month	Area	N	Mean	Range	n	Mean	Range
2007	Jun.	N	1	399.7		1	37.9	
		C	3	162.7	79-289	3	69.7	59-82
		S	2	196.0	115-277	2	95.0	90-100
	Aug.	C	2	160.6	91-230	2	75.1	50-100
	Sep.	N	1	196.0		1	29.1	
2008	Jul.	N	1	360.9		1	68.1	
	Aug.	C	4	139.1	17-231	4	97.0	17-155
	Sep.	N	2	599.7	583-616	2	88.2	59-117
2009	Jun.	C	1	210.8		1	27.1	
	Sep.	N	3	1,007.1	706-1,436	3	120.7	68-154
2011	Jun.	N	1	600.3		1	213.2	
		C	2	375.8	239-513	2	191.5	118-265
2012	Jun.	C	2	254.2	170-338	2	65.5	61-70
	Total	N	9	642.0	196-1,436	9	98.5	29-213
			(36.0%)			(36.0%)		
		C	14	202.6	17-512.8	14	92.0	17-265
			(56.0%)			(56.0%)		
		S	2	196.0	115-277	2	95.0	90-100
			(8.0%)			(8.0%)		
	Overall		25	360.2	17-1,436	25	94.6	17-265

Table 3.5a. Monthly summary of sampling of anchored gill nets during September 2007 through May 2008 by area fished (N (Northern) = north of Cape Hatteras; C (Central) = Cape Hatteras to Cape Lookout; S (Southern) = west of Cape Lookout); N = number of catches sampled + catches for which only trip tickets were obtained; n = number of catches sampled.

				Catch weight (lb)			Sample weight (lb)	
Year	Month	Area	N	Mean	Range	n	Mean	Range
2007	Sep.	C	1	579.1		1	175.3	
		S	5	128.1	46-305	5	58.9	46-86
	Oct.	S	16	590.6	141-1,289	16	115.1	50-173
	Nov.	C	1	15.2		1	15.2	
		S	24	767.9	50-2,160	24	89.0	50-281
	Dec.	S	19	797.3	99-5,159	19	76.8	45-170
2008	Jan.	C	2	1,657.2	1,400-1,914	2	171.0	142-200
		S	15	623.5	50-5,000	15	84.5	21-235
	Feb.	S	7	596.2	140-872	7	179.9	30-459
	Mar.	N	5	693.6	300-1,1556	5	318.4	210-539
		C	1	370.2		1	55.3	
		S	16	220.8	31-1,156	16	91.2	24-452
	Apr.	N	2	1,543.0	1,384-1,702	2	114.9	17-213
		C	3	529.3	163-773	3	54.6	48-60
		S	20	536.7	53-1,185	20	46.2	25-173
	May	N	2	811.5	283-1,340	2	50.5	50-51
		C	2	403.0	70-736	2	118.8	52-186
		S	2	27.6	17-38	2	22.3	17-27
	Total	N	9	908.5	283-1,702	9	213.7	17-539
			(6.3%)			(6.3%)		
		C	10	667.3	15-1,914	10	98.9	15-200
			(7.0%)			(7.0%)		
		S	124	576.7	17-5,159	124	86.2	17-459
			(86.7%)			(86.7%)		
	Overall		143	603.9	15-5,159	143	95.1	15-539

Table 3.5b. Monthly summary of sampling of anchored gill nets during July 2007 through May 2008 by area fished (N (Northern) = north of Cape Hatteras; C (Central) = Cape Hatteras to Cape Lookout; S (Southern) = west of Cape Lookout); N = number of catches sampled + catches for which only trip tickets were obtained; n = number of catches sampled.

				Catch weight (lb)			Sample weight (lb)	
Year	Month	Area	N	Mean	Range	n	Mean	Range
2008	Jul.	N	2	1,171.6	120-2,224	2	148.9	105-193
	Aug.	N	1	915.1		1	328.0	
	Sep.	N	3	1,357.2	529-2,062	3	255.4	162-395
	Oct.	N	1	836.0		1	308.2	
		S	13	792.0	90-4,274	13	102.2	15-239
	Nov.	C	2	593.1	492-695	2	81.6	81-83
		S	22	559.2	108-1,670	22	55.3	25-120
	Dec.	S	3	300.0	172-509	3	77.6	50-92
2009	Jan.	C	2	1,324.2	948-1,700	2	264.2	182-347
		S	2	94.5	27-162	2	38.4	27-50
	Feb.	S	21	695.2	46-1,643	21	39.3	8-76
	Mar.	N	2	435.1	215-655	2	170.5	120-221
		S	3	414.4	126-694	3	30.6	25-40
	Apr.	N	10	1,739.5	169-3,888	10	236.5	97-497
		C	1	1,552.0		1	1,552.0	
		S	9	593.8	47-2,515	9	34.9	25-47
	May	C	4	1,4841.4	618-2,368	4	333.9	176-653
	Total	N	19	1,391.1	120-3,888	19	231.9	97-497
			(18.8%)			(18.8%)		
		C	9	1,256.9	492-2,368	9	260.8	81-653
			(8.9%)			(8.9%)		
		S	73	614.7	27-4,274	73	56.0	8-239
			(72.3%)			(72.3%)		
	Overall		101	818.0	27-4,274	101	107.3	8-653

Table 3.5c. Monthly summary of sampling of anchored gill nets during October 2009 through May 2010 by area fished (N (Northern) = north of Cape Hatteras; C (Central) = Cape Hatteras to Cape Lookout; S (Southern) = west of Cape Lookout); N = number of catches sampled + catches for which only trip tickets were obtained; n = number of catches sampled.

				Catch weight (lb)			Sample weight (lb)	
Year	Month	Area	N	Mean	Range	n	Mean	Range
2009	Oct.	S	6	1,269.9	206-2,969	6	101	25-207
	Nov.	S	9	946.6	26-2,400	9	62.8	25-151
	Dec.	C	1	2,005.5		1	472.0	
		S	6	778.5	320-1,209	6	100.1	50-197
2010	Jan.	C	2	3,087.5	3,000-3,175	2	337.2	240-435
		S	6	1,3037.2	24-3,000	6	79.7	24-142
	Mar.	S	2	66.8	53-80	2	40.7	30-51
	Apr.	N	3	749.8	184-1,149	3	251.5	119-452
		S	9	911.5	119-2,260	9	49.5	45-50
	May	C	2	166.4	132-201	2	49.5	47-53
		S	2	703.0	227-1,179	2	51.1	24-78
	Total	N	3	749.8	184-1,149	3	251.5	119-452
			(6.3%)			(6.3%)		
		C	5	1,702.7	132-3,175	5	249.1	47-472
			(10.4%)			(10.4%)		
		S	40	959.9	24-3,000	40	72.0	24-207
			(83.3%)			(83.3%)		
	Overall		48	1,024.1	24-3,175	48	101.6	24-472

Table 3.5d. Monthly summary of sampling of anchored gill nets during October 2010 through May 2011 by area fished (N (Northern) = north of Cape Hatteras; C (Central) = Cape Hatteras to Cape Lookout; S (Southern) = west of Cape Lookout); N = number of catches sampled + catches for which only trip tickets were obtained; n = number of catches sampled.

				Catch weight (lb)			Sample weight (lb)	
Year	Month	Area	N	Mean	Range	n	Mean	Range
2010	Oct.	C	2	2,238.3	2,064-2,413	2	419.8	250-590
		S	2	576.7	267-886	2	65.2	52-78
	Nov.	C	1	754.2		1	96.1	
	Dec.	C	1	253.7		1	43.2	
		S	3	1,242.7	1,019-1,642	3	133.5	16-214
2011	Jan.	C	8	2,471.4	1,200-3,000	8	127.1	97-200
	Feb.	C	1	245.2		1	64.2	
	Mar.	C	2	956.6	274-1,639	2	100.1	50-150
		S	2	332.1	273-391	2	130.4	80-181
	Apr.	N	9	1,050	41-2,297	9	161.3	12-307
		S	8	518.6	102-1,014	8	19.4	6-50
	May	C	1	351.0		1	171.7	
	Total	N	9	1,050.3	41-2,297	9	161.3	12-307
			(22.5%)			(22.5%)		
		C	16	1,735.3	245-3,000	16	152.0	43-590
			(40.0%)			(40.0%)		
		S	15	646.3	102-1,642	15	63.1	6-214
			(37.5%)			(37.5%)		
	Overall		40	1,172.8	41-3,000	40	120.8	6-590

Table 3.5e. Monthly summary of sampling of anchored gill nets during August 2011 through May 2012 by area fished (N (Northern) = north of Cape Hatteras; C (Central) = Cape Hatteras to Cape Lookout; S (Southern) = west of Cape Lookout); N = number of catches sampled + catches for which only trip tickets were obtained; n = number of catches sampled.

				Catch weight (lb)			Sample weight (lb)	
Year	Month	Area	N	Mean	Range	n	Mean	Range
2011	Aug.	S	1	130.1		1	7.5	
	Sept.	N	2	585.1	556-614	2	119.0	58-180
	Oct.	N	2	815.7	726-905	2	199.5	184-215
		C	1	1,348.1		1	109.1	
		S	8	448.8	138-820	8	156.6	82-238
	Nov.	C	2	999.1	580-1,418	2	101.7	100-103
		S	4	585.2	68-1,103	4	66.0	14-219
	Dec.	S	15	581.5	47-1,638	15	82.8	31-141
2012	Jan.	C	3	3,014.3	729-4,249	3	258.7	237-299
		S	28	3,015.3	554-4,055	28	250.0	76-332
	Mar.	N	1	643.1		1	200.0	
		C	6	1,365.3	462-1,852	6	665.3	295-1,160
		S	1	471.4		1	111.0	
	Apr.	C	2	822.1	86-1,558	2	38.4	27-50
		S	8	669.8	467-971	8	72.3	27-138
	May	C	1	789.5		1	177.5	
		S	3	1,012.0	449-1,407	3	201.4	111-274
	Total	N	5	688.9	556-905	5	167.4	58-215
			(5.7%)			(5.7%)		
		C	15	1.534.3	86-4,249	15	355.6	27-1,160
			(17.0%)			(17.0%)		
		S	68	1,589.4	47-4,054	68	162.6	8-332
			(77.3%)			(77.3%)		
	Overall		88	1,528.8	47-4,249	88	195.8	8-1,160

Table 3.6. Monthly summary of sampling of runaround gill nets during September 2007 through June 2012 by area fished: S (Southern) = west of Cape Lookout); N = number of catches sampled + catches for which only trip tickets were obtained; n = number of catches sampled.

				Catch weight (lb)			Sample weight (lb)	
Year	Month	Area	N	Mean	Range	n	Mean	Range
2007	Sep.	S	2	385.7	49-722	2	75.7	49-102
	Oct.	S	6	3,021.1	583-6,278	6	256.0	100-550
	Nov.	S	1	160.1		1	47.4	
2008	Oct.	S	2	5,606.4	4,272-6,941	2	372.2	350-394
	Nov.	S	3	2,061.6	754-4,436	3	270.0	244-300
2009	Nov.	S	2	1,305.5	204-2,407	2	224.1	204-244
2010	Oct.	S	1	1,317.0		1	100.1	
	Nov.	S	1	1,676.3		1	324.2	
2011	Oct.	S	4	800.9		1	103.2	
	Nov.	S	1	886.7		1	369.1	
2012	May	S	1	178.6		1		
	Jun.	S	2	290.8	223-359	2	142.4	108-177
	Overall		26	1,804.2	49-6,941	26	230.4	47-550

Table 3.7. Seasonal commercial landings (weight; lb) in North Carolina from gill nets fished in the ocean from 2007-2012 (season = June-May) for North Carolina, Dare/Hyde counties, Carteret County, and the southern counties combined (Onslow, Pender, New Hanover, Brunswick), including the total value (1,000's of dollars) of the landings and relative contribution of each area grouping (percent).

		June 2007 – May 2008		June 2008 – May 2009		June 2009 – May 2010	
		Landed (Pounds)	Value/ Percent	Landed (Pounds)	Value/ Percent	Landed (Pounds)	Value/ Percent
ANGLERFISH (MONKFISH)		54,361	$60,807	70,286	$78,243	15,225	$25,264
	CARTERET						
	DARE/HYDE	54,361	100	70,286	100	15,225	100
	SOUTHERN						
	OTHER						
BLUEFISH		1,451,096	$545,133	1,742,822	$614,282	1,751,586	$875,166
	CARTERET	8,829	<1.0	3,625	<1.0	13,766	<1.0
	DARE/HYDE	1,425,496	98.2	1,730,493	99.3	1,714,211	97.9
	SOUTHERN	12,811	<1.0	6,237	<1.0	17,717	1
	OTHER	3,960	<1.0	2,467	<1.0	5,892	<1.0
BUTTERFISH		21,305	$10,932	23,182	$11,661	26,211	$12,899
	CARTERET	3,401	16	1,188	5.1	465	1.8
	DARE/HYDE	16,205	76.1	19,104	82.4	23,794	90.8
	SOUTHERN	1,440	6.8	2,282	9.8	1,106	4.2
	OTHER	259	1.2	608	2.6	846	3.2
CROAKER, ATLANTIC		1,813,731	$1,177,948	2,227,756	$1,279,376	3,090,792	$2,009,694
	CARTERET	1,485	<1.0	919	<1.0	796	<1.0
	DARE/HYDE	1,794,960	99	2,224,226	99.8	3,083,983	99.8
	SOUTHERN	8,800	<1.0	1,843	<1.0	4,795	<1.0
	OTHER	8,486	<1.0	768	<1.0	1,218	<1.0
DRUM,BLACK		3,865	$1,320	4,801	$1,972	7,543	$3,462
	CARTERET	216	5.6	123	2.6	2,534	33.6
	DARE/HYDE	2,851	73.8	4,484	93.4	4,682	62.1
	SOUTHERN	599	15.5	31	<1.0	268	3.6
	OTHER	199	5.1	163	3.4	59	<1.0
DRUM,RED		3,687	$5,388	791	$1,190	3,402	$6,025
	CARTERET	517	14	19	2.4	2,835	83.3
	DARE/HYDE	2,477	67.2	766	96.8	567	16.7
	SOUTHERN	88	2.4	0	<1.0	0	<1.0
	OTHER	605	16.4	6	<1.0	0	<1.0
FLOUNDERS, FLUKE		2,948	$6,980	1,581	$3,492	1,537	$2,938
	CARTERET	598	20.3	23	1.5	525	34.2
	DARE/HYDE	2,075	70.4	1,533	97	941	61.2
	SOUTHERN	227	7.7	18	1.1	52	3.4
	OTHER	48	1.6	7	<1.0	19	1.2
HARVESTFISH		11,864	$12,946	7,585	$8,522	10,184	$11,617
	CARTERET	48	<1.0	0	<1.0	11	<1.0
	DARE/HYDE	11,715	98.7	7,249	95.6	10,066	98.8
	SOUTHERN	90	<1.0	309	4.1	0	<1.0
	OTHER	11	<1.0	27	<1.0	107	1.1
KINGFISHES (SEA MULLETS)		451,302	$417,982	522,631	$530,440	660,046	$710,012
	CARTERET	54,218	12	30,286	5.8	55,902	8.5
	DARE/HYDE	149,269	33.1	265,127	50.7	266,551	40.4
	SOUTHERN	230,578	51.1	214,835	41.1	318,410	48.2
	OTHER	17,237	3.8	12,383	2.4	19,183	2.9

3.7 (Continued)

		June 2007 – May 2008		June 2008 – May 2009		June 2009 – May 2010	
		Landed (Pounds)	Value/ Percent	Landed (Pounds)	Value/ Percent	Landed (Pounds)	Value/ Percent
MACKEREL, ATLANTIC		40	$20	200	$78	345	$173
	CARTERET						
	DARE/HYDE	40	100	194	97	344	99.7
	SOUTHERN			6	3	1	<1.0
	OTHER						
MACKEREL, SPANISH		330,889	$507,365	197,211	$274,156	384,597	$417,409
	CARTERET	4,669	1.4	2,600	1.3	14,506	3.8
	DARE/HYDE	295,060	89.2	187,625	95.1	348,051	90.5
	SOUTHERN	30,655	9.3	6,541	3.3	14,941	3.9
	OTHER	505	<1.0	445	<1.0	7,099	1.9
MULLETS		103,336	$44,508	133,446	$49,978	70,663	$29,841
	CARTERET	34,256	33.2	66,905	50.1	39,233	55.5
	DARE/HYDE	1,277	1.2	1,190	<1.0	2,065	2.9
	SOUTHERN	17,488	16.9	3,685	2.8	14,505	20.5
	OTHER	50,315	48.7	61,666	46.2	14,860	21
POMPANO		2,057	$3,202	348	$641	452	$776
	CARTERET	47	2.3	21	6	41	9.1
	DARE/HYDE	1,881	91.4	277	79.6	335	74
	SOUTHERN	102	5	50	14.4	71	15.7
	OTHER	27	1.3	0	<0.1	6	1.3
SEA BASSES		887	$1,757	1,522	$3,061	318	$572
	CARTERET	0	<0.1	2	<1.0	0	<0.1
	DARE/HYDE	22	2.5	28	1.8	0	<0.1
	SOUTHERN	864	97.4	1,492	98	312	98.1
	OTHER	1	<1.0	0	<0.1	6	1.9
SEATROUT, SPOTTED		5,551	$7,766	6,189	$10,084	5,760	$10,405
	CARTERET	1,123	20.2	2,394	38.7	3,875	67.3
	DARE/HYDE	1,898	34.2	1,691	27.3	625	10.9
	SOUTHERN	1,799	32.4	327	5.3	419	7.3
	OTHER	731	13.2	1,777	28.7	841	14.6
SHARKS,DOGFISH		804,464	$236,214	2,239,872	$491,317	3,437,261	$788,324
	CARTERET	30,726	3.8	187,529	8.4	338,332	9.8
	DARE/HYDE	758,986	94.3	2,043,032	91.2	3,069,563	89.3
	SOUTHERN	12,752	1.6	9,039	<1.0	28,868	<1.0
	OTHER	2,000	<1.0	272	<0.1	498	<0.1
SPOT		213,305	$148,153	112,035	$68,968	263,639	$158,687
	CARTERET	22,102	10.4	14,692	13.1	21,658	8.2
	DARE/HYDE	9,026	4.2	6,622	5.9	5,452	2.1
	SOUTHERN	157,517	73.8	83,108	74.2	174,917	66.3
	OTHER	24,660	11.6	7,613	6.8	61,612	23.4
STRIPED BASS		138,905	$309,658	51,648	$125,419	71,664	$214,005
	CARTERET	439	<1.0	39	<1.0	40	<1.0
	DARE/HYDE	127,661	91.9	51,513	99.7	70,184	97.9
	SOUTHERN	0	<0.1	0	<0.1	3	<0.1
	OTHER	10,805	7.8	96	<1.0	1,437	2
WEAKFISH (GRAY TROUT)		30,757	$26,304	54,399	$50,136	40,819	$42,203
	CARTERET	4,850	15.8	2,668	4.9	2,283	5.6
	DARE/HYDE	3,812	12.4	9,525	17.5	9,323	22.8
	SOUTHERN	21,635	70.3	41,616	76.5	28,100	68.8
	OTHER	460	1.5	590	1.1	1,114	2.7

3.7 (Continued)

	June 2007 – May 2008		June 2008 – May 2009		June 2009 – May 2010	
	Landed (Pounds)	Value/ Percent	Landed (Pounds)	Value/ Percent	Landed (Pounds)	Value/ Percent
ALL OTHERS	449,573	$455,270	462,888	$422,406	388,365	$389,505
CARTERET	2,380	<0.1	155	<0.1	1,796	<1.0
DARE/HYDE	440,478	98	459,878	99.3	379,009	97.6
SOUTHERN	5,972	1.3	1,712	<1.0	5,872	1.5
OTHER	743	<1.0	1,143	<1.0	1,705	<1.0
SCRAP	61,730	$6,719	51,845	$5,368	68,512	$7,207
CARTERET	13,207	21.4	22	<0.1	5,312	7.8
DARE/HYDE	27,821	45.1	23,709	45.7	36,549	53.3
SOUTHERN	20,467	33.2	26,999	52.1	25,389	37.1
OTHER	235	<1.0	1,115	2.2	1,262	1.8
TOTAL	5,955,653	$3,986,373	7,913,038	$4,030,788	10,298,490	$5,713,988
CARTERET	183,111	3.1	313,210	4	503,910	4.9
DARE/HYDE	5,127,371	86.1	7,108,552	89.8	9,041,520	87.8
SOUTHERN	523,884	8.8	400,130	5.1	635,746	6.2
OTHER	121,287	2	91,146	1.2	117,764	1.1

3.7 (Continued)

		June 2010 – May 2011		June 2011* – May 2012*	
		Landed (Pounds)	Value/ Percent	Landed (Pounds)	Value/ Percent
ANGLERFISH (MONKFISH)		8,879	$11,219	9,237	$0
	CARTERET	0	<1	0	<1
	DARE/HYDE	8,879	100	9,237	100
	SOUTHERN	0	<1	0	<1
	OTHER	0	<1	0	<1
BLUEFISH		1,687,664	$829,888	130,532	$11,428
	CARTERET	9,995	<1.0	5,825	4.5
	DARE/HYDE	1,649,862	97.8	115,797	88.7
	SOUTHERN	20,675	1.2	5,307	4.1
	OTHER	7,132	<1.0	3,603	2.8
BUTTERFISH		35,350	$11,697	60,022	$4,402
	CARTERET	1,540	4.4	2,005	3.3
	DARE/HYDE	28,136	79.6	53,090	88.5
	SOUTHERN	3,384	9.6	1,311	6
	OTHER	2,290	6.5	3,616	2.2
CROAKER, ATLANTIC		3,936,628	$2,515,065	2,805,234	$416,626
	CARTERET	13,710	<1.0	643	<1
	DARE/HYDE	3,870,204	98.3	2,762,809	98.5
	SOUTHERN	25,226	<1.0	6,505	<1
	OTHER	27,488	<1.0	35,277	1.3
DRUM,BLACK		7,730	$3,614	3,123	$727
	CARTERET	123	1.6	445	14.2
	DARE/HYDE	7,254	93.8	1,760	56.4
	SOUTHERN	105	1.4	381	12.2
	OTHER	248	3.2	537	17.2
DRUM,RED		3,151	$5,680	1,896	$1,726
	CARTERET	2,179	69.2	629	33.2
	DARE/HYDE	360	11.4	946	49.9
	SOUTHERN	44	1.4	39	2.1
	OTHER	568	18	282	14.9
FLOUNDERS, FLUKE		1,335	$2,881	18,106	$2,961
	CARTERET	2	<1.0	20	1.2
	DARE/HYDE	1,233	92.4	18,011	95.1
	SOUTHERN	55	4.1	52	<1
	OTHER	45	3.4	23	<1
HARVESTFISH		13,360	$12,783	9,399	$2,367
	CARTERET	13	<1.0	85	<1
	DARE/HYDE	12,968	97.1	9,082	96.6
	SOUTHERN	332	2.5	110	1.2
	OTHER	47	<1.0	122	1.3
KINGFISHES (SEA MULLETS)		362,890	$388,116	482,892	$169,823
	CARTERET	18,591	5.1	34,461	7.1
	DARE/HYDE	69,615	19.2	162,163	33.6
	SOUTHERN	229,057	63.1	258,941	53.6
	OTHER	45,627	12.6	27,330	5.7
MACKEREL, ATLANTIC		1,599	$807	439	$78
	CARTERET	31	1.9	<1	<1
	DARE/HYDE	1,558	97.4	439	100
	SOUTHERN	6	<1.0	<1	<1
	OTHER	4	<1.0	<1	<1

3.7 (Continued)

		June 2010 – May 2011		June 2011* – May 2012*	
		Landed (Pounds)	Value/ Percent	Landed (Pounds)	Value/ Percent
MACKEREL, SPANISH		180,241	$254,534	182,772	$139,357
	CARTERET	2,910	1.6	3,453	1.9
	DARE/HYDE	167,245	92.8	174,935	95.7
	SOUTHERN	7,113	3.9	2,749	1.5
	OTHER	2,973	1.6	1,636	<1.0
MULLETS		157,649	$136,733	42,205	$28,237
	CARTERET	55,733	35.4	12,731	30.2
	DARE/HYDE	619	<1.0	8,205	19.4
	SOUTHERN	49,095	31.1	10,743	25.5
	OTHER	52,202	33.1	10,526	24.9
POMPANO		640	$1,291	556	$1,058
	CARTERET	13	2	17	3.1
	DARE/HYDE	533	83.3	443	79.7
	SOUTHERN	47	7.3	40	7.2
	OTHER	47	7.3	56	10.1
SEA BASSES		223	$540	103	0
	CARTERET	0	<0.1	<1	<1.0
	DARE/HYDE	223	100	103	100
	SOUTHERN	0	<0.1	<1	<1.0
	OTHER	0	<0.1	<1	<1.0
SEATROUT, SPOTTED		2,663	$4,831	1,536	$2,405
	CARTERET	1,201	45.1	473	30.8
	DARE/HYDE	186	7	306	19.9
	SOUTHERN	788	29.6	327	21.3
	OTHER	488	18.3	430	28
SHARKS, DOGFISH		3,850,987	$798,549	3,626,353	$26,393
	CARTERET	699,024	18.2	693,290	19.1
	DARE/HYDE	3,116,643	80.9	2,900,008	80
	SOUTHERN	11,730	<1.0	17,183	<1
	OTHER	23,590	<1.0	15,872	<1
SPOT		74,303	$57,531	235,170	$181,904
	CARTERET	3,725	5	22,227	9.5
	DARE/HYDE	1,175	1.6	10,110	4.3
	SOUTHERN	49,861	67.1	175,816	74.8
	OTHER	19,542	26.3	27,017	11.5
STRIPED BASS		139,406	$406,521	4063	0
	CARTERET	<1	<1	<1	<1
	DARE/HYDE	131,609	94.4	716	17.6
	SOUTHERN	<1	<1	3347	82.4
	OTHER	7,797	5.6	<1	<1
WEAKFISH (GRAY TROUT)		38,919	$47,329	14,761	$9,484
	CARTERET	2,119	5.4	1,983	13.4
	DARE/HYDE	25,285	65	7,656	51.9
	SOUTHERN	10,952	28.1	4,974	33.7
	OTHER	563	1.4	151	1
ALL OTHERS		395,542	$420,079	502,516	$200,800
	CARTERET	638	<1.0	25,689	5.1
	DARE/HYDE	387,210	97.9	467,553	93
	SOUTHERN	1,165	<1.0	8,406	1.7
	OTHER	6,529	1.7	876	<1.0
SCRAP		61,112	$6,183	93,053	$1,380
	CARTERET	1,666	2.7	9,142	9.8
	DARE/HYDE	29,798	48.8	50,060	53.8
	SOUTHERN	27,272	44.6	10,858	24.7
	OTHER	2,376	3.9	22,993	11.7

3.7 (Continued)

		June 2010 – May 2011		June 2011* – May 2012*	
		Landed (Pounds)	Value/ Percent	Landed (Pounds)	Value/ Percent
Total		10,960,271	$5,915,870	8,223,983	$1,201,156
	CARTERET	813,213	7.4	813,118	9.9
	DARE/HYDE	9,510,595	82.1	6,753,429	82.1
	SOUTHERN	436,907	4	518,182	6.3
	OTHER	199,556	1.8	139,254	1.7

Table 3.8a. Species composition and mean catch per trip of traditional winter sink net catches (N=74) sampled from October 2007 through May 2008.

Species	Weight		Number		Mean Fish Weight	Percent freq. Occurrence
	Mean	Percent	Mean	Percent		
Atlantic Croaker	60,495.7	42.4	70,641	73	0.9	39.2
Bluefish	57,788.3	40.5	11,710	12.1	4.9	35.1
Spiny Dogfish	18,252.9	12.8	5,605	5.8	3.3	10.8
Southern Kingfish	4,908.1	3.4	8,057	8.3	0.6	12.2
Spanish Mackerel	520.9	0.4	222	0.2	2.3	4.1
Striped Bass	306.0	0.2	13	0	24.4	9.5
Smooth Dogfish	232.3	0.2	58	0.1	4.0	31.1
Butterfish	81.6	0.1	363	0.4	0.2	21.6
Little Tunny	53.5	<0.1	6	0	8.5	21.6
Blueline Tilefish	35.6	<0.1	10	0	3.4	4.1
Weakfish	29.4	<0.1	40	0	0.7	14.9
Thresher Shark	11.6	<0.1	<1	0	78.1	5.4
Kingfishes	6.1	<0.1	10	0	0.6	4.1
Spot	5.1	<0.1	18	0	0.3	4.1
Atlantic Bonito	5.0	<0.1	1	0	4.5	4.1
King Mackerel	3.8	<0.1	<1	0	8.4	2.7
Atlantic Sharpnose Shark	3.6	<0.1	1	0	3.9	2.7
Cobia	2.1	<0.1	<1	0	25.5	1.4
Anglerfish (Monkfish)	1.3	<0.1	<1	0	7.2	9.5
Harvestfish	0.2	<0.1	1	0	0.2	4.1
Sheepshead	0.2	<0.1	<1	0	2.8	1.4
Florida Pompano	0.2	<0.1	1	0	0.3	2.7
Northern Kingfish	0.1	<0.1	<1	0	0.8	2.7
Spotted Seatrout	<0.1	<0.1	<1	0	0.6	2.7
Black Sea Bass	<0.1	<0.1	<1	0	1.1	1.4
Black Drum	<0.1	<0.1	<1	0	1.1	2.7
Hickory Shad	<0.1	<0.1	<1	0	0.7	1.4
Observed Species						
White Shrimp						
Atlantic Menhaden						

Table 3.8b. Species composition and mean catch per trip of traditional winter sink net catches (N=124) sampled from October 2008 through May 2009.

Species	Weight Mean	Weight Percent	Number Mean	Number Percent	Mean Fish Weight	Percent freq. Occurrence
Bluefish	101,088.3	57	20,590	19.9	5.0	49.2
Atlantic Croaker	49,465.3	27.9	67,837	65.7	0.7	37.9
Spiny Dogfish	20,427.8	11.5	3,734	3.6	5.5	26.6
Southern Kingfish	4,822.5	2.7	9,164	8.9	0.5	14.5
Spanish Mackerel	683.1	0.4	385	0.4	1.8	8.1
Kingfishes	341.7	0.2	697	0.7	0.5	12.1
Blueline Tilefish	141.2	0.1	27	0	5.3	6.5
Smooth Dogfish	121.7	0.1	31	0	3.9	33.1
Butterfish	96.1	0.1	537	0.5	0.2	24.2
Northern Kingfish	96.0	0.1	162	0.2	0.6	4
Striped Bass	59.2	<0.1	2	0	26.5	2.4
Spot	32.1	<0.1	112	0.1	0.3	7.3
King Mackerel	30.5	<0.1	4	0	8.2	2.4
Weakfish	24.0	<0.1	18	0	1.3	25.8
Little Tunny	9.9	<0.1	1	0	7.7	17.7
Horseshoe Crab	3.2	<0.1	1	0	3.0	1.6
Harvestfish	2.5	<0.1	11	0	0.2	6.5
Thresher Shark	1.8	<0.1	<1	0	55.0	3.2
Sheepshead	1.5	<0.1	<1	0	7.8	2.4
Anglerfish (Monkfish)	1.0	<0.1	<1	0	4.3	8.1
Atlantic Bonito	1.0	<0.1	<1	0	4.4	3.2
Cobia	1.0	<0.1	<1	0	20.2	2.4
Sharks	0.9	<0.1	4	0	0.2	2.4
Atlantic Sharpnose Shark	0.9	<0.1	<1	0	4.1	3.2
Blacktip Shark	0.9	<0.1	<1	0	17.7	2.4
Snowy Grouper	0.8	<0.1	<1	0	20.0	0.8
Houndfish	0.6	<0.1	<1	0	3.8	3.2
Black Drum	0.3	<0.1	<1	0	3.6	0.8
Finetooth Shark	0.2	<0.1	<1	0	14.6	0.8
Black Sea Bass	0.1	<0.1	<1	0	1.4	2.4
Atlantic Cutlassfish	0.1	<0.1	<1	0	3.7	1.6
Atlantic Mackerel	0.1	<0.1	<1	0	0.9	4
Shortfin Mako	0.1	<0.1	<1	0	9.9	0.8
Shark Fins	0.1	<0.1	1	0	0.1	1.6
Spotted Hake	0.1	<0.1	<1	0	0.7	0.8
Spotted Seatrout	<0.1	<0.1	<1	0	1.4	1.6
Gulf Kingfish	<0.1	<0.1	<1	0	0.7	0.8
Observed Species						
Atlantic Menhaden						

Table 3.8c. Species composition and mean catch per trip of traditional winter sink net catches (N=92) sampled from October 2009 through April 2010.

Species	Weight		Number		Mean Fish Weight	Percent freq. Occurrence
	Mean	Percent	Mean	Percent		
Bluefish	50,024.5	42.9	8,996	11.9	5.6	25
Atlantic Croaker	45,390.6	39	58,449	77.6	0.8	39.1
Spiny Dogfish	18,336.1	15.7	3,128	4.2	5.9	19.6
Southern Kingfish	2,118.5	1.8	3,709	4.9	0.6	16.3
Striped Bass	356.9	0.3	19	0	18.7	9.8
Smooth Dogfish	133.6	0.1	39	0.1	3.4	34.8
Butterfish	100.5	0.1	847	1.1	0.1	20.7
Weakfish	17.0	<0.1	20	0	0.8	22.8
Thresher Shark	13.0	<0.1	<1	0	42.6	10.9
Spanish Mackerel	7.3	<0.1	3	0	2.1	1.1
Sharks	6.2	<0.1	56	0.1	0.1	1.1
Atlantic Sharpnose Shark	5.6	<0.1	1	0	4.0	2.2
Harvestfish	5.4	<0.1	27	0	0.2	1.1
Little Tunny	3.0	<0.1	<1	0	9.5	17.4
Red Drum	2.8	<0.1	1	0	5.3	1.1
Florida Pompano	2.3	<0.1	4	0	0.6	1.1
King Mackerel	1.4	<0.1	<1	0	9.4	1.1
Atlantic Bonito	0.6	<0.1	<1	0	1.1	3.3
Northern Kingfish	0.4	<0.1	<1	0	1.2	1.1
Blueline Tilefish	0.4	<0.1	<1	0	3.3	3.3
Mullets	0.3	<0.1	<1	0	0.8	1.1
Kingfishes	0.2	<0.1	<1	0	0.5	5.4
Anglerfish (Monkfish)	0.1	<0.1	<1	0	2.0	1.1
Spot	<0.1	<0.1	<1	0	0.4	5.4
American Shad	<0.1	<0.1	<1	0	2.0	1.1
Atlantic Cutlassfish	<0.1	<0.1	<1	0	2.0	1.1
Atlantic Mackerel	<0.1	<0.1	<1	0	1.5	2.2
Spotted Seatrout	<0.1	<0.1	<1	0	1.1	1.1

Observed Species
Atlantic Menhaden
Sheepshead

Table 3.8d. Species composition and mean catch per trip of traditional winter sink net catches (N=103) sampled from November 2010 through May 2011.

Species	Weight		Number		Mean Fish Weight	Percent freq. Occurrence
	Mean	Percent	Mean	Percent		
Atlantic Croaker	56,936.2	54.4	73,019	86.7	0.8	44.7
Bluefish	31,794.2	30.4	7,115	8.5	4.5	32
Spiny Dogfish	14,412.6	13.8	2,416	2.9	6.0	25.2
Spanish Mackerel	600.4	0.6	376	0.4	1.6	7.8
Southern Kingfish	433.1	0.4	734	0.9	0.6	11.7
Striped Bass	215.5	0.2	10	0	21.0	7.8
Smooth Dogfish	93.1	0.1	29	0	3.2	22.3
Northern Kingfish	72.2	0.1	98	0.1	0.7	1
Weakfish	56.0	0.1	52	0.1	1.1	15.5
Little Tunny	38.8	<0.1	4	0	10.3	5.8
Spot	34.8	<0.1	119	0.1	0.3	4.9
Harvestfish	27.6	<0.1	137	0.2	0.2	3.9
Butterfish	15.5	<0.1	83	0.1	0.2	15.5
Frigate Mackerel	9.4	<0.1	6	0	1.6	2.9
Atlantic Bonito	1.7	<0.1	<1	0	5.3	3.9
Houndfish	0.5	<0.1	<1	0	4.3	3.9
Anglerfish (Monkfish)	0.3	<0.1	<1	0	8.4	2.9
Thresher Shark	0.2	<0.1	<1	0	22.9	1
Gulf Kingfish	0.2	<0.1	<1	0	0.8	1
Shark Fins	0.1	<0.1	1	0	0.1	1.9
Blueline Tilefish	<0.1	<0.1	<1	0	4.2	1
Caulolatilus Tilefishes	<0.1	<0.1	<1	0	4.0	1
Kingfishes	<0.1	<0.1	<1	0	0.6	2.9
Atlantic Tripletail	<0.1	<0.1	<1	0	1.1	1
Florida Pompano	<0.1	<0.1	<1	0	0.5	1
Observed Species						
White Shrimp						

Table 3.8e. Species composition and mean catch per trip of traditional winter sink net catches (N=110) sampled from October 2011 through March 2012.

Species	Weight		Number		Mean Fish Weight	Percent freq. Occurrence
	Mean	Percent	Mean	Percent		
Atlantic Croaker	47,096.0	51	58,677	81.9	0.8	42.7
Spiny Dogfish	42,143.2	45.6	6,959	9.7	6.1	30.9
Southern Kingfish	2,062.6	2.2	4,012	5.6	0.5	30
Bluefish	659.3	0.7	516	0.7	1.3	31.8
Butterfish	183.6	0.2	1,351	1.9	0.1	53.6
Spanish Mackerel	155.4	0.2	95	0.1	1.6	3.6
Little Tunny	24.8	<0.1	3	0	8.2	32.7
Atlantic Sharpnose Shark	21.8	<0.1	6	0	3.8	10.9
Weakfish	16.3	<0.1	13	0	1.2	32.7
Smooth Dogfish	16.0	<0.1	3	0	5.1	14.5
Kingfishes	7.1	<0.1	14	0	0.5	10
Thresher Shark	5.8	<0.1	<1	0	42.5	10
King Mackerel	3.9	<0.1	<1	0	13.1	8.2
Anglerfish (Monkfish)	1.9	<0.1	<1	0	4.1	9.1
Hickory Shad	1.5	<0.1	3	0	0.5	2.7
Cobia	0.7	<0.1	<1	0	37.0	1.8
Shark Fins	0.6	<0.1	5	0	0.1	2.7
White Shark	0.6	<0.1	<1	0	62.0	0.9
Black Drum	0.3	<0.1	<1	0	32.0	0.9
Clearnose Skate	0.3	<0.1	<1	0	2.1	0.9
Northern Kingfish	0.1	<0.1	<1	0	1.5	0.9
Atlantic Mackerel	0.1	<0.1	<1	0	0.5	8.2
Sheepshead	0.1	<0.1	<1	0	11.9	0.9
Atlantic Cutlassfish	0.1	<0.1	<1	0	3.0	1.8
Sharks	<0.1	<0.1	<1	0	0.1	0.9
Lookdown	<0.1	<0.1	<1	0	0.2	0.9
Harvestfish	<0.1	<0.1	<1	0	0.2	1.8
Florida Pompano	<0.1	<0.1	<1	0	0.4	1.8
Spot	<0.1	<0.1	<1	0	0.3	1.8

Observed Species
White Shrimp
Sandbar Shark
American Shad
Atlantic Menhaden

Table 3.9 Species composition, mean weight (lb) and mean number of fish per trip of the top 99% (by weight) of the traditional winter sink net catches, partitioned by area fished, from June 2007 through May 2009; n= number of catches sampled.

Species	Mean wt.	%	Mean no. fish	Mean fish weight (lb.)	Species	Mean wt.	%	Mean no. fish	Mean fish weight (lb.)	Species	Mean wt.	%	Mean no. fish	Mean fish weight (lb.)
NORTH OF CAPE HATTERAS					CAPE HATTERAS TO CAPE LOOKOUT					WEST OF CAPE LOOKOUT				
2007-08 (n = 54)					**2007-08 (n = 18)**					**2007-08 (n =2)**				
Atlantic croaker	82,899.70	50.8	96,799	0.9	Spiny dogfish	75,039.90	77.3	23,041	3.3	Southern kingfish	2,645.50	82	3,774	0.7
Bluefish	78,872.60	48.4	15,660	5.0	Southern kingfish	19,882.50	20.5	32,701	0.6	Butterfish	365.4	11.3	1,502	0.2
					Bluefish	956.2	1	1,160	0.8	Weakfish	170.5	5.3	196	0.9
					Smooth dogfish	665.5	0.7	148	4.5	Little tunny	45	1.4	5	10.0
2008-09 (n = 98)					**2008-09 (n = 25)**					**2008-09 (n = 1)**				
Bluefish	127,807.10	59.6	25,964	4.9	Spiny dogfish	15,978.70	41.2	2,590	6.2	Southern kingfish	26,045.40	99.9	43,717	0.6
Atlantic croaker	61,757.80	28.8	84,554	0.7	Southern kingfish	13,874.50	35.8	24,376	0.6					
Spiny dogfish	21,771.20	10.2	4,064	5.4	Atlantic croaker	3,257.40	8.4	5,016	0.6					
Southern kingfish	2,296.70	1.1	4,931	0.5	Spanish mackerel	2,803.10	7.2	1,678	1.7					
					Kingfishes	1,685.60	4.4	3,443	0.5					
					Bluefish	393.8	1	350	1.1					

Table 3.9 (Continued)

Species	Mean wt.	%	Mean no. fish	Mean fish weight (lb.)	Species	Mean wt.	%	Mean no. fish	Mean fish weight (lb.)	Species	Mean wt.	%	Mean no. fish	Mean fish weight (lb.)
NORTH OF CAPE HATTERAS					CAPE HATTERAS TO CAPE LOOKOUT					WEST OF CAPE LOOKOUT				
2009-10 (n = 49)					**2009-10 (n = 43)**					**2009-10 (n =0)**				
Bluefish	93,832.60	58.7	16,863	5.6	Atlantic croaker	34,250.10	51	40,186	0.9					
Atlantic croaker	55,166.90	34.5	74,477	0.7	Spiny dogfish	27,674.90	41.2	4,644	6.0					
Spiny dogfish	10,140.90	6.3	1,797	5.6	Southern kingfish	4,532.60	6.8	7,936	0.6					
Striped bass	649.6	0.4	35	18.5	Butterfish	208.7	0.3	1,763	0.1					
2010-11 (n = 41)					**2010-11 (n = 58)**					**2010-11 (n = 4)**				
Bluefish	56,971.60	58.7	7,152	8.0	Atlantic croaker	76,495.50	65.6	96,280	0.8	Southern kingfish	8,570.50	71.9	14,454	0.6
Atlantic croaker	34,821.60	35.9	47,238	0.7	Spiny dogfish	23,604.60	20.3	3,887	6.1	Spanish mackerel	1,092.40	9.2	914	1.2
Spiny dogfish	2,815.30	2.9	572	4.9	Bluefish	16,117.70	13.8	7,515	2.1	Bluefish	1,034.40	8.7	934	1.1
Spanish mackerel	1,293.90	1.3	799	1.6	Southern kingfish	142.2	0.1	249	0.6	Spot	893.3	7.5	3,034	0.3
Striped bass	541.5	0.6	26	21.0						Harvestfish	140.4	1.2	991	0.1
										Smooth dogfish	98.8	0.8	74	1.3
										Butterfish	81.5	0.7	420	0.2
2011-12 (n = 36)					**2011-12(n = 74)**					**2011-12 (n = 0)**				
Atlantic croaker	106,061.30	56.8	138,808	0.8	Spiny dogfish	24,638.80	53	4,134	6.0					
Spiny dogfish	78,124.40	41.8	12,766	6.1	Atlantic croaker	18,410.10	39.6	19,694	0.9					
Bluefish	1,953.80	1	1,496	1.3	Southern kingfish	3,061.80	6.6	5,961	0.5					
Spanish mackerel	474.7	0.3	291	1.6	Butterfish	240	0.5	1,814	0.1					
					Atlantic sharpnose shark	31.5	0.1	8	3.8					

Table 3.10a. Species composition and mean catch per trip of summer sink net catches sampled (N=9) from June 2007 through September 2008.

Species	Weight Mean	Weight Percent	Number Mean	Number Percent	Mean Fish Weight	Percent freq. Occurrence
Spanish Mackerel	2,243.2	73.1	1,806	74.2	1.2	100
Bluefish	767.8	25	608	25	1.3	100
Smooth Dogfish	48.6	1.6	14	0.6	3.5	33.3
Atlantic Cutlassfish	5.4	0.2	2	0.1	3.2	33.3
King Mackerel	2.6	0.1	<1	<0.1	7.9	33.3
Spot	0.7	<0.1	2	0.1	0.3	33.3
Harvestfish	0.7	<0.1	3	0.1	0.2	33.3
Florida Pompano	0.4	<0.1	<1	<0.1	1.1	33.3

Table 3.10b. Species composition and mean catch per trip of summer sink net catches sampled (N=7) from June 2008 through September 2009.

Species	Weight Mean	Weight Percent	Number Mean	Number Percent	Mean Fish Weight	Percent freq. Occurrence
Spanish Mackerel	31,223.6	99.5	22,340	99.1	1.4	100
Bluefish	134.9	0.4	164	0.7	0.8	100
Cobia	10.3	<0.1	1	<0.1	15.4	66.7
Harvestfish	6.7	<0.1	30	0.1	0.2	66.7
Finetooth Shark	5.7	<0.1	<1	<0.1	17.0	33.3
Little Tunny	1.3	<0.1	<1	<0.1	4.0	33.3
Florida Pompano	0.7	<0.1	1	<0.1	0.6	66.7
Atlantic Croaker	0.4	<0.1	1	<0.1	0.6	33.3
Paralicthid Flounders	0.4	<0.1	<1	<0.1	1.1	33.3

Table 3.10c. Species composition and mean catch per trip of summer sink net catches sampled (N=4) from June 2009 through September 2010.

Species	Weight Mean	Weight Percent	Number Mean	Number Percent	Mean Fish Weight	Percent freq. Occurrence
Spanish Mackerel	4,522	87.4	2,573	70.1	1.8	100
Bluefish	478.5	9.2	508	13.8	0.9	71.4
Harvestfish	71.7	1.4	287	7.8	0.3	28.6
Butterfish	34.1	0.7	177	4.8	0.2	42.9
Blacktip Shark	23.1	0.4	2	0.1	10.1	28.6
Cobia	19.1	0.4	1	<0.1	22.3	42.9
Shark Fins	12.7	0.2	115	3.1	0.1	28.6
Smooth Dogfish	5.3	0.1	1	<0.1	7.4	14.3
King Mackerel	3.1	0.1	1	<0.1	3.7	14.3
Florida Pompano	2	<0.1	4	0.1	0.5	14.3
Blue Runner	0.4	<0.1	1	<0.1	0.8	14.3
Atlantic Croaker	0.4	<0.1	1	<0.1	0.4	14.3
Balistes Triggerfishes	0.4	<0.1	<1	<0.1	1.0	14.3
Sheepshead	0.3	<0.1	<1	<0.1	2.0	14.3
Weakfish	0.3	<0.1	<1	<0.1	1.0	14.3
Kingfishes	0.3	<0.1	<1	<0.1	0.7	14.3
Black Sea Bass	0.2	<0.1	<1	<0.1	0.6	14.3
Caranx Jacks	0.2	<0.1	<1	<0.1	1.1	14.3
Gulf Kingfish	0.1	<0.1	<1	<0.1	0.9	14.3
Southern Kingfish	0.1	<0.1	<1	<0.1	0.4	14.3
Observed Species						
Atlantic Sharpnose Shark						

Table 3.10d. Species composition and mean catch per trip of summer sink net catches sampled (N=3) from June 2010 through September 2011.

Species	Weight Mean	Weight Percent	Number Mean	Number Percent	Mean Fish Weight	Percent freq. Occurrence
Spanish Mackerel	10,108.6	92.8	7,543	90.6	1.3	100
Bluefish	640.5	5.9	638	7.7	1.0	100
Gulf Kingfish	85.8	0.8	107	1.3	0.8	33.3
Frigate Mackerel	21.5	0.2	14	0.2	1.5	66.7
Atlantic Sharpnose Shark	14	0.1	3	<0.1	4.2	33.3
Finetooth Shark	12	0.1	1	<0.1	12.0	33.3
Bonnethead Shark	4.3	<0.1	1	<0.1	3.3	33.3
Butterfish	1.3	<0.1	6	0.1	0.2	33.3
Harvestfish	1.3	<0.1	9	0.1	0.2	33.3
Observed Species						
Houndfish						

Table 3.10e. Species composition and mean catch per trip of summer sink net catches sampled (N=2) from June 2011 through September 2012.

Species	Weight		Number		Mean Fish Weight	Percent freq. Occurrence
	Mean	Percent	Mean	Percent		
Spanish Mackerel	5,181.2	69.3	5,253	63.3	1.0	100
Bluefish	2,100.8	28.1	1,805	21.7	1.2	100
Butterfish	141	1.9	895	10.8	0.2	100
Harvestfish	48.7	0.7	349	4.2	0.1	100
Bonnethead Shark	4	0.1	1	<0.1	4.0	50
Gulf Kingfish	0.6	<0.1	1	<0.1	1.1	50
Little Tunny	0.6	<0.1	1	<0.1	1.1	50
Weakfish	0.4	<0.1	1	<0.1	0.9	50

Table 3.11a. Species composition and mean catch per trip of anchored gill net catches (N=143) sampled from September 2007 through May 2008.

Species	Weight		Number		Mean Fish Weight	Percent freq. Occurrence
	Mean	Percent	Mean	Percent		
Southern Kingfish	11,061.1	59.3	18,984	64.6	0.6	74.1
Spot	3,035.0	16.3	7,689	26.2	0.4	62.2
Spiny Dogfish	1,753.8	9.4	289	1	6.1	11.9
Spanish Mackerel	978.2	5.2	851	2.9	1.2	21
Anglerfish (Monkfish)	604.4	3.2	57	0.2	10.6	4.2
Weakfish	320.4	1.7	353	1.2	0.9	58
Bluefish	294.0	1.6	263	0.9	1.1	22.4
Spotted Seatrout	188.4	1	179	0.6	1.1	14.7
Northern Kingfish	112.3	0.6	173	0.6	0.6	17.5
Striped Mullet	111.7	0.6	76	0.3	1.5	7.7
Gulf Kingfish	56.1	0.3	89	0.3	0.6	37.8
Atlantic Croaker	39.1	0.2	102	0.3	0.4	31.5
Butterfish	22.9	0.1	125	0.4	0.2	11.9
Kingfishes	21.3	0.1	37	0.1	0.6	8.4
Smooth Dogfish	16.8	0.1	6	<0.1	2.9	11.9
White Mullet	10.4	0.1	12	<0.1	0.9	3.5
Silver Seatrout	9.1	<0.1	24	0.1	0.4	3.5
Southern Flounder	6.9	<0.1	3	<0.1	2.3	3.5
White Shrimp	3.8	<0.1	47	0.2	0.1	10.5
Harvestfish	2.8	<0.1	13	<0.1	0.2	3.5
Florida Pompano	1.9	<0.1	8	<0.1	0.2	4.2
Atlantic Bonito	1.6	<0.1	<1	<0.1	4.5	2.1
Black Drum	0.7	<0.1	<1	<0.1	4.2	4.2
Mullets	0.5	<0.1	1	<0.1	0.8	1.4
Pigfish	0.4	<0.1	1	<0.1	0.4	9.1
Cobia	0.4	<0.1	<1	<0.1	13.0	1.4
Hickory Shad	0.3	<0.1	1	<0.1	0.7	5.6
Little Tunny	0.3	<0.1	<1	<0.1	9.5	0.7
Banded Drum	0.2	<0.1	<1	<0.1	0.4	4.2
Spottail Pinfish	0.1	<0.1	<1	<0.1	0.5	2.8
Sheepshead	0.1	<0.1	<1	<0.1	6.2	2.1
King Mackerel	0.1	<0.1	<1	<0.1	6.9	1.4
Black Sea Bass	0.1	<0.1	<1	<0.1	0.6	7.7
Paralicthid Flounders	0.1	<0.1	<1	<0.1	1.4	1.4
Gulf Flounder	<0.1	<0.1	<1	<0.1	0.7	0.7
Red Drum	<0.1	<0.1	<1	<0.1	5.3	1.4
Shark Fins	<0.1	<0.1	<1	<0.1	0.1	0.7
Octopi	<0.1	<0.1	<1	<0.1	4.0	0.7
Needlefishes	<0.1	<0.1	<1	<0.1	4.0	0.7
Horseshoe Crab	<0.1	<0.1	<1	<0.1	3.1	3.5
Jawed Fishes	<0.1	<0.1	<1	<0.1	0.2	0.7
Atlantic Mackerel	<0.1	<0.1	<1	<0.1	1.0	1.4
Pinfish	<0.1	<0.1	<1	<0.1	0.4	2.8
Silver Perch	<0.1	<0.1	<1	<0.1	0.6	1.4
Spotted Hake	<0.1	<0.1	<1	<0.1	0.9	0.7

Table 3.11a. Continued

Species	Weight		Number		Mean Fish Weight	Percent freq. Occurrence
	Mean	Percent	Mean	Percent		
Observed Species						
Jelly Bomb						
Knobbed Whelk						
Channeled Whelk						
Spider Crabs						
Libinia Spider Crabs						
Blue Crab						
Blotched Swimming Crab						
Florida Stone Crab						
Atlantic Purple Sea Urchi						
Sand Tiger Shark						
Atlantic Sharpnose Shark						
Dusky Shark						
Sandbar Shark						
Clearnose Skate						
Atlantic Stingray						
Atlantic Sturgeon						
Palespotted Eel						
Blueback Herring						
Atlantic Menhaden						
Striped Anchovy						
Urophycis Hakes						
Prionotus Searobins						
Northern Searobin						
Bighead Searobin						
Rock Sea Bass						
White Grunt						
Fringed Flounder						
Common Loon						

Table 3.11b. Species composition and mean catch per trip of anchored gill net catches (N=101) sampled from July 2008 through May 2009.

Species	Weight		Number		Mean Fish Weight	Percent freq. Occurrence
	Mean	Percent	Mean	Percent		
Southern Kingfish	9,721.2	42.5	16,400	56.2	0.6	65.3
Spanish Mackerel	3,688.3	16.1	2,993	10.3	1.2	19.8
Anglerfish (Monkfish)	2,953.6	12.9	280	1	10.5	10.9
Spot	2,541.7	11.1	6,491	22.3	0.4	66.3
Bluefish	2,268.1	9.9	1,866	6.4	1.2	26.7
Spiny Dogfish	921.6	4	136	0.5	6.8	3
Weakfish	410.4	1.8	496	1.7	0.8	58.4
Gulf Kingfish	144.9	0.6	216	0.7	0.7	30.7
Northern Kingfish	90.9	0.4	149	0.5	0.6	5
Smooth Dogfish	15.6	0.1	4	<0.1	3.8	15.8
King Mackerel	15.4	0.1	2	<0.1	9.9	5
Little Tunny	13.2	0.1	3	<0.1	5.2	5.9
Blacktip Shark	12.4	0.1	1	<0.1	13.6	5.9
Kingfishes	11.3	<0.1	22	0.1	0.5	12.9
Harvestfish	9.6	<0.1	45	0.2	0.2	7.9
Black Drum	8.2	<0.1	<1	<0.1	18.3	5
Spotted Seatrout	7.7	<0.1	5	<0.1	1.4	11.9
Butterfish	5.9	<0.1	29	0.1	0.2	18.8
Skates	5.7	<0.1	5	<0.1	1.1	5
Thresher Shark	1.2	<0.1	<1	<0.1	125.0	3
Atlantic Croaker	1.2	<0.1	3	<0.1	0.4	17.8
Horseshoe Crab	1.1	<0.1	<1	<0.1	3.2	6.9
Tiger Shark	1.0	<0.1	<1	<0.1	33.0	1
Bonnethead Shark	0.8	<0.1	<1	<0.1	3.3	1
Bull Shark	0.6	<0.1	<1	<0.1	63.9	1

Table 3.11b Continued

Species	Weight Mean	Weight Percent	Number Mean	Number Percent	Mean Fish Weight	Percent freq. Occurrence
Carolina Hake	0.6	<0.1	1	<0.1	0.7	2
Shark Fins	0.5	<0.1	4	<0.1	0.1	5
Cobia	0.4	<0.1	<1	<0.1	13.7	3
Pigfish	0.4	<0.1	1	<0.1	0.4	3
Blue Runner	0.4	<0.1	<1	<0.1	0.8	2
Florida Pompano	0.4	<0.1	1	<0.1	0.4	4
Sheepshead	0.4	<0.1	<1	<0.1	5.1	5.9
Mullets	0.2	<0.1	<1	<0.1	0.8	3
Red Drum	0.2	<0.1	<1	<0.1	4.7	1
Houndfish	0.2	<0.1	<1	<0.1	4.2	2
Striped Mullet	0.1	<0.1	<1	<0.1	0.8	1
Paralicthid Flounders	0.1	<0.1	<1	<0.1	1.5	2
Finetooth Shark	0.1	<0.1	<1	<0.1	11.9	1
Caranx Jacks	0.1	<0.1	<1	<0.1	0.8	2
Urophycis Hakes	0.1	<0.1	<1	<0.1	1.0	5
Blueline Tilefish	0.1	<0.1	<1	<0.1	4.0	1
Southern Hake	<0.1	<0.1	<1	<0.1	0.7	1
Atlantic Mackerel	<0.1	<0.1	<1	<0.1	1.2	2
Spotted Hake	<0.1	<0.1	<1	<0.1	1.1	1
Black Sea Bass	<0.1	<0.1	<1	<0.1	0.6	1
Northern Puffer	<0.1	<0.1	<1	<0.1	0.3	1
Observed Species						
Octopi	<0.1	<0.1				1
Atlantic Cutlassfish	<0.1	<0.1				1
Atlantic Menhaden						

Table 3.11c. Species composition and mean catch per trip of anchored gill net catches (N=48) sampled from October 2009 through May 2010.

Species	Weight Mean	Weight Percent	Number Mean	Number Percent	Mean Fish Weight	Percent freq. Occurrence
Southern Kingfish	17,197.3	49.6	29,753	60.6	0.6	75
Spiny Dogfish	9,001.7	25.9	1,564	3.2	5.8	12.5
Spot	5,797.9	16.7	14,356	29.2	0.4	45.8
Anglerfish (Monkfish)	743.4	2.1	98	0.2	7.6	6.3
Silver Seatrout	594.1	1.7	1,199	2.4	0.5	4.2
Bluefish	550.9	1.6	704	1.4	0.8	20.8
Weakfish	440.2	1.3	574	1.2	0.8	52.1
Spanish Mackerel	78.3	0.2	80	0.2	1.0	12.5
Atlantic Croaker	76.1	0.2	217	0.4	0.4	31.3
Gulf Kingfish	65.0	0.2	78	0.2	0.8	37.5
Butterfish	54.8	0.2	421	0.9	0.1	14.6
Smooth Dogfish	30.2	0.1	8	<0.1	3.8	4.2
Northern Kingfish	28.2	0.1	41	0.1	0.7	18.8
Little Tunny	10.9	<0.1	2	<0.1	6.1	8.3
Skates	7.2	<0.1	6	<0.1	1.1	2.1
Cobia	3.6	<0.1	<1	<0.1	19.0	4.2
Kingfishes	2.8	<0.1	6	<0.1	0.5	2.1
Horseshoe Crab	2.5	<0.1	<1	<0.1	7.4	2.1
Florida Pompano	1.4	<0.1	4	<0.1	0.4	4.2
American Shad	1.1	<0.1	<1	<0.1	52.9	2.1
Pigfish	0.4	<0.1	1	<0.1	0.7	4.2
Sheepshead	0.3	<0.1	<1	<0.1	2.8	4.2
White Mullet	0.3	<0.1	<1	<0.1	0.8	2.1
Carolina Hake	0.2	<0.1	<1	<0.1	1.0	2.1
Striped Mullet	0.2	<0.1	<1	<0.1	1.0	2.1
Atlantic Bonito	0.2	<0.1	<1	<0.1	4.0	2.1
Harvestfish	0.2	<0.1	1	<0.1	0.2	2.1
Octopi	0.1	<0.1	<1	<0.1	3.0	2.1
Spotted Seatrout	0.1	<0.1	<1	<0.1	1.8	2.1
Summer Flounder	0.1	<0.1	<1	<0.1	1.9	2.1
Shark Fins	0.1	<0.1	1	<0.1	0.1	2.1
Black Drum	<0.1	<0.1				2.1
Urophycis Hakes	<0.1	<0.1	<1	<0.1	1.1	2.1
Red Hake	<0.1	<0.1	<1	<0.1	1.1	2.1
Observed Species						
Pinfish						
Banded Drum						

Table 3.11d. Species composition and mean catch per trip of anchored gill net catches (N=40) sampled from October 2010 through May 2011.

Species	Weight Mean	Weight Percent	Number Mean	Number Percent	Mean Fish Weight	Percent freq. Occurrence
Atlantic Croaker	9861	33	19768	58.2	0.5	35
Spiny Dogfish	8900.1	29.8	1549	4.6	5.7	17.5
Southern Kingfish	4164.3	13.9	7234	21.3	0.6	50
Bluefish	2979.2	10	1603	4.7	1.9	20
Anglerfish (Monkfish)	2172.1	7.3	305	0.9	7.1	15
Northern Kingfish	739.6	2.5	1198	3.5	0.6	25
Weakfish	303.5	1	440	1.3	0.7	52.5
Spot	256.7	0.9	688	2	0.4	40
Spanish Mackerel	248.1	0.8	274	0.8	0.9	12.5
Butterfish	101.2	0.3	666	2	0.2	32.5
Blacktip Shark	25.9	0.1	<1	<0.1	81.6	2.5
Atlantic Sharpnose Shark	24.4	0.1	6	<0.1	4.2	2.5
Harvestfish	23.9	0.1	115	0.3	0.2	5
Kingfishes	18	0.1	36	0.1	0.5	10
Atlantic Bonito	16.8	0.1	3	<0.1	5.0	5
Skates	16.7	0.1	15	<0.1	1.1	12.5
Spotted Seatrout	12.9	<0.1	14	<0.1	0.9	7.5
Smooth Dogfish	12.2	<0.1	4	<0.1	3.1	17.5
Little Tunny	5.1	<0.1	1	<0.1	8.8	12.5
Black Drum	4.5	<0.1	<1	<0.1	36.2	7.5
Peprilus Butterfish	4	<0.1	18	0.1	0.2	2.5
Gulf Kingfish	3.3	<0.1	5	<0.1	0.7	2.5
King Mackerel	3	<0.1	<1	<0.1	10.1	2.5
Northern Puffer	1.9	<0.1	7	<0.1	0.3	2.5
Finetooth Shark	1.9	<0.1	<1	<0.1	12.5	2.5
Shark Fins	1.6	<0.1	15	<0.1	0.1	2.5
Cobia	1.4	<0.1	<1	<0.1	19.3	5
Florida Pompano	1.4	<0.1	3	<0.1	0.5	2.5
Houndfish	1.3	<0.1	<1	<0.1	4.6	2.5
Thresher Shark	0.8	<0.1	<1	<0.1	31.1	2.5
Sheepshead	0.7	<0.1	1	<0.1	0.7	12.5
American Shad	0.4	<0.1	<1	<0.1	2.0	5
Paralicthid Flounders	0.2	<0.1	<1	<0.1	1.6	5
Hickory Shad	0.2	<0.1	<1	<0.1	0.7	5
Atlantic Mackerel	0.2	<0.1	<1	<0.1	1.0	7.5
Horseshoe Crab	0.2	<0.1	<1	<0.1	3.1	5
Urophycis Hakes	<0.1	<0.1	<1	<0.1	1.0	2.5
Observed Species						
Atlantic Cutlassfish	<0.1	<0.1				2.5

Table 3.11e. Species composition and mean catch per trip of anchored gill net catches (N=88) sampled from June 2011 through May 2012.

Species	Weight		Number		Mean Fish Weight	Percent freq. Occurrence
	Mean	Percent	Mean	Percent		
Spiny Dogfish	39,359.6	81.4	5,997	28.8	6.6	35.2
Southern Kingfish	4,072.8	8.4	6,718	32.3	0.6	47.7
Spot	1,657.9	3.4	3,952	19	0.4	39.8
Spanish Mackerel	1,144.3	2.4	782	3.8	1.5	19.3
Atlantic Croaker	874.1	1.8	1,019	4.9	0.9	26.1
Bluefish	294.9	0.6	296	1.4	1.0	33
Butterfish	202.4	0.4	1,144	5.5	0.2	30.7
Gulf Kingfish	195.4	0.4	234	1.1	0.8	20.5
Northern Kingfish	118.3	0.2	181	0.9	0.7	14.8
Smooth Dogfish	113.7	0.2	22	0.1	5.1	19.3
Weakfish	79.8	0.2	88	0.4	0.9	42
Anglerfish (Monkfish)	59.3	0.1	7	<0.1	8.8	1.1
Black Drum	44.7	0.1	127	0.6	0.4	14.8
Atlantic Sharpnose Shark	41.5	0.1	11	0.1	3.9	8
Harvestfish	28.3	0.1	127	0.6	0.2	9.1
King Mackerel	27.9	0.1	2	<0.1	16.1	2.3
Banded Drum	13.9	<0.1	48	0.2	0.3	2.3
Red Drum	13.6	<0.1	2	<0.1	6.0	2.3
Little Tunny	8.8	<0.1	1	<0.1	6.1	9.1
Florida Pompano	6.9	<0.1	27	0.1	0.3	9.1
Spotted Seatrout	6.8	<0.1	5	<0.1	1.3	14.8
Thresher Shark	5.7	<0.1	<1	<0.1	71.1	5.7
Horseshoe Crab	3.3	<0.1	1	<0.1	3.1	3.4
Shark Fins	2.7	<0.1	24	0.1	0.1	8

Table 3.11e Continued

Species	Weight		Number		Mean Fish Weight	Percent freq. Occurrence
	Mean	Percent	Mean	Percent		
Skates	1.8	<0.1	1	<0.1	2.1	2.3
Sharks	0.7	<0.1	7	<0.1	0.1	1.1
Crevalle Jack	0.7	<0.1	2	<0.1	0.3	5.7
Cobia	0.6	<0.1	<1	<0.1	26.6	2.3
White Mullet	<0.1	<0.1	<1	<0.1	0.5	3.4
Pigfish	<0.1	<0.1	1	<0.1	0.3	6.8
Houndfish	<0.1	<0.1	<1	<0.1	3.6	1.1
Sheepshead	<0.1	<0.1	<1	<0.1	7.5	2.3
Striped Mullet	<0.1	<0.1	<1	<0.1	0.8	2.3
Atlantic Bonito	<0.1	<0.1	<1	<0.1	4.7	1.1
Kingfishes	<0.1	<0.1	<1	<0.1	0.5	3.4
Southern Hake	<0.1	<0.1	<1	<0.1	0.7	1.1
American Shad	<0.1	<0.1	<1	<0.1	2.5	1.1
Northern Puffer	<0.1	<0.1	<1	<0.1	0.3	2.3
Atlantic Mackerel	<0.1	<0.1	<1	<0.1	0.8	2.3
Octopi	<0.1	<0.1	<1	<0.1	2.4	1.1
Hickory Shad	<0.1	<0.1	<1	<0.1	0.9	1.1
Southern Flounder	<0.1	<0.1	<1	<0.1	1.5	1.1
Banded Rudderfish	<0.1	<0.1	<1	<0.1	1.1	1.1
White Shrimp	<0.1	<0.1	<1	<0.1	0.1	1.1
Spotted Hake	<0.1	<0.1	<1	<0.1	0.4	1.1

Table 3.12. Species composition, mean weight (lb) and mean number of fish per trip of the top 99% (by weight) of the anchored gill net catches, partitioned by area fished, from July 2007 through June 2009; n= number of catches sampled.

Species	Mean wt.	%	Mean no. fish	Mean fish weight (lb.)	Species	Mean wt.	%	Mean no. fish	Mean fish weight (lb.)	Species	Mean wt.	%	Mean no. fish	Mean fish weight (lb.)
	NORTH OF CAPE HATTERAS					CAPE HATTERAS TO CAPE LOOKOUT					WEST OF CAPE LOOKOUT			
2007-08 (n = 9)					**2007-08 (n = 10)**					**2007-08 (n =124)**				
Anglerfish(Monkfish)	9,604.0	53.3	909	10.6	Southern kingfish	10,569.3	73.5	18,121	0.6	Southern kingfish	11,304.6	59.4	19,378	0.6
Southern kingfish	8,252.7	45.8	14,507	0.6	Bluefish	1,474.3	10.2	1,498	1.0	Spot	3,499.4	18.4	8,865	0.4
Gulf kingfish	66.9	0.4	133	0.5	Northern kingfish	1,361.4	9.5	2,108	0.6	Spiny dogfish	2,022.6	10.6	333	6.1
Northern kingfish	61.5	0.3	123	0.5	Spanish mackerel	589.5	4.1	311	1.9	Spanish mackerel	1,080.6	5.7	956	1.1
										Weakfish	368.4	1.9	405	0.9
										Bluefish	220.0	1.2	183	1.2
										Spotted seatrout	217.2	1.1	207	1.1
										Striped mullet	128.8	0.7	87	1.5
2008-09 (n = 19)					**2008-09 (n = 9)**					**2008-09 (n = 73)**				
Anglerfish (Monkfish)	15,700.5	39.1	1,490	1.4	Spanish mackerel	17,300.6	46.2	12,717	1.4	Southern kingfish	11,713.6	70.8	19,226	0.6
Spanish mackerel	10,205.3	25.4	8,906	6.8	Spiny dogfish	10,342.2	27.6	1,530	6.8	Spot	3,436.3	20.8	8,796	0.4
Bluefish	7,666.8	19.1	6,072	1.1	Bluefish	6,455.2	17.2	5,726	1.1	Weakfish	523.2	3.2	648	0.8
Southern kingfish	5,882.4	14.6	11,900	0.6	Southern kingfish	1,664.4	4.4	2,977	0.6	Bluefish	346.7	2.1	296	1.2
Northern kingfish	363.0	0.9	621	0.4	Spot	640.7	1.7	1,464	0.4	Spanish mackerel	313.9	1.9	255	1.2
				1.2	Weakfish	358.7	1.0	305	1.2	Gulf kingfish	189.3	1.1	276	0.7
				0.7	Northern kingfish	252.9	0.7	357	0.7					
				3.7	Smooth dogfish	151.0	0.4	41	3.7					

Table 3.12 (Continued)

Species	Mean wt.	%	Mean no. fish	Mean fish weight (lb.)	Species	Mean wt.	%	Mean no. fish	Mean fish weight (lb.)	Species	Mean wt.	%	Mean no. fish	Mean fish weight (lb.)
	NORTH OF CAPE HATTERAS					CAPE HATTERAS TO CAPE LOOKOUT					WEST OF CAPE LOOKOUT			
2009-10 (n = 3)					**2009-10 (n = 5)**					**2009-10 (n =40)**				
Anglerfish(Monkfish)	11,894.9	98.7	1,574	7.6	Spiny dogfish	62,401.0	91.6	10,859	5.7	Southern kingfish	20,050.2	62.2	34,611	0.6
Skates	115.0	1.0	100	1.1	Southern kingfish	4,692.8	6.9	8,740	0.5	Spot	6,957.5	21.6	17,227	0.4
Horseshoe crab	39.4	0.3	5	7.4	Butterfish	468.7	0.7	3,673	0.1	Spiny dogfish	3,001.9	9.3	520	5.8
										Silver seatrout	712.9	2.2	1,439	0.5
										Bluefish	655.9	2.0	842	0.8
										Weakfish	522.9	1.6	682	0.8
2010-11 (n = 9)					**2010-11 (n = 16)**					**2010-11 (n =15)**				
Atlantic croaker	19,860.5	66.6	48,958	0.4	Spiny dogfish	22,250.2	49.4	3,873	5.7	Southern kingfish	7,804.1	56.5	12,598	0.6
Anglerfish(Monkfish)	9,653.8	32.4	1,356	7.1	Atlantic croaker	11,497.3	25.5	15,624	0.7	Atlantic croaker	2,115.8	15.3	6,673	0.3
Southern kingfish	144.4	0.5	309	0.5	Bluefish	7,153.4	15.9	3,792	1.9	Northern kingfish	1,870.4	13.5	3,027	0.6
					Southern kingfish	3,013.2	6.7	6,100	0.5	Weakfish	746.3	5.4	1,071	0.7
					Spanish mackerel	572.1	1.3	627	0.9	Spot	682.9	4.9	1,831	0.4
										Bluefish	314.3	2.3	230	1.4
										Butterfish	98.2	0.7	590	0.2
										Spanish mackerel	51.5	0.4	61	0.8
2011-12 (n = 5)					**2011-12 (n = 15)**					**2011-12 (n =68)**				
Spanish mackerel	14,070.5	84.5	9,263	1.5	Spiny dogfish	22,744.5	68.2	3,661	6.2	Spiny dogfish	45,918.8	84.9	6,953	6.6
Anglerfish(Monkfish)	1,043.9	6.3	118	8.8	Atlantic croaker	5,007.0	15.0	5,572	0.9	Southern kingfish	5,059.0	9.4	8,265	0.6
Butterfish	706.0	4.2	3,763	0.2	Spot	2,445.8	7.3	5,572	0.4	Spot	1,606.0	3.0	3,885	0.4
Bluefish	581.1	3.5	468	1.2	Spanish mackerel	1,003.9	3.0	679	1.5	Bluefish	301.5	0.6	319	0.9
Harvestfish	179.5	1.1	734	0.2	Southern kingfish	959.8	2.9	1,942	0.5	Gulf kingfish	252.9	0.5	303	0.8
					Smooth dogfish	520.7	1.6	95	5.5	Butterfish	247.9	0.5	1,364	0.2
										Spanish mackerel	224.8	0.4	181	1.2

Table 3.13a. Species composition and mean catch per trip of runaround gill net catches sampled from September through November 2007 (N=9).

Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean fish weight (lb)	Percent freq. occur.
Striped mullet	69,071.5	68.5	36,516	27.6	1.9	77.8
Spot	30,500.5	30.3	94,467	71.5	0.3	22.2
Bluefish	649.0	0.6	376	0.3	1.7	55.6
Spotted seatrout	162.7	0.2	71	0.1	2.3	22.2
Spanish mackerel	132.7	0.1	142	0.1	0.9	33.3
Pigfish	116.4	0.1	420	0.3	0.3	11.1
Weakfish	103.6	0.1	117	0.1	0.9	11.1
Southern kingfish	10.2	<0.1	7	<0.1	1.4	11.1
Black drum	9.6	<0.1	6	<0.1	1.6	33.3
Red drum	6.5	<0.1	1	<0.1	4.5	22.2
Atlantic croaker	0.9	<0.1	1	<0.1	0.6	11.1
Southern flounder	0.7	<0.1		<0.1	2.1	22.2
Kingfishes	0.4	<0.1	1	<0.1	0.6	11.1
Summer flounder	0.4	<0.1		<0.1	0.9	11.1
Sheepshead	0.3	<0.1		<0.1	0.8	11.1
Mullets	0.3	<0.1		<0.1	1.5	11.1
Florida pompano	0.2	<0.1		<0.1	2.0	11.1

Observed Species
Atlantic stingray
Northern searobin
Crevalle jack
Lookdown
Pinfish
Atlantic spadefish
White mullet

Table 3.13b. Species composition and mean catch per trip of runaround gill net catches sampled from October through November 2008 (N=5).

Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean fish weight (lb)	Percent freq. occur.
Striped mullet	165,001.1	89.6	62,617	88.6	2.6	100.0
Spotted seatrout	18,468.1	10.0	7,718	10.9	2.4	60.0
Black drum	493.3	0.3	261	0.4	1.9	60.0
Gulf kingfish	125.7	0.1	72	0.1	1.7	20.0
Red drum	59.5	<0.1	14	<0.1	4.4	60.0

Table 3.13c. Species composition and mean catch per trip of runaround gill net catches sampled in November 2009 (N=2).

Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean fish weight (lb)	Percent freq. occur.
Bluefish	49,993.0	96.7	16,530	96.1	3.0	100.0
Black drum	614.1	1.2	146	0.8	4.2	100.0
Striped mullet	500.8	1.0	178	1.0	2.8	50.0
Florida pompano	356.1	0.7	128	0.7	2.8	50.0
Spotted seatrout	114.2	0.2	38	0.2	3.0	100.0
Sheepshead	70.3	0.1	144	0.8	0.5	100.0
Gulf kingfish	12.0	<0.1	8	0.0	1.5	50.0
Southern kingfish	12.0	<0.1	18	0.1	0.7	50.0
Red drum	5.0	<0.1	1	<0.1	5.0	50.0
Paralicthid flounders	1.8	<0.1	2	<0.1	1.2	50.0
Butterfish	0.5	<0.1	2	<0.1	0.2	50.0

Table 3.13d. Species composition and mean catch per trip of runaround gill net catches sampled from October through November 2010 (N=2).

Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean fish weight (lb)	Percent freq. occur.
Striped mullet	48,899.6	89.1	17965	87.8	2.7	100.0
Bluefish	5,687.9	10.4	1511	7.4	3.8	50.0
Sheepshead	234.1	0.4	986	4.8	0.2	50.0
Black drum	26.9	<0.1	5	<0.1	5.0	50.0
Summer flounder	5.1	<0.1	4	<0.1	1.3	50.0
Red drum	3.0	<0.1	1	<0.1	6.0	50.0
Spotted seatrout	1.5	<0.1	1	<0.1	2.6	50.0

Table 3.13e. Species composition and mean catch per trip of runaround gill net catches sampled from October 2011 through June 2012 (N=8).

Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean fish weight (lb)	Percent freq. occur.
Striped mullet	26,384.3	87.3	10175	78.1	2.6	62.5
Spanish mackerel	2,490.4	8.2	1768	13.6	1.4	37.5
Spotted seatrout	824.5	2.7	453	3.5	1.8	12.5
Gulf kingfish	233.6	0.8	145	1.1	1.6	25.0
Little tunny	101.2	0.3	74	0.6	1.4	12.5
Bluefish	81.4	0.3	92	0.7	0.9	50.0
Butterfish	60.0	0.2	262	2.0	0.2	37.5
Black drum	20.2	0.1	32	0.2	0.6	12.5
Spot	5.5	<0.1	17	0.1	0.3	12.5
Harvestfish	3.8	<0.1	17	0.1	0.2	25.0
Red drum	1.8	<0.1	1	<0.1	2.8	25.0
Florida pompano	0.6	<0.1	1	<0.1	1.2	12.5
Weakfish	0.1	<0.1	0	<0.1	0.6	12.5

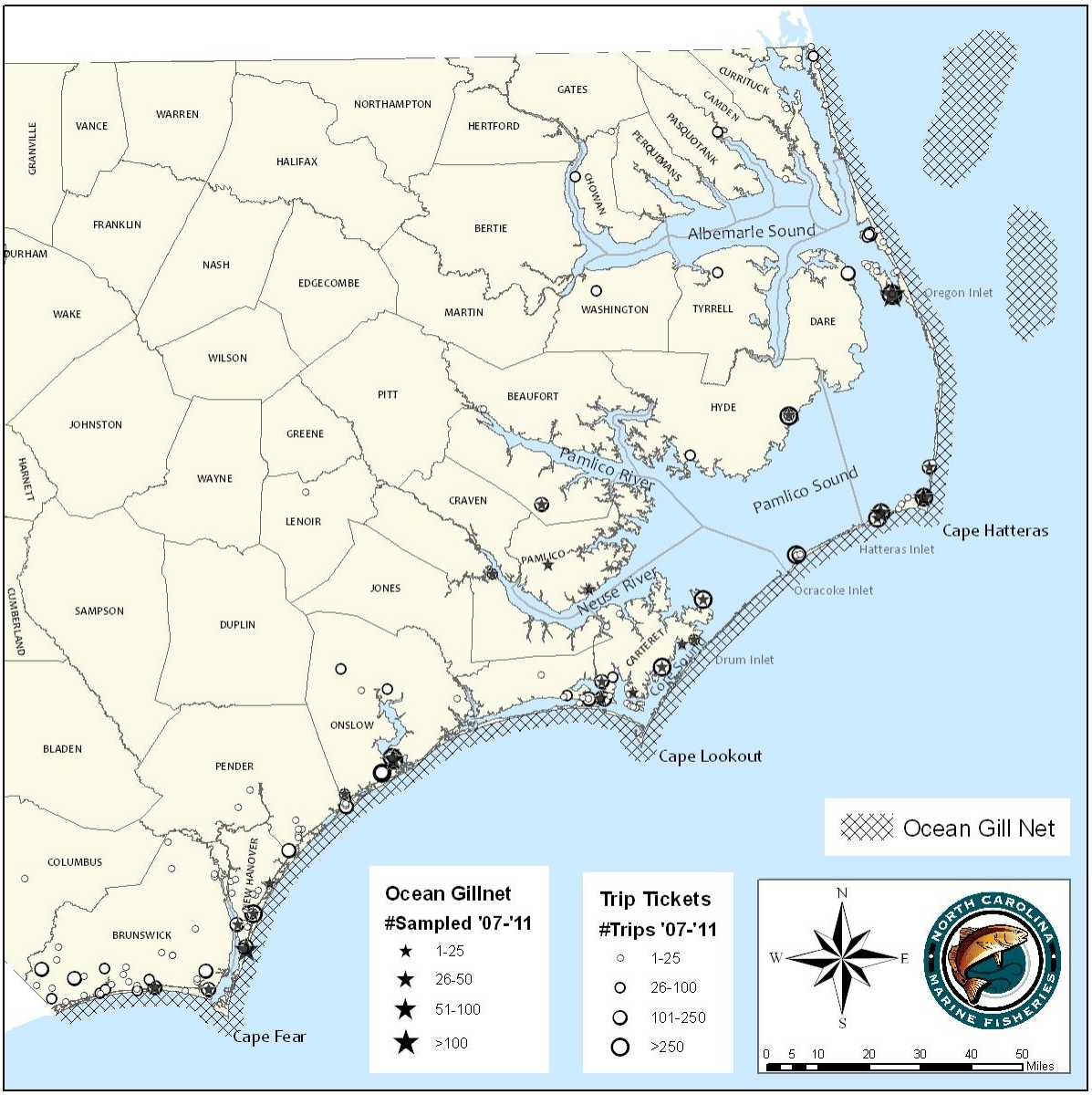

Figure 3.1 Locations and numbers of trip ticket landings and ocean gill net fish house samples taken by number for 2007 through 2011.

ASSESSMENT OF NORTH CAROLINA COMMERCIAL FINFISHERIES

Final Performance Report for Award Number NA07NMF4070047

November 2012
FISHERY SECTION 4

FLOUNDER POUND NET FISHERY ASSESSMENT

JOB 4

by

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ABSTRACT

The North Carolina pound net fishery for flounder targets paralichthid flounders. The pound net is a stationary gear, constructed of multifilament nylon webbing which intercepts maturing adult and sub-adult flounder as they migrate from estuarine waters to ocean waters prior to spawning in the fall. The fishery takes place in shallow waters (6 – 30 feet) along the mainland and barrier island shorelines from Albemarle Sound, south to Back Sound (near Cape Lookout). From 2007 to 2011, 375 catches were sampled to determine species composition, seasonality, and length distributions of commercially important species. Catches were sampled at landing sites during the fishing season (September to December). The largest catches occurred during October for most years. The flounder pound net fishery contributed 1.8-2.8% of the weight, and 3.5-4.2% of the total value of the state of North Carolina's edible finfish landings from 2007 to 2011. Edible finfish landings from flounder pound nets were higher than the previous reporting period (2004 to 2006). Southern flounder (*Paralichthys lethostigma*) accounted for 75-84% of the landed flounder pound net catch, by weight during this period. Harvestfish (*Peprilus alepidotus*), butterfish (*Peprilus triacanthus*), Gulf flounder (*Paralichthys albigutta*), summer flounder (*Paralichthys dentatus*), black drum (*Pogonias cromis*), Florida pompano (*Trachinotus carolinus*), and striped bass (*Morone saxatilis*) were economically important species also caught by this fishery. The North Carolina Southern Flounder Fishery Management Plan implemented regulations that impacted the flounder pound net fishery. Future regulations for southern flounder and sea turtles could further impact this fishery.

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INTRODUCTION

The North Carolina pound net fishery for flounder targets paralichthid flounders. The fishery takes place in shallow waters (6 to 30 feet) along the mainland and barrier island shorelines from Albemarle Sound south to Back Sound, near Cape Lookout (Figure 4.1). Maturing adult and subadult flounder are primarily caught in pound nets as they migrate from estuarine waters to ocean waters. Most fish caught in Albemarle Sound and Roanoke Island areas are landed in Wanchese and Manns Harbor. Ports at Avon, Hatteras and Ocracoke are used for landing fish caught near the Outer Banks. Cedar Island, Atlantic and Sea Level are landing sites for southeastern Pamlico and Core Sounds. Back Sound catches are landed at Harkers Island.

Pound nets are a stationary net gear that directs fish into enclosures or “pounds” through leads. A typical flounder pound net consists of at least one lead, heart, and pound (Figure 4.2). A crew (two to four fishermen) generally sets three to four pounds that are attached to gum tree stakes, and interconnected by leads. Nets are placed end to end in sets of one to over 20 pounds and leads. The leads usually begin in shallow water on a shoal or nearshore, with the water depth increasing towards the pound, although some nets are set in waters where there is no depth change. Fish follow the leads to the heart and are then directed into the pound by way of a mesh tunnel. The pound has a bottom and four sides. The tunnel is held approximately 8 inches off the bottom of the pound by a steel frame. After flounder enter the pound they stay on the bottom and are hindered from exiting through the tunnel since the opening is raised off the bottom. The leads are constructed of large mesh, from 7-10 inches stretched mesh (ISM), and are 150 to 600 yards long depending on water depth and the proximity of the net to shoals. Nets that do not come off shoals have longer leads. Hearts are made of 4-5 ISM, while pounds are constructed of 4 ISM. Flounder pound nets must be fitted with escape panels that allow the escape of undersized flounder. Escape panels must measure 5½ ISM minimum, sewn into the offshore corners of the pound (Figure 4.3). The pounds or “cribs” range from 25 to 28 ft square in shallower waters, such as Core Sound, to 32-35 ft square in deeper waters behind Ocracoke and Hatteras. All pound nets are constructed from multifilament nylon webbing which is dipped in an anti-fouling solution.

The fishing season generally begins in early September, with the first shift in wind direction to the northeast from the predominant summer direction of southwest. Nets are set from late August into September in preparation for these shifts and are fished into November when the nets are removed but the stakes remain. Pound nets are fished on a daily to weekly basis, depending on the weather, size of the catches, and market conditions (DeVries 1981). A skiff, 1.5-6 m (6-20 ft), is driven into the pound after shoving one of the sides down. When the nets are located a long distance from the landing site, or in deeper water, a larger vessel of 7.6-10.7 m (25-35 ft) may be used to tow the skiff to and from the fishing site. The bottom of the pound is gathered-up, working from the tunnel wall to the back wall of the pound until the fish are concentrated in the back of the pound. The fish in the pound are either “rolled” into the skiff by pulling the gathered netting and fish into the skiff, bailed out using “dip” nets, or picked out by hand. Undersized/oversized, out of season, or otherwise unmarketable finfish and invertebrates

are culled at the nets; low mortality rates are assumed but insufficient data exist to estimate discard mortality.

The North Carolina Division of Marine Fisheries (NCDMF) sampled the pound net fishery for flounder in Core Sound in 1976 (Wolff 1977) and again in 1979 (Devries 1981). The NCDMF resumed sampling in 1989 on a statewide basis, and it has continued since. This report describes sampling and fishery effort, species composition, catch per trip and landings for North Carolina's pound net flounder fishery for the 2007-2011 fishing seasons.

METHODS AND MATERIALS

Flounder pound net catches were typically sampled at fish houses late-August through early-December, based on availability of landings and when the season was open. Generally four or more catches (often 20 or more) were sampled each month during this period (Table 4.1). Since most flounder pound net catches were culled at the fishing site, the samples taken were random stratified (graded) samples. For each species, a representative number of random basket samples (50 lb) were obtained from each size category (jumbo, large, medium, small, etc.), with more samples for larger fish. Additional species were sampled or noted. Each sample was weighed to the nearest 0.1 lb and all individuals were measured (mm) in total length (TL) or fork length (FL). If the individuals in a fish box were too numerous to measure, at least 30 were measured, and the remainder counted. When available, crew members were interviewed to determine: approximate location of the pound nets, number of pounds fished for the trip, lead length and mesh size, pound mesh size, and escape panel mesh size. Weights and lengths were converted to English units for this report.

Existing fishery dependent pound net data on species composition, location and seasonality were used to distinguish flounder pound net landings in the North Carolina Trip Ticket database (NCTTP) from pound nets targeting herrings and sciaenids. The criteria for designating flounder pound net landings were pound net landings from Beaufort, Carteret, Hyde and Tyrrell counties for September through December, and Dare County for October through December. A pound net fishery for sciaenids occurs during September in Dare County, and although this fishery has declined in recent years these landings were not included in flounder pound net landings, resulting in under reporting of the total annual landings from flounder pound nets. However, these selection criteria capture the majority of flounder pound net landings and allow for comparisons to earlier years.

A sample map (Figure 4.1) was created using dealer addresses, trip ticket landings and independent fish house sampling data. The addresses were created with a georeferencing tool within ArcMap 10 software using the Dealer address records contained in the NCTTP database. Each unique dealer address was run through the georeferencing tool, and placed on the map as accurately as possible. If there was no match for the address using ArcMap georeferencing, it was searched on Google Maps, and interactively created and accurately placed by the GIS analyst. Trip ticket landing data were compiled from records that the NCDMF trip ticket program

manages on their database. The data were summarized by dealer, fishery gear and the sum of trips by dealers in 2007-2011. The independent fish house sampling data shown on the maps were created using records contained in the Biological Database. These data reflect the sum of flounder pound net fish house samples that were taken in 2007-2011, by gear and dealer. The results were then joined and displayed in ArcMap to the proper dealer address location using the dealer code and\or product number. Shaded areas identified the general area where the fishery occurred.

RESULTS AND DISCUSSION

CATCH RATES AND LANDINGS

Six percent (375) of the catches from the pound net fishery for flounder were sampled out of 6,247 trips from 2007 to 2011 (Table 4.1). Most of the samples were collected from Pamlico Sound and Core Sound (Figure 4.2). The port with the greatest landings and most trips in 2007-2011 was in Cedar Island (26% of landings). The port of Wanchese was second in landings but third in the number of trips that landed (Sea Level had the second highest number of trips). Atlantic was third in landings but fifth in the number of trips. Cedar Island, Wanchese and Atlantic landed nearly 1.9 million pounds (58% of total landings) just over 3,300 trips (53% of trips) in 2007-2011 (Figure 4.2). Large landings also occurred at Ocracoke, Sea Level, Buxton and Avon. The largest number of samples collected from the pound net fishery in 2007-2011 came from Sea Level (97) where 1,115 trips offloaded (the second highest number of trips). Cedar Island had the highest number of trips (1,794) and the second highest number of trips sampled (84). In Wanchese, 73 samples were collected of the 961 trips that landed. In Avon, 37 trips were sampled of the 219 trips taken while 31 of 217 trips were sampled in Hatteras. There were 30 trips sampled in Atlantic of 598 trips taken and 20 trips sampled in Buxton where 247 trips landed. Only 8 of the 721 trips landed were sampled in Ocracoke. The remaining two sampled trips were from Manns Harbor and Harkers Island where 339 total trips landed.

Data from the NCTTP indicated 47% of the trips in the pound net fishery landed 200 pounds or less per trip (Table 4.2. Only 13% of trips caught 1,000 lb or more. The greatest percentage of the harvest, 25.5%, came from trips landing between 1,000 and 2,000 lb. Landings over 10,000 lb represented less than one percent of the flounder pound net fishery harvest for 2007-2011 (Table 4.2).

Catches were sampled from September through December, with the largest catches occurring in either September or October. Sampled catches averaged 930 lb and ranged from 20 to 8,865 lb/trip. Average weight per trip from the NCTTP was less (514 lb), indicating sampling is biased toward trips with larger landings (Table 4.1).

In 2007, 80 flounder pound net catches were sampled, 6.1% of the annual trips reported for the flounder pound net fishery (1,322 trips). Sampled catches ranged from 20 to 8,156 lb/trip and

averaged 852 lb/trip. The mean trip weight reported on trip tickets for 2007 was 416 lb (Table 4.1). The season was closed from December 14 through 31, 2007.

In 2008, 102 flounder pound net catches were sampled, 8.8% of the annual trips reported for the flounder pound net fishery (1,158 trips). Sample catches ranged from 45 to 8,144 lb/trip and averaged 1,059 lb/trip. The mean trip weight reported on trip tickets for 2008 was 658 lb (Table 4.1). The season was closed during December 2008.

In 2009, 78 flounder pound net catches were sampled, 6.1% of the annual trips reported for the flounder pound net fishery (1,280 trips). Sampled catches ranged from 47 to 8,865 lb/trip and averaged 956 lb/trip. The mean trip weight reported on trip tickets for 2009 was 523 lb (Table 4.1). The season was closed during December 2009.

In 2010, 59 flounder pound net catches was sampled, 4.7% of the annual trips recorded for the flounder pound net fishery (1,243 trips). Sampled catches ranged from 37 to 6,019 lb/trip and averaged 935 lb/trip. The mean trip weight reported on trip tickets for 2010 was 518 lb. (Table 4.1). The season was closed during December 2010.

In 2011, 56 flounder pound net catches was sampled, 4.5% of the annual trips recorded for the flounder pound net fishery (1,244 trips). Sampled catches ranged from 36 to 3,511 lb/trip and averaged 766 lb/trip. The mean trip weight reported on trip tickets for 2011 was 471 lb (Table 4.1). The season was closed during December 2011.

The contribution, in weight, of the flounder pound net fishery to the annual State edible finfish landings for 2007-2011 was: 1.8%, 2.8%, 2.2%, 2.1%, and 2.2%. The value of this fishery for 2007-2011 was: 3.5%, 4.2%, 3.5%, 3.6% and 3.7% of the total value of the State's edible finfish landings. The average price per lb of flounder for 2007- 2011 was: $2.36, $1.92, $1.75, $1.77 and $1.95.

Landings by North Carolina flounder pound nets have fluctuated over the years due to changes in fishing effort, hurricanes, and fish availability. Landings increased in 1987 and remained relatively high through 1996, with peak landings in 1994 at 2,478,420 lb (Burns and Batsavage 2004). Annual landings in 2003 were the lowest since 1985. Reduced fishing effort due to hurricanes and fewer participants in the fishery may be responsible for the lower landings.

Flounder landings by flounder pound nets generally parallel the trends in statewide total landings. Flounder landings increased in 1986 and remained relatively high through 1996, with peak landings in 1993 at 2,176,335 lb (Burns and Batsavage 2004). Flounder landings decreased sharply in 2003 to the lowest levels since 1985 and remained at similar levels through 2011. The percentage of overall flounder pound net landings composed of flounder fluctuated in 2007-2011, ranging from 75% (2011) to 84% (2007) by weight (Table 4.3a-b).

Annual mean sample trip weights fluctuated over the study period. Mean sample trip weights were high for 1994-1996 (1,548-1,585 lb), but steadily declined from 1998 to 2000 with catches

similar to those in 1989-1993 (Monaghan and Watterson 2001, Burns 2004). The lowest annual mean sample trip weight for 2007-2011 was 766 lb in 2011. This was higher than all annual mean sample trip weights for 2004-2006, which had a maximum of 657 lb in 2006. However, 2007 had the lowest mean trip ticket weight for 2007-2011 at 416 lb. The number of fishermen in the fishery dwindled from 74 participants in 2007 to 54 participants in 2011, although annual trips have been relatively stable over the same time frame (Table 4.1 and Table 4.3a-b). The low number of participants in 2011 may be due to impacts by hurricane Irene in August 2011.

Total trip weight of fish house samples for flounder species were lower in 2007-2011 when compared to annual sampled trip weights for flounder in 1989-2003 where flounder species composed 81-96% of the catch, but were higher than in 2004-2006 (Tables 5.3a-c, Monaghan and Watterson 2001, Burns 2004, Burns and Batsavage 2004). Catch weights of flounder were highest in 1994 to 1996 (1,433-1,453 lb), and declined from 1998 to 2000 (Burns 2004). Since 1989, the mean sampled trip weight of flounder was lowest in 1990 (313 lb) and highest in 1996 (1,453 lb) (Monaghan and Watterson 2001). The mean sampled trip weight for 2007-2011 ranged from 481 lb in 2011 to 704 lb in 2008 (Table 4.4a-e).

SPECIES COMPOSITION

The flounder pound net fishery, although targeting southern flounder (*Paralichthys lethostigma*), caught a wide variety of fishes in 2007- 2011 (Tables 4.4a-e). Southern flounder accounted for 60%-72% landed catches by weight and 34%-70% by number. Except for an increase in 2010, the percentage of total landings composed of southern flounder trended downward in 2007 to 2011, with 2011 being the lowest percentage by number and second lowest by weight. Other commercially important flounder species captured by this gear included Gulf flounder (*P. albigutta*) (0.3-1% by weight and 0.2-1% by number) and summer flounder (*P. dentatus*) (0.2-1% by weight and 0.2-1% by number). Gulf flounder percentage of the landings increased in 2007-2010 (by weight and number) but declined in 2011. A similar pattern was seen in summer flounder, which increased each year in 2007 to 2010, but declined in 2011. Also, a category for paralichthid flounders (i.e. unidentified to species level) composed 5-15% of landings by weight and 3-10% by number in 2007 to 2011. The percentage of landings generally decreased for this category (except in 2010), with the lowest percentage in 2011. Sheepshead (*Archosargus probatocephalus*) and harvestfish (*Peprilus alepidotus)* were unusually abundant in 2009 (13% and 11% of total weight) and the contribution of flounder was only 68% (Table 4.4c). Harvestfish accounted for 8-51% of the landings by number (although only 1.4-10.9% by weight) and generally increased in 2007 to 2011. Sheephead landings ranged from 3.0% to 12.8% by weight and 1.9 to 7.1% by number of the total, generally increasing for 2007-2011. Black drum (*Pogonias cromis*) were 0.8-6% by weight and 0.5-3% by number of landings with no clear trend. Red drum (*Sciaenops ocellatus*) composed 0.5%-1% by weight and 0.1-0.4% by number of landings and showed no clear trend. Striped bass (*Morone saxatilis*) landings were less than 1% of the total except in 2011 (1.4%). Florida pompano (*Trachinotus carolinus*) were less than 1% of landings by weight except in 2008 (3.0%) and ranged from 0.5% to 3% by number in 2007 to 2011. Other species observed were below 1% of landings by weight.

SCRAP FISH

The scrap component of this fishery is negligible and consists mainly of skates and stingrays that were not culled at the fishing net. Very few scrap samples were taken during the sampling period and none are reported in this document.

MANAGEMENT ISSUES

The number of pound nets set for flounder increased dramatically between the late-1980s and mid-1990s. A decline in the summer flounder winter trawl fishery in the mid-1980s and federal restrictions implemented in 1993 resulted in an increased demand and value for flounder (NCDMF 2005). There also was a significant increase in the number of applications for new pound nets submitted to the NCDMF in recent years due to the increased price and demand for live or bled flounder, combined with increased regulations on estuarine gill nets. In the mid-1990s there was a decline in effort and landings in the flounder pound net fishery, coinciding with a dramatic increase in effort in the estuarine gill net fishery. Gill nets became the dominant gear in the southern flounder fishery because of the relative mobility of the gear and the lower overhead costs and labor for this gear compared to the flounder pound net fishery.

The North Carolina Marine Fisheries Commission (NCMFC) approved the North Carolina Southern Flounder Fishery Management Plan (FMP) in February 2005. The FMP implemented management measures to rebuild the stock within 10 years and still allow the commercial and recreational fisheries to occur. The 2004 southern flounder stock assessment determined that the southern flounder stock in North Carolina was overfished and overfishing was occurring. Several management measures were implemented that had an impact on the flounder pound net fishery. These included increasing the minimum size limit for paralichthid flounders in internal waters from 13 inches to 14 inches total length, a commercial seasonal closure in internal waters from December 1 to 31, maintaining the 200-yard limit between gill nets and active pound nets statewide except in the Albemarle Sound, excluding tributaries, during August 15 – November 30 where the minimum distance is 500 yards, requiring the incorporation of escape panels with 14 cm (5½-inch) stretched mesh in all flounder pound nets statewide and continued the rule requiring a minimum distance of 1,000 yards between new and existing flounder pound nets (NCDMF 2005).

Amendment 1 of the Southern Flounder FMP is currently in the final stages for adoption. The stock assessment for southern flounder was updated in 2009 and determined the stock was still overfished and overfishing was occurring up to the terminal year of 2007 (Takade-Heumacher and Batsavage 2009). The preferred management strategy for the recreational fishery was a statewide minimum size limit of 15 inches and a six-fish creel limit, which would result in an overall recreational harvest reduction of 20.2%, based on 2007 recreational landings. Supplement A to the Southern Flounder FMP implemented the 15-inch minimum size limit and six-fish creel limit for the recreational fishery on February 21, 2011. Due to regulations

implemented through NCDMF proclamations in 2010 to reduce sea turtle interactions with fishing gear, substantial reductions in effort for the commercial sector occurred in the 2010 and 2011 fishing seasons. These regulations do not require a reduction in effort or gear modification by the pound net fishery, rather they affect the large mesh gill net fishery only.

The NCMFC formed the Sea Turtle Advisory Committee (STAC) in response to problems with protected species interactions with fisheries in North Carolina (STAC 2006). The STAC was comprised of stakeholders concerned with the bycatch of protected species in the commercial and recreational fisheries. Pound nets (flounder pound nets in particular) were identified as a gear of primary concern due to: known sea turtle interactions, potential sea turtle mortalities associated with this gear, long soak times for the gear and gear left in the water after the season ends (STAC 2006). The most significant management recommendation for pound nets was for the State to apply for a Section 10 Incidental Take Permit through the Endangered Species Act for the pound net fishery. This permit is for activities that are lawful but are expected to incidentally take a federally listed species. The permit holders must develop and implement conservation plans that reduce and minimize impacts of the interactions. The permit also includes reporting requirements as well as other conditions such as tagging, handling guidelines and data analyses (STAC 2006). Flounder pound nets commonly catch live sea turtles and the National Marine Fisheries (NMFS) staff relies on this gear as a primary method to collect sea turtles for tagging studies and biological data (NCDMF 2005). It is unknown if these recommendations will be enacted and how they might affect the flounder pound net fishery.

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Table 4.1. Monthly summary of fish house sampling, mean trip ticket trip weights (lb), and trips in the North Carolina flounder pound net fishery, 2007-2011.

		Fish house sampling					Commercial trip ticket landings		
Year	Month	Number of trips sampled	Mean weight of trips sampled (lb/trip)	Weight range of trips sampled (lb)	Mean sample weight (lb/sample)	Weight range of samples (lb)	Total number of trips	Mean weight of all trips (lb/trip)	Weight range of all trips (lb)
2007	Sep	10	574	48-1,455	155	7-405	121	238	3-1,467
	Oct	35	1,214	20-8,156	214	20-609	537	475	2-8,030
	Nov	30	643	56-2,915	207	56-709	557	435	4-4,956
	Dec	5	125	52-318	88	46-237	107	199	6-2,677
	All	80	852	20-8,156	196	7-709	1,322	416	3-8,030
2008	Sep	30	1,320	94-8,144	317	52-719	109	698	11-2,709
	Oct	45	1,137	152-3,817	267	25-655	628	796	7-9,334
	Nov	27	624	45-3,399	161	13-486	419	322	6-3,563
	Dec						2	*	*
	All	102	1,059	45-8,144	254	13-655	1,158	658	6-9,334
2009	Sep	24	698	70-2,345	138	29-300	208	440	13-2,995
	Oct	29	1,605	60-8,865	252	33-825	594	655	8-13,088
	Nov	16	490	47-1,161	137	25-258	390	385	10-4,933
	Dec	9	379	77-863	125	27-163	88	256	8-2,060
	All	78	956	47-8,865	179	25-825	1,280	523	8-13,088
2010	Sep	3	143	37-200	38	24-61	86	205	14-814
	Oct	28	776	112-2,339	240	101-487	605	563	8-7,044
	Nov	28	1,146	48-6,019	230	18-653	549	487	2-6,019
	Dec						3	*	*
	All	59	935	37-6,019	234	24-653	1,243	518	2-7,044
2011	Sep	7	894	270-2,244	289	149-467	138	610	10-3,697
	Oct	27	981	83-3,511	265	32-759	614	595	15-5,800
	Nov	20	467	36-2,143	164	11-571	417	309	6-3,500
	Dec	2	103	101-106	52	37-67	75	*	16-571
	All	56	766	36-3,511	227	11-759	1,244	471	6-5,800
2007-11	Sep	74	726	37-8,144	188	7-719	662	438	3-3,697
	Oct	164	1,143	20-8,865	247	20-825	2,978	617	2-13,088
	Nov	121	674	36-6,019	180	13-709	2,332	388	2-6,019
	Dec	16	122	52-863	53	27-237	275	91	6-2,677
	All	375	930	20-8,865	218	11-825	6,247	514	2-13,088

Table 4.2. Flounder pound net landings (pounds), number of trips, and number of dealers for landings by trip category for 2007 to 2011 combined. Source: NC Trip Ticket Program

Landings range (lb)	Total landings (lb)	Percent landings	Number of trips	Percent trips	Number of dealers
1-100	100,038	3.1	1,724	27.0	31
101-200	182,587	5.7	1,257	19.7	31
201-300	164,995	5.1	670	10.5	30
301-400	187,138	5.8	536	8.4	28
401-500	160,818	5.0	357	5.6	24
501-600	167,006	5.2	304	4.8	24
601-700	140,056	4.4	215	3.4	23
701-800	139,365	4.3	187	2.9	18
801-900	128,743	4.0	151	2.4	21
901-1,000	121,831	3.8	129	2.0	20
1,001-2,000	818,971	25.5	588	9.2	19
2,001-3,000	374,267	11.7	155	2.4	16
3,001-4,000	200,768	6.3	58	0.9	12
4,001-5000	148,040	4.6	33	0.5	7
5,001-6,000	65,545	2.0	12	0.2	3
6,001-7,000	31,943	1.0	5	0.1	3
7,001-8,000	14,979	0.5	2	<0.1	2
8,001-9,000	41,975	1.3	5	0.1	2
9,001-10,000	9,334	0.3	1	<0.1	1
>10,001	13,088	0.4	1	<0.1	1
Total	3,211,488	100.0	6,390	100.0	

Table 4.3. North Carolina flounder pound net reported commercial landings (pounds) and value (thousand dollars) for selected species, 2007 to 2009, including number of participants, trips, and relative contributions of the species to the fishery.

	2007				2008				2009			
Species	Pounds	% Pounds of fishery	Value ($)	% Value of fishery	Pounds	% Pounds of fishery	Value ($)	% Value of fishery	Pounds	% Pounds of fishery	Value ($)	% Value of fishery
Atlantic croaker	474	0.1	159	<0.1	104	<0.1	29	<0.1	49	<0.1	19	<0.1
Black drum	5,957	1.1	2,028	0.2	69,451	9.1	23,910	1.6	13,212	2.0	5,750	0.5
Bluefish	681	0.1	145	<0.1	965	0.1	311	<0.1	514	0.1	124	<0.1
Butterfish	5,880	1.1	2,985	0.2	9,298	1.2	4,811	0.3	7,282	1.1	3,442	0.3
Florida pompano	7,230	1.3	13,380	1.1	4,716	0.6	13,121	0.9	5,550	0.8	13,266	1.1
Flounders	462,899	84.1	1,192,851	94.2	597,772	78.5	1,352,492	92.9	517,046	77.2	1,029,254	88.1
Harvestfish	10,618	1.9	11,677	0.9	7,991	1.0	8,101	0.6	43,565	6.5	53,116	4.5
Red drum	6,929	1.3	10,080	0.8	6,863	0.9	10,410	0.7	6,668	1.0	10,667	0.9
Spanish mackerel	32	<0.1	44	0.0	168	<0.1	165	<0.1	243	<0.1	197	<0.1
Spot	2,123	0.4	1,485	0.1	164	<0.1	101	<0.1	1,469	0.2	882	0.1
Spotted seatrout	633	0.1	829	0.1	798	0.1	1,075	0.1	627	0.1	1,021	0.1
Striped bass	8,148	1.5	15,641	1.2	6,671	0.9	13,514	0.9	5,890	0.9	12,068	1.0
Weakfish	902	0.2	699	0.1	573	0.1	510	<0.1	305	<0.1	304	<0.1
All others	37,666	6.8	13,952	1.1	55,897	7.3	27,758	1.9	67,315	10.1	37,847	3.2
Total pounds	550,171	100.0	1,265,955	100.0	761,432	100.0	1,456,308	100.0	669,735	100.0	1,167,957	100.0
Total participants		74				69				69		
Total trips		1,322				1,158				1,280		

Table 4.3. (continued) .

Species	2010 Pounds	2010 % Pounds of fishery	2010 Value ($)	2010 % Value of fishery	2011 Pounds	2011 % Pounds of fishery	2011 Value ($)	2011 % Value of fishery	2007-2011 Mean Pounds	2007-2011 Mean % Pounds of fishery	2007-2011 Mean Value ($)	2007-2011 Mean % Value of fishery
Atlantic croaker	118	<0.1	72	<0.1	103	<0.1	61	<0.1	170	<0.1	68	<0.1
Black drum	9,951	1.5	4,684	0.4	8,090	1.4	3,806	0.3	21,332	3.3	8,035	0.6
Bluefish	885	0.1	340	<0.1	858	0.1	339	<0.1	781	0.1	252	<0.1
Butterfish	1,816	0.3	936	0.1	10,428	1.8	5,389	0.5	6,941	1.1	3,513	0.3
Florida pompano	3,836	0.6	8,221	0.6	4,540	0.8	10,002	0.9	5,174	0.8	11,598	0.9
Flounders	540,857	83.9	1,216,117	92.7	441,273	75.3	1,013,057	89.0	511,969	79.7	1,160,754	91.6
Harvestfish	16,747	2.6	16,046	1.2	17,303	3.0	16,799	1.5	19,245	3.0	21,148	1.7
Red drum	6,560	1.0	11,852	0.9	5,439	0.9	9,819	0.9	6,492	1.0	10,566	0.8
Spanish mackerel	19	<0.1	23	<0.1	58	<0.1	62	<0.1	104	<0.1	98	<0.1
Spot	755	0.1	589	<0.1	12,663	2.2	8,998	0.8	3,435	0.5	2,411	0.2
Spotted seatrout	578	0.1	837	0.1	463	0.1	948	0.1	620	0.1	942	0.1
Striped bass	5,406	0.8	13,566	1.0	8,200	1.4	20,964	1.8	6,863	1.1	15,151	1.2
Weakfish	228	<0.1	245	<0.1	209	<0.1	244	<0.1	443	0.1	400	<0.1
All others	56,544	8.8	37,732	2.9	76,228	13.0	47,440	4.2	58,730	9.1	32,946	2.6
Total pounds	644,299	100.0	1,311,260	100.0	585,854	100.0	1,137,927	100.0	642,299	100.0	1,267,882	100.0
Total participants		66				54				66		
Total trips		1,243				1,244				1,249		

Table 4.4a. Annual overall species composition from fish house samples, mean weight (lb) and number per trip, mean weight (lb) per fish, and annual percent occurrence across all samples collected from North Carolina flounder pound nets (N=80) September through December 2007.

	Weight (lb)		Number		Mean fish	Frequency of
Species	Mean	Percent	Mean	Percent	weight (lb)	occurrence (%)
Southern flounder	612.8	71.9	308	55.6	2.0	100.0
Paralichthid flounders	124.4	14.6	52	9.4	2.4	41.3
Harvestfish	32.4	3.8	148	26.7	0.2	48.8
Sheepshead	25.4	3.0	10	1.9	2.4	47.5
Red drum	10.8	1.3	2	0.4	5.0	38.8
Florida pompano	7.7	0.9	7	1.3	1.1	32.5
Striped bass	7.5	0.9	2	0.3	4.0	16.2
Black drum	6.6	0.8	3	0.6	2.0	52.5
Atlantic spadefish	5.5	0.7	9	1.7	0.6	18.8
White catfish	3.7	0.5	2	0.3	2.5	5.0
Gulf flounder	3.3	0.4	2	0.4	1.3	31.3
Horseshoe crab	2.9	0.3	1	0.2	3.0	13.8
Striped mullet	1.8	0.2	1	0.2	1.8	15.0
Bluefish	1.5	0.2	1	0.1	2.2	17.5
Summer flounder	1.5	0.2	1	0.2	1.6	25.0
Catfishes	1.3	0.1	0	0.1	2.7	6.3
Spotted sea trout	0.9	0.1	0	0.0	3.3	10.0
Butterfish	0.4	0.1	2	0.3	0.3	13.8

Observed Species*		
Atlantic tripletail	White perch	Butterfly ray
Great barracuda	Spot	Lookdown
Atlantic croaker	Crevalle jack	Windowpane flounder
Weakfish	Atlantic cutlassfish	Smooth puffer
Spanish mackerel	Permit	Striped burrfish
Kingfishes	Pigfish	
Northern puffer	Pinfish	

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 4.4b. Annual overall species composition from fish house samples. Mean weight (lb) and number per trip, mean weight (lb) per fish, and annual percent occurrence across all samples collected from North Carolina flounder pound nets (N=102) September through November 2008.

	Weight (lb)		Number		Mean fish	Frequency of
Species	Mean	Percent	Mean	Percent	weight (lb)	occurrence (%)
Southern flounder	704.3	66.5	384	50.4	1.8	98.0
Paralichthid flounders	125.7	11.9	52	6.9	2.4	34.3
Black drum	60.2	5.7	25	3.3	2.4	83.3
Harvestfish	48.5	4.6	229	30.1	2.1	52.0
Sheepshead	42.8	4.0	21	2.7	2.1	70.6
Florida pompano	32.0	3.0	21	2.8	1.5	51.0
Gulf flounder	7.9	0.8	6	0.8	1.4	55.9
White catfish	6.8	0.6	3	0.3	2.6	2.9
Red drum	5.7	0.5	1	0.1	6.5	43.1
Atlantic spadefish	5.3	0.5	8	1.0	0.7	17.6
Summer flounder	5.1	0.5	3	0.4	1.6	46.1
Striped bass	4.6	0.4	1	0.2	3.7	12.7
Butterfish	1.3	0.1	4	0.6	0.3	9.8
Channel catfish	1.1	0.1	0	0.1	2.4	1.0
Bluefish	1.1	0.1	0	0.0	2.9	15.7
Striped mullet	0.9	0.1	0	0.0	2.7	12.7
Atlantic tripletail	0.9	0.1	0	0.0	12.8	3.9
Horseshoe crab	0.9	0.1	0	0.0	3.0	4.9
Unclassified fishes	0.7	0.1	-	-	-	2.0
Catfishes	0.7	0.1	0	0.0	2.8	5.9
Lookdown	0.7	0.1	0	0.0	1.8	13.7

Observed Species*

Spotted sea trout	Weakfish	Windowpane flounder
Cobia	Gray triggerfish	Smooth dogfish
Northern puffer	Atlantic croaker	Southern stingray
Spanish mackerel	Jacks	Smooth butterfly ray
Mullets	Blue runner	Atlantic menhaden
African pompano	Permit	Orange filefish
Crevalle jack	Pigfish	Striped burrfish
White perch	Spot	

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 4.4c. Annual overall species composition from fish house samples. Mean weight (lb) and number per trip, mean weight (lb) per fish, and annual percent occurrence across all samples collected from North Carolina flounder pound nets (N=78) September through November 2009.

	Weight (lb)		Number		Mean fish	Frequency of
Species	Mean	Percent	Mean	Percent	weight (lb)	occurrence (%)
Southern flounder	575.1	60.1	279	36.1	2.1	98.7
Sheepshead	122.8	12.8	55	7.1	2.2	48.7
Harvestfish	104.3	10.9	355	46.0	0.3	48.7
Paralichthid flounders	67.9	7.1	31	4.1	2.2	38.5
Black drum	21.8	2.3	4	0.5	5.9	52.6
Summer flounder	9.3	1.0	6	0.8	1.5	42.3
Florida pompano	9.0	0.9	11	1.4	0.9	42.3
White catfish	8.8	0.9	3	0.4	2.8	5.1
Gulf flounder	7.9	0.8	6	0.8	1.4	46.2
Atlantic spadefish	7.9	0.8	13	1.7	0.6	19.2
Striped bass	6.6	0.7	2	0.2	3.6	15.4
Red drum	6.0	0.6	1	0.1	5.3	37.2
Atlantic tripletail	2.4	0.3	0	0.0	11.1	12.8
Catfishes	2.0	0.2	1	0.1	2.7	9.0
Butterfish	1.3	0.1	4	0.5	0.3	10.3
Bluefish	0.7	0.1	0	0.0	2.7	12.8

Observed Species*		
Spotted sea trout	Atlantic croaker	African pompano
Northern puffer	Longfin squid	Southern stingray
Gray triggerfish	Striped mullet	Smooth butterfly ray
Common carp	Pigfish	Cownose ray
Mullets	Atlantic cutlassfish	Lookdown
Spanish mackerel	Kingfishes	Atlantic moonfish
Weakfish	Permit	Striped burrfish

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 4.4d. Annual overall species composition from fish house samples. Mean weight (lb) and number per trip, mean weight (lb) per fish, and annual percent occurrence across all samples collected from North Carolina flounder pound nets (N=59) September through November 2010.

	Weight (lb)		Number		Mean fish	Frequency of
Species	Mean	Percent	Mean	Percent	weight (lb)	occurrence (%)
Southern flounder	650.3	70.7	324	69.6	2.0	96.6
Paralichthid flounders	112.7	12.2	47	10.1	2.4	18.6
Sheepshead	75.0	8.2	23	5.1	3.2	69.5
Black drum	13.0	1.4	4	0.8	3.6	64.4
Harvestfish	12.8	1.4	36	7.7	0.4	27.1
Gulf flounder	11.0	1.2	7	1.4	1.7	50.8
Summer flounder	10.6	1.2	6	1.4	1.7	42.4
Red drum	9.0	1.0	1	0.3	6.4	42.4
Striped bass	8.6	0.9	2	0.5	3.6	18.6
Catfishes	7.3	0.8	3	0.6	2.7	8.5
Atlantic spadefish	2.6	0.3	5	1.1	0.5	10.2
Northern puffer	1.8	0.2	2	0.4	1.0	18.6
Florida pompano	1.5	0.2	2	0.5	0.7	25.4
Lookdown	0.7	0.1	-	-	-	5.1
White catfish	0.4	0.1	0	0.0	2.9	5.1
Bluefish	0.4	0.1	0	0.1	1.4	10.2

Observed Species*

Horseshoe crab	Striped mullet	Gray triggerfish
Butterfish	Atlantic croaker	Permit
Atlantic tripletail	Weakfish	Hickory shad
Mullets	Spotted sea trout	

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

Table 4.4e. Annual overall species composition from fish house samples. Mean weight (lb) and number per trip, mean weight (lb) per fish, and annual percent occurrence across all samples collected from North Carolina flounder pound nets (N=56) September through November 2011.

	Weight (lb)		Number		Mean fish	Frequency of
Species	Mean	Percent	Mean	Percent	weight (lb)	occurrence (%)
Southern flounder	480.7	63.6	212	34.4	2.3	87.5
Sheepshead	76.5	10.1	18	2.9	4.3	69.6
Harvestfish	61.1	8.1	313	50.8	0.2	46.4
White catfish	38.1	5.1	12	2.0	3.1	10.7
Paralichthid flounders	38.1	4.5	16	2.6	2.1	30.4
Black drum	34.0	2.1	7	1.1	2.4	58.9
Striped bass	15.7	1.4	3	0.5	3.5	21.4
Summer flounder	10.8	1.1	5	0.8	1.6	55.4
Striped mullet	8.2	0.7	2	0.4	2.4	21.4
Red drum	5.3	0.6	1	0.1	5.7	28.6
Atlantic spadefish	4.9	0.5	6	1.0	0.7	16.1
Ictalurus catfishes	4.2	0.5	1	0.2	2.8	7.1
Butterfish	4.2	0.4	11	1.9	0.3	17.9
Florida pompano	3.3	0.3	4	0.6	0.7	32.1
Gulf flounder	2.4	0.3	1	0.2	1.6	21.4
Bluefish	2.4	0.2	0	0.0	5.1	19.6
Atlantic tripletail	0.9	0.1	0	0.0	7.7	7.1
White perch	0.4	0.1	1	0.1	0.6	7.1
Spotted sea trout	0.4	0.0	0	0.0	3.5	12.5

Observed Species*		
Northern puffer	Lookdown	Striped burrfish
Weakfish	Kingfishes	
Permit	Spot	
Atlantic croaker	Stargazers	
Spanish mackerel	Windowpane flounder	

* Observed species are those species that contributed less than 0.1%, by weight, of the sampled catch.

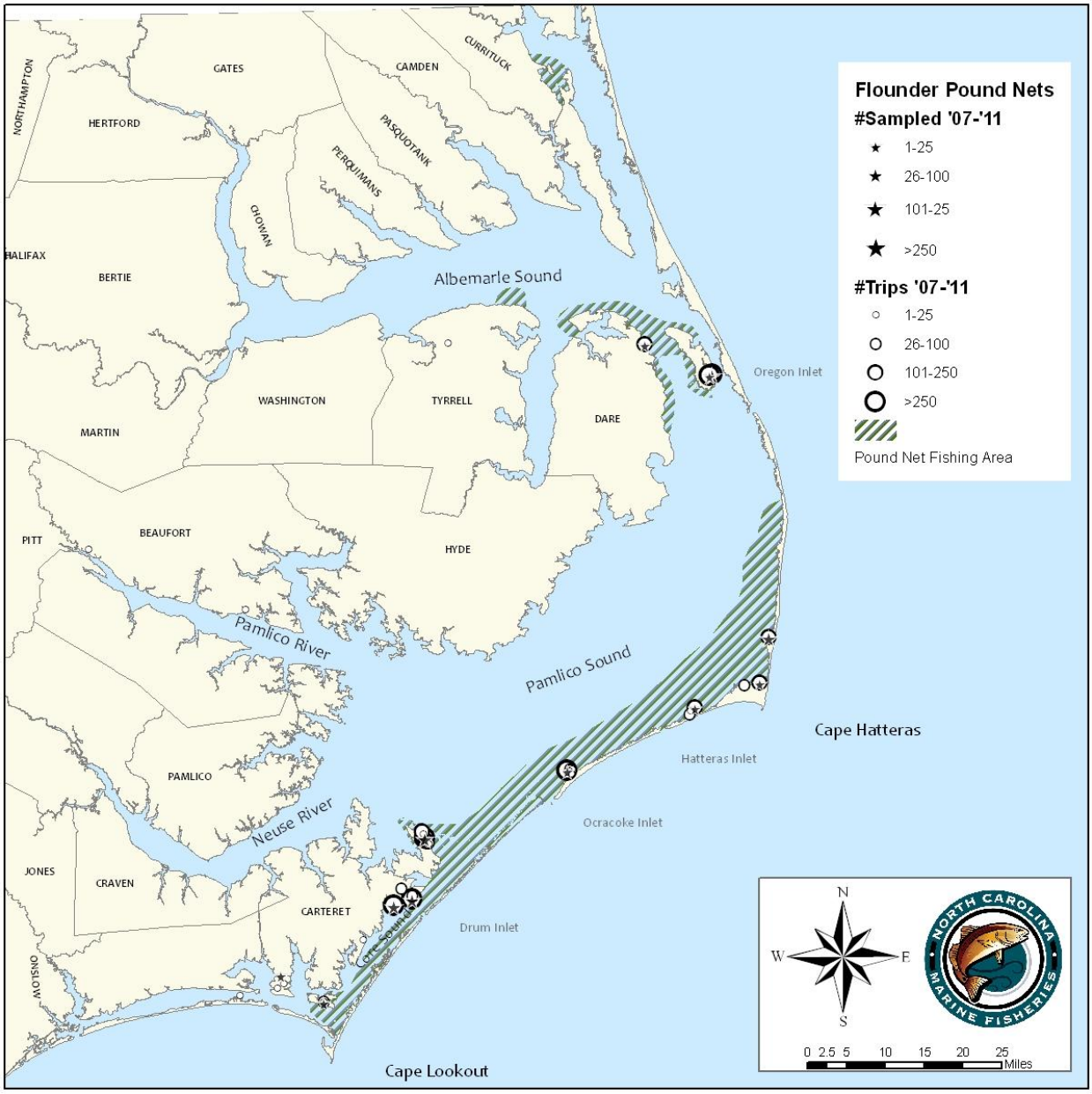

Figure 4.1. Fishing grounds (shaded areas) and fish house locations showing number of biological samples collected and total number of trips taken in North Carolina's flounder pound net fishery from 2007 to 2011.

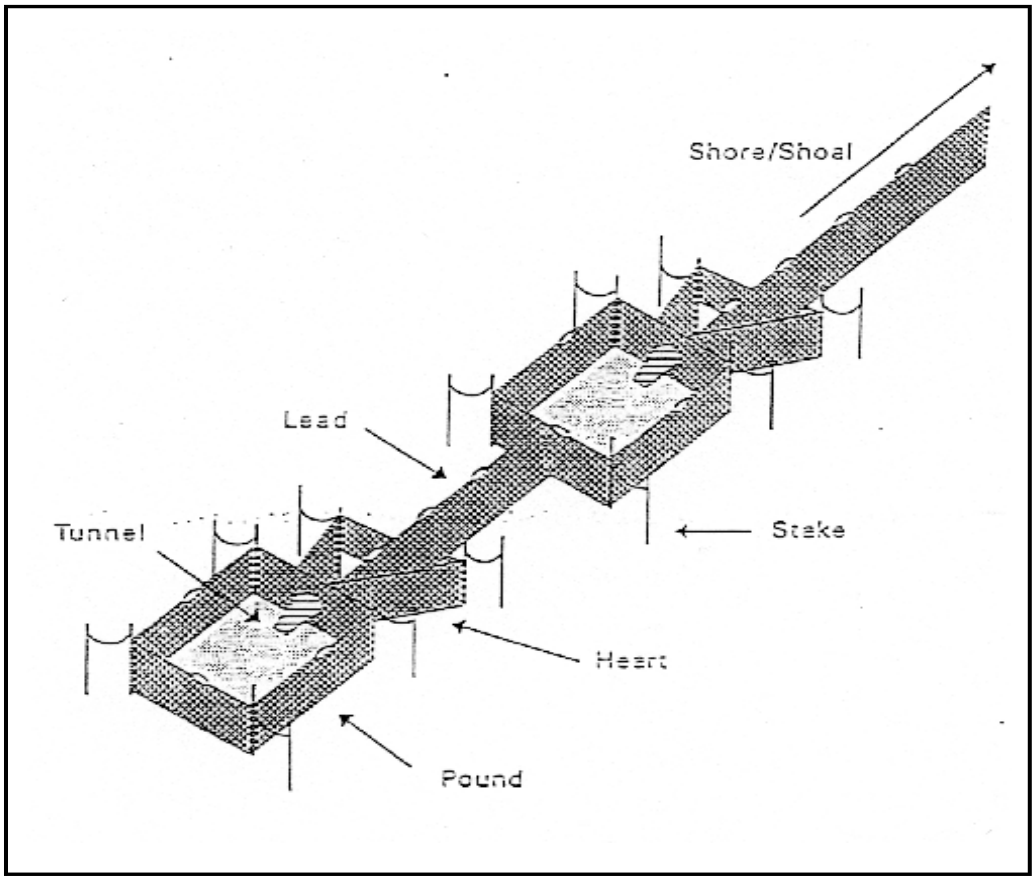

Figure 4.2 Characteristics of a generalized flounder pound net.

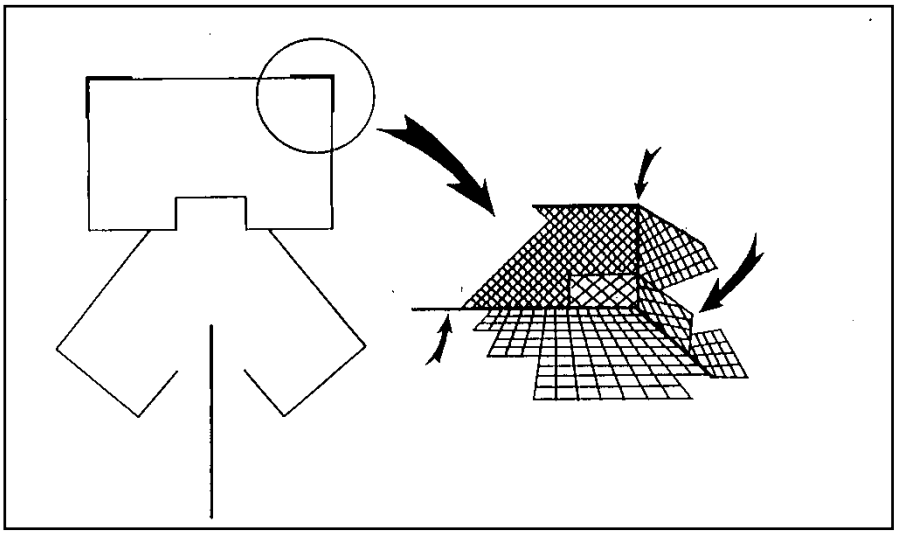

Figure 4.3. Location of escape panels in flounder pound nets.

ASSESSMENT OF NORTH CAROLINA COMMERCIAL FINFISHERIES

Final Performance Report for Award Number NA07NMF4070047

November 2012
FISHERY SECTION 5

ESTUARINE GILL NET FISHERY ASSESSMENT

Job 5

by

Jason Rock

ABSTRACT

The estuarine gill net fishery in North Carolina is a year round multi-species fishery where the netting used and species targeted vary by area and season. Estuarine gill nets are one of the dominant gear types in the state based on the amount of gear used and the number of people involved. Commercial fish house sampling has increased 30% this period from levels seen during the 2004-2006 reporting period (based on average number of samples annually). Unlike most commercial gears, large quantities of gill nets are frequently used by part-time commercial and recreational fishermen. Estuarine gill nets were the most widely used commercial finfish gear during the reporting period (2007 – 2011), comprising 21.7% of the total trips reported. Three primary types of gill nets are used: set, runaround, and drift gill nets. Set nets are the largest component of the fishery and are typically divided into large (≥ 5 inches stretch mesh) and small (< 5 inches stretch mesh) mesh. Estuarine gill nets contributed 8.2 – 9.4% by weight of the edible finfish landings in North Carolina from 2007 – 2011. Southern flounder (*Paralichthys lethostigma*) were the top finfish species landed by weight and was most prevalent in large mesh set gill nets. Southern flounder accounted for 11.5 – 28.9% of the total estuarine gill net landings in the state. Striped mullet (*Mugil cephalus*) was the second highest species landed by weight and most prevalent in runaround gill nets. Striped mullet accounted for 23.1 – 28.0% of the total estuarine gill net landings in the state. Other common species in estuarine gill net catches included: American shad (*Alosa sapidissima*), bluefish (*Pomatomus saltatrix*), Atlantic menhaden (*Brevoortia tyrannus*), spot (*Leiostomus xanthurus*), striped bass (*Morone saxatilis*), spotted seatrout (*Cynoscion nebulosus*), Spanish mackerel (*Scomberomorus maculatus*), and red drum (*Sciaenops ocellatus*). The incidental capture of non-targeted finfish, protected species, and undersized market species continues to be both a biological and economical concern in this fishery.

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INTRODUCTION

The estuarine gill net fishery in North Carolina is a year round multi-species fishery where the netting used and species targeted varies by area and season. Species commonly targeted by the estuarine gill net fishery include: southern flounder (*Paralichthys lethostigma*), striped mullet (*Mugil cephalus*), American shad (*Alosa sapidissima*), bluefish (*Pomatomus saltatrix*), Atlantic menhaden (*Brevoortia tyrannus*), spot (*Leiostomus xanthurus*), striped bass (*Morone saxatilis*), spotted seatrout (*Cynoscion nebulosus*), Spanish mackerel (*Scomberomorus maculatus*), and red drum (*Sciaenops ocellatus*) .

Unlike most other commercial finfish gears, gill nets are frequently used in North Carolina for part-time commercial and recreational purposes. The ubiquity of the gear makes it difficult to estimate the quantity used and the number of fishermen involved at any given time. Effort (in trips) for the commercial sector is available through a mandatory trip ticket reporting program implemented in 1994. Estuarine gill nets are the most widely used commercial finfish gear reported by the trip ticket program, comprising 21.7% of all the trips reported from 2007 - 2011. Estuarine gill net landings contributed 17.7 – 21.1% by weight of all edible finfish species landed by all gear types in North Carolina from 2007 to 2011.

Three primary types of gill nets exist in the North Carolina estuarine gill net fishery: set, runaround, and drift gill nets. Set nets are deployed and left from a few hours to a few days depending on water temperature and season (current regulations limit set times to a maximum of 12 hours in most areas with some areas still allowing 24 hour soak times). Set nets can be further divided into float and sink categories, depending on how they fish within the water column. Float nets fish the entire height of the water column, while sink nets fish a fixed distance off the bottom and do not extend into the upper portion of the water column if the water is deeper than the height of the net. Tie-downs and nets without floats are also implemented in some areas of the state to reduce the height of the net in the water column in order to avoid non-target species. Runaround gill nets, also referred to as drop or strike nets, are fished in one or two ways. In the first method, the net is attached to a point on shore and deployed parallel with the terminal end finishing at another point along the shore to block a section of the shoreline. The boat is driven into the blocked section and the fish are driven into the deeper water and caught in the net. The net is retrieved after several passes are made within the blocked area. In the second method, the net is set to encircle or wrap up a school of fish. Runaround nets are primarily used in the fall for the striped mullet fishery. Drift nets are similar to set nets but do not have enough weight attached to the lead line to remain stationary. The nets are allowed to drift with the current. Drift nets are primarily used for American shad and river herring [blueback herring (*A. aestivalis*) and alewife (*A. pseudoharengus*)] during spawning runs.

An in depth characterization of the estuarine gill net fishery was undertaken in the 2008 red drum fishery management plan (FMP) amendment I (Paramore 2007). As part of an analysis for estimating gill net discards 16 target fisheries were defined and described by number of trips,

range of mesh sizes used, yards fished, soak times and depth fished. Trip ticket data collected from 2001 to 2006 were analyzed to determine the target species for each individual trip made. The species of highest abundance in landings (95% of cases) was considered the target species and was used to define the trip. After all analysis, 99% of all gill net trips fell into one of sixteen key species. Species with similar gear parameters for mesh size were grouped together into large (≥ 5 inch stretch mesh; ISM) or small mesh (<5 ISM) gill net fisheries. Flounders, striped bass, red drum, American shad, hickory shad (*A. mediocris*), and catfishes (Ictaluridae species) were defined as large mesh fisheries. Ten other species were defined as small mesh fisheries including spot, striped mullet, spotted seatrout, bluefish, weakfish *(C. regalis*), Atlantic menhaden, Spanish mackerel, white perch (*Morone americana*), river herring, and sea mullet (*Menticirrhus* spp.).

The North Carolina Division of Marine Fisheries (NCDMF) initiated a statewide program to sample the dominant commercial finfish fisheries in 1982. The objective was to obtain biological and fisheries data on the economically important fishes to assist in management decisions. The objectives of this report are to present the species composition, relative abundance, distribution, and seasonality of estuarine gill net catches from 2007 – 2011. A summary of sampled estuarine gill net catches is presented for January 2007 to June 2012. Catch-per-unit-effort (CPUE) and landings data are also presented with species and fishery specific data from the NCDMF trip ticket database for 2007 – 2011.

METHODS AND MATERIALS

Sampling of the estuarine gill net fishery was initiated by the NCDMF in April 1991 to determine relative abundance, age, size, and composition of species taken in the Pamlico Sound area. Two modes of sampling were included in the project: at-sea sampling and fish house sampling as catches are unloaded to the seafood dealer. Most sampling was conducted at the fish house after fishermen landed and graded their catch. In 1994, at-sea and fish house sampling of estuarine gill nets was expanded to include all other areas within North Carolina.

For estuarine gill net samples the following trip information was collected: general location or waterbody, total length of nets (feet), soak time (minutes), specific net type (i.e. float, sink, etc.), mesh size (bar mesh, inches), net depth (float nets, recorded in feet), vertical fishing depth (sink nets, recorded in feet), twine size, average water depth (meters), and incidental species. For on the water samples, fish were categorized into market and discard groups (based on size limits and marketability). Each category (market or discard) was separated into species groups. Commercially important species from each category were counted, measured to the nearest mm (FL or TL), and weighed by species aggregates to the nearest 0.1 kg. Counts and total weights (kg) by species were obtained for the non-marketable species within the discard portion. Weights were estimated for discarded fish that were shaken free from the net during the gear retrieval process.

At the fish house random samples of the graded catch (cartons from each market category) were taken. All fish in the sample were identified and measured to the nearest mm (FL or TL). Total weight of the sample and the species component weights were recorded. Total weight of the species component from the sampled catch was obtained directly from the fishermen or the trip ticket. Estimates (number and weight) of the discard component were obtained from the fishermen.

Estuarine gill net catches were analyzed by location and mesh class. Area designations include the Albemarle area, Pamlico area, Rivers area, Central area, and the Southern area (Figure 5.1). The Albemarle area included all inside waters designated as the Albemarle Sound Management Area (ASMA) from the Virginia-North Carolina line, including Currituck Sound, the Albemarle Sound and all tributaries, Croatan Sound, and Roanoke Sound to the south end of Roanoke Marshes. The Pamlico area included all waters in Pamlico Sound south of the Roanoke Marshes running south to the northern boundary of Core Sound. The Rivers area included the Bay, Neuse, Pamlico, and Pungo Rivers. The Central area included all of Core Sound and south through Bogue Sound, the North, Newport, and White Oak Rivers. The Southern area included all inside waters south and west of the mouth of the White Oak River including the New, Lockwood Folly, and Shallotte Rivers, Topsail Sound, and the Cape Fear River, to the North Carolina-South Carolina line.

Landings were obtained from the NCDMF trip ticket database and categorized as large or small mesh using NCDMF fish house and commercial observer data. The fish house and observer data contained detailed trip level information on gear parameters (mesh size(s) used, yards fished, soak time, etc...), species composition, and species proportions. Data were used to characterize each species as a large mesh or small mesh species based on the mean mesh size of all the sampled trips each occurred. From this, each trip ticket was classified as either a large or small mesh trip based on the top finfish species landed by weight. This procedure builds upon that performed by Paramore 2007. Mesh sizes were divided into large ($\geq$ 5 ISM) and small (< 5 ISM). All commercial estuarine gill net trips were classified as either large or small mesh trips using the criteria described above.

RESULTS AND SPECIES TRENDS

Estuarine gill nets are the dominant finfish gear type used in the state based on the amount of gear utilized and number of people involved. A total of 165,197 estuarine gill net trips took place from 2007 – 2011. A total of 36.9% of all trips occurred in the Albemarle area, 25.0% in the Pamlico area, 14.7% in the Rivers area, 13.6% in the Central area, and 9.8% in the Southern area. Large mesh gill net landings and effort decreased sharply in the Albemarle area with all other areas showing slight overall decreases. Small mesh gill net landings remained steady while effort has generally decreased in the Albemarle area. In the Pamlico area, small mesh landings have increased sharply while effort has remained relatively steady. Small mesh landings and effort decreased in the Rivers area, while remaining stable in the Central and

Southern areas. Approximately 59.4% of all gill net trips landed less than 500 lb and 90.1% of all trips landed less than 2,000 lb from 2007 – 2011 (Table 5.1).

BIOLOGICAL SAMPLING

A total of 4,672 estuarine gill net catches were sampled during this reporting period (Table 5.2a). Samples from the Albemarle area (n=656) comprised 14.0% of the samples collected, the Pamlico area (n=1,595) comprised 34.1% of the samples, the Rivers area (n=1,155) comprised 24.7% of the samples, the Central area (n=922) comprised 19.7% of the samples, and the Southern area (n=344) comprised 7.4% of the samples. Estuarine gill net trips were the highest during the months of March, April, August, September, and October (Table 5.2a).

Biological sampling coverage for all estuarine gill net trips statewide was 2.8% from 2007 – 2011. Overall, coverage increased throughout the sampling period: 2007=2.4%, 2008=2.8%, 2009=2.6%, 2010=2.9%, 2011=3.6%. This increase in sampling coverage was due to a decrease in trips which averaged 36,419 trips/year from 2007 – 2009, and then decreased to 30,308 trips in 2010 and 25,632 trips in 2011 (Table 5.2a). This represents a 29.6% decrease in estuarine gill net trips from the 2007 – 2009 average to 2011. For the January – June 2012 period, 390 gill net trips were sampled (Table 5.2b). Data for 2012 are excluded from all analyses because they are preliminary and typically data are analyzed as a calendar year for stock assessments.

Albemarle Sound Area

Annual biological sampling coverage in the Albemarle area was 1.1% from 2007 – 2011 for large and small mesh combined (Table 5.2a). A total of 484 large mesh trips were sampled and the average catch of large mesh trips during this period was 134 lb/trip, with the average trip fishing 1,367 yards of gill net and an average soak time of 26 hours. The highest landings and effort for large mesh gill nets in the Albemarle area occurred during March, April, September, October, and November (Table 5.2a).

From 2007 – 2011, 172 small mesh gill net trips were sampled in the Albemarle area. The average catch of small mesh trips during this period was 272 lb/trip, with the average trip fishing 685 yards of gill net and an average soak time of 19 hours (Table 5.2a). The highest landings and effort for small mesh gill nets in the Albemarle area occurred during January, February, March, April, and October (Table 5.2a).

Pamlico Sound Area

Annual biological sampling coverage in the Pamlico area was 3.9% from 2007 – 2011. During this period 932 large mesh gill net trips were sampled. The average catch of large mesh trips during this period was 106 lb/trip, with the average trip fishing 1,611 yards of gill net and an

average soak time of 22 hours. Landings and effort were highest in September and October (Table 5.2a).

From 2007 – 2011, 663 small mesh gill net trips were sampled in the Pamlico area. The average catch of small mesh trips during this period was 338 lb/trip, with the average trip fishing 1,099 yards of gill net and an average soak time of 14 hours. The highest landings and effort for small mesh gill nets in the Pamlico area occurred during April and August (Table 5.2a).

Rivers Area

Annual biological sampling coverage in the Rivers area was 4.7% from 2007 – 2011. During this period, 659 large mesh gill net trips were sampled. The average catch of large mesh trips during this period was 88 lb/trip, with the average trip fishing 1,044 yards of gill net and an average soak time of 20 hours. Landings and effort were highest in March, September, and October (Table 5.2a).

From 2007 – 2011, 496 small mesh gill net trips were sampled in the Rivers area. The average catch of small mesh trips during this period was 296 lb/trip, with the average trip fishing 662 yards of gill net and an average soak time of 6 hours. The highest landings and effort for small mesh gill nets in the Rivers area occurred during October and November (Table 5.2a).

Central Area

Annual biological sampling coverage in the Central area was 4.1% from 2007 – 2011. During this period, 672 large mesh gill net trips were sampled. The average catch of large mesh trips during this period was 86 lb/trip, with the average trip fishing 2,036 yards of gill net and an average soak time of 19 hours. Landings and effort were highest from May – October (Table 5.2a).

From 2007 – 2011, 250 small mesh gill net trips were sampled in the Central area. The average catch of small mesh trips during this period was 400 lb/trip, with the average trip fishing 510 yards of gill net and an average soak time of 7 hours. The highest landings and effort for small mesh gill nets in the Central area occurred during October and November (Table 5.2a).

Southern Area

Annual biological sampling coverage in the Southern area was 2.1% from 2007 – 2011. During this period, 195 large mesh gill net trips were sampled. The average catch of large mesh trips during this period was 68 lb/trip, with the average trip fishing 1,020 yards of gill net and an average soak time of 19 hours. Landings and effort were highest from September and October (Table 5.2a).

From 2007 – 2011, 149 small mesh gill net trips were sampled in the Southern area. The average catch of small mesh trips during this period was 216 lb/trip, with the average trip fishing

331 yards of gill net and an average soak time of 3 hours. The highest landings and effort for small mesh gill nets in the Southern area occurred during October and November (Table 5.2a).

COMMERCIAL LANDINGS

The overall CPUE for the report period from sampled trips (all areas combined) was 252 lb/trip, while the trip ticket overall CPUE was 183 lb/trip from 2007 – 2011. The average amount of gill net fished was 1,263 yards/trip with an average soak time of 17 hr/trip (Table 5.2a).

Based on trip ticket data, the dominant species in the estuarine gill net landings from 2007 – 2011 were, in order of highest landings: striped mullet (40.6%), southern flounder (14.7%), bluefish (9.0%), Spanish mackerel (6.0%), spotted seatrout (4.2%), American shad (3.6%), Atlantic menhaden (2.9%), spot (2.3%), red drum (2.2%), hickory shad (1.6%), black drum (*Pogonias cromis*; 1.4%), and striped bass (1.2%).

Atlantic croaker represented 0.5 – 2.7% of annual estuarine gill net landings from 2007 – 2011 (Table 5.3). Atlantic croaker ranked sixteenth in overall estuarine gill net landings. There was a 42.3% decrease in 2011 landings from the 10-year average (2002 – 2011). Atlantic croaker was primarily captured in small mesh gill nets and composed a greater proportion of the catch and had the highest landings in the Pamlico area.

Atlantic menhaden (bait) contributed 4.5 – 6.6% of annual estuarine gill net landings from 2007 – 2011 (Table 5.3). Atlantic menhaden, primarily marketed as bait, ranked fourth in overall estuarine gill net landings. There was a 41.2% decrease in landings for 2011 compared to the 10-year average. Atlantic menhaden composed a greater proportion of the catch in the Pamlico area but landings were highest in the Albemarle area.

Black drum accounted for 0.6 – 3.4% of annual estuarine gill net landings from 2007 – 2011 (Table 5.3). Black drum ranked thirteenth in overall estuarine gill net landings. There was a 60.5% decrease in landings for 2011 compared to the 10-year average. Black drum composed a greater proportion of the catch in the Southern area but landings were highest in the Pamlico area.

Bluefish accounted for 5.2 – 13.4% of annual estuarine gill net landings from 2007 – 2011 (Table 5.3). Bluefish ranked third in overall estuarine gill net landings. There was an 80.4% increase in landings for 2011 compared to the 10-year average. Bluefish composed a greater proportion of the catch and had the highest landings in the Pamlico area.

Flounder (*Paralichthys* spp.) contributed 11.5 – 28.9% of annual estuarine gill net landings (Table 5.3). Flounders ranked second in overall estuarine gill net landings. There was a 54.1% decrease in flounder landings in 2011 compared to the 10-year average. Flounder composed a greater proportion of the catch and landings were highest in the Albemarle area. Flounder were

primarily captured in large mesh nets and comprised 21.3% of all estuarine gill net landings from 2007 – 2011.

Kingfishes (*Menticirrhus* spp.) accounted for 0.9 – 2.5% of annual estuarine gill net landings (Table 5.3). Kingfishes ranked fourteenth in overall estuarine gill net landings. There was a 79.2% increase in kingfish landings in 2011 compared to the 10-year average. Kingfishes composed a greater proportion of the catch in the Southern area but landings were highest in the Pamlico area.

Red drum contributed 1.4 – 4.0% of annual estuarine gill net landings (Table 5.3). Red drum ranked eleventh in overall estuarine gill net landings. There was a 41.6% decrease in red drum landings in 2011 compared to the 10-year average. Red drum composed a greater proportion of the catch in the Central area but landings were highest in the Albemarle area.

Shad (American and hickory combined) contributed 1.9 – 5.2% of annual estuarine gill net landings (Table 5.3). Shad ranked eighth in overall estuarine gill net landings. There was an 11.0% decrease in shad landings in 2011 compared to the 10-year average. Shad composed a greater proportion of the catch and had the highest landings in the Albemarle area.

Spanish mackerel accounted for 1.0 – 9.8% of annual estuarine gill net landings (Table 5.3). Spanish mackerel ranked fifth in overall estuarine gill net landings. There was a 135.3% increase in Spanish mackerel landings in 2011 compared to the 10-year average. Spanish mackerel composed a greater proportion of the catch and landings were highest in the Pamlico area.

Spot contributed 2.5 – 7.5% of annual estuarine gill net landings (Table 5.3). Spot ranked sixth in overall estuarine gill net landings. There was a 9.2% decrease in spot landings in 2011 compared to the 10-year average. Spot composed a greater proportion of the catch and had the highest landings in the Southern area.

Spotted seatrout contributed 1.0 – 5.0% of annual estuarine gill net landings (Table 5.3). Spotted seatrout ranked tenth in overall estuarine gill net landings. There was a 65.0% decrease in spotted seatrout landings in 2011 compared to the 10-year average. Spotted seatrout composed a greater proportion of the catch and had the highest landings in the Rivers area.

Striped bass contributed 1.1 – 3.2% of annual estuarine gill net landings (Table 5.3). Striped bass ranked twelfth in overall estuarine gill net landings. There was a 24.9% decrease in striped bass landings in 2011 compared to the 10-year average. Striped bass composed a greater proportion of the catch and had the highest landings in the Albemarle area.

Striped mullet contributed 22.7 – 28.0% of annual estuarine gill net landings (Table 5.3). Striped mullet ranked first in overall estuarine gill net landings. There was a 3.3% decrease in

striped mullet landings in 2011 compared to the 10-year average. Striped mullet composed a greater proportion of the catch and had the highest landings in the Central area.

Weakfish contributed 0.4 – 0.7% of annual estuarine gill net landings (Table 5.3). Weakfish ranked nineteenth in overall estuarine gill net landings. There was a 65.8% decrease in weakfish landings in 2011 compared to the 10-year average. Weakfish composed a greater proportion of the catch and had the highest landings in the Pamlico area.

Based on trip ticket data, the dominant species overall in estuarine large mesh gill net catches include, in order of highest landings: flounders (primarily southern flounder), shad, red drum, catfishes, striped bass, and black drum. Other common species included: sheepshead (*Archosargus probatocephalus*), bluefish, Atlantic menhaden, white perch, spotted seatrout, and striped mullet.

Based on trip ticket data, the dominant species overall in estuarine small mesh gill net catches include, in order of highest landings: striped mullet, bluefish, Spanish mackerel, Atlantic menhaden, spot, and white perch. Other common species included: spotted seatrout, kingfishes, shad, Atlantic croaker, red drum, and flounder.

SPECIES COMPOSITION

Albemarle Sound Area

Large Mesh

Southern flounder was the dominant species encountered in large mesh gill net samples in the Albemarle area from 2007 – 2009 (Table 5.4a-c). In 2007, southern flounder contributed 63.6% by weight to the sampled catch followed by American shad (12.7%). In 2008, southern flounder contributed 49.9% by weight to the sampled catch followed by American shad (7.3%). In 2009, southern flounder contributed 39.7% by weight to the sampled catch followed by American shad (28.0%). In 2010 and 2011, American shad were the dominant species sampled (Table 5.4d-e). In 2010, American shad contributed 35.5% by weight to the sampled catch followed by southern flounder (22.3%). In 2011, American shad contributed 49.9% by weight to the sampled catch followed by southern flounder (11.6%).

Small Mesh

Striped mullet was the dominant species encountered in small mesh gill net samples in the Albemarle area from 2007 – 2011 (Table 5.4a-e). In 2007, striped mullet contributed 75.8% by weight to the sampled catch followed by white mullet (*Mugil curema*; 5.7%). In 2008, striped mullet contributed 83.2% by weight to the sampled catch followed by bluefish (3.3%). In 2009, striped mullet contributed 35.0% by weight to the sampled catch followed by spot (11.1%). In 2010, striped mullet contributed 67.3% by weight to the sampled catch followed by bluefish

(12.3%). In 2011, striped mullet contributed 65.5% by weight to the sampled catch followed by white perch (12.2%).

Pamlico Sound Area

Large Mesh

Southern flounder was the dominant species encountered in large mesh gill net samples in the Pamlico area from 2007 – 2011 (Table 5.4a-e). In 2007, southern flounder contributed 45.4% by weight to the sampled catch followed by red drum (13.3%). In 2008, southern flounder contributed 47.3% by weight to the sampled catch followed by bluefish (9.5%). In 2009, southern flounder contributed 61.5% by weight to the sampled catch followed by red drum (6.1%). In 2010, southern flounder contributed 55.4% by weight to the catch sampled followed by sheepshead (8.6%). In 2011, southern flounder contributed 59.2% by weight to the sampled catch followed by bluefish (7.4%).

Small Mesh

Bluefish was the dominant species encountered in small mesh gill net samples in the Pamlico area in 2007 and 2011. Striped mullet was the dominant species encountered in 2008 and 2009. In 2010, Spanish mackerel was the dominant species encountered in small mesh gill net samples (Table 5.4a-e). In 2007, bluefish contributed 38.3% by weight to the sampled catch followed by striped mullet (36.5%). In 2008, striped mullet contributed 56.3% by weight to the sampled catch followed by bluefish (19.5%). In 2009, striped mullet contributed 48.5% by weight to the sampled catch followed by bluefish (17.5%). In 2010, Spanish mackerel contributed 39.0% by weight to the catch sampled followed by striped mullet (28.5%). In 2011, bluefish contributed 35.9% by weight to the sampled catch followed by Spanish mackerel (27.5%).

Rivers Area

Large Mesh

American shad was the dominant species encountered in large mesh gill net samples in the Rivers area in 2007. For 2008 – 2011, southern flounder was the dominant species encountered in large mesh gill net samples in the Rivers area (Table 5.4a-e). In 2007, American shad contributed 38.3% by weight to the sampled catch followed by southern flounder (28.8%). In 2008, southern flounder contributed 36.1% by weight to the sampled catch followed by American shad (26.3%). In 2009, southern flounder contributed 42.1% by weight to the sampled catch followed by American shad (16.5%). In 2010, southern flounder contributed 25.6% by weight to the catch sampled followed by American shad (20.1%). In 2011, southern flounder contributed 39.0% by weight to the sampled catch followed by American shad (25.7%).

Small Mesh

Striped mullet was the dominant species encountered in small mesh gill net samples in the Rivers area from 2007 – 2011 (Table 5.4a-e). In 2007, striped mullet contributed 73.3% by weight to the sampled catch followed by spotted seatrout (19.3%). In 2008, striped mullet contributed 75.2% by weight to the sampled catch followed by spotted seatrout (6.3%). In 2009, striped mullet contributed 71.9% by weight to the sampled catch followed by spotted seatrout (12.8%). In 2010, striped mullet contributed 72.8% by weight to the sampled catch followed by Spanish mackerel (8.8%). In 2011, striped mullet contributed 75.0% by weight to the sampled catch followed by spotted seatrout (5.7%).

Central Area

Large Mesh

Southern flounder was the dominant species encountered in large mesh gill net samples in the Central area from 2007 – 2011 (Table 5.4a-e). In 2007, southern flounder contributed 68.9% by weight to the sampled catch followed by black drum (11.7%). In 2008, southern flounder contributed 77.3% by weight to the sampled catch followed by red drum (4.2%). In 2009, southern flounder contributed 75.9% by weight to the sampled catch followed by red drum (6.4%). In 2010, southern flounder contributed 67.2% by weight to the catch sampled followed by horseshoe crab (7.5%). In 2011, southern flounder contributed 63.8% by weight to the sampled catch followed by red drum (9.8%).

Small Mesh

Striped mullet was the dominant species encountered in small mesh gill net samples in the Central area from 2007 – 2011 (Table 5.4a-e). In 2007, striped mullet contributed 67.9% by weight to the sampled catch followed by bluefish (10.4%). In 2008, striped mullet contributed 83.8% by weight to the sampled catch followed by spotted seatrout (6.0%). In 2009, striped mullet contributed 89.5% by weight to the sampled catch followed by spot (9.8%). In 2010, striped mullet contributed 87.4% by weight to the sampled catch followed by bluefish (5.3%). In 2011, striped mullet contributed 68.6% by weight to the sampled catch followed by spot (19.2%).

Southern Area

Large Mesh

Southern flounder was the dominant species encountered in large mesh gill net samples in the Southern area from 2007 – 2011 (Table 5.4a-e). In 2007, southern flounder contributed 57.8% by weight to the sampled catch followed by American shad (15.5%). In 2008, southern flounder contributed 64.4% by weight to the sampled catch followed by American shad (11.5%). In 2009, southern flounder contributed 58.2% by weight to the sampled catch followed by American shad

(19.5%). In 2010, southern flounder contributed 38.1% by weight to the catch sampled followed by American shad (28.6%). In 2011, southern flounder contributed 76.1% by weight to the sampled catch followed by red drum (16.8%).

Small Mesh

Striped mullet was the dominant species encountered in small mesh gill net samples in the Southern area from 2007 – 2011 (Table 5.4a-e). In 2007, striped mullet contributed 63.9% by weight to the sampled catch followed by spot (12.2%). In 2008, striped mullet contributed 72.7% by weight to the sampled catch followed by spot (12.9%). In 2009, striped mullet contributed 55.9% by weight to the sampled catch followed by spotted seatrout (18.7%). In 2010, striped mullet contributed 54.3% by weight to the sampled catch followed by spot (9.7%). In 2011, striped mullet contributed 67.1% by weight to the sampled catch followed by spot (17.7%).

SCRAP FISH

Statewide, unclassified marketed scrap fish landings from estuarine gill nets comprised 5.2 – 7.5% by weight of the sampled catch from 2007 – 2011. Scrap fish species identified in fish house samples include: Atlantic menhaden, hickory shad, gizzard shad (*Dorosoma cepedianum*), and bluefish (Table 5.5).

No at-sea samples were collected for discards and most fishermen cull their catches on the water. Hence, the quantity of unmarketable bycatch in the fishery is unavailable as only a small amount of unwanted, unmarketable, or regulatory discards are observed in fish house samples. However, discarded bycatch species identified either in samples or reported by fishermen include: Atlantic menhaden, gizzard shad, blue crab (*Callinectes sapidus*), longnose gar (*Lepisosteus osseus*), southern flounder, red drum, common carp (*Cyprinus carpio*), striped bass, and cownose ray *(Rhinoptera bonasus*; Table 5.6).

MANAGEMENT ISSUES

The use of gill nets in estuarine waters is an important management issue in North Carolina. Contributing to this issue are: 1) negative public perception that gill net fisheries are wasteful (bycatch of non-target species and/or regulatory discards), 2) harvest of species that are overfished, 3) allocation of the resource between user groups, 4) conflict over fishing grounds (i.e. flounder pound nets, crab pots, and recreational fishing), and 5) interactions with protected species (e.g. sea turtles, Atlantic sturgeon (*Acipenser oxyrinchus*), and marine mammals).

To address these issues the North Carolina Fisheries Director may, by proclamation, impose restrictions on any or all of the following regarding the use of gill nets: area, season, mesh size, means/methods, net number, and net length. Additionally, through the development of state

FMPs, rules have been implemented to address species-specific issues related to gill nets (NCMFC 2011). These proclamations and rules are currently used to reduce waste, protect specific fish stocks (e.g. striped bass, southern flounder, spotted seatrout, and red drum), minimize conflicts, and reduce the catch of non-target species. An overview of specific gill net management measures in estuarine waters for each area follows below.

Although more restrictive measures may occur seasonally or in certain areas, the following restrictions are the minimum gill net regulations either set in rule or issued by Proclamation and in effect statewide unless otherwise noted:

- All unattended gill nets ≥ 5 ISM must be at least 10 feet from shore from June through November (NCDMF 2008).
- Gill nets with a mesh size ≥ 5 ISM and <5 ½ ISM are prohibited from April 15 through December 15 (NCDMF 2005).
- 3,000 yard/vessel limit on gill nets ≥ 5 ISM (NCDMF 2005).
- Gill nets with a mesh size < 5 ISM must be attended in all primary and secondary nursery areas and no-trawl areas described in NCMFC rule 15A NCAC 3R.0106(2), (4), (5), (7), (8), (10), (11), and (12) from May 1 through November 30 (NCDMF 2001).
- It is unlawful to set gill nets in joint waters from midnight on Friday to midnight on Sunday each week, except in Albemarle Sound and Currituck Sound north of the Highway 158 Wright Memorial Bridge (NCDMF 2012).
- The use of gill nets > 6 ½ ISM stretch mesh is prohibited in all waters.
- It is unlawful to use gill nets with a mesh size < 2 ½ inches ISM stretch mesh.
- It is unlawful to use gill nets within 200 yards of any finfish pound net set with a lead and either pound or heart in use, except from August 15 through December 31 in Albemarle Sound when the minimum distance will be 500 yards (NCDMF 2005).
- It is unlawful to use gill nets from March 1 through October 31 in the Intracoastal Waterway within 150 yards of any railroad or highway bridge.
- It is unlawful to use gill nets within 100 feet either side of the center line of the Intracoastal Waterway Channel south of the entrance to the Alligator-Pungo Canal in the Alligator River to the South Carolina line unless:
    - No more than two gill nets per vessel may be used at any one time.
    - Any net must be attended.
    - Nets shall be removed, when necessary, to permit unrestricted boat navigation.

- Minimum of 3 ¼ ISM length for drift gill nets.

- All drift gill nets must not block more than two-thirds of any natural or man-made waterway, sound, bay, creek, inlet, or any other body of water and:

    - No more than two gill nets per vessel may be used at any one time.
    - Any net must be attended.
    - Nets shall be removed, when necessary, to permit unrestricted boat navigation.

- Drift gill nets may not be used in the joint waters of the Roanoke, Middle, Eastmost, Cashie, Chowan, and Meherrin Rivers and all other joint waters of the ASMA.

- It is unlawful to use drift gill nets in the Albemarle Sound and Chowan River River herring management area described in rule 15A NCAC 03J.0209 from January 1 through May 15.

- Commercial fishing gear may not be used in military danger zones and restricted areas as stated in rules 15A NCAC 03I.0110 and 15A NCAC 03R.0102.

- To address user conflicts the Fisheries Director has the authority, by proclamation, to close areas described in rule 15A NCAC 03J.0401 to specific fishing gears during the time(s) and date(s) specified from the Friday before Easter through December 31.

- Gill nets are also prohibited during the dates and times specified in those areas outlined in rule 15A NCAC 03J.0402.

- It is unlawful to use gill nets in those areas described in rules 15A NCAC 03J.0206 and 15A NCAC 03J.0207

- The recreational use of gill nets is restricted as outlined in rule 15A NCAC 03O.0302 (a) (5).

Sea Turtle Settlement

The Sea Turtle Settlement Agreement with the Karen Beasley Sea Turtle Rescue and Rehabilitation Center requires the state to follow certain guidelines regarding the use of set gill nets ≥ 4 ISM. Since the initial agreement in May 2010 several amendments have been made to the initial restrictions including changes in areas exempt from certain restrictions. The Albemarle Sound and Currituck Sound (north of the Currituck Sound Bridge) were exempt from the restrictions of the initial agreement because of a lack of observed sea turtles in those waters. The requirements of the settlement agreement supersede all NCMFC rules which are less restrictive in the use of set gill nets. The current set gill net requirements (issued by Proclamation) for sea turtle conservation are:

Areas exempt from the set gill net gear construction and use requirements and the net setting time requirements are:

- The Albemarle Sound Management Area.
- The Pamlico, Pungo, Bay, and Neuse Rivers (all waters west of the 76° 30.0000'W longitude line).
- Within the areas above, gill nets must be checked at least once during a 24 hour period and no later than noon each day.

The gear construction and use requirements for all set gill nets ≥ 4 ISM are:

- Nets must not be more than 15 meshes in height and must have a lead core or leaded bottom line.
- It is unlawful to use corks, floats, or other buoys except those required for identification in all areas north of the Highway 58 Bridge.
- It is unlawful to use more than 2,000 yards of gill net per fishing operation regardless of the number of vessels used North of Core Banks in Core Sound.
- From southern Core Sound (inclusive) and south to the South Carolina state-line, it is unlawful to use more than 1,000 yards of gill net per fishing operation regardless of the number of vessels used.
- It is unlawful to use more than 100 yards of gill net without leaving a space of at least 25 yards between separate lengths of gill net.

The gill net setting time requirements restrict the use of set gill nets ≥ 4 ISM to the following periods:

- Nets set for Tuesday retrieval may be set no sooner than 1 hour before sunset on Monday and must be retrieved no later than 1 hour after sunrise on Tuesday.
- Nets set for Wednesday retrieval may be set no sooner than 1 hour before sunset on Tuesday and must be retrieved no later than 1 hour after sunrise on Wednesday.
- Nets set for Thursday retrieval may be set no sooner than 1 hour before sunset on Wednesday and must be retrieved no later than 1 hour after sunrise on Thursday.
- Nets set for Friday retrieval may be set no sooner than 1 hour before sunset on Thursday and must be retrieved no later than 1 hour after sunrise on Friday.

Areas on the western side of the North River and south and west of a line running from Lennoxville Point to Shackleford Banks are allowed an additional gill net set period in addition to those above:

- Nets set for Monday retrieval may be set no sooner than 1 hour before sunset on Sunday and must be retrieved no later than 1 hour after sunrise on Monday.

Other measures outside of the settlement agreement have also been implemented periodically to enhance sea turtle conservation. These include enacting the gear construction and use requirements and/or setting time requirements in those areas exempted above. Additionally, seasonal closures have been implemented as needed (through Proclamation) in areas with high numbers of sea turtle interactions. The settlement agreement also specifies that a minimum of 7% observer coverage be maintained statewide with a target of 10% observer coverage of the estuarine set gill net fishery for mesh sizes ≥ 4 ISM.

Albemarle Sound Area

The Albemarle area has regulations based on individual mesh sizes rather than the traditional large and small mesh classifications. In Albemarle Sound and its tributaries and in Currituck Sound north of the Highway 158 Wright Memorial Bridge the following regulations are in effect:

- Gill nets ≥ 5 ½ ISM stretch mesh must not fish more than 48 ISM from the bottom either with tie downs or float limits and are limited to 2,000 yards.

- Gill nets with a mesh size > 4 ISM and < 5 ½ ISM stretch mesh are prohibited.

- Gill nets with a mesh size ≥ 3 ISM and ≤4 ISM stretch mesh are limited to 800 yards and must be attended at all times.

- Gill nets with a mesh size < 3 ISM stretch mesh shall not be used.

- No gill nets may be used in an area south and west of a line running from Black Walnut Point to the mouth of Mackey's Creek, including the Roanoke, Cashie, Middle, and Eastmost Rivers.

In the eastern/southern area of the ASMA, south of the Highway 158 Wright Memorial Bridge south to a line running from Roanoke Marshes Point to the north point of Eagles Nest Bay the following regulations are in effect:

- Gill nets with a mesh length < 3 ISM stretch mesh shall not be used (NCDMF 2007).

- Gill nets with a mesh size ≥ 3 ISM and <4 ISM stretch mesh are limited to 800 yards and must be attended at all times (NCDMF 2007).

- Gill nets with a mesh size ≥ 4 ISM and < 5 ½ ISM stretch mesh are prohibited.

- Gill nets ≥ 5 ½ ISM must not fish more than 48 inches from the bottom either with tie downs or float limits and are limited to 2,000 yards.

- Gill nets with a mesh size > 6 ½ ISM shall not be used.

Pamlico Sound Area

<u>Large Mesh</u>

- In all waters west of the 76° 28.0000'W longitude line, gill nets with a mesh size > 5 inches stretch mesh must be equipped with tie downs spaced no farther than 10 yards apart, reducing the vertical distance between the top and bottom line to 36 inches or less. Nets must be set to fish on the bottom and not exceed a vertical height of 36 inches. These requirements are in effect from the end of the commercial striped bass harvest season through December 31 each year (NCDMF and WRC 2004).

<u>Small Mesh</u>

Attendance of small mesh gill nets (<5 ISM) is required May 1 through November 30 in the following areas:

- Along the Outer Banks, small mesh gill net attendance is required in all areas outlined in NCMFC rule 15A NCAC 3R.0112 (b) 1-2. This covers the area from Eagles Nest Bay to Wainright Island within a mean distance of 4,400 yards of shore.

- Within 50 yards of shore in all areas not described above.

Rivers Area

<u>Large Mesh</u>

- In all waters west of the 76° 28.0000'W longitude line, gill nets with a mesh size > 5 inches stretch mesh must be equipped with tie downs spaced no farther than 10 yards apart, reducing the vertical distance between the top and bottom line to 36 inches or less. Nets must be set to fish on the bottom and not exceed a vertical height of 36 inches. These requirements are in effect from the end of the commercial striped bass harvest season through December 31 each year (NCDMF and WRC 2004).

<u>Small Mesh</u>

Attendance of small mesh gill nets (<5 ISM) is required year round in the following areas:

- Upper portions of the Pamlico, Pungo, Neuse, and Trent Rivers

- Within 200 yards of shore in the lower portions of the Pamlico, Pungo, Neuse, and Trent Rivers

Central Area

<u>Small Mesh</u>

Attendance of small mesh gill nets (<5 ISM) is required May 1 through November 30 in the following areas:

- Along the Outer Banks, small mesh gill net attendance is required in all areas outlined in NCMFC rule 15A NCAC 3R.0112(b) 1-2. This area covers all of Core Sound and through the Shackleford Banks area of Back Sound within a mean distance of 1,700 yards of shore (NCDMF 2008)

- Within 50 yards of shore in all areas not described above, except during October and November when attendance requirements are lifted for the spot fishery.

Southern Area

<u>Small Mesh</u>

Attendance of small mesh gill nets (<5 ISM) is required May 1 through September 30 in the following areas:

- Within 50 yards of shore in all areas described in rule 15A NCAC 03R.0112.

Sampling of small mesh fisheries has greatly improved during this period. Small mesh gill nets accounted for 37.0% of fish house samples and 37.7% of commercial trip tickets. This indicates both small and large mesh fisheries are being sampled in proportion to the overall trips that occur.

Future management of estuarine gill nets is likely to be impacted by the recent Endangered Species Act listing of Atlantic sturgeon and the likely listing of river herring (alewife and blueback herring). The Sea Turtle Settlement Agreement currently requires a minimum of 7% observer coverage for set gill nets ≥ 4 ISM. This program should be expanded to cover all estuarine gill net fisheries. If and when other species are listed under the ESA, future management of estuarine gill net fisheries as it relates to these species needs to be based on what is currently occurring in the fishery, not on what has occurred in the past or using surrogates from other states.

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Table 5.1 Commercial landings (pounds), number of trips, and number of dealers by trip landings category, 2007-2011. Source: NC Trip Ticket Program.

Landings Range (lb/trip)	Total Landings (lb)	Percent Landings	Number of Trips	Percent Trips	Number of Dealers
1-100	4,701,434	15.5	88,639	53.9	405
101-200	5,435,721	17.9	38,483	23.4	309
201-300	3,518,687	11.6	14,397	8.8	247
301-400	2,496,285	8.2	7,210	4.4	187
401-500	1,846,761	6.1	4,135	2.5	159
501-600	1,453,724	4.8	2,654	1.6	131
601-700	1,217,481	4.0	1,879	1.1	109
701-800	1,009,249	3.3	1,349	0.8	104
801-900	834,220	2.8	983	0.6	87
901-1,000	720,783	2.4	760	0.5	78
1,001-2,000	4,056,176	13.4	3,002	1.8	101
2,001-3,000	1,364,403	4.5	566	0.3	58
3,001-4,000	628,706	2.1	185	0.1	38
4,001-5,000	339,502	1.1	76	0.0	16
5,001-6,000	231,730	0.8	43	0.0	17
6,001-7,000	145,679	0.5	22	0.0	8
7,001-8,000	105,184	0.3	14	0.0	8
8,001-9,000	75,434	0.2	9	0.0	4
9,001-10,000	46,288	0.2	5	0.0	5
10,001-20,000	65,525	0.2	6	0.0	4
Total	30,292,973		164,417		

Table 5.2a Summary of sampled commercial estuarine gill net catches, total landings, yards of gill net fished, and soak times (January 2007-December 2011) from the Albemarle (A), Pamlico (P), Rivers (R), Central (C), and Southern (S) areas by year, month, and mesh size category. Source: NC Trip Ticket Program and NCDMF fisheries dependent biological database.

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2007	Jan	A	L	1	65	-	1	65	-	675	58,458	87	1-496	900	-	24	-
			S	0	-	-	0	-	-	104	18,249	175	10-765	-	-	-	-
			All	1	65	-	1	65	-	779	76,707	98	1-765	900	-	24	-
		P	L	1	136	-	1	135	-	16	1,878	117	28-262	800	-	24	-
			S	0	-	-	0	-	-	115	10,604	92	3-430	-	-	-	-
			All	1	136	-	1	135	-	131	12,482	95	3-430	800	-	24	-
		R	L	1	30	-	1	30	-	24	1,825	76	1-361	1,200	-	48	-
			S	19	171	11-837	19	120	11-294	142	23,877	168	4-1,820	588	200-1,200	6	0-24
			All	20	164	11-837	20	115	11-294	166	25,702	155	1-1,820	617	200-1,200	8	0-48
		C	L	0	-	-	0	-	-	8	811	101	38-183	-	-	-	-
			S	1	1,346	-	1	87	-	61	28,475	467	9-1,723	500	-	1	-
			All	1	1,346	-	1	87	-	69	29,286	424	9-1,723	500	-	1	-
		S	L	0	-	-	0	-	-	60	2,622	44	3-97	-	-	-	-
			S	0	-	-	0	-	-	84	20,368	242	10-5,400	-	-	-	-
			All	0	-	-	0	-	-	144	22,990	160	3-5,400	-	-	-	-
		All		23	210	11-1,346	23	113	11-294	1,289	167,165	130	1-5,400	632	200-1,200	9	0-48
	Feb	A	L	1	222	-	1	147	-	895	75,298	84	7-2,373	-	-	24	-
			S	0	-	-	0	-	-	259	50,869	196	13-1,055	-	-	-	-
			All	1	222	-	1	147	-	1,154	126,167	109	7-2,373	-	-	24	-
		P	L	0	-	-	0	-	-	80	8,399	105	3-326	-	-	-	-
			S	16	112	9-513	16	73	9-160	238	35,436	149	9-2,800	1,429	200-3,000	18	12-24
			All	16	112	9-513	16	73	9-160	318	43,834	138	3-2,800	1,429	200-3,000	18	12-24
		R	L	12	226	54-459	12	192	54-370	108	15,944	148	2-609	1,220	333-1,800	40	24-72
			S	17	221	1-1,149	17	118	1-303	262	86,237	329	1-3,298	499	200-800	9	0-48
			All	29	223	1-1,149	29	149	1-370	370	102,180	276	1-3,298	769	200-1,800	22	0-72
		C	L	0	-	-	0	-	-	1	25	-	-	-	-	-	-
			S	1	639	-	1	55	-	64	31,807	497	1-3,597	500	-	1	-
			All	1	639	-	1	55	-	65	31,832	490	1-3,597	500	-	1	-
		S	L	1	225	-	1	74	-	95	6,860	72	4-376	350	-	24	-
			S	0	-	-	0	-	-	60	18,568	309	7-1,578	-	-	-	-
			All	1	225	-	1	74	-	155	25,428	164	4-1,578	350	-	24	-
		All		48	195	1-1,149	48	120	1-370	2,062	329,441	160	1-3,597	947	200-3,000	20	0-72
	Mar	A	L	7	204	44-608	7	64	17-122	1,480	269,838	182	7-1,903	1,500	1,500-1,500	21	12-24
			S	1	177	-	1	45	-	402	162,420	404	7-5,160	800	-	24	-
			All	8	201	44-608	8	62	17-122	1,882	432,258	230	7-5,160	1,150	800-1,500	22	12-24

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2007	Mar	P	L	0	-	-	0	-	-	122	14,066	115	8-1,200	-	-	-	-
			S	2	23	11-35	2	23	11-35	390	71,793	184	5-2,813	600	600-600	18	12-24
			All	2	23	11-35	2	23	11-35	512	85,859	168	5-2,813	600	600-600	18	12-24
		R	L	41	124	19-475	41	101	12-289	680	63,625	94	2-1,540	740	50-1,800	18	10-48
			S	13	204	15-782	13	75	15-183	341	76,655	225	4-1,956	758	200-1,200	19	1-48
			All	54	143	15-782	54	95	12-289	1,021	140,279	137	2-1,956	745	50-1,800	18	1-48
		C	L	0	-	-	0	-	-	13	1,256	97	5-177	-	-	-	-
			S	0	-	-	0	-	-	66	10,818	164	9-1,033	-	-	-	-
			All	0	-	-	0	-	-	79	12,074	153	5-1,033	-	-	-	-
		S	L	0	-	-	0	-	-	175	18,894	108	2-514	-	-	-	-
			S	0	-	-	0	-	-	65	14,607	225	8-1,570	-	-	-	-
			All	0	-	-	0	-	-	240	33,501	140	2-1,570	-	-	-	-
		All		64	147	11-782	64	88	11-289	3,734	703,971	189	2-5,160	757	50-1,800	19	1-48
	Apr	A	L	7	175	48-614	7	93	48-211	890	119,879	135	2-2,270	1,060	800-1,500	24	12-48
			S	5	120	51-307	5	47	22-73	390	103,900	266	2-1,945	580	200-800	24	12-48
			All	12	152	48-614	12	74	22-211	1,280	223,779	175	2-2,270	820	200-1,500	24	12-48
		P	L	5	157	45-330	5	92	39-185	122	12,275	101	9-514	800	800-800	20	12-24
			S	36	365	21-1,714	36	73	15-150	815	241,659	297	8-2,750	1,147	300-3,400	23	12-48
			All	41	340	21-1,714	41	75	15-185	937	253,934	271	8-2,750	1,117	300-3,400	23	12-48
		R	L	41	85	19-238	41	73	6-224	460	37,759	82	4-858	1,140	373-2,000	21	10-72
			S	3	291	41-775	3	49	38-57	216	47,954	222	3-2,546	1,167	700-2,000	8	0-24
			All	44	99	19-775	44	71	6-224	676	85,712	127	3-2,546	1,142	373-2,000	20	0-72
		C	L	12	135	59-291	12	117	40-260	149	17,278	116	8-979	2,192	1,000-3,000	19	12-24
			S	9	259	67-879	9	71	54-118	68	22,126	325	33-1,407	664	275-1,000	11	1-12
			All	21	188	59-879	21	97	40-260	217	39,404	182	8-1,407	1,537	275-3,000	15	1-24
		S	L	1	383	-	1	103	-	156	13,061	84	3-419	400	-	24	-
			S	0	-	-	0	-	-	111	25,764	232	8-3,129	-	-	-	-
			All	1	383	-	1	103	-	267	38,825	145	3-3,129	400	-	24	-
		All		119	205	19-1,714	119	78	6-260	3,377	641,655	190	2-3,129	1,176	200-3,400	21	0-72
	May	A	L	0	-	-	0	-	-	400	31,522	79	2-523	-	-	-	-
			S	1	6	-	1	3	-	149	22,423	150	2-1,581	-	-	-	-
			All	1	6	-	1	3	-	549	53,945	98	2-1,581	-	-	-	-
		P	L	5	130	37-196	5	118	37-196	346	30,140	87	3-533	2,350	400-3,000	21	12-24
			S	18	143	23-866	18	64	9-142	572	108,251	189	7-1,953	1,047	300-1,800	24	12-48
			All	23	140	23-866	23	76	9-196	918	138,391	151	3-1,953	1,321	300-3,000	23	12-48
		R	L	7	80	18-194	7	63	18-185	415	23,743	57	2-597	1,348	233-3,000	36	12-120
			S	0	-	-	0	-	-	203	31,395	155	4-2,023	-	-	-	-

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2007	May	R	All	7	80	18-194	7	63	18-185	618	55,138	89	2-2,023	1,348	233-3,000	36	12-120
		C	L	14	122	38-243	14	106	38-175	447	38,883	87	5-491	2,379	400-3,000	20	12-24
			S	2	57	17-97	2	57	17-97	58	12,282	212	6-917	400	400-400	1	1-1
			All	16	114	17-243	16	100	17-175	505	51,165	101	5-917	2,131	400-3,000	17	1-24
		S	L	1	69	-	1	69	-	203	12,564	62	2-312	1,500	-	24	-
			S	0	-	-	0	-	-	65	9,051	139	12-1,064	-	-	-	-
			All	1	69	-	1	69	-	268	21,615	81	2-1,064	1,500	-	24	-
		All		48	118	6-866	48	80	3-196	2,858	320,254	112	2-2,023	1,631	233-3,000	23	1-120
	Jun	A	L	2	22	17-27	2	15	14-17	415	27,575	66	2-485	1,000	1,000-1,000	12	12-12
			S	4	619	295-1,155	4	75	50-100	71	12,035	170	7-1,157	-	-	-	-
			All	6	420	17-1,155	6	55	14-100	486	39,610	82	2-1,157	1,000	1,000-1,000	12	12-12
		P	L	8	84	29-163	8	57	29-74	438	34,041	78	1-841	1,125	500-2,000	22	12-48
			S	8	382	46-633	8	142	32-199	304	70,296	231	6-2,338	1,600	600-2,200	6	1-12
			All	16	233	29-633	16	100	29-199	742	104,336	141	1-2,338	1,329	500-2,200	14	1-48
		R	L	0	-	-	0	-	-	253	12,957	51	4-257	-	-	-	-
			S	0	-	-	0	-	-	157	25,127	160	3-1,600	-	-	-	-
			All	0	-	-	0	-	-	410	38,084	93	3-1,600	-	-	-	-
		C	L	20	76	12-199	20	76	12-199	501	32,739	65	1-300	2,389	500-3,000	23	12-24
			S	2	185	87-283	2	69	50-87	66	13,817	209	8-695	300	200-400	2	2-2
			All	22	86	12-283	22	75	12-199	567	46,555	82	1-695	2,199	200-3,000	21	2-24
		S	L	0	-	-	0	-	-	206	11,353	55	3-276	-	-	-	-
			S	0	-	-	0	-	-	57	4,741	83	13-268	-	-	-	-
			All	0	-	-	0	-	-	263	16,094	61	3-276	-	-	-	-
		All		44	185	12-1,155	44	81	12-199	2,468	244,679	99	1-2,338	1,837	200-3,000	18	1-48
	Jul	A	L	7	43	7-69	7	37	7-69	525	39,190	75	1-353	1,850	1,350-2,900	21	12-24
			S	3	330	65-477	3	57	15-100	125	26,095	209	5-1,122	533	500-600	-	-
			All	10	129	7-477	10	43	7-100	650	65,285	100	1-1,122	1,455	500-2,900	21	12-24
		P	L	18	97	34-227	18	57	6-107	431	35,686	83	6-636	2,287	1,000-3,000	18	12-24
			S	4	1,127	891-1,632	4	127	50-212	212	54,281	256	6-1,879	550	550-550	0	0-0
			All	22	284	34-1,632	22	70	6-212	643	89,968	140	6-1,879	1,997	550-3,000	15	0-24
		R	L	11	60	18-118	11	57	18-118	257	14,507	56	3-234	1,336	400-3,000	14	2-24
			S	6	718	147-1,667	6	106	34-181	129	36,903	286	4-1,844	459	250-600	2	0-6
			All	17	293	18-1,667	17	74	18-181	386	51,410	133	3-1,844	1,017	250-3,000	10	0-24
		C	L	18	43	3-88	18	43	3-88	424	25,182	59	3-285	2,438	580-3,000	20	2-24
			S	3	147	91-200	3	49	48-50	63	20,160	320	17-1,966	400	400-400	2	2-3
			All	21	58	3-200	21	44	3-88	487	45,342	93	3-1,966	2,147	400-3,000	18	2-24
		S	L	0	-	-	0	-	-	128	6,823	53	3-368	-	-	-	-

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2007	Jul	S	S	0	-	-	0	-	-	55	5,937	108	8-1,755	-	-	-	-
			All	0	-	-	0	-	-	183	12,759	70	3-1,755	-	-	-	-
		All		70	196	3-1,667	70	59	3-212	2,349	264,763	113	1-1,966	1,779	250-3,000	15	0-24
	Aug	A	L	5	52	19-103	5	41	19-73	682	59,028	87	2-756	1,200	800-1,800	14	12-24
			S	0	-	-	0	-	-	110	23,157	211	11-1,908	-	-	-	-
			All	5	52	19-103	5	41	19-73	792	82,185	104	2-1,908	1,200	800-1,800	14	12-24
		P	L	33	84	2-243	33	60	2-191	463	36,853	80	3-592	1,366	100-3,000	19	12-48
			S	11	597	14-2,712	11	116	14-271	296	75,092	254	4-1,921	622	400-1,200	2	0-6
			All	44	212	2-2,712	44	74	2-271	759	111,945	147	3-1,921	1,199	100-3,000	15	0-48
		R	L	11	50	13-149	11	47	13-126	330	18,271	55	3-225	1,467	900-3,000	16	12-24
			S	2	1,001	965-1,036	2	138	115-161	149	48,239	324	4-2,979	500	500-500	1	1-1
			All	13	196	13-1,036	13	61	13-161	479	66,510	139	3-2,979	1,329	500-3,000	14	1-24
		C	L	15	61	16-128	15	61	16-128	477	27,555	58	5-242	2,573	1,400-3,000	20	12-24
			S	1	366	-	1	57	-	114	22,517	198	12-1,792	400	-	3	-
			All	16	80	16-366	16	61	16-128	591	50,071	85	5-1,792	2,438	400-3,000	19	3-24
		S	L	2	187	174-199	2	70	69-70	247	12,497	51	2-449	1,800	1,800-1,800	12	12-12
			S	0	-	-	0	-	-	80	15,510	194	5-1,250	-	-	-	-
			All	2	187	174-199	2	70	69-70	327	28,007	86	2-1,250	1,800	1,800-1,800	12	12-12
		All		80	172	2-2,712	80	67	2-271	2,948	338,719	115	2-2,979	1,517	100-3,000	16	0-48
	Sep	A	L	10	64	11-123	10	51	11-109	1,008	106,345	106	1-1,783	1,300	400-2,000	24	12-48
			S	0	-	-	0	-	-	171	25,108	147	8-1,350	-	-	-	-
			All	10	64	11-123	10	51	11-109	1,179	131,452	111	1-1,783	1,300	400-2,000	24	12-48
		P	L	29	74	15-161	29	55	15-99	584	47,116	81	1-554	1,275	75-3,000	22	12-72
			S	4	215	135-405	4	115	80-164	223	64,189	288	1-3,200	400	200-600	2	1-2
			All	33	91	15-405	33	62	15-164	807	111,306	138	1-3,200	1,193	75-3,000	20	1-72
		R	L	3	299	117-650	3	163	50-307	321	23,773	74	2-1,146	2,600	2,600-2,600	24	24-24
			S	2	1,012	129-1,895	2	85	69-100	169	44,008	260	5-2,400	1,050	600-1,500	1	0-2
			All	5	585	117-1,895	5	132	50-307	490	67,781	138	2-2,400	1,825	600-2,600	13	0-24
		C	L	14	97	16-346	14	89	16-234	558	44,230	79	2-520	2,029	800-3,000	18	12-24
			S	5	1,013	150-2,468	5	176	50-323	114	36,240	318	10-2,045	660	300-900	11	1-24
			All	19	338	16-2,468	19	112	16-323	672	80,470	120	2-2,045	1,668	300-3,000	16	1-24
		S	L	11	79	26-144	11	59	26-144	290	18,165	63	3-624	923	200-1,700	20	0-24
			S	5	297	75-545	5	69	50-91	111	13,573	122	10-1,700	360	200-400	0	0-1
			All	16	147	26-545	16	62	26-144	401	31,738	79	3-1,700	747	200-1,700	14	0-24
		All		83	185	11-2,468	83	76	11-323	3,549	422,747	119	1-3,200	1,260	75-3,000	18	0-72
	Oct	A	L	4	131	70-185	4	83	58-140	1,692	243,382	144	1-3,018	1,625	1,000-1,900	30	24-48
			S	3	198	139-285	3	51	47-55	261	88,885	341	1-6,691	633	400-900	36	24-48

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2007	Oct	A	All	7	160	70-285	7	69	47-140	1,953	332,267	170	1-6,691	1,200	400-1,900	32	24-48
		P	L	53	121	11-679	53	72	11-253	1,042	123,618	119	1-2,963	1,597	300-5,000	23	12-72
			S	7	979	55-2,355	7	127	55-260	311	167,128	537	1-6,149	600	300-1,500	3	0-12
			All	60	221	11-2,355	60	79	11-260	1,353	290,746	215	1-6,149	1,479	300-5,000	21	0-72
		R	L	14	100	18-310	14	72	18-181	542	48,022	89	2-583	1,230	400-2,700	16	12-30
			S	20	837	47-4,134	20	143	44-405	359	190,380	530	5-8,006	718	370-1,400	1	0-5
			All	34	533	18-4,134	34	114	18-405	901	238,402	265	2-8,006	908	370-2,700	8	0-30
		C	L	25	104	22-228	25	102	22-228	467	41,931	90	1-471	2,120	400-3,000	19	12-24
			S	19	357	42-1,633	19	100	20-300	344	125,491	365	5-4,622	463	200-1,000	8	1-12
			All	44	213	22-1,633	44	101	20-300	811	167,422	206	1-4,622	1,405	200-3,000	14	1-24
		S	L	3	115	30-254	3	59	30-88	267	19,090	71	2-386	1,033	400-1,700	17	12-20
			S	3	88	50-127	3	42	26-50	209	28,577	137	2-1,900	300	200-500	4	0-12
			All	6	101	30-254	6	51	26-88	476	47,667	100	2-1,900	667	200-1,700	11	0-20
		All		151	282	11-4,134	151	92	11-405	5,494	1,076,504	196	1-8,006	1,300	200-5,000	17	0-72
	Nov	A	L	13	387	40-1,401	13	87	24-172	1,792	331,592	185	5-2,418	1,927	1,000-3,000	27	12-48
			S	0	-	-	0	-	-	256	42,553	166	1-1,492	-	-	-	-
			All	13	387	40-1,401	13	87	24-172	2,048	374,146	183	1-2,418	1,927	1,000-3,000	27	12-48
		P	L	25	178	33-397	25	83	7-206	444	56,455	127	1-757	1,964	700-5,000	25	12-48
			S	11	253	32-838	11	85	32-142	457	96,795	212	2-3,072	845	200-2,000	26	0-72
			All	36	201	32-838	36	83	7-206	901	153,249	170	1-3,072	1,644	200-5,000	25	0-72
		R	L	7	57	11-118	7	54	11-103	356	37,313	105	4-838	1,107	333-3,000	31	12-48
			S	17	295	26-1,019	17	132	26-384	304	81,438	268	9-4,838	700	300-1,200	4	0-12
			All	24	226	11-1,019	24	109	11-384	660	118,751	180	4-4,838	797	300-3,000	12	0-48
		C	L	18	228	21-671	18	132	21-209	188	19,583	104	5-451	2,450	700-3,000	18	12-24
			S	15	877	24-3,080	15	209	24-421	288	86,225	299	10-3,050	592	200-1,500	3	0-12
			All	33	523	21-3,080	33	167	21-421	476	105,808	222	5-3,050	1,605	200-3,000	12	0-24
		S	L	0	-	-	0	-	-	119	10,535	89	3-583	-	-	-	-
			S	4	283	49-827	4	49	46-50	343	109,683	320	1-3,066	200	200-200	1	0-1
			All	4	283	49-827	4	49	46-50	462	120,218	260	1-3,066	200	200-200	1	0-1
		All		110	328	11-3,080	110	113	7-421	4,547	872,171	192	1-4,838	1,435	200-5,000	18	0-72
	Dec	A	L	13	358	44-1,004	13	69	7-157	720	93,716	130	5-1,115	2,030	667-3,000	45	24-72
			S	0	-	-	0	-	-	306	46,254	151	4-1,789	-	-	-	-
			All	13	358	44-1,004	13	69	7-157	1,026	139,970	136	4-1,789	2,030	667-3,000	45	24-72
		P	L	5	86	39-145	5	53	34-113	25	3,340	134	24-820	-	-	-	-
			S	4	255	84-705	4	156	42-415	225	48,728	217	6-3,594	300	300-300	48	48-48
			All	9	161	39-705	9	99	34-415	250	52,068	208	6-3,594	300	300-300	48	48-48
		R	L	6	45	7-106	6	27	7-55	48	3,791	79	15-323	1,040	100-2,000	17	12-24

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2007	Dec	R	S	13	150	49-330	13	104	32-246	124	17,576	142	5-2,288	763	400-1,500	9	0-12
			All	19	117	7-330	19	80	7-246	172	21,367	124	5-2,288	844	100-2,000	12	0-24
		C	L	1	20	-	1	20	-	10	380	38	14-117	700	-	12	-
			S	4	489	83-849	4	329	83-573	72	24,736	344	20-,1991	738	700-750	4	2-5
			All	5	395	20-849	5	268	20-573	82	25,116	306	14-1,991	730	700-750	5	2-12
		S	L	0	-	-	0	-	-	17	1,295	76	17-135	-	-	-	-
			S	3	354	330-382	3	67	49-103	72	24,338	338	12-2,388	667	200-1,000	0	0-0
			All	3	354	330-382	3	67	49-103	89	25,632	288	12-2,388	667	200-1,000	0	0-0
		All		49	232	7-1,004	49	99	7-573	1,619	264,153	163	4-3,594	1,102	100-3,000	21	0-72
	All	A	L	70	206	7-1,401	70	67	7-211	11,174	1,455,823	130	1-3,018	1,618	400-3,000	27	12-72
			S	17	285	6-1,155	17	53	3-100	2,604	621,948	239	1-,6691	600	200-900	27	12-48
			All	87	221	6-1,401	87	64	3-211	13,778	2,077,771	151	1-6,691	1,427	200-3,000	27	12-72
		P	L	182	111	2-679	182	68	2-253	4,113	403,866	98	1-2,963	1,592	75-5,000	22	12-72
			S	121	357	9-2,712	121	89	9-415	4,158	1,044,252	251	1-6,149	1,030	200-3,400	18	0-72
			All	303	209	2-2,712	303	77	2-415	8,271	1,448,118	175	1-6,149	1,381	75-5,000	20	0-72
		R	L	154	104	7-650	154	85	6-370	3,794	301,528	79	1-1,540	1,085	50-3,000	22	2-120
			S	112	380	1-4,134	112	116	1-405	2,555	709,787	278	1-8,006	667	200-2,000	7	0-48
			All	266	220	1-4,134	266	98	1-405	6,349	1,011,316	159	1-8,006	893	50-3,000	16	0-120
		C	L	137	107	3-671	137	90	3-260	3,243	249,853	77	1-979	2,307	400-3,000	19	2-24
			S	62	525	17-3,080	62	137	17-573	1,378	434,693	315	1-4,622	547	200-1,500	6	0-24
			All	199	237	3-3,080	199	104	3-573	4,621	684,545	148	1-4,622	1,759	200-3,000	15	0-24
		S	L	19	119	26-383	19	64	26-144	1,963	133,758	68	2-624	1,005	200-1,800	19	0-24
			S	15	263	49-827	15	58	26-103	1,312	290,714	222	1-5,400	367	200-1,000	1	0-12
			All	34	183	26-827	34	61	26-144	3,275	424,473	130	1-5,400	724	200-1,800	11	0-24
		All		889	219	1-4,134	889	87	1-573	36,294	5,646,222	156	1-8,006	1,308	50-5,000	18	0-120
2008	Jan	A	L	0	-	-	0	-	-	318	25,980	82	3-3,053	-	-	-	-
			S	0	-	-	0	-	-	501	107,677	215	3-1,683	-	-	-	-
			All	0	-	-	0	-	-	819	133,657	163	3-3,053	-	-	-	-
		P	L	4	38	6-82	4	38	6-82	94	4,817	51	8-319	198	198-198	12	0-48
			S	3	93	82-105	3	34	13-74	178	24,468	137	4-4,100	1,167	200-2,000	24	24-24
			All	7	61	6-105	7	36	6-82	272	29,285	108	4-4,100	925	198-2,000	17	0-48
		R	L	2	83	29-138	2	58	29-88	49	5,110	104	4-806	700	400-1,000	43	13-72
			S	6	358	101-594	6	88	28-176	138	30,867	224	7-1,757	618	450-680	1	0-2
			All	8	289	29-594	8	80	28-176	187	35,977	192	4-1,757	641	400-1,000	13	0-72
		C	L	0	-	-	0	-	-	2	980	490	119-861	-	-	-	-
			S	5	670	191-1,543	5	175	70-285	58	23,532	406	5-2,600	660	600-750	2	1-3
			All	5	670	191-1,543	5	175	70-285	60	24,512	409	5-2,600	660	600-750	2	1-3

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2008	Jan	S	L	0	-	-	0	-	-	19	1,076	57	20-164	-	-	-	-
			S	2	238	160-315	2	52	50-54	63	19,087	303	4-2,105	200	200-200	4	4-4
			All	2	238	160-315	2	52	50-54	82	20,163	246	4-2,105	200	200-200	4	4-4
		All		22	299	6-1,543	22	85	6-285	1,420	243,594	172	3-4,100	660	198-2,000	11	0-72
	Feb	A	L	5	111	32-252	5	40	4-80	883	76,378	86	1-1,717	1,040	800-1,600	24	24-24
			S	0	-	-	0	-	-	809	162,948	201	4-2,033	-	-	-	-
			All	5	111	32-252	5	40	4-80	1,692	239,326	141	1-2,033	1,040	800-1,600	24	24-24
		P	L	1	40	-	1	40	-	133	14,454	109	17-3,332	-	-	-	-
			S	1	245	-	1	133	-	123	20,376	166	4-3,975	3,800	-	12	-
			All	2	143	40-245	2	86	40-133	256	34,830	136	4-3,975	3,800	3,800-3,800	12	12-12
		R	L	12	93	28-190	12	93	28-190	102	11,532	113	7-534	754	333-1,900	31	12-48
			S	14	163	12-623	14	75	8-158	167	49,979	299	10-2,181	744	400-1,700	12	3-24
			All	26	131	12-623	26	83	8-190	269	61,511	229	7-2,181	750	333-1,900	23	3-48
		C	L	0	-	-	0	-	-	2	285	143	58-227	-	-	-	-
			S	2	512	58-965	2	73	58-89	27	8,564	317	11-2,016	600	600-600	4	1-6
			All	2	512	58-965	2	73	58-89	29	8,849	305	11-,2016	600	600-600	4	1-6
		S	L	1	97	-	1	58	-	66	2,619	40	5-245	200	-	24	-
			S	4	287	195-361	4	69	35-95	45	10,905	242	10-1,231	200	200-200	5	5-5
			All	5	249	97-361	5	67	35-95	111	13,525	122	5-1,231	200	200-200	9	5-24
		All		40	163	12-965	40	75	4-190	2,357	358,040	152	1-3,975	794	200-3,800	19	1-48
	Mar	A	L	8	98	31-372	8	51	15-76	952	94,206	99	1-755	1,017	500-1,700	30	12-72
			S	0	-	-	0	-	-	867	215,665	249	10-9,210	-	-	-	-
			All	8	98	31-372	8	51	15-76	1,819	309,871	170	1-9,210	1,017	500-1,700	30	12-72
		P	L	13	74	32-254	13	56	32-175	407	22,866	56	1-712	-	-	22	0-24
			S	12	130	28-558	11	41	28-62	315	64,127	204	1-7,550	1,400	1,000-1,800	20	12-24
			All	25	101	28-558	24	49	28-175	722	86,993	120	1-7,550	1,400	1,000-1,800	21	0-24
		R	L	32	84	5-210	32	84	5-210	344	28,818	84	5-475	705	200-2,200	21	12-48
			S	9	260	5-1,814	9	58	5-187	200	55,413	277	5-2,721	669	300-1,000	14	1-24
			All	41	122	5-1,814	41	78	5-210	544	84,231	155	5-2,721	697	200-2,200	19	1-48
		C	L	0	-	-	0	-	-	31	1,252	40	5-115	-	-	-	-
			S	1	248	-	1	27	-	34	5,732	169	6-688	800	-	24	-
			All	1	248	-	1	27	-	65	6,985	107	5-688	800	-	24	-
		S	L	3	120	50-232	3	54	33-78	134	11,298	84	8-346	200	200-200	24	24-24
			S	4	501	90-678	4	47	32-55	39	8,920	229	11-810	200	200-200	3	1-4
			All	7	338	50-678	7	50	32-78	173	20,218	117	8-810	200	200-200	12	1-24
		All		82	133	5-1,814	81	64	5-210	3,323	508,297	153	1-9,210	733	200-2,200	20	0-72
	Apr	A	L	15	128	20-316	15	47	4-179	674	97,292	144	2-7,095	1,485	700-2,200	29	12-48

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2008	Apr	A	S	9	361	11-1,636	9	42	8-105	491	122,597	250	3-1,900	1,138	400-2,600	24	0-48
			All	24	215	11-1,636	24	46	4-179	1,165	219,889	189	2-7,095	1,352	400-2,600	27	0-48
		P	L	9	71	9-138	9	53	9-133	160	10,555	66	12-461	2,125	1,000-3,000	23	12-24
			S	29	206	52-587	29	57	7-114	702	123,909	177	3-1,506	1,411	500-2,200	23	9-48
			All	38	174	9-587	38	56	7-133	862	134,464	156	3-1,506	1,574	500-3,000	23	9-48
		R	L	33	79	6-245	33	64	6-158	346	25,895	75	4-344	1,147	333-3,000	21	12-72
			S	8	106	30-244	8	60	30-151	235	61,502	262	8-3,497	733	300-1,000	11	1-15
			All	41	84	6-245	41	64	6-158	581	87,397	150	4-3,497	1,084	300-3,000	19	1-72
		C	L	10	62	21-144	10	60	21-144	214	13,329	62	2-413	2,040	600-3,000	24	24-24
			S	1	225	-	1	25	-	89	20,741	233	7-1,233	400	-	1	-
			All	11	77	21-225	11	57	21-144	303	34,069	112	2-1,233	1,891	400-3,000	22	1-24
		S	L	8	90	38-138	8	70	32-115	110	7,286	66	5-206	763	200-1,100	21	14-24
			S	5	160	79-278	5	59	27-108	65	4,527	70	3-353	410	200-1,250	8	4-24
			All	13	117	38-278	13	66	27-115	175	11,813	68	3-353	627	200-1,250	16	4-24
		All		127	139	6-1,636	127	57	4-179	3,086	487,633	158	2-7,095	1,300	200-3,000	22	0-72
	May	A	L	1	108	-	1	17	-	556	71,047	128	3-918	800	-	12	-
			S	4	584	54-1,772	4	55	31-83	253	64,133	253	1-2,400	750	700-800	16	0-24
			All	5	488	54-1,772	5	48	17-83	809	135,180	167	1-2,400	767	700-800	15	0-24
		P	L	14	167	29-464	14	127	17-399	251	20,876	83	3-507	2,250	600-3,000	20	0-24
			S	9	304	24-1,016	9	54	24-88	463	95,744	207	1-2,383	917	200-1,600	18	3-24
			All	23	221	24-1,016	23	99	17-399	714	116,620	163	1-2,383	1,806	200-3,000	19	0-24
		R	L	3	137	47-289	3	137	47-289	183	11,736	64	6-218	2,333	1,000-3,000	24	24-24
			S	1	165	-	1	118	-	233	39,898	171	4-1,890	400	-	4	-
			All	4	144	47-289	4	132	47-289	416	51,633	124	4-1,890	1,850	400-3,000	19	4-24
		C	L	21	105	16-259	21	84	16-259	633	55,497	88	3-588	2,295	200-3,000	21	12-24
			S	2	77	35-120	2	58	35-80	47	4,569	97	7-497	400	400-400	2	1-3
			All	23	102	16-259	23	82	16-259	680	60,066	88	3-588	2,114	200-3,000	19	1-24
		S	L	9	94	47-129	9	69	32-90	149	8,496	57	2-374	1,344	1,200-1,450	23	22-23
			S	3	573	147-1,419	3	55	50-61	103	15,128	147	10-1,808	250	200-350	3	2-4
			All	12	214	47-1,419	12	65	32-90	252	23,624	94	2-1,808	1,071	200-1,450	18	2-23
		All		67	194	16-1,772	67	85	16-399	2,871	387,123	135	1-2,400	1,715	200-3,000	19	0-24
	Jun	A	L	4	46	30-80	4	30	6-67	711	82,045	115	2-1,123	433	400-500	24	24-24
			S	5	119	23-310	5	44	19-88	136	33,854	249	4-4,932	800	800-800	24	24-24
			All	9	87	23-310	9	38	6-88	847	115,898	137	2-4,932	580	400-800	24	24-24
		P	L	13	72	8-263	13	57	8-160	397	36,563	92	3-2,550	1,946	800-3,000	20	12-24
			S	15	345	23-1,465	15	71	19-150	270	63,935	237	4-1,711	723	200-1,200	20	0-48
			All	28	218	8-1,465	28	64	8-160	667	100,498	151	3-2,550	1,335	200-3,000	20	0-48

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2008	Jun	R	L	1	170	-	1	107	-	266	20,341	76	1-441	3,000	-	24	-
			S	0	-	-	0	-	-	163	25,891	159	2-1,280	-	-	-	-
			All	1	170	-	1	107	-	429	46,233	108	1-1,280	3,000	-	24	-
		C	L	23	86	11-192	23	83	11-155	832	65,708	79	3-530	2,265	200-3,000	21	12-24
			S	1	205	-	1	150	-	46	5,634	122	3-541	400	-	4	-
			All	24	91	11-205	24	85	11-155	878	71,342	81	3-541	2,188	200-3,000	20	4-24
		S	L	4	43	20-69	4	41	20-62	141	6,334	45	3-443	1,400	1,400-1,400	21	21-22
			S	1	92	-	1	62	-	97	11,188	115	6-696	200	-	1	-
			All	5	53	20-92	5	45	20-62	238	17,522	74	3-696	1,160	200-1,400	17	1-22
		All		67	142	8-1,465	67	68	6-160	3,059	351,493	115	1-4,932	1,621	200-3,000	20	0-48
	Jul	A	L	10	114	22-242	10	49	8-78	844	97,605	116	2-1,120	1,700	1,500-2,000	16	12-24
			S	4	823	42-1,735	4	95	28-159	142	44,410	313	3-2,414	700	700-700	-	-
			All	14	317	22-1,735	14	62	8-159	986	142,015	144	2-2,414	1,450	700-2,000	16	12-24
		P	L	27	109	8-356	27	55	8-110	786	63,346	81	1-606	1,961	240-3,200	21	12-48
			S	9	504	55-1,154	9	106	55-150	157	49,214	313	3-2,480	340	250-400	2	0-7
			All	36	208	8-1,154	36	67	8-150	943	112,560	119	1-2,480	1,650	240-3,200	16	0-48
		R	L	2	80	55-105	2	64	46-82	298	24,338	82	2-372	1,200	1,200-1,200	12	12-12
			S	3	701	97-1,884	3	100	52-184	95	24,680	260	2-2,314	458	300-675	1	0-2
			All	5	453	55-1,884	5	85	46-184	393	49,017	125	2-2,314	644	300-1,200	4	0-12
		C	L	22	122	40-249	22	83	40-118	650	47,689	73	2-375	2,886	2,600-3,000	22	12-24
			S	3	204	28-473	3	59	28-100	77	16,905	220	4-1,180	400	400-400	2	1-3
			All	25	132	28-473	25	81	28-118	727	64,595	89	2-1,180	2,588	400-3000	19	1-24
		S	L	4	80	62-92	4	71	58-92	223	9,508	43	2-195	1,200	1,200-1,200	24	23-24
			S	1	67	-	1	48	-	110	18,738	170	12-622	200	-	2	-
			All	5	77	62-92	5	67	48-92	333	28,246	85	2-622	1,000	200-1,200	19	2-24
		All		85	210	8-1,884	85	71	8-184	3,382	396,433	117	1-2,480	1,890	200-3,200	17	0-48
	Aug	A	L	11	45	15-86	11	34	10-65	1,034	112,828	109	2-3,706	1,229	800-1,600	24	24-24
			S	0	-	-	0	-	-	127	34,854	274	6-2,015	-	-	-	-
			All	11	45	15-86	11	34	10-65	1,161	147,682	127	2-3,706	1,229	800-1,600	24	24-24
		P	L	34	83	12-308	34	49	8-140	763	66,782	88	1-1,375	1,705	275-5,600	22	10-48
			S	16	706	58-3,469	16	126	24-312	216	94,609	438	1-4,055	1,015	250-2,000	3	0-10
			All	50	282	12-3,469	50	74	8-312	979	161,391	165	1-4,055	1,544	250-5,600	17	0-48
		R	L	7	58	30-109	7	58	30-109	370	35,627	96	6-1,331	1,167	1,000-1,400	12	0-24
			S	5	368	181-744	5	136	64-200	175	52,206	298	2-4,456	535	200-700	3	0-12
			All	12	187	30-744	12	91	30-200	545	87,833	161	2-4,456	880	200-1,400	9	0-24
		C	L	30	86	9-244	30	74	9-144	757	56,487	75	2-356	2,568	1,000-5,333	24	24-24
			S	3	241	30-537	3	78	30-105	101	28,871	286	4-1,212	550	550-550	2	1-3

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2008	Aug	C	All	33	100	9-537	33	74	9-144	858	85,358	99	2-1,212	2,366	550-5,333	22	1-24
		S	L	8	59	16-99	8	55	16-99	253	17,273	68	4-507	975	500-1,200	15	1-24
			S	5	102	35-145	5	56	16-83	152	23,023	151	6-972	170	150-200	2	1-2
			All	13	75	16-145	13	55	16-99	405	40,296	99	4-972	665	150-1,200	10	1-24
		All		119	178	9-3,469	119	70	8-312	3,948	522,560	132	1-4,456	1,580	150-5,600	17	0-48
	Sep	A	L	23	156	33-605	23	54	14-159	1,341	214,327	160	1-3,222	1,675	600-3,000	26	12-48
			S	3	1,302	96-2,370	3	133	50-200	108	50,740	470	3-4,485	-	-	-	-
			All	26	288	33-2,370	26	63	14-200	1,449	265,067	183	1-4,485	1,675	600-3,000	26	12-48
		P	L	34	111	13-320	34	73	9-255	815	86,314	106	1-1,247	1,415	300-3,000	24	12-48
			S	7	508	24-1,137	7	104	22-250	229	65,167	285	1-3,529	533	400-600	1	0-5
			All	41	179	13-1,137	41	78	9-255	1,044	151,481	145	1-3,529	1,280	300-,3000	20	0-48
		R	L	7	87	24-180	7	73	14-180	340	38,058	112	5-1,645	850	500-1,200	24	12-48
			S	6	838	220-1,711	6	154	100-292	157	49,627	316	3-1,711	813	400-1,500	3	0-5
			All	13	434	24-1,711	13	110	14-292	497	87,685	176	3-1,711	825	400-1,500	12	0-48
		C	L	42	212	40-762	42	117	40-236	641	95,324	149	2-3,436	2,539	800-3,000	25	24-48
			S	3	487	33-924	3	169	33-250	135	51,517	382	8-3,677	625	150-1,000	13	2-24
			All	45	230	33-924	45	121	33-250	776	146,841	189	2-3,677	2,369	150-3,000	24	2-48
		S	L	11	110	34-332	11	68	34-110	298	19,849	67	6-611	1,291	500-2,000	19	12-28
			S	4	244	33-802	4	30	17-44	153	27,935	183	7-963	163	150-200	6	4-6
			All	15	146	33-802	15	58	17-110	451	47,784	106	6-963	990	150-2,000	15	4-28
		All		140	236	13-2,370	140	90	9-292	4,217	698,858	166	1-4,485	1,679	150-3,000	21	0-48
	Oct	A	L	28	258	36-1,539	28	73	14-509	1,735	331,488	191	4-1,650	1,983	650-3,200	25	0-54
			S	4	697	29-1,961	4	77	12-181	219	101,570	464	2-3,969	-	-	-	-
			All	32	312	29-1,961	32	73	12-509	1,954	433,057	222	2-3,969	1,983	650-3,200	25	0-54
		P	L	46	140	11-440	46	68	11-193	912	118,070	129	1-2,995	1,303	400-2,000	23	12-48
			S	7	588	52-1,785	7	89	24-200	316	103,134	326	7-3,788	700	600-900	8	1-12
			All	53	199	11-1,785	53	70	11-200	1,228	221,204	180	1-3,788	1,255	400-2,000	21	1-48
		R	L	14	84	12-373	14	67	12-240	363	45,790	126	1-1,273	856	67-2,000	12	12-12
			S	20	616	38-2,698	20	128	36-302	271	135,563	500	6-4,686	1,272	100-4,500	4	1-12
			All	34	397	12-2,698	34	103	12-302	634	181,353	286	1-4,686	1,106	67-4,500	8	1-12
		C	L	22	129	36-407	22	117	36-272	455	52,103	115	9-642	1,732	500-3,000	23	12-28
			S	20	1,147	17-6,533	20	162	17-500	433	262,541	606	3-9,543	503	200-1,000	11	1-24
			All	42	613	17-6,533	42	138	17-500	888	314,644	354	3-9,543	1,146	200-3,000	17	1-28
		S	L	8	115	40-186	8	53	40-81	229	14,999	65	5-260	1,188	600-1,800	27	13-48
			S	11	212	31-710	11	32	13-60	452	85,966	190	4-3,750	305	100-500	2	0-5
			All	19	171	31-710	19	41	13-81	681	100,965	148	4-3,750	676	100-1,800	13	0-48
		All		180	350	11-6,533	180	90	11-509	5,385	1,251,222	232	1-9,543	1,217	67-4,500	18	0-54

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2008	Nov	A	L	20	129	23-457	20	61	11-302	1,003	166,953	166	5-1,628	1,489	600-2,400	38	24-48
			S	1	93	-	1	23	-	178	38,630	217	5-4,963	600	-	6	-
			All	21	127	23-457	21	59	11-302	1,181	205,583	174	5-4,963	1,400	600-2,400	34	6-48
		P	L	15	88	29-183	15	39	9-94	209	18,242	87	1-494	1,138	100-1,800	33	12-48
			S	4	400	83-928	4	92	45-150	299	88,552	296	6-4,603	1,000	600-1,800	9	0-12
			All	19	153	29-928	19	50	9-150	508	106,794	210	1-4,603	1,106	100-1,800	28	0-48
		R	L	1	24	-	1	24	-	96	10,901	114	9-1,189	-	-	-	-
			S	20	1,720	22-4,343	20	206	22-550	222	80,148	361	4-6,680	645	200-1,000	2	0-12
			All	21	1,639	22-4,343	21	198	22-550	318	91,048	286	4-6,680	645	200-1,000	2	0-12
		C	L	1	115	-	1	115	-	55	7,237	132	8-1,560	1,000	-	24	-
			S	11	1,208	26-3,712	11	199	26-500	290	211,195	728	3-8,523	435	200-700	11	0-48
			All	12	1,117	26-3,712	12	192	26-500	345	218,432	633	3-8,523	482	200-1,000	12	0-48
		S	L	3	66	23-140	3	35	23-48	112	13,742	123	10-1,649	1,033	700-1,200	24	24-24
			S	5	693	314-1,185	5	69	26-97	261	85,822	329	2-5,775	200	200-200	0	0-1
			All	8	458	23-1,185	8	56	23-97	373	99,564	267	2-5,775	513	200-1,200	9	0-24
		All		81	705	22-4,343	81	112	9-550	2,725	721,421	265	1-8,523	835	100-2,400	17	0-48
	Dec	A	L	0	-	-	0	-	-	61	10,073	165	11-1,319	-	-	-	-
			S	1	104	-	1	50	-	272	59,232	218	7-3,165	-	-	-	-
			All	1	104	-	1	50	-	333	69,305	208	7-3,165	-	-	-	-
		P	L	0	-	-	0	-	-	2	400	200	28-372	-	-	-	-
			S	11	324	11-2,479	11	53	4-150	245	34,935	143	2-2,492	1,280	500-2,900	20	1-24
			All	11	324	11-2,479	11	53	4-150	247	35,335	143	2-2,492	1,280	500-2,900	20	1-24
		R	L	0	-	-	0	-	-	3	230	77	60-101	-	-	-	-
			S	7	157	52-365	7	107	52-181	193	40,147	208	7-1,661	487	300-600	2	1-3
			All	7	157	52-365	7	107	52-181	196	40,377	206	7-1,661	487	300-600	2	1-3
		C	L	0	-	-	0	-	-	2	302	151	146-156	-	-	-	-
			S	7	274	104-696	7	177	70-431	64	29,065	454	31-1,687	574	250-650	2	1-3
			All	7	274	104-696	7	177	70-431	66	29,367	445	31-1,687	574	250-650	2	1-3
		S	L	0	-	-	0	-	-	6	3,764	627	62-1,173	-	-	-	-
			S	6	232	81-547	6	66	50-91	73	16,448	225	9-1,047	317	200-600	2	0-3
			All	6	232	81-547	6	66	50-91	79	20,212	256	9-1,173	317	200-600	2	0-3
		All		32	253	11-2,479	32	94	4-431	921	194,596	211	2-3,165	776	200-2,900	8	0-24
	All	A	L	125	149	15-1,539	125	55	4-509	10,112	1,380,222	136	1-7,095	1,485	400-3,200	27	0-72
			S	31	528	11-2,370	31	64	8-200	4,103	1,036,309	253	1-9,210	964	400-2,600	21	0-48
			All	156	224	11-2,370	156	56	4-509	14,215	2,416,531	170	1-9,210	1,400	400-3,200	26	0-72
		P	L	210	107	6-464	210	63	6-399	4,929	463,284	94	1-3,332	1,602	100-5,600	23	0-48
			S	123	363	11-3,469	122	75	4-312	3,513	828,170	236	1-7,550	1,085	200-3,800	16	0-48

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2008	All	P	All	333	201	6-3,469	332	67	4-399	8,442	1291454	153	1-7,550	1,425	100-5,600	20	0-48
		R	L	114	84	5-373	114	75	5-289	2,760	258,374	94	1-1,645	984	67-3,000	21	0-72
			S	99	652	5-4,343	99	122	5-550	2,249	645,920	287	2-6,680	729	100-4,500	6	0-24
			All	213	348	5-4,343	213	97	5-550	5,009	904,294	181	1-6,680	875	67-4,500	15	0-72
		C	L	171	128	9-762	171	93	9-272	4,274	396,194	93	2-3,436	2,377	200-5,333	23	12-48
			S	59	782	17-6,533	59	151	17-500	1,401	668,866	477	3-9,543	518	150-1,000	8	0-48
			All	230	296	9-6,533	230	108	9-500	5,675	1065059	188	2-9,543	1,881	150-5,333	19	0-48
		S	L	59	90	16-332	59	61	16-115	1,740	116,245	67	2-1,649	1,085	200-2,000	21	1-48
			S	51	294	31-1,419	51	52	13-108	1,613	327,686	203	2-5,775	254	100-1,250	3	0-24
			All	110	185	16-,1419	110	56	13-115	3,353	443,931	132	2-,5775	700	100-2,000	13	0-48
		All		1,042	254	5-6,533	1,041	80	4-550	36,694	6,121,269	167	1-9,543	1,342	67-5,600	18	0-72
2009	Jan	A	L	1	9	-	1	9	-	72	7,057	98	7-881	480	-	48	-
			S	0	-	-	0	-	-	437	90,580	207	8-1,056	-	-	-	-
			All	1	9	-	1	9	-	509	97,637	192	7-1,056	480	-	48	-
		P	L	0	-	-	0	-	-	21	3,946	188	16-1,010	-	-	-	-
			S	1	91	-	1	91	-	121	16,039	133	7-2,232	800	-	12	-
			All	1	91	-	1	91	-	142	19,985	141	7-2,232	800	-	12	-
		R	L	0	-	-	0	-	-	20	1,157	58	7-179	-	-	-	-
			S	0	-	-	0	-	-	116	32,752	282	5-3,500	-	-	-	-
			All	0	-	-	0	-	-	136	33,909	249	5-3,500	-	-	-	-
		C	S	0	-	-	0	-	-	49	21,979	449	22-5,315	-	-	-	-
			All	0	-	-	0	-	-	49	21,979	449	22-5,315	-	-	-	-
		S	L	0	-	-	0	-	-	12	2,293	191	6-781	-	-	-	-
			S	2	104	90-118	2	46	40-52	65	11,269	173	10-1,922	500	400-600	1	1-1
			All	2	104	90-118	2	46	40-52	77	13,562	176	6-1,922	500	400-600	1	1-1
		All		4	77	9-118	4	48	9-91	913	187,071	205	5-5,315	570	400-800	16	1-48
	Feb	A	L	0	-	-	0	-	-	218	28,773	132	4-920	-	-	-	-
			S	0	-	-	0	-	-	573	152,969	267	6-2,100	-	-	-	-
			All	0	-	-	0	-	-	791	181,742	230	4-2,100	-	-	-	-
		P	L	0	-	-	0	-	-	21	2,399	114	2-845	-	-	-	-
			S	1	374	-	1	23	-	209	58,099	278	3-5,650	-	-	-	-
			All	1	374	-	1	23	-	230	60,498	263	2-5,650	-	-	-	-
		R	L	10	160	62-271	10	151	38-271	93	12,109	130	2-914	1,280	266-2,000	34	24-48
			S	7	310	31-863	7	108	20-167	133	49,125	369	5-4,130	829	400-1,400	17	8-24
			All	17	222	31-863	17	133	20-271	226	61,234	271	2-4,130	1,111	266-2,000	28	8-48
		C	L	0	-	-	0	-	-	1	130	130	130-130	-	-	-	-
			S	0	-	-	0	-	-	29	6,860	237	11-844	-	-	-	-

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2009	Apr	C	All	0	-	-	0	-	-	30	6,990	233	11-844	-	-	-	-
		S	L	1	231	-	1	50	-	49	2,317	47	3-231	200	-	24	-
			S	3	291	200-387	3	45	35-50	53	11,751	222	5-1,092	200	200-200	2	2-2
			All	4	276	200-387	4	47	35-50	102	14,068	138	3-1,092	200	200-200	7	2-24
		All		22	238	31-863	22	113	20-271	1,379	324,531	235	2-5,650	929	200-2,000	23	2-48
	Mar	A	L	20	317	40-794	20	66	30-150	619	120,666	195	6-2,218	1,100	1,000-1,600	39	12-96
			S	4	169	100-293	4	69	33-97	556	166,828	300	8-1,492	800	800-800	24	24-24
			All	24	293	40-794	24	67	30-150	1,175	287,494	245	6-2,218	1,080	800-1,600	38	12-96
		P	L	0	-	-	0	-	-	34	4,604	135	9-296	-	-	-	-
			S	10	343	51-621	10	53	25-116	249	53,477	215	1-1,600	600	400-1,000	8	1-12
			All	10	343	51-621	10	53	25-116	283	58,081	205	1-,1600	600	400-1,000	8	1-12
		R	L	34	175	3-1,261	34	99	3-326	578	56,891	98	2-782	1,062	50-2,500	25	7-48
			S	6	75	32-191	6	32	12-55	166	39,625	239	3-2,999	967	250-2,400	12	12-12
			All	40	160	3-1,261	40	89	3-326	744	96,515	130	2-2,999	1,054	50-2,500	24	7-48
		C	L	0	-	-	0	-	-	7	1,703	243	3-790	-	-	-	-
			S	0	-	-	0	-	-	36	14,575	405	11-4,050	-	-	-	-
			All	0	-	-	0	-	-	43	16,278	379	3-4,050	-	-	-	-
		S	L	7	182	85-328	7	65	36-104	114	11,315	99	10-328	200	200-200	24	24-24
			S	2	118	112-123	2	44	21-67	51	7,076	139	8-533	200	200-200	2	2-2
			All	9	167	85-328	9	60	21-104	165	18,391	111	8-533	200	200-200	19	2-24
		All		83	221	3-1,261	83	75	3-326	2,410	476,760	198	1-4,050	907	50-2,500	25	1-96
	Apr	A	L	2	132	30-235	2	46	16-76	927	156,129	168	5-5,150	-	-	-	-
			S	2	400	269-531	2	96	82-109	446	86,440	194	6-1,998	900	900-900	-	-
			All	4	266	30-531	4	71	16-109	1,373	242,569	177	5-5,150	900	900-900	-	-
		P	L	1	47	-	1	12	-	79	7,338	93	4-559	1,000	-	24	-
			S	23	239	14-776	23	65	7-250	657	141,865	216	3-4,700	985	400-2,200	27	1-72
			All	24	231	14-776	24	63	7-250	736	149,203	203	3-4,700	986	400-2,200	27	1-72
		R	L	7	72	24-198	7	54	24-70	445	28,238	63	5-457	1,011	266-3,000	22	12-24
			S	2	25	8-41	2	23	8-38	197	25,526	130	3-2,341	500	500-500	12	12-12
			All	9	62	8-198	9	47	8-70	642	53,763	84	3-2,341	938	266-3,000	21	12-24
		C	L	0	-	-	0	-	-	107	10,009	94	1-459	-	-	-	-
			S	0	-	-	0	-	-	112	25,738	230	8-980	-	-	-	-
			All	0	-	-	0	-	-	219	35,748	163	1-980	-	-	-	-
		S	L	6	137	83-226	6	57	32-83	169	18,599	110	6-646	1,492	200-2,050	22	20-24
			S	0	-	-	0	-	-	99	12,697	128	8-808	-	-	-	-
			All	6	137	83-226	6	57	32-83	268	31,296	117	6-808	1,492	200-2,050	22	20-24
		All		43	186	8-776	43	59	7-250	3,238	512,578	158	1-5,150	1,060	200-3,000	25	1-72

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2009	May	A	L	2	190	77-302	2	43	29-58	600	80,500	134	1-2,423	2,500	2,000-3,000	30	12-48
			S	3	264	227-298	3	37	10-51	326	67,299	206	3-3,011	1,000	1,000-1,000	24	24-24
			All	5	234	77-302	5	39	10-58	926	147,799	160	1-3,011	1,600	1,000-3,000	26	12-48
		P	L	23	107	13-262	23	93	13-230	185	19,718	107	1-1,240	2,447	700-3,000	24	24-24
			S	14	307	22-857	14	80	7-282	432	92,835	215	3-2,050	883	700-1,500	14	12-24
			All	37	182	13-857	37	88	7-282	617	112,553	182	1-2,050	1,842	700-3,000	22	12-24
		R	L	8	69	35-110	8	69	35-110	262	21,362	82	3-297	1,386	200-3,000	32	12-48
			S	22	114	28-325	22	87	12-288	328	38,695	118	3-1,526	531	200-1,000	4	2-12
			All	30	102	28-325	30	82	12-288	590	60,057	102	3-1,526	846	200-3,000	17	2-48
		C	L	23	118	27-375	23	94	27-153	671	70,157	105	1-566	2,719	800-3,000	24	24-24
			S	1	1,188	-	1	150	-	56	9,840	176	18-1,249	500	-	-	-
			All	24	162	27-1,188	24	97	27-153	727	79,997	110	1-1,249	2,618	500-3,000	24	24-24
		S	L	4	128	103-172	4	86	51-118	194	16,227	84	8-576	1,938	1,600-2,050	22	20-23
			S	3	130	82-192	3	89	66-122	101	13,779	136	15-625	967	700-1,500	7	1-20
			All	7	129	82-192	7	87	51-122	295	30,007	102	8-625	1,521	700-2,050	16	1-23
		All		103	153	13-1,188	103	86	7-288	3,155	430,413	136	1-3,011	1,779	200-3,000	21	1-48
	Jun	A	L	9	93	10-312	9	35	8-115	784	71,276	91	1-2,066	1,625	1,000-3,000	27	12-45
			S	3	506	85-913	2	189	50-328	195	36,412	187	2-2,311	-	-	-	-
			All	12	196	10-913	11	63	8-328	979	107,688	110	1-2,311	1,625	1,000-3,000	27	12-45
		P	L	21	104	3-304	21	69	3-172	356	28,137	79	4-838	2,418	250-6,000	22	12-24
			S	14	381	20-3,254	14	94	14-223	341	68,414	201	2-3,254	1,034	200-2,960	9	3-12
			All	35	215	3-3,254	35	79	3-223	697	96,551	139	2-3,254	1,883	200-6,000	19	3-24
		R	L	9	54	11-168	9	54	11-168	376	29,491	78	3-399	925	400-1,400	21	12-24
			S	7	104	13-243	7	77	13-134	255	29,938	117	2-1,397	570	400-750	10	2-24
			All	16	76	11-243	16	64	11-168	631	59,428	94	2-1,397	728	400-1,400	15	2-24
		C	L	29	92	39-315	29	75	39-137	757	57,234	76	3-343	2,804	2,000-3,000	24	24-24
			S	4	390	27-1,153	4	51	26-100	49	12,384	253	10-1,884	450	400-600	2	1-3
			All	33	128	27-1,153	33	72	26-137	806	69,618	86	3-1,884	2,500	400-3,000	22	1-24
		S	L	9	56	14-95	9	42	14-56	308	19,477	63	2-325	1,133	200-1,600	21	12-24
			S	5	115	68-153	5	76	39-89	96	11,217	117	2-805	520	200-800	1	1-2
			All	14	77	14-153	14	54	14-89	404	30,693	76	2-805	914	200-1,600	14	1-24
		All		110	149	3-3,254	109	70	3-328	3,517	363,979	103	1-3,254	1,817	200-6,000	19	1-45
	Jul	A	L	5	33	13-57	5	20	13-32	843	69,219	82	2-673	1,050	1,000-1,100	12	11-12
			S	2	543	483-602	2	51	45-58	151	30,977	205	4-2,765	500	500-500	-	-
			All	7	178	13-602	7	29	13-58	994	100,196	101	2-2,765	867	500-1,100	12	11-12
		P	L	39	79	16-316	39	58	16-176	675	53,897	80	3-599	2,215	550-3,000	22	12-24
			S	21	322	30-1,244	21	91	23-169	345	125,677	364	3-5,958	1,008	500-1,800	3	1-5

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2009	Jul	P	All	60	164	16-1,244	60	69	16-176	1,020	179,574	176	3-5,958	1,798	500-3,000	18	1-24
		R	L	15	63	21-119	15	55	20-114	429	34,627	81	6-2,019	1,320	700-3,000	12	12-12
			S	2	559	59-1,059	2	80	59-100	179	29,943	167	3-2,006	900	800-1,000	2	1-2
			All	17	121	21-1,059	17	58	20-114	608	64,569	106	3-2,019	1,200	700-3,000	9	1-12
		C	L	13	55	18-112	13	55	18-112	409	23,889	58	3-294	1,715	1,000-3,000	24	24-24
			S	2	106	96-116	2	81	66-96	61	10,098	166	1-686	325	300-350	4	3-4
			All	15	61	18-116	15	58	18-112	470	33,987	72	1-686	1,530	300-3,000	21	3-24
		S	L	5	90	68-116	5	44	35-51	224	11,041	49	3-1,717	1,140	800-1,600	20	12-23
			S	1	94	-	1	94	-	89	8,526	96	10-385	200	-	2	-
			All	6	91	68-116	6	53	35-94	313	19,566	63	3-1,717	983	200-1,600	17	2-23
		All		105	139	13-1,244	105	62	13-176	3,405	397,892	117	1-5,958	1,613	200-3,000	18	1-24
	Aug	A	L	12	89	14-153	12	35	12-87	823	83,400	101	3-953	1,411	1,000-2,000	15	12-24
			S	4	160	67-299	4	30	5-55	169	32,523	192	3-1,465	500	500-500	-	-
			All	16	106	14-299	16	34	5-87	992	115,923	117	3-1,465	1,183	500-2,000	15	12-24
		P	L	46	113	9-908	46	76	8-424	788	76,680	97	3-566	2,026	467-3,000	21	1-72
			S	19	422	121-1,405	19	108	15-174	505	289,688	574	5-3,780	811	200-2,000	6	1-24
			All	65	203	9-1,405	65	86	8-424	1,293	366,368	283	3-3,780	1,738	200-3,000	18	1-72
		R	L	17	93	39-173	17	93	39-173	420	34,761	83	8-398	1,878	1,400-2,000	17	12-24
			S	3	66	45-83	3	66	45-83	176	51,949	295	10-6,933	600	600-600	4	4-4
			All	20	89	39-173	20	89	39-173	596	86,710	145	8-6,933	1,750	600-2,000	16	4-24
		C	L	14	54	20-168	14	49	20-131	450	32,783	73	3-279	1,475	650-3,000	23	12-24
			S	3	173	140-207	3	57	50-71	110	35,623	324	5-2,746	350	350-350	4	2-6
			All	17	75	20-207	17	51	20-131	560	68,406	122	3-2,746	1,276	350-3,000	20	2-24
		S	L	11	102	24-226	11	64	24-122	296	19,693	67	6-478	1,200	600-2,500	20	1-24
			S	0	-	-	0	-	-	137	15,262	111	4-416	-	-	-	-
			All	11	102	24-226	11	64	24-122	433	34,955	81	4-478	1,200	600-2,500	20	1-24
		All		129	148	9-1,405	129	73	5-424	3,874	672,361	174	3-6,933	1,552	200-3,000	18	1-72
		A	L	17	143	12-735	17	85	9-475	1,569	183,184	117	1-1,261	1,886	450-6,000	21	12-48
			S	2	808	358-1,258	2	102	54-150	193	57,069	296	1-1,604	-	-	-	-
			All	19	213	12-1,258	19	87	9-475	1,762	240,254	136	1-1,604	1,886	450-6,000	21	12-48
		P	L	42	99	15-306	42	58	12-146	993	113,127	114	1-678	1,677	150-3,000	24	12-72
			S	8	698	79-1,858	8	117	35-232	282	139,892	496	1-7,670	783	400-1,500	5	2-9
			All	50	195	15-1,858	50	67	12-232	1,275	253,019	198	1-7,670	1,563	150-3,000	23	2-72
		R	L	24	97	24-214	24	92	24-214	492	51,217	104	4-1,397	1,733	600-3,333	18	12-24
			S	16	210	30-936	16	123	5-367	171	36,771	215	4-1,530	684	142-2,000	3	0-9
			All	40	142	24-936	40	104	5-367	663	87,988	133	4-1,530	1,307	142-3,333	12	0-24
		C	L	18	125	32-424	18	93	32-155	515	47,222	92	3-341	1,059	1,000-2,000	25	24-48

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2009	Sep	C	S	1	395	-	1	65	-	145	52,465	362	7-2,445	400	-	12	-
			All	19	139	32-424	19	91	32-155	660	99,687	151	3-2,445	1,022	400-2,000	25	12-48
		S	L	11	99	15-233	11	52	15-105	407	31,507	77	5-487	1,340	500-1,800	15	12-24
			S	2	115	99-131	2	39	19-59	162	20,666	128	4-1,523	225	150-300	3	1-4
			All	13	102	15-233	13	50	15-105	569	52,174	92	4-1,523	1,154	150-1,800	13	1-24
		All		141	166	12-1,858	141	82	5-475	4,929	733,121	149	1-7,670	1,402	142-6,000	19	0-72
	Oct	A	L	19	180	23-593	19	74	9-317	2,107	372,412	177	1-1,844	1,689	500-3,000	28	12-48
			S	0	-	-	0	-	-	277	89,809	324	1-4,411	-	-	-	-
			All	19	180	23-593	19	74	9-317	2,384	462,220	194	1-4,11	1,689	500-3,000	28	12-48
		P	L	16	130	49-295	16	79	34-164	829	125,641	152	1-1,577	1,744	600-3,000	25	12-48
			S	6	2,137	25-6,095	6	140	25-300	329	216,641	658	6-13,056	450	200-600	5	1-12
			All	22	677	25-6,095	22	96	25-300	1,158	342,282	296	1-13,056	1,485	200-3,000	22	1-48
		R	L	16	136	30-397	16	122	30-252	485	58,269	120	9-2,460	1,193	400-3,433	15	0-24
			S	18	1,010	29-7,653	18	146	29-274	334	215,452	645	3-8,812	759	300-2,200	1	0-6
			All	34	599	29-7,653	34	135	29-274	819	273,721	334	3-8,812	966	300-3,433	8	0-24
		C	L	10	108	24-318	10	95	24-219	378	51,213	135	4-5,000	1,070	700-2,000	25	12-48
			S	18	764	28-3,208	18	113	28-255	374	259,654	694	5-11,469	500	250-800	7	1-24
			All	28	530	24-3,208	28	107	24-255	752	310,867	413	4-11,469	704	250-2,000	14	1-48
		S	L	2	69	45-94	2	45	45-46	275	22,173	81	5-319	900	900-900	24	24-24
			S	2	209	178-239	2	21	20-22	499	106,230	213	2-3,750	150	100-200	3	3-3
			All	4	139	45-239	4	33	20-46	774	128,403	166	2-3,750	400	100-900	10	3-24
		All		107	505	23-7,653	107	105	9-317	5,887	1,517,493	258	1-13,056	1,119	100-3,433	17	0-48
	Nov	A	L	26	149	12-429	26	64	10-252	1,109	176,891	160	2-1,335	1,608	800-3,000	48	24-72
			S	1	3,749	-	1	46	-	233	81,947	352	8-5,445	-	-	-	-
			All	27	282	12-3,749	27	64	10-252	1,342	258,838	193	2-5,445	1,608	800-3,000	48	24-72
		P	L	0	-	-	0	-	-	23	8,847	385	32-5,538	-	-	-	-
			S	8	534	66-2,383	8	72	23-150	198	69,322	350	1-2,419	1,740	1,200-2,000	12	12-12
			All	8	534	66-2,383	8	72	23-150	221	78,169	354	1-5,538	1,740	1,200-2,000	12	12-12
		R	L	3	42	16-70	3	35	16-70	78	8,463	109	12-572	1,100	1,000-1,200	12	12-12
			S	16	888	26-3,338	16	164	26-318	217	106,892	493	6-5,396	450	200-800	2	0-12
			All	19	754	16-3,338	19	143	16-318	295	115,355	391	6-5,396	550	200-1,200	4	0-12
		C	L	5	62	34-115	5	62	34-115	147	12,756	87	6-556	860	300-1,200	29	24-48
			S	7	1,041	60-2,074	7	139	15-255	164	126,345	770	8-10,108	337	200-600	1	1-1
			All	12	633	34-2,074	12	107	15-255	311	139,101	447	6-10,108	555	200-1,200	13	1-48
		S	L	4	104	23-223	4	39	7-68	184	14,452	79	5-394	863	325-1,400	13	12-14
			S	4	872	298-1,938	4	139	43-208	208	54,901	264	2-9,175	350	200-600	1	0-2
			All	8	488	23-1,938	8	89	7-208	392	69,353	177	2-9,175	521	200-1,400	5	0-14

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2009	Nov	All		74	510	12-3,749	74	95	7-318	2,561	660,817	258	1-10,108	950	200-3,000	13	0-72
	Dec	A	L	0	-	-	0	-	-	183	18,681	102	10-1,015	-	-	-	-
			S	1	101	-	1	51	-	226	35,546	157	4-1,305	-	-	-	-
			All	1	101	-	1	51	-	409	54,227	133	4-1,305	-	-	-	-
		P	L	2	33	18-48	2	24	14-35	17	781	46	17-125	2,000	2,000-2,000	12	12-12
			S	10	127	10-261	10	69	10-138	243	32,419	133	10-1,118	1,557	1,100-1,800	15	12-24
			All	12	111	10-261	12	61	10-138	260	33,200	128	10-1,118	1,613	1,100-2,000	15	12-24
		R	L	0	-	-	0	-	-	3	429	143	56-229	-	-	-	-
			S	13	244	10-1,195	13	97	10-517	176	39,581	225	4-2,203	733	400-1,100	8	0-24
			All	13	244	10-1,195	13	97	10-517	179	40,010	224	4-2,203	733	400-1,100	8	0-24
		C	L	0	-	-	0	-	-	5	275	55	20-91	-	-	-	-
			S	1	262	-	1	169	-	58	22,570	389	19-1,868	700	-	1	-
			All	1	262	-	1	169	-	63	22,845	363	19-1,868	700	-	1	-
		S	L	0	-	-	0	-	-	5	313	63	4-173	-	-	-	-
			S	0	-	-	0	-	-	85	21,483	253	5-1,782	-	-	-	-
			All	0	-	-	0	-	-	90	21,796	242	4-1,782	-	-	-	-
		All		27	180	10-1,195	27	82	10-517	1,001	172,077	172	4-2,203	1,102	400-2,000	11	0-24
	All	A	L	113	166	9-794	113	61	8-475	9,854	1,368,188	139	1-5,150	1,542	450-6,000	30	11-96
			S	22	499	67-3,749	21	70	5-328	3,782	928,397	245	1-5,445	744	500-1,000	24	24-24
			All	135	221	9-3,749	134	62	5-475	13,636	2,296,586	168	1-5,445	1,454	450-6,000	29	11-96
		P	L	190	101	3-908	190	69	3-424	4,021	445,114	111	1-5,538	2,039	150-6,000	23	1-72
			S	135	428	10-6,095	135	86	7-300	3,911	1,304,367	334	1-13,056	986	200-2,960	14	1-72
			All	325	237	3-6,095	325	76	3-424	7,932	1,749,481	221	1-13,056	1,651	150-6,000	20	1-72
		R	L	143	114	3-1,261	143	91	3-326	3,681	337,013	92	2-2,460	1,318	50-3,433	22	0-48
			S	112	412	8-7,653	112	110	5-517	2,448	696,247	284	2-8,812	660	142-2,400	6	0-24
			All	255	245	3-7,653	255	99	3-517	6,129	1,033,260	169	2-8,812	1,041	50-3,433	16	0-48
		C	L	112	94	18-424	112	77	18-219	3,447	307,372	89	1-5,000	1,951	300-3,000	24	12-48
			S	37	680	27-3,208	37	106	15-255	1,243	598,131	481	1-11,469	445	200-800	5	1-24
			All	149	239	18-3,208	149	85	15-255	4,690	905,504	193	1-11,469	1,564	200-3,000	20	1-48
		S	L	60	109	14-328	60	55	7-122	2,237	169,407	76	2-1,717	1,133	200-2,500	20	1-24
			S	24	271	68-1,938	24	72	19-208	1,645	294,858	179	2-9,175	410	100-1,500	2	0-20
			All	84	156	14-1,938	84	60	7-208	3,882	464,265	120	2-9,175	916	100-2,500	15	0-24
		All		948	230	3-7,653	947	80	3-517	36,269	6,449,095	178	1-1,3056	1,395	50-6,000	19	0-96
2010	Jan	A	L	1	96	-	1	53	-	332	28,157	85	2-491	200	-	6	-
			S	0	-	-	0	-	-	465	108,246	233	6-5,681	-	-	-	-
			All	1	96	-	1	53	-	797	136,403	171	2-5,681	200	-	6	-
		P	L	0	-	-	0	-	-	54	3,752	69	4-164	-	-	-	-

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2010	Jan	P	S	4	327	67-518	4	76	50-103	117	22,944	196	5-1,483	1,500	1,500-1,500	12	12-12
			All	4	327	67-518	4	76	50-103	171	26,696	156	4-1,483	1,500	1,500-1,500	12	12-12
		R	L	0	-	-	0	-	-	22	1,712	78	28-244	-	-	-	-
			S	5	362	26-1,099	5	84	26-188	166	44,378	267	5-2,462	775	750-800	12	1-24
			All	5	362	26-1,099	5	84	26-188	188	46,090	245	5-2,462	775	750-800	12	1-24
		C	L	0	-	-	0	-	-	7	426	61	27-122	-	-	-	-
			S	0	-	-	0	-	-	41	15,721	383	50-1,190	-	-	-	-
			All	0	-	-	0	-	-	48	16,147	336	27-1,190	-	-	-	-
		S	L	1	104	-	1	37	-	30	1,854	62	5-153	375	-	24	-
			S	4	272	100-584	4	55	30-99	107	25,907	242	13-2,513	225	200-300	1	0-2
			All	5	238	100-584	5	51	30-99	137	27,761	203	5-,2513	255	200-375	6	0-24
		All		15	294	26-1,099	15	69	26-188	1,341	253,096	189	2-5,681	503	200-1,500	9	0-24
	Feb	A	L	10	223	28-446	10	87	28-180	762	78,428	103	6-728	1,056	700-1,800	38	24-72
			S	1	147	-	1	77	-	368	82,114	223	4-1,920	-	-	-	-
			All	11	216	28-446	11	86	28-180	1,130	160,542	142	4-1,920	1,056	700-1,800	38	24-72
		P	L	2	156	114-197	2	50	47-53	15	886	59	22-96	800	700-900	24	24-24
			S	4	144	83-238	4	37	14-56	107	40,876	382	6-4,686	1,350	1,350-1,350	24	24-24
			All	6	148	83-238	6	41	14-56	122	41,762	342	6-4,686	983	700-1,350	24	24-24
		R	L	3	441	422-466	3	257	207-289	30	3,421	114	17-383	1,800	1,800-1,800	32	24-48
			S	20	220	47-468	20	155	47-347	166	32,251	194	2-1,635	836	500-1,550	22	2-24
			All	23	249	47-468	23	168	47-347	196	35,672	182	2-1,635	1,006	500-1,800	24	2-48
		C	L	0	-	-	0	-	-	5	1,037	207	57-393	-	-	-	-
			S	0	-	-	0	-	-	58	18,732	323	31-3,990	-	-	-	-
			All	0	-	-	0	-	-	63	19,769	314	31-3,990	-	-	-	-
		S	L	3	58	52-64	3	48	34-58	51	1,904	37	4-117	417	375-500	24	24-24
			S	3	393	54-940	3	62	48-89	91	20,242	222	5-1,020	600	300-750	16	1-24
			All	6	226	52-940	6	55	34-89	142	22,145	156	4-1,020	508	300-750	20	1-24
		All		46	225	28-940	46	117	14-347	1,653	279,889	169	2-4,686	931	300-1,800	26	1-72
	Mar	A	L	11	276	34-748	11	96	24-287	1,932	331,589	172	2-1,527	883	400-1,800	27	12-48
			S	2	246	34-458	2	66	15-117	619	283,119	457	13-9,160	450	200-700	21	18-24
			All	13	271	34-748	13	91	15-287	2,551	614,707	241	2-9,160	775	200-1,800	25	12-48
		P	L	4	145	76-207	4	65	26-100	121	10,803	89	2-810	500	300-700	12	12-12
			S	16	264	28-744	16	55	28-121	436	166,000	381	4-7,569	1,100	200-1,500	23	12-48
			All	20	240	28-744	20	57	26-121	557	176,803	317	2-7,569	1,029	200-1,500	23	12-48
		R	L	53	110	9-533	53	95	9-323	680	53,044	78	2-436	800	100-2,400	19	1-48
			S	9	265	22-734	9	85	22-195	123	37,233	303	7-4,050	800	600-1,400	1	1-2
			All	62	133	9-734	62	93	9-323	803	90,277	112	2-4,050	800	100-2400	18	1-48

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2010	Mar	C	L	0	-	-	0	-	-	21	973	46	8-126	-	-	-	-
			S	0	-	-	0	-	-	84	28,770	343	19-1,958	-	-	-	-
			All	0	-	-	0	-	-	105	29,743	283	8-1,958	-	-	-	-
		S	L	6	143	58-245	6	40	32-54	169	15,301	91	5-413	620	500-800	23	20-24
			S	2	438	134-742	2	41	32-50	39	5,144	132	6-923	200	150-250	1	0-1
			All	8	216	58-742	8	40	32-54	208	20,445	98	5-923	515	150-800	18	0-24
		All		103	178	9-748	103	82	9-323	4,224	931,974	221	2-9,160	817	100-2,400	19	0-48
	Apr	A	L	10	103	34-240	10	58	16-122	1,215	171,739	141	7-758	633	450-1,000	12	12-12
			S	7	312	44-599	7	92	31-175	290	63,688	220	12-3,323	800	800-800	12	12-12
			All	17	189	34-599	17	72	16-175	1,505	235,427	156	7-3,323	675	450-1,000	12	12-12
		P	L	4	68	58-80	4	58	40-73	201	19,660	98	7-1,062	2,550	1,200-3,000	24	24-24
			S	13	253	77-899	13	78	49-155	763	226,236	297	1-7,450	925	300-1,600	18	12-48
			All	17	209	58-899	17	73	40-155	964	245,896	255	1-7,450	1,331	300-3,000	20	12-48
		R	L	2	137	121-154	2	137	121-154	170	10,773	63	5-282	600	600-600	12	12-12
			S	5	132	50-292	5	111	28-292	147	24,669	168	1-1,959	1,100	600-1,600	7	1-12
			All	7	134	50-292	7	118	28-292	317	35,442	112	1-1,959	850	600-1,600	9	1-12
		C	L	16	86	5-272	16	77	5-272	153	11,060	72	5-664	2,088	600-3,000	23	12-24
			S	3	499	93-1,109	3	79	50-129	138	37,287	270	10-1,561	550	200-1,000	9	4-12
			All	19	151	5-1,109	19	77	5-272	291	48,347	166	5-1,561	1,845	200-3,000	20	4-24
		S	L	5	107	58-149	5	64	37-107	117	11,581	99	7-399	1,460	800-1,700	24	24-24
			S	1	153	-	1	56	-	68	9,806	144	5-1,902	150	-	1	-
			All	6	114	58-153	6	63	37-107	185	21,387	116	5-1,902	1,242	150-1,700	20	1-24
		All		66	171	5-1,109	66	78	5-292	3,262	586,500	180	1-7,450	1,427	150-3,000	19	1-48
	May	A	L	0	-	-	0	-	-	213	16,262	76	4-395	-	-	-	-
			S	9	341	43-632	9	86	27-139	233	38,983	167	4-1,788	1,040	800-1,200	12	12-12
			All	9	341	43-632	9	86	27-139	446	55,245	124	4-1,788	1,040	800-1,200	12	12-12
		P	L	7	268	95-549	7	106	90-132	174	22,329	128	8-733	2,000	2,000-2,000	12	12-12
			S	8	210	41-448	8	70	29-139	482	152,954	317	4-4,619	600	500-700	12	12-12
			All	15	237	41-549	15	87	29-139	656	175,283	267	4-4,619	1,222	500-2,000	12	12-12
		R	L	1	87	-	1	87	-	119	7,601	64	8-383	1,900	-	12	-
			S	4	133	25-308	4	72	25-118	153	25,847	169	2-1,395	300	200-400	-	-
			All	5	124	25-308	5	75	25-118	272	33,448	123	2-1,395	833	200-1,900	12	12-12
		C	L	13	103	26-233	13	76	26-151	207	16,748	81	3-537	1,823	1,000-2,000	12	12-12
			S	0	-	-	0	-	-	49	8,747	179	10-611	-	-	-	-
			All	13	103	26-233	13	76	26-151	256	25,494	100	3-611	1,823	1,000-2,000	12	12-12
		S	L	6	86	37-150	6	58	23-79	86	3,624	42	2-163	1,057	100-1,300	19	0-24
			S	1	100	-	1	21	-	77	9,754	127	5-1,289	650	-	1	-

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2010	May	S	All	7	88	37-150	7	52	21-79	163	13,378	82	2-1,289	999	100-1,300	16	0-24
		All		49	188	25-632	49	78	21-151	1,793	302,848	169	2-4,619	1,335	100-2,000	13	0-24
	Jun	A	L	1	63	-	1	34	-	246	13,847	56	2-908	1,500	-	12	-
			S	3	206	58-350	3	42	19-54	177	32,327	183	6-1,942	525	250-800	6	0-12
			All	4	170	58-350	4	40	19-54	423	46,174	109	2-1,942	850	250-1,500	8	0-12
		P	L	10	99	48-185	10	70	18-131	247	24,350	99	8-352	1,971	1,800-2,000	12	12-12
			S	12	574	44-1,338	12	103	24-180	513	277,428	541	7-3,840	967	400-1,600	10	1-48
			All	22	358	44-1,338	22	88	18-180	760	301,779	397	7-3,840	1,337	400-2,000	11	1-48
		R	L	3	6	4-11	3	6	4-11	106	5,173	49	6-133	600	600-600	10	10-11
			S	2	119	20-217	2	97	20-175	90	17,067	190	7-1,528	-	-	-	-
			All	5	51	4-217	5	43	4-175	196	22,240	113	6-1,528	600	600-600	10	10-11
		C	L	27	127	15-376	27	83	15-166	423	32,242	76	1-295	1,763	667-2,000	12	12-12
			S	2	64	50-78	2	64	50-78	54	17,240	319	18-1,630	450	450-450	4	3-4
			All	29	122	15-376	29	81	15-166	477	49,482	104	1-1,630	1,665	450-2,000	11	3-12
		S	L	2	67	41-92	2	67	41-92	85	3,460	41	5-162	550	300-800	11	10-12
			S	1	389	-	1	67	-	67	6,893	103	8-499	650	-	2	-
			All	3	174	41-389	3	67	41-92	152	10,352	68	5-499	583	300-800	8	2-12
		All		63	205	4-1,338	63	77	4-180	2,008	430,026	214	1-3,840	1,390	250-2,000	11	0-48
	Jul	A	L	1	36	-	1	36	-	302	19,521	65	4-1,220	-	-	-	-
			S	2	63	63-64	2	48	47-50	218	57,683	265	3-2,031	-	-	-	-
			All	3	54	36-64	3	44	36-50	520	77,204	148	3-2,031	-	-	-	-
		P	L	9	97	23-215	9	81	23-215	335	27,459	82	4-587	1,775	1,100-2,000	12	11-12
			S	29	656	103-1,775	29	121	25-243	528	280,877	532	12-5,358	1,346	400-2,200	4	0-7
			All	38	523	23-1,775	38	111	23-243	863	308,336	357	4-5,358	1,400	400-2,200	5	0-12
		R	L	7	53	23-71	7	53	23-71	125	6,487	52	5-146	950	900-1,000	12	12-12
			S	6	492	121-844	6	173	69-307	72	17,349	241	5-1,168	800	600-1,100	4	1-9
			All	13	256	23-844	13	108	23-307	197	23,836	121	5-1,168	843	600-1,100	5	1-12
		C	L	2	52	29-76	2	31	12-50	94	7,002	74	5-392	1,000	1,000-1,000	12	12-12
			S	0	-	-	0	-	-	106	33,766	319	9-1,892	-	-	-	-
			All	2	52	29-76	2	31	12-50	200	40,768	204	5-1,892	1,000	1,000-1,000	12	12-12
		S	L	0	-	-	0	-	-	83	3,170	38	4-166	-	-	-	-
			S	0	-	-	0	-	-	89	14,190	159	7-618	-	-	-	-
			All	0	-	-	0	-	-	172	17,360	101	4-618	-	-	-	-
		All		56	419	23-1,775	56	104	12-307	1,952	467,505	240	3-5,358	1,293	400-2,200	5	0-12
	Aug	A	L	3	108	55-145	3	63	55-76	541	44,368	82	2-948	-	-	-	-
			S	2	829	268-1,390	2	82	50-113	168	50,716	302	4-1,677	-	-	-	-
			All	5	396	55-1,390	5	71	50-113	709	95,084	134	2-1,677	-	-	-	-

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2010	Aug	P	L	18	63	13-169	18	49	11-90	577	58,067	101	4-401	1,587	500-2,000	12	12-12
			S	34	858	116-2,735	34	142	18-329	620	375,037	605	8-3,949	1,213	300-2,000	3	0-8
			All	52	583	13-2,735	52	110	11-329	1,197	433,104	362	4-3,949	1,346	300-2,000	7	0-12
		R	L	17	73	24-172	17	73	24-172	169	10,494	62	4-223	1,358	200-2,000	11	11-12
			S	13	283	46-1,042	13	136	23-273	199	48,029	241	4-1,391	1,022	400-2,200	2	1-5
			All	30	164	24-1,042	30	100	23-273	368	58,523	159	4-1,391	1,157	200-2,200	7	1-12
		C	L	1	24	-	1	24	-	106	7,576	71	11-476	2,000	-	12	-
			S	3	380	61-578	3	65	46-100	125	35,454	284	15-1,477	333	300-400	1	1-1
			All	4	291	24-578	4	55	24-100	231	43,031	186	11-1,477	750	300-2,000	5	1-12
		S	L	1	34	-	1	34	-	120	4,987	42	3-210	700	-	10	-
			S	1	47	-	1	43	-	125	16,978	136	8-1,229	300	-	4	-
			All	2	41	34-47	2	39	34-43	245	21,965	90	3-1,229	500	300-700	7	4-10
		All		93	414	13-2,735	93	101	11-329	2,750	651,707	237	2-3,949	1,237	200-2,200	7	0-12
	Sep	A	L	6	113	20-275	6	55	20-84	977	113,751	116	1-1118	1,350	1,000-2,000	11	8-12
			S	2	1,375	450-2,300	2	75	50-100	86	31,546	367	11-2,300	400	400-400	-	-
			All	8	428	20-2,300	8	60	20-100	1,063	145,296	137	1-2,300	1,160	400-2,000	11	8-12
		P	L	37	181	21-527	37	104	21-352	798	100,631	126	7-530	1,419	300-2,000	16	11-24
			S	6	544	35-,1202	6	161	35-300	257	115,005	447	4-3,760	770	250-2,000	6	1-8
			All	43	231	21-1,202	43	112	21-352	1,055	215,636	204	4-3,760	1,338	250-2,000	15	1-24
		R	L	23	81	25-253	23	69	13-205	299	26,359	88	17-330	1,003	600-2,000	12	11-13
			S	14	327	31-1,604	14	94	11-219	174	47,376	272	13-2,165	433	200-600	2	2-2
			All	37	174	25-1,604	37	79	11-219	473	73,735	156	13-21,65	813	200-2,000	10	2-13
		C	L	19	103	36-205	19	90	36-172	267	28,870	108	6-337	1,853	1,000-2,000	12	12-12
			S	4	316	87-897	4	78	55-100	105	32,373	308	12-1,905	300	200-400	6	1-12
			All	23	140	36-897	23	88	36-172	372	61,243	165	6-1,905	1,583	200-2,000	11	1-12
		S	L	2	77	36-118	2	33	15-50	147	6,869	47	6-175	550	100-1,000	5	1-10
			S	5	155	73-221	5	39	22-62	158	30,166	191	10-1,800	470	200-750	4	0-10
			All	7	133	36-221	7	37	15-62	305	37,035	121	6-1,800	493	100-1,000	4	0-10
		All		118	203	20-2,300	118	89	11-352	3,268	532,945	163	1-3,760	1,187	100-2,000	12	0-24
	Oct	A	L	14	184	30-487	14	59	17-115	1,179	177,382	150	1-1,630	1,689	800-3,000	20	12-24
			S	9	1,222	137-3,561	8	146	37-280	163	82,424	506	21-3,561	200	200-200	-	-
			All	23	590	30-3,561	22	91	17-280	1,342	259,806	194	1-3,561	1,418	200-3,000	20	12-24
		P	L	58	222	35-953	58	93	19-323	1,346	216,926	161	1-1,915	1,362	500-4,000	22	12-48
			S	4	2,103	112-4,447	4	188	50-300	344	137,173	399	7-4,447	533	400-800	3	3-3
			All	62	344	35-4,447	62	99	19-323	1,690	354,099	210	1-4,447	1,318	400-4,000	22	3-48
		R	L	13	174	51-570	13	138	51-288	250	23,802	95	12-654	1,338	1,150-1,400	12	12-12
			S	14	514	61-1,485	14	145	50-330	124	61,190	493	10-7,732	666	300-1,700	3	1-12

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2010	Oct	R	All	27	351	51-1,485	27	142	50-330	374	84,991	227	10-7,732	845	300-1,700	8	1-12
		C	L	22	126	36-224	22	123	36-205	356	43,348	122	13-525	1,561	933-2,000	12	12-12
			S	14	427	22-1,920	14	95	22-220	409	175,339	429	6-3,847	436	200-600	11	1-24
			All	36	243	22-1,920	36	112	22-220	765	218,688	286	6-3,847	1,123	200-2,000	11	1-24
		S	L	5	104	9-259	5	58	9-118	227	15,814	70	5-358	840	100-1,100	9	1-12
			S	6	47	6-110	6	20	6-44	221	28,352	128	3-1,301	354	1-1,000	3	1-12
			All	11	73	6-259	11	37	6-118	448	44,166	99	3-1,301	575	1-1,100	6	1-12
		All		159	339	6-4,447	158	104	6-330	4,619	961,749	208	1-7,732	1,155	1-4,000	15	1-48
	Nov	A	L	6	160	78-296	6	64	31-110	801	82,120	103	4-1,130	1,640	1,000-2,000	24	12-48
			S	2	1,931	,	2	145	58-232	209	62,624	300	7-3,560	550	550-550	24	24-24
			All	8	602	78-3,560	8	85	31-232	1,010	144,745	143	4-3,560	1,458	550-2,000	24	12-48
		P	L	31	107	14-473	31	55	8-198	511	58,096	114	4-2,698	1,108	650-2,500	38	12-72
			S	4	142	9-290	4	33	7-100	311	160,330	516	1-9,200	1,825	750-2,900	24	24-24
			All	35	111	9-473	35	53	7-198	822	218,426	266	1-9,200	1,152	650-2,900	37	12-72
		R	L	2	70	19-121	2	70	19-121	38	3,383	89	5-416	-	-	-	-
			S	17	1,797	102-8,078	17	184	100-321	199	149,197	750	1-7,049	518	200-730	2	0-12
			All	19	1,615	19-8,078	19	172	19-321	237	152,580	644	1-7,049	518	200-730	2	0-12
		C	L	11	148	40-331	11	139	40-299	126	14,353	114	26-418	1,245	800-2,000	13	12-24
			S	20	967	52-4,942	20	134	50-250	358	212,773	594	7-8,437	443	200-730	8	1-24
			All	31	677	40-4,942	31	136	40-299	484	227,127	469	7-8,437	737	200-2,000	10	1-24
		S	L	2	135	114-156	2	69	63-75	120	10,402	87	3-1,746	1,000	1,000-1,000	12	12-12
			S	9	641	11-1,548	9	35	11-87	254	140,778	554	3-10,550	403	125-1,000	2	0-12
			All	11	549	11-1,548	11	41	11-87	374	151,180	404	3-10,550	523	125-1,000	4	0-12
		All		104	638	9-8,078	104	101	7-321	2,927	894,057	305	1-10,550	882	125-2,900	20	0-72
	Dec	A	L	0	-	-	0	-	-	52	3,891	75	6-297	-	-	-	-
			S	1	822	-	1	150	-	175	30,196	173	2-1,137	-	-	-	-
			All	1	822	-	1	150	-	227	34,087	150	2-1,137	-	-	-	-
		P	L	0	-	-	0	-	-	3	636	212	18-513	-	-	-	-
			S	1	2,699	-	1	299	-	76	25,180	331	9-4,668	-	-	-	-
			All	1	2,699	-	1	299	-	79	25,816	327	9-4,668	-	-	-	-
		R	L	0	-	-	0	-	-	3	457	152	103-243	-	-	-	-
			S	3	185	62-266	3	181	62-256	53	17,349	327	7-2,450	-	-	-	-
			All	3	185	62-266	3	181	62-256	56	17,806	318	7-2,450	-	-	-	-
		C	S	0	-	-	0	-	-	50	20,730	415	12-1,351	-	-	-	-
			All	0	-	-	0	-	-	50	20,730	415	12-1,351	-	-	-	-
		S	L	0	-	-	0	-	-	3	1,307	436	49-933	-	-	-	-
			S	5	298	30-643	5	28	11-37	96	42,417	442	13-3,000	245	125-400	1	1-1

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2010	Dec	S	All	5	298	30-643	5	28	11-37	99	43,724	442	13-3,000	245	125-400	1	1-1
		All		10	557	30-2,699	10	113	11-299	511	142,162	278	2-4,668	245	125-400	1	1-1
	All	A	L	63	175	20-748	63	69	16-287	8,552	1,081,054	126	1-1,630	1,242	200-3,000	22	6-72
			S	40	668	34-3,561	39	97	15-280	3,171	923,665	291	2-9,160	664	200-1,200	14	0-24
			All	103	366	20-3,561	102	80	15-287	11,723	2,004,719	171	1-9,160	1,087	200-3,000	20	0-72
		P	L	180	161	13-953	180	81	8-352	4,382	543,596	124	1-2,698	1,412	300-4,000	22	11-72
			S	135	601	9-4,447	135	108	7-329	4,554	1,980,039	435	1-9,200	1,123	200-2,900	10	0-48
			All	315	349	9-4,447	315	93	7-352	8,936	2,523,635	282	1-9,200	1,292	200-4,000	17	0-72
		R	L	124	108	4-570	124	91	4-323	2,011	152,706	76	2-654	946	100-2,400	16	1-48
			S	112	532	20-8,078	112	135	11-347	1,666	521,932	313	1-7,732	715	200-2,200	7	0-24
			All	236	309	4-8,078	236	112	4-347	3,677	674,638	183	1-7,732	841	100-2,400	13	0-48
		C	L	111	114	5-376	111	94	5-299	1,765	163,634	93	1-664	1,735	600-3,000	14	12-24
			S	46	638	22-4,942	46	106	22-250	1,577	636,932	404	6-8,437	428	200-1,000	8	1-24
			All	157	267	5-4,942	157	98	5-299	3,342	800,566	240	1-8,437	1,351	200-3,000	12	1-24
		S	L	33	100	9-259	33	53	9-118	1,238	80,273	65	2-1,746	851	100-1,700	18	0-24
			S	38	320	6-1,548	38	38	6-99	1,392	350,626	252	3-10,550	372	1-1,000	3	0-24
			All	71	218	6-1,548	71	45	6-118	2,630	430,898	164	2-10,550	598	1-1,700	10	0-24
		All		882	315	4-8,078	881	94	4-352	30,308	6,434,457	212	1-10,550	1,119	1-4,000	15	0-72
2011	Jan	A	L	0	-	-	0	-	-	179	17,011	95	3-701	-	-	-	-
			S	6	616	56-1,550	6	67	36-100	514	176,262	343	4-7,633	300	100-500	24	24-24
			All	6	616	56-1,550	6	67	36-100	693	193,272	279	3-7,633	300	100-500	24	24-24
		P	L	0	-	-	0	-	-	2	675	338	89-586	-	-	-	-
			S	0	-	-	0	-	-	56	18,912	338	16-3,233	-	-	-	-
			All	0	-	-	0	-	-	58	19,587	338	16-3,233	-	-	-	-
		R	L	1	92	-	1	91	-	9	334	37	10-84	-	-	-	-
			S	0	-	-	0	-	-	40	12,951	324	11-1,096	-	-	-	-
			All	1	92	-	1	91	-	49	13,285	271	10-1,096	-	-	-	-
		C	S	0	-	-	0	-	-	32	7,691	240	38-1,001	-	-	-	-
			All	0	-	-	0	-	-	32	7,691	240	38-1,001	-	-	-	-
		S	L	0	-	-	0	-	-	7	597	85	10-397	-	-	-	-
			S	5	241	80-361	5	27	6-47	101	35,468	351	29-1,644	233	200-300	0	0-1
			All	5	241	80-361	5	27	6-47	108	36,065	334	10-1,644	233	200-300	0	0-1
		All		12	416	56-1,550	12	52	6-100	940	269,900	287	3-7,633	260	100-500	6	0-24
	Feb	A	L	22	166	64-478	21	57	16-119	552	99,434	180	2-1,411	706	400-1,200	26	12-48
			S	11	445	49-1,020	11	54	4-150	601	223,536	372	2-3,300	650	400-800	12	0-24
			All	33	259	49-1,020	32	56	4-150	1,153	322,970	280	2-3,300	688	400-1,200	23	0-48
		P	L	2	85	55-115	2	29	18-40	1	198	198	198-198	1,200	1,200-1,200	24	24-24

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2011	Feb	P	S	13	183	4-445	12	54	4-100	162	71,850	444	16-5,200	1,040	500-1,600	17	12-24
			All	15	170	4-445	14	51	4-100	163	72,048	442	16-5,200	1,067	500-1,600	18	12-24
		R	L	13	154	4-362	13	130	4-334	107	10,143	95	4-562	1,281	88-1,800	34	23-48
			S	5	706	46-1,727	5	92	46-158	67	24,868	371	4-1,777	525	400-600	6	1-24
			All	18	307	4-1,727	18	119	4-334	174	35,011	201	4-1,777	1,092	88-1,800	27	1-48
		C	S	1	1,175	-	1	121	-	40	15,607	390	20-2,602	300	-	-	-
			All	1	1,175	-	1	121	-	40	15,607	390	20-2,602	300	-	-	-
		S	L	0	-	-	0	-	-	64	3,507	55	12-580	-	-	-	-
			S	0	-	-	0	-	-	33	14,637	444	60-1,111	-	-	-	-
			All	0	-	-	0	-	-	97	18,144	187	12-1,111	-	-	-	-
		All		67	266	4-1,727	65	74	4-334	1,627	463,780	285	2-5,200	888	88-1,800	23	0-48
	Mar	A	L	17	214	23-527	17	67	23-120	1,026	199,169	194	6-2,301	917	300-1,000	46	24-72
			S	4	48	2-112	3	42	37-50	270	97,781	362	5-4,436	600	400-800	32	24-48
			All	21	182	2-527	20	63	23-120	1,296	296,950	229	5-4,436	850	300-1,000	44	24-72
		P	L	1	72	-	1	50	-	14	1,220	87	18-191	1,200	-	-	-
			S	2	222	103-341	2	55	54-56	304	85,963	283	3-2,650	400	400-400	72	72-72
			All	3	172	72-341	3	53	50-56	318	87,183	274	3-2,650	800	400-1,200	72	72-72
		R	L	63	73	13-212	63	73	13-212	666	51,309	77	3-502	511	88-1,800	22	12-48
			S	7	148	17-307	6	115	37-212	112	34,998	312	13-3,000	737	610-900	28	24-36
			All	70	81	13-307	69	76	13-212	778	86,307	111	3-3,000	522	88-1,800	22	12-48
		C	L	0	-	-	0	-	-	6	112	19	7-35	-	-	-	-
			S	3	295	203-409	3	83	50-100	49	11,682	238	13-1,485	500	300-800	24	24-24
			All	3	295	203-409	3	83	50-100	55	11,794	214	7-1,485	500	300-800	24	24-24
		S	L	0	-	-	0	-	-	158	15,849	100	5-580	-	-	-	-
			S	4	99	48-217	4	31	11-73	44	11,788	268	10-1,741	263	50-400	9	1-24
			All	4	99	48-217	4	31	11-73	202	27,637	137	5-1,741	263	50-400	9	1-24
		All		101	112	2-527	99	71	11-212	2,649	509,870	192	3-4,436	583	50-1,800	26	1-72
	Apr	A	L	22	188	70-573	22	78	8-225	1,039	164,563	158	3-2,082	906	500-2,000	29	12-72
			S	6	357	50-1,440	5	110	32-348	288	74,183	258	1-2,773	553	267-700	12	12-12
			All	28	224	50-1,440	27	84	8-348	1,327	238,746	180	1-2,773	822	267-2,000	25	12-72
		P	L	0	-	-	0	-	-	23	4,209	183	11-1,042	-	-	-	-
			S	28	544	25-1,651	28	82	25-241	696	264,568	380	2-4,797	1,079	400-2,000	19	7-24
			All	28	544	25-1,651	28	82	25-241	719	268,777	374	2-4,797	1,079	400-2,000	19	7-24
		R	L	1	28	-	1	18	-	27	1,010	37	10-67	-	-	-	-
			S	2	77	39-114	2	49	39-59	57	6,081	107	1-1,518	400	400-400	7	2-12
			All	3	61	28-114	3	39	18-59	84	7,091	84	1-1,518	400	400-400	7	2-12
		C	L	2	85	32-138	2	47	32-61	39	1,796	46	4-220	1,400	800-2,000	12	12-12

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2011	Apr	C	S	6	250	72-753	6	72	34-87	95	25,231	266	14-1,451	708	300-1,050	12	12-12
			All	8	208	32-753	8	66	32-87	134	27,027	202	4-1,451	881	300-2,000	12	12-12
		S	L	1	35	-	1	24	-	97	9,647	99	11-336	1,000	-	12	-
			S	0	-	-	0	-	-	86	30,635	356	5-1,992	-	-	-	-
			All	1	35	-	1	24	-	183	40,283	220	5-1,992	1,000	-	12	-
		All		68	344	25-1,651	67	78	8-348	2,447	581,924	238	1-4,797	934	267-2,000	19	2-72
	May	A	L	0	-	-	0	-	-	56	12,362	221	1-2,224	-	-	-	-
			S	9	272	50-826	9	52	20-100	226	51,558	228	1-4,047	583	200-800	19	8-48
			All	9	272	50-826	9	52	20-100	282	63,919	227	1-4,047	583	200-800	19	8-48
		P	L	8	131	43-300	8	85	43-135	225	24,837	110	3-1,157	1,800	1,200-2,000	12	12-12
			S	24	500	51-1,391	24	117	37-383	740	298,030	403	1-2,416	1,365	500-2,200	9	2-24
			All	32	407	43-1,391	32	109	37-383	965	322,868	335	1-2,416	1,489	500-2,200	10	2-24
		R	L	4	119	24-276	4	61	24-130	93	5,909	64	1-248	1,500	1,000-2,000	18	12-24
			S	4	129	51-199	4	70	24-128	59	8,369	142	10-1,040	933	400-1,200	2	1-2
			All	8	124	24-276	8	65	24-130	152	14,278	94	1-1,040	1,160	400-2,000	10	1-24
		C	L	25	73	17-166	25	67	16-157	328	19,494	59	7-306	1,672	700-2,000	13	12-36
			S	1	52	-	1	52	-	82	16,499	201	10-1,580	300	-	12	-
			All	26	72	17-166	26	66	16-157	410	35,993	88	7-1,580	1,619	300-2,000	13	12-36
		S	L	0	-	-	0	-	-	135	6,396	47	4-254	-	-	-	-
			S	0	-	-	0	-	-	87	10,109	116	9-689	-	-	-	-
			All	0	-	-	0	-	-	222	16,504	74	4-689	-	-	-	-
		All		75	245	17-1,391	75	83	16-383	2,031	453,562	223	1-4,047	1,432	200-2,200	12	1-48
	Jun	A	L	4	28	17-44	4	21	12-35	114	6,862	60	6-1,184	867	600-1,000	12	12-12
			S	8	249	21-737	8	43	6-104	117	18,695	160	5-781	-	-	-	-
			All	12	176	17-737	12	35	6-104	231	25,556	111	5-1,184	867	600-1,000	12	12-12
		P	L	8	43	12-119	8	39	7-119	411	30,347	74	2-332	1,175	800-2,000	12	12-12
			S	17	613	87-1,236	17	172	26-354	420	155,084	369	12-2,315	1,527	400-2,900	3	0-8
			All	25	431	12-1,236	25	130	7-354	831	185,431	223	2-2,315	1,404	400-2,900	6	0-12
		R	L	0	-	-	0	-	-	193	11,900	62	12-247	-	-	-	-
			S	1	97	-	1	97	-	53	7,833	148	16-790	600	-	1	-
			All	1	97	-	1	97	-	246	19,733	80	12-790	600	-	1	-
		C	L	38	96	23-338	38	76	21-179	418	24,518	59	3-351	1,779	600-2,000	12	12-12
			S	2	356	77-636	2	89	77-100	56	11,386	203	7-1,960	300	300-300	1	1-1
			All	40	109	23-636	40	77	21-179	474	35,904	76	3-1,960	1,705	300-2,000	11	1-12
		S	L	0	-	-	0	-	-	146	7,430	51	1-1,174	-	-	-	-
			S	0	-	-	0	-	-	65	8,880	137	15-1,218	-	-	-	-
			All	0	-	-	0	-	-	211	16,310	77	1-1,218	-	-	-	-

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2011	Jun	All		78	222	12-1,236	78	88	6-354	1,993	282,934	142	1-2,315	1,548	300-2,900	10	0-12
	Jul	A	L	8	57	21-139	8	39	9-81	213	12,881	60	2-382	1,525	1,000-2,000	12	12-12
			S	3	50	26-86	3	21	11-32	177	43,032	243	3-1,427	1,000	1,000-1,000	-	-
			All	11	55	21-139	11	34	9-81	390	55,913	143	2-1,427	1,467	1,000-2,000	12	12-12
		P	L	23	93	15-325	23	72	8-325	569	46,088	81	5-381	1,202	600-2,000	12	8-12
			S	17	545	78-1,376	17	125	26-241	462	228,364	494	5-2,740	1,254	400-1,800	5	1-12
			All	40	285	15-1,376	40	95	8-325	1,031	274,452	266	5-2,740	1,221	400-2,000	10	1-12
		R	L	10	93	19-235	10	85	19-235	175	15,319	88	8-387	1,060	600-2,000	10	6-12
			S	2	85	77-93	2	78	63-93	81	12,806	158	4-712	130	130-130	3	3-3
			All	12	92	19-235	12	84	19-235	256	28,125	110	4-712	905	130-2,000	10	3-12
		C	L	17	61	16-125	17	54	16-102	301	15,879	53	3-255	1,647	600-2,000	12	12-12
			S	0	-	-	0	-	-	68	19,995	294	18-2,397	-	-	-	-
			All	17	61	16-125	17	54	16-102	369	35,873	97	3-2,397	1,647	600-2,000	12	12-12
		S	L	4	52	26-76	4	41	26-62	128	5,877	46	7-390	800	600-1,000	11	10-12
			S	0	-	-	0	-	-	52	5,473	105	12-351	-	-	-	-
			All	4	52	26-76	4	41	26-62	180	11,350	63	7-390	800	600-1,000	11	10-12
		All		84	171	15-1,376	84	75	8-325	2,226	405,713	182	2-2,740	1,272	130-2,000	11	1-12
	Aug	A	L	4	42	29-55	3	40	28-55	209	13,486	65	3-523	1,400	1,000-2,000	12	12-12
			S	4	361	210-523	4	70	50-100	139	41,036	295	5-2,541	650	300-1,000	3	3-3
			All	8	201	29-523	7	57	28-100	348	54,522	157	3-2,541	1,150	300-2,000	10	3-12
		P	L	29	131	15-758	29	90	2-250	568	52,048	92	1-474	1,381	500-2,000	12	2-12
			S	15	765	208-1,261	15	143	60-409	409	225,811	552	1-2,866	1,352	600-2,875	3	0-7
			All	44	347	15-1,261	44	108	2-409	977	277,859	284	1-2,866	1,371	500-2,875	9	0-12
		R	L	22	132	19-628	22	107	19-214	221	23,839	108	16-462	1,453	600-2,000	12	12-12
			S	6	74	15-117	6	48	14-117	123	32,838	267	2-1,457	220	130-500	1	1-1
			All	28	120	15-628	28	94	14-214	344	56,677	165	2-1,457	1,131	130-2,000	11	1-12
		C	L	18	81	15-177	18	77	15-150	244	17,669	72	2-282	1,878	600-2,000	12	12-12
			S	1	178	-	1	57	-	95	16,888	178	17-937	400	-	1	-
			All	19	87	15-178	19	76	15-150	339	34,557	102	2-937	1,800	400-2,000	11	1-12
		S	L	4	148	47-268	4	81	47-110	133	5,703	43	1-272	1,000	1,000-1,000	12	12-12
			S	2	200	165-235	2	24	17-32	62	6,977	113	9-631	520	350-690	2	2-2
			All	6	166	47-268	6	62	17-110	195	12,680	65	1-631	840	350-1,000	9	2-12
		All		105	218	15-1,261	104	92	2-409	2,203	436,295	198	1-2,866	1,352	130-2,875	10	0-12
	Sep	A	L	12	66	21-157	12	54	8-111	300	22,266	74	0-609	1,175	800-2,000	12	11-12
			S	1	2,266	-	1	252	-	96	28,291	295	10-2,397	-	-	-	-
			All	13	236	21-2,266	13	69	8-252	396	50,557	128	0-2,397	1,175	800-2,000	12	11-12
		P	L	39	145	16-397	39	100	16-276	563	76,979	137	3-1,590	1,605	600-2,000	15	12-24

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2011	Sep	P	S	2	741	552-930	2	100	50-150	282	146,743	520	8-2,683	-	-	-	-
			All	41	174	16-930	41	100	16-276	845	223,722	265	3-2,683	1,605	600-2,000	15	12-24
		R	L	7	153	76-200	7	145	76-200	404	65,009	161	5-1,212	1,500	1,000-2,000	20	12-24
			S	1	329	-	1	54	-	41	14,636	357	13-1,273	300	-	3	-
			All	8	175	76-329	8	134	54-200	445	79,645	179	5-1,273	1,100	300-2,000	16	3-24
		C	L	32	101	18-238	32	93	9-226	403	43,476	108	3-536	1,588	1,000-2,000	12	12-24
			S	6	323	41-793	6	52	33-73	310	84,910	274	3-2,242	329	100-700	6	1-12
			All	38	136	18-793	38	86	9-226	713	128,386	180	3-2,242	1,389	100-2,000	11	1-24
		S	L	9	60	15-112	9	44	15-82	203	11,117	55	3-472	778	400-1,000	12	12-12
			S	2	222	24-419	2	11	10-12	335	47,177	141	1-1,150	445	200-690	1	0-1
			All	11	89	15-419	11	38	10-82	538	58,294	108	1-1,150	717	200-1,000	10	0-12
		All		111	160	15-2,266	111	88	8-276	2,937	540,604	184	0-2,683	1,363	100-2,000	13	0-24
	Oct	A	L	13	134	21-821	13	53	21-123	339	31,259	92	3-622	1,445	1,000-2,000	26	12-72
			S	4	1,609	13-5,346	4	79	13-200	271	208,930	771	12-6,976	600	600-600	0	0-0
			All	17	481	13-5,346	17	59	13-200	610	240,189	394	3-6,976	1,375	600-2,000	24	0-72
		P	L	57	146	11-914	57	64	4-207	1,071	131,166	122	6-784	1,223	500-2,600	28	12-48
			S	13	768	36-4,524	13	95	3-205	264	105,890	401	6-3,514	875	300-2,000	6	0-12
			All	70	262	11-4,524	70	70	3-207	1,335	237,056	178	6-3,514	1,186	300-2,600	26	0-48
		R	L	3	75	47-93	3	58	45-83	221	24,577	111	8-795	1,700	1,400-2,000	6	1-12
			S	14	395	72-1,051	14	116	12-315	177	136,441	771	7-8,221	430	200-800	1	1-2
			All	17	339	47-1,051	17	106	12-315	398	161,018	405	7-8,221	793	200-2,000	2	1-12
		C	L	9	165	57-393	9	144	57-268	302	33,554	111	2-619	1,200	1,000-2,000	12	12-12
			S	16	375	20-2,054	16	89	20-191	722	332,799	461	2-6,035	661	200-1,500	10	1-12
			All	25	299	20-2,054	25	109	20-268	1,024	366,353	358	2-6,035	855	200-2,000	11	1-12
		S	L	5	95	45-136	5	91	45-136	144	9,655	67	4-559	800	600-900	12	12-12
			S	3	163	53-370	3	44	14-65	498	99,643	200	1-1,601	325	75-700	1	1-2
		S	All	8	120	45-370	8	73	14-136	642	109,298	170	1-1,601	622	75-900	8	1-12
		All		137	297	11-5,346	137	80	3-315	4,009	1,113,914	278	1-8,221	1,063	75-2,600	19	0-72
	Nov	A	L	10	74	8-181	10	37	8-66	286	23,811	83	2-1,686	950	600-1,600	14	12-24
			S	4	275	98-610	4	95	48-186	186	63,164	340	9-5,208	550	100-1,000	6	0-12
			All	14	132	8-610	14	54	8-186	472	86,975	184	2-5,208	790	100-1,600	11	0-24
		P	L	3	42	10-93	3	41	10-88	164	10,848	66	4-681	1,200	1,000-1,400	24	12-48
			S	18	205	57-476	18	57	7-108	213	55,360	260	2-6,945	1,280	600-2,000	12	6-12
			All	21	182	10-476	21	55	7-108	377	66,208	176	2-6,945	1,268	600-2000	14	6-48
		R	L	0	-	-	0	-	-	29	3,493	120	12-708	-	-	-	-
			S	18	684	12-6,320	18	105	8-315	182	71,838	395	2-6,320	398	200-730	1	0-2
			All	18	684	12-6,320	18	105	8-315	211	75,331	357	2-6,320	398	200-730	1	0-2

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2011	Nov	C	L	0	-	-	0	-	-	120	9,974	83	12-261	-	-	-	-
			S	6	1,664	112-6,114	6	206	112-313	280	91,827	328	6-2,935	650	300-1,400	9	1-12
			All	6	1,664	112-6,114	6	206	112-313	400	101,800	255	6-2,935	650	300-1,400	9	1-12
		S	L	1	31	-	1	31	-	81	4,545	56	1-697	1,000	-	12	-
			S	3	346	83-868	3	106	28-251	289	109,079	377	4-3,407	300	300-300	1	1-1
			All	4	267	31-868	4	87	28-251	370	113,625	307	1-3,407	533	300-1,000	4	1-12
		All		63	461	8-6,320	63	85	7-315	1,830	443,938	243	1-6,945	837	100-2,000	10	0-48
	Dec	A	L	1	52	-	1	52	-	103	16,029	156	7-1,021	500	-	-	-
			S	2	561	224-898	2	49	19-80	271	35,358	130	3-898	600	600-600	-	-
			All	3	391	52-898	3	50	19-80	374	51,387	137	3-1,021	550	500-600	-	-
		P	L	0	-	-	0	-	-	15	4,433	296	19-3,560	-	-	-	-
			S	0	-	-	0	-	-	78	12,991	167	12-1,097	-	-	-	-
			All	0	-	-	0	-	-	93	17,424	187	12-3,560	-	-	-	-
		R	L	0	-	-	0	-	-	2	72	36	11-61	-	-	-	-
			S	1	154	-	1	154	-	46	7,088	154	7-1,217	-	-	-	-
			All	1	154	-	1	154	-	48	7,159	149	7-1,217	-	-	-	-
		C	L	0	-	-	0	-	-	3	468	156	107-254	-	-	-	-
			S	4	101	23-185	4	71	23-121	104	41,071	395	8-3,066	725	500-800	9	1-12
			All	4	101	23-185	4	71	23-121	107	41,539	388	8-3,066	725	500-800	9	1-12
		S	L	0	-	-	0	-	-	1	196	196	196-196	-	-	-	-
			S	2	904	456-1,352	2	150	134-166	117	27,885	238	3-2,995	350	350-350	1	1-2
			All	2	904	456-1,352	2	150	134-166	118	28,081	238	3-2,995	350	350-350	1	1-2
		All		10	354	23-1,352	10	89	19-166	740	145,590	197	3-3,560	588	350-800	6	1-12
	All	A	L	113	137	8-821	111	57	8-225	4,416	619,132	140	0-2,301	1,045	300-2,000	24	11-72
			S	62	450	2-5,346	60	65	4-348	3,156	1,061,824	336	1-7,633	593	100-1,000	15	0-48
			All	175	248	2-5,346	171	60	4-348	7,572	1,680,956	222	0-7,633	923	100-2,000	22	0-72
		P	L	170	128	10-914	170	77	2-325	3,626	383,049	106	1-3,560	1,363	500-2,600	18	2-48
			S	149	513	4-4,524	148	105	3-409	4,086	1,669,565	409	1-6,945	1,241	300-2,900	11	0-72
			All	319	308	4-4,524	318	90	2-409	7,712	2,052,614	266	1-6,945	1,310	300-2,900	15	0-72
		R	L	124	100	4-628	124	89	4-334	2,147	212,913	99	1-1,212	861	88-2,000	20	1-48
			S	61	398	12-6,320	60	97	8-315	1,038	370,747	357	1-8,221	443	130-1,200	6	0-36
			All	185	198	4-6,320	184	91	4-334	3,185	583,660	183	1-8,221	746	88-2,000	17	0-48
		C	L	141	91	15-393	141	80	9-268	2,164	166,939	77	2-619	1,671	600-2,000	12	12-36
			S	46	496	20-6,114	46	95	20-313	1,933	675,585	350	2-6,035	581	100-1,500	9	1-24
			All	187	191	15-6,114	187	83	9-313	4,097	842,524	206	2-6,035	1,403	100-2,000	12	1-36
		S	L	24	78	15-268	24	58	15-136	1,297	80,519	62	1-1,174	842	400-1,000	12	10-12
			S	21	275	24-1,352	21	51	6-251	1,769	407,753	230	1-3,407	331	50-700	3	0-24

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
			All	45	170	15-1,352	45	55	6-251	3,066	488,272	159	1-3,407	623	50-1,000	8	0-24
		All		911	243	2-6,320	905	81	2-409	25,632	5,648,025	220	0-8,221	1,128	50-2,900	15	0-72
2007-2011	Jan	A	L	3	57	9-96	3	42	9-65	1,576	136,662	87	1-3,053	527	200-900	26	6-48
			S	6	616	56-1,550	6	67	36-100	2,021	501,014	248	3-7,633	300	100-500	24	24-24
			All	9	429	9-1,550	9	59	9-100	3,597	637,676	177	1-7,633	436	100-900	26	6-48
		P	L	5	57	6-136	5	57	6-135	187	15,068	81	4-1,010	499	198-800	15	0-48
			S	8	210	67-518	8	62	13-103	587	92,966	158	3-4,100	1,160	200-2,000	18	12-24
			All	13	151	6-518	13	60	6-135	774	108,034	140	3-4,100	971	198-2,000	16	0-48
		R	L	4	72	29-138	4	59	29-91	124	10,138	82	1-806	867	400-1,200	44	13-72
			S	30	240	11-1,099	30	107	11-294	602	144,823	241	4-3,500	607	200-1,200	6	0-24
			All	34	221	11-1,099	34	102	11-294	726	154,961	213	1-3,500	633	200-1,200	9	0-72
		C	L	0	-	-	0	-	-	17	2,217	130	27-861	-	-	-	-
			S	6	783	191-1,543	6	160	70-285	241	97,397	404	5-5,315	633	500-750	2	1-3
			All	6	783	191-1,543	6	160	70-285	258	99,614	386	5-5,315	633	500-750	2	1-3
		S	L	1	104	-	1	37	-	128	8,441	66	3-781	375	-	24	-
			S	13	229	80-584	13	42	6-99	420	112,100	267	4-5,400	273	200-600	1	0-4
			All	14	220	80-584	14	42	6-99	548	120,541	220	3-5,400	281	200-600	3	0-24
		All		76	278	6-1,550	76	83	6-294	5,903	1,120,826	190	1-7,633	586	100-2,000	10	0-72
	Feb	A	L	38	175	28-478	37	65	4-180	3,310	358,312	108	1-2,373	867	400-1,800	28	12-72
			S	12	420	49-1,020	12	56	4-150	2,610	672,435	258	2-3,300	650	400-800	12	0-24
			All	50	234	28-1,020	49	63	4-180	5,920	1,030,747	174	1-3,300	821	400-1,800	26	0-72
		P	L	5	104	40-197	5	40	18-53	250	26,336	105	2-3,332	1,000	700-1,200	24	24-24
			S	35	153	4-513	34	62	4-160	839	226,636	270	3-5,650	1,367	200-3,800	18	12-24
			All	40	147	4-513	39	59	4-160	1,089	252,972	232	2-5,650	1,318	200-3,800	19	12-24
		R	L	50	175	4-466	50	148	4-370	440	53,147	121	2-914	1,177	88-2,000	34	12-72
			S	63	256	1-1,727	63	117	1-347	795	242,460	305	1-4130	669	200-1,700	13	0-48
			All	113	220	1-1,727	113	131	1-370	1,235	295,607	239	1-4130	910	88-2,000	24	0-72
		C	L	0	-	-	0	-	-	9	1,477	164	25-393	-	-	-	-
			S	4	709	58-1,175	4	81	55-121	218	81,569	374	1-3,990	500	300-600	3	1-6
			All	4	709	58-1,175	4	81	55-121	227	83,046	366	1-3,990	500	300-600	3	1-6
		S	L	6	121	52-231	6	54	34-74	325	17,207	53	3-580	333	200-500	24	24-24
			S	10	320	54-940	10	60	35-95	282	76,103	270	5-1,578	320	200-750	7	1-24
			All	16	246	52-940	16	58	34-95	607	93,310	154	3-1,578	325	200-750	14	1-24
		All		223	221	1-1,727	221	97	1-370	9,078	1,755,681	193	1-5,650	899	88-3,800	22	0-72
	Mar	A	L	63	242	23-794	63	69	15-287	6,009	1,015,467	169	1-2,301	1,001	300-1,800	37	12-96
			S	11	140	2-458	10	58	15-117	2,714	925,813	341	5-9,210	613	200-800	27	18-48
			All	74	227	2-794	73	68	15-287	8,723	1,941,280	223	1-9,210	939	200-1,800	35	12-96

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2007-2011	Mar	P	L	18	89	32-254	18	58	26-175	698	53,559	77	1-1,200	733	300-1,200	21	0-24
			S	42	231	11-744	41	49	11-121	1,694	441,360	261	1-7,569	1,035	200-1,800	22	1-72
			All	60	189	11-744	59	52	11-175	2,392	494,919	207	1-7,569	1,003	200-1,800	22	0-72
		R	L	223	108	3-1,261	223	89	3-326	2,948	253,687	86	2-1,540	729	50-2,500	21	1-48
			S	44	202	5-1,814	43	73	5-212	942	243,923	259	3-4,050	761	200-2,400	15	1-48
			All	267	124	3-1,814	266	86	3-326	3,890	497,610	128	2-4,050	734	50-2,500	20	1-48
		C	L	0	-	-	0	-	-	78	5,296	68	3-790	-	-	-	-
			S	4	283	203-409	4	69	27-100	269	71,577	266	6-4,050	575	300-800	24	24-24
			All	4	283	203-409	4	69	27-100	347	76,873	222	3-4,050	575	300-800	24	24-24
		S	L	16	155	50-328	16	53	32-104	750	72,657	97	2-580	358	200-800	24	20-24
			S	12	292	48-742	12	40	11-73	238	47,535	200	6-1,741	221	50-400	4	0-24
			All	28	214	48-742	28	48	11-104	988	120,191	122	2-1,741	299	50-800	15	0-24
		All		433	158	2-1,814	430	76	3-326	16,340	3,130,872	192	1-9,210	749	50-2,500	22	0-96
	Apr	A	L	56	153	20-614	56	67	4-225	4,745	709,602	150	2-7,095	1,108	450-2,200	27	12-72
			S	29	310	11-1,636	28	72	8-348	1,905	450,808	237	1-3,323	823	200-2,600	20	0-48
			All	85	206	11-1,636	84	69	4-348	6,650	1160410	174	1-7,095	1,008	200-2,600	25	0-72
		P	L	19	92	9-330	19	62	9-185	585	54,037	92	4-1,062	1,913	800-3,000	23	12-24
			S	129	335	14-1,714	129	70	7-250	3,633	998,238	275	1-7,450	1,142	300-3,400	23	1-72
			All	148	303	9-1,714	148	69	7-250	4,218	1052274	249	1-7,450	1,235	300-3,400	23	1-72
		R	L	84	82	6-245	84	69	6-224	1,448	103,674	72	4-858	1,118	266-3,000	21	10-72
			S	20	129	8-775	20	66	8-292	852	165,732	195	1-3,497	814	300-2,000	9	0-24
			All	104	91	6-775	104	68	6-292	2,300	269,406	117	1-3,497	1,069	266-3,000	19	0-72
		C	L	40	95	5-291	40	83	5-272	662	53,472	81	1-979	2,073	600-3,000	21	12-24
			S	19	292	67-1,109	19	70	25-129	502	131,123	261	7-1,561	646	200-1,050	10	1-12
			All	59	158	5-1,109	59	79	5-272	1,164	184,596	159	1-1,561	1,613	200-3,000	18	1-24
		S	L	21	119	35-383	21	64	24-115	649	60,175	93	3-646	1,131	200-2,050	22	12-24
			S	6	159	79-278	6	59	27-108	429	83,429	194	3-3,129	367	150-1,250	7	1-24
			All	27	128	35-383	27	63	24-115	1,078	143,604	133	3-3,129	961	150-2,050	18	1-24
		All		423	200	5-1,714	422	70	4-348	15,410	2,810,289	182	1-7,450	1,201	150-3,400	21	0-72
	May	A	L	3	162	77-302	3	35	17-58	1,825	211,693	116	1-2,423	1,933	800-3,000	24	12-48
			S	26	333	6-1,772	26	60	3-139	1,187	244,395	206	1-4,047	825	200-1,200	18	0-48
			All	29	315	6-1,772	29	58	3-139	3,012	456,088	151	1-4,047	1,000	200-3,000	19	0-48
		P	L	57	147	13-549	57	104	13-399	1,181	117,900	100	1-1,240	2,240	400-3,000	20	0-24
			S	73	319	22-1,391	73	84	7-383	2,689	747,815	278	1-4,619	1,071	200-2,200	15	2-48
			All	130	243	13-1,391	130	93	7-399	3,870	865,715	224	1-4,619	1,594	200-3,000	17	0-48
		R	L	23	91	18-289	23	75	18-289	1,072	70,351	66	1-597	1,552	200-3,000	30	12-120
			S	31	120	25-325	31	84	12-288	976	144,204	148	2-2,023	565	200-1,200	3	1-12

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2007-2011	May	R	All	54	108	18-325	54	80	12-289	2,048	214,554	105	1-2,023	1,084	200-3,000	20	1-120
		C	L	96	102	16-375	96	84	16-259	2,286	200,778	88	1-588	2,168	200-3,000	18	12-36
			S	6	252	17-1,188	6	72	17-150	292	51,937	178	6-1,580	400	300-500	4	1-12
			All	102	111	16-1,188	102	84	16-259	2,578	252,715	98	1-1,580	2,060	200-3,000	17	1-36
		S	L	20	97	37-172	20	69	23-118	767	47,307	62	2-576	1,385	100-2,050	22	0-24
			S	7	316	82-1,419	7	65	21-122	433	57,821	134	5-1,808	614	200-1,500	5	1-20
			All	27	154	37-1,419	27	68	21-122	1,200	105,128	88	2-1,808	1,185	100-2,050	17	0-24
		All		342	181	6-1,772	342	83	3-399	12,708	1,894,201	149	1-4,619	1,608	100-3,000	18	0-120
	Jun	A	L	20	62	10-312	20	29	6-115	2,270	201,604	89	1-2,066	1,075	400-3,000	18	12-45
			S	23	313	21-1,155	22	62	6-328	696	133,323	192	2-4,932	663	250-800	15	0-24
			All	43	196	10-1,155	42	46	6-328	2,966	334,927	113	1-4,932	972	250-3,000	17	0-45
		P	L	60	85	3-304	60	61	3-172	1,849	153,438	83	1-2,550	1,881	250-6,000	19	12-48
			S	66	468	20-3,254	66	116	14-354	1,848	635,157	344	2-3,840	1,136	200-2,960	10	0-48
			All	126	286	3-3,254	126	90	3-354	3,697	788,595	213	1-3,840	1,499	200-6,000	15	0-48
		R	L	13	52	4-170	13	47	4-168	1,194	79,862	67	1-441	1,063	400-3,000	17	10-24
			S	10	106	13-243	10	83	13-175	718	105,856	147	2-1,600	575	400-750	8	1-24
			All	23	76	4-243	23	63	4-175	1,912	185,717	97	1-1,600	854	400-3,000	14	1-24
		C	L	137	97	11-376	137	78	11-199	2,931	212,441	72	1-530	2,160	200-3,000	18	12-24
			S	11	270	27-1,153	11	72	26-150	271	60,461	223	3-1,960	391	200-600	2	1-4
			All	148	110	11-1,153	148	78	11-199	3,202	272,901	85	1-1,960	2,025	200-3,000	17	1-24
		S	L	15	54	14-95	15	45	14-92	886	48,053	54	1-1,174	1,127	200-1,600	20	10-24
			S	7	151	68-389	7	73	39-89	382	42,918	112	2-1,218	493	200-800	1	1-2
			All	22	85	14-389	22	54	14-92	1,268	90,971	72	1-1,218	925	200-1,600	14	1-24
		All		362	178	3-3,254	361	76	3-354	13,045	1,673,112	128	1-4,932	1,646	200-6,000	16	0-48
	Jul	A	L	31	68	7-242	31	39	7-81	2,727	238,416	87	1-1,220	1,618	1,000-2,900	16	11-24
			S	14	403	26-1,735	14	58	11-159	813	202,196	249	3-2,765	633	500-1,000	-	-
			All	45	172	7-1,735	45	45	7-159	3,540	440,612	124	1-2,765	1,390	500-2,900	16	11-24
		P	L	116	93	8-356	116	61	6-325	2,796	226,477	81	1-636	1,919	240-3,200	18	8-48
			S	80	551	30-1,775	80	112	23-243	1,704	738,413	433	3-5,958	1,125	250-2,200	3	0-12
			All	196	280	8-1,775	196	82	6-325	4,500	964,890	214	1-5,958	1,596	240-3,200	13	0-48
		R	L	45	68	18-235	45	62	18-235	1,284	95,277	74	2-2,019	1,186	400-3,000	12	2-24
			S	19	561	59-1,884	19	120	34-307	556	121,680	219	2-2,314	579	130-1,100	2	0-9
			All	64	215	18-1,884	64	79	18-307	1,840	216,957	118	2-2,314	949	130-3,000	8	0-24
		C	L	72	74	3-249	72	60	3-118	1,878	119,641	64	2-392	2,235	580-3,000	19	2-24
			S	8	158	28-473	8	61	28-100	375	100,924	269	1-2,397	381	300-400	3	1-4
			All	80	82	3-473	80	60	3-118	2,253	220,565	98	1-2,397	2,047	300-3,000	18	1-24
		S	L	13	75	26-116	13	51	26-92	786	36,418	46	2-1,717	1,054	600-1,600	18	10-24

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2007-2011	Jul	S	S	2	80	67-94	2	71	48-94	395	52,863	134	7-1,755	200	200-200	2	2-2
			All	15	76	26-116	15	54	26-94	1,181	89,282	76	2-1,755	940	200-1,600	16	2-24
		All		400	210	3-1,884	400	72	3-325	13,314	1,932,306	145	1-5,958	1,577	130-3,200	14	0-48
	Aug	A	L	35	66	14-153	34	39	10-87	3,289	313,111	95	2-3,706	1,321	800-2,000	15	12-24
			S	10	374	67-1,390	10	56	5-113	713	182,286	256	3-2,541	560	300-1,000	3	3-3
			All	45	135	14-1,390	44	43	5-113	4,002	495,397	124	2-3,706	1,190	300-2,000	15	3-24
		P	L	160	98	2-908	160	67	2-424	3,159	290,430	92	1-1,375	1,659	100-5,600	18	1-72
			S	95	700	14-3,469	95	130	14-409	2,046	1,060,236	518	1-4,055	1,068	200-2,875	3	0-24
			All	255	322	2-3,469	255	90	2-424	5,205	1,350,667	259	1-4,055	1,464	100-5,600	14	0-72
		R	L	74	91	13-628	74	82	13-214	1,510	122,992	81	3-1,331	1,490	200-3,000	14	0-24
			S	29	282	15-1,042	29	111	14-273	822	233,261	284	2-6,933	650	130-2,200	3	0-12
			All	103	144	13-1,042	103	90	13-273	2,332	356,253	153	2-6,933	1,210	130-3,000	11	0-24
		C	L	78	74	9-244	78	67	9-150	2,034	142,070	70	2-476	2,192	600-5,333	20	12-24
			S	11	266	30-578	11	65	30-105	545	139,353	256	4-2,746	409	300-550	2	1-6
			All	89	97	9-578	89	67	9-150	2,579	281,423	109	2-2,746	1,964	300-5,333	18	1-24
		S	L	26	100	16-268	26	63	16-122	1,049	60,154	57	1-507	1,127	500-2,500	16	1-24
			S	8	120	35-235	8	46	16-83	556	77,749	140	4-1,250	274	150-690	2	1-4
			All	34	105	16-268	34	59	16-122	1,605	137,903	86	1-1,250	926	150-2,500	13	1-24
		All		526	219	2-3,469	525	80	2-424	15,723	2,621,642	167	1-6,933	1,464	100-5,600	14	0-72
	Sep	A	L	68	120	11-735	68	61	8-475	5,195	639,873	123	0-3,222	1,485	400-6,000	19	8-48
			S	8	1,317	96-2,370	8	126	50-252	654	192,754	295	1-4,485	400	400-400	-	-
			All	76	246	11-2,370	76	68	8-475	5,849	832,627	142	0-4,485	1,461	400-6,000	19	8-48
		P	L	181	124	13-527	181	79	9-352	3,753	424,167	113	1-1,590	1,495	75-3,000	20	11-72
			S	27	546	24-1,858	27	122	22-300	1,273	530,996	417	1-7,670	648	200-2,000	3	0-9
			All	208	179	13-1,858	208	84	9-352	5,026	955,163	190	1-7,670	1,408	75-3,000	19	0-72
		R	L	64	106	24-650	64	91	13-307	1,856	204,415	110	2-1,645	1,416	500-3,333	16	11-48
			S	39	393	30-1,895	39	113	5-367	712	192,418	270	3-2,400	636	142-2,000	3	0-9
			All	103	214	24-1,895	103	99	5-367	2,568	396,833	155	2-2,400	1,102	142-3,333	12	0-48
		C	L	125	141	16-762	125	100	9-236	2,384	259,123	109	2-3,436	1,923	800-3,000	19	12-48
			S	19	533	33-2,468	19	109	33-323	809	257,505	318	3-3,677	469	100-1,000	9	1-24
			All	144	193	16-2,468	144	101	9-323	3,193	516,627	162	2-3,677	1,719	100-3,000	18	1-48
		S	L	44	88	15-332	44	55	15-144	1,345	87,507	65	3-624	1,066	100-2,000	16	0-28
			S	18	217	24-802	18	42	10-91	919	139,518	152	1-1,800	341	150-750	3	0-10
			All	62	125	15-802	62	51	10-144	2,264	227,025	100	1-1,800	852	100-2,000	12	0-28
		All		593	191	11-2,468	593	86	5-475	18,900	2,928,275	155	0-7,670	1,391	75-6,000	17	0-72
	Oct	A	L	78	198	21-1,539	78	68	9-509	7,052	1,155,923	164	1-3,018	1,725	500-3,200	26	0-72
			S	20	1,041	13-5,346	19	102	12-280	1,191	571,616	480	1-6,976	483	200-900	24	0-48

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2007-2011	Oct	A	All	98	370	13-5,346	97	75	9-509	8,243	1,727,539	210	1-6,976	1,608	200-3,200	26	0-72
		P	L	230	157	11-953	230	75	4-323	5,200	715,421	138	1-2,995	1,402	300-5,000	24	12-72
			S	37	1,140	25-6,095	37	117	3-300	1,564	729,965	467	1-13,056	652	200-2,000	5	0-12
			All	267	293	11-6,095	267	81	3-323	6,764	1,445,386	214	1-13,056	1,328	200-5,000	23	0-72
		R	L	60	121	12-570	60	98	12-288	1,861	200,461	108	1-2,460	1,191	67-3,433	14	0-30
			S	86	697	29-7,653	86	136	12-405	1,265	739,025	584	3-8,812	783	100-4,500	2	0-12
			All	146	460	12-7,653	146	120	12-405	3,126	939,486	301	1-8,812	936	67-4,500	8	0-30
		C	L	88	122	22-407	88	114	22-272	1,958	222,150	113	1-5,000	1,670	400-3,000	18	12-48
			S	87	637	17-6,533	87	114	17-500	2,282	1,155,823	506	2-1,1469	512	200-1,500	9	1-24
			All	175	378	17-6,533	175	114	17-500	4,240	1,377,973	325	1-1,1469	1,094	200-3,000	14	1-48
		S	L	23	104	9-259	23	63	9-136	1,142	81,731	72	2-559	986	100-1,800	18	1-48
			S	25	151	6-710	25	31	6-65	1,879	348,768	186	1-3,750	306	1-1,000	3	0-12
			All	48	129	6-710	48	46	6-136	3,021	430,499	143	1-3,750	624	1-1,800	10	0-48
		All		734	346	6-7,653	733	94	3-509	25,394	5,920,883	233	1-13,056	1,182	1-5,000	17	0-72
	Nov	A	L	75	176	8-1,401	75	64	8-302	4,991	781,367	157	2-2,418	1,577	600-3,000	30	12-72
			S	8	1,100	93-3,749	8	92	23-232	1,062	288,918	272	1-5,445	558	100-1,000	9	0-24
			All	83	265	8-3,749	83	67	8-302	6,053	1,070,286	177	1-5,445	1,455	100-3,000	27	0-72
		P	L	74	125	10-473	74	61	7-206	1,351	152,488	113	1-5,538	1,415	100-5,000	32	12-72
			S	45	287	9-2,383	45	67	7-150	1,478	470,358	318	1-9,200	1,224	200-2,900	16	0-72
			All	119	186	9-2,383	119	63	7-206	2,829	622,845	220	1-9,200	1,350	100-5,000	27	0-72
		R	L	13	53	11-121	13	50	11-121	597	63,552	106	4-1,189	1,105	333-3,000	26	12-48
			S	88	1,096	12-8,078	88	159	8-550	1,124	489,513	436	1-7,049	559	200-12,00	3	0-12
			All	101	962	11-8,078	101	145	8-550	1,721	553,064	321	1-7,049	609	200-3,000	5	0-48
		C	L	35	176	21-671	35	124	21-299	636	63,903	100	5-1,560	1,803	300-3,000	18	12-48
			S	59	1,069	24-6,114	59	173	15-500	1,380	728,365	528	3-10108	488	200-1,500	7	0-48
			All	94	736	21-6,114	94	155	15-500	2,016	792,268	393	3-10,108	983	200-3,000	11	0-48
		S	L	10	91	23-223	10	43	7-75	616	53,677	87	1-1,746	978	325-1,400	17	12-24
			S	25	596	11-1,938	25	69	11-251	1,355	500,263	369	1-10,550	305	125-1,000	1	0-12
			All	35	452	11-1,938	35	62	7-251	1,971	553,940	281	1-10,550	479	125-1,400	5	0-24
		All		432	524	8-8,078	432	103	7-550	14,590	3,592,403	246	1-10,550	1,036	100-5,000	16	0-72
	Dec	A	L	14	336	44-1,004	14	68	7-157	1,119	142,390	127	5-1,319	1,877	500-3,000	45	24-72
			S	5	430	101-898	5	70	19-150	1,250	206,585	165	2-3,165	600	600-600	-	-
			All	19	361	44-1,004	19	69	7-157	2,369	348,975	147	2-31,65	1,761	500-3,000	45	24-72
		P	L	7	71	18-145	7	45	14-113	62	9,590	155	17-3,560	2,000	2,000-2,000	12	12-12
			S	26	329	10-2,699	26	84	4-415	867	154,253	178	2-4,668	1,333	300-2,900	19	1-48
			All	33	274	10-2,699	33	76	4-415	929	163,843	176	2-4,668	1,368	300-2,900	19	1-48
		R	L	6	45	7-106	6	27	7-55	59	4,978	84	11-323	1,040	100-2,000	17	12-24

Table 5.2a (Continued)

				Fish House Sampling						Commercial Trip Ticket Landings				Fishery Description			
Year	Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Total Number of Trips	Total Weight of Trips (lb)	Mean Weight of Trips (lb/trip)	Weight Range of Trips (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
2007-2011	Dec	R	S	37	187	10-1,195	37	110	10-517	592	121,740	206	4-2,450	718	300-1,500	7	0-24
			All	43	167	7-1,195	43	98	7-517	651	126,718	195	4-2,450	771	100-2,000	9	0-24
		C	L	1	20	-	1	20	-	20	1,425	71	14-254	700	-	12	-
			S	16	284	23-849	16	188	23-573	348	138,172	397	8-3,066	661	250-800	4	1-12
			All	17	268	20-849	17	178	20-573	368	139,597	379	8-3,066	663	250-800	5	1-12
		S	L	0	-	-	0	-	-	32	6,875	215	4-1,173	-	-	-	-
			S	16	360	30-1,352	16	65	11-166	443	132,571	299	3-3,000	364	125-1,000	1	0-3
			All	16	360	30-1,352	16	65	11-166	475	139,445	294	3-3,000	364	125-1,000	1	0-3
		All		128	261	7-2,699	128	95	4-573	4,792	918,577	192	2-4,668	920	100-3,000	13	0-72
	All	A	L	484	162	7-1,539	482	60	4-509	44,108	5,904,420	134	0-7,095	1,367	200-6,000	26	0-96
			S	172	505	2-5,346	168	71	3-348	16,816	4,572,143	272	1-9,210	685	100-2,600	19	0-48
			All	656	252	2-5,346	650	63	3-509	60,924	10,476,563	172	0-9,210	1,229	100-6,000	25	0-96
		P	L	932	121	2-953	932	71	2-424	21,071	2,238,909	106	1-5,538	1,611	75-6,000	22	0-72
			S	663	457	4-6,095	661	93	3-415	20,222	6,826,392	338	1-13,056	1,099	200-3,800	14	0-72
			All	1,595	261	2-6,095	1,593	80	2-424	41,293	9,065,302	220	1-13,056	1,413	75-6,000	19	0-72
		R	L	659	103	3-1,261	659	86	3-370	14,393	1,262,533	88	1-2460	1,044	50-3,433	20	0-120
			S	496	478	1-8,078	495	118	1-550	9,956	2,944,633	296	1-8,812	662	100-4,500	6	0-48
			All	1,155	264	1-8,078	1,154	100	1-550	24,349	4,207,166	173	1-8,812	886	50-4,500	15	0-120
		C	L	672	108	3-762	672	87	3-299	14,893	1,283,992	86	1-5,000	2,036	200-5,333	19	2-48
			S	250	624	17-6,533	250	122	15-573	7,532	3,014,207	400	1-11,469	510	100-1,500	7	0-48
			All	922	248	3-6,533	922	97	3-573	22,425	4,298,199	192	1-11,469	1,616	100-5,333	16	0-48
		S	L	195	99	9-383	195	58	7-144	8,475	580,202	68	1-1,746	1,020	100-2,500	19	0-48
			S	149	291	6-1,938	149	52	6-251	7,731	1,671,637	216	1-10,550	331	1-1,500	3	0-24
			All	344	182	6-1,938	344	55	6-251	16,206	2,251,839	139	1-10,550	723	1-2,500	12	0-48
		All		4,672	252	1-8,078	4,663	84	1-573	165,197	30,299,069	183	0-13,056	1,263	1-6,000	17	0-120

Table 5.2b Summary of sampled commercial estuarine gill net catches including yardage of net fished and soak time from the Albemarle (A), Pamlico (P), Rivers (R), Central (C), and Southern (S) areas by month and mesh size category, January – June 2012. Source: NCDMF fisheries dependent biological database.

			Fish House Sampling						Fishery Description			
Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
Jan	A	L	-	-	-	-	-	-	-	-	-	-
		S	-	-	-	-	-	-	-	-	-	-
		All	-	-	-	-	-	-	-	-	-	-
	P	L	-	-	-	-	-	-	-	-	-	-
		S	1	21	-	1	17	-	-	-	24	-
		All	1	21	-	1	17	-	-	-	24	-
	R	L	2	120	99-140	2	55	10-99	1,115	330-1,900	24	24-24
		S	1	55	-	1	55	-	-	-	-	-
		All	3	98	55-140	3	55	10-99	1,115	330-1,900	24	24-24
	C	L	-	-	-	-	-	-	-	-	-	-
		S	1	88	-	1	88	-	400	-	1	-
		All	1	88	-	1	88	-	400	-	1	-
	S	L	-	-	-	-	-	-	-	-	-	-
		S	2	151	80-221	2	49	19-78	300	200-400	1	1-2
		All	2	151	80-221	2	49	19-78	300	200-400	1	1-2
	All		7	101	21-221	7	52	10-99	646	200-1,900	13	1-24
Feb	A	L	5	88	44-135	5	63	44-102	840	500-1,000	18	12-24
		S	1	383	-	1	66	-	800	-	12	-
		All	6	137	44-383	6	63	44-102	833	500-1,000	17	12-24
	P	L	1	113	-	1	63	-	1,500	-	24	-
		S	1	201	-	1	51	-	800	-	12	-
		All	2	157	113-201	2	57	51-63	1,150	800-1,500	18	12-24
	R	L	27	141	36-434	27	130	36-279	1,202	264-2,000	28	14-48
		S	8	132	24-364	8	112	8-364	1,392	1,000-2,250	28	24-48
		All	35	139	24-434	35	126	8-364	1,236	264-2,250	28	14-48
	C	L	-	-	-	-	-	-	-	-	-	-
		S	1	86	-	1	86	-	200	-	1	-
		All	1	86	-	1	86	-	200	-	1	-
	S	L	-	-	-	-	-	-	-	-	-	-
		S	2	522	357-687	2	51	50-52	350	300-400	1	0-1
		All	2	522	357-687	2	51	50-52	350	300-400	1	0-1
	All		46	155	24-687	46	111	8-364	1,114	200-2,250	24	0-48
Mar	A	L	20	185	74-366	20	63	7-162	912	500-1,200	23	12-48
		S	8	91	12-228	8	23	8-50	500	300-700	19	12-24
		All	28	158	12-366	28	52	7-162	818	300-1,200	22	12-48
	P	L	-	-	-	-	-	-	-	-	-	-
		S	23	130	12-670	22	55	9-236	1,331	600-3,150	23	12-72
		All	23	130	12-670	22	55	9-236	1,331	600-3,150	23	12-72
	R	L	53	96	15-285	53	95	15-275	765	200-2,000	22	12-24
		S	6	43	23-65	6	36	7-65	-	-	-	-
		All	59	90	15-285	59	89	7-275	765	200-2,000	22	12-24
	C	L	-	-	-	-	-	-	-	-	-	-

Table 5.2b (Continued)

			Fish House Sampling						Fishery Description			
Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
Mar	C	S	7	151	23-399	7	63	23-121	586	200-900	14	1-24
		All	7	151	23-399	7	63	23-121	586	200-900	14	1-24
	S	L	1	101	-	1	79	-	90	-	24	-
		S	-	-	-	-	-	-	-	-	-	-
		All	1	101	-	1	79	-	90	-	24	-
	All		118	118	12-670	117	72	7-275	876	90-3,150	22	1-72
Apr	A	L	1	259	-	1	159	-	-	-	-	-
		S	12	162	9-919	12	36	2-119	713	400-800	21	8-24
		All	13	170	9-919	13	45	2-159	713	400-800	21	8-24
	P	L	-	-	-	-	-	-	-	-	-	-
		S	29	237	8-1,282	29	66	8-151	863	400-1,500	22	2-48
		All	29	237	8-1,282	29	66	8-151	863	400-1,500	22	2-48
	R	L	-	-	-	-	-	-	-	-	-	-
		S	3	39	11-56	3	39	11-56	-	-	-	-
		All	3	39	11-56	3	39	11-56	-	-	-	-
	C	L	5	70	16-102	5	60	16-102	1,500	600-2,000	12	12-12
		S	6	208	39-401	6	83	39-108	733	300-1,100	12	12-12
		All	11	145	16-401	11	73	16-108	1,082	300-2,000	12	12-12
	S	L	4	36	15-81	4	35	15-78	500	500-500	12	12-12
		S	-	-	-	-	-	-	-	-	-	-
		All	4	36	15-81	4	35	15-78	500	500-500	12	12-12
	All		60	182	8-1,282	60	59	2-159	858	300-2,000	18	2-48
May	A	L	1	78	-	1	78	-	700	-	12	-
		S	3	263	236-303	3	100	79-121	500	350-800	12	12-12
		All	4	217	78-303	4	95	78-121	550	350-800	12	12-12
	P	L	5	71	49-100	5	59	32-77	1,380	700-2,000	12	11-12
		S	25	342	22-859	25	159	8-342	1,836	400-3,000	9	0-12
		All	30	297	22-859	30	142	8-342	1,748	400-3,000	9	0-12
	R	L	-	-	-	-	-	-	-	-	-	-
		S	7	97	4-275	7	40	4-71	392	200-800	4	1-12
		All	7	97	4-275	7	40	4-71	392	200-800	4	1-12
	C	L	8	69	11-108	8	62	11-108	1,857	1,000-2,000	12	12-12
		S	-	-	-	-	-	-	-	-	-	-
		All	8	69	11-108	8	62	11-108	1,857	1,000-2,000	12	12-12
	S	L	3	38	12-55	3	27	12-52	333	250-500	12	12-12
		S	-	-	-	-	-	-	-	-	-	-
		All	3	38	12-55	3	27	12-52	333	250-500	12	12-12
	All		52	214	4-859	52	106	4-342	1,391	200-3,000	10	0-12
Jun	A	L	16	76	9-250	16	61	9-154	1,450	700-2,000	14	12-48
		S	7	287	96-606	7	72	50-106	675	200-1,300	12	12-12
		All	23	141	9-606	23	64	9-154	1,278	200-2,000	14	12-48
	P	L	45	89	13-275	45	67	13-198	1,187	600-2,200	12	12-12
		S	25	401	19-2,716	25	78	8-274	1,382	400-2,100	5	0-12
		All	70	201	13-2,716	70	71	8-274	1,254	400-2,200	10	0-12
	R	L	-	-	-	-	-	-	-	-	-	-

Table 5.2b (Continued)

			Fish House Sampling						Fishery Description			
Month	Area	Mesh	Number of Trips Sampled	Mean Weight of Trips Sampled (lb/trip)	Weight Range of Trips Sampled (lb)	Number of Trips with Biological Samples	Mean Sample Weight (lb/sample)	Weight Range of Samples (lb)	Mean Yards of Gill Net Fished (yds/trip)	Yardage Range of Gill Nets Fished (yds)	Mean Soak Time of Gill Nets (hrs/trip)	Soak Time Range of Gill Nets (hrs)
Jun	R	S	1	55	-	1	55	-	600	-	2	-
		All	1	55	-	1	55	-	600	-	2	-
	C	L	6	64	8-185	6	52	8-151	1,550	300-2,000	12	12-12
		S	1	228	-	1	50	-	250	-	1	-
		All	7	88	8-228	7	52	8-151	1,364	250-2,000	10	1-12
	S	L	6	35	21-54	6	31	21-47	583	400-1,000	12	10-12
		S	-	-	-	-	-	-	-	-	-	-
		All	6	35	21-54	6	31	21-47	583	400-1,000	12	10-12
	All		107	170	8-2,716	107	66	8-274	1,218	200-2,200	11	0-48
All	A	L	43	133	9-366	43	65	7-162	1,100	500-2,000	18	12-48
		S	31	189	9-919	31	48	2-121	629	200-1,300	17	8-24
		All	74	156	9-919	74	58	2-162	929	200-2,000	18	8-48
	P	L	51	88	13-275	51	66	13-198	1,214	600-2,200	12	11-24
		S	104	276	8-2,716	103	88	8-342	1,336	400-3,150	15	0-72
		All	155	214	8-2,716	154	81	8-342	1,293	400-3,150	14	0-72
	R	L	82	111	15-434	82	106	10-279	925	200-2,000	24	12-48
		S	26	85	4-364	26	62	4-364	869	200-2,250	16	1-48
		All	108	105	4-434	108	95	4-364	917	200-2,250	23	1-48
	C	L	19	68	8-185	19	58	8-151	1,656	300-2,000	12	12-12
		S	16	169	23-401	16	73	23-121	584	200-1,100	11	1-24
		All	35	114	8-401	35	65	8-151	1,151	200-2,000	11	1-24
	S	L	14	40	12-101	14	35	12-79	471	90-1,000	13	10-24
		S	4	336	80-687	4	50	19-78	325	200-400	1	0-2
		All	18	106	12-687	18	38	12-79	438	90-1,000	10	0-24
	All		390	159	4-2,716	389	77	2-364	1,069	90-3,150	17	0-72

Table 5.3 Estuarine gill net landings (lb) and value (dollars) for select species, 2007-2011. Included is the relative contribution of each species to the harvest of each area and overall. Data from the NCDMF Trip Ticket Program.

		2007		2008		2009		2010		2011	
Species	Area	Pounds	% area	Pounds	% area	Pounds	% area	Pounds	% area	Pounds	% area
Atlantic croaker	Albemarle	10,910	0.5	26,645	1.1	9,781	0.4	47,456	2.4	13,623	0.8
	Pamlico	4,693	0.2	24,310	1.0	23,302	1.0	101,475	5.1	9,925	0.6
	Rivers	8,220	0.4	7,927	0.3	13,215	0.6	15,331	0.8	6,345	0.4
	Central	2,804	0.1	5,140	0.2	2,314	0.1	2,128	0.1	8,638	0.5
	Southern	1,757	0.1	3,383	0.1	3,980	0.2	5,435	0.3	7,392	0.4
	State	28,384	0.5	67,405	1.1	52,592	0.8	171,825	2.7	45,923	0.8
	Value	$ 9,219	0.2	$ 38,027	0.6	$ 21,775	0.3	$ 107,331	1.6	$ 27,200	0.5
Black drum	Albemarle	9,502	0.5	71,624	3.0	17,074	0.7	3,696	0.2	2,704	0.2
	Pamlico	42,016	2.0	45,963	1.9	28,948	1.3	18,575	0.9	12,993	0.8
	Rivers	11,856	0.6	34,847	1.4	16,261	0.7	4,230	0.2	6,930	0.4
	Central	33,634	1.6	27,643	1.1	27,601	1.2	9,069	0.5	8,921	0.5
	Southern	10,351	0.5	25,598	1.1	28,660	1.2	5,754	0.3	6,526	0.4
	State	107,358	1.9	205,675	3.4	118,544	1.8	41,323	0.6	38,073	0.7
	Value	$ 36,516.16	0.6	$ 71,664	1.1	$ 51,608	0.8	$ 19,548	0.3	$ 17,984	0.3
Bluefish	Albemarle	64,658	3.1	67,917	2.8	65,445	2.8	33,965	1.7	79,099	4.7
	Pamlico	330,412	15.9	188,681	7.8	290,294	12.6	482,151	24.1	599,092	35.4
	Rivers	18,974	0.9	20,058	0.8	20,261	0.9	11,136	0.6	3,587	0.2
	Central	25,837	1.2	27,768	1.1	33,915	1.5	48,104	2.4	61,822	3.6
	Southern	4,673	0.2	14,505	0.6	10,342	0.5	11,975	0.6	13,867	0.8
	State	444,554	7.9	318,929	5.2	420,256	6.4	587,331	9.1	757,467	13.4
	Value	$ 103,628.12	1.7	$ 96,825	1.5	$ 125,578	2.0	$ 228,841	3.5	$ 298,216	5.8
Flounders	Albemarle	795,011	38.3	920,835	38.1	823,639	35.9	354,246	17.7	67,921	4.0
	Pamlico	243,678	11.7	304,816	12.6	313,892	13.7	381,928	19.1	286,425	16.9
	Rivers	163,217	7.9	158,044	6.5	191,635	8.3	65,075	3.2	130,348	7.7
	Central	178,926	8.6	321,472	13.3	225,790	9.8	119,662	6.0	129,059	7.6
	Southern	74,902	3.6	65,038	2.7	103,007	4.5	37,361	1.9	39,935	2.4
	State	1,455,734	25.8	1,770,204	28.9	1,657,962	25.3	958,271	14.8	653,687	11.5
	Value	$ 3,397,407.12	55.5	$ 3,798,463	57.6	$ 3,160,492	49.5	$ 2,047,208	31.2	$ 1,399,451	27.2
Kingfishes	Albemarle	3,347	0.2	7,431	0.3	7,606	0.3	2,776	0.1	2,728	0.2
	Pamlico	28,119	1.4	67,779	2.8	30,861	1.3	36,430	1.8	28,564	1.7
	Rivers	679	<0.1	2,175	0.1	1,083	<0.1	290	<0.1	199	<0.1
	Central	7,676	0.4	58,191	2.4	17,780	0.8	4,995	0.2	32,134	1.9
	Southern	18,008	0.9	14,926	0.6	4,781	0.2	12,575	0.6	49,155	2.9
	State	57,829	1.0	150,501	2.5	62,111	0.9	57,066	0.9	112,779	2.0
	Value	$ 56,422	0.9	$ 133,482	2.0	$ 67,684	1.1	$ 61,041	0.9	$ 120,652	2.3

Table 5.3 (Continued)

		2007		2008		2009		2010		2011	
Species	Area	Pounds	% area	Pounds	% area	Pounds	% area	Pounds	% area	Pounds	% area
Menhaden/Bait	Albemarle	146,214	7.0	64,418	2.7	113,200	4.9	183,642	9.2	151,238	8.9
	Pamlico	94,259	4.5	68,516	2.8	215,613	9.4	148,471	7.4	115,180	6.8
	Rivers	114,554	5.5	105,048	4.3	61,080	2.7	27,491	1.4	39,742	2.3
	Central	14,891	0.7	36,398	1.5	19,916	0.9	19,056	1.0	20,401	1.2
	Southern	403	<0.1	3,580	0.1	1,934	0.1	753	<0.1	5,365	0.3
	State	370,321	6.6	277,960	4.5	411,742	6.3	379,413	5.9	331,926	5.9
	Value	$ 43,837	0.7	$ 28,946	0.4	$ 40,363	0.6	$ 34,987	0.5	$ 30,608	0.6
Striped Mullet	Albemarle	205,668	9.9	321,033	13.3	240,502	10.5	381,796	19.1	529,271	31.2
	Pamlico	355,286	17.1	268,132	11.1	384,027	16.7	442,284	22.1	252,704	14.9
	Rivers	398,585	19.2	298,295	12.3	372,094	16.2	325,497	16.2	256,532	15.1
	Central	263,140	12.7	399,903	16.5	397,519	17.3	442,368	22.1	294,961	17.4
	Southern	160,853	7.7	147,492	6.1	92,572	4.0	215,824	10.8	149,517	8.8
	State	1,383,531	24.5	1,434,855	23.4	1,486,714	22.7	1,807,768	28.0	1,482,984	26.2
	Value	$ 591,055	9.7	$ 575,036	8.7	$ 625,885	9.8	$ 1,146,142	17.5	$ 928,204	18.0
Red drum	Albemarle	77,767	3.7	107,982	4.5	74,453	3.2	68,803	3.4	6,455	0.4
	Pamlico	69,061	3.3	63,142	2.6	42,202	1.8	75,850	3.8	22,637	1.3
	Rivers	34,013	1.6	18,525	0.8	27,153	1.2	26,669	1.3	10,810	0.6
	Central	31,607	1.5	21,553	0.9	31,236	1.4	32,376	1.6	26,894	1.6
	Southern	12,144	0.6	7,633	0.3	12,581	0.5	12,443	0.6	14,900	0.9
	State	224,592	4.0	218,835	3.6	187,625	2.9	216,141	3.3	81,695	1.4
	Value	$ 326,662	5.3	$ 335,815	5.1	$ 305,376	4.8	$ 401,361	6.1	$ 148,391	2.9
Shad	Albemarle	206,723	9.9	75,265	3.1	115,345	5.0	181,786	9.1	155,302	9.2
	Pamlico	9,231	0.4	3,862	0.2	6,713	0.3	6,727	0.3	868	0.1
	Rivers	49,713	2.4	18,918	0.8	23,579	1.0	17,762	0.9	20,238	1.2
	Central	40	<0.1	92	<0.1	20	<0.1	1,111	0.1	4	<0.1
	Southern	29,463	1.4	15,915	0.7	19,235	0.8	23,723	1.2	22,354	1.3
	State	295,169	5.2	114,051	1.9	164,891	2.5	231,109	3.6	198,765	3.5
	Value	$ 276,895	4.5	$ 164,441	2.5	$ 201,961	3.2	$ 202,329	3.1	$ 179,448	3.5
Spanish mackerel	Albemarle	1,464	0.1	1,224	0.1	10,192	0.4	3,374	0.2	8,881	0.5
	Pamlico	49,878	2.4	61,858	2.6	222,097	9.7	587,104	29.3	505,018	29.8
	Rivers	2,587	0.1	22,499	0.9	30,141	1.3	37,578	1.9	1,443	0.1
	Central	2,100	0.1	1,545	0.1	803	<0.1	1,117	0.1	6,867	0.4
	Southern	1,115	0.1	6,453	0.3	4,321	0.2	2,046	0.1	2,760	0.2
	State	57,144	1.0	93,579	1.5	267,553	4.1	631,218	9.8	524,969	9.3
	Value	$ 84,347	1.4	$ 126,242	1.9	$ 276,367	4.3	$ 854,147	13.0	$ 718,028	13.9
Spot	Albemarle	14,596	0.7	18,551	0.8	31,305	1.4	7,646	0.4	10,259	0.6
	Pamlico	16,939	0.8	28,444	1.2	48,504	2.1	22,160	1.1	26,783	1.6
	Rivers	37,970	1.8	43,251	1.8	54,661	2.4	24,776	1.2	41,623	2.5
	Central	39,166	1.9	83,677	3.5	83,357	3.6	50,695	2.5	209,015	12.3
	Southern	81,739	3.9	104,426	4.3	131,583	5.7	53,706	2.7	139,457	8.2
	State	190,410	3.4	278,349	4.5	349,410	5.3	158,982	2.5	427,138	7.5
	Value	$ 132,799	2.2	$ 171,180	2.6	$ 209,194	3.3	$ 123,756	1.9	$ 332,684	6.5

Table 5.3 (Continued)

Species	Area	2007 Pounds	2007 % area	2008 Pounds	2008 % area	2009 Pounds	2009 % area	2010 Pounds	2010 % area	2011 Pounds	2011 % area
Spotted seatrout	Albemarle	23,974	1.2	23,470	1.0	25,868	1.1	7,982	0.4	4,074	0.2
	Pamlico	85,417	4.1	50,395	2.1	63,875	2.8	28,195	1.4	7,060	0.4
	Rivers	98,998	4.8	105,882	4.4	121,086	5.3	68,010	3.4	11,455	0.7
	Central	60,231	2.9	39,898	1.7	29,410	1.3	28,877	1.4	16,412	1.0
	Southern	13,570	0.7	16,453	0.7	31,006	1.4	32,009	1.6	19,856	1.2
	State	282,190	5.0	236,097	3.9	271,245	4.1	165,072	2.6	58,857	1.0
	Value	$ 394,473	6.4	$ 361,744	5.5	$ 448,292	7.0	$ 320,887	4.9	$ 114,144	2.2
Striped bass	Albemarle	151,055	7.3	60,556	2.5	77,598	3.4	182,212	9.1	122,282	7.2
	Pamlico	7,247	0.3	584	0.0	1,302	0.1	1,886	0.1	730	<0.1
	Rivers	15,977	0.8	8,387	0.3	23,159	1.0	21,976	1.1	27,123	1.6
	Central	12	<0.1	-	-	-	-	-	-	-	-
	Southern	1,601	0.1	831	<0.1	-	-	-	-	-	-
	State	175,892	3.1	70,357	1.1	102,059	1.6	206,074	3.2	150,135	2.7
	Value	$ 383,664	6.3	$ 158,203	2.4	$ 246,761	3.9	$ 569,765	8.7	$ 413,532	8.0
Weakfish	Albemarle	4,694	0.2	6,343	0.3	2,516	0.1	1,046	0.1	679	<0.1
	Pamlico	13,059	0.6	21,297	0.9	30,289	1.3	31,309	1.6	13,441	0.8
	Rivers	2,649	0.1	3,414	0.1	2,220	0.1	634	<0.1	105	<0.1
	Central	5,105	0.2	6,844	0.3	6,590	0.3	4,465	0.2	4,347	0.3
	Southern	1,084	0.1	2,329	0.1	1,415	0.1	722	0.0	2,228	0.1
	State	26,590	0.5	40,226	0.7	43,029	0.7	38,175	0.6	20,799	0.4
	Value	$ 23,582	0.4	$ 36,573	0.6	$ 45,518	0.7	$ 43,155	0.7	$ 24,666	0.5
Total	Albemarle	2,077,771	36.8	2,416,531	39.5	2,296,586	35.1	2,003,385	31.0	1,694,549	29.9
	Pamlico	1,448,182	25.7	1,291,454	21.1	1,843,931	28.2	2,549,451	39.5	2,052,614	36.3
	Rivers	1,010,890	17.9	904,294	14.8	1,033,260	15.8	674,785	10.4	583,076	10.3
	Central	684,545	12.1	1,065,059	17.4	905,504	13.8	800,566	12.4	842,524	14.9
	Southern	424,473	7.5	443,931	7.3	464,265	7.1	430,898	6.7	488,272	8.6
	State	5,645,861	100.0	6,121,269	100.0	6,543,545	100.0	6,459,086	100.0	5,661,034	100.0
	Value	$ 6,120,551		$ 6,596,931		$ 6,385,463		$ 6,559,730		$ 5,148,125	

Table 5.4a Overall marketable species composition of estuarine gill net samples by weight and number for each area and mesh class for 2007. Mesh class n-values represent the number of trips sampled. Data from NCDMF fishery dependent biological database.

	Weight (lb)		Number			
Area/Mesh Class/Species	Mean	Percent	Mean	Percent	Mean Fish Weight (lb)	Percent Occurrence
Albemarle						
Large Mesh n=70						
Southern Flounder	130.8	63.6	90.6	74.5	1.5	74.3
American Shad	26.0	12.7	7.3	6	3.6	12.9
Paralicthid Flounders	17.4	8.4	13.0	10.7	1.3	41.4
Striped Bass	17.3	8.4	2.0	1.7	8.6	34.3
Red Drum	6.1	3	1.4	1.2	4.3	34.3
Common Carp	1.6	0.8	0.2	0.1	10.4	2.9
Bluefish	1.0	0.5	1.1	0.9	1.0	24.3
Hickory Shad	1.0	0.5	0.5	0.4	1.9	4.3
Weakfish	1.0	0.5	1.2	0.9	0.8	34.3
Spot	0.7	0.3	1.6	1.3	0.4	10.0
Sheepshead	0.6	0.3	0.5	0.4	1.3	14.3
Black Drum	0.5	0.2	0.3	0.2	1.8	11.4
Spotted Seatrout	0.3	0.1	0.2	0.1	1.6	12.9
Blue Crab	0.3	0.1	0.7	0.6	0.4	7.1
Horseshoe Crab	0.2	0.1	0.1	<0.1	4.2	5.7
Atlantic Croaker	0.2	0.1	0.2	0.2	1.1	12.9
White Perch	0.1	0.1	0.2	0.2	0.7	2.9
Atlantic Spadefish	0.1	0.1	0.1	0.1	1.1	4.3
Kingfishes	0.1	<0.1	0.1	0.1	1.0	2.9
Southern Kingfish	0.1	<0.1	0.2	0.1	0.4	5.7
Striped Mullet	0.1	<0.1	<0.1	<0.1	4.6	1.4
Harvestfish	0.1	<0.1	0.2	0.2	0.3	4.3
Summer Flounder	0.1	<0.1	<0.1	<0.1	1.4	4.3
Ictalurus Catfishes	<0.1	<0.1	<0.1	<0.1	1.1	4.3
White Catfish	<0.1	<0.1	<0.1	<0.1	0.9	2.9
Crevalle Jack	<0.1	<0.1	<0.1	<0.1	1.0	1.4
Atlantic Mackerel	<0.1	<0.1	<0.1	<0.1	1.1	1.4
Small Mesh n=17						
Striped Mullet	215.9	75.8	177.4	71.2	1.2	64.7
White Mullet	16.2	5.7	16.2	6.5	1.0	5.9
Bluefish	15.7	5.5	13.4	5.4	1.2	47.1
Spot	9.6	3.4	24.1	9.7	0.4	52.9
Mullets	5.3	1.9	4.8	1.9	1.1	5.9
Ictalurus Catfishes	5.1	1.8	3.7	1.5	1.4	29.4
Spotted Seatrout	3.7	1.3	2.1	0.9	1.7	41.2
Striped Bass	2.3	0.8	0.3	0.1	7.8	17.6
Common Carp	2.3	0.8	0.1	<0.1	19.5	5.9
Red Drum	2.0	0.7	0.5	0.2	4.3	23.5
Weakfish	1.6	0.6	1.7	0.7	0.9	23.5
Atlantic Croaker	1.3	0.5	1.5	0.6	0.8	41.2
Southern Flounder	1.1	0.4	0.7	0.3	1.6	17.6
Paralicthid Flounders	0.7	0.2	0.2	0.1	3.0	5.9
Hickory Shad	0.5	0.2	0.5	0.2	1.0	5.9
Southern Kingfish	0.3	0.1	0.3	0.1	1.1	11.8
White Perch	0.3	0.1	0.6	0.2	0.5	11.8
Black Drum	0.3	0.1	0.5	0.2	0.6	5.9
Northern Kingfish	0.3	0.1	0.2	0.1	1.2	5.9
American Shad	0.1	<0.1	0.1	<0.1	2.0	5.9
Yellow Perch	0.1	<0.1	0.1	<0.1	0.6	5.9
Atlantic Mackerel	0.1	<0.1	0.1	<0.1	1.1	5.9
Butterfish	0.1	<0.1	0.2	0.1	0.4	5.9

Table 5.4a (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Pamlico						
Large Mesh n=182						
Southern Flounder	50.4	45.4	24.4	43.1	2.1	88.5
Red Drum	14.8	13.3	3.3	5.9	4.4	72.0
Paralicthid Flounders	14.4	13	9.6	17	1.5	36.3
Bluefish	9.9	8.9	7.8	13.9	1.3	53.3
Black Drum	7.0	6.3	3.1	5.4	2.3	52.2
Sheepshead	3.6	3.3	2.5	4.5	1.4	52.7
Striped Bass	3.1	2.8	0.2	0.3	18.1	3.3
Spotted Seatrout	2.6	2.3	1.2	2.2	2.1	33.0
Gulf Flounder	0.9	0.8	0.6	1.1	1.5	15.9
Striped Mullet	0.8	0.7	0.4	0.7	2.1	7.7
Summer Flounder	0.7	0.6	0.4	0.7	1.7	12.1
Mullets	0.5	0.4	0.4	0.8	1.1	2.2
Weakfish	0.4	0.3	0.3	0.6	1.1	8.8
Florida Pompano	0.3	0.3	0.2	0.3	1.8	12.1
Spot	0.3	0.3	0.8	1.4	0.4	18.7
Horseshoe Crab	0.3	0.3	0.1	0.2	3.0	3.3
Atlantic Spadefish	0.3	0.3	0.3	0.6	0.9	8.8
Atlantic Croaker	0.2	0.2	0.3	0.6	0.6	11.5
Pinfish	0.2	0.1	0.3	0.5	0.6	10.4
Southern Kingfish	0.1	0.1	0.2	0.3	0.7	8.8
Permit	0.1	0.1	<0.1	<0.1	14.1	0.5
Atlantic Tripletail	0.1	0.1	<0.1	<0.1	5.1	1.1
Houndfish	0.1	<0.1	<0.1	<0.1	3.3	1.1
Pigfish	0.1	<0.1	0.1	0.1	0.7	4.4
Ladyfish	<0.1	<0.1	<0.1	<0.1	3.6	0.5
Kingfishes	<0.1	<0.1	<0.1	<0.1	1.1	1.6
Northern Kingfish	<0.1	<0.1	<0.1	<0.1	1.0	0.5
Spanish Mackerel	<0.1	<0.1	<0.1	<0.1	0.6	0.5
Harvestfish	<0.1	<0.1	<0.1	<0.1	0.4	0.5
Pamlico						
Small Mesh n=121						
Bluefish	136.8	38.3	98.5	39.8	1.4	55.4
Striped Mullet	130.3	36.5	84.7	34.2	1.5	27.3
Spotted Seatrout	32.7	9.2	12.8	5.2	2.6	61.2
Spanish Mackerel	17.1	4.8	9.1	3.7	1.9	13.2
Red Drum	9.0	2.5	2.0	0.8	4.6	33.1
Weakfish	4.6	1.3	4.9	2	0.9	38.8
Hickory Shad	3.6	1	3.1	1.2	1.2	19.0
Spot	2.9	0.8	7.7	3.1	0.4	36.4
Black Drum	2.4	0.7	2.1	0.9	1.1	20.7
Pinfish	2.3	0.6	8.0	3.2	0.3	9.9
Striped Bass	2.3	0.6	0.1	<0.1	25.0	3.3
Southern Kingfish	2.0	0.6	2.6	1	0.8	14.9
Kingfishes	1.8	0.5	1.8	0.7	1.0	10.7
American Shad	1.4	0.4	0.4	0.2	3.5	6.6
Southern Flounder	1.4	0.4	0.7	0.3	1.9	16.5
Northern Kingfish	1.3	0.4	1.3	0.5	1.0	13.2
White Perch	1.2	0.3	2.0	0.8	0.6	5.8
Houndfish	1.2	0.3	0.3	0.1	3.8	6.6
Atlantic Croaker	0.5	0.1	0.8	0.3	0.7	15.7
Butterfish	0.5	0.1	2.3	0.9	0.2	13.2
Mullets	0.5	0.1	0.4	0.2	1.1	2.5
Harvestfish	0.3	0.1	1.3	0.5	0.3	5.0
Paralicthid Flounders	0.3	0.1	0.2	0.1	1.5	5.8

Table 5.4a (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Pamlico						
Small Mesh n=121						
White Catfish	0.2	0.1	0.1	<0.1	2.2	1.7
Florida Pompano	0.2	0.1	0.2	0.1	0.9	5.8
Smooth Dogfish	0.1	<0.1	<0.1	<0.1	4.0	0.8
Sheepshead	0.1	<0.1	0.1	<0.1	1.1	3.3
Ictalurus Catfishes	0.1	<0.1	0.1	<0.1	1.1	0.8
Horseshoe Crab	<0.1	<0.1	<0.1	<0.1	3.1	0.8
Caranx Jacks	<0.1	<0.1	<0.1	<0.1	1.0	0.8
Pigfish	<0.1	<0.1	<0.1	<0.1	0.4	0.8
Atlantic Spadefish	<0.1	<0.1	<0.1	<0.1	1.1	0.8
Atlantic Mackerel	<0.1	<0.1	<0.1	<0.1	1.1	0.8
Northern Puffer	<0.1	<0.1	<0.1	<0.1	1.1	0.8
Rivers						
Large Mesh n=154						
American Shad	40.0	38.3	11.2	22.6	3.6	43.5
Southern Flounder	30.2	28.8	19.9	40.2	1.5	76.0
White Catfish	6.6	6.3	2.4	4.9	2.7	34.4
Hickory Shad	5.0	4.7	2.6	5.3	1.9	18.2
Red Drum	4.9	4.7	1.1	2.2	4.5	25.3
Striped Bass	4.3	4.1	0.9	1.9	4.5	24.0
Paralicthid Flounders	2.5	2.4	1.8	3.6	1.4	6.5
Spotted Seatrout	2.3	2.2	1.0	2	2.4	30.5
Black Drum	1.8	1.7	0.7	1.3	2.8	16.9
Spot	1.3	1.3	3.3	6.6	0.4	11.7
Bluefish	1.3	1.2	1.1	2.3	1.1	5.8
Ictalurus Catfishes	1.0	0.9	0.7	1.4	1.3	1.9
Atlantic Croaker	0.6	0.5	1.1	2.2	0.5	11.7
Channel Catfish	0.4	0.4	0.1	0.2	4.8	4.5
Mullets	0.4	0.4	0.4	0.7	1.1	1.9
Sheepshead	0.3	0.3	0.2	0.4	1.5	8.4
Common Carp	0.3	0.3	<0.1	<0.1	15.7	1.3
Longnose Gar	0.2	0.2	0.1	0.1	3.7	0.6
Striped Mullet	0.2	0.2	0.2	0.4	1.1	4.5
Striped Bass X White	0.2	0.2	0.1	0.1	3.8	4.5
Blue Catfish	0.2	0.2	0.1	0.1	2.8	1.9
Horseshoe Crab	0.2	0.1	0.1	0.1	3.0	0.6
Weakfish	0.2	0.1	0.2	0.3	0.9	9.7
Brown Bullhead	0.1	0.1	0.1	0.1	2.0	2.6
Blue Crab	0.1	0.1	0.3	0.5	0.4	0.6
Atlantic Spadefish	0.1	0.1	<0.1	<0.1	4.2	1.9
White Perch	<0.1	<0.1	0.1	0.1	1.1	3.2
Flathead Catfish	<0.1	<0.1	<0.1	<0.1	3.7	1.3
Florida Pompano	<0.1	<0.1	<0.1	0.1	1.2	1.9
Southern Kingfish	<0.1	<0.1	<0.1	0.1	0.5	1.9
Yellow Bullhead	<0.1	<0.1	<0.1	<0.1	2.0	0.6
Alewife	<0.1	<0.1	<0.1	<0.1	0.6	0.6
Kingfishes	<0.1	<0.1	<0.1	<0.1	1.1	0.6
Rivers						
Small Mesh n=112						
Striped Mullet	278.9	73.3	243.7	77.3	1.1	70.5
Spotted Seatrout	73.2	19.3	39.8	12.6	1.9	80.4
Bluefish	4.4	1.2	7.0	2.2	0.6	6.3
Hickory Shad	4.4	1.1	2.7	0.8	1.6	9.8
Spot	2.5	0.7	6.2	2	0.4	18.8
White Perch	2.5	0.7	4.0	1.3	0.6	36.6

Table 5.4a (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Rivers						
Small Mesh n=112						
Red Drum	2.5	0.7	0.7	0.2	3.7	19.6
White Catfish	2.1	0.6	1.8	0.6	1.2	5.4
Black Drum	1.8	0.5	3.2	1	0.6	16.1
Southern Flounder	1.6	0.4	1.1	0.4	1.4	16.1
American Shad	1.3	0.3	0.6	0.2	2.3	5.4
Paralicthid Flounders	1.1	0.3	0.8	0.2	1.4	3.6
Striped Bass	1.0	0.3	0.2	0.1	4.3	6.3
Spanish Mackerel	1.0	0.3	0.7	0.2	1.6	1.8
Atlantic Croaker	0.7	0.2	1.5	0.5	0.4	7.1
Mullets	0.6	0.2	0.5	0.2	1.1	5.4
Weakfish	0.2	0.1	0.3	0.1	0.9	10.7
Brown Bullhead	0.1	<0.1	0.2	<0.1	1.0	3.6
Atlantic Spadefish	0.1	<0.1	<0.1	<0.1	2.3	1.8
Ictalurus Catfishes	0.1	<0.1	0.1	<0.1	1.5	1.8
Common Carp	0.1	<0.1	<0.1	<0.1	1.5	0.9
Channel Catfish	<0.1	<0.1	<0.1	<0.1	2.7	0.9
Yellow Perch	<0.1	<0.1	0.1	<0.1	0.6	1.8
Atlantic Tripletail	<0.1	<0.1	<0.1	<0.1	1.7	0.9
Kingfishes	<0.1	<0.1	<0.1	<0.1	1.1	0.9
Butterfish	<0.1	<0.1	<0.1	<0.1	0.3	0.9
Southern Kingfish	<0.1	<0.1	<0.1	<0.1	0.4	0.9
Yellow Bullhead	<0.1	<0.1	<0.1	<0.1	0.8	0.9
Sheepshead	<0.1	<0.1	<0.1	<0.1	0.4	0.9
Florida Pompano	<0.1	<0.1	<0.1	<0.1	0.2	0.9
Atlantic Menhaden	-	-	-	-	-	-
Central						
Large Mesh n=137						
Southern Flounder	73.6	68.9	39.9	75.2	1.9	98.5
Black Drum	12.5	11.7	4.7	8.9	2.6	50.4
Red Drum	9.3	8.7	2.1	4	4.4	59.1
Horseshoe Crab	2.1	2	0.7	1.3	3.0	8.8
Gulf Flounder	2.0	1.9	1.3	2.5	1.5	37.2
Sheepshead	2.0	1.8	0.8	1.6	2.4	29.9
Bluefish	1.3	1.3	0.7	1.4	1.8	14.6
Spotted Seatrout	1.3	1.2	0.5	0.9	2.9	29.2
Conchs	0.8	0.7	0.7	1.2	1.2	8.8
Striped Mullet	0.4	0.3	0.3	0.5	1.3	4.4
Weakfish	0.3	0.3	0.3	0.6	1.0	16.1
Summer Flounder	0.3	0.3	0.2	0.4	1.3	13.1
Gizzard Shad	0.2	0.2	0.1	0.2	2.2	0.7
Florida Pompano	0.2	0.1	0.1	0.1	2.4	4.4
Paralicthid Flounders	0.1	0.1	0.1	0.2	1.5	0.7
Atlantic Spadefish	0.1	0.1	<0.1	0.1	2.4	2.9
Atlantic Tripletail	0.1	0.1	<0.1	<0.1	7.1	1.5
Blue Crab	0.1	0.1	0.2	0.3	0.3	0.7
Southern Kingfish	0.1	0.1	0.1	0.1	0.9	6.6
Spot	0.1	<0.1	0.2	0.3	0.3	0.7
Pigfish	<0.1	<0.1	0.1	0.1	0.4	2.9
Atlantic Croaker	<0.1	<0.1	<0.1	0.1	0.5	2.2
Northern Kingfish	<0.1	<0.1	<0.1	<0.1	1.3	0.7
Harvestfish	<0.1	<0.1	<0.1	<0.1	0.4	0.7

Table 5.4a (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Central						
Small Mesh n=62						
Striped Mullet	356.4	67.9	266.7	54.9	1.3	66.1
Bluefish	54.8	10.4	40.8	8.4	1.3	19.4
Spot	50.8	9.7	130.3	26.8	0.4	30.6
Spotted Seatrout	40.9	7.8	17.3	3.6	2.4	40.3
Black Drum	9.2	1.7	11.9	2.5	0.8	16.1
Atlantic Croaker	6.9	1.3	13.2	2.7	0.5	22.6
Red Drum	3.1	0.6	0.7	0.1	4.8	19.4
Weakfish	1.2	0.2	1.2	0.2	1.0	21.0
Pigfish	0.4	0.1	1.3	0.3	0.3	4.8
Southern Kingfish	0.4	0.1	0.4	0.1	0.9	14.5
Spanish Mackerel	0.3	0.1	0.4	0.1	0.8	3.2
Butterfish	0.3	0.1	1.4	0.3	0.2	8.1
Southern Flounder	0.3	0.1	0.1	<0.1	3.4	4.8
Sheepshead	0.1	<0.1	0.1	<0.1	1.5	3.2
White Perch	<0.1	<0.1	0.1	<0.1	0.6	1.6
Northern Kingfish	<0.1	<0.1	<0.1	<0.1	1.0	1.6
Florida Pompano	<0.1	<0.1	<0.1	<0.1	1.0	1.6
White Mullet	<0.1	<0.1	<0.1	<0.1	0.7	1.6
Harvestfish	<0.1	<0.1	<0.1	<0.1	0.3	1.6
Southern						
Large Mesh n=19						
Southern Flounder	68.9	57.8	36.2	64	1.9	89.5
American Shad	18.4	15.5	5.0	8.8	3.7	10.5
Blue Catfish	10.3	8.7	4.3	7.6	2.4	10.5
Striped Mullet	7.3	6.1	5.2	9.3	1.4	5.3
Red Drum	5.9	5	1.4	2.4	4.3	42.1
Black Drum	5.6	4.7	2.4	4.2	2.3	31.6
Bluefish	0.7	0.6	0.5	0.9	1.3	10.5
Spotted Seatrout	0.7	0.6	0.6	1	1.1	15.8
Sheepshead	0.6	0.5	0.3	0.6	1.9	21.1
Weakfish	0.5	0.4	0.4	0.7	1.1	5.3
Atlantic Tripletail	0.2	0.1	0.1	0.1	3.1	5.3
Florida Pompano	0.1	0.1	0.1	0.1	2.0	5.3
Spot	0.1	<0.1	0.1	0.1	1.1	5.3
Southern Kingfish	0.1	<0.1	0.1	0.1	1.1	5.3
Southern						
Small Mesh n=15						
Striped Mullet	168.0	63.9	125.6	47.1	1.3	80.0
Mullets	36.4	13.8	21.1	7.9	1.7	6.7
Spot	32.0	12.2	89.7	33.6	0.4	60.0
Bluefish	12.0	4.6	9.2	3.4	1.3	26.7
Spanish Mackerel	6.6	2.5	7.4	2.8	0.9	13.3
Spotted Seatrout	3.7	1.4	3.6	1.4	1.0	33.3
Atlantic Croaker	1.9	0.7	7.6	2.9	0.2	26.7
Red Drum	0.6	0.2	0.1	0.1	4.5	6.7
Southern Kingfish	0.6	0.2	1.2	0.5	0.5	20.0
White Mullet	0.6	0.2	0.8	0.3	0.7	20.0
Southern Flounder	0.3	0.1	0.1	0.1	2.0	6.7
Ladyfish	0.1	0.1	0.1	<0.1	2.0	6.7
Haemulon Grunt	0.1	0.1	-	-	-	6.7
Black Drum	0.1	<0.1	0.1	<0.1	1.8	6.7
Pigfish	<0.1	<0.1	0.1	<0.1	0.4	6.7

Table 5.4b Overall marketable species composition of estuarine gill net samples by weight and number for each area and mesh class for 2008. Mesh class n-values represent the number of trips sampled. Data from NCDMF fishery dependent biological database.

	Weight (lb)		Number			
Area/Mesh Class/Species	Mean	Percent	Mean	Percent	Mean Fish Weight (lb)	Percent Occurrence
Albemarle						
Large Mesh n=125						
Southern Flounder	74.4	49.9	42.3	51	1.8	76.8
Paralicthid Flounders	28.8	19.3	19.2	23.2	1.5	63.2
American Shad	10.9	7.3	3.7	4.4	3.0	11.2
Black Drum	9.3	6.2	4.7	5.7	2.0	31.2
Red Drum	6.4	4.3	1.6	1.9	4.0	39.2
Striped Bass	6.3	4.2	0.7	0.9	8.5	19.2
Bluefish	3	2	0.9	1.1	3.2	23.2
Horseshoe Crab	1.7	1.1	0.5	0.5	3.6	8.0
Sheepshead	1.4	0.9	1.1	1.4	1.2	22.4
Blue Crab	1.4	0.9	3.8	4.6	0.4	12.0
Spotted Seatrout	1.2	0.8	0.7	0.8	1.9	11.2
White Catfish	1.2	0.8	0.8	0.9	1.5	5.6
Weakfish	0.6	0.4	0.6	0.7	1.1	13.6
Ictalurus Catfishes	0.5	0.3	0.4	0.4	1.5	4.0
Hickory Shad	0.4	0.3	0.4	0.5	0.9	7.2
Channel Catfish	0.4	0.3	0.1	0.1	5.2	0.8
Atlantic Croaker	0.3	0.2	0.6	0.7	0.5	19.2
Kingfishes	0.2	0.1	0.2	0.2	1.1	7.2
Gulf Flounder	0.1	0.1	0.1	0.1	1.8	3.2
Summer Flounder	0.1	0.1	0.1	0.1	1.6	4.0
Spot	0.1	0.1	0.2	0.3	0.4	8.0
Southern Kingfish	0.1	0.1	0.1	0.2	0.6	2.4
Spanish Mackerel	<0.1	<0.1	<0.1	<0.1	2.5	1.6
Harvestfish	<0.1	<0.1	0.1	0.1	0.3	3.2
White Perch	<0.1	<0.1	0.1	0.1	0.4	2.4
Atlantic Spadefish	<0.1	<0.1	<0.1	<0.1	0.6	1.6
Florida Pompano	<0.1	<0.1	<0.1	<0.1	1.8	0.8
Striped Mullet	<0.1	<0.1	<0.1	<0.1	1.1	0.8
Yellow Perch	<0.1	<0.1	<0.1	<0.1	0.5	0.8
Albemarle						
Small Mesh n=31						
Striped Mullet	438.8	83.2	344	75.6	1.3	48.4
Bluefish	17.6	3.3	12.8	2.8	1.4	45.2
Spot	14.9	2.8	39.3	8.6	0.4	61.3
White Perch	12.2	2.3	22.4	4.9	0.6	25.8
Kingfishes	10.4	2	9.7	2.1	1.1	29.0
Spotted Seatrout	7.4	1.4	3.3	0.7	2.2	38.7
Southern Flounder	7.3	1.4	4.9	1.1	1.5	16.1
Black Drum	3.5	0.7	2.6	0.6	1.3	25.8
Atlantic Croaker	2.7	0.5	5.6	1.2	0.5	48.4
Weakfish	2.5	0.5	3.4	0.7	0.8	25.8
Red Drum	2.2	0.4	0.6	0.1	3.6	19.4
Horseshoe Crab	1.6	0.3	0.6	0.1	3.0	6.5
Paralicthid Flounders	1.2	0.2	0.9	0.2	1.3	19.4
Southern Kingfish	1.2	0.2	1	0.2	1.1	9.7
Striped Bass	1.1	0.2	0.3	0.1	4.2	12.9
Summer Flounder	0.6	0.1	0.4	0.1	1.5	6.5
Ictalurus Catfishes	0.6	0.1	0.4	0.1	1.4	6.5
Spanish Mackerel	0.5	0.1	0.4	0.1	1.4	12.9
Common Carp	0.4	0.1	0.2	<0.1	2.7	3.2

Table 5.4b (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Albemarle						
Small Mesh n=31						
Butterfish	0.3	0.1	1.4	0.3	0.2	6.5
Atlantic Tripletail	0.2	<0.1	0.1	<0.1	1.7	3.2
Yellow Perch	0.1	<0.1	0.2	<0.1	0.6	9.7
Houndfish	0.1	<0.1	<0.1	<0.1	4.0	3.2
Mullets	0.1	<0.1	0.1	<0.1	1.0	3.2
American Shad	0.1	<0.1	<0.1	<0.1	3.0	3.2
Hickory Shad	<0.1	<0.1	0.1	<0.1	0.7	3.2
Atlantic Spadefish	<0.1	<0.1	<0.1	<0.1	1.1	3.2
Northern Kingfish	<0.1	<0.1	<0.1	<0.1	0.7	3.2
Black Crappie	<0.1	<0.1	<0.1	<0.1	0.4	3.2
Pamlico						
Large Mesh n=210						
Southern Flounder	50.4	47.3	26.9	47.1	1.9	86.2
Paralicthid Flounders	17.8	16.7	11.8	20.7	1.5	46.7
Bluefish	10.1	9.5	4.5	7.9	2.2	42.4
Red Drum	8.7	8.1	1.9	3.2	4.7	47.1
Black Drum	5.9	5.6	3.5	6.1	1.7	43.8
Horseshoe Crab	2.9	2.7	0.9	1.5	3.3	8.1
Sheepshead	2.4	2.3	1.4	2.4	1.7	36.7
Spotted Seatrout	1.4	1.3	0.5	0.9	2.6	24.8
American Shad	1.4	1.3	1	1.7	1.4	2.4
Gulf Flounder	1.2	1.1	0.8	1.4	1.5	24.8
Florida Pompano	0.8	0.8	0.4	0.7	2.0	11.0
Weakfish	0.6	0.5	0.6	1	0.9	21.0
Mullets	0.4	0.4	0.3	0.6	1.3	1.0
Striped Bass	0.4	0.4	<0.1	<0.1	19.7	1.0
Summer Flounder	0.3	0.3	0.2	0.3	1.7	9.5
Spot	0.3	0.3	0.7	1.2	0.4	12.9
Atlantic Spadefish	0.2	0.2	0.2	0.3	1.6	7.1
Kingfishes	0.2	0.2	0.2	0.4	1.1	8.1
Atlantic Croaker	0.2	0.2	0.4	0.8	0.5	12.9
Southern Kingfish	0.2	0.2	0.2	0.4	0.8	9.5
Striped Mullet	0.1	0.1	0.1	0.1	1.9	3.8
Hickory Shad	0.1	0.1	0.1	0.2	1.0	1.0
Pinfish	0.1	0.1	0.2	0.3	0.6	5.2
Houndfish	0.1	0.1	<0.1	<0.1	2.8	1.0
Caranx Jacks	<0.1	<0.1	0.1	0.2	0.3	1.0
Whelks	<0.1	<0.1	<0.1	<0.1	1.4	0.5
Spanish Mackerel	<0.1	<0.1	<0.1	<0.1	1.4	0.5
Pigfish	<0.1	<0.1	0.1	0.1	0.4	1.9
Blue Crab	<0.1	<0.1	0.1	0.1	0.3	1.0
Northern Kingfish	<0.1	<0.1	<0.1	<0.1	1.2	1.0
Unid. Percoidei Fishes	<0.1	<0.1	<0.1	<0.1	0.4	0.5
Balistes Triggerfishes	<0.1	<0.1	<0.1	<0.1	1.1	0.5
Conchs	<0.1	<0.1	<0.1	<0.1	1.0	0.5
Harvestfish	<0.1	<0.1	<0.1	<0.1	0.4	0.5
Pamlico						
Small Mesh n=123						
Striped Mullet	203.6	56.3	105.7	46.9	1.9	38.5
Bluefish	70.4	19.5	42.7	19	1.7	57.4
Southern Kingfish	15.4	4.3	23.9	10.6	0.6	20.5
Spotted Seatrout	13.9	3.8	6.1	2.7	2.3	40.2
Spanish Mackerel	13.2	3.7	7.9	3.5	1.7	14.8
Houndfish	9.4	2.6	3.1	1.4	3.1	14.8

Table 5.4b (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Pamlico						
Small Mesh n=123						
Weakfish	6.1	1.7	6.7	3	0.9	46.7
Black Drum	5.5	1.5	2.8	1.3	2.0	16.4
Hickory Shad	4.5	1.2	4.1	1.8	1.1	13.1
Red Drum	4	1.1	0.8	0.4	4.9	21.3
Kingfishes	3.9	1.1	3.6	1.6	1.1	11.5
Spot	2.3	0.6	6	2.6	0.4	27.0
Mullets	1.9	0.5	1.4	0.6	1.3	1.6
Northern Kingfish	1.5	0.4	2.1	0.9	0.7	15.6
Paralicthid Flounders	1.2	0.3	0.8	0.4	1.5	11.5
Pinfish	1.1	0.3	1.9	0.8	0.6	11.5
American Shad	1	0.3	0.5	0.2	2.1	3.3
Butterfish	0.6	0.2	2.6	1.1	0.2	15.6
Southern Flounder	0.5	0.1	0.2	0.1	2.2	4.9
Atlantic Croaker	0.4	0.1	1	0.4	0.4	12.3
Harvestfish	0.2	0.1	0.8	0.3	0.3	1.6
Sheepshead	0.2	0.1	0.2	0.1	1.1	6.6
Little Tunny	0.1	<0.1	<0.1	<0.1	6.0	1.6
Striped Bass	0.1	<0.1	<0.1	<0.1	5.9	1.6
Pigfish	0.1	<0.1	0.2	0.1	0.4	6.6
Horseshoe Crab	<0.1	<0.1	<0.1	<0.1	3.0	0.8
Florida Pompano	<0.1	<0.1	0.1	<0.1	0.9	3.3
Smooth Dogfish	<0.1	<0.1	<0.1	<0.1	5.1	0.8
Atlantic Spadefish	<0.1	<0.1	<0.1	<0.1	1.2	0.8
Carolina Hake	<0.1	<0.1	<0.1	<0.1	2.0	0.8
White Perch	<0.1	<0.1	<0.1	<0.1	0.4	0.8
Northern Puffer	<0.1	<0.1	<0.1	<0.1	1.0	0.8
Skates	-	-	-	-	-	0.8
Rivers						
Large Mesh n=114						
Southern Flounder	30.3	36.1	19.4	45.5	1.6	86.0
American Shad	22	26.3	6.4	15	3.5	46.5
White Catfish	6.5	7.7	2.1	5	3.0	39.5
Black Drum	4.6	5.5	1.8	4.3	2.5	24.6
Striped Bass	4.4	5.2	0.6	1.4	7.1	21.9
Red Drum	3.9	4.6	0.8	1.9	4.8	23.7
Hickory Shad	2.3	2.8	1.8	4.2	1.3	20.2
Bluefish	1.8	2.2	1.6	3.8	1.1	11.4
Spotted Seatrout	1.5	1.7	0.7	1.6	2.1	21.1
Horseshoe Crab	0.9	1.1	0.3	0.7	3.0	0.9
Spot	0.8	1	2.2	5.1	0.4	7.0
Blue Crab	0.8	1	1.7	4.1	0.5	3.5
Paralicthid Flounders	0.8	0.9	0.6	1.4	1.3	4.4
Striped Mullet	0.7	0.8	0.6	1.4	1.2	5.3
Channel Catfish	0.4	0.5	0.1	0.2	5.1	5.3
Atlantic Croaker	0.4	0.4	0.6	1.3	0.7	9.6
Longnose Gar	0.3	0.3	0.1	0.2	3.7	0.9
Weakfish	0.3	0.3	0.3	0.7	0.9	13.2
Flathead Catfish	0.2	0.3	<0.1	0.1	6.3	3.5
Blue Catfish	0.2	0.3	0.1	0.1	4.0	1.8
Sheepshead	0.1	0.2	0.1	0.3	1.1	7.9
White Perch	0.1	0.2	0.2	0.5	0.7	3.5
Mullets	0.1	0.1	0.1	0.2	1.1	0.9
Striped Bass X White	0.1	0.1	<0.1	<0.1	4.0	1.8
Ictalurus Catfishes	0.1	0.1	<0.1	0.1	1.4	0.9
Kingfishes	0.1	0.1	0.1	0.1	1.0	0.9

Table 5.4b (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Rivers						
Large Mesh n=114						
Atlantic Menhaden	0.1	0.1	0.2	0.5	0.3	0.9
Southern Kingfish	0.1	0.1	0.1	0.2	0.6	5.3
Common Carp	<0.1	<0.1	<0.1	<0.1	3.1	0.9
Spanish Mackerel	<0.1	<0.1	<0.1	<0.1	1.5	1.8
Florida Pompano	<0.1	<0.1	<0.1	<0.1	2.0	0.9
Brown Bullhead	<0.1	<0.1	<0.1	<0.1	1.9	0.9
Yellow Perch	<0.1	<0.1	<0.1	<0.1	1.0	0.9
Rivers						
Small Mesh n=99						
Striped Mullet	490.4	75.2	304.8	73.2	1.6	66.7
Mullets	46.8	7.2	25.6	6.1	1.8	9.1
Spotted Seatrout	41.3	6.3	22.5	5.4	1.8	64.6
Spanish Mackerel	22.1	3.4	10.7	2.6	2.1	10.1
Hickory Shad	7.5	1.1	8.1	1.9	0.9	10.1
Black Drum	6.8	1	10.5	2.5	0.6	32.3
Bluefish	5.8	0.9	4.8	1.2	1.2	20.2
Paralicthid Flounders	5	0.8	3.7	0.9	1.3	8.1
American Shad	4.3	0.7	1.3	0.3	3.2	10.1
Red Drum	4	0.6	1.1	0.3	3.7	22.2
Spot	3.5	0.5	9.2	2.2	0.4	33.3
White Perch	3.4	0.5	5.6	1.3	0.6	30.3
White Catfish	3.1	0.5	1.5	0.4	2.0	8.1
Southern Flounder	2.6	0.4	1.7	0.4	1.5	19.2
Weakfish	2.2	0.3	2.2	0.5	1.0	35.4
Striped Bass	1	0.2	0.3	0.1	3.6	10.1
Longnose Gar	0.9	0.1	0.3	0.1	3.2	1.0
Atlantic Croaker	0.6	0.1	1.3	0.3	0.5	14.1
Ictalurus Catfishes	0.2	<0.1	0.1	<0.1	1.4	2.0
Brown Bullhead	0.1	<0.1	0.1	<0.1	1.3	1.0
Harvestfish	0.1	<0.1	0.4	0.1	0.3	1.0
Southern Kingfish	0.1	<0.1	0.1	<0.1	0.8	6.1
Butterfish	0.1	<0.1	0.3	0.1	0.3	4.0
Sheepshead	0.1	<0.1	0.1	<0.1	0.4	3.0
Pigfish	0.1	<0.1	0.1	<0.1	0.5	2.0
Striped Bass X White	0.1	<0.1	<0.1	<0.1	2.6	1.0
Kingfishes	<0.1	<0.1	<0.1	<0.1	1.0	2.0
Yellow Perch	<0.1	<0.1	0.1	<0.1	0.6	2.0
Summer Flounder	<0.1	<0.1	<0.1	<0.1	2.1	1.0
Central						
Large Mesh n=171						
Southern Flounder	98.9	77.3	59.9	79.2	1.7	99.4
Red Drum	5.4	4.2	1.1	1.5	4.8	41.5
Gulf Flounder	4.7	3.7	3.3	4.3	1.5	56.1
Whelks	3.8	3	4.1	5.4	0.9	24.6
Paralicthid Flounders	3.5	2.8	1.4	1.9	2.5	7.0
Black Drum	3	2.4	1.2	1.6	2.6	32.2
Horseshoe Crab	3	2.3	1	1.3	3.0	13.5
Conchs	1.7	1.3	1.3	1.8	1.3	9.9
Sheepshead	1	0.8	0.6	0.7	1.8	25.7
Bluefish	0.8	0.6	0.4	0.5	2.2	9.4
Spotted Seatrout	0.6	0.5	0.2	0.3	2.7	15.8
Summer Flounder	0.5	0.4	0.4	0.5	1.4	17.5
Weakfish	0.3	0.2	0.3	0.3	0.9	7.0
Southern Kingfish	0.2	0.2	0.3	0.4	0.7	14.6

Table 5.4b (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Central						
Large Mesh n=171						
Florida Pompano	0.2	0.1	0.1	0.1	1.8	5.8
Striped Mullet	0.2	0.1	0.1	0.1	2.4	1.8
Atlantic Spadefish	0.1	<0.1	<0.1	<0.1	4.7	0.6
Atlantic Croaker	<0.1	<0.1	0.1	0.1	0.6	2.3
Atlantic Tripletail	<0.1	<0.1	<0.1	<0.1	2.0	1.2
Spot	<0.1	<0.1	<0.1	<0.1	0.6	2.3
Spanish Mackerel	<0.1	<0.1	<0.1	<0.1	2.0	0.6
Pigfish	<0.1	<0.1	<0.1	<0.1	0.5	0.6
Central						
Small Mesh n=59						
Striped Mullet	655.4	83.8	388.5	68.7	1.7	78.0
Spotted Seatrout	47.1	6	21.8	3.8	2.2	47.5
Spot	37.9	4.8	81.4	14.4	0.5	20.3
Black Drum	29.3	3.7	64.7	11.4	0.5	32.2
Bluefish	7.6	1	5.5	1	1.4	11.9
Red Drum	1.7	0.2	0.3	0.1	5.0	13.6
Southern Flounder	1.3	0.2	0.6	0.1	2.1	8.5
Pigfish	0.4	0.1	1	0.2	0.5	6.8
Weakfish	0.4	0.1	0.6	0.1	0.7	13.6
Atlantic Croaker	0.4	<0.1	0.6	0.1	0.6	10.2
Southern Kingfish	0.3	<0.1	0.4	0.1	0.8	6.8
Northern Kingfish	0.1	<0.1	0.1	<0.1	0.8	1.7
White Catfish	0.1	<0.1	0.1	<0.1	1.2	1.7
Hickory Shad	0.1	<0.1	0.1	<0.1	0.7	1.7
Spanish Mackerel	0.1	<0.1	<0.1	<0.1	1.5	1.7
Gulf Flounder	<0.1	<0.1	<0.1	<0.1	1.2	3.4
Gulf Kingfish	<0.1	<0.1	<0.1	<0.1	1.0	1.7
Southern						
Large Mesh n=59						
Southern Flounder	57.9	64.4	27.2	68.5	2.1	86.4
American Shad	10.3	11.5	2.7	6.9	3.8	11.9
Red Drum	6	6.7	1.3	3.3	4.5	49.2
Black Drum	5	5.6	2.2	5.5	2.3	44.1
Sheepshead	3	3.3	1.5	3.8	1.9	37.3
Striped Bass	1.8	2	0.2	0.6	7.4	8.5
Bluefish	1.4	1.5	0.4	1.1	3.3	18.6
Spotted Seatrout	1.1	1.3	0.7	1.7	1.7	25.4
Atlantic Croaker	0.7	0.7	1.5	3.8	0.4	20.3
Atlantic Tripletail	0.6	0.7	0.2	0.5	3.3	15.3
Blue Catfish	0.6	0.7	0.2	0.5	3.3	1.7
Ictalurus Catfishes	0.6	0.6	0.4	1	1.5	1.7
Paralicthid Flounders	0.2	0.2	0.1	0.2	2.8	6.8
Florida Pompano	0.2	0.2	0.1	0.2	2.5	5.1
Spanish Mackerel	0.2	0.2	0.1	0.3	1.7	3.4
Spot	0.2	0.2	0.5	1.4	0.3	5.1
Striped Mullet	0.2	0.2	0.1	0.3	1.3	1.7
Common Carp	0.1	0.1	<0.1	<0.1	5.1	1.7
Southern Kingfish	<0.1	<0.1	<0.1	0.1	1.1	3.4
Pigfish	<0.1	<0.1	0.2	0.4	0.2	1.7
Permit	<0.1	<0.1	<0.1	<0.1	1.1	1.7
Kingfishes	<0.1	<0.1	<0.1	<0.1	1.1	1.7

Table 5.4b (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Southern						
Small Mesh n=51						
Striped Mullet	213.7	72.7	177.9	57.3	1.2	70.6
Spot	37.8	12.9	95.6	30.8	0.4	41.2
Spotted Seatrout	21.1	7.2	12.3	3.9	1.7	54.9
Bluefish	8.9	3	8	2.6	1.1	21.6
Atlantic Croaker	4	1.4	9.5	3.1	0.4	35.3
Black Drum	2	0.7	2.6	0.8	0.8	29.4
Southern Flounder	1.4	0.5	0.7	0.2	1.9	11.8
Spanish Mackerel	1.4	0.5	0.9	0.3	1.6	9.8
Weakfish	0.9	0.3	1	0.3	0.9	5.9
Ictalurus Catfishes	0.8	0.3	0.6	0.2	1.5	7.8
Red Drum	0.5	0.2	0.2	0.1	3.4	9.8
Blue Catfish	0.4	0.1	0.1	<0.1	3.0	3.9
Kingfishes	0.3	0.1	0.3	0.1	1.1	5.9
Southern Kingfish	0.2	0.1	0.3	0.1	0.8	13.7
Paralicthid Flounders	0.1	<0.1	0.1	<0.1	1.0	7.8
White Mullet	0.1	<0.1	0.2	0.1	0.4	3.9
Silver Perch	0.1	<0.1	0.2	0.1	0.3	9.8
Sheepshead	0.1	<0.1	<0.1	<0.1	3.1	2.0
Mullets	<0.1	<0.1	<0.1	<0.1	1.2	2.0
Seatrouts	<0.1	<0.1	<0.1	<0.1	2.0	2.0
Pigfish	<0.1	<0.1	0.1	<0.1	0.4	2.0
Blue Runner	<0.1	<0.1	0.1	<0.1	0.3	2.0
Gulf Kingfish	<0.1	<0.1	<0.1	<0.1	0.7	2.0
Crevalle Jack	<0.1	<0.1	<0.1	<0.1	0.2	2.0

Table 5.4c Overall marketable species composition of estuarine gill net samples by weight and number for each area and mesh class for 2009. Mesh class n-values represent the number of trips sampled. Data from NCDMF fishery dependent biological database.

	Weight (lb)		Number			
Area/Mesh Class/Species	Mean	Percent	Mean	Percent	Mean Fish Weight (lb)	Percent Occurrence
Albemarle						
Large Mesh n=113						
Southern Flounder	66.0	39.7	37.3	41.4	1.8	75.2
American Shad	46.5	28.0	15.9	17.6	2.9	18.6
Paralicthid Flounders	20.3	12.2	13.1	14.5	1.5	59.3
Red Drum	6.5	3.9	1.5	1.7	4.3	35.4
White Catfish	6.3	3.8	3.2	3.6	2.0	13.3
Striped Bass	4.7	2.8	0.5	0.6	8.8	16.8
Striped Mullet	2.7	1.6	2.6	2.9	1.0	4.4
Blue Crab	2.2	1.3	5.7	6.3	0.4	10.6
Ictalurus Catfishes	1.9	1.1	1.3	1.4	1.5	14.2
Sheepshead	1.6	1.0	1.2	1.3	1.4	30.1
Hickory Shad	1.4	0.8	1.1	1.2	1.3	12.4
Black Drum	1.1	0.7	0.4	0.4	3.1	17.7
Common Carp	1.0	0.6	0.1	0.1	9.0	1.8
Bluefish	0.8	0.5	0.4	0.4	2.2	11.5
Atlantic Croaker	0.6	0.3	0.9	1.0	0.6	15.9
Spotted Seatrout	0.5	0.3	0.3	0.3	2.1	12.4
Gizzard Shad	0.3	0.2	1.6	1.7	0.2	1.8
Weakfish	0.3	0.2	0.3	0.3	1.1	12.4
Spot	0.3	0.2	0.8	0.9	0.4	10.6
White Perch	0.3	0.2	0.6	0.6	0.5	5.3
Mullets	0.2	0.1	0.2	0.2	1.1	2.7
Atlantic Menhaden	0.1	0.1	0.5	0.6	0.2	0.9
Gulf Flounder	0.1	0.1	0.1	0.1	2.0	0.9
Whelks	0.1	0.1	0.1	0.1	1.1	0.9
Atlantic Spadefish	0.1	0.1	0.1	0.2	0.7	2.7
Bowfin	0.1	<0.1	0.0	<0.1	2.1	1.8
Spanish Mackerel	0.1	<0.1	0.1	0.1	1.1	0.9
Kingfishes	0.1	<0.1	0.2	0.2	0.4	4.4
Florida Pompano	0.1	<0.1	0.1	0.1	1.2	0.9
Horseshoe Crab	0.1	<0.1	0.0	<0.1	3.0	0.9
Summer Flounder	0.0	<0.1	0.0	<0.1	1.3	1.8
Harvestfish	0.0	<0.1	0.1	0.1	0.3	2.7
Houndfish	0.0	<0.1	0.0	<0.1	1.5	0.9
Atlantic Mackerel	0.0	<0.1	0.0	<0.1	1.0	1.8
Yellow Perch	0.0	<0.1	0.0	<0.1	0.5	1.8
Atlantic Sturgeon	0.0	<0.1	0.0	<0.1	1.1	0.9
Redhorse Suckers	0.0	<0.1	0.0	<0.1	0.9	0.9
Southern Kingfish	0.0	<0.1	0.0	<0.1	0.4	0.9
Albemarle						
Small Mesh n=22						
Striped Mullet	174.7	35.0	101.8	18.9	1.7	45.5
Mullets	139.0	27.9	126.2	23.4	1.1	27.3
Spot	55.4	11.1	165.6	30.7	0.3	63.6
Bluefish	38.2	7.7	20.2	3.7	1.9	59.1
White Perch	27.8	5.6	56.7	10.5	0.5	36.4
Atlantic Croaker	19.2	3.8	40.5	7.5	0.5	59.1
Striped Bass	12.9	2.6	2.6	0.5	5.0	22.7
Ictalurus Catfishes	10.8	2.2	7.5	1.4	1.5	22.7
Spanish Mackerel	4.6	0.9	3.8	0.7	1.2	18.2
Red Drum	3.6	0.7	0.9	0.2	4.2	31.8
Spotted Seatrout	3.5	0.7	2.5	0.5	1.4	54.5

Table 5.4c (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Albemarle						
Small Mesh n=22						
Kingfishes	2.1	0.4	4.2	0.8	0.5	13.6
White Catfish	1.9	0.4	1.6	0.3	1.1	4.5
Houndfish	1.6	0.3	0.7	0.1	2.1	13.6
Yellow Perch	1.1	0.2	1.5	0.3	0.8	22.7
Bowfin	0.8	0.2	0.3	0.1	2.4	9.1
Paralicthid Flounders	0.5	0.1	0.3	0.1	1.9	18.2
Southern Flounder	0.3	0.1	0.2	<0.1	1.5	4.5
Harvestfish	0.2	<0.1	0.9	0.2	0.3	4.5
Weakfish	0.2	<0.1	0.2	<0.1	1.0	18.2
Common Carp	0.2	<0.1	0.1	<0.1	4.0	4.5
Sheepshead	0.2	<0.1	0.1	<0.1	1.2	9.1
Hickory Shad	0.1	<0.1	0.1	<0.1	1.5	4.5
Blue Crab	0.1	<0.1	0.2	<0.1	0.4	4.5
Butterfish	0.1	<0.1	0.4	0.1	0.2	4.5
Pamlico						
Large Mesh n=190						
Southern Flounder	62.2	61.5	39.1	61.7	1.6	95.8
Paralicthid Flounders	9.1	9.0	5.8	9.1	1.6	24.2
Red Drum	6.1	6.1	1.6	2.5	3.9	48.9
Bluefish	5.7	5.6	3.5	5.6	1.6	31.1
Black Drum	4.8	4.7	1.8	2.9	2.6	42.1
Sheepshead	2.7	2.7	1.7	2.6	1.6	46.3
Spotted Seatrout	2.5	2.5	1.2	1.9	2.1	25.8
Horseshoe Crab	1.7	1.7	0.6	0.9	3.0	5.3
Atlantic Croaker	1.2	1.2	2.6	4.1	0.5	22.1
Florida Pompano	1.0	1.0	0.5	0.8	2.0	11.6
Spot	0.9	0.8	2.0	3.1	0.4	11.1
Gulf Flounder	0.8	0.7	0.4	0.7	1.7	20.5
Striped Mullet	0.6	0.6	0.6	0.9	1.1	4.2
Southern Kingfish	0.4	0.4	0.6	1.0	0.6	21.6
Weakfish	0.3	0.3	0.3	0.4	1.1	10.0
Atlantic Spadefish	0.3	0.3	0.3	0.5	0.9	10.5
Whelks	0.3	0.3	0.3	0.4	1.0	3.2
Mullets	0.2	0.2	0.2	0.3	0.9	1.6
Spanish Mackerel	0.2	0.2	0.1	0.2	1.4	3.2
Summer Flounder	0.1	0.1	0.1	0.1	1.4	5.3
Houndfish	0.0	<0.1	0.0	<0.1	2.6	1.1
Blue Crab	0.0	<0.1	0.1	0.1	0.7	1.1
Atlantic Tripletail	0.0	<0.1	0.0	<0.1	5.1	0.5
Kingfishes	0.0	<0.1	0.0	0.1	0.5	2.1
Butterfish	0.0	<0.1	0.1	0.1	0.2	1.6
Pigfish	0.0	<0.1	0.0	<0.1	0.4	1.6
Pinfish	0.0	<0.1	0.0	<0.1	0.4	1.1
Sharks	0.0	<0.1	0.0	<0.1	1.1	0.5
Gulf Kingfish	0.0	<0.1	0.0	<0.1	1.0	0.5
Crevalle Jack	0.0	<0.1	0.0	<0.1	0.9	0.5
Pamlico						
Small Mesh n=135						
Striped Mullet	207.2	48.5	103.1	36.8	2.0	34.8
Bluefish	74.6	17.5	49.0	17.5	1.5	51.9
Spanish Mackerel	47.2	11.0	32.9	11.7	1.4	35.6
Spotted Seatrout	29.8	7.0	17.6	6.3	1.7	57.0
Hickory Shad	18.0	4.2	13.3	4.8	1.3	9.6
Weakfish	11.5	2.7	11.8	4.2	1.0	27.4

Table 5.4c (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Pamlico						
Small Mesh n=135						
Spot	6.9	1.6	18.2	6.5	0.4	44.4
Mullets	5.5	1.3	4.4	1.6	1.3	7.4
Red Drum	4.1	1.0	1.2	0.4	3.5	22.2
Southern Kingfish	3.5	0.8	5.0	1.8	0.7	24.4
Kingfishes	2.5	0.6	4.5	1.6	0.6	11.1
Atlantic Croaker	2.4	0.5	4.5	1.6	0.5	36.3
Atlantic Cutlassfish	2.0	0.5	2.5	0.9	0.8	3.7
Houndfish	1.8	0.4	0.9	0.3	2.1	7.4
Paralicthid Flounders	1.8	0.4	1.1	0.4	1.6	4.4
Northern Kingfish	1.6	0.4	2.0	0.7	0.8	8.1
Black Drum	1.5	0.4	0.3	0.1	5.4	8.1
American Shad	1.5	0.4	0.6	0.2	2.5	3.0
Sheepshead	0.6	0.1	0.5	0.2	1.3	10.4
Harvestfish	0.6	0.1	2.3	0.8	0.3	7.4
Southern Flounder	0.5	0.1	0.3	0.1	1.7	5.9
Butterfish	0.5	0.1	2.2	0.8	0.2	9.6
Crevalle Jack	0.4	0.1	0.4	0.1	1.0	1.5
Pinfish	0.3	0.1	0.5	0.2	0.6	5.9
Goosefish	0.3	0.1	0.0	<0.1	18.7	0.7
White Catfish	0.3	0.1	0.1	<0.1	1.9	0.7
Horseshoe Crab	0.2	<0.1	0.1	<0.1	3.0	1.5
Florida Pompano	0.1	<0.1	0.1	<0.1	1.0	6.7
White Perch	0.1	<0.1	0.3	0.1	0.4	1.5
Caranx Jacks	0.1	<0.1	0.1	<0.1	1.0	3.0
Gulf Kingfish	0.1	<0.1	0.1	<0.1	0.9	0.7
Pigfish	0.1	<0.1	0.3	0.1	0.4	5.9
Longnose Gar	0.1	<0.1	0.0	<0.1	4.0	0.7
Atlantic Tripletail	0.0	<0.1	0.0	<0.1	5.3	0.7
Atlantic Spadefish	0.0	<0.1	0.0	<0.1	0.9	1.5
Atlantic Sharpnose Shark	0.0	<0.1	0.0	<0.1	3.1	0.7
Ictalurus Catfishes	0.0	<0.1	0.0	<0.1	1.5	0.7
Atlantic Mackerel	0.0	<0.1	0.0	<0.1	1.0	1.5
Atlantic Menhaden	-	-	-	-	-	0.7
Rivers						
Large Mesh n=143						
Southern Flounder	47.9	42.1	29.0	50.3	1.7	82.5
American Shad	18.7	16.5	5.7	9.9	3.3	27.3
White Catfish	12.0	10.6	3.8	6.7	3.1	26.6
Ictalurus Catfishes	5.9	5.2	4.1	7.1	1.5	3.5
Red Drum	5.9	5.2	1.2	2.2	4.7	37.8
Striped Bass	5.7	5.0	1.2	2.1	4.7	21.0
Hickory Shad	4.9	4.3	3.1	5.4	1.6	13.3
Spotted Seatrout	4.4	3.9	2.0	3.4	2.2	36.4
Black Drum	1.8	1.6	0.6	1.1	2.9	27.3
Striped Mullet	1.2	1.1	1.0	1.8	1.2	9.1
Paralicthid Flounders	0.8	0.7	0.7	1.1	1.2	4.2
Sheepshead	0.8	0.7	0.5	0.8	1.7	20.3
Atlantic Croaker	0.7	0.6	1.5	2.6	0.5	25.9
Weakfish	0.5	0.5	0.4	0.6	1.4	13.3
Blue Crab	0.4	0.3	1.0	1.7	0.4	2.1
White Perch	0.4	0.3	0.5	0.8	0.8	7.7
Common Carp	0.3	0.3	0.0	0.1	10.0	1.4
Spot	0.3	0.3	0.7	1.2	0.4	16.1
Blue Catfish	0.3	0.2	0.1	0.1	3.6	3.5
Flathead Catfish	0.2	0.2	0.0	<0.1	13.0	1.4

Table 5.4c (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Rivers						
Large Mesh n=143						
Channel Catfish	0.2	0.2	0.0	<0.1	6.2	2.1
Southern Kingfish	0.1	0.1	0.2	0.3	0.7	9.8
Mullets	0.1	0.1	0.1	0.1	1.1	1.4
Bluefish	0.1	0.1	0.1	0.1	1.1	4.2
Striped Bass X White	0.1	0.1	0.0	<0.1	3.5	2.1
Kingfishes	0.0	<0.1	0.1	0.2	0.4	1.4
Summer Flounder	0.0	<0.1	0.0	<0.1	1.3	0.7
Yellow Bullhead	0.0	<0.1	0.0	<0.1	1.3	0.7
Florida Pompano	0.0	<0.1	0.0	<0.1	0.7	0.7
Crevalle Jack	0.0	<0.1	0.0	<0.1	1.1	0.7
Alewife	0.0	<0.1	0.0	<0.1	0.6	0.7
Atlantic Menhaden	-	-	-	-	-	1.4
Rivers						
Small Mesh n=112						
Striped Mullet	296.2	71.9	166.5	66.0	1.8	51.8
Spotted Seatrout	52.6	12.8	29.3	11.6	1.8	74.1
Bluefish	13.8	3.4	7.7	3.0	1.8	23.2
Hickory Shad	13.3	3.2	10.4	4.1	1.3	7.1
Spanish Mackerel	12.9	3.1	6.4	2.5	2.0	16.1
Spot	9.1	2.2	20.6	8.2	0.4	42.0
Mullets	2.9	0.7	2.0	0.8	1.4	6.3
Red Drum	2.8	0.7	0.7	0.3	3.8	23.2
Southern Flounder	2.6	0.6	1.6	0.6	1.6	18.8
Atlantic Croaker	1.2	0.3	2.2	0.9	0.5	28.6
White Perch	1.1	0.3	1.6	0.6	0.7	17.0
Black Drum	0.8	0.2	0.9	0.3	0.9	18.8
Striped Bass	0.5	0.1	0.1	<0.1	4.4	4.5
Weakfish	0.5	0.1	0.4	0.2	1.1	20.5
Paralicthid Flounders	0.4	0.1	0.3	0.1	1.4	5.4
White Catfish	0.3	0.1	0.1	0.1	2.2	0.9
American Shad	0.3	0.1	0.1	<0.1	2.6	4.5
Southern Kingfish	0.2	0.1	0.3	0.1	0.8	10.7
Sheepshead	0.1	<0.1	0.1	0.1	0.9	8.0
Unidentified Fishes	0.1	<0.1	0.6	0.2	0.2	0.9
Kingfishes	0.1	<0.1	0.1	0.1	0.4	4.5
Ictalurus Catfishes	0.0	<0.1	0.0	<0.1	1.7	1.8
Florida Pompano	0.0	<0.1	0.0	<0.1	0.9	1.8
Yellow Perch	0.0	<0.1	0.0	<0.1	0.6	0.9
Pigfish	0.0	<0.1	0.0	<0.1	0.5	0.9
Central						
Large Mesh n=112						
Southern Flounder	71.2	75.9	46.4	79.4	1.5	99.1
Red Drum	6.0	6.4	1.4	2.4	4.3	47.3
Whelks	5.3	5.7	5.2	8.9	1.0	34.8
Black Drum	4.3	4.6	1.6	2.7	2.7	42.0
Gulf Flounder	1.8	1.9	1.1	1.9	1.6	33.0
Spotted Seatrout	1.2	1.2	0.4	0.7	2.9	17.0
Sheepshead	1.0	1.0	0.5	0.9	1.8	27.7
Paralicthid Flounders	0.8	0.8	0.5	0.8	1.5	1.8
Bluefish	0.6	0.7	0.1	0.2	6.4	4.5
Horseshoe Crab	0.5	0.6	0.2	0.3	3.0	2.7
Striped Mullet	0.4	0.5	0.2	0.4	1.9	0.9
Summer Flounder	0.3	0.3	0.2	0.4	1.5	11.6
Southern Kingfish	0.1	0.1	0.2	0.4	0.7	10.7

Table 5.4c (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Central						
Large Mesh n=112						
Atlantic Croaker	0.1	0.1	0.2	0.4	0.4	2.7
Weakfish	0.0	0.1	0.1	0.1	0.9	5.4
Spot	0.0	<0.1	0.1	0.1	0.5	2.7
Spanish Mackerel	0.0	<0.1	0.0	<0.1	1.0	0.9
Florida Pompano	0.0	<0.1	0.0	<0.1	2.0	0.9
Pigfish	0.0	<0.1	0.0	<0.1	0.5	0.9
Central						
Small Mesh n=37						
Striped Mullet	608.7	89.5	321.9	67.1	1.9	83.8
Spot	66.6	9.8	154.4	32.2	0.4	27.0
Bluefish	1.2	0.2	0.4	0.1	2.8	2.7
Red Drum	1.0	0.2	0.2	<0.1	4.8	5.4
Spotted Seatrout	0.8	0.1	0.4	0.1	2.0	16.2
Southern Flounder	0.6	0.1	0.3	0.1	2.0	2.7
Atlantic Croaker	0.5	0.1	1.0	0.2	0.6	10.8
Gulf Flounder	0.2	<0.1	0.1	<0.1	1.4	2.7
Black Drum	0.2	<0.1	0.1	<0.1	2.2	5.4
Pigfish	0.1	<0.1	0.4	0.1	0.3	5.4
Southern Kingfish	0.1	<0.1	0.2	<0.1	0.7	5.4
Spanish Mackerel	0.1	<0.1	0.1	<0.1	1.5	5.4
Weakfish	0.1	<0.1	0.1	<0.1	1.0	5.4
Summer Flounder	0.0	<0.1	0.0	<0.1	1.7	2.7
Southern						
Large Mesh n=60						
Southern Flounder	63.6	58.2	31.5	61.1	2.0	83.3
American Shad	21.3	19.5	6.3	12.2	3.4	15.0
Black Drum	4.9	4.5	1.5	2.9	3.3	45.0
Sheepshead	4.3	4.0	2.4	4.6	1.8	48.3
Red Drum	3.4	3.1	0.9	1.7	4.0	30.0
Ictalurus Catfishes	2.9	2.6	2.0	3.8	1.5	6.7
Blue Catfish	2.9	2.6	1.5	2.8	2.0	1.7
Summer Flounder	1.6	1.5	0.8	1.6	2.0	1.7
Atlantic Tripletail	1.6	1.4	0.3	0.6	4.9	13.3
Spot	1.1	1.0	3.0	5.7	0.4	6.7
Spotted Seatrout	0.8	0.7	0.5	0.9	1.7	18.3
Atlantic Croaker	0.3	0.2	0.6	1.1	0.5	5.0
Bluefish	0.2	0.2	0.1	0.2	2.8	3.3
Gulf Flounder	0.2	0.2	0.1	0.2	1.5	3.3
Florida Pompano	0.2	0.2	0.2	0.3	1.1	3.3
Southern Kingfish	0.0	<0.1	0.0	0.1	1.0	1.7
Pigfish	0.0	<0.1	0.1	0.1	0.5	1.7
Weakfish	0.0	<0.1	0.0	0.1	0.6	1.7
Mullets	0.0	<0.1	0.0	<0.1	1.1	1.7
Spanish Mackerel	0.0	<0.1	0.0	<0.1	1.1	1.7
Hickory Shad	0.0	<0.1	0.0	0.1	0.4	1.7
Atlantic Spadefish	0.0	<0.1	0.0	<0.1	0.7	1.7
Southern						
Small Mesh n=24						
Striped Mullet	151.6	55.9	84.1	32.8	1.8	75.0
Spotted Seatrout	50.8	18.7	29.0	11.3	1.7	79.2
Spot	36.6	13.5	109.7	42.8	0.3	50.0
Southern Flounder	8.0	3.0	4.5	1.8	1.8	37.5
Red Drum	5.4	2.0	1.3	0.5	4.1	41.7

Table 5.4c (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Southern						
Small Mesh n=24						
Atlantic Croaker	4.6	1.7	11.1	4.3	0.4	50.0
Black Drum	4.3	1.6	7.2	2.8	0.6	37.5
Bluefish	3.2	1.2	2.6	1.0	1.2	20.8
Paralicthid Flounders	1.5	0.5	0.6	0.2	2.5	4.2
Sheepshead	1.3	0.5	0.5	0.2	2.4	25.0
Blue Catfish	1.2	0.5	0.4	0.1	3.3	8.3
Spanish Mackerel	1.2	0.4	1.2	0.5	1.0	25.0
Kingfishes	0.6	0.2	1.3	0.5	0.4	8.3
Butterfish	0.5	0.2	2.2	0.9	0.2	4.2
Atlantic Tripletail	0.4	0.2	0.1	<0.1	3.3	12.5
Southern Kingfish	0.2	0.1	0.3	0.1	0.8	16.7
Pigfish	0.0	<0.1	0.1	<0.1	0.6	4.2
Silver Perch	0.0	<0.1	0.0	<0.1	0.2	4.2

Table 5.4d Overall marketable species composition of estuarine gill net samples by weight and number for each area and mesh class for 2010. Mesh class n-values represent the number of trips sampled. Data from NCDMF fishery dependent biological database.

	Weight (lb)		Number			
Area/Mesh Class/Species	Mean	Percent	Mean	Percent	Mean Fish Weight (lb)	Percent Occurrence
Albemarle						
Large Mesh n=63						
American Shad	62	35.5	20.8	25.9	3.0	30.2
Southern Flounder	39	22.3	19.9	24.8	2.0	50.8
Paralicthid Flounders	20.2	11.5	15.9	19.8	1.3	41.3
Striped Bass	16.2	9.2	3	3.7	5.4	47.6
Ictalurus Catfishes	7	4	4	5	1.7	17.5
Red Drum	6.7	3.8	1.3	1.6	5.2	33.3
Hickory Shad	5.2	3	3.7	4.7	1.4	25.4
Common Carp	4.5	2.6	1	1.2	4.8	9.5
Bluefish	3.2	1.8	2.8	3.5	1.1	17.5
White Catfish	2.1	1.2	0.8	0.9	2.9	11.1
Sheepshead	2	1.1	2.1	2.6	0.9	14.3
Atlantic Croaker	1.6	0.9	1.9	2.4	0.9	25.4
Mullets	1.5	0.9	1.2	1.5	1.3	9.5
Striped Mullet	1.3	0.7	0.8	1	1.6	12.7
Blueback Herring	0.9	0.5	0.4	0.5	2.5	1.6
Spotted Seatrout	0.5	0.3	0.2	0.2	2.5	11.1
Black Drum	0.3	0.2	0.1	0.2	2.6	6.3
Weakfish	0.2	0.1	0.1	0.1	1.9	7.9
Florida Pompano	0.2	0.1	0.1	0.1	2.3	3.2
Horseshoe Crab	0.1	0.1	0.1	0.1	3.0	1.6
Summer Flounder	0.1	0.1	0.1	0.1	1.5	1.6
Kingfishes	0.1	<0.1	0.1	0.2	0.4	4.8
White Perch	<0.1	<0.1	0.1	0.1	0.4	1.6
Albemarle						
Small Mesh n=40						
Striped Mullet	459.1	67.3	294.7	61.9	1.6	56.4
Bluefish	83.6	12.3	55	11.6	1.5	43.6
Atlantic Croaker	56.4	8.3	68.5	14.4	0.8	53.8
Mullets	50.3	7.4	29.4	6.2	1.7	10.3
White Perch	5.8	0.9	9.8	2.1	0.6	12.8
Ictalurus Catfishes	4.1	0.6	2	0.4	2.1	7.7
Spanish Mackerel	3.6	0.5	2.9	0.6	1.2	12.8
Striped Bass	3.3	0.5	0.5	0.1	7.1	23.1
Red Drum	3.1	0.5	0.7	0.1	4.7	15.4
Common Carp	2.1	0.3	0.3	0.1	6.3	2.6
Spot	1.9	0.3	5.7	1.2	0.3	28.2
Southern Flounder	1.5	0.2	0.9	0.2	1.7	20.5
Horseshoe Crab	1.2	0.2	0.4	0.1	3.0	7.7
White Catfish	1.2	0.2	0.7	0.2	1.7	5.1
Paralicthid Flounders	1.1	0.2	0.6	0.1	1.7	10.3
Southern Kingfish	0.6	0.1	0.7	0.2	0.9	17.9
Spotted Seatrout	0.6	0.1	0.3	0.1	1.7	23.1
Kingfishes	0.5	0.1	0.5	0.1	1.0	5.1
American Shad	0.4	0.1	0.2	<0.1	2.5	2.6
Harvestfish	0.3	<0.1	1	0.2	0.3	7.7
Sheepshead	0.3	<0.1	0.1	<0.1	2.0	7.7
Northern Kingfish	0.2	<0.1	0.3	0.1	0.6	5.1
Black Drum	0.2	<0.1	<0.1	<0.1	6.2	2.6
Weakfish	0.1	<0.1	0.1	<0.1	1.1	10.3

Table 5.4d (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Albemarle						
Small Mesh n=40						
Blue Crab	0.1	<0.1	0.4	0.1	0.3	5.1
Yellow Perch	0.1	<0.1	0.1	<0.1	0.6	5.1
Hickory Shad	0.1	<0.1	0.1	<0.1	1.0	2.6
Pamlico						
Large Mesh n=180						
Southern Flounder	89.1	55.4	45.3	51.4	2.0	93.9
Paralicthid Flounders	22	13.7	14.7	16.7	1.5	44.4
Sheepshead	13.9	8.6	9.5	10.7	1.5	55.0
Red Drum	7.9	4.9	1.6	1.9	4.8	42.2
Bluefish	6.6	4.1	4.3	4.9	1.5	37.8
Horseshoe Crab	3.6	2.2	0.9	1	4.0	2.2
Black Drum	3.5	2.1	1.6	1.9	2.1	40.6
American Shad	2.3	1.4	0.9	1	2.5	2.8
Gulf Flounder	2.1	1.3	1.1	1.3	1.9	14.4
Spotted Seatrout	1.6	1	0.5	0.5	3.4	20.6
Weakfish	1.4	0.8	1.3	1.4	1.1	33.9
Summer Flounder	1.2	0.8	0.7	0.8	1.8	21.1
Mullets	1.2	0.7	0.9	1.1	1.3	3.3
Florida Pompano	0.9	0.5	0.4	0.4	2.4	11.7
Striped Mullet	0.7	0.4	0.6	0.6	1.3	3.3
Atlantic Croaker	0.7	0.4	1	1.1	0.7	21.7
Hickory Shad	0.6	0.4	0.5	0.5	1.3	1.7
Southern Kingfish	0.5	0.3	0.8	0.9	0.6	18.3
Striped Bass	0.3	0.2	<0.1	<0.1	11.2	2.8
Whelks	0.2	0.1	0.2	0.2	0.9	1.7
Kingfishes	0.1	0.1	0.3	0.3	0.4	6.1
Ictalurus Catfishes	0.1	0.1	0.1	0.1	1.1	0.6
Spot	0.1	0.1	0.2	0.3	0.4	10.0
Atlantic Spadefish	0.1	0.1	0.1	0.1	0.8	1.1
White Catfish	0.1	<0.1	<0.1	<0.1	3.2	1.1
Butterfish	0.1	<0.1	0.4	0.5	0.2	0.6
Common Carp	<0.1	<0.1	<0.1	<0.1	6.3	0.6
Atlantic Cod	<0.1	<0.1	<0.1	<0.1	4.9	0.6
Pigfish	<0.1	<0.1	0.1	0.1	0.5	3.3
Northern Puffer	<0.1	<0.1	<0.1	<0.1	1.1	0.6
Harvestfish	<0.1	<0.1	<0.1	<0.1	0.3	1.1
Pinfish	<0.1	<0.1	<0.1	<0.1	1.0	1.7
Spanish Mackerel	<0.1	<0.1	<0.1	<0.1	1.8	0.6
Blue Crab	-	-	-	-	-	0.6
Cownose Ray	-	-	-	-	-	0.6
Pamlico						
Small Mesh n=135						
Spanish Mackerel	234.2	39	173	39.2	1.3	49.6
Striped Mullet	171	28.5	122.4	27.7	1.4	21.5
Bluefish	115	19.1	69	15.6	1.7	60.7
Hickory Shad	32.9	5.5	23.2	5.2	1.4	14.8
Spotted Seatrout	14.8	2.5	7	1.6	2.1	33.3
Mullets	6.2	1	4.4	1	1.4	7.4
Atlantic Croaker	6.2	1	9.1	2.1	0.7	31.9
Spot	5.3	0.9	12.8	2.9	0.4	22.2
Harvestfish	3.1	0.5	12.1	2.7	0.2	30.4
Red Drum	2.7	0.4	0.7	0.2	3.7	14.8

Table 5.4d (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Pamlico						
Small Mesh n=135						
Houndfish	1.6	0.3	0.4	0.1	4.6	13.3
Paralicthid Flounders	1.4	0.2	0.9	0.2	1.6	7.4
Weakfish	1.3	0.2	1.3	0.3	1.0	32.6
Southern Kingfish	1.1	0.2	1.9	0.4	0.6	15.6
Striped Bass	0.7	0.1	0.1	<0.1	10.2	1.5
Pinfish	0.4	0.1	0.8	0.2	0.6	4.4
Sheepshead	0.4	0.1	0.3	0.1	1.6	2.2
Black Drum	0.4	0.1	0.3	0.1	1.4	8.1
Southern Flounder	0.4	0.1	0.2	<0.1	2.3	8.1
Kingfishes	0.3	0.1	0.5	0.1	0.7	13.3
American Shad	0.3	<0.1	0.1	<0.1	2.7	5.2
Gulf Kingfish	0.2	<0.1	0.3	0.1	0.7	0.7
Cobia	0.2	<0.1	<0.1	<0.1	22.0	0.7
Florida Pompano	0.2	<0.1	0.2	<0.1	0.8	8.9
Butterfish	0.1	<0.1	0.4	0.1	0.3	8.9
White Perch	0.1	<0.1	0.2	<0.1	0.6	3.0
Pigfish	0.1	<0.1	0.2	<0.1	0.4	3.0
White Catfish	0.1	<0.1	<0.1	<0.1	1.6	0.7
Northern Kingfish	0.1	<0.1	<0.1	<0.1	1.2	2.2
Atlantic Cod	<0.1	<0.1	<0.1	<0.1	4.4	0.7
Atlantic Tripletail	<0.1	<0.1	<0.1	<0.1	1.8	0.7
Crevalle Jack	<0.1	<0.1	<0.1	<0.1	1.1	0.7
Rivers						
Large Mesh n=124						
Southern Flounder	27.7	25.6	15.3	36.8	1.8	70.2
American Shad	21.7	20.1	6.5	15.7	3.3	33.1
Striped Bass	19	17.6	3.9	9.3	4.9	40.3
Red Drum	12.8	11.9	2.4	5.8	5.3	40.3
White Catfish	6.8	6.2	1.7	4.2	3.9	16.1
Ictalurus Catfishes	4	3.7	2.4	5.8	1.7	5.6
Spotted Seatrout	2.5	2.3	0.9	2.2	2.7	29.0
Striped Mullet	2.1	1.9	1.6	3.9	1.3	13.7
Hickory Shad	2	1.9	1	2.5	1.9	12.1
Black Drum	1.9	1.7	0.6	1.5	3.1	21.0
Common Carp	1.6	1.5	0.3	0.7	5.3	4.0
Paralicthid Flounders	1.6	1.5	0.9	2.1	1.9	4.8
Atlantic Croaker	1	0.9	1.7	4	0.6	23.4
Mullets	0.9	0.8	0.7	1.6	1.3	3.2
Striped Bass X White	0.8	0.7	0.2	0.5	3.4	6.5
Bluefish	0.5	0.4	0.4	0.8	1.3	3.2
Sheepshead	0.3	0.3	0.2	0.5	1.8	8.9
Blue Catfish	0.3	0.3	<0.1	0.1	8.0	1.6
Spot	0.3	0.3	0.7	1.6	0.4	12.1
Channel Catfish	0.3	0.2	<0.1	0.1	6.5	2.4
Southern Kingfish	0.1	0.1	0.1	0.2	0.7	7.3
Weakfish	<0.1	<0.1	0.1	0.1	0.9	3.2
Atlantic Tripletail	<0.1	<0.1	<0.1	<0.1	5.3	0.8
White Perch	<0.1	<0.1	<0.1	0.1	0.8	3.2
Pigfish	<0.1	<0.1	<0.1	<0.1	0.4	1.6
Rivers						
Small Mesh n=113						
Striped Mullet	386.9	72.8	244.3	55.3	1.6	63.4

Table 5.4d (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Rivers						
Small Mesh n=113						
Spanish Mackerel	46.7	8.8	30.6	6.9	1.5	17.9
Spotted Seatrout	46.4	8.7	22.1	5	2.1	67.9
Hickory Shad	12.3	2.3	8.8	2	1.4	17.0
Spot	8.7	1.6	23.2	5.2	0.4	29.5
Mullets	8.1	1.5	6.3	1.4	1.3	8.9
Red Drum	6.3	1.2	1.4	0.3	4.5	26.8
Atlantic Croaker	5	0.9	97.8	22.1	0.0	25.9
Bluefish	4.1	0.8	3.1	0.7	1.3	18.8
Southern Flounder	1.8	0.3	1.1	0.3	1.7	14.3
American Shad	1.8	0.3	0.7	0.1	2.8	9.8
Black Drum	0.6	0.1	0.4	0.1	1.5	8.9
White Perch	0.4	0.1	0.5	0.1	0.8	15.2
Atlantic Mackerel	0.4	0.1	0.3	0.1	1.5	0.9
Striped Bass	0.4	0.1	0.1	<0.1	3.4	2.7
White Catfish	0.4	0.1	0.1	<0.1	3.8	3.6
Ictalurus Catfishes	0.3	0.1	0.2	<0.1	1.5	1.8
Paralicthid Flounders	0.2	<0.1	0.1	<0.1	1.3	6.3
Weakfish	0.2	<0.1	0.2	<0.1	1.1	4.5
Sheepshead	0.1	<0.1	0.1	<0.1	2.2	3.6
Channel Catfish	0.1	<0.1	0.1	<0.1	1.4	0.9
Common Carp	0.1	<0.1	<0.1	<0.1	4.5	0.9
Southern Kingfish	0.1	<0.1	0.1	<0.1	0.9	4.5
Florida Pompano	0.1	<0.1	0.1	<0.1	0.7	4.5
Harvestfish	0.1	<0.1	0.2	<0.1	0.3	4.5
Blue Catfish	<0.1	<0.1	<0.1	<0.1	2.5	0.9
Pigfish	<0.1	<0.1	<0.1	<0.1	0.5	1.8
Alewife	<0.1	<0.1	<0.1	<0.1	0.6	0.9
Central						
Large Mesh n=111						
Southern Flounder	76.5	67.2	44.3	69.5	1.7	100.0
Horseshoe Crab	8.5	7.5	2.7	4.3	3.1	18.9
Red Drum	6.4	5.6	1.3	2	5.1	38.7
Whelks	4.9	4.3	5.5	8.6	0.9	36.0
Gulf Flounder	3.8	3.3	2.1	3.3	1.8	50.5
Paralicthid Flounders	3.7	3.2	1.5	2.3	2.4	8.1
Black Drum	2.9	2.6	0.8	1.2	3.8	36.0
Sheepshead	2.8	2.4	1.3	2.1	2.1	50.5
Summer Flounder	0.8	0.7	0.6	0.9	1.4	31.5
Bluefish	0.8	0.7	0.5	0.8	1.5	6.3
Spot	0.7	0.6	1.6	2.4	0.5	6.3
Weakfish	0.7	0.6	0.6	1	1.0	23.4
Spotted Seatrout	0.6	0.5	0.2	0.2	3.6	11.7
Striped Mullet	0.4	0.4	0.3	0.4	1.6	4.5
Southern Kingfish	0.2	0.2	0.3	0.4	0.8	18.0
Florida Pompano	0.1	0.1	0.1	0.1	1.7	1.8
Atlantic Spadefish	0.1	0.1	<0.1	<0.1	4.0	1.8
Pigfish	0.1	<0.1	0.1	0.2	0.4	6.3
Atlantic Croaker	<0.1	<0.1	<0.1	<0.1	0.8	1.8
Northern Kingfish	<0.1	<0.1	<0.1	<0.1	1.1	0.9
Central						
Small Mesh n=51						
Striped Mullet	557.9	87.4	286.1	77.8	1.9	78.3

Table 5.4d (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Central						
Small Mesh n=51						
Bluefish	34	5.3	20.9	5.7	1.6	10.9
Spot	19	3	45.8	12.5	0.4	26.1
Spotted Seatrout	16	2.5	6.6	1.8	2.4	34.8
Mullets	5.2	0.8	2.7	0.7	2.0	4.3
Red Drum	1.3	0.2	0.4	0.1	3.0	10.9
Weakfish	1.1	0.2	1	0.3	1.1	13.0
Southern Flounder	1.1	0.2	0.5	0.1	2.3	10.9
Pigfish	0.9	0.1	2.2	0.6	0.4	10.9
Sheepshead	0.5	0.1	0.3	0.1	1.6	13.0
Spanish Mackerel	0.4	0.1	0.2	0.1	1.8	4.3
Atlantic Croaker	0.4	0.1	0.7	0.2	0.5	17.4
Southern Kingfish	0.2	<0.1	0.3	0.1	0.8	8.7
Black Drum	0.1	<0.1	<0.1	<0.1	4.0	2.2
Northern Kingfish	<0.1	<0.1	<0.1	<0.1	0.9	2.2
Summer Flounder	<0.1	<0.1	<0.1	<0.1	1.0	2.2
Southern						
Large Mesh n=33						
Southern Flounder	38	38.1	21.3	44.4	1.8	66.7
American Shad	28.5	28.6	9.6	20	3.0	27.3
Red Drum	13.5	13.5	2.7	5.6	5.1	51.5
Black Drum	9.2	9.2	2.7	5.6	3.4	42.4
Spot	2.8	2.8	6.9	14.3	0.4	9.1
Ictalurus Catfishes	2	2	1.4	2.9	1.5	3.0
Sheepshead	1.5	1.6	1	2	1.6	30.3
Blue Catfish	1.4	1.4	0.3	0.6	4.6	6.1
Spotted Seatrout	1.2	1.2	0.9	1.8	1.4	18.2
Bluefish	0.6	0.6	0.6	1.3	0.9	9.1
Mullets	0.4	0.4	0.3	0.7	1.3	3.0
Flathead Catfish	0.2	0.2	<0.1	0.1	6.0	3.0
Atlantic Tripletail	0.1	0.1	0.1	0.1	2.2	3.0
Kingfishes	0.1	0.1	0.1	0.1	1.1	6.1
Weakfish	0.1	0.1	0.1	0.1	1.0	3.0
Southern Kingfish	<0.1	<0.1	<0.1	0.1	1.1	3.0
Gulf Kingfish	<0.1	<0.1	<0.1	0.1	1.1	3.0
Atlantic Croaker	<0.1	<0.1	<0.1	0.1	1.1	3.0
Florida Stone Crab	<0.1	<0.1	-	-	-	3.0
Southern						
Small Mesh n=38						
Striped Mullet	173.7	54.3	121.6	40.6	1.4	57.9
Mullets	59	18.5	36.7	12.2	1.6	23.7
Spot	31	9.7	87.9	29.4	0.4	28.9
Spotted Seatrout	19.9	6.2	10.6	3.5	1.9	50.0
Bluefish	13.2	4.1	19.6	6.5	0.7	23.7
Red Drum	6	1.9	1.3	0.4	4.6	34.2
Black Drum	4.6	1.5	4.9	1.6	0.9	23.7
Southern Kingfish	3.5	1.1	6.5	2.2	0.6	5.3
Atlantic Croaker	2.6	0.8	4.9	1.6	0.5	23.7
Southern Flounder	2.5	0.8	1.5	0.5	1.8	21.1
Weakfish	1.8	0.6	1.5	0.5	1.2	7.9
Sheepshead	0.4	0.1	0.4	0.1	1.0	7.9
Atlantic Tripletail	0.4	0.1	0.1	<0.1	3.5	5.3
Paralicthid Flounders	0.3	0.1	0.2	0.1	2.0	2.6

Table 5.4d (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Southern						
Small Mesh n=38						
Gulf Kingfish	0.3	0.1	0.6	0.2	0.6	2.6
Butterfish	0.2	0.1	1	0.3	0.2	2.6
Spanish Mackerel	0.1	<0.1	0.1	<0.1	1.1	7.9
Blue Catfish	0.1	<0.1	<0.1	<0.1	3.1	2.6
Kingfishes	0.1	<0.1	0.2	0.1	0.4	2.6

Table 5.4e Overall marketable species composition of estuarine gill net samples by weight and number for each area and mesh class for 2011. Mesh class n-values represent the number of trips sampled. Data from NCDMF fishery dependent biological database.

	Weight (lb)		Number			
Area/Mesh Class/Species	Mean	Percent	Mean	Percent	Mean Fish Weight (lb)	Percent Occurrence
Albemarle						
Large Mesh n=113						
American Shad	69.4	49.9	22.2	37.9	3.1	42.9
Southern Flounder	16.1	11.6	7.7	13.2	2.1	43.8
Striped Bass	15.4	11.1	2.0	3.5	7.6	34.8
White Catfish	9.0	6.5	3.2	5.4	2.9	22.3
Ictalurus Catfishes	6.1	4.4	5.1	8.8	1.2	19.6
Paralicthid Flounders	5.2	3.7	3.2	5.4	1.6	34.8
Hickory Shad	4.1	2.9	2.5	4.3	1.6	28.6
White Perch	2.1	1.5	4.3	7.3	0.5	2.7
Sheepshead	2.0	1.4	0.7	1.2	2.9	11.6
Bluefish	1.7	1.3	1.1	1.9	1.6	19.6
Common Carp	1.6	1.2	0.2	0.3	8.8	3.6
Atlantic Menhaden	1.0	0.7	3.8	6.5	0.3	0.9
Horseshoe Crab	0.9	0.6	0.2	0.4	3.5	6.3
Sharks	0.8	0.5	0.2	0.4	3.5	0.9
Red Drum	0.7	0.5	0.2	0.3	3.7	11.6
Black Drum	0.7	0.5	0.4	0.6	1.9	12.5
Mullets	0.4	0.3	0.4	0.7	1.1	3.6
Spotted Seatrout	0.4	0.3	0.2	0.3	2.0	8.0
Atlantic Croaker	0.2	0.2	0.4	0.6	0.6	14.3
Florida Pompano	0.2	0.1	0.1	0.1	3.2	3.6
Atlantic Cod	0.2	0.1	<0.1	0.1	4.2	3.6
Silver Perch	0.2	0.1	0.1	0.1	2.6	0.9
Striped Mullet	0.1	0.1	0.1	0.1	2.2	1.8
Summer Flounder	0.1	0.1	<0.1	0.1	2.0	1.8
Atlantic Mackerel	0.1	<0.1	0.1	0.2	0.6	6.3
Spot	0.1	<0.1	0.2	0.3	0.4	4.5
Kingfishes	0.1	<0.1	0.1	0.1	1.0	1.8
Houndfish	<0.1	<0.1	<0.1	<0.1	3.1	0.9
Weakfish	<0.1	<0.1	<0.1	<0.1	1.0	2.7
Southern Kingfish	<0.1	<0.1	<0.1	0.1	0.7	1.8
Tautog	<0.1	<0.1	<0.1	<0.1	2.2	0.9
Albemarle						
Small Mesh n=62						
Striped Mullet	294.5	65.5	251.6	58.1	1.2	51.6
White Perch	54.7	12.2	91.5	21.1	0.6	35.5
Bluefish	33.1	7.4	24.2	5.6	1.4	33.9
Mullets	16.3	3.6	14.5	3.3	1.1	21.0
Ictalurus Catfishes	12.1	2.7	8.4	1.9	1.5	9.7
Striped Bass	9.1	2.0	0.9	0.2	9.9	25.8
White Catfish	5.8	1.3	3.4	0.8	1.7	11.3
Atlantic Croaker	5.5	1.2	13.1	3.0	0.4	33.9
Spot	2.9	0.7	8.4	1.9	0.4	24.2
Houndfish	2.7	0.6	1.0	0.2	2.8	9.7
Black Drum	2.4	0.5	4.9	1.1	0.5	3.2
American Shad	2.2	0.5	0.7	0.2	3.3	6.5
Southern Kingfish	1.5	0.3	2.2	0.5	0.7	6.5
Yellow Perch	1.4	0.3	2.4	0.5	0.6	11.3
Kingfishes	1.1	0.2	1.1	0.3	1.0	6.5
Spanish Mackerel	0.7	0.2	0.5	0.1	1.5	6.5
Harvestfish	0.5	0.1	1.8	0.4	0.3	6.5
Spotted Seatrout	0.5	0.1	0.2	0.1	2.0	12.9

Table 5.4e (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Albemarle						
Small Mesh n=62						
Hickory Shad	0.4	0.1	0.3	0.1	1.5	3.2
Paralicthid Flounders	0.4	0.1	0.3	0.1	1.4	14.5
Weakfish	0.4	0.1	0.4	0.1	0.9	9.7
Blue Crab	0.3	0.1	0.7	0.2	0.4	1.6
Northern Kingfish	0.3	0.1	0.4	0.1	0.7	3.2
Sheepshead	0.2	0.1	0.2	<0.1	1.4	3.2
Common Carp	0.2	<0.1	<0.1	<0.1	6.5	1.6
Southern Flounder	0.2	<0.1	0.1	<0.1	2.0	1.6
Red Drum	0.2	<0.1	0.1	<0.1	2.8	3.2
Horseshoe Crab	0.1	<0.1	<0.1	<0.1	3.0	1.6
Butterfish	<0.1	<0.1	0.1	<0.1	0.2	1.6
Pamlico						
Large Mesh n=170						
Southern Flounder	75.7	59.2	38.8	57.8	2.0	92.9
Paralicthid Flounders	13.5	10.6	7.7	11.5	1.7	40.0
Bluefish	9.4	7.4	5.2	7.7	1.8	37.6
Sheepshead	7.4	5.8	3.5	5.2	2.2	52.9
Red Drum	5.6	4.4	1.1	1.6	5.2	38.2
Horseshoe Crab	3.8	2.9	1.2	1.8	3.2	5.3
Black Drum	3.7	2.9	1.7	2.6	2.2	39.4
Spanish Mackerel	1.9	1.5	1.5	2.2	1.3	0.6
Spotted Seatrout	1.4	1.1	0.7	1.1	1.9	20.6
Atlantic Croaker	0.7	0.5	1.6	2.4	0.4	22.9
Weakfish	0.6	0.4	0.6	0.9	1.0	17.1
American Shad	0.6	0.4	0.2	0.3	3.1	1.8
Hickory Shad	0.6	0.4	0.4	0.6	1.5	1.8
Florida Pompano	0.4	0.3	0.2	0.3	2.3	12.4
Summer Flounder	0.4	0.3	0.3	0.4	1.5	10.6
Striped Mullet	0.4	0.3	0.1	0.1	4.3	2.4
Spot	0.3	0.3	0.8	1.2	0.4	14.7
Atlantic Spadefish	0.2	0.2	0.4	0.5	0.7	7.1
Mullets	0.2	0.2	0.2	0.3	1.1	1.8
Whelks	0.2	0.1	0.3	0.4	0.7	1.8
White Perch	0.2	0.1	0.3	0.5	0.5	0.6
Striped Bass	0.1	0.1	<0.1	<0.1	7.6	1.2
Atlantic Tripletail	0.1	0.1	<0.1	<0.1	7.5	1.8
Southern Kingfish	0.1	0.1	0.2	0.3	0.7	10.0
Gulf Flounder	0.1	0.1	0.1	0.1	1.9	5.3
Kingfishes	0.1	0.1	0.1	0.1	1.1	4.7
Pigfish	<0.1	<0.1	0.1	0.1	0.5	2.9
Harvestfish	<0.1	<0.1	0.1	0.1	0.3	0.6
Houndfish	<0.1	<0.1	<0.1	<0.1	3.7	0.6
Atlantic Cod	<0.1	<0.1	<0.1	<0.1	3.5	0.6
Silver Perch	<0.1	<0.1	<0.1	<0.1	3.3	0.6
Pinfish	<0.1	<0.1	<0.1	<0.1	0.7	0.6
Butterfish	<0.1	<0.1	<0.1	<0.1	0.4	0.6
Pamlico						
Small Mesh n=149						
Bluefish	183.9	35.9	110.2	30.2	1.7	69.8
Spanish Mackerel	141.0	27.5	94.6	25.9	1.5	38.3
Striped Mullet	116.3	22.7	64.2	17.6	1.8	20.1
Hickory Shad	20.7	4.0	14.7	4.0	1.4	13.4
Southern Kingfish	14.0	2.7	23.9	6.5	0.6	14.8

Table 5.4e (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Pamlico						
Small Mesh n=149						
Weakfish	8.0	1.6	8.9	2.4	0.9	43.0
Harvestfish	4.3	0.8	16.4	4.5	0.3	23.5
Spot	3.9	0.8	9.8	2.7	0.4	22.8
Kingfishes	3.6	0.7	3.6	1.0	1.0	17.4
Southern Flounder	2.9	0.6	1.8	0.5	1.6	8.7
Mullets	2.1	0.4	1.7	0.5	1.3	9.4
Houndfish	1.9	0.4	0.5	0.1	4.1	14.8
White Perch	1.7	0.3	3.2	0.9	0.5	4.0
Butterfish	1.6	0.3	6.9	1.9	0.2	24.8
Spotted Seatrout	1.3	0.3	0.8	0.2	1.8	20.8
Atlantic Croaker	1.0	0.2	1.8	0.5	0.5	19.5
American Shad	0.9	0.2	0.5	0.1	1.9	1.3
Paralicthid Flounders	0.6	0.1	0.3	0.1	1.7	6.0
Red Drum	0.5	0.1	0.2	<0.1	3.7	5.4
Striped Bass	0.5	0.1	0.1	<0.1	5.3	3.4
Sheepshead	0.4	0.1	0.1	<0.1	2.8	5.4
Smooth Dogfish	0.3	0.1	0.1	<0.1	4.4	0.7
Northern Kingfish	0.2	<0.1	0.2	0.1	1.1	6.0
Black Drum	0.2	<0.1	0.1	<0.1	1.9	3.4
Horseshoe Crab	0.1	<0.1	0.1	<0.1	3.0	0.7
Atlantic Bonito	0.1	<0.1	<0.1	<0.1	5.5	0.7
Finetooth Shark	0.1	<0.1	<0.1	<0.1	13.0	0.7
Cobia	0.1	<0.1	<0.1	<0.1	13.0	0.7
Florida Pompano	0.1	<0.1	0.1	<0.1	0.8	5.4
Atlantic Mackerel	0.1	<0.1	0.2	<0.1	0.5	1.3
Atlantic Spadefish	0.1	<0.1	0.1	<0.1	0.9	2.7
Northern Puffer	<0.1	<0.1	<0.1	<0.1	1.0	2.0
Pigfish	<0.1	<0.1	0.1	<0.1	0.4	2.7
Pinfish	<0.1	<0.1	<0.1	<0.1	0.6	1.3
Atlantic Cutlassfish	<0.1	<0.1	<0.1	<0.1	1.1	2.0
Gray Triggerfish	<0.1	<0.1	<0.1	<0.1	1.8	0.7
Summer Flounder	<0.1	<0.1	<0.1	<0.1	1.3	0.7
Permit	<0.1	<0.1	<0.1	<0.1	0.3	0.7
Yellow Perch	<0.1	<0.1	<0.1	<0.1	1.1	0.7
Gulf Kingfish	<0.1	<0.1	<0.1	<0.1	1.1	0.7
Crevalle Jack	<0.1	<0.1	<0.1	<0.1	0.4	0.7
Rivers						
Large Mesh n=124						
Southern Flounder	39.3	39.0	22.6	48.9	1.7	53.2
American Shad	25.9	25.7	7.4	16.1	3.5	42.7
Striped Bass	20.8	20.6	3.6	7.9	5.7	49.2
Blue Catfish	1.5	1.5	0.2	0.5	6.2	4.8
Hickory Shad	1.4	1.4	0.9	1.9	1.6	10.5
Red Drum	1.4	1.4	0.3	0.7	4.6	13.7
Black Drum	1.4	1.4	0.7	1.4	2.1	14.5
White Catfish	1.3	1.3	0.4	0.8	3.8	15.3
Atlantic Menhaden	1.1	1.1	4.4	9.6	0.3	1.6
Mullets	1.1	1.1	1.0	2.1	1.1	0.8
Paralicthid Flounders	0.9	0.9	0.8	1.7	1.1	4.0
Common Carp	0.9	0.9	0.1	0.2	7.6	6.5
Striped Mullet	0.7	0.7	0.7	1.5	1.0	8.1
Bluefish	0.7	0.7	0.5	1.0	1.6	3.2
Atlantic Spadefish	0.5	0.5	0.7	1.5	0.8	3.2
Channel Catfish	0.5	0.5	0.1	0.2	4.6	4.8
Atlantic Croaker	0.3	0.3	0.8	1.7	0.4	8.1

Table 5.4e (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Rivers						
Large Mesh n=124						
Spot	0.3	0.3	0.7	1.6	0.4	7.3
Striped Bass X White	0.2	0.2	0.1	0.1	4.1	5.6
Flathead Catfish	0.2	0.2	<0.1	<0.1	13.0	1.6
Spotted Seatrout	0.2	0.2	0.1	0.3	1.6	8.1
Spanish Mackerel	<0.1	<0.1	<0.1	<0.1	1.2	0.8
White Perch	<0.1	<0.1	<0.1	0.1	0.5	0.8
Southern Kingfish	<0.1	<0.1	<0.1	0.1	0.7	2.4
Florida Pompano	<0.1	<0.1	<0.1	<0.1	1.9	0.8
Harvestfish	<0.1	<0.1	<0.1	<0.1	0.3	0.8
Rivers						
Small Mesh n=61						
Striped Mullet	298.5	75.0	179.4	63.9	1.7	67.2
Mullets	26.0	6.5	14.8	5.3	1.8	21.3
Spotted Seatrout	22.6	5.7	11.2	4.0	2.0	50.8
Spot	16.7	4.2	45.3	16.1	0.4	29.5
White Perch	7.6	1.9	14.0	5.0	0.6	27.9
Hickory Shad	6.2	1.6	4.2	1.5	1.5	11.5
American Shad	5.3	1.3	1.5	0.5	3.4	8.2
Striped Bass	4.0	1.0	0.8	0.3	4.9	8.2
Atlantic Croaker	2.1	0.5	5.0	1.8	0.4	18.0
Common Carp	1.8	0.4	0.2	0.1	9.1	3.3
Spanish Mackerel	1.6	0.4	1.0	0.3	1.7	4.9
Red Drum	1.4	0.3	0.3	0.1	4.6	13.1
White Catfish	1.0	0.2	0.5	0.2	1.9	4.9
Black Drum	0.8	0.2	0.7	0.3	1.1	13.1
Southern Flounder	0.8	0.2	0.6	0.2	1.2	18.0
Bluefish	0.7	0.2	0.5	0.2	1.4	6.6
Paralicthid Flounders	0.6	0.1	0.3	0.1	1.8	8.2
Blue Catfish	0.3	0.1	<0.1	<0.1	6.3	1.6
Little Tunny	0.1	<0.1	<0.1	<0.1	1.7	1.6
Ictalurus Catfishes	<0.1	<0.1	<0.1	<0.1	1.0	1.6
Atlantic Mackerel	<0.1	<0.1	0.1	<0.1	0.7	1.6
Butterfish	<0.1	<0.1	0.1	<0.1	0.2	1.6
Central						
Large Mesh n=141						
Southern Flounder	58.2	63.8	35.6	69.0	1.6	100.0
Red Drum	8.9	9.8	2.0	3.9	4.5	56.7
Horseshoe Crab	8.4	9.3	2.2	4.3	3.8	21.3
Whelks	6.6	7.3	7.4	14.2	0.9	49.6
Sheepshead	3.0	3.3	1.4	2.6	2.2	43.3
Black Drum	2.0	2.2	0.8	1.5	2.6	27.7
Paralicthid Flounders	1.5	1.7	0.6	1.2	2.5	4.3
Gulf Flounder	0.8	0.8	0.4	0.8	1.8	18.4
Summer Flounder	0.4	0.5	0.3	0.6	1.4	21.3
Bluefish	0.3	0.3	0.1	0.2	3.0	3.5
Striped Mullet	0.2	0.3	0.1	0.1	3.5	3.5
Spotted Seatrout	0.2	0.2	0.1	0.2	1.6	8.5
Spot	0.2	0.2	0.3	0.6	0.5	1.4
Florida Stone Crab	0.1	0.1	-	-	-	1.4
Southern Kingfish	0.1	0.1	0.1	0.3	0.6	7.1
Atlantic Spadefish	0.1	0.1	0.1	0.1	1.1	2.8
Florida Pompano	0.1	0.1	<0.1	<0.1	2.6	1.4
Crevalle Jack	<0.1	<0.1	<0.1	<0.1	5.1	0.7
Pigfish	<0.1	<0.1	0.1	0.1	0.4	2.8

Table 5.4e (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Central						
Large Mesh n=141						
Weakfish	<0.1	<0.1	<0.1	<0.1	1.0	2.1
Atlantic Croaker	<0.1	<0.1	<0.1	<0.1	0.8	1.4
Gray Triggerfish	<0.1	<0.1	<0.1	<0.1	2.0	0.7
Gulf Kingfish	<0.1	<0.1	<0.1	<0.1	1.0	0.7
Central						
Small Mesh n=46						
Striped Mullet	340.3	68.6	226.2	46.0	1.5	56.5
Spot	95.5	19.2	220.4	44.8	0.4	52.2
Bluefish	41.8	8.4	29.9	6.1	1.4	43.5
Spotted Seatrout	4.4	0.9	2.4	0.5	1.8	45.7
Southern Flounder	3.9	0.8	1.9	0.4	2.0	19.6
Weakfish	3.3	0.7	2.5	0.5	1.3	34.8
Red Drum	1.5	0.3	0.4	0.1	4.1	15.2
Black Drum	1.3	0.3	2.4	0.5	0.6	28.3
Pigfish	0.7	0.2	1.7	0.3	0.4	21.7
Southern Kingfish	0.5	0.1	0.7	0.1	0.8	19.6
Atlantic Croaker	0.5	0.1	1.2	0.2	0.4	17.4
Sheepshead	0.4	0.1	0.2	<0.1	2.4	2.2
White Mullet	0.4	0.1	0.7	0.1	0.6	10.9
Hickory Shad	0.3	0.1	0.3	0.1	1.0	2.2
Summer Flounder	0.3	0.1	0.3	0.1	1.2	8.7
Northern Kingfish	0.3	0.1	0.3	0.1	1.0	10.9
Whelks	0.2	<0.1	0.2	<0.1	1.0	6.5
Spanish Mackerel	0.2	<0.1	0.1	<0.1	1.4	4.3
Gulf Kingfish	0.1	<0.1	0.1	<0.1	0.8	4.3
Gulf Flounder	0.1	<0.1	<0.1	<0.1	1.3	4.3
Butterfish	0.1	<0.1	0.2	<0.1	0.4	4.3
Florida Pompano	<0.1	<0.1	0.2	<0.1	0.3	2.2
Atlantic Spadefish	<0.1	<0.1	0.1	<0.1	0.5	2.2
White Perch	<0.1	<0.1	<0.1	<0.1	0.5	2.2
Harvestfish	<0.1	<0.1	0.1	<0.1	0.2	2.2
Southern						
Large Mesh n=24						
Southern Flounder	59.5	76.1	32.2	86.4	1.9	100.0
Red Drum	13.1	16.8	2.7	7.1	4.9	50.0
Sheepshead	2.1	2.7	0.5	1.5	3.9	33.3
Black Drum	1.2	1.6	0.5	1.2	2.7	12.5
Longnose Gar	1.0	1.3	0.1	0.3	7.9	8.3
Bluefish	0.9	1.1	1.0	2.6	0.9	20.8
Atlantic Tripletail	0.1	0.2	<0.1	0.1	3.1	4.2
Striped Mullet	0.1	0.1	0.1	0.2	1.3	8.3
Atlantic Croaker	0.1	0.1	0.1	0.3	0.5	12.5
Summer Flounder	0.1	0.1	<0.1	0.1	1.3	4.2
Pigfish	<0.1	<0.1	<0.1	0.1	0.4	4.2
Southern						
Small Mesh n=22						
Striped Mullet	184.6	67.1	111.7	41.0	1.7	61.9
Spot	48.8	17.7	129.3	47.4	0.4	33.3
Red Drum	8.9	3.2	1.7	0.6	5.1	33.3
Mullets	8.9	3.2	6.9	2.5	1.3	19.0
Spotted Seatrout	8.5	3.1	3.9	1.4	2.2	38.1
Black Drum	4.4	1.6	8.0	2.9	0.6	42.9
Blue Catfish	3.4	1.2	0.3	0.1	10.1	4.8

Table 5.4e (Continued)

Area/Mesh Class/Species	Weight (lb) Mean	Weight (lb) Percent	Number Mean	Number Percent	Mean Fish Weight (lb)	Percent Occurrence
Southern						
Small Mesh n=22						
Atlantic Croaker	3.3	1.2	7.4	2.7	0.4	9.5
Bluefish	2.2	0.8	2.1	0.8	1.1	14.3
Southern Flounder	1.8	0.7	1.1	0.4	1.6	9.5
Paralicthid Flounders	0.1	0.1	0.1	<0.1	1.5	9.5
American Shad	0.1	<0.1	0.1	<0.1	2.4	4.8
Gulf Kingfish	<0.1	<0.1	0.1	<0.1	1.0	4.8

Table 5.5 Percent occurrence of species in the marketed scrap fish component of estuarine gill net catches by area and mesh class, 2007-2011. Source: NCDMF fishery dependent biological database.

Year/Area/Mesh Class/Species	Percent Occurrence
2007	
Albemarle	
Large Mesh n=70	
Atlantic Menhaden	1.4
Southern Flounder	1.4
Small Mesh n=17	
Atlantic Menhaden	5.9
Central	
Small Mesh n=62	
Bluefish	9.7
Atlantic Menhaden	6.5
Hickory Shad	3.2
Gizzard Shad	1.6
Pamlico n=182	
Large Mesh	
Atlantic Menhaden	0.5
Small Mesh n=121	
Bluefish	2.5
Atlantic Menhaden	0.8
Rivers	
Large Mesh n=154	
Atlantic Menhaden	9.1
Hickory Shad	3.2
American shad	1.9
Gizzard Shad	1.3
Bluefish	0.6
Small Mesh n=112	
Atlantic Menhaden	9.8
Hickory Shad	3.6
Gizzard Shad	0.9
Black Drum	0.9

Year/Area/Mesh Class/Species	Percent Occurrence
2008	
Albemarle	
Large Mesh n=125	
Atlantic Menhaden	2.4
Small Mesh n=31	
Atlantic Menhaden	6.5
Central	
Large Mesh n=171	
Sheepshead	0.6
Small Mesh n=59	
Atlantic Menhaden	3.4
Pamlico	
Small Mesh n=123	
Atlantic Menhaden	3.3
Hickory Shad	1.6
Rivers	
Large Mesh n=114	
Atlantic Menhaden	11.4
Hickory Shad	4.4
Bluefish	0.9
Small Mesh n=99	
Atlantic Menhaden	16.2
Gizzard Shad	4.0
Hickory Shad	4.0
Bluefish	1.0
Ladyfish	1.0
Striped Mullet	1.0
White Perch	1.0

Year/Area/Mesh Class/Species	Percent Occurrence
2009	
Albemarle	
Large Mesh n=113	
Atlantic Menhaden	6.2
Spiny Dogfish	0.9
Small Mesh n=22	
Atlantic Menhaden	9.1
Pamlico	
Large Mesh n=190	
Bluefish	1.1
Small Mesh n=135	
Atlantic Menhaden	3.7
Bluefish	2.2
Rivers	
Large Mesh n=143	
Atlantic Menhaden	1.4
Gizzard Shad	1.4
Small Mesh n=112	
Bluefish	3.6
Atlantic Menhaden	2.7
Hickory Shad	0.9
2010	
Albemarle	
Large Mesh n=63	
Atlantic Menhaden	11.1
Small Mesh n=40	
Atlantic Menhaden	7.5

Year/Area/Mesh Class/Species	Percent Occurrence
2010	
Pamlico	
Large Mesh n=180	
Atlantic Menhaden	0.6
Weakfish	0.6
Small Mesh n=135	
Atlantic Menhaden	2.2
Rivers	
Large Mesh n=124	
Atlantic Menhaden	1.6
American Shad	0.8
Atlantic Croaker	0.8
Small Mesh n=113	
Atlantic Croaker	0.9
Atlantic Menhaden	0.9
Bluefish	0.9
Gizzard Shad	0.9
Ladyfish	0.9
Silver Perch	0.9
2011	
Albemarle	
Large Mesh n=113	
Atlantic Menhaden	17.7
Small Mesh n=62	
Atlantic Menhaden	17.7
Hickory Shad	1.6
Central	
Small Mesh n=51	
Atlantic Menhaden	2.0
Gizzard Shad	2.0

Year/Area/Mesh Class/Species	Percent Occurrence
2011	
Pamlico	
Large Mesh n=170	
Atlantic Menhaden	1.2
Small Mesh n=149	
Atlantic Menhaden	4.7
Rivers	
Large Mesh n=124	
Atlantic Menhaden	4.8
American Shad	0.8
Gizzard Shad	0.8
Small Mesh n=61	
Atlantic Menhaden	13.1
Gizzard Shad	4.9

Table 5.6 Percent occurrence of discarded bycatch species reported or observed in sampled estuarine gill net catches, 2007 – 2011. Source: NCDMF fishery dependent biological database.

Species	Percent Occurrence	Species	Percent Occurrence
Atlantic Menhaden	6.2	American Shad	0.1
Gizzard Shad	3.0	Channel Catfish	0.1
Blue Crab	2.5	Houndfish	0.1
Longnose Gar	2.4	Striped Bass X White	0.1
Southern Flounder	1.6	Longtail Bass	0.1
Paralicthid Flounders	1.5	Southern Kingfish	0.1
Red Drum	1.4	Ladyfish	<0.1
Common Carp	1.2	Tarpon	<0.1
Striped Bass	1.2	Redhorse Suckers	<0.1
Cownose Ray	0.6	Lepomis Sunfishes	<0.1
Silver Redhorse	0.6	Silver Perch	<0.1
Creek Chubsucker	0.6	Atlantic Spadefish	<0.1
White Catfish	0.5	Mullets	<0.1
Hickory Shad	0.5	Striped Mullet	<0.1
Bluefish	0.4	Butterfish	<0.1
Atlantic Croaker	0.3	Harvestfish	<0.1
Spot	0.3	Gulf Flounder	<0.1
Bowfin	0.3	Speckled Swimming Crab	<0.1
Black Drum	0.2	Florida Stone Crab	<0.1
Stingrays	0.1	Clearnose Skate	<0.1
Atlantic Sturgeon	0.1	Dasyatis Stingrays	<0.1
Pigfish	0.1	Suckers	<0.1
Horseshoe Crab	0.1	Shorthead Redhorse	<0.1
Ictalurus Catfishes	0.1	Pumpkinseed	<0.1
White Perch	0.1	Largemouth Bass	<0.1
Spotted Seatrout	0.1	Black Crappie	<0.1
Weakfish	0.1	Atlantic Tripletail	<0.1
Atlantic Stingray	0.1	Sheepshead	<0.1
Pinfish	0.1	Spanish Mackerel	<0.1
Double-crested Cormorant	0.1	Common Snapping Turtle	<0.1
Spiny Dogfish	0.1	Diamondback Turtle	<0.1
Rays	0.1		

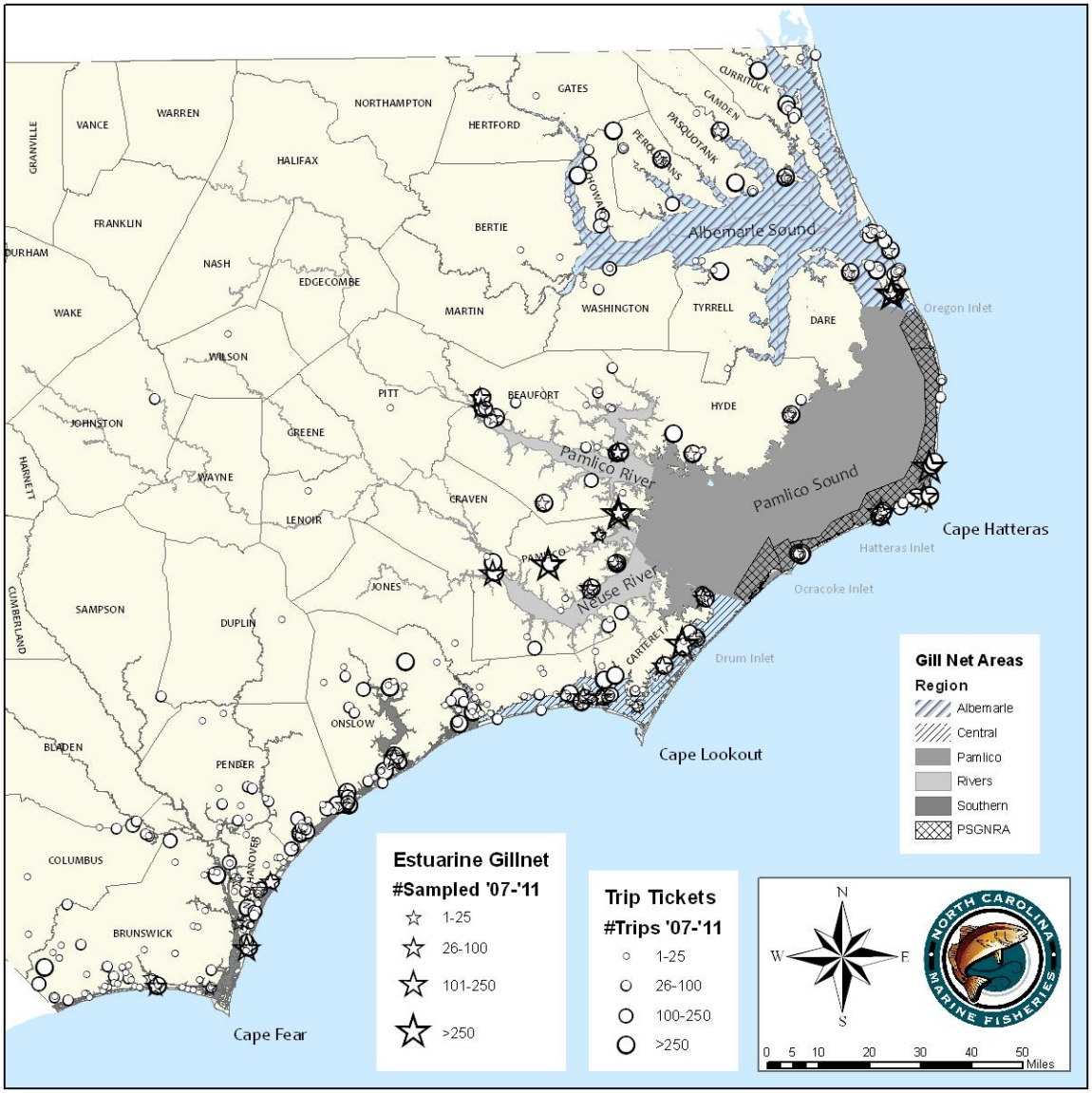

Figure 5.1 Fishing grounds of North Carolina's estuarine gill net fishery divided into the Albemarle, Pamlico, Rivers, Central, and Southern areas. Also shown are the locations of fish houses with the magnitude of trip tickets processed and trips sampled by the NCDMF, 2007 – 2011.

ASSESSMENT OF NORTH CAROLINA COMMERCIAL FINFISHERIES, 2007-2012

Final Performance Report for Award Number NA07NMF4070047

November 2012

SPECIES SECTION 6

Species Summarization:

Weakfish – Lee Paramore
Atlantic croaker – Jason Rock
Spot – Kevin Brown
Bluefish – Holly White
Black drum – Chris Stewart
Kingfish – Chip Collier
Summer flounder – Tina Moore and Tom Wadsworth
Southern flounder – Tina Moore and Tom Wadsworth

ABSTRACT

Length distributions, Catch-Per-Unit-Effort (CPUE), landings and management issues are described for weakfish (*Cynoscion regalis*), Atlantic croaker (*Micropogonias undulatus*), spot (*Leiostomus xanthurus*), bluefish (*Pomatomus saltatrix*), black drum (*Pogonais cromis*), kingfish (*Menticirrhus spp.*), summer flounder (*Paralichthys dentatus*) and southern flounder (*Paralichthys lethostigma).* The implementation of different minimum size limits for weakfish among gears has resulted in a shift in the size distributions of the different fisheries in North Carolina. The smallest weakfish, mostly less than 12 inches, were taken in the long haul and sciaenid pound net fisheries, while the ocean gill net, winter trawl, and estuarine gill net fisheries landed mostly fish greater than 12 inches. Weakfish landings and CPUE trends for the combined fisheries are down dramatically. Current weakfish landings are the lowest on record. Annual length distributions of Atlantic croaker across all fisheries reflect the contribution by size of each fishery. Due to the magnitude of their harvest, the two ocean fisheries dominate the overall length distributions. The ocean trawl fishery typically peaks in the 10 inches total length (TL) size class where the ocean gill net fishery peaks in the 12 inches TL size class. Overall commercial marketable landings for Atlantic croaker dropped consistently since 2002. Harvest has been below the 10 year average for the last five years. The CPUE trends have varied throughout the period but have shown a general decrease over time. The dominant gears for spot were the long haul seine along with estuarine and ocean gill nets. Length frequencies indicate that the long haul and the ocean trawl fisheries land smaller fish than the gill net fisheries. Total landings by all gears for spot fluctuated over the sampling period with an overall decreasing trend. Although fluctuations are expected for such a short-lived species, the recent declines are concerning to fishery managers. As the supply of spot has seemingly contracted, the price has increased significantly. Estuarine gill nets and ocean gill nets accounted for most of the bluefish landings. Bluefish from estuarine gill nets generally dominated in the 10-18 inches group. Ocean gill nets were important contributors of all sizes of fish, and particularly to the large size range. For the combined fisheries, bluefish landings generally increased from 2002-2004, but decreased from 2004-2006 and rebounded from 2007-2011. Overall trends are largely driven by trends in the ocean gill net fishery. The majority of black drum landed in the estuarine gill net and pound net fisheries were 14 to 17 inches CL, while fish 11 to 14 inches CL made up the majority of the landings in the long haul seine fishery. Overall, the ocean fisheries landed smaller black drum. Overall commercial landings of marketable black drum have fluctuated over the last 10 years. The overall length distribution for marketable size southern kingfish varied only slightly from year to year. The majority of the fish were from the ocean gill net fishery. The annual landings and CPUEs for kingfish declined from 2003 to 2005 and then generally increased from 2005 to 2010. The 2011 annual landings and CPUE were below the 10-year average. Weighted length frequencies for southern flounder were primarily derived from fish house samples of the estuarine gill net fishery and the flounder pound net fishery. Southern flounder were landed primarily by the estuarine gill net fishery. The number of estuarine gill net trips landing southern flounder ranged from 23,849 to 11,414 in 2002-2011. Variations in fishing effort within each target fishery can confound trends in commercial southern flounder CPUE. The result is a high degree of uncertainty in the annual pound net CPUE

calculation and comparisons made among years for this fishery. In comparison, estuarine gill net landings are generally made after a single day fishing trip so the effort measurement used in the CPUE calculation was much more consistent. Weighted length frequencies for summer flounder shifted slightly during the time period of this study. Summer flounder landed in other fisheries were incidental catches, which limits the analysis of CPUE trends in these fisheries. All fisheries besides ocean trawl that landed summer flounder were not targeted fisheries and contributed less than one percent to the total landings of summer flounder with no clear trends.

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INTRODUCTION

The purpose of the species section is to provide information on the length distribution, catch per unit effort, and landings of selected commercially important finfishes of North Carolina. Prior study reports included age distributions, but age distributions will no longer be reported. Age data is collected and available for the target species. Since species age series are generally constructed for coast wide assessments under specific protocols, it was determined to be inefficient and burdensome to include incomplete age series in this report. **Although this report emphasizes the study period (July 2007 through June 2012) we have presented data from the past 10 years so that trends in these important fisheries can be described and discussed.** North Carolina's commercial finfish fisheries capture a variety of species important to the State. The top three species, in value, for the period 2002-2012 were summer flounder (*Paralichthys dentatus*), southern flounder (*Paralichthys lethostigma*) and Atlantic croaker (*Micropogonias undulatus*) (NCDMF Commercial Landings Database). The top three species, in pounds landed, for the same period were Atlantic croaker (*Micropogonias undulatus*), summer flounder (*Paralichthys dentatus*) and bluefish (*Pomatomus saltatrix*).

Data on the target species were compiled from the long haul seine, pound net, winter trawl, ocean gill net, and estuarine gill net fisheries in order to present a statewide assessment for each of these fish. Target species, except southern flounder, have Mid-Atlantic Fishery Management Council (MAFMC), or Atlantic States Marine Fisheries Commission (ASMFC), or joint MAFMC/ASMFC fishery management plans (FMP). In addition the North Carolina Division of Marine Fisheries (NCDMF) prepared a state Interjurisdictional (IJ) FMP that adopts these federal FMP's, consistent with North Carolina law, by reference and implements corresponding fishery regulations in North Carolina in order to provide compliance or compatibility with approved federal FMP's and amendments. The IJ FMP was adopted by the North Carolina Marine Fisheries Commission (NCMFC) in February 2005.

METHODS AND MATERIALS

The NCDMF has sampled the state's major commercial finfish fisheries on a continual basis since 1982. Winter trawl, ocean winter trawl, and ocean trawl were used interchangeably in this report to describe the trawl fishery which takes place in the ocean generally from November through April. This fishery consists of two main components: fly nets and flounder trawl. A fly net is a two-seam otter trawl designed to target sciaenids, bluefish and Atlantic mackerel. Although this report emphasizes the study period (July 2007 through June 2012) we have presented data from the past 10 years so that trends in these important fisheries can be described and discussed.

For the species discussed the following standard annual information is presented for selected fisheries and combined overall: marketable harvest (lb and number of individuals) and value (ex-vessel dollars), trips, bait (estimated lb and number of individuals), marketed catch per trip

(CPUE, lb), separate length distributions (in) for bait and marketed. Two major methodology changes from previous project reports include the length graphs only represent the marketed component and CPUEs are solely calculated from dealer submitted landings and trips from the North Carolina Trip Ticket Program (NCTTP). Previous reports CPUEs were based on the biological sample data collected at the fish houses.

The number of individuals, weight, and length frequencies of each species in a sample (see Fisheries Methods Sections) were expanded to represent the species quantities in the total State catch (trip sample data were expanded to represent the total catch-see Fisheries Methods Section for details). Expansion was accomplished by matching at the market grade level biological fish house sample data (mean weight or length data) to the corresponding NCTTP market grade harvest. For example, the total length frequency of a species within a catch was derived by expanding the length frequency of the individuals measured in the subsample of a market grade (culled samples) to the total market category weight of that species in the sampled trip. These sample distributions were then summed and the summed distribution applied to the total state landings of that market grade. Finally, all of the annual (or semi-annual) market grade distributions were summed to produce a single annual length distribution (i.e., weighted by number individuals in each distribution). In cases where only partial data sets were obtained such as no fish house sampled for a reported market grade, substitute values were calculated across fisheries within the year. In cases where species collection weight was obtained, but not species collection number, substitute estimates based on means calculated from available data in the same or adjacent sampling cells were used to fill in missing values. Also for the flounder species an additional step was needed to first divide the NCTTP data, which records all flounder landed in the ocean as summer flounder and all flounder landed in estuarine waters as southern flounder, into the component species (southern and summer). The proportion of these species in the biological fish house samples was used to accomplish this.

Total weight of a species in the scrap fish samples was calculated by determining the proportion of a species in the subsample and expanding that to the respective species proportional weight of the total scrap fish for the trip. Scrap fish sampling was initiated in 1986. The number of individuals per species in the scrap fish component was calculated by expanding the number of individuals in the sample to represent the total weight of the species for the scrap fish in the samples. Estimates of annual statewide scrap fish landings for individual species were determined by applying the semi-annual ratio of marketable fish to scrap fish in the fish house samples to the reported semi-annual marketable landings (see Fishery Methods Sections).

WEAKFISH

Background

Weakfish (*Cynoscion regalis*) occur along the east coast of the United States from southern Florida to the Gulf of Maine, and occasionally as far north as Nova Scotia. They are most abundant from North Carolina to New York. Weakfish spawn near the inlets along the coast and in the Sounds from March through September, with peak spawning occurring during May and June. Young weakfish are most abundant in the deeper areas of the estuaries in July and August. Juveniles and adults migrate out of the estuaries to the ocean with declining water temperatures in the fall. In general, adult weakfish follow a seasonal migratory pattern, moving south and offshore during autumn/winter and north and inshore during spring/summer. Adults return to the estuaries in the spring and spend the summer in the Sounds and bays. Eighty-five percent of weakfish are mature at age 1 (7-8 inches TL) and 99% are mature by age 2 (Daniel and Armstrong 2000). Weakfish size at age is highly variable, but in general, they reach age 1 at about 7 inches, age 2 at 10 inches, age 3 at 12-13 inches, age 4 at 15-17 inches, and ages 5-7 from 17-28 inches (ASMFC 1991, Lowerre-Barbieri *et a.l* 1994).

Weakfish are harvested by commercial and recreational methods along the east coast from Massachusetts to Florida. Commercial fisheries have generally followed the stock on its annual north-south migration to wintering grounds off Virginia and North Carolina. Pound nets, long haul seines, and gill nets are the principal fisheries that operate during spring and summer, whereas ocean winter trawl (flynet) and sink net fisheries are active in late fall and winter. Weakfish also support an important recreational fishery in the mid-Atlantic (ASMFC 1996).

Length Distributions

Fishery dependent sampling for lengths was conducted in the long haul seine fishery, sciaenid pound net fishery, ocean sink net fishery, ocean winter trawl fishery and the estuarine gill net fishery. For each North Carolina fishery, annual length distributions (reported in fork length (FL)) weighted by commercial landings are presented for weakfish.

Weakfish in the long haul seine fishery were dominated by 9 to 12 inch FL fish. This is consistent with the 10 inch total length (TL) minimum size limit that has been in place for this gear since 1992 (Figure 6.1). The annual range of lengths of 9-18 inches FL accounted for the vast majority of the landings. Larger fish up to 34 inches have been captured but were uncommon.

The sciaenid pound net fishery is seasonally and geographically similar to the long haul seine fishery and landed similarly sized weakfish, with a modal peak of 10 to 12 inches FL (Figure 6.2). The modal peak in size distribution of these catches varied little since 2002 and was just above the 10 inch TL minimum size limit. The annual range of lengths of 9-16 inches FL accounted for most of the fish.

In the early 1980s, the ocean sink net fishery had a bimodal distribution with one mode at 13-15 inches FL and another at 28-30 inches FL. The group of larger fish was not observed after 1985 but became more representative in catches in the mid-1990's as the stock was rebuilt and the age structure expanded. Since the late 1990s, the stock has been in severe decline and larger fish became less common in the ocean gill net fishery. Since 2005, very few weakfish over 20 inches FL were observed. Prior to 2005, weakfish over 20 inches FL up to 34 inches FL were not uncommon. Throughout 2002 to 2011 most weakfish in the ocean gill net fishery ranged from 11 to 16 inches FL (Figure 6.3).

The length distributions of weakfish taken in the ocean trawl flynet fishery were dominated by weakfish less than 10-12 inches FL until regulatory changes occurred in the mid-1990s. These changes included the closure to flynets south of Cape Hatteras (an overwintering nursery area for age 0 and 1 weakfish), an increase in the minimum size limit to 12 inches TL, and an increase in the minimum trawl mesh size. These regulatory changes dramatically altered the size distribution of the catches since the mid-1990s. From 2002 to 2011, most weakfish harvested ranged from 11 to 14 inches FL (Figure 6.4). Similar to ocean sink nets, larger weakfish in ocean trawls were rare in recent years but were more common prior to 2004.

The estuarine gill net fishery landings were dominated by fish 11 to 17 inches FL from 2002 to 2011 (Figure 6.5). The modal size of fish taken in this fishery was 13 inches FL. Weakfish over 20 inches FL occurred but were not common with the exception of some larger fish taken from 2002 to 2005.

Annual length distributions for weakfish combined across all fisheries reflect the contribution, by size, of each fishery to the overall harvest (Figure 6.6). The implementation of different minimum size limits among gears has resulted in a shift in the size distributions of the different fisheries in North Carolina. Estuarine long haul seine and pound nets have a minimum size limit of 10 inches TL. Consequently, most of the landings from these gears are comprised of weakfish near the minimum size limit (from 10 to 12 inch TL). All ocean fisheries (i.e., ocean trawl and sink net) and estuarine gill nets have a minimum size limit of 12 inches TL. Consequently, the harvest is primarily between 11 and 17 inches FL. The largest weakfish are typically encountered in the ocean fisheries, particularly the sink net fishery.

Table 6.1 presents the size distribution of weakfish in scrap (bait) samples. Scrap sizes ranged from 4 to 16 inches FL. Length modes for scrap weakfish by fishery were 6 to 9 inches FL for the long haul seine, 7 to 10 inches FL for pound net fisheries, and 6 to 11 inches FL in the ocean trawl. The implementation of minimum size limits and mesh restrictions resulted in a considerable decline in the scrap component of the weakfish fishery over what was historically taken.

CPUE and Landings

The long haul seine fishery accounted for 6.8 to 34.9% of the marketable North Carolina weakfish landings during the report period (Table 6.2). Long haul seine landings and catch per

unit effort (CPUE; defined as pounds landed per trip) exhibited a slight increase in 2003 and 2004 but then continued an overall downward trend to their lowest level in 2011 (Table 6.3 and Figure 6.7). Landings for the bait component of this fishery were much lower than in years prior to 2002. Since 2002, scrap (bait) has comprised less than 1 to 36% of all weakfish landed by number (Table 6.3).

The sciaenid pound net fishery is a minor contributor to the marketable North Carolina weakfish landings ranging from 0.5 to 3.4% of the overall landings from 2002 to 2011 (Table 6.2). Landings and CPUE trended downward (Figure 6.7). The scrap (bait) component of this fishery was low (Table 6.3).

Ocean sink nets were typically the single largest contributor to landings of marketable weakfish over the last 10 years. Annual contributions fluctuated from a high of 57.6% in 2002 to a low of 19.7% in 2010 (Table 6.2). While ocean sink net landings exhibited an upward trend during the mid-1990s, landings declined dramatically since, reaching the lowest annual landings in the time-series in 2010 (Figure 6.7). The CPUE trends declined similar to landings. Essentially all weakfish taken in this fishery were marketable (Table 6.3).

The ocean trawl fishery had an overall decrease in its contribution to the state's weakfish landings. During the early 1990s, winter trawl fisheries contributed over 40% of the overall landings. That percentage declined to an all time low of 0.8% in 2011. Over the last 10 years the highest contribution was 27.7% in 2002 (Table 6.2). Since 2002, landings have been historically low and continue to decline (Figure 6.7). Weakfish landed as scrap (bait) in the ocean trawl fishery decreased due to regulations. The percentage of weakfish landed as scrap (bait), however, increased recently as landings of marketable weakfish hit historic lows (Table 6.3).

The estuarine gill net fishery's annual contribution to weakfish landings increased in recent years. In 2010, estuarine gill nets were the largest contributor to landings (35.9%) and from 2002 to 2011 the contribution from this gear ranged from 5.3 to 35.9% (Table 6.2). Landings of weakfish from estuarine gill nets did not decrease as precipitously as other major gears in North Carolina, but have trended downward since 2002 (Figure 6.7). The CPUE followed a similar trend to landings. Essentially all weakfish taken in this fishery were marketable (Table.6.3).

Landings and CPUE trends for the five fisheries combined were down dramatically in 2002-2011 (Figure 6.7). Landings in 2011 were the lowest on record. While this may be partly attributed to the implementation of rigid controls on the fishery, weather patterns or market conditions, it appears that the primary reason is that weakfish along the Atlantic coast are currently at a level of low abundance (NEFSC 2009a, NEFSC 2009b). Additional harvest restrictions implemented during 2010 did impact harvest to some degree in 2010 and 2011.

Management Issues

The Atlantic States Marine Fisheries Commission (ASMFC) adopted the Fishery Management Plan for Weakfish (FMP) in 1985. Original provisions of the plan called for the delay of harvest of weakfish until age one and promoted the use of Bycatch Reduction Devices (BRDs) in the southern shrimp fishery. The continuing weakfish decline prompted the adoption of FMP Amendment 1 in October 1991. The FMP declared weakfish overfished with a fishing mortality rate (F) twice the level recommended to insure long-term stock replacement. Amendment 1 adopted the target fishery mortality rate of F_{20} and recommended management measures to achieve a 52% reduction in fishing mortality by 1995. However, during 1992-1993, none of the states with directed weakfish fisheries had achieved the mortality reduction goals (ASMFC 1996).

The failure of states to implement the management measures for weakfish under the original voluntary state compliance with the ASMFC FMP contributed to the enactment of the Atlantic Coastal Fisheries Cooperative Management Act in December 1993. This act provided for mandatory state compliance with ASMFC approved FMPs. The law provides that the federal government may impose a state fishing moratorium if the state is not in compliance with the FMP.

Amendment 2 was passed in October 1994 as a temporary measure to stabilize the decline of weakfish until a more comprehensive amendment could be developed. Amendment 2 required: 1) states with directed weakfish fisheries to implement a 12 inch TL minimum size or equivalent measure; 2) states must maintain current minimum mesh sizes; 3) states with directed fisheries to implement harvest control strategies to reduce exploitation 25% by 1 April 1995; 4) South Atlantic states to implement management measures to achieve a 50% reduction in weakfish bycatch in the shrimp trawl fisheries for the 1996 shrimp fishing year; and 5) in the event that the ASMFC did not complete Amendment 3 by March 31, 1996, states with directed weakfish fisheries must implement harvest control strategies to achieve F_{20} for the fishing year beginning April 1, 1996 (ASMFC 1996).

The Weakfish Management Board passed Amendment 3 in May 1996. The objectives of Amendment 3 were: 1) to rebuild the weakfish stock over a five year period; 2) to reach and maintain a target fishing mortality rate of F = 0.5; and 3) to restore the historic, expanded age and size structure of the stock. To comply with Amendment 3 to the Weakfish FMP, the NCMFC and NCDMF put into place in 1997 the following management measures for weakfish:

1. For hook-and-line, a 14 inches TL minimum size and 10 fish per day limit;
2. For commercial gear within state waters or within 200 miles of shore in the Atlantic Ocean, a 12 inch TL minimum size;
3. For long haul seines and pound nets, a 10 inch TL minimum size;
4. Defined a flynet and specified a minimum stretched mesh length of 3.5 inches hung on the square or 3.75 inches hung on a diamond. Prohibited flynets south of Cape Hatteras to the NC/SC border line.

5. One or more functional BRDs must be installed in shrimp trawl tailbags. The NCDMF has documented the weakfish reduction capability of three devices (Florida Fish Excluder, large mesh, and extended funnel BRDs) at over 40% by number.

The Weakfish Management Board passed Amendment 4 in November 2002. Amendment 4 was designed to build on the achievements of Amendment 3 and continue to manage the fishery by minimum size limits, bag limits, minimum mesh sizes, bycatch reduction devices in shrimp trawls and long hauls seines, and the closure south of Cape Hatteras to flynets. Changes in North Carolina's fisheries as a result of Amendment 4 included a recreational bag/size limit of 7 weakfish at 12 inch TL and an increase in the commercial trip limit from 150 to 300 lbs for bycatch of weakfish in any gear not meeting the minimum mesh sizes required for targeting weakfish. Weakfish landed as bycatch must have at least an equal poundage of other species retained on the vessel in order to retain and land any weakfish.

The original 1985 FMP suggested that by protecting the young-of-the-year and delaying harvest until age two, the weakfish stock would improve. This is precisely what North Carolina did with size limits and gear restrictions. Many of the management options taken to date were directed toward achieving this objective. Requiring BRDs in South Atlantic shrimp trawl fisheries reduced bycatch of weakfish by at least 40%. Minimum size limits, minimum mesh size requirements and harvest restrictions increased the age of recruitment in directed fisheries to three. Finally, the closure of the flynet fishery south of Cape Hatteras has protected age zero and age one weakfish in their overwintering nursery area. Because 85% of weakfish are sexually mature at age one, the majority of weakfish are now able to spawn at least twice before becoming vulnerable to directed harvest.

Despite the various conservation measures and harvest restrictions in place for weakfish, landings from 1999 to 2011 plummeted to all time lows along the Atlantic coast. The most recent assessment indicates that there was no substantive increase in fishing mortality to explain the dramatic decrease in weakfish biomass (NEFSC 2009a, NEFSC 2009b). The available data suggest instead, that natural mortality has risen sharply, likely causing the weakfish decline. Reasons for the natural mortality increase are not fully understood. However, a decline in forage species, especially menhaden, and increased predation by striped bass were strongly correlated to the recent decline in weakfish. Cyclical changes in abundance over time are not uncommon for weakfish, which have experienced periodic high and low commercial landings dating back to the 1920s.

As of the last stock assessment, the stock's spawning potential is at only 3% of an unfished stock, well below the 20% spawning potential threshold and 30% spawning potential target adopted in Addendum IV to Amendment 4. Trends indicate a stable and modest fishing mortality rate. Thus, while the stock biomass is depleted, overfishing is not occurring.

While overfishing did not occur in recent years, the Weakfish Management Board took additional steps to protect weakfish with the passing of Addendum IV to Amendment 4 in 2009.

Harvest measures required by Addendum IV were aimed at achieving a 60% reduction in recreational and commercial harvest. The measures were aimed at reducing additional mortality from fishing while poising the stock for a quicker recovery should natural mortality decline. In North Carolina, restrictions were implemented in August of 2010 and included a one fish recreational bag limit and a commercial harvest limit that made weakfish a bycatch-only fishery. Under this regulation, weakfish can only be landed if their weight does not exceed 10% of all other finfish landed in a trip, up to 1,000 lb of weakfish. These regulations likely had an impact on landings of weakfish for 2010 and 2011, although the stock has shown little indication of any rebuilding through 2011.

Table 6.1 North Carolina weakfish (*Cynoscion regalis*) expanded length frequency of bait samples for selected fisheries, 2002-2011; n=number of fish measured, en=expanded number of individuals in catches sampled.

Fishery/ Year	n	en	number	Length (in) 4	5	6	7	8	9	10	11	12	13	14	15	16
Ocean trawl																
2002	350	11,081	101,920	-	-	2.6	28.9	13.2	9	14.7	15.9	10.3	3.4	1.3	0.4	0.2
2003	167	11,391	202,005	-	1.2	0.9	4.9	2.9	12	24.8	23.4	13.8	6.1	6.2	3.3	0.6
2004	203	12,025	431,398	-	0.1	2.4	6	8.3	26.6	29.7	21.1	5.2	0.7	-	-	-
2005	153	15,706	134,693	-	1	2.8	12	10.2	25.6	26.9	14.8	4.4	1.9	0.4	-	-
2006	275	23,845	148,676	-	-	1.5	24.3	22.6	20.7	19.1	7.4	2.8	1.4	-	-	-
2007	62	6,128	29,280	0.2	0.6	3	12.8	13.7	31.9	19.1	13.5	-	5.2	-	-	-
2008	77	4,974	78,077	-	0.1	0.2	9.5	29.4	36.1	10.5	8.9	3.5	1.7	-	-	-
2009	142	34,867	213,954	-	-	0.1	7.3	14.8	50.5	11	14.1	2.2	-	-	-	-
2010	64	26,009	124,099	-	20.2	18.8	9.4	4.7	7.6	25.8	12.7	0.8	-	-	-	-
2011	1	76	120	-	-	-	-	-	100	-	-	-	-	-	-	-
Ocean gill net																
2002	0	0	9	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	4	16	463	-	-	-	-	-	-	75.0	-	25.0	-	-	-	-
2004	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2006	5	5	27	-	-	-	-	20.0	20.0	-	20.0	40.0	-	-	-	-
2007	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2008	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2009	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2010	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2011	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
Sciaenid pound net																
2002	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	10	92	660	-	-	-	-	-	-	80.4	19.6	-	-	-	-	-
2004	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	4	594	2,117	-	-	-	-	25.8	74.2	-	-	-	-	-	-	-
2006	3	18	123	-	-	-	77.8	22.2	-	-	-	-	-	-	-	-
2007	2	103	2,738	-	-	-	-	29.1	-	70.9	-	-	-	-	-	-
2008	8	189	670	-	-	-	33.9	66.1	-	-	-	-	-	-	-	-
2009	10	62	264	-	-	-	-	-	80.6	19.4	-	-	-	-	-	-
2010	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2011	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6.1 (Continued)

Fishery/ Year	n	en	number	Length (in) 4	5	6	7	8	9	10	11	12	13	14	15	16
Long haul																
2002	3	358	2,370	-	-	-	85.5	-	-	14.5	-	-	-	-	-	-
2003	32	2,095	16,714	4.4	-	24.2	46.4	5.4	11	8.5	-	-	-	-	-	-
2004	15	2,288	17,832	-	-	3.8	19.3	19.4	54.5	3	-	-	-	-	-	-
2005	2	132	1,900	-	-	-	49.2	-	50.8	-	-	-	-	-	-	-
2006	18	1,381	21,140	-	-	5.4	17.1	27.3	38.7	-	-	11.5	-	-	-	-
2007	17	3,199	14,251	-	-	11	63.2	17.6	-	8.1	-	-	-	-	-	-
2008	58	9,077	160,668	-	6	20.5	20.4	28.3	19.1	5.7	-	-	-	-	-	-
2009	18	6,800	108,904	-	-	1.5	6.2	67.7	24.6	-	-	-	-	-	-	-
2010	20	6,639	60,519	-	-	-	27.3	45.4	27.3	-	-	-	-	-	-	-
2011	2	672	10,213	-	-	-	50.0	50.0	-	-	-	-	-	-	-	-
Estuarine gill net																
2002	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2006	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2008	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2009	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-
2010	1	1	59	-	-	-	-	-	-	-	-	100	-	-	-	-
2011	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 6.2. North Carolina commercial landings of marketable weakfish by fishery, 2002-2011, includes landings (thousands of pounds), value (thousands of dollars), and contribution of fishery to NC weakfish landings.

	YEAR									
Fishery	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Long Haul										
Pounds	124.7	221.0	221.1	100.6	73.2	49.4	53.6	57.0	27.3	10.7
Value ($)	60.8	132.3	144.3	80.1	60.9	37.9	44.2	55.0	25.0	11.1
% State	6.8	26.0	32.3	23.8	20.2	28.1	33.0	34.9	25.7	16.2
Flounder Pound Net										
Pounds	1.7	0.1	0.5	0.7	0.3	0.9	0.6	0.3	0.2	0.2
Value ($)	0.9	0.1	0.4	0.6	0.3	0.7	0.5	0.3	0.2	0.2
% State	0.1	0.0	0.1	0.2	0.1	0.5	0.4	0.2	0.2	0.3
Sciaenid Pound Net										
Pounds	23.2	5.9	6.2	14.6	3.8	2.5	1.8	0.8	3.1	0.8
Value ($)	11.4	3.4	4.0	11.0	3.1	1.9	1.5	0.7	3.0	0.8
% State	1.3	0.7	0.9	3.4	1.1	1.4	1.1	0.5	2.9	1.2
Estuarine Gill Net										
Pounds	97.0	71.7	91.4	103.9	75.6	26.6	40.2	43.0	38.2	20.8
Value ($)	54.5	46.8	68.0	91.7	68.6	23.6	36.6	45.5	39.3	24.7
% State	5.3	8.5	13.3	24.6	20.8	15.1	24.8	26.4	35.9	31.6
Ocean Gill Net										
Pounds	1053.7	420.3	301.7	129.8	171.2	59.7	52.3	41.4	20.9	32.1
Value ($)	610.8	268.5	227.6	113.6	143.9	51.8	47.2	41.7	22.1	40.1
% State	57.6	49.5	44.0	30.8	47.1	34.0	32.2	25.4	19.7	48.8
Ocean Trawl										
Pounds	506.5	122.8	50.5	53.4	27.5	33.7	9.9	18.7	13.8	0.5
Value ($)	302.1	77.6	35.0	45.1	23.9	30.9	8.9	18.1	13.0	0.7
% State	27.7	14.5	7.4	12.7	7.6	19.2	6.1	11.5	13.0	0.8
Other Gears										
Pounds	21.3	6.9	14.2	18.9	11.5	2.9	4.1	1.9	2.8	0.8
Value ($)	10.7	4.2	9.6	14.9	9.9	2.4	3.6	1.9	2.7	1.0
% State	1.2	0.8	2.1	4.5	3.2	1.7	2.5	1.2	2.6	1.2
All										
Pounds	1828.1	848.8	685.5	421.8	363.1	175.6	162.5	163.1	106.3	65.9
Value ($)	1051.1	532.9	488.9	357.1	310.7	149.2	142.5	163.2	105.3	78.5

Source: North Carolina Division of Marine Fisheries commercial landings database.
Long Haul includes: gear code 030 or 025 and non-ocean waters.
Flounder Pound Net includes: gear code 275, months October, November, December for Counties Beaufort, Carteret, Dare, Hyde, Tyrrell, and month September for Counties Beaufort, Carteret, Hyde and Tyrrell.
Sciaenid Pound Net includes: gear code 275, May to August for Counties Dare and Hyde, and September for Dare.
Estuarine Gill Net includes: gear code 425, 426, 427, 470, 475, 480 and all non-ocean waters.
Ocean Gill Net includes: gear code 425, 426, 427, 470, 475, 480 and Atlantic Ocean.
Ocean Trawl includes: gear codes 210 and 230, Atlantic Ocean, in January to May and September to December.

Table 6.3. North Carolina weakfish *(Cynoscion regalis*) total and marketable landings by weight (1000s lb) and number (1000s of individuals), marketable CPUE (lb/trip), bait landings (by weight) and numbers, bait percentage of total landings, – lb), and total number of trips for selected commercial fisheries, 2002-2011.

		Landings									
		Weight					Number				# Trips
		Total		Market	Bait	%Bait	Total	Market	Bait	%Bait	
Fishery	Year	Landed (1000s lb)	Landed (1000s lb)	CPUE (lb/trip)	Landed (1000s lb)		Landed (1000s)	Landed (1000s)	Landed (1000s)		
Long Haul											
	2002	125.4	124.7	500.9	0.7	0.6	200.3	197.9	2.4	1.2	249
	2003	223.5	221.1	667.7	2.5	1.1	405.1	388.4	16.7	4.1	331
	2004	225.5	221.1	661.9	4.4	1.9	373.4	355.6	17.8	4.8	334
	2005	101.0	100.6	369.7	0.4	0.4	159.4	157.5	1.9	1.2	272
	2006	79.0	73.3	243.4	5.8	7.3	141.9	120.7	21.1	14.9	301
	2007	52.3	49.4	254.4	2.9	5.5	117.5	103.3	14.3	12.1	194
	2008	70.2	53.6	300.9	16.6	23.7	271.0	110.3	160.7	59.3	178
	2009	81.3	57.0	339.3	24.3	29.9	235.3	126.4	108.9	46.3	168
	2010	42.7	27.3	126.4	15.3	36.0	109.7	49.2	60.5	55.2	216
	2011	12.4	10.7	75.8	1.7	13.6	28.0	17.8	10.2	36.5	141
Sciaenid Pound Net											
	2002	23.3	23.2	118.0	0.0	0.0	45.5	45.5	0.0	0.0	197
	2003	6.2	5.9	82.2	0.2	3.8	12.2	11.6	0.7	5.4	72
	2004	6.2	6.2	70.2	0.0	0.0	8.4	8.4	0.0	0.0	88
	2005	15.1	14.6	158.2	0.6	3.7	26.1	24.0	2.1	8.1	92
	2006	3.8	3.8	33.5	0.0	0.3	8.9	8.8	0.1	1.4	114
	2007	3.0	2.5	24.8	0.6	18.5	8.2	5.4	2.7	33.4	100
	2008	2.0	1.8	17.9	0.1	7.6	4.1	3.4	0.7	16.4	101
	2009	0.9	0.8	10.0	0.1	9.6	1.6	1.3	0.3	16.7	77
	2010	3.1	3.1	19.3	0.0	0.0	6.2	6.2	0.0	0.0	161
	2011	0.8	0.8	9.5	0.0	0.0	1.6	1.6	0.0	0.0	80

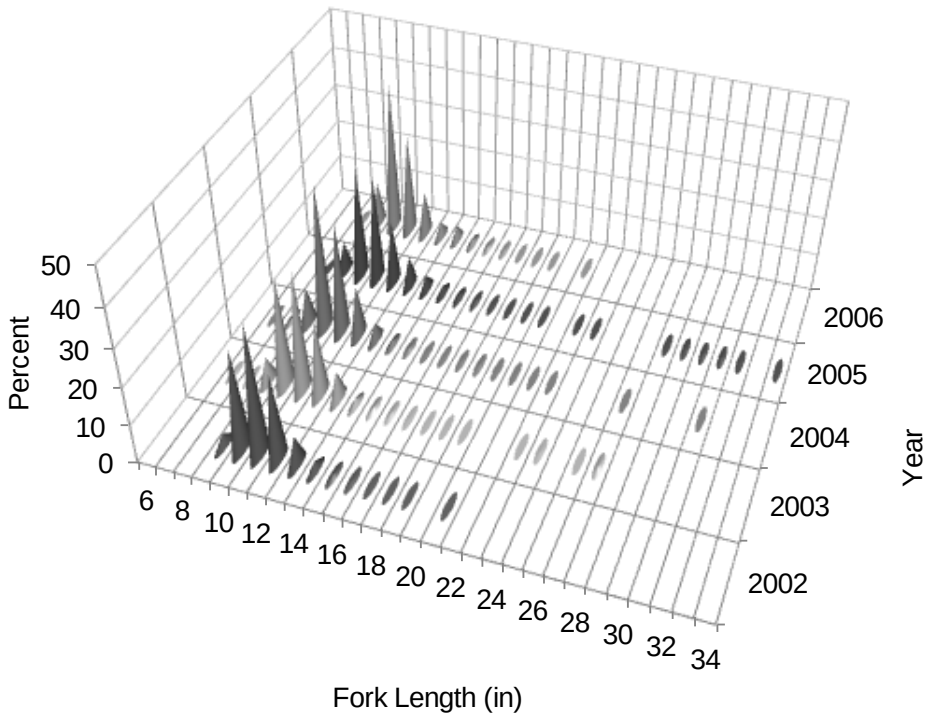
Table 6.3. (Continued).

		Landings									
		Weight					Number				# Trips
		Total		Market	Bait	%Bait	Total	Market	Bait	%Bait	
Fishery	Year	Landed (1000s lb)	Landed (1000s lb)	CPUE (lb/trip)	Landed (1000s lb)		Landed (1000s)	Landed (1000s)	Landed (1000s)		
Estuarine gill net											
	2002	97.0	97.0	15.8	0.0	0.0	90.0	90.0	0.0	0.0	6,129
	2003	71.7	71.7	13.8	0.0	0.0	65.3	65.3	0.0	0.0	5,199
	2004	91.4	91.4	17.9	0.0	0.0	94.4	94.4	0.0	0.0	5,103
	2005	103.9	103.9	19.0	0.0	0.0	102.6	102.6	0.0	0.0	5,462
	2006	75.6	75.6	16.2	0.0	0.0	74.3	74.3	0.0	0.0	4,660
	2007	26.6	26.6	7.1	0.0	0.0	26.8	26.8	0.0	0.0	3,771
	2008	40.2	40.2	9.1	0.0	0.0	41.6	41.6	0.0	0.0	4,428
	2009	43.0	43.0	14.6	0.0	0.0	41.8	41.8	0.0	0.0	2,949
	2010	38.2	38.2	12.1	0.0	0.1	35.7	35.6	0.1	0.2	3,154
	2011	20.8	20.8	8.0	0.0	0.0	20.7	20.7	0.0	0.0	2,593
Ocean gill net											
	2002	1,053.9	1,053.7	452.6	0.0	0.0	765.5	765.4	0.0	0.0	2,328
	2003	420.6	420.3	169.6	0.2	0.1	388.4	388.0	0.5	0.1	2,478
	2004	301.7	301.7	143.7	0.0	0.0	169.4	169.4	0.0	0.0	2,099
	2005	129.8	129.8	91.9	0.0	0.0	90.0	90.0	0.0	0.0	1,413
	2006	171.2	171.2	117.7	0.0	0.0	225.2	225.2	0.0	0.0	1,454
	2007	59.7	59.7	43.2	0.0	0.0	69.1	69.1	0.0	0.0	1,380
	2008	52.3	52.3	45.3	0.0	0.0	56.9	56.9	0.0	0.0	1,155
	2009	41.4	41.4	37.1	0.0	0.0	48.8	48.8	0.0	0.0	1,116
	2010	20.9	20.9	22.5	0.0	0.0	27.7	27.7	0.0	0.0	931
	2011	32.2	32.1	32.1	0.0	0.0	33.9	33.9	0.0	0.0	1,001

Table 6.3. (Continued).

		Landings									
		Weight					Number				# Trips
		Total		Market	Bait	%Bait	Total	Market	Bait	%Bait	
Fishery	Year	Landed (1000s lb)	Landed (1000s lb)	CPUE (lb/trip)	Landed (1000s lb)		Landed (1000s)	Landed (1000s)	Landed (1000s)		
	2002	556.3	506.6	2,495.2	49.7	8.9	469.7	367.8	101.9	21.7	203
	2003	225.9	122.8	536.2	103.1	45.6	299.4	97.4	202.0	67.5	229
	2004	231.7	50.5	435.1	181.3	78.2	491.3	59.9	431.4	87.8	116
	2005	102.8	53.4	480.7	49.4	48.1	184.9	50.2	134.7	72.9	111
	2006	75.4	27.5	177.3	47.9	63.5	170.1	21.5	148.7	87.4	155
	2007	41.3	33.7	209.0	7.6	18.5	53.4	24.1	29.3	54.9	161
	2008	32.1	9.9	102.3	22.2	69.1	85.7	7.6	78.1	91.1	97
	2009	88.4	18.7	212.6	69.7	78.8	235.0	21.0	214.0	91.1	88
	2010	57.7	13.8	212.8	43.9	76.0	141.6	17.5	124.1	87.7	65
	2011	0.5	0.5	51.7	0.0	4.8	0.6	0.5	0.1	20.4	10
Fisheries combined											
	2002	1,855.9	1,805.5	198.2	50.4	2.7	1,572.0	1,467.1	104.3	6.6	9,106
	2003	948.0	842.0	101.3	106.1	11.2	1,171.1	950.8	219.9	18.8	8,309
	2004	856.5	670.9	86.7	185.6	21.7	1,142.2	688.2	449.2	39.3	7,740
	2005	452.6	402.3	54.7	50.3	11.1	564.2	424.6	138.7	24.6	7,350
	2006	405.1	351.4	52.6	53.7	13.3	623.9	450.8	170.0	27.2	6,684
	2007	182.9	171.8	30.6	11.1	6.1	275.3	228.8	46.3	16.8	5,606
	2008	196.8	157.9	26.5	39.0	19.8	462.7	220.2	239.4	51.7	5,959
	2009	255.1	161.0	36.6	94.1	36.9	563.3	239.4	323.1	57.4	4,398
	2010	162.6	103.3	22.8	59.3	36.4	321.0	136.3	184.7	57.5	4,527
	2011	66.6	64.9	17.0	1.7	2.6	84.8	74.4	10.3	12.2	3,825

Source: NCDMF commercial landings database and NCDMF fishery biological database.
Bait quantity estimate obtained from ratio of market to bait in fish house samples. Does not include discards at sea.



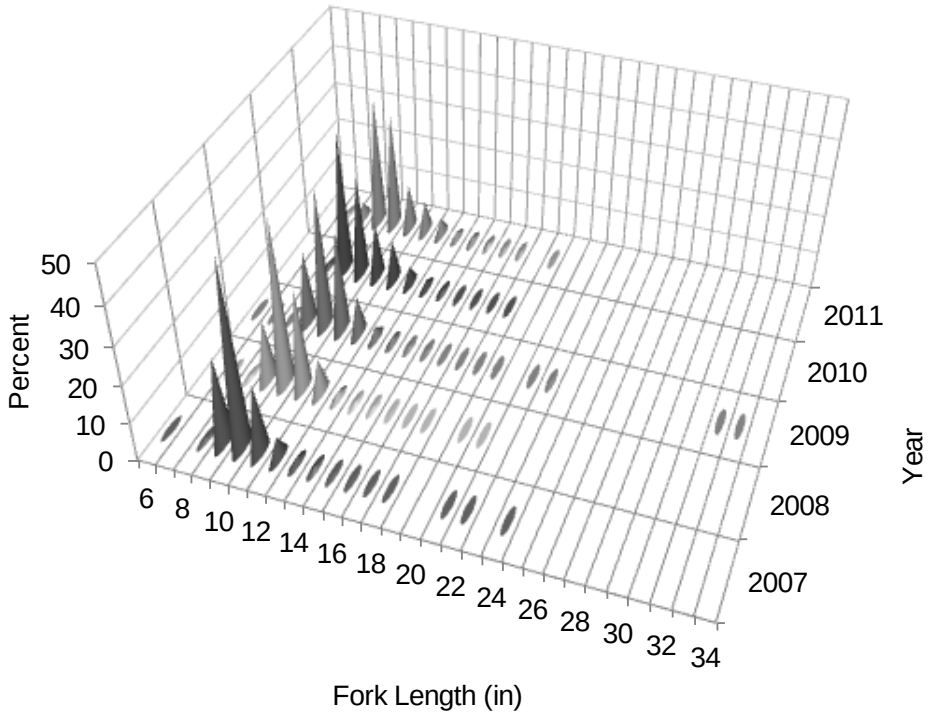
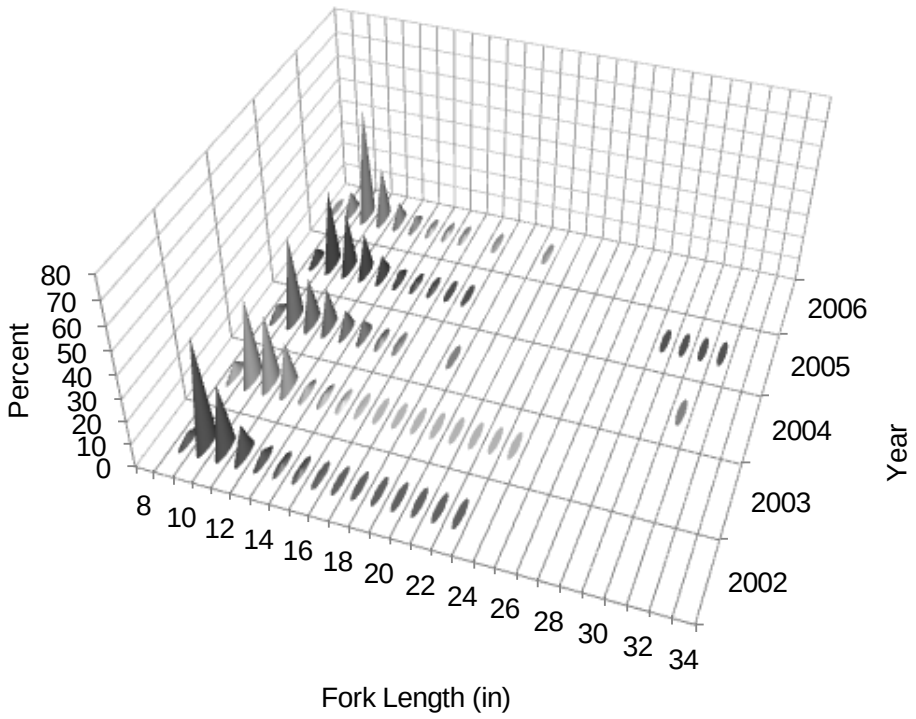


Figure 6.1. North Carolina long haul seine fishery weighted length frequency distributions for marketable weakfish (*Cynoscion regalis*), 2002-2011.



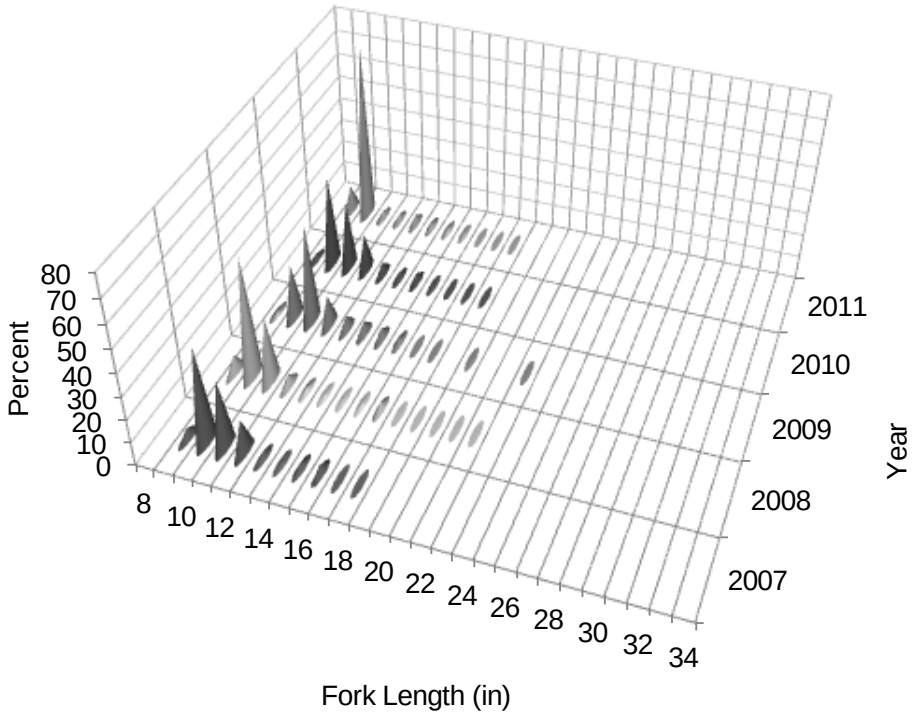
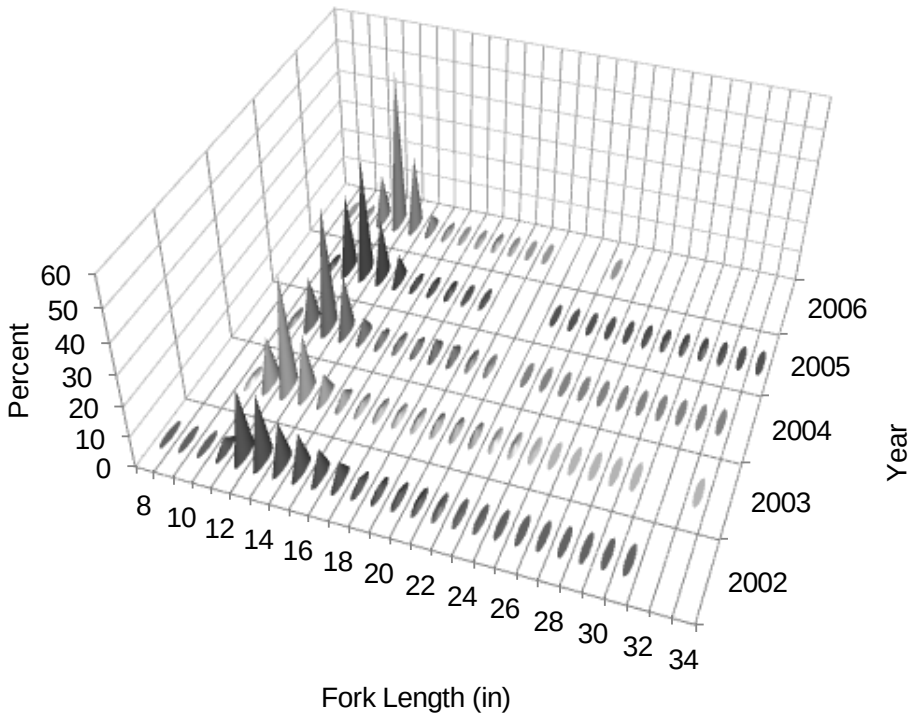


Figure 6.2. North Carolina sciaenid pound net fishery weighted length frequency distributions for marketable weakfish (*Cynoscion regalis*), 2002-2011.



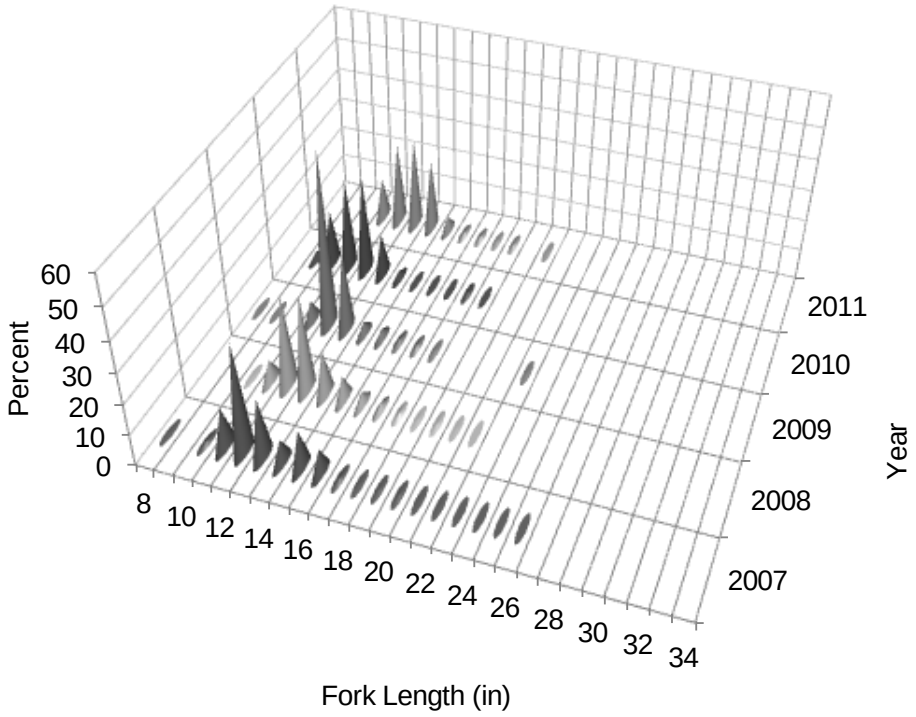


Figure 6.3. North Carolina ocean gill net fishery weighted length frequency distributions for marketable weakfish (*Cynoscion regalis*), 2002-2011.

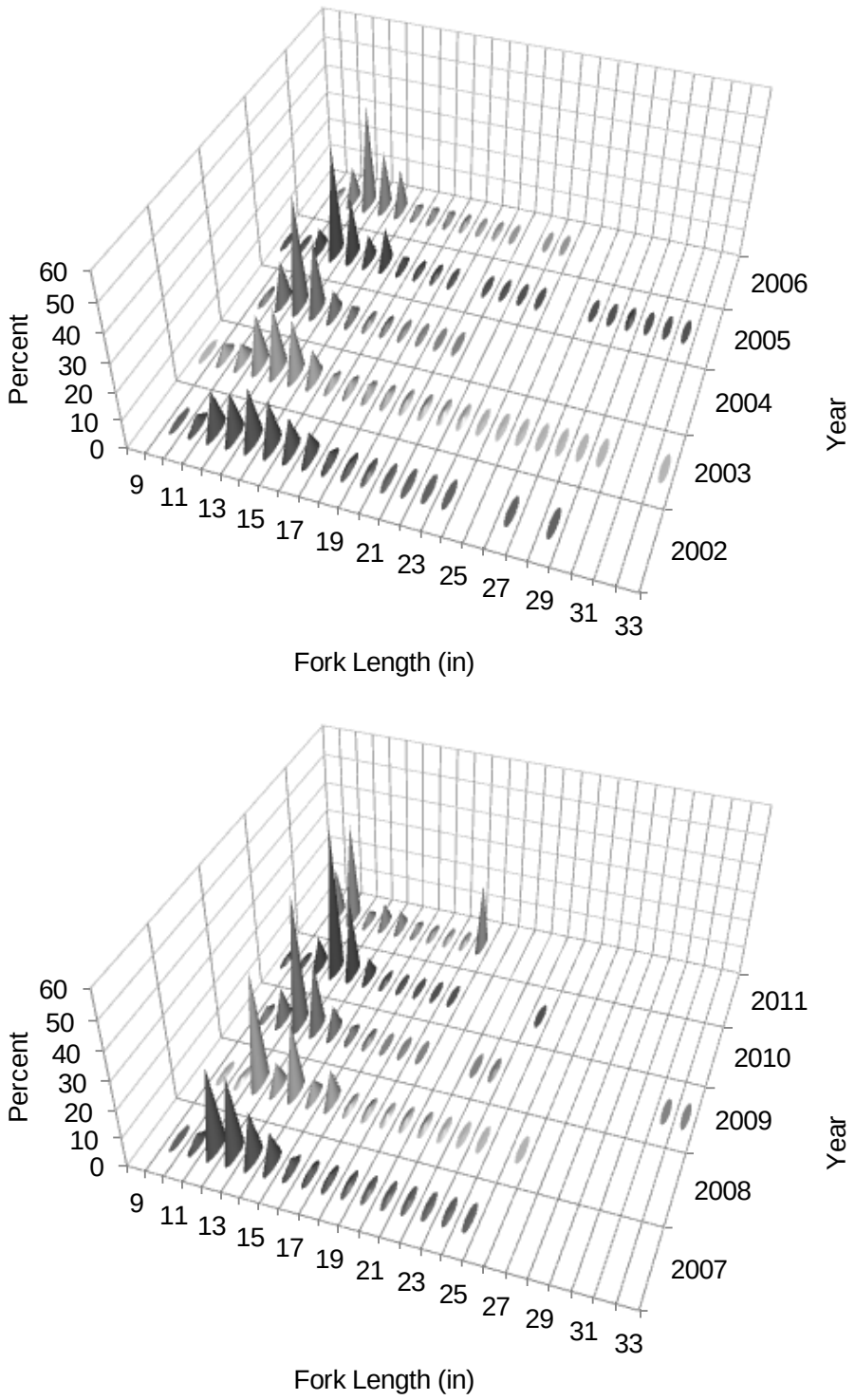
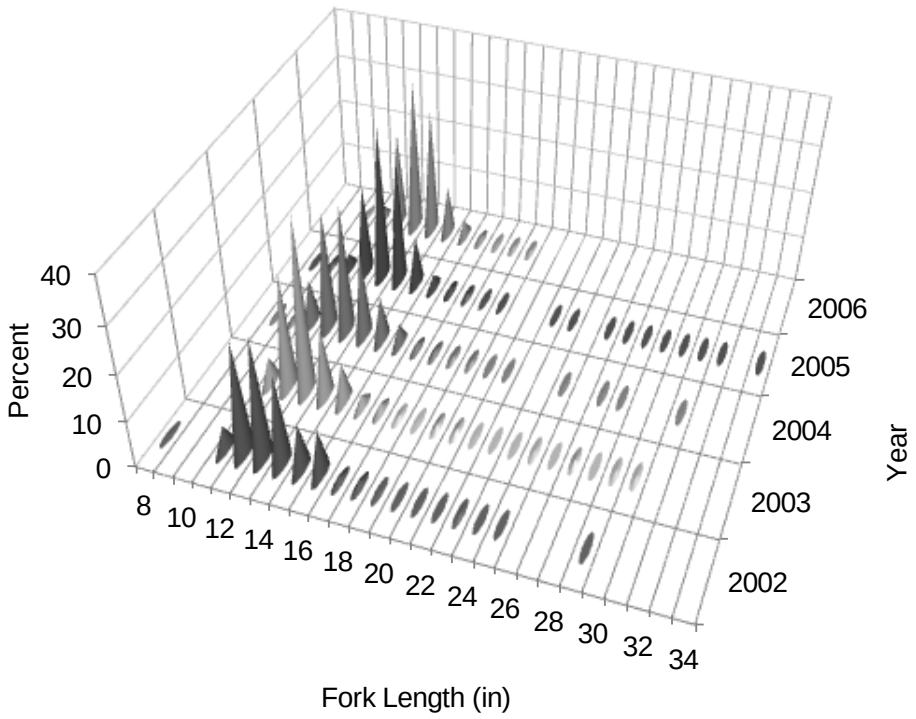


Figure 6.4. North Carolina ocean trawl fishery weighted length frequency distributions for marketable weakfish (*Cynoscion regalis*), 2002-2011.



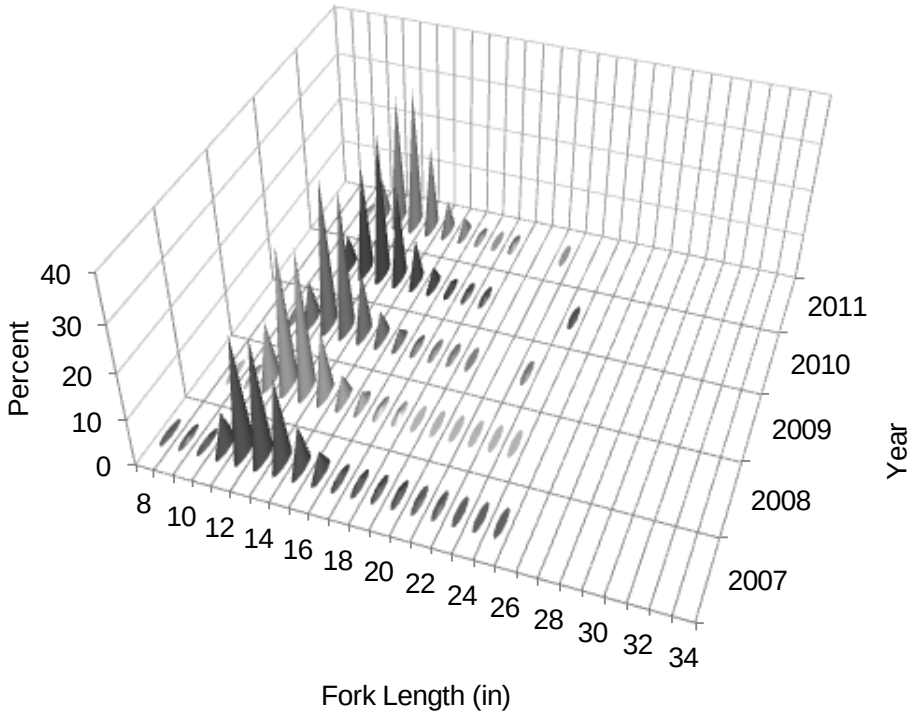


Figure 6.5. North Carolina estuarine gill net fishery weighted length frequency distributions formarketable weakfish (*Cynoscion regalis*), 2002-2011.

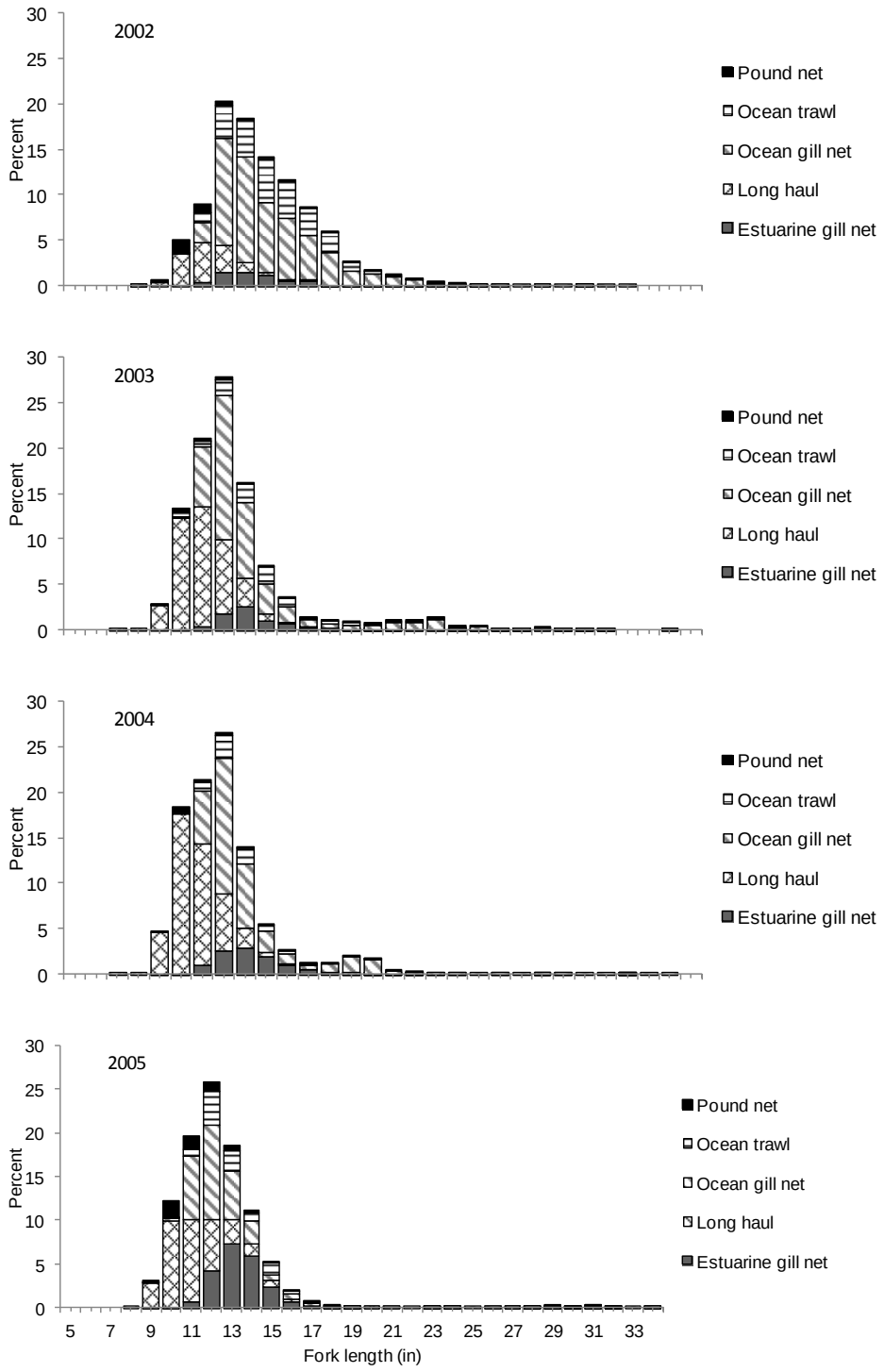


Figure 6.6. North Carolina commercial fishery weighted length frequency distributions for marketable weakfish (Cynoscion regalis), 2002-2011.

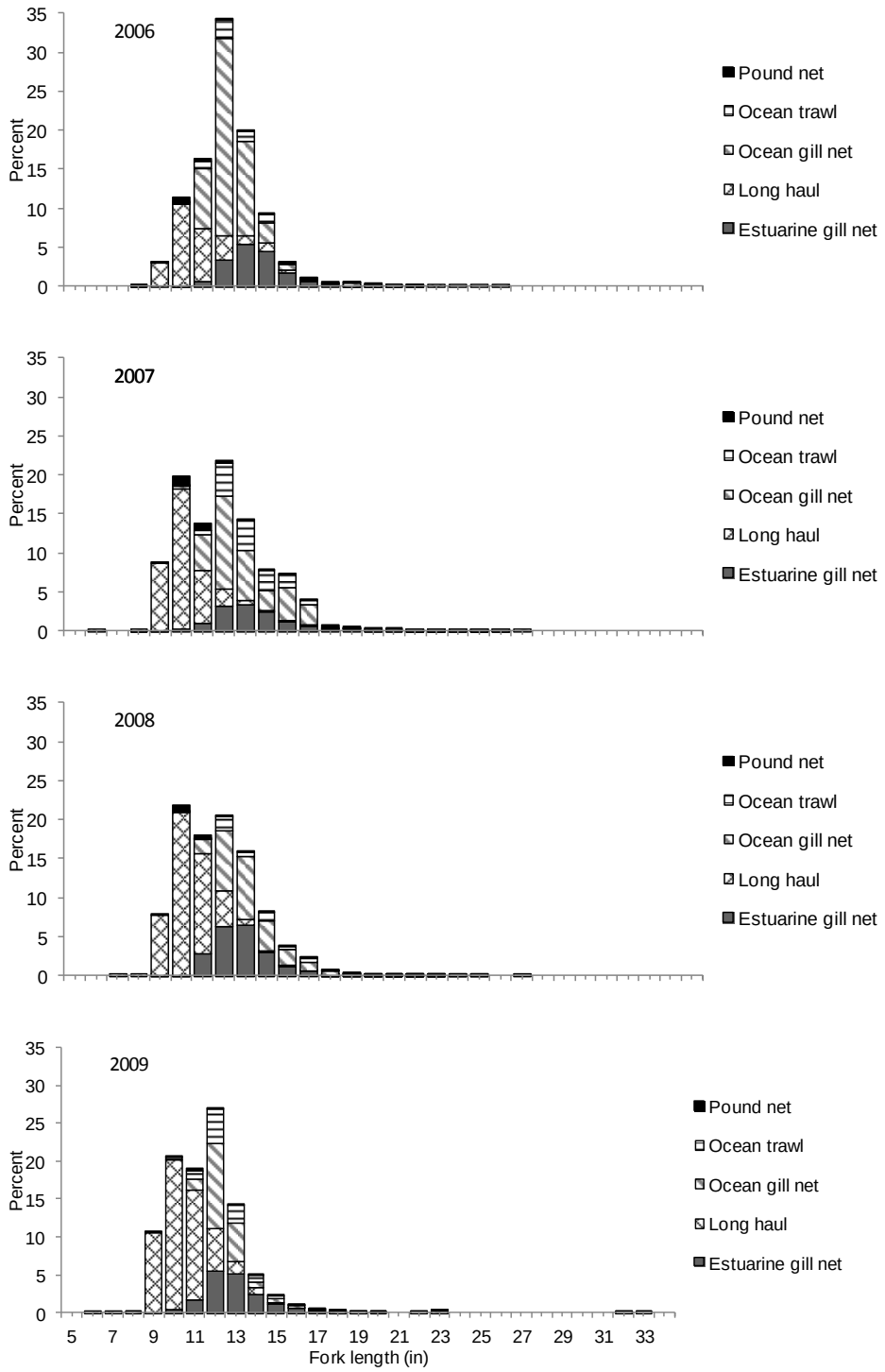


Figure 6.6. (Continued)

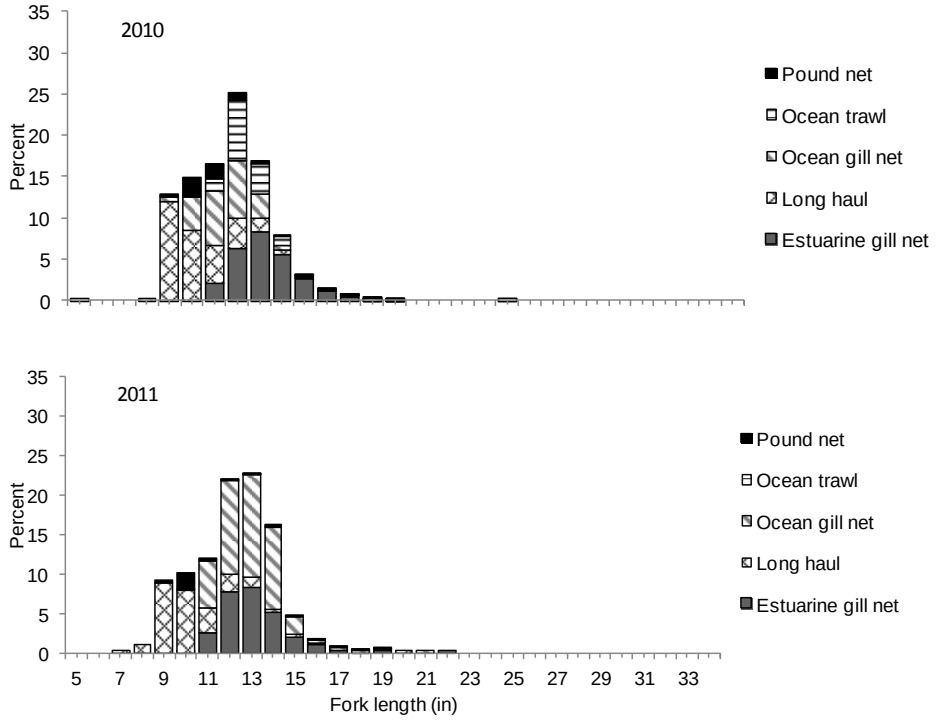


Figure 6.6. (Continued)

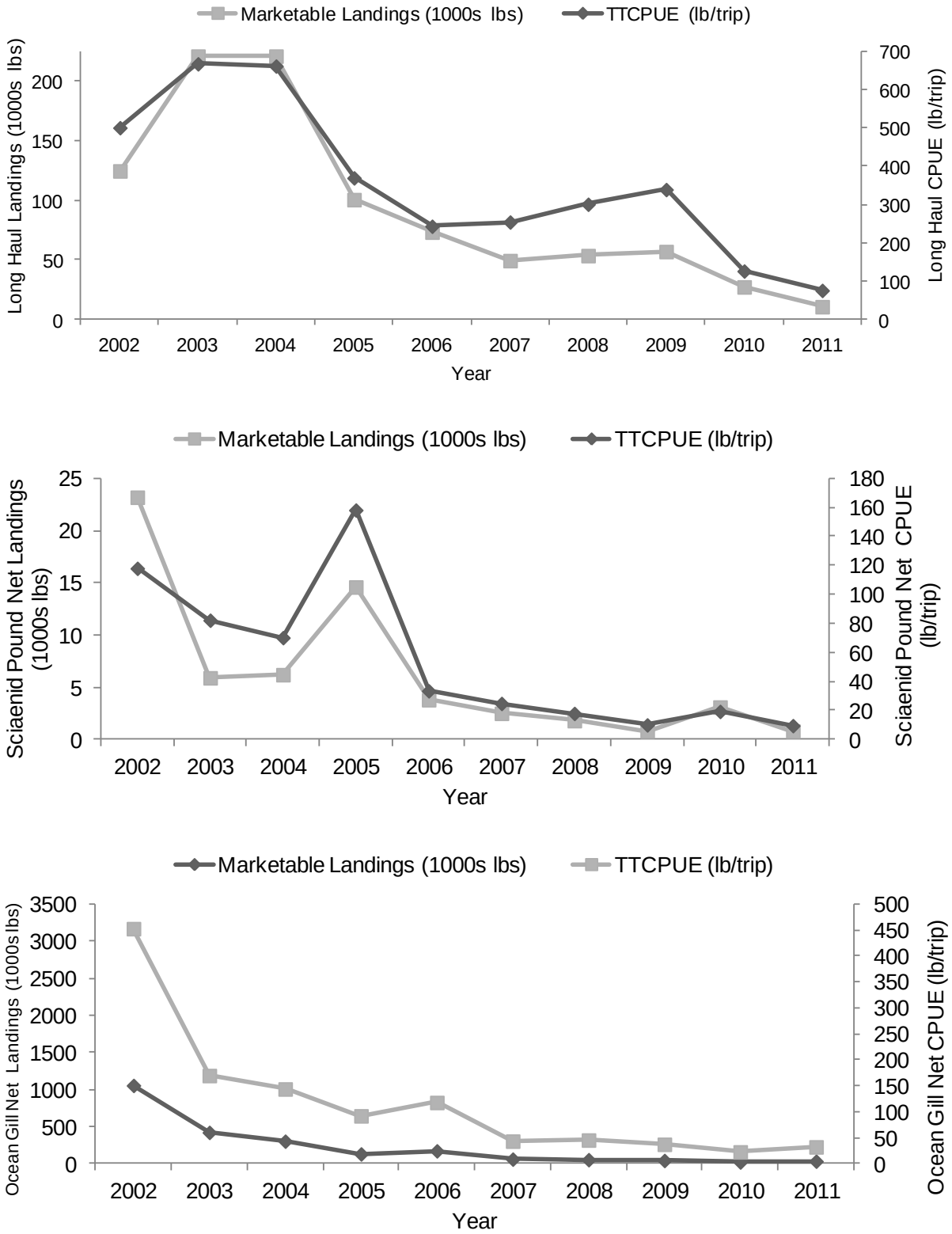
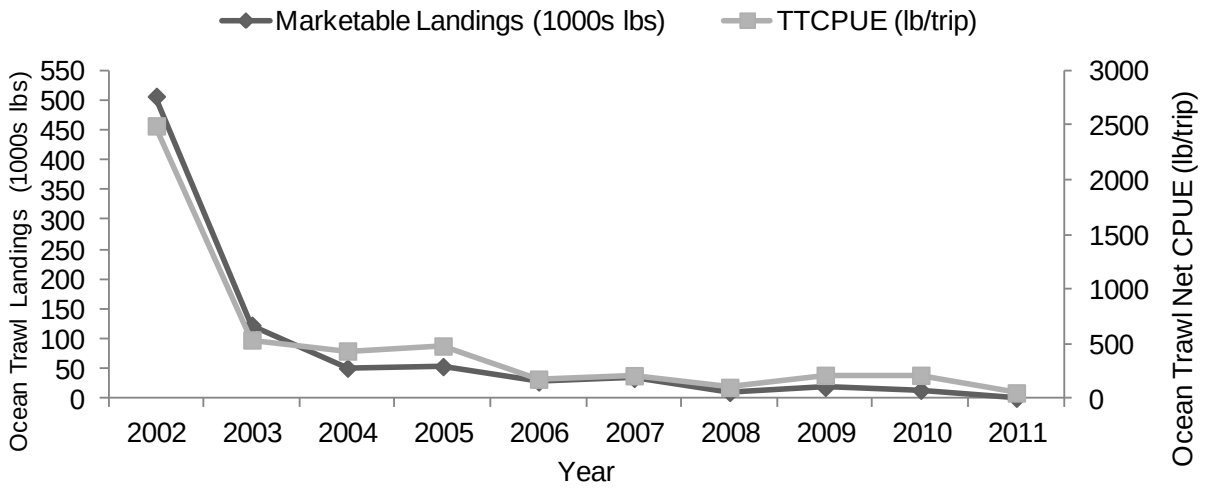
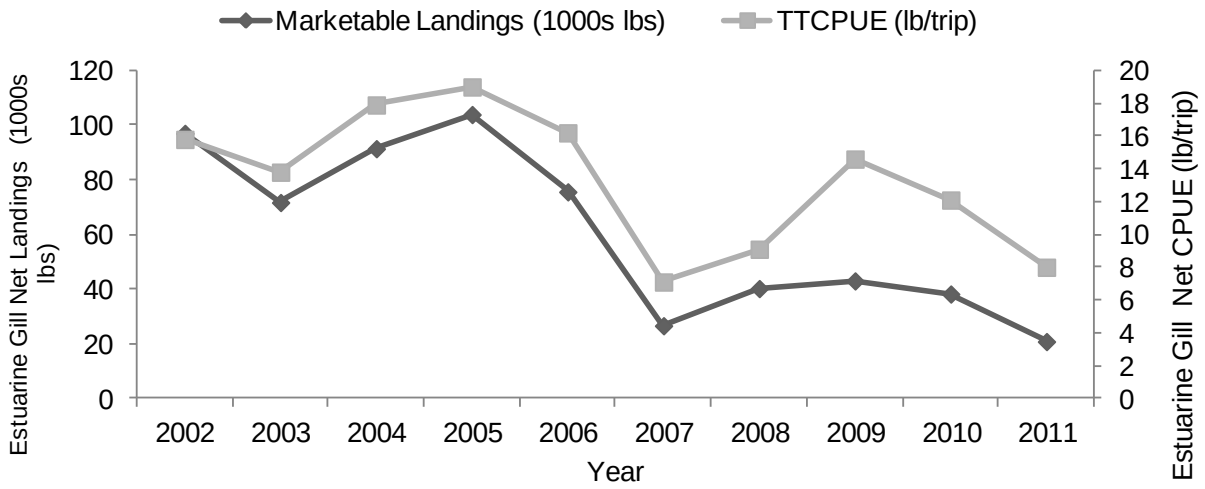


Figure 6.7. North Carolina weakfish (*Cynoscion regalis*) annual commercial landings (1000s of pounds) and CPUE (lb/trip) for selected fisheries and overall, 2002-2011.





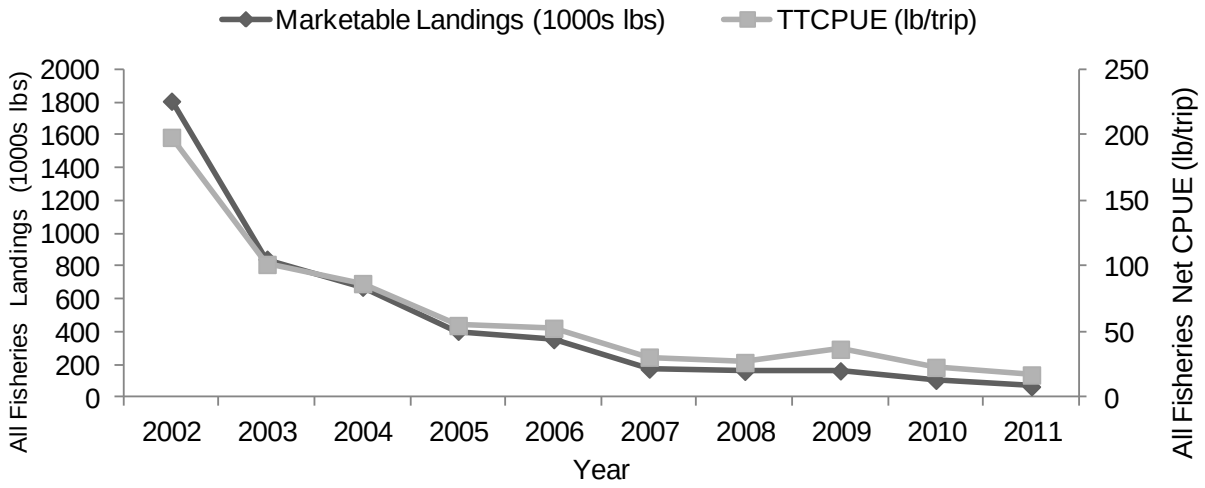


Figure 6.7. (continued).

ATLANTIC CROAKER

Background

Atlantic croaker (*Micropogonias undulatus*) is one of 23 members of the family Sciaenidae, commonly known as drums. While Atlantic croaker is present from Cape Cod, Massachusetts to the Bay of Campeche, Mexico, the area of greatest abundance extends from the Chesapeake Bay to Florida (Smith 1898, Welsh and Breder 1923, Hildebrand 1955, Gutherz and Thompson 1977). Atlantic croaker is one of the most abundant inshore demersal fish species in the southeastern Atlantic and the northern Gulf of Mexico (Haven 1957, Bearden 1964, Anderson 1968, Chittenden and McEachran 1976). Spawning occurs in the fall some distance from shore in continental shelf waters (Bearden 1964, Hoese 1973, Morse 1980). Recruitment of young-of-the-year to estuarine areas occurs over an extended period but generally peaks in the fall north of Cape Hatteras, North Carolina and in the winter and early spring to the south (Hansen 1969, Nelson 1969, Warlen 1980, Miglarese et al. 1982, Lewis and Judy 1983). Annual recruitment is highly variable and dependent on natural environmental conditions. Individuals appear sexually mature between the ages of two and three, at lengths of 5-9 inches for males and 7-9 inches for females. Size at any given age varies throughout the range (ASMFC 1987a).

Atlantic croaker is a principal target of the major North Carolina finfish fisheries. The North Carolina fisheries coincide with the seasonal migrations of Atlantic croaker. During the warmer months as the fish move northward and inshore they are exploited by the long haul, pound net, and estuarine gill net fisheries. During the winter months, Atlantic croaker is exploited by the ocean trawl (fly net) and ocean sink net fisheries as they move southward in the ocean.

Length Distribution

Fishery dependent length sampling was conducted in the estuarine gill net, long haul, ocean gill net, ocean trawl, and pound net fisheries. For each fishery, the annual length distribution (reported in inches total length (TL)) of Atlantic croaker is weighted by commercial landings (lb, semi-annually).

From 2002 – 2011 the maximum lengths for Atlantic croaker decreased for all fisheries, down to 14 in TL in 2011 in both the estuarine gill net and pound net fisheries. The minimum ranges have remained constant for all fisheries in the 4 – 6 in TL range from 2002 – 2011. The modal peaks have decreased slightly in recent years in all fisheries.

Atlantic croaker captured by the estuarine gill net fishery from 2002 – 2011 exhibited a decreasing trend in maximum size (Figure 6.8). The maximum length class ranged from a high of 24 in TL in 2006 to a low of 15 in TL in 2011. The minimum length classes ranged from a low of 7 in TL in 2002, 2007, and 2009 – 2011 to a high of 8 in TL in 2003 – 2006 and 2008. The annual length frequency distributions are typically unimodal with peaks in the 8 – 10 in TL size classes.

The long haul fishery from 2002 – 2011 exhibited a decreasing trend in maximum size for Atlantic croaker (Figure 6.9). The maximum length classes ranged from a high of 17 in TL in 2003, 2004, 2005 to a low of 14 in TL in2007 and 2009. The minimum length classes ranged from a low of 2 in TL in 2004 to a high of 8 in TL in 2003 and 2008. The annual length frequency distribution is typically unimodal with peaks in the 9 – 10 in TL size classes.

The ocean gill net fishery exhibited a decreasing trend in maximum size of Atlantic croaker from 2002 – 2011 (Figure 6.10). The maximum length classes ranged from a high of 19 in TL in 2002 and 2005 to a low of 15 in TL in 2008. The minimum length classes ranged from a low of 5 in TL in 2007 to a high of 8 in TL in 2003, 2004, and 2009. The annual length frequency distribution is typically unimodal with peaks in the 12 – 14 in TL size classes.

The ocean trawl fishery exhibited a decreasing trend in Atlantic croaker maximum size from 2002 – 2011 (Figure 6.11). The maximum length class ranged from a high of 24 in TL in 2006 to a low of 16 in TL in 2011. The minimum length class ranged from a low of 5 in TL in 2010 to a high of 8 in TL in 2002, 2003, and 2004. The annual length frequency distribution is typically unimodal with peaks in the 10 – 11 in TL size classes.

Due to small sample sizes it is difficult to characterize the length distributions of the pound net fishery. The pound net fishery exhibited a decreasing trend in Atlantic croaker maximum size from 2002 – 2011 (Figure 6.12). The maximum length class ranged from a high of 18 in TL in 2006 to a low of 13 in TL in 2009. The minimum length class ranged from a low of 5 in TL in 2007 and 2010 to a high of 8 in TL in 2002 – 2005. The annual length frequency distribution is typically unimodal with peaks in the 9 – 10 in TL size classes.

Annual length distributions of Atlantic croaker across all fisheries reflect the contribution by size of each fishery to the overall harvest (Figure 6.13). Due to the magnitude of their harvest, the two ocean fisheries dominate the overall length distributions. The ocean trawl fishery typically peaks in the 10 in TL size class where the ocean gill net fishery peaks in the 12 in TL size class. In 2011 the ocean trawl fishery contribution decreased sharply, this is largely due to the filling in of Oregon Inlet making it impassable to the large trawl boats.

Lengths of Atlantic croaker in scrap fish samples ranged from 2 – 14 in TL (Table 6.4). Dominant length modes of scrap fish in each fishery were generally in the 6 – 8 in TL size classes. The pound net, estuarine gill net, and ocean gill net fisheries have relatively low scrap fish landings and few scrap fish samples making it difficult to characterize and describe trends in the scrap fish harvest. The long haul and ocean trawl fisheries are the primary scrap fish fisheries for Atlantic croaker. Scrap fish in the long haul fishery is mostly in the 6 in TL size class where scrap fish in the ocean trawl fishery is primarily in the 8 in TL size class.

Landings, Trips, and CPUE

Overall commercial marketable landings for Atlantic croaker dropped consistently since peaking in 2003 (Table 6.5, Figure 6.14). The lowest harvest of Atlantic croaker in the 10 year period

occurred in 2008 and 2011. Harvest has been below the 10 year average for the last five years. Average landings during the report period of 2007 – 2011 were 30% below the 10 year average. For the selected target fisheries combined (Table 6.6, Figure 6.14) the peak CPUE occurred in 2003, and the CPUE for the report period decreased 26% from the 10 year average. The CPUE trends have varied throughout the period but have shown a general decrease over time. Report period average effort (6,000 trips) declined 6% from the 10 year average of 6,408 trips. The contribution of Atlantic croaker scrap fish (by weight) to the total landings (market plus scrap fish) has varied without trend, with the report period average of 6.1% being 35% above the 10 year average (4.5%).

The estuarine gill net fishery is a minor contributor to the marketable Atlantic croaker landings ranging from 0.4 – 2.3% of the overall landings from 2002 – 2011 (Table 6.5). Landings and CPUE have remained low with a general downward trend (Figure 6.14). The scrap fish component of this fishery is virtually nonexistent with less than 100 lb landed annually (Table 6.6).

The pound net fishery is also a minor contributor to the marketable Atlantic croaker landings making up <0.1% of the overall landings from 2002 – 2011 (Table 6.5). Landings and CPUE have remained low with no real trend (Figure 6.14). The scrap fish component of the fishery accounts for the majority of the landings (Table 6.6).

The long haul fishery is another minor contributor to marketable Atlantic croaker landings ranging from 0.2 – 2.3% of the overall landings from 2002 – 2011 (Table 6.5). Landings and CPUE have remained stable with landings and CPUE highest in 2010 and 2011 (Figure 6.14). The scrap fish component of the fishery accounts for the majority of the landings (Table 6.6).

The ocean gill net fishery is the second largest contributor to Atlantic croaker landings, ranging from 26.5 – 87.9% of the landings from 2002 – 2011 (Table 6.5). Landings and CPUE for this fishery have been up and down with landings in 2011 at their highest level since 2005 (Figure 6.14). The scrap fish component of the fishery is extremely small with most years recording no scrap fish landings (Table 6.6).

The ocean trawl fishery is the largest fishery for Atlantic croaker with landings ranging from 9.5 – 70.9% of the landings from 2002 – 2011 (Table 6.5). The landings drop in 2011 is due to a drop in effort caused by the shoaling of Oregon Inlet making it impassable for the trawl boats. Landings and CPUE have dropped during this period to their lowest level in 2011. The scrap fish component of the fishery accounted for 2.6 – 14.1 % of the total Atlantic croaker landings in the fishery. However, scrap fish from the ocean trawl fishery accounted for 7 – 89% of all scrap fish landings of Atlantic croaker from 2002 – 2011 (Table 6.6).

Annual landings and CPUE for Atlantic croaker combined across these five fisheries have decreased from 2002 – 2011 (Figure 6.14). Current landings are the lowest seen since 1994. During this period landings and CPUE for each fishery and overall follow the same pattern

(Figure 6.14). Since effort has remained relatively stable this suggests landings are strongly tied to fluctuations in annual fish availability rather than fluctuations in effort in the fisheries.

Management Issues

The North Carolina 2012 stock status report lists Atlantic croaker as a species of concern. The Atlantic croaker population is not experiencing overfishing and is likely not overfished. Most available data, including commercial landings and the juvenile abundance indices demonstrates the stock to be viable. This is a recruitment driven stock where abundance fluctuates in response to large year classes, and over the last few years this abundance has been declining for Atlantic croaker along the Atlantic coast (NCDMF 2012a). The CPUEs for Atlantic croaker from 2002 – 2011 decreased in the ocean trawl and ocean gill net fisheries and the size distributions shifted slightly to younger smaller fish. Some of this decrease is attributable to weak year classes moving through the fishery. Comparable decreases were also seen in the inside Sound water fisheries; the long haul and pound net fisheries continue to show low harvest of Atlantic croaker. There have also been socioeconomic changes within the inside fisheries that may contribute to the decline in commercial landings for these inside fisheries. Overall recreational landings have a downward trend by weight. There also is no evidence of a major increase or decrease in the annual abundance of juvenile Atlantic croaker in North Carolina nursery areas or the Pamlico Sound trawl survey (NCDMF 2012b).

Atlantic croaker is included in the North Carolina Interjurisdictional FMP, which defers to the Atlantic States Marine Fisheries Commission (ASMFC) FMP compliance requirements. An ASMFC FMP was initially approved in 1987, Amendment 1 to the FMP was approved in November 2005 (ASMFC 2005a), and Addendum I was approved in March 2011 (ASMFC 2011). The amendment was fully implemented by January 1, 2006. Amendment 1 did not require any specific measures restricting recreational or commercial harvest of Atlantic croaker. States with more conservative management measures were encouraged to maintain those requirements.

The goal of Amendment 1 was to utilize interstate management to perpetuate the self-sustainable Atlantic croaker resource throughout its range and generate the greatest economic and social benefits from its commercial and recreational harvest and utilization over time. Amendment 1 contained four objectives:

1) Manage the fishing mortality rate for Atlantic croaker to provide adequate spawning potential to sustain long-term abundance of the Atlantic croaker population.

2) Manage the Atlantic croaker stock to maintain the spawning stock biomass above the target biomass levels and restrict fishing mortality to rates below the threshold.

3) Develop a management program for restoring and maintaining essential Atlantic croaker habitat.

4) Develop research priorities that will further refine the Atlantic croaker management program to maximize the biological, social, and economic benefits derived from the Atlantic croaker population.

Consistent with the 2010 stock assessment, Addendum I redefined Atlantic croaker into one management area from New Jersey south through Florida. Addendum I established biological reference points (BRPs) similar to those in Amendment 1 to define overfished stock status and overfishing. Overfished status is defined by a threshold ratio female spawning stock biomass (SSB) where $SSB_{threshold} = 0.70*SSB_{MSY}$, with a target $SSB = SSB_{MSY}$. Overfishing is defined by a threshold fishing mortality ratio of $F_{threshold} = F_{MSY}$, with a target $F = 0.75*F_{MSY}$. Absolute estimates of SSB and F were not produced because of uncertainty in the assessment resulting from inadequate data on the magnitude of Atlantic croaker discards in the South Atlantic shrimp trawl fishery. Using the ratio-based BRPs, it was determined the stock is not experiencing overfishing but it could not be determined if the stock was overfished (ASMFC 2011). Data for North Carolina from this project that allowed for the production of individual state fisheries seasonal aged based data series were crucial for an approved SEDAR assessment for Atlantic croaker. As noted below this included project estimates of Atlantic croaker landed as scrap fish.

Addendum I retained the same triggers established in Amendment 1 to initiate a stock assessment prior to the normal five year time span. For the landings trigger, Amendment 1 states that a stock assessment will be triggered if the most recent year's commercial or recreational landings are less than 70% of the previous two years' average landings (ASMFC 2012). Completion of the trigger exercise in 2012 demonstrated the 2011 coast-wide landings of Atlantic croaker did not trigger a stock assessment prior to the tentatively scheduled 2015 SEDAR assessment.

Currently, no regulations directly govern fishing practices for Atlantic croaker in North Carolina. However, several regulations indirectly impact the harvest of small croaker. The rule (15A NCAC 3M .0162) limiting the scrap fish catch to 5,000 lb per vessel per day had an indirect effect on Atlantic croaker, because the species comprise a large percentage by weight of the scrap fish landed by North Carolina commercial fishing gears. Bycatch Reduction Devices (BRDs) were required in all shrimp trawls in the fall of 1992 by proclamation (and by the consent of the NCMFC (15A NCAC 3J .0104). Since 1991, area restrictions and incidental finfish limits taken by shrimp and crab trawls in inside waters limit these gears from having no more than 500 lb of finfish from December 1 through February 28 and 1,000 pounds of finfish from March 1 to November 30 (15A NCAC 3J .0104(a)). Minimum mesh size restrictions in shrimp trawls (1 ½" tailbag) have been in effect since 1991 as well as for fly nets (4" main body, 3" extension, and 1 3/4" tail bag) since 1997 (Proclamation FF-26-92), and the closure of ocean waters south of Cape Hatteras to the South Carolina state line for fly nets in 1994 (Proclamation FF-18-94), all of which may indirectly affect the fishing impact on Atlantic croaker and change the size and age distributions of the harvest.

The NCDMF conducted a study to evaluate the use of culling panels in long hauls and swipe nets (Gearhart 2000). The study proved that shifts occurred in the length frequency distribution

of many species including Atlantic croaker, which resulted in a 1999 permanent rule change mandating the use of culling panels in some areas of North Carolina. Language in this rule was modified and strengthened for improved enforcement in August 2003.

In the 2010 ASMFC stock assessment, aggregate, unculled ("scrap") scrap fish fisheries landings data were included for North Carolina and at-sea discard data were included from gill net and trawl fisheries. Scrap landings and discards were combined in the model. The stock assessment indicated that between 1973 and 1995, scrap/discards accounted for an average 20% of removals, from 1996 to 2002 an average 3% of removals, and from 2002 – 2008 an average 4% of removals (ASMFC 2010a). Management actions appear to be reducing the quantity of sub-adult Atlantic croaker harvested and this should increase spawning stock biomass and increase yield per recruit.

Table 6.4. North Carolina Atlantic croaker (*Micropogonias undulatus*) expanded length frequency of scrap fish samples for selected fisheries, 2002 – 2011.

Fishery/Year	Number Measured	Expanded Number	Estimated Landings Number (1000's)	Length (inches) 2	4	6	8	10	12	14
Long Haul										
2002	1,436	271,050	652	-	0.8	71.1	27.6	0.5	-	-
2003	1,467	311,884	1,234	-	14.6	55.6	28.8	1.0	-	-
2004	648	64,454	269	<0.1	21.2	51.8	26.6	0.4	-	-
2005	744	61,720	205	-	25.3	42.6	32.0	<0.1	-	-
2006	769	82,650	490	-	12.7	50.5	36.7	0.0	-	-
2007	919	209,866	978	-	19.7	75.2	5.1	<0.1	-	-
2008	911	344,848	681	-	29.1	62.3	8.6	-	-	-
2009	318	86,024	1,576	-	23.0	75.0	1.8	0.1	-	-
2010	493	161,411	788	-	11.7	39.5	48.7	0.1	-	-
2011	526	168,626	832	0.1	0.1	62.7	37.0	-	-	-
Sciaenid Pound Net										
2002	55	2,666	153	-	-	85.3	14.7	-	-	-
2003	6	234	19	-	-	76.9	19.2	-	3.8	-
2004	22	344	0.7	-	22.7	27.3	50.0	-	-	0.0
2005	80	1,886	28	-	13.5	84.4	1.9	0.2	-	-
2006	144	7,372	33	-	2.5	81.9	15.6	-	-	-
2007	115	7,176	284	-	-	89.4	10.6	-	-	-
2008	165	7,650	11	-	4.1	58.8	37.1	-	-	-
2009	1	5	0.5	-	-	100.0	-	-	-	-
2010	2	50	0.3	-	-	50.0	50.0	-	-	-
2011	27	637	19	-	-	92.0	7.1	-	0.9	-
Estuarine Gill Net										
2002	-	-	<0.1	-	-	-	-	-	-	-
2003	-	-	<0.1	-	-	-	-	-	-	-
2004	-	-	<0.1	-	-	-	-	-	-	-
2005	-	-	-	-	-	-	-	-	-	-
2006	-	-	<0.1	-	-	-	-	-	-	-
2007	-	-	<0.1	-	-	-	-	-	-	-
2008	-	-	<0.1	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-	-	-
2010	-	-	-	-	-	-	-	-	-	-
2011	-	-	<0.1	-	-	-	-	-	-	-
Ocean Gill Net										
2002	45	288	10.1	-	-	-	5.9	94.1	-	-
2003	-	-	-	-	-	-	-	-	-	-
2004	57	57	1.1	-	-	-	82.5	17.5	-	-
2005	-	-	-	-	-	-	-	-	-	-
2006	5	8	0.1	-	-	25.0	75.0	-	-	-
2007	-	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-	-	-
2009	2	2	-	-	-	-	100.0	-	-	-
2010	-	-	<0.1	-	-	-	-	-	-	-
2011	191	1,883	49.9	-	-	21.9	78.1	-	-	-

Table 6.4. (Continued)

Fishery/Year	Number Measured	Expanded Number	Estimated Landings Number (1000's)	Length (inches) 2	4	6	8	10	12	14
Ocean Trawl										
2002	1,005	103,027	524.5	-	-	1.6	48.5	49.3	0.5	0.2
2003	2,319	320,299	1,652.5	-	-	4.3	52.6	41.4	1.7	-
2004	1,636	202,639	1,045.2	-	0.1	1.3	60.4	35.8	2.2	0.2
2005	949	89,435	569.0	-	-	8.1	49.6	40.6	1.6	<0.1
2006	918	120,009	694.3	-	-	9.6	80.7	9.0	0.7	0.1
2007	582	126,143	703.7	-	0.2	12.3	79.7	7.0	0.8	-
2008	664	52,012	357.8	-	-	33.5	61.1	5.3	0.1	-
2009	892	197,607	906.3	-	0.4	19.3	76.2	4.1	-	-
2010	735	442,342	2,607.8	-	0.5	21.2	76.3	1.9	<0.1	-
2011	166	32,927	55.3	-	-	11.2	88.8	-	-	-

Table 6.5. North Carolina commercial landings of marketable Atlantic croaker (*Micropogonias undulatus*) by fishery, 2002 – 2011, includes landings (thousands pounds), value (thousand dollars), and contribution of fishery to North Carolina Atlantic croaker landings (percent).

	Year									
Fishery	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Estuarine Gill Net										
Pounds	130.1	89.2	82.6	67.0	61.2	28.4	67.4	52.6	171.8	45.9
Value ($)	43.2	17.9	24.5	19.2	21.1	9.2	38.0	21.8	85.3	27.2
% State	1.3	0.6	0.7	0.6	0.6	0.4	1.2	0.9	2.3	0.9
Flounder Pound Net										
Pounds	0.5	0.1	0.3	0.2	0.8	0.5	0.1	0.0	0.1	0.1
Value ($)	0.1	0.0	0.1	0.1	0.3	0.2	0.0	0.0	0.1	0.1
% State	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Haul										
Pounds	30.0	51.5	34.6	32.1	35.8	18.0	11.8	33.3	171.7	80.8
Value ($)	7.2	10.7	8.6	7.5	8.3	5.0	3.9	10.7	80.7	44.9
% State	0.3	0.4	0.3	0.3	0.3	0.2	0.2	0.5	2.3	1.6
Ocean Gill Net										
Pounds	4,209.8	4,114.8	3,970.3	4,444.8	2,756.7	2,057.8	2,180.6	2,001.2	3,038.0	4,441.9
Value ($)	1,496.7	806.9	1,261.0	1,409.4	1,054.9	901.8	1,405.4	1,130.7	1,772.4	2,857.1
% State	41.3	28.5	33.1	37.3	26.5	28.3	37.7	32.6	41.5	87.9
Ocean Trawl										
Pounds	5,810.8	10,165.1	7,893.7	7,354.1	7,538.6	5,155.5	3,529.1	4,034.8	3,920.4	482.4
Value ($)	1,684.2	2,086.7	2,230.7	1,971.1	2,477.0	1,793.8	1,693.6	1,834.4	1,466.9	233.0
% State	57.0	70.4	65.8	61.8	72.5	70.9	60.9	65.8	53.6	9.5
Sciaenid Pound Net										
Pounds	0.7	0.3	1.1	0.4	0.2	1.1	0.2	0.0	1.6	0.4
Value ($)	0.2	0.1	0.3	0.1	0.0	0.3	0.1	0.0	0.9	0.2
% State	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others										
Pounds	7.4	8.2	10.4	4.7	3.3	9.8	2.5	13.4	8.5	2.7
Value ($)	1.8	1.7	2.8	1.2	1.0	3.7	0.9	6.2	3.4	1.5
% State	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.2	0.1	0.1
All										
Pounds	10,189.2	14,429.2	11,993.0	11,903.3	10,396.6	7,271.2	5,791.8	6,135.4	7,312.2	5,054.2
Value ($)	3,233.4	2,923.9	3,528.0	3,408.5	3,562.5	2,714.0	3,141.9	3,003.9	3,409.7	3,164.0

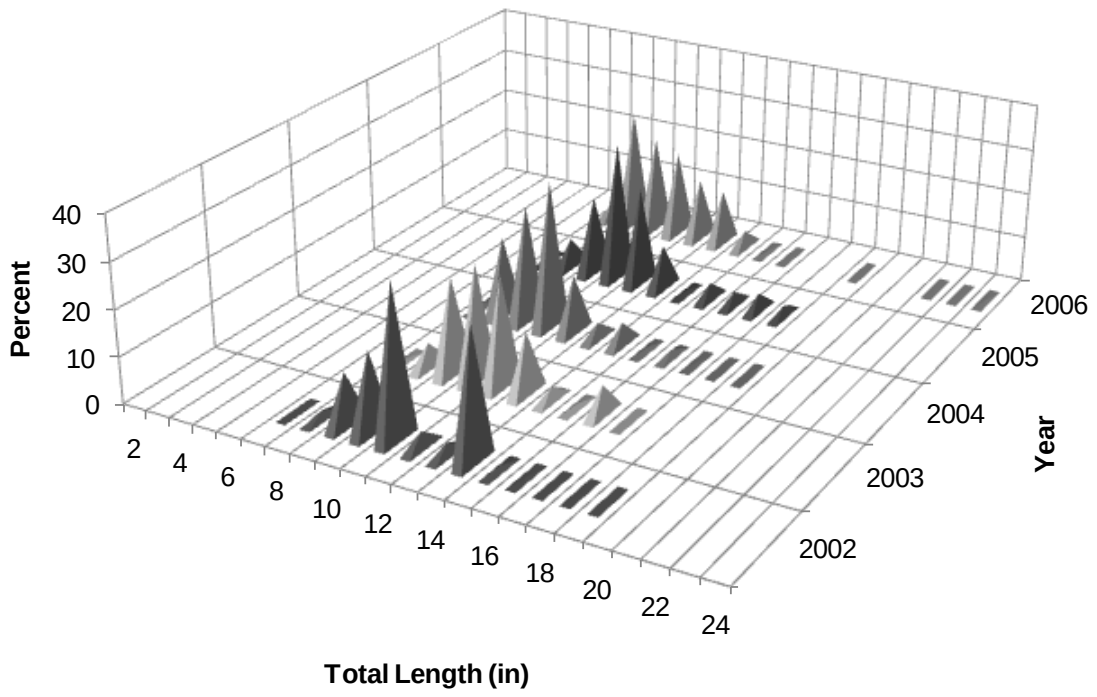
Source: North Carolina Division of Marine Fisheries commercial landings database.
Long Haul includes: gear code 030 or 025 and non-ocean waters.
Flounder Pound Net includes: gear code 275, October, November, and December for Counties Beaufort, Carteret, Dare, Hyde, Tyrrell, and September for Counties Beaufort, Carteret, Hyde, and Tyrrell.
Sciaenid Pound Net includes: gear code 275, May through August for Counties Dare and Hyde, and September for Dare.
Estuarine Gill Net includes: gear code 425, 426, 427, 470, 475, 480 and all non-ocean waters.
Ocean Gill Net includes: gear code 425, 426, 427, 470, 475, 480 and Atlantic Ocean.
Ocean Trawl includes: gear codes 210 and 230, Atlantic Ocean, and months January through May and September through December.

Table 6.6. North Carolina Atlantic croaker *(Micropogonias undulatus*) landings by weight (thousands pounds) and number (1000's individuals) for marketable (CPUE lb/trip) and estimated scrap fish landings per trip, and total number of trips, by type for selected commercial fisheries, 2002 – 2011.

			Landings								
			Weight					Number			
			Total	Market		Scrap fish		Total	Market	Scrap fish	
Fishery	Year	# Trips	Landed (1000's lb)	Landed (1000's lb)	CPUE	Landed (1000's lb)	% Scrap fish	Landed (1000's)	Landed (1000's)	Landed (1000's)	% Scrap fish
Long Haul	2002	165	172.7	30.0	182.0	142.7	82.6	712.4	60.3	652.1	91.5
	2003	151	274.1	51.5	340.9	222.7	81.2	1,309.9	75.4	1,234.5	94.2
	2004	161	84.8	34.6	215.2	50.1	59.1	328.4	59.1	269.3	82.0
	2005	120	63.7	32.1	267.4	31.6	49.6	263.0	58.1	204.8	77.9
	2006	212	94.5	35.8	168.8	58.7	62.1	572.0	82.0	490.0	85.7
	2007	131	142.3	18.0	137.4	124.3	87.3	1,024.9	46.9	978.0	95.4
	2008	109	106.5	11.8	108.2	94.7	88.9	708.3	27.0	681.3	96.2
	2009	165	260.4	33.3	201.5	227.2	87.2	1,643.4	67.6	1,575.8	95.9
	2010	239	342.0	171.7	718.6	170.2	49.8	1,086.9	299.3	787.7	72.5
	2011	199	247.0	80.8	406.1	166.2	67.3	1,063.6	231.9	831.7	78.2
Sciaenid Pound Net	2002	198	24.3	0.7	3.5	23.7	97.5	154.0	0.9	153.1	99.4
	2003	68	4.0	0.3	4.4	3.8	95.0	19.0	0.2	18.8	98.7
	2004	122	0.8	0.7	5.7	0.1	12.5	1.3	0.6	0.7	55.2
	2005	99	3.9	0.4	4.0	3.6	92.3	28.6	0.6	27.9	97.8
	2006	49	4.6	0.2	4.1	4.4	95.7	33.1	0.3	32.9	99.1
	2007	89	40.3	1.1	12.4	39.2	97.3	285.9	1.5	284.3	99.5
	2008	29	2.2	0.2	6.9	2.0	90.9	11.1	0.5	10.5	95.2
	2009	38	0.2	0.0	0.0	0.1	50.0	0.6	0.1	0.5	82.8
	2010	114	1.7	1.6	14.0	0.1	5.9	3.6	3.2	0.4	10.3
	2011	67	3.3	0.4	6.0	3.0	90.9	20.1	0.8	19.3	96.2
Estuarine Gill Net	2002	5,874	130.1	130.1	22.1	<0.1	<0.1	191.6	191.6	<0.1	<0.1
	2003	4,862	89.2	89.2	18.4	<0.1	<0.1	123.2	123.2	<0.1	<0.1
	2004	5,341	82.6	82.6	15.5	<0.1	<0.1	115.6	115.6	<0.1	<0.1
	2005	4,488	67.0	67.0	14.9	0.0	0.0	99.0	99.0	0.0	0.0
	2006	3,971	61.2	61.2	15.4	<0.1	<0.1	109.7	109.7	<0.1	<0.1
	2007	4,216	28.4	28.4	6.7	<0.1	<0.1	51.4	51.4	<0.1	<0.1
	2008	4,484	67.4	67.4	15.0	<0.1	<0.1	143.1	143.1	<0.1	<0.1
	2009	5,474	52.6	52.6	9.6	0.0	0.0	107.0	107.0	0.0	0.0
	2010	5,249	171.8	171.8	32.7	0.0	0.0	233.5	233.5	0.0	0.0
	2011	2,622	45.9	45.9	17.5	<0.1	<0.1	98.3	98.3	<0.1	<0.1
Ocean Gill Net	2002	1,716	4,214.4	4,209.8	2,453.3	4.5	0.1	3,769.9	3,759.8	10.1	0.3
	2003	1,542	4,114.9	4,114.9	2,668.5	0.0	0.0	3,438.8	3,438.8	0.0	0.0
	2004	1,364	3,970.7	3,970.3	2,910.8	0.4	<0.1	3,557.4	3,556.3	1.1	<0.1
	2005	1,250	4,444.9	4,444.9	3,555.9	0.0	0.0	4,484.9	4,484.9	0.0	0.0
	2006	1,240	2,756.8	2,756.8	2,223.2	<0.1	<0.1	3,157.3	3,157.2	0.1	<0.1
	2007	1,096	2,057.8	2,057.8	1,877.6	0.0	0.0	2,314.8	2,314.8	0.0	0.0
	2008	1,084	2,180.7	2,180.7	2,011.7	0.0	0.0	2,777.0	2,777.0	0.0	0.0
	2009	1,026	2,001.3	2,001.3	1,950.5	0.0	0.0	2,766.9	2,766.9	0.0	0.0
	2010	1,134	3,038.1	3,038.1	2,679.1	<0.1	<0.1	3,922.2	3,922.2	<0.1	<0.1
	2011	1,743	4,453.4	4,442.0	2,548.5	11.4	0.3	5,785.9	5,736.0	49.9	0.9
Ocean Trawl	2002	222	6,023.8	5,810.9	26,175.0	212.9	3.5	7,780.0	7,255.5	524.5	6.7
	2003	239	10,778.4	10,165.3	42,532.5	613.2	5.7	14,783.4	13,131.0	1,652.5	11.2

Table 6.6. (Continued)

			Landings								
			Weight					Number			
			Total	Market		Scrap fish		Total	Market	Scrap fish	
Fishery	Year	# Trips	Landed (1000's lb)	Landed (1000's lb)	CPUE	Landed (1000's lb)	% Scrap fish	Landed (1000's)	Landed (1000's)	Landed (1000's)	% Scrap fish
Ocean Trawl	2004	239	8,322.8	7,893.8	33,028.5	429.0	5.2	11,220.0	10,174.8	1,045.2	9.3
	2005	197	7,549.2	7,354.2	37,331.0	194.9	2.6	10,409.2	9,840.2	569.0	5.5
	2006	195	7,767.7	7,538.7	38,660.0	229.0	2.9	11,953.0	11,258.7	694.3	5.8
	2007	172	5,353.5	5,155.6	29,974.6	197.8	3.7	8,214.8	7,511.0	703.7	8.6
	2008	139	3,621.6	3,529.2	25,389.9	92.4	2.6	5,895.7	5,537.9	357.8	6.1
	2009	209	4,295.5	4,034.9	19,305.7	260.6	6.1	7,454.7	6,548.5	906.3	12.2
	2010	141	4,562.4	3,920.4	27,804.4	641.9	14.1	9,089.5	6,481.6	2,607.8	28.7
	2011	30	407.2	393.4	13,114.5	13.8	3.4	726.2	670.9	55.3	7.6
All Fisheries	2002	8,175	10,565.2	10,181.5	1,245.4	383.8	3.6	12,607.9	11,268.2	1,339.8	10.6
	2003	6,862	15,260.6	14,421.1	2,101.6	839.6	5.5	19,674.3	16,768.6	2,905.8	14.8
	2004	7,227	12,461.7	11,982.1	1,658.0	479.7	3.8	15,222.7	13,906.4	1,316.3	8.6
	2005	6,154	12,128.6	11,898.6	1,933.5	230.1	1.9	15,284.7	14,482.9	801.8	5.2
	2006	5,667	10,684.8	10,392.6	1,833.9	292.1	2.7	15,825.2	14,607.9	1,217.2	7.7
	2007	5,704	7,622.2	7,260.9	1,273.0	361.3	4.7	11,891.7	9,925.6	1,966.1	16.5
	2008	5,845	5,978.3	5,789.3	990.5	189.1	3.2	9,535.2	8,485.5	1,049.7	11.0
	2009	6,912	6,610.0	6,122.0	885.7	487.9	7.4	11,972.7	9,490.0	2,482.6	20.7
	2010	6,877	8,115.9	7,303.7	1,062.0	812.3	10.0	14,335.8	10,939.8	3,395.9	23.7
	2011	4,661	5,156.9	4,962.6	1,064.7	194.4	3.8	7,694.1	6,737.9	956.2	12.4



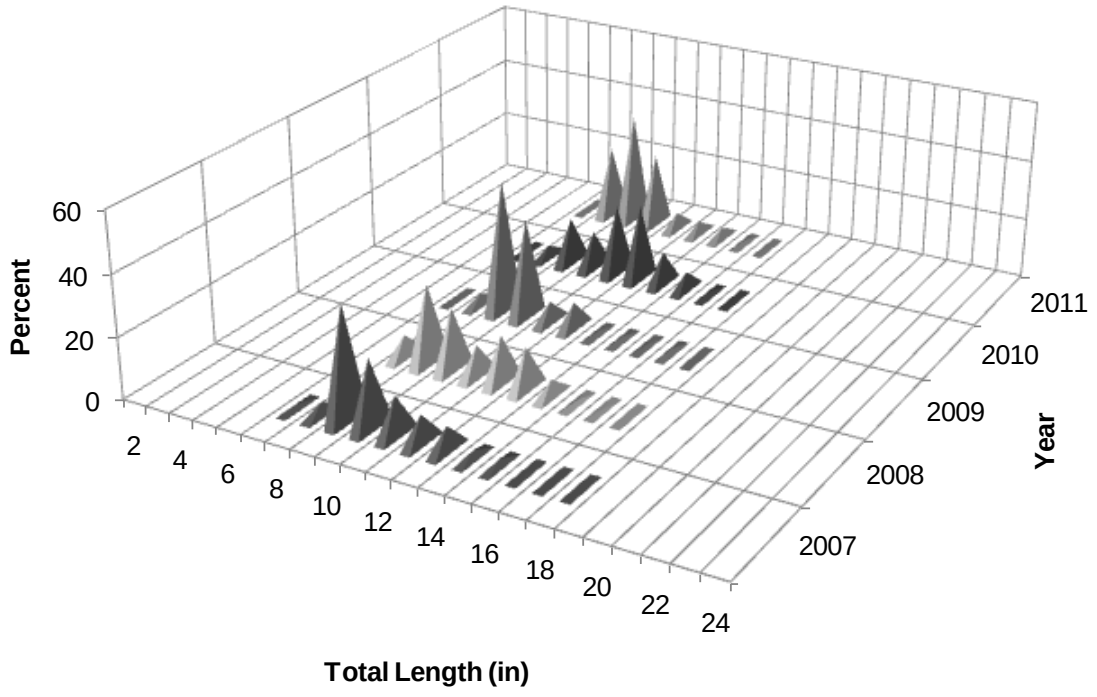
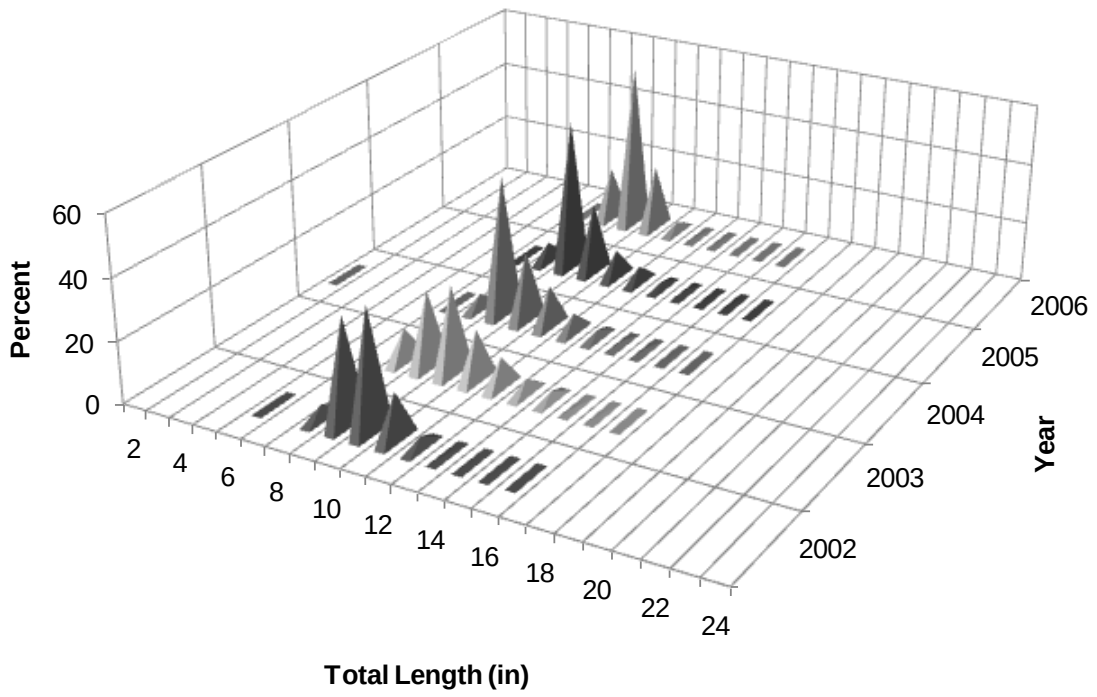


Figure 6.8. North Carolina estuarine gill net fishery weighted length frequency distributions for marketable Atlantic croaker (*Micropogonias undulatus*), 2002 – 2011.



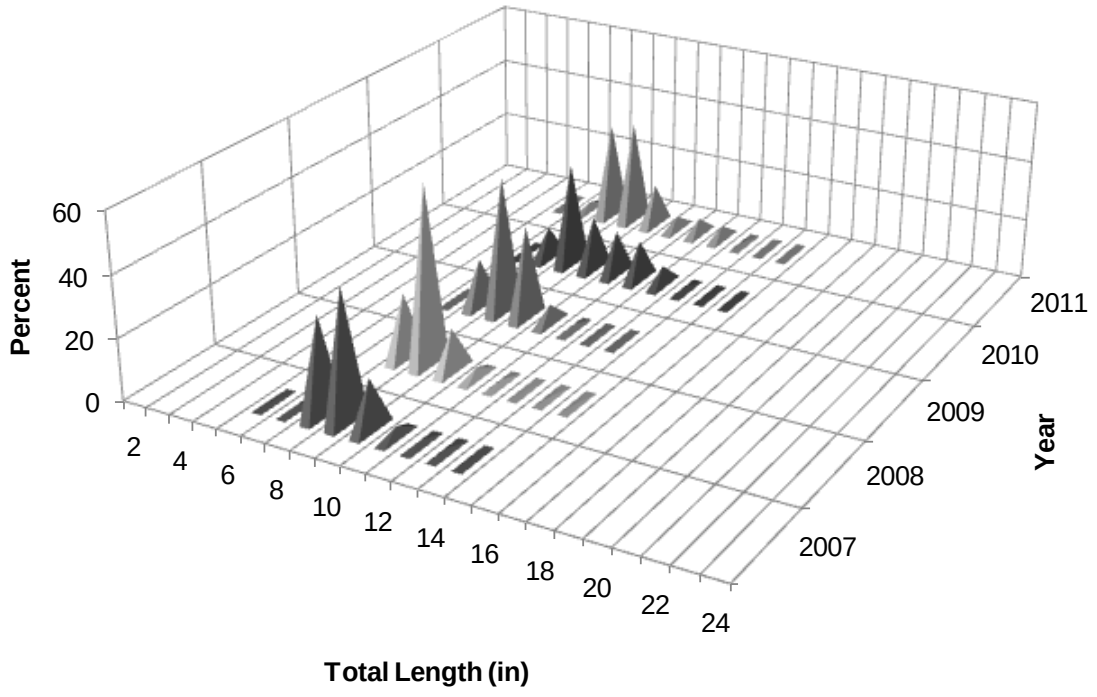
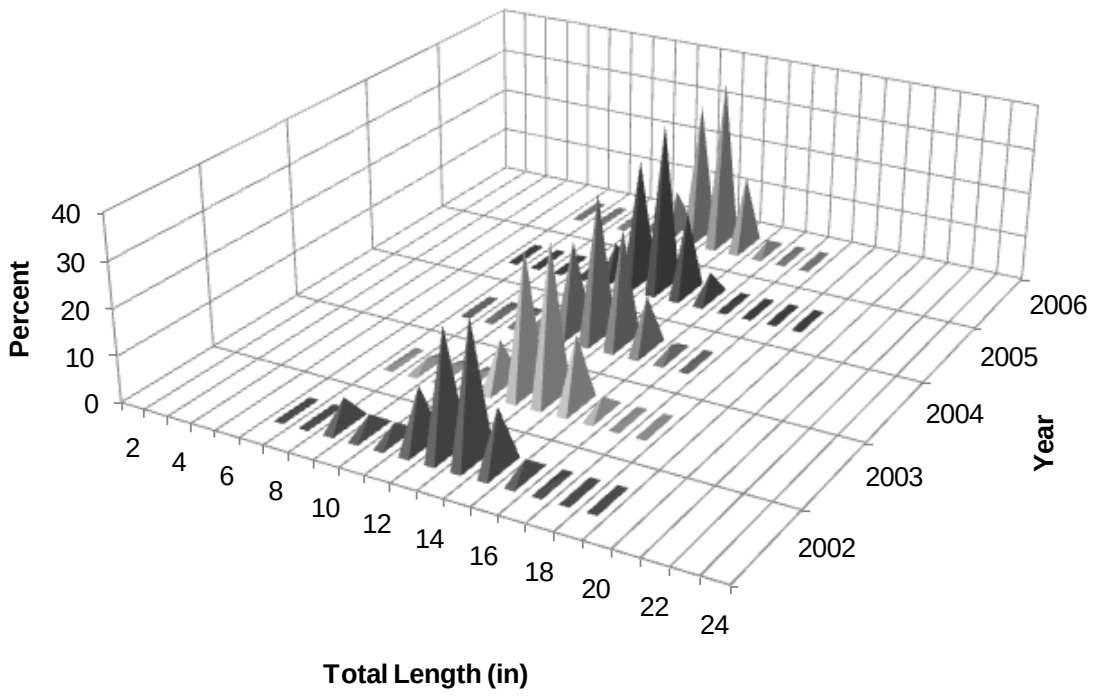


Figure 6.9. North Carolina long haul fishery weighted length frequency distributions for marketable Atlantic croaker (*Micropogonias undulatus*), 2002 – 2011.



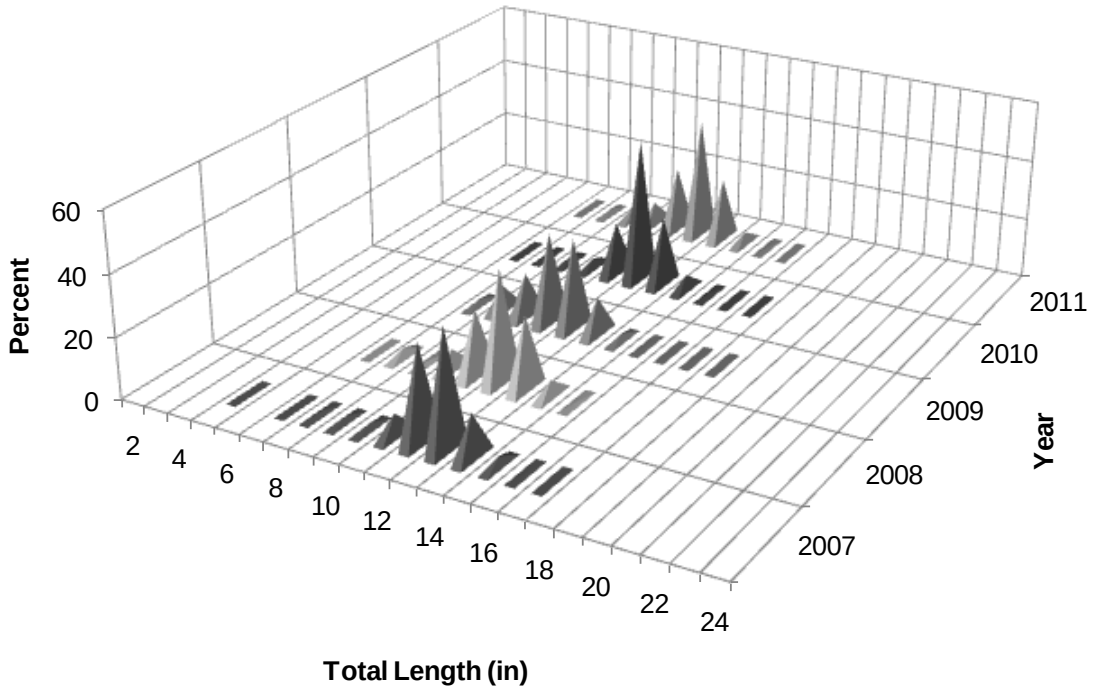
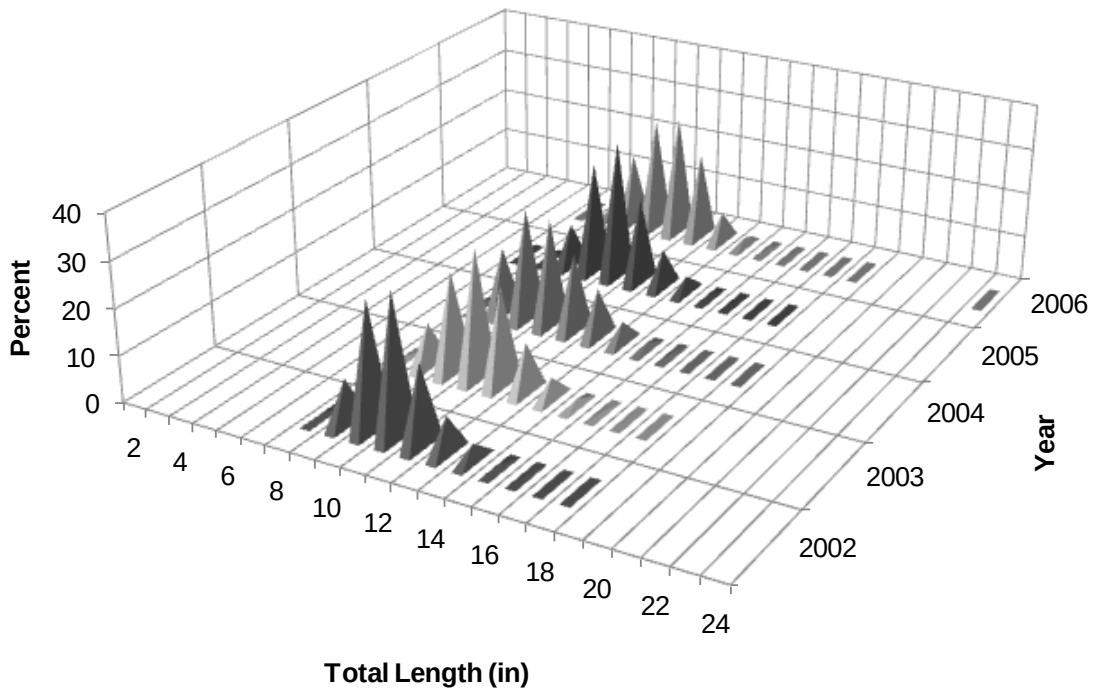


Figure 6.10. North Carolina ocean gill net fishery weighted length frequency distributions for marketable Atlantic croaker (*Micropogonias undulatus*), 2002 – 2011.



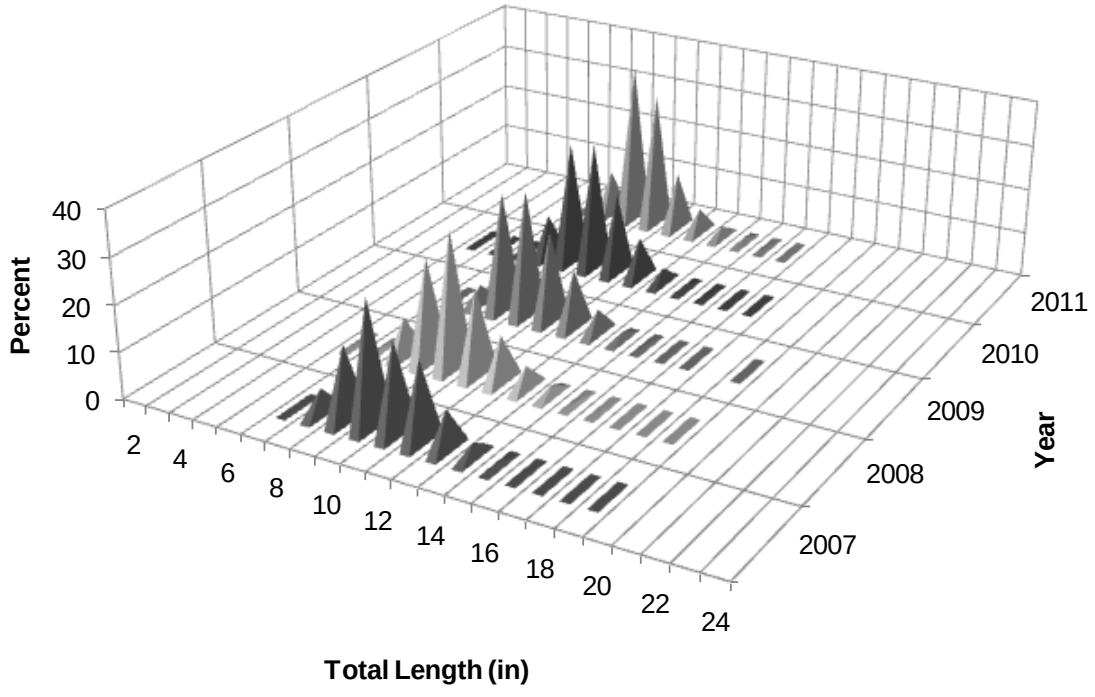


Figure 6.11. North Carolina ocean trawl fishery weighted length frequency distributions for marketable Atlantic croaker (*Micropogonias undulatus*), 2002 – 2011.

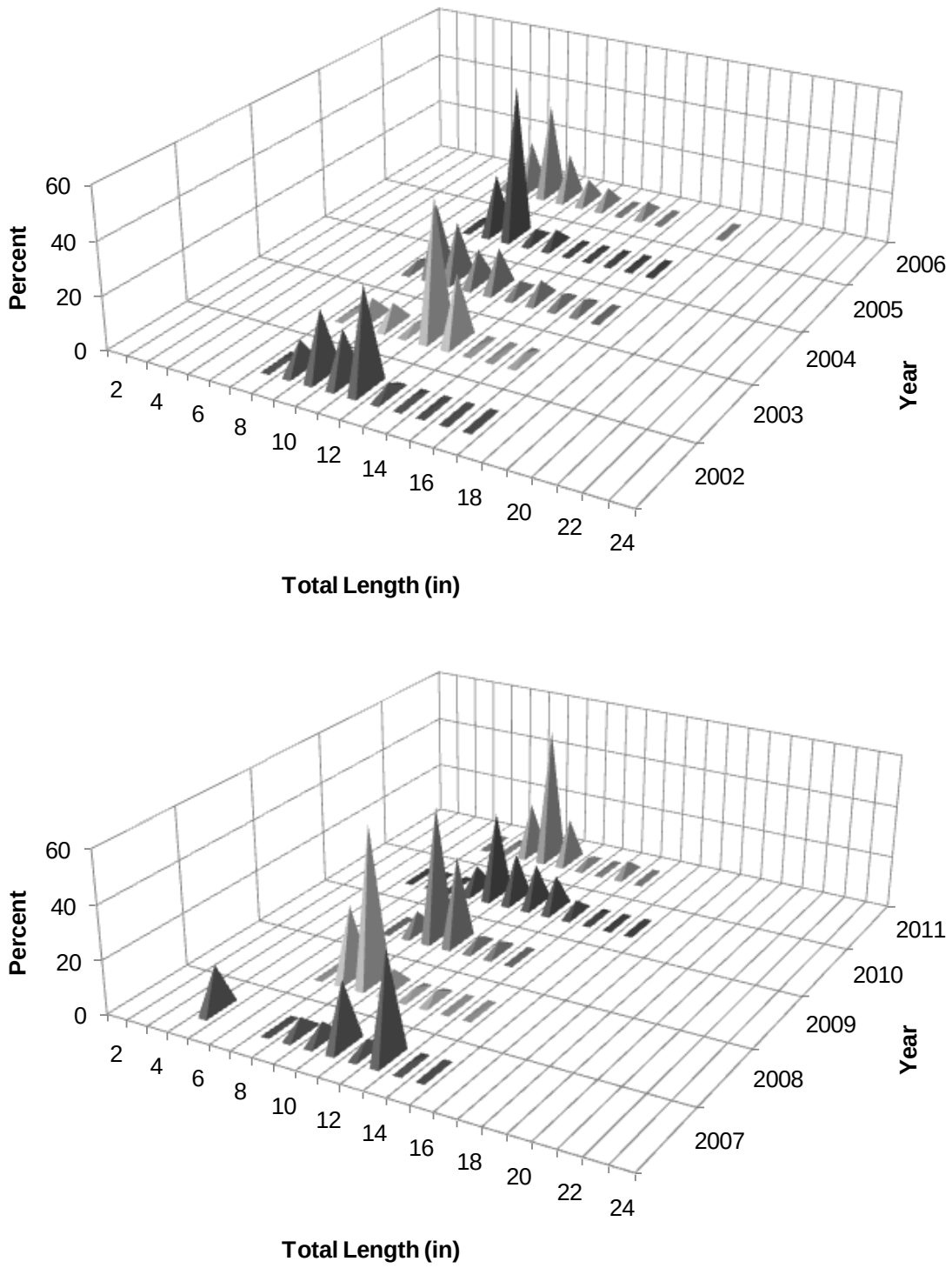


Figure 6.12. North Carolina pound net fishery weighted length frequency distributions for marketable Atlantic croaker (*Micropogonias undulatus*), 2002 – 2011.

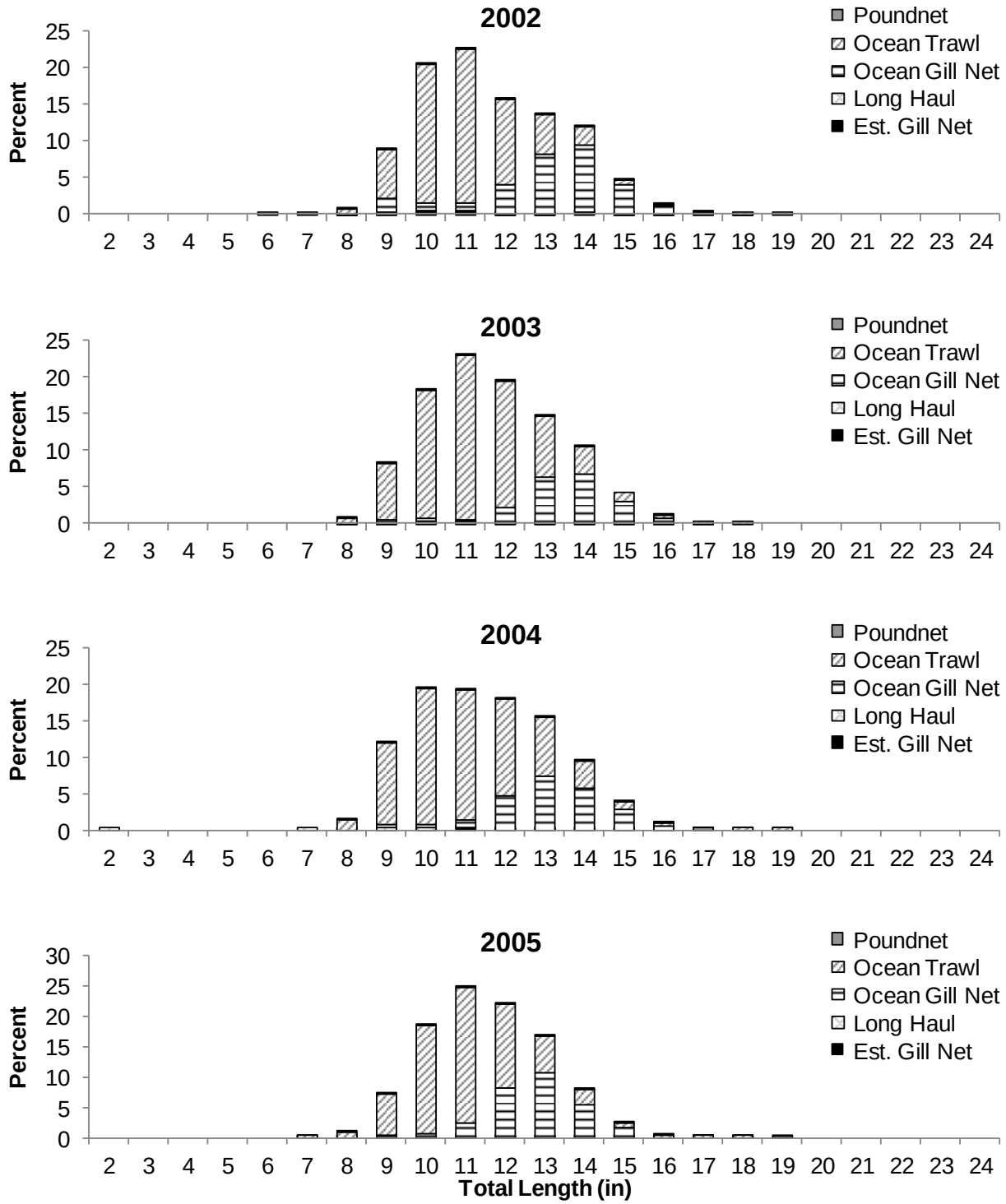


Figure 6.13. North Carolina commercial fishery weighted length frequency distributions for marketable Atlantic croaker (*Micropogonias undulatus*), 2002 – 2011.

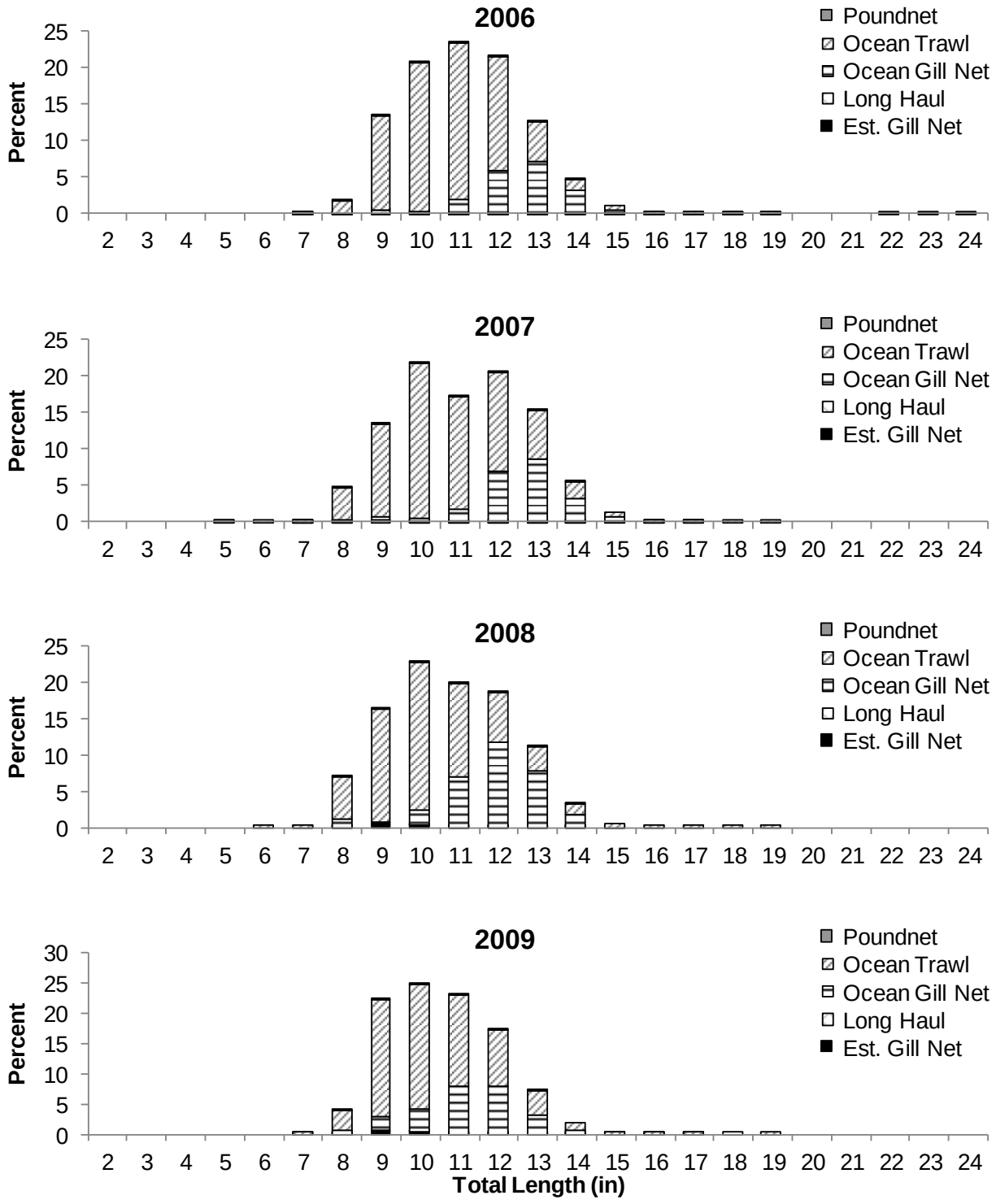


Figure 6.13. (Continued)

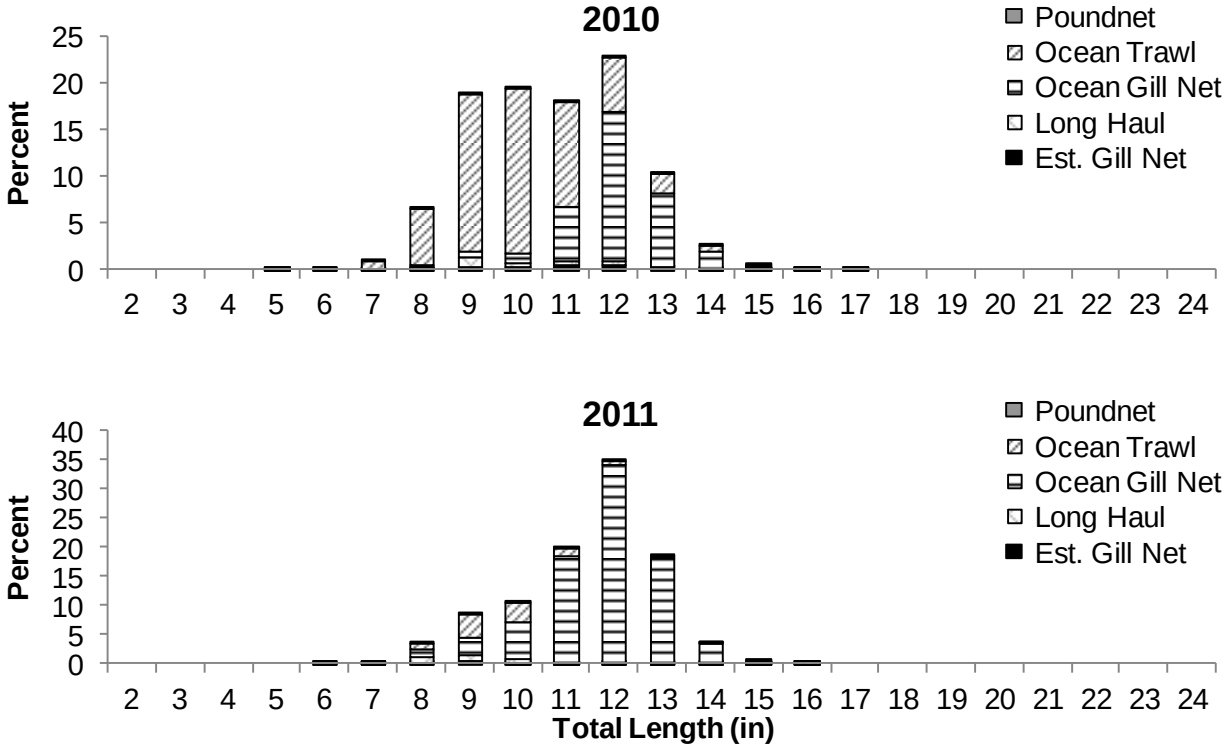


Figure 6.13. (Continued)

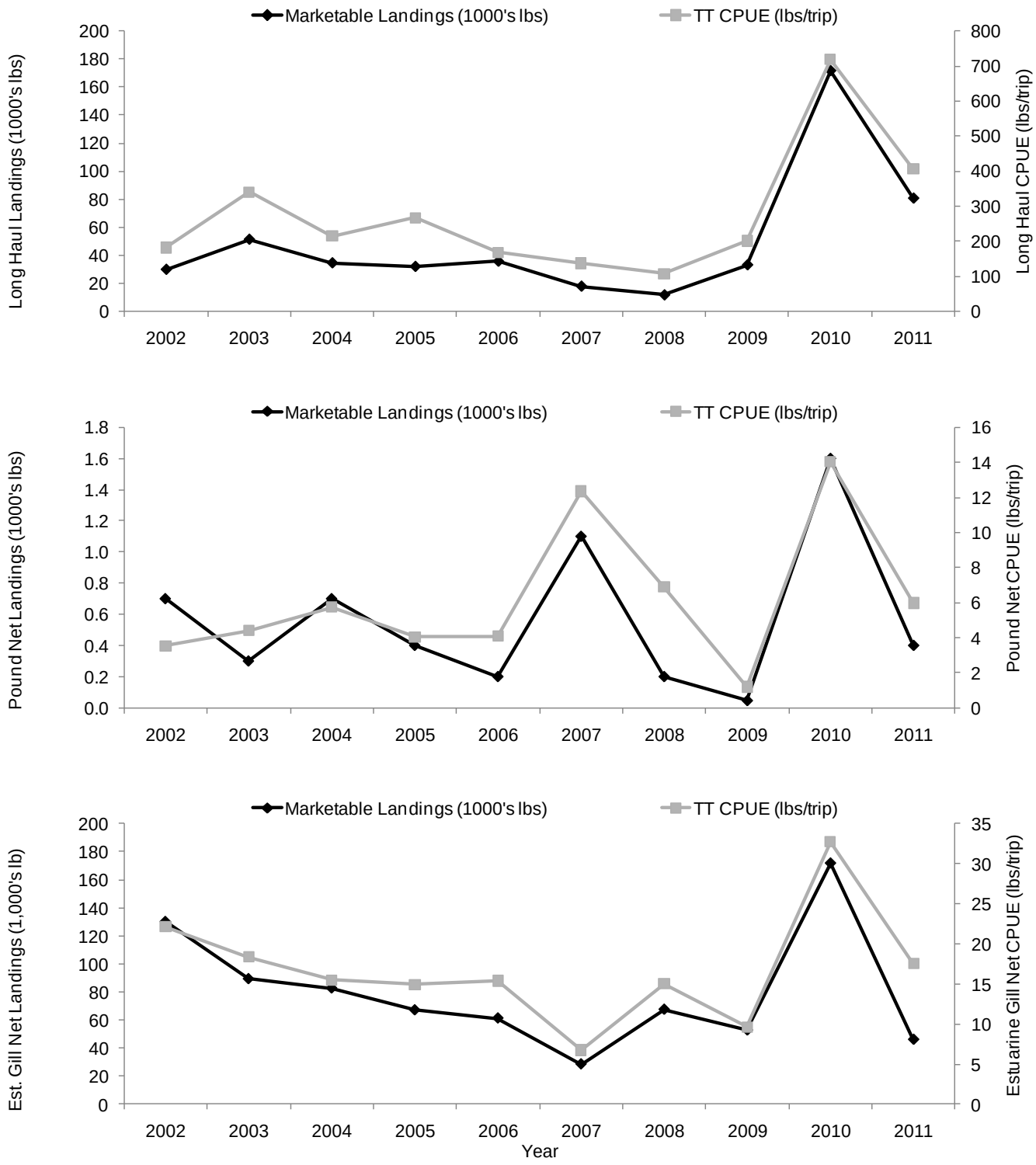


Figure 6.14. North Carolina Atlantic croaker (*Micropogonias undulatus*) annual marketable commercial landings (1000's lb) and CPUE (lb/trip) for selected fisheries and overall, 2002 – 2011.

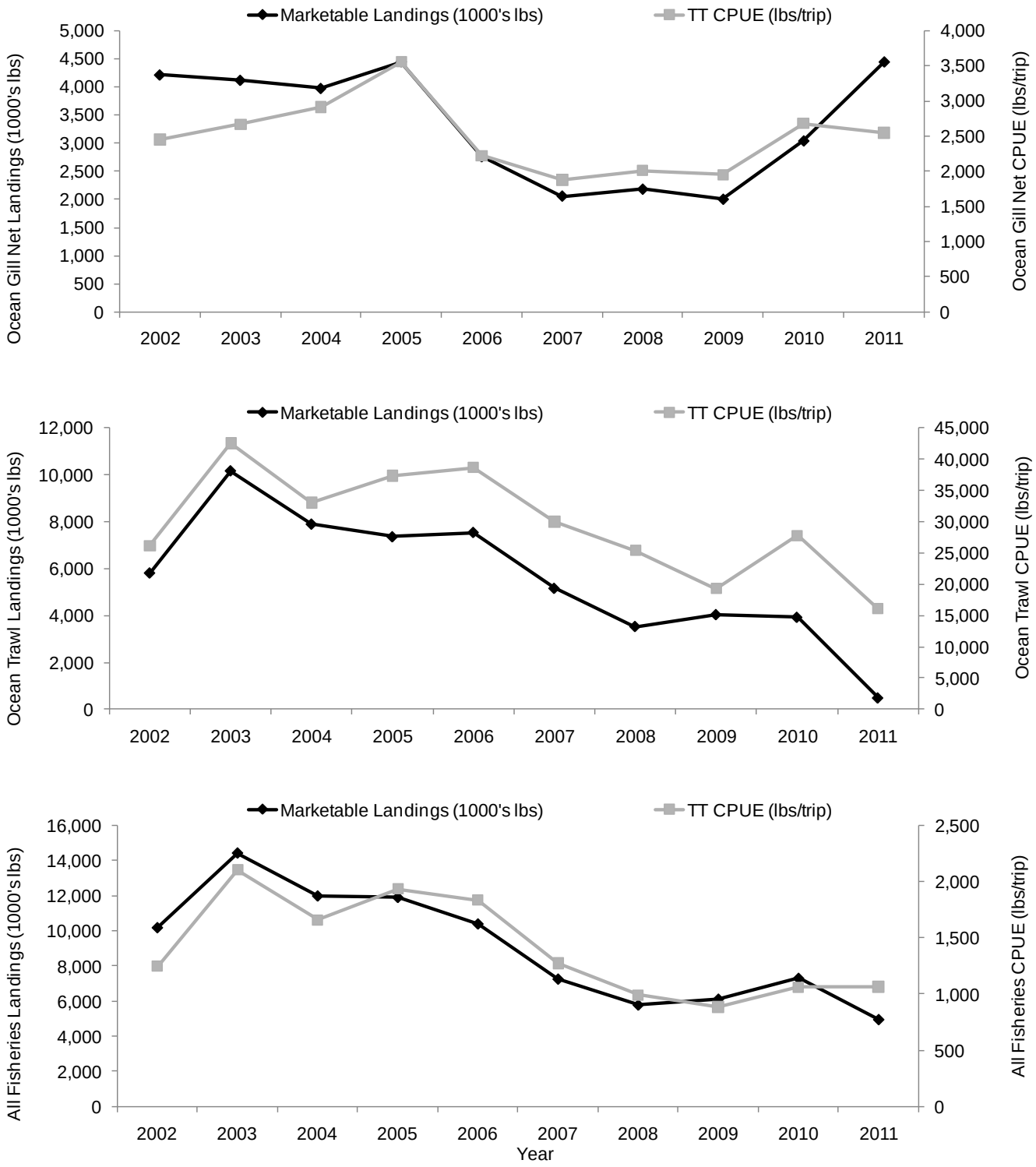


Figure 6.14. (Continued)

SPOT

Background

Spot (*Leiostomus xanthurus*) range from the Gulf of Maine to the Bay of Campeche, Mexico in estuarine and coastal waters to depths of at least 205 m (Smith and Goffin 1973; Bigelow and Schroeder 1953; Dawson 1958; Springer and Bullis 1956). The highest abundance occurs from Chesapeake Bay to South Carolina (Mercer 1987). Spot form huge aggregations during seasonal spawning offshore-inshore migrations, increasing vulnerability to commercial and recreational fishing pressure. Spot mature between their second and third year of life, at a size of 7.3-8.5 inches.

Spot are short-lived sciaenids and year-to-year fluctuations in catch are not surprising since the catch in most years consists largely of one or two year classes (Mercer 1987). This age structure is typical of species with short life spans (NCDMF 1992). The strength of a particular year class is recruitment driven and largely dependent on environmental conditions that prevail on spawning grounds and in nursery areas (Joseph 1972).

Spot is one of eight members of the family Sciaenidae that support important commercial fisheries along the North Carolina coast. Commercial gears used to harvest spot include long haul seines, estuarine gill nets, near-shore ocean gill nets and to a lesser extent trawls and pound nets. This report will address these gears and their effects on the spot harvest during the 10-year period from 2001-2011 with specific comments on 2007-2011.

Length Distribution

Fishery dependent sampling for lengths was conducted in the long haul seine fishery, sciaenid pound net fishery, ocean sink net fishery, ocean winter trawl fishery, and the estuarine gill net fishery. For each North Carolina fishery, annual length distributions (all lengths reported in fork length (in)) weighted by commercial landings (lb) are presented for spot.

Weighted fork length (FL) frequency distributions for spot landed in the long haul seine fishery during 2002-2011 ranged from 4-12.5 inches with the modal peaks fluctuating between 7 and 9.5 inches (Figure 6.15).

Weighted length frequency distributions for spot landed in the sciaenid pound net fishery during the same period ranged from 5-13 inches with the vast majority of landings ranging from 7 to 9.5 inches (Figure 6.16).

Weighted length frequency distributions for spot landed in the ocean gill net fishery during 2002-2011 are depicted in Figure 6.17. Spot landed in this fishery during 2002-2011 ranged from 4-12.5 inches. In contrast to the long haul and sciaenid pound net gears, distinct modal peaks are evident between 7 and 9.5 inches indicating the size selectivity of these gill nets.

Weighted length frequency distributions for spot landed in the ocean trawl fishery during the study period 2002-2011 ranged from 5-13 inches (Figure 6.18). Modal peaks were variable during the ten-year period 2002-2011, fluctuating between 7.5 and 11.5 inches. Size classes landed in this fishery are variable due to small sample sizes in most years. There were no length frequencies taken for marketable spot in this fishery in 2011.

Weighted length frequencies of spot landed in the estuarine gill net fishery during the study period 2002-2011 are presented in Figure 6.19. Spot landed in this fishery during 2002-2011 ranged from 4.5-13 inches. Estuarine gill net fishers utilize similar gill net mesh sizes as those targeting spot in the ocean. Consequently, the length frequencies for both fisheries are similar with modal peaks ranging from 7.5 to 9 inches due to the selectivity of the gear (Figures 7.17 and 7.19).

Combined length frequencies for the major spot fisheries were charted (Figure 6.20) for the period 2002-2011. The dominant gears during 2002-2011 were the long haul seine along with estuarine and ocean gill nets. Length frequencies indicate that the long haul and the ocean trawl fisheries land smaller fish than the gill net fisheries.

Length frequencies of spot sampled in the sold bait samples are presented in Table 6.7 for the major fisheries during 2002-2011. The majority of the bait in the long haul fishery consists of young immature spot (less than 7.5 inches). The estimated number of bait spot landed and sold in each of the fisheries is presented in Table 6.7. During 2002-2011, the long haul fishery averaged about 1.1 million bait spot sold. The majority of the bait in the ocean trawl fishery consists of immature spot (less than 7.5 inches). During 2002-2011, the ocean trawl fishery averaged 0.8 million bait spot sold, ranging from 37,030 in 2010 to 3,146,386 in 2009. Other spot fisheries did not land significant numbers of bait spot.

Landings, Trips, and CPUEs

Total landings by all gears for spot fluctuated from 2002-2011 with general decreasing trend. Landings in 2010 reached a historic low and rebounded by 61% in 2011 (Table 6.8). Although fluctuations are expected for such a short-lived species, the recent declines are concerning to fishery managers. Landings averaged approximately 1,191,610 lb between 2002-2011 ranging from a high of 2,317,169 lb in 2004 to a historical low of 572,315 lb in 2010. As the supply of spot has seemingly contracted, the price has increased significantly. The value of the fish has increased from $0.43/lb in 2002 to $0.77 in 2011. Total dockside values ranged from $0.38 million in 2010 to $1.07 million in 2004.

Long haul's contribution to the total spot landings ranged from a high of 48 % in 2010 to a low of 22.2 % in 2011. Long haul landings averaged 36% of the total spot landings during the study period 2002-2011.

The long haul fishery lands a significant amount of spot that can only be marketed as scrap fish or bait (Table 6.9). Spot less than 7.6 inches are unmarketable (NCDMF 1992a). Between

2002 and 2011, 74% of the spot landed by weight were marketable as food fish and 26% were sold as bait.

In terms of numbers of spot landed in the long haul fishery, 46% of the total number of spot landed over the ten-year period fell into the bait category. This represents an increase from 33% during the previous study period and despite DMF's culling panel regulation this indicates there is still a significant catch of small immature fish in the long haul fishery.

The sciaenid pound net fishery during 2002-2011 never accounted for more than 4,000 lb or 0.2% of total spot landings (Table 6.8). Most of the spot landed in the sciaenid pound net fishery are not marketable except as bait but the decrease in effort over the last decade has mitigated growth overfishing concerns that existed prior to the mid 1990s.

Sciaenid pound net fishery landings were separated into market and bait grade categories, and are listed in Table 6.9. Between 2002 and 2011, there was a consistent excess of bait spot landed in relation to market grade fish. On average, by weight, the portion of the catch classified as bait was 83%.

The ocean trawl fishery for spot consists of the flynet fishery, the flounder trawl fishery and to a lesser extent the shrimp trawl fishery. Landings from these fisheries were slight, ranging from a peak of 3.4% of the total commercial spot catch in 2002, to a low of 0.0% in 2011. As indicated in Table 6.9, most of the spot landed in the ocean trawl fishery were too small to sell as food fish. Between 2002 and 2011, on average, 63% of the spot were classified bait. However, six of the nine years with landings, bait represented over 90%.

The percentage of spot landed in the estuarine gill net fishery ranged from 21.7% in 2007 to 45.6 in 2011 during the study period (2002-2011) (Table 6.8). The estuarine gill net fishery landed the highest percentage of spot five out of the ten years.

Landings in the ocean gill net fishery have trended down during the study period (Table 6.8). During 2002-2011, ocean gill netting ranged 13.3% (2010) to 26.6% (2009) of the total spot landings. As depicted in Figure 6.17 and Table 6.9, the ocean and estuarine gill net fisheries landed spot that were almost 100% marketable. Growth overfishing is not a problem with these gears.

CPUEs of spot landed and sold from the major fisheries were calculated from NCDMF's trip ticket program and are presented in Table 6.9 and Figure 6.21. CPUEs in the long haul fishery ranged from a high of 402 lbs/trip in 2006 to a low of 307 lbs/trip in 2005. The average during 2003-2006 was 345 lbs/trip. The average number of trips for the 10-year period 2002-2011 was 1,372 trips. The number of trips ranged from a high of 2,098 trips in 2002 to a low of 653 trips in 2011 (Table 6.9, Figure 6.21).

Spot CPUEs in the sciaenid pound net fishery ranged from a low of 16 lb/trip in 2009 to 88 lbs/trip in 2002. The number of trips ranged from a high of 87 trips in 2004 to a low of 4 in 2009 (Table 6.9, Figure 6.21).

CPUEs in the spot ocean trawl fishery ranged from 2 lb/trip in 2010 to 34 lb/trip in 2002. There were no reported trips or landings of spot in this fishery in 2011. The number of ocean trawl trips landing spot ranged from a high of 2,174 trips in 2002 to zero trips in 2011 with an average of 414 trips during the study period (Table 6.9, Figure 6.21).

CPUEs in the estuarine gill net fishery ranged from a high of 107 lb/trip in 2004 and 2011 to a low of 39 lb/trip in 2007. The 10-year average CPUE for trips landing spot during 2002-2011 was 77 lb/trip. The number of trips ranged from 3,297 in 2010 to 8,848 in 2002. The average number of trips in this fishery for the 10-year period was 6,079 (Table 6.9, Figure 6.21).

CPUEs in the ocean gill net fishery ranged from 594 lbs/trip kg in 2010 to 1,692 lb/trip in 2003 and averaged 1,176 lb/trip. The number of trips ranged from 128 in 2010 to 396 in 2002. The average number of trips in this fishery for the 10-year period was 252 (Table 6.9, Figure 6.21).

CPUEs were examined for all major fisheries combined and those data are presented in Table 6.9 and Figure 6.21. CPUEs ranged from a high of 219 lb/trip in 2004 to a low of 114 lb/trip in 2008 with a 10-year average of 154 lbs/trip. The number of trips showed a decreasing trend during 2002-2011. The number of trips landing spot for all fisheries combined ranged from 4,231 trips in 2010 to 13,533 trips in 2002 with a 10-year average of 8,141 trips.

Management Issues

Currently, the NCDMF does not have any regulations directed at the commercial or recreational spot fisheries. However, there are several regulations dealing with fishing gears and areas that affect the capturing efficiency of spot. Regulation 15A NCAC 3M.0162 limits the scrap fish catch to 5,000 pounds per vessel, and indirectly affects spot since they comprise a large percentage by weight of the scrap fish landed by North Carolina fishers. A regulation enacted in 1991 (15A NCAC 3J .0104(a)) includes area restrictions and incidental finfish limits on fish captured by shrimp and crab trawls in inside waters. Trips by these gears are limited to 500 lb of finfish from December 1 through February 28 and 1,000 lb of finfish from March 1 to November 30.

A rule (15A NCAC 3J 0202 (4) made permanent in 1996 restricts ocean trawls (flynets) from Cape Hatteras to the North Carolina/ South Carolina boundary. This rule was followed in 1998 by the “50-50” rule (15A NCAC 3J 0202 5 (a,b) which requires that the weight of finfish caught in shrimp and crab trawl operations from November 30 to March 1 be equal to or less than the shrimp or crab catch weight except that an additional 300 lb of kingfish are allowed south of Bogue Inlet. In addition, a rule directed at the flynet fishery limits mesh sizes to 4 inches in the main body, 3 inches in the extension, and 1 ¾ inches in the tailbag. Finfish reduction devices have been required in all shrimp trawls since the fall of 1992 (15A NCAC 3J.0104) and escape

panels have been required (since April 1999) in the bunt nets of long haul seines in an area south and west of Bluff Shoals in the Pamlico Sound (15A NCAC 03J.0109). This rule was modified by the NCMFC in August 2003 to include more specific wording on installation and placement of the culling panels. This rule resulted from a NCDMF study on the use of culling panels in long haul and swipe nets (Gearhart 2000).

Bycatch Reduction Devices (BRDs) were required in all shrimp trawls in the fall of 1992 by proclamation (and by the consent of the NCMFC (15A NCAC 3J .0104). Since 1991, area restrictions and incidental finfish limits taken by shrimp and crab trawls in inside waters limit these gears from having no more than 500 lb of finfish from December 1 through February 28 and 1,000 pounds of finfish from March 1 to November 30 (15A NCAC 3J .0104(a)). Minimum mesh size restrictions in shrimp trawls (1 ½" tailbag) have been in effect since 1991 as well as for fly nets (4" main body, 3" extension, and 1 3/4" tail bag) since 1997 (Proclamation FF-26-92), and the closure of ocean waters south of Cape Hatteras to the South Carolina state line for fly nets in 1994 (Proclamation FF-18-94), all of which may indirectly affect the fishing impact on Atlantic croaker and change the size and age distributions of the harvest.

The NCDMF in 2006 has classified the stock status of spot as concerned in North Carolina (NCDMF 2006a). Managers are concerned over the recent declines in the abundance of spot. Reasons for these declines are being investigated but may include growth overfishing in the long haul fishery and to a much lesser extent in the winter trawl and flounder pound net fisheries. The culling panels required in long haul seines since April 1999 have reduced the harvest of bait fish. However, since excessive fishing mortality on small spots still occurs, there is a need to increase the size of fish harvested and reduce the amount of bait fish landed. This would alleviate the growth overfishing and possibly result in a larger spawning stock biomass. However, incorporating this strategy is difficult since spot isn't a targeted species but is harvested by mixed species gears (Mercer 1987).

An ASMFC FMP was initially approved in 1987, prior to passage of the Atlantic Coastal Fisheries Cooperative Management Act (1993) and the ASMFC Interstate Fishery Management Program Charter (1995). After the passage of the Act, the Commission adopted the Charter in order to establish standards and procedures for the preparation and adoption of the FMPs. Once an FMP is amended to incorporate the standards and procedures in the ISFMP Charter, the Commission can also adopt management requirements that can be enforced through the Act. The Spot FMP had not been amended to reflect the content of these two documents, and is thus inconsistent with Commission policies. State compliance with any management measures in the plan cannot be enforced through the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA) until the plan is modified to incorporate the standards and procedures described in the ISFMP Charter. In October 2008, the South Atlantic State/Federal Fisheries Management Board initiated the development of an amendment to the Spanish Mackerel Fishery Management Plan. In August 2009, the Management Board decided to expand the amendment into an Omnibus Amendment to also revise the fishery management plans for spot and spotted seatrout. The primary goal of the Omnibus Amendment was to bring the FMPs for Spanish mackerel, spot, and spotted seatrout under the authority of the Act,

providing for more efficient and effective management and changes to management for the future. Currently, the Spot Plan Review Team does not recommend a coastwide stock assessment, due to the lack of needed bycatch data. Collection of this needed data is included as recommendation for future research. In addition, until such a stock assessment can occur, the Spot Plan Review Team will conduct an annual monitoring analysis and report on the results of the management trigger to the Board. The Board will be prompted to consider management action when the terminal values in two of the relative abundance indices, at least one of which must be a fishery-independent index, are equal to or below their respective data set's 10th percentile. The indices include:

- Coastwide recreational landings (numbers), 1981 – present
- Coastwide commercial landings (pounds), 1950 – present
- SEAMAP-South Atlantic Trawl Survey CPUE (NC – FL), 1989 – present
- NMFS Bottom Trawl Survey CPUE (NY – NC), 1972 – present
- Maryland DNR Chesapeake Bay Seine Survey CPUE, 1967 – present.

The ASMFC fishery management plan written for spot in 1987 (Mercer 1987) outlined specific management objectives that might perpetuate the spot resource. Although several objectives have been met, data in other areas are still lacking and need to be collected. Data on reproduction, migration patterns, and stock structure are still incomplete. The effect of spawning stock size on recruitment is still unknown. It is known that spot are a short-lived species and that landings in most years consist largely of a single year class (Mercer 1987); the strength of that year class is most likely dependent on recruitment, which is based on natural environmental factors. However, manmade environmental factors may also be a factor in the recent decline in abundance. Spot are estuarine dependent sciaenids that depend on nursery areas for their growth and development. Coastwide development has placed many anthropogenic perturbations on their nursery areas including water quality stresses from both pollutants and freshwater runoff. The effect of these stresses on the nursery areas needs to be analyzed relative to their habitat to determine possible impacts on the spot stocks. Protection of nursery areas and high standards of water quality must be maintained to ensure optimum recruitment.

Table 6.7 North Carolina spot (*Leiostomus xanthurus*) expanded length frequency of bait samples for selected fisheries, 2002-2011; n=number of fish measured, en=expanded number of individuals in catches sampled.

Fishery/Year	n	en	number	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5
Long Haul																							
2002	1,524	148,296	656,429	0.2	-	-	0.9	3.7	12.4	9.5	8.0	9.5	13.3	21.1	13.2	6.3	1.6	0.2	0.1	-	-	-	-
2003	1,323	219,528	1,706,034	0.0	-	0.1	1.2	8.7	8.3	6.5	10.4	14.4	14.5	24.1	9.8	1.7	0.3	-	-	-	-	-	-
2004	957	234,829	1,676,677	-	-	0.1	2.4	12.8	9.9	8.7	9.5	33.6	8.5	6.6	3.9	3.3	0.8	-	-	-	-	-	-
2005	1,272	87,887	579,855	-	-	0.0	0.1	4.5	5.9	7.1	14.5	23.8	24.1	14.3	5.0	0.6	0.0	0.0	-	-	-	-	-
2006	1,134	124,627	738,838	-	-	-	-	5.4	7.6	13.5	11.9	19.1	18.5	16.6	6.1	1.1	0.0	0.1	-	-	-	-	-
2007	1,277	349,127	2,288,229	-	-	-	0.1	10.4	30.1	15.7	10.9	13.3	7.9	6.1	4.0	1.4	-	0.0	-	-	-	-	0.0
2008	896	443,736	2,363,455	-	-	0.0	4.9	14.4	8.6	15.5	11.9	10.4	10.8	17.1	4.5	1.0	0.6	0.1	-	-	-	0.2	-
2009	260	39,193	466,808	-	-	-	0.9	8.9	10.0	5.4	3.7	15.1	23.1	29.6	3.3	0.1	-	-	-	-	-	-	-
2010	393	63,806	402,068	-	-	-	5.9	21.7	13.1	9.1	10.0	9.4	14.7	8.9	5.6	0.2	1.5	-	-	-	-	-	-
2011	298	65,483	1,032,543	-	-	-	-	4.1	8.3	15.7	12.2	20.5	21.2	15.5	2.6	-	-	-	-	-	-	-	-
Ocean Gill Net																							
2002	0	0	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	0	0	988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	13	121	5,112	-	-	-	-	-	-	-	-	-	15.7	15.7	47.9	20.7	-	-	-	-	-	-	-
2005	0	0	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2006	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	0	0	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2008	1	4	39	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-
2009	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2010	0	0	108	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2011	17	177	10,844	-	-	-	-	-	-	17.5	1.7	1.1	8.5	39.5	16.4	15.3	-	-	-	-	-	-	-
Ocean Trawl																							
2002	107	4,248	434,563	-	-	-	-	-	-	-	-	3.6	30.1	34.0	18.4	7.3	0.5	1.5	2.7	0.2	0.4	0.6	0.6
2003	156	9,548	141,445	-	-	-	-	-	-	-	-	12.5	28.7	41.7	16.7	0.4	-	-	-	-	-	-	-
2004	29	1,984	222,038	-	-	-	-	-	-	-	-	35.2	22.4	5.6	-	7.4	3.3	14.2	11.9	-	-	-	-
2005	123	12,579	164,929	-	-	-	-	-	-	7.1	11.0	34.5	27.7	11.7	4.2	0.8	0.9	0.3	0.5	0.1	0.2	-	1.0
2006	178	19,824	841,008	-	-	-	-	-	0.2	1.1	10.6	26.6	35.9	23.2	1.3	0.5	0.4	0.4	-	-	-	-	-
2007	78	9,890	1,859,764	-	-	-	-	-	-	6.9	9.5	23.5	28.1	26.8	5.2	-	-	-	-	-	-	-	-
2008	321	37,699	1,316,563	-	-	-	-	-	-	0.2	4.5	26.2	37.4	25.9	5.7	-	0.1	-	-	-	-	-	-
2009	261	63,343	3,146,386	-	-	-	-	-	2.9	3.7	12.7	28.1	24.3	22.1	5.5	-	0.5	-	-	-	-	-	-
2010	28	18,775	37,030	-	-	-	-	4.1	6.5	20.5	14.3	9.9	0.6	28.9	7.0	5.8	1.2	-	-	-	1.2	-	-
2011	45	15,149	615,861	-	-	-	-	-	6.3	36.2	32.6	20.8	4.1	-	-	-	-	-	-	-	-	-	-

Table 6.7 (Continued)

Fishery/Year	n	en	number	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5
Estuarine Gill Net																							
2002	0	0	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2003	0	0	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2004	0	0	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2005	2	14	1,238	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0	50.0	-	-	-	-	-
2006	1	1	100	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2007	0	0	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2008	0	0	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2009	0	0	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2010	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2011	0	0	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pound Net																							
2002	11	304	56,598	-	-	-	-	-	11.5	9.2	12.5	18.4	30.9	11.5	5.9	-	-	-	-	-	-	-	-
2003	12	430	49,125	-	-	-	-	-	30.7	-	-	8.6	30.7	27.9	-	-	2.1	-	-	-	-	-	-
2004	49	766	3,885	-	-	-	-	-	10.2	6.1	16.3	51.0	10.2	6.1	-	-	-	-	-	-	-	-	-
2005	245	17,215	8,349	-	-	-	-	1.5	3.9	1.6	25.7	48.4	14.7	3.7	0.5	-	-	-	-	-	-	-	-
2006	314	11,450	11,623	-	-	-	-	-	8.4	14.8	31.6	33.5	6.9	4.8	-	-	-	-	-	-	-	-	-
2007	48	2,459	130,434	-	-	-	-	-	-	4.8	26.0	44.8	14.6	5.9	0.8	3.0	-	-	-	-	-	-	-
2008	138	5,153	6,772	-	-	-	-	-	1.0	3.0	14.5	38.2	15.1	16.9	3.4	7.0	1.0	-	-	-	-	-	-
2009	11	277	11,344	-	-	-	-	-	-	18.4	38.3	36.1	7.2	-	-	-	-	-	-	-	-	-	-
2010	8	111	2,038	-	-	-	22.5	-	-	-	44.1	5.4	17.1	-	5.4	-	5.4	-	-	-	-	-	-
2011	41	1,156	77,249	-	-	-	-	3.9	10.7	25.7	30.8	22.0	2.6	3.0	1.3	-	-	-	-	-	-	-	-

Table 6.8 North Carolina commercial landings of marketable spot by fishery,2002-2011, includes landings (pounds), value (dollars) and contribution of fishery to NC spot landings.

Fishery	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Estuarine gill net										
Pounds	721,619.3	691,036.2	765,341.3	753,048.0	369,324.5	190,409.6	278,348.7	349,410.5	158,981.9	427,137.6
Value ($)	307,767.0	306,983.7	352,950.0	396,428.4	272,152.6	132,798.9	171,179.6	209,194.5	106,995.7	332,683.9
Percent total	33.0	33.8	33.0	43.9	27.1	21.7	37.8	34.7	27.8	45.6
Flounder pound net										
Pounds	1,245.0	321.0	2,402.0	1,530.0	244.0	2,123.0	164.0	1,469.0	755.0	12,663.0
Value ($)	531.5	140.8	1,165.6	806.1	178.4	1,485.4	101.5	881.6	509.4	8,998.1
Percent total	0.1	<0.1	0.1	0.1	<0.1	0.2	<0.1	0.1	0.1	1.4
Long Haul										
Pounds	654,709.5	709,718.0	738,725.0	520,167.0	604,538.0	396,109.0	311,765.0	317,899.0	274,747.0	207,675.0
Value ($)	279,170.2	317,610.6	341,911.6	273,137.3	438,498.3	276,681.9	192,863.2	190,164.2	185,237.8	161,931.1
Percent total	30.0	34.7	31.9	30.3	44.3	45.1	42.3	31.6	48.0	22.2
Ocean Gill Net										
Pounds	550,328.3	480,065.1	581,062.3	229,098.8	214,610.0	221,036.7	107,802.9	267,435.6	76,027.7	235,533.3
Value ($)	234,813.1	214,655.3	266,594.3	120,564.6	156,134.9	153,280.7	66,516.5	160,393.0	50,867.2	182,925.8
Percent total	25.2	23.5	25.1	13.4	15.7	25.1	14.6	26.6	13.3	25.1
Ocean trawl										
Pounds	73,925.0	37,478.0	2,449.0	849.0	117.0	103.0	412.0	2,551.0	7.0	0.0
Value ($)	31,523.6	16,797.5	1,141.5	525.6	85.5	58.4	254.6	971.5	4.7	0.0
Percent total	3.4	1.8	0.1	<0.1	<0.1	<0.1	0.1	0.3	<0.1	0.0
Other fisheries										
Pounds	180,714.4	123,995.4	223,451.4	209,668.6	175,713.5	68,007.3	37,086.2	67,666.9	60,888.5	53,201.7
Value ($)	77,086.5	53,809.8	102,544.5	113,486.6	130,854.1	47,482.1	22,639.1	40,198.3	40,174.4	41,349.6
Percent total	8.3	6.1	9.6	12.2	12.9	7.7	5.0	6.7	10.6	5.7
Sciaenid pound net										
Pounds	1,491.0	773.0	3,738.0	123.0	196.0	1,293.0	905.0	68.0	908.0	755.0
Value ($)	635.8	303.0	1,723.2	64.6	143.3	885.7	560.1	40.8	597.2	583.4
Percent total	0.1	<0.1	0.2	<0.1	<0.1	0.1	0.1	<0.1	0.2	0.1
All										
Total pounds	2,184,032.5	2,043,386.7	2,317,169.1	1,714,484.5	1,364,743.1	879,081.6	736,483.8	1,006,500.0	572,315.1	936,965.6
Total Value ($)	931,527.7	910,300.7	1,068,030.9	905,013.1	998,047.2	612,673.1	454,114.6	601,843.9	384,386.5	728,471.8

Source: North Carolina Division of Marine Fisheries commercial landings database. Long Haul includes: gear code 030 or 025 and non-ocean waters. Flounder Pound Net includes: gear code 275, months October, November, December for Counties Beaufort, Carteret, Dare, Hyde, Tyrrell, and month September for Counties Beaufort, Carteret, Hyde and Tyrrell. Sciaenid Pound Net includes: gear code 275, months May through August for Counties Dare and Hyde, and month September for Dare. Estuarine Gill Net includes: gear code 425, 426, 427, 470, 475, 480 and all non-ocean waters. Ocean Gill Net includes: gear code 425, 426, 427, 470, 475, 480 and Atlantic Ocean. Ocean Trawl includes: gear codes 210 and 230, Atlantic Ocean, and months January through May and September through December.

Table 6.9 North Carolina spot *(Leiostomus xanthurus*) landings (weight - lb, number – 1000's individuals), marketable landings per trip (CPUE weight - lb), and total number of trips, by type for selected commercial fisheries, 2002-2011.

		Landings									
		Weight					Number				# Trips
		Total	Market		Bait	% Bait	Total	Market	Bait	% Bait	
Fishery	Year	Landed (1000's lbs)	Landed (1000's lbs)	CPUE	Landed (1000's lbs)		Landed (1000's)	Landed (1000's)	Landed (1000's)		
Estuarine Gill Net	2002	722	722	82	<1	<1	1,407	1,407	<1	<1	8,848
	2003	691	691	89	<1	<1	1,247	1,247	<1	<1	7,729
	2004	765	765	107	<1	<1	1,461	1,461	<1	<1	7,134
	2005	754	753	101	1	<1	1,427	1,425	1	<1	7,492
	2006	369	369	60	<1	<1	790	790	<1	<1	6,150
	2007	190	190	39	<1	<1	472	472	<1	<1	4,914
	2008	278	278	56	<1	<1	680	680	<1	<1	4,956
	2009	349	349	56	<1	<1	884	884	<1	<1	6,289
	2010	159	159	48	0	0	386	386	0	0	3,297
	2011	427	427	107	<1	<1	1,042	1,042	<1	<1	3,979
Ocean Gill Net	2002	550	550	1,391	<1	<1	1,114	1,114	<1	<1	396
	2003	480	480	1,692	<1	<1	1,033	1,032	1	<1	284
	2004	583	581	1,542	1	<1	1,276	1,271	5	<1	377
	2005	229	229	950	<1	<1	521	521	<1	<1	241
	2006	215	215	1,038	0	0	536	536	0	0	207
	2007	221	221	1,204	<1	<1	589	589	<1	<1	184
	2008	108	108	801	<1	<1	274	274	<1	<1	135
	2009	267	267	990	0	0	723	723	0	0	270
	2010	76	76	594	<1	<1	204	204	<1	<1	128
	2011	237	236	786	2	1	600	589	11	2	300
Sciaenid Pound Net	2002	11	1	88	9	86	61	5	57	93	17
	2003	10	1	33	9	92	52	3	49	95	23
	2004	4	4	43	1	12	13	9	4	30	87
	2005	1	0	21	1	89	9	0	8	96	6
	2006	1	0	29	1	86	12	1	12	94	7
	2007	17	1	53	16	93	135	5	130	96	24
	2008	2	1	28	1	55	10	3	7	69	32
	2009	2	0	16	2	96	12	0	11	98	4
	2010	1	1	41	<1	17	5	3	2	39	22
	2011	10	1	39	9	92	80	3	77	96	19

Table 6.9 (Continued)

		Landings									
		Weight					Number				# Trips
		Total	Market		Bait	% Bait	Total	Market	Bait	% Bait	
Fishery	Year	Landed (1000's lbs)	Landed (1000's lbs)	CPUE	Landed (1000's lbs)		Landed (1000's)	Landed (1000's)	Landed (1000's)		
Ocean Trawl	2	138	74	34	64	46	342	92	250	73	2,174
	3	44	37	33	6	14	80	53	28	34	1,136
	4	15	2	19	12	84	42	4	38	90	129
	5	9	1	17	8	91	47	1	46	97	50
	6	2	0	5	2	95	9	0	9	99	23
	7	4	0	2	4	97	24	0	24	99	52
	8	15	0	7	14	97	87	1	86	99	59
	9	92	3	5	89	97	538	11	527	98	510
	10	0	0	2	0	97	1	0	1	99	4
	11	0	0	0	0	0	0	0	0	0	0
Long Haul	2002	771	655	312	117	15	2,408	1,751	656	27	2,098
	2003	997	710	360	287	29	3,678	1,972	1,706	46	1,971
	2004	963	739	382	225	23	3,599	1,922	1,677	47	1,934
	2005	611	520	307	91	15	1,960	1,380	580	30	1,694
	2006	716	605	402	111	15	2,508	1,769	739	29	1,504
	2007	662	396	333	265	40	3,652	1,364	2,288	63	1,190
	2008	617	312	319	306	49	3,335	971	2,363	71	977
	2009	383	318	345	65	17	1,549	1,082	467	30	921
	2010	323	275	352	48	15	1,305	903	402	31	781
	2011	400	208	318	193	48	1,731	698	1,033	60	653
Combined	2002	2,192	2,002	149	190	9	5,331	4,368	963	18	13,533
	2003	2,222	1,919	175	302	14	6,090	4,306	1,784	29	11,143
	2004	2,331	2,092	219	239	10	6,390	4,667	1,724	27	9,660
	2005	1,604	1,504	159	100	6	3,964	3,328	635	16	9,483
	2006	1,303	1,189	152	114	9	3,856	3,097	760	20	7,891
	2007	1,094	809	128	285	26	4,871	2,429	2,442	50	6,363
	2008	1,020	699	114	321	31	4,385	1,929	2,456	56	6,159
	2009	1,094	938	119	156	14	3,706	2,701	1,005	27	7,995
	2010	559	511	121	48	9	1,902	1,496	406	21	4,231
	2011	1,075	871	176	204	19	3,453	2,332	1,121	32	4,951

Source: NCDMF commercial landings database and NCDMF fishery biological database.
Bait quantity estimate obtained from ratio of market to bait in fish house samples.
Does not include discards at sea.

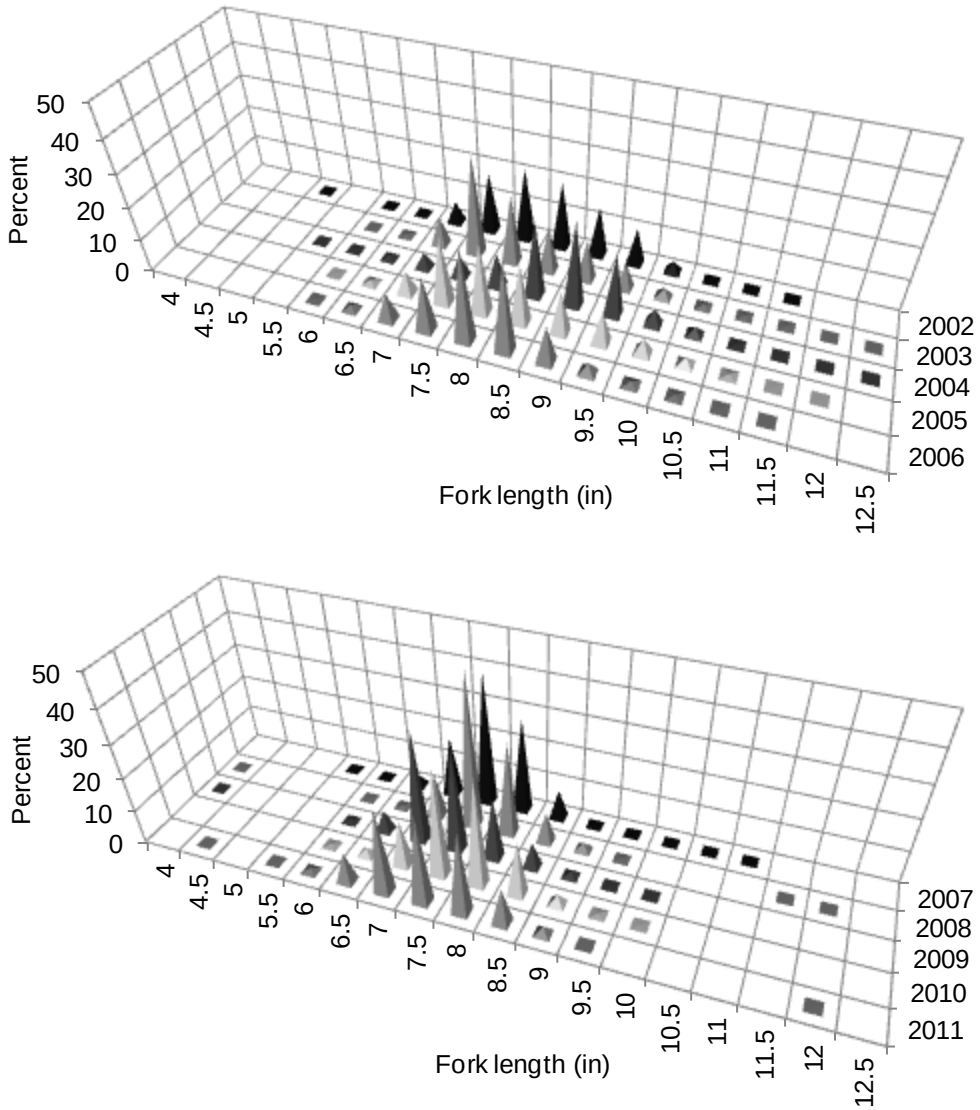


Figure 6.15 North Carolina long haul seine fishery weighted length frequency distributions for marketable spot (*Leiostomus xanthurus*) 2002-2011

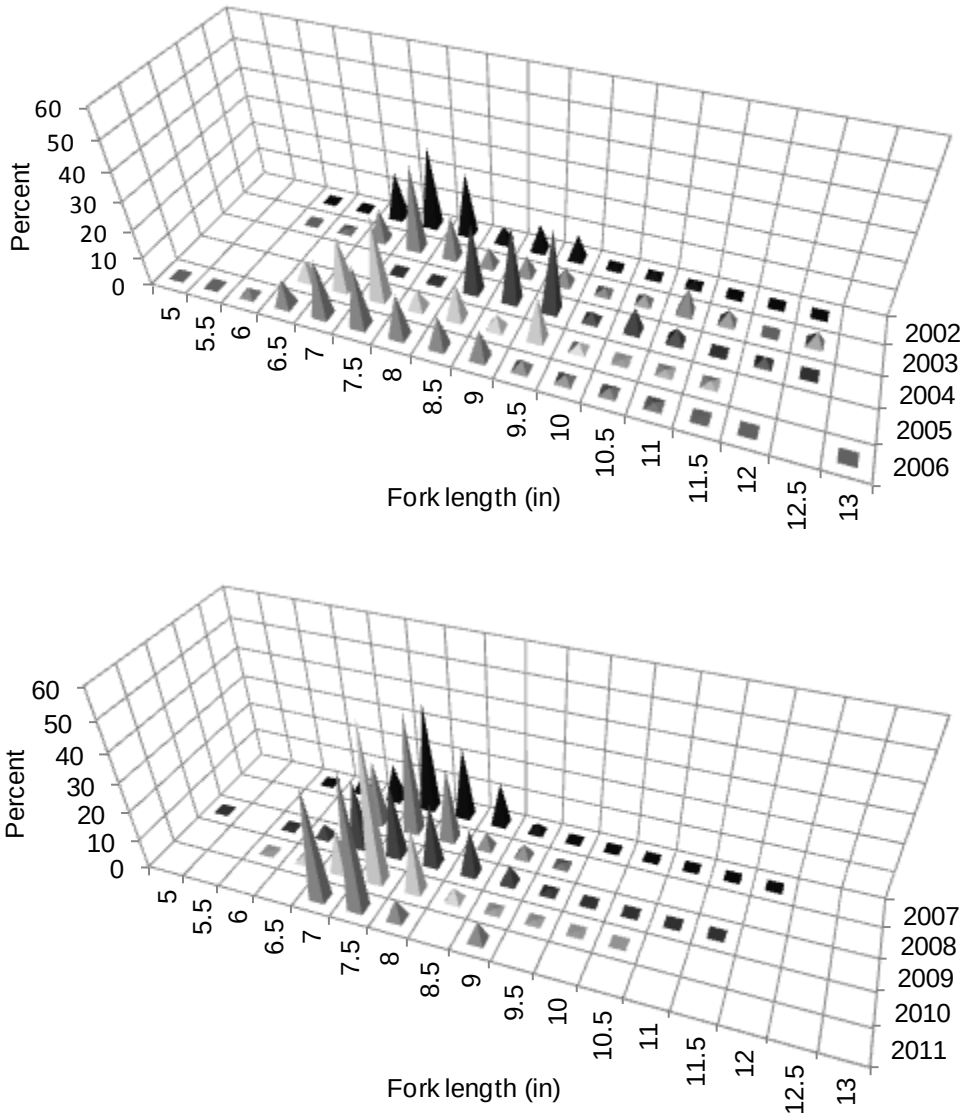


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Figure 6.16 North Carolina sciaenid pound net fishery weighted length frequency distributions for marketable spot (*Leiostomus xanthurus*), 2002-2011.

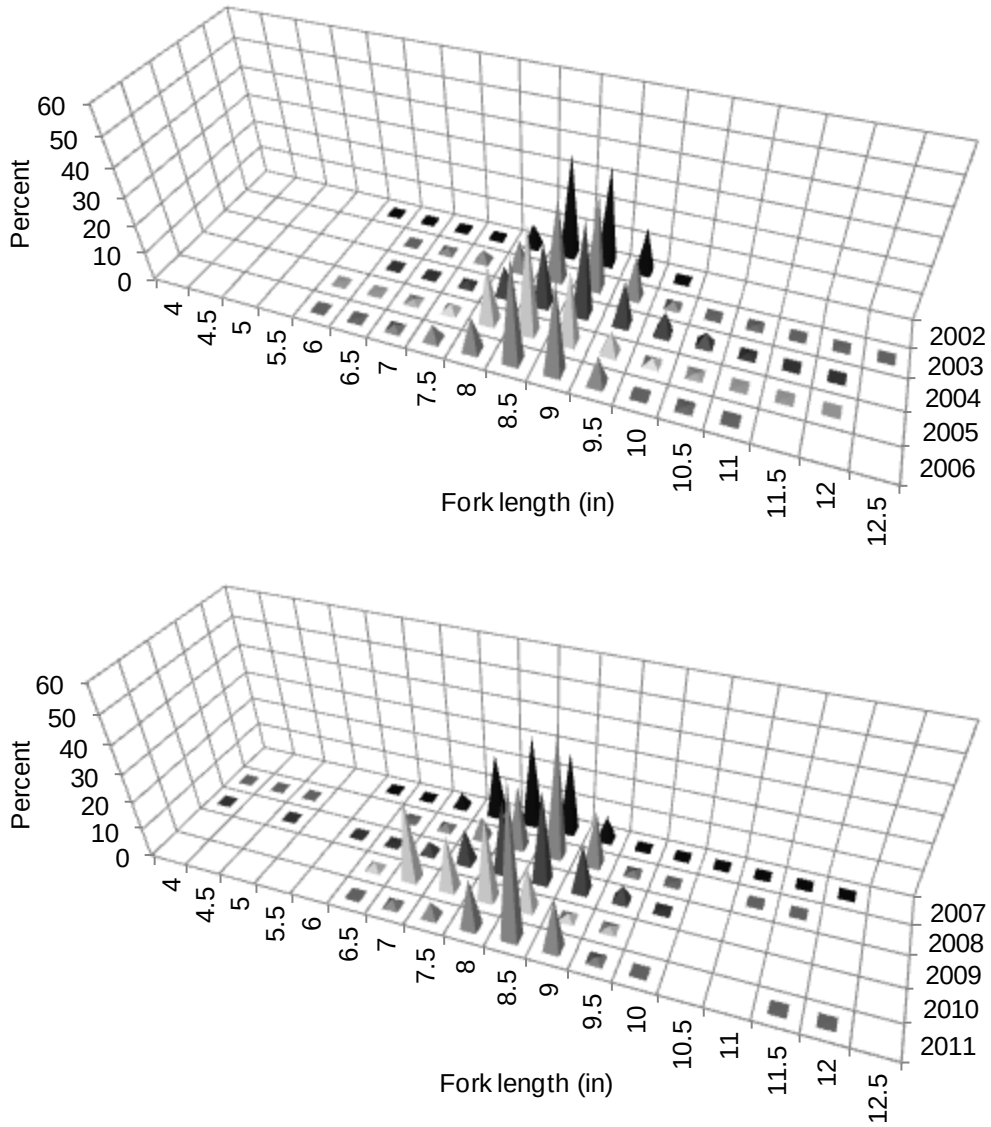


Figure 6.17 North Carolina ocean gill net fishery weighted length frequency distributions for marketable spot (*Leiostomus xanthurus*), 2002-2011.

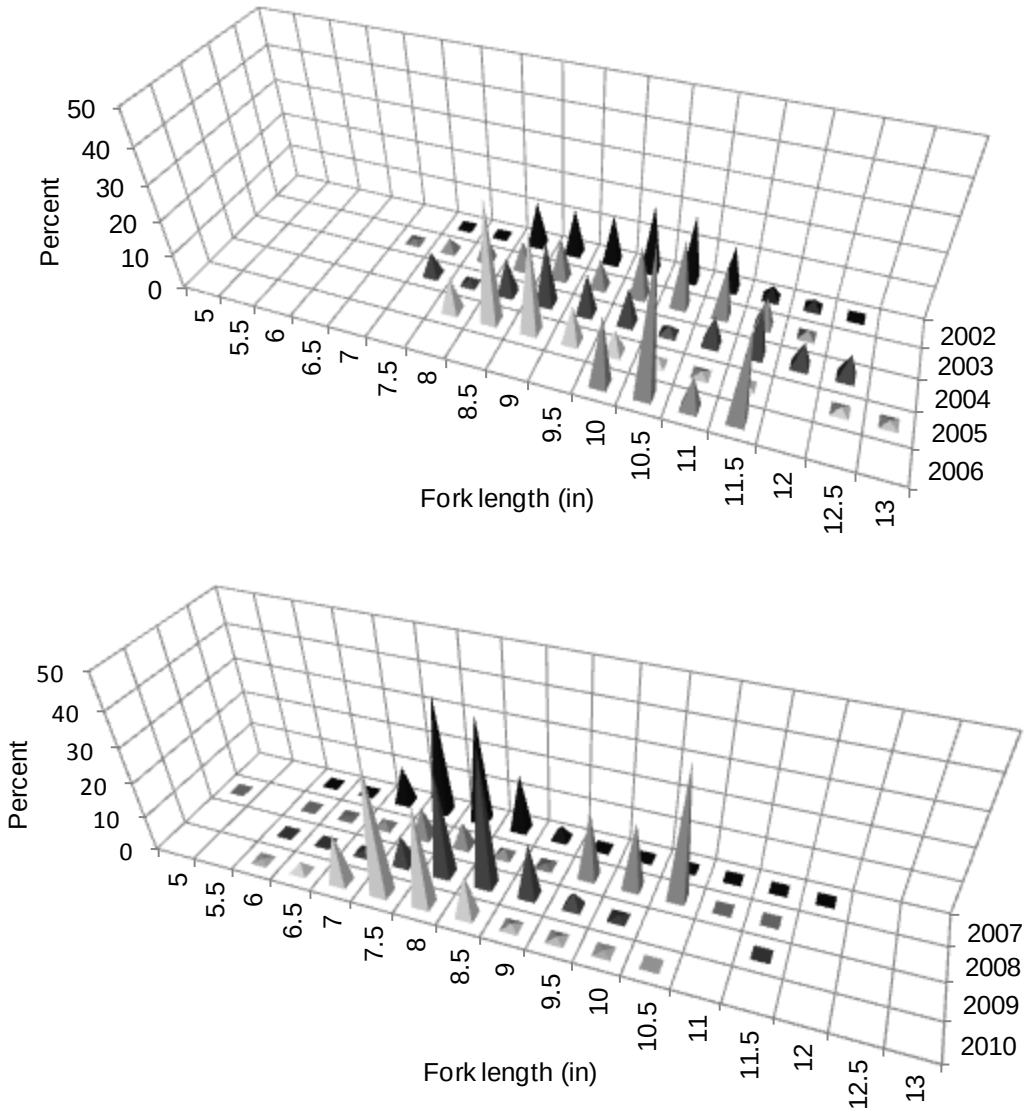


Figure 6.18 North Carolina ocean trawl fishery weighted length frequency distributions for marketable spot (*Leiostomus xanthurus*), 2002-2010. Note there were no length frequencies taken for marketable spot in 2011.

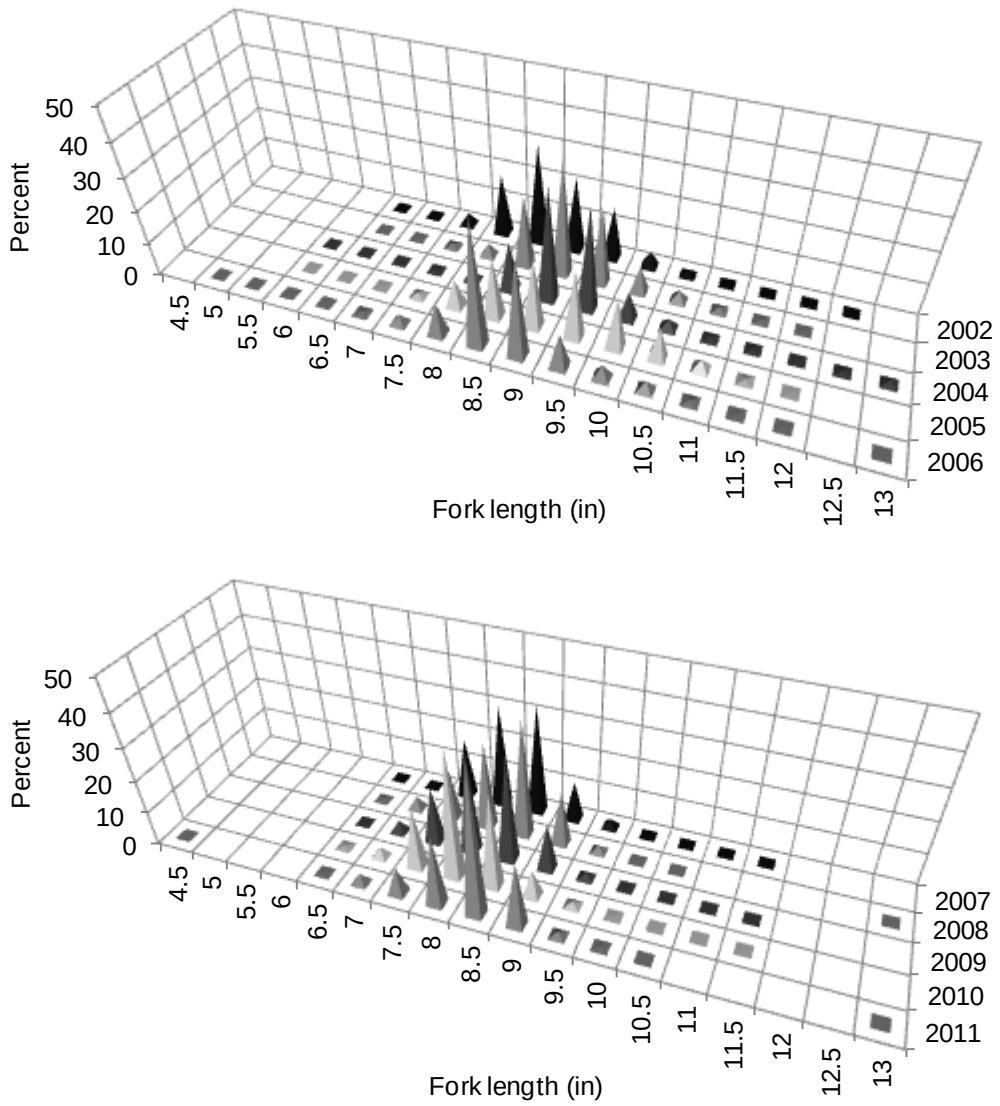


Figure 6.19 North Carolina estuarine gill net fishery weighted length frequency distributions for marketable spot (*Leiostomus xanthurus*), 2002-2011.

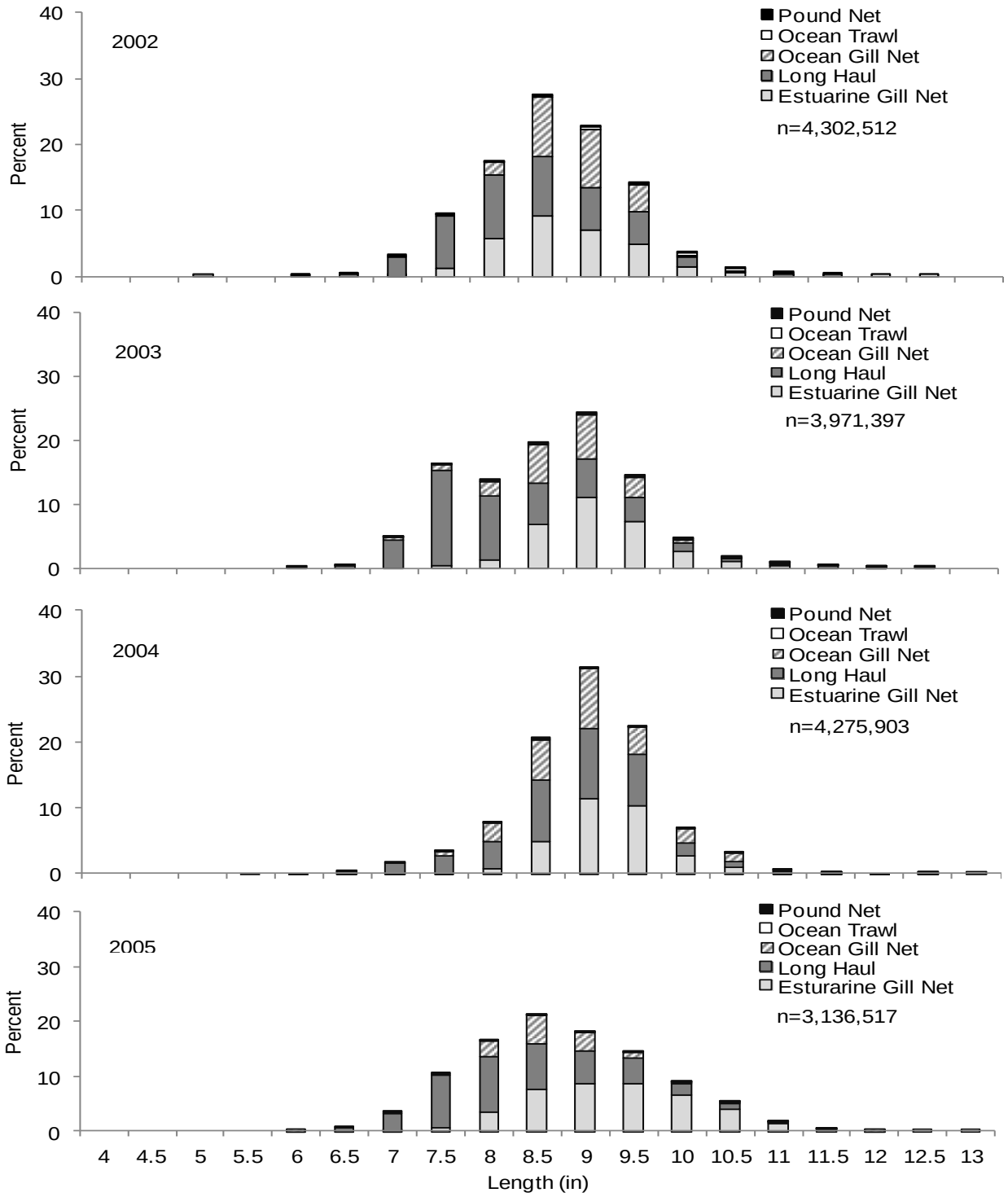


Figure 6.20 North Carolina commercial fishery weighted length frequency distributions for marketable spot (*Leiostomus xanthurus*), 2002-2011.

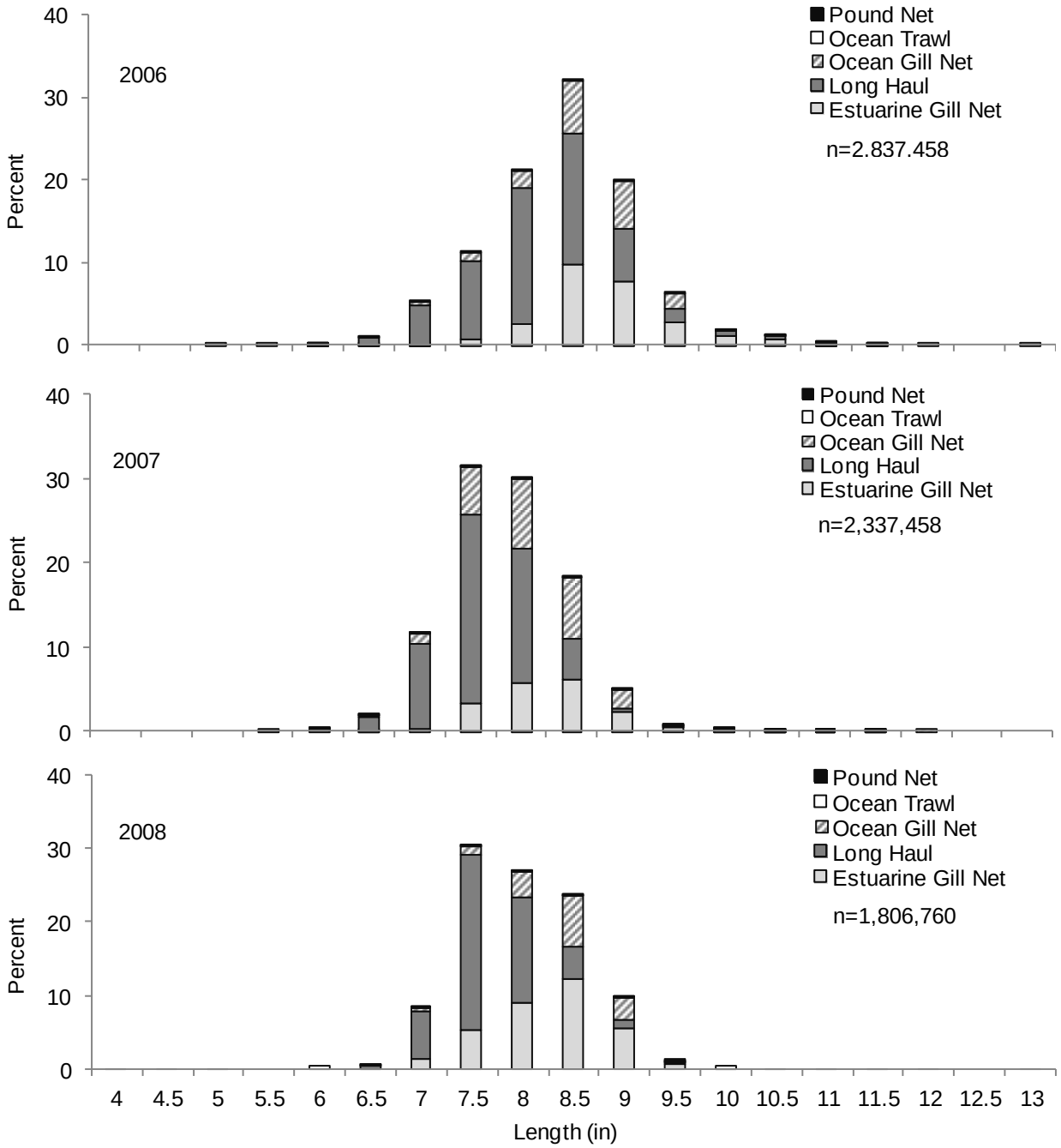


Figure 6.20 (Continued)

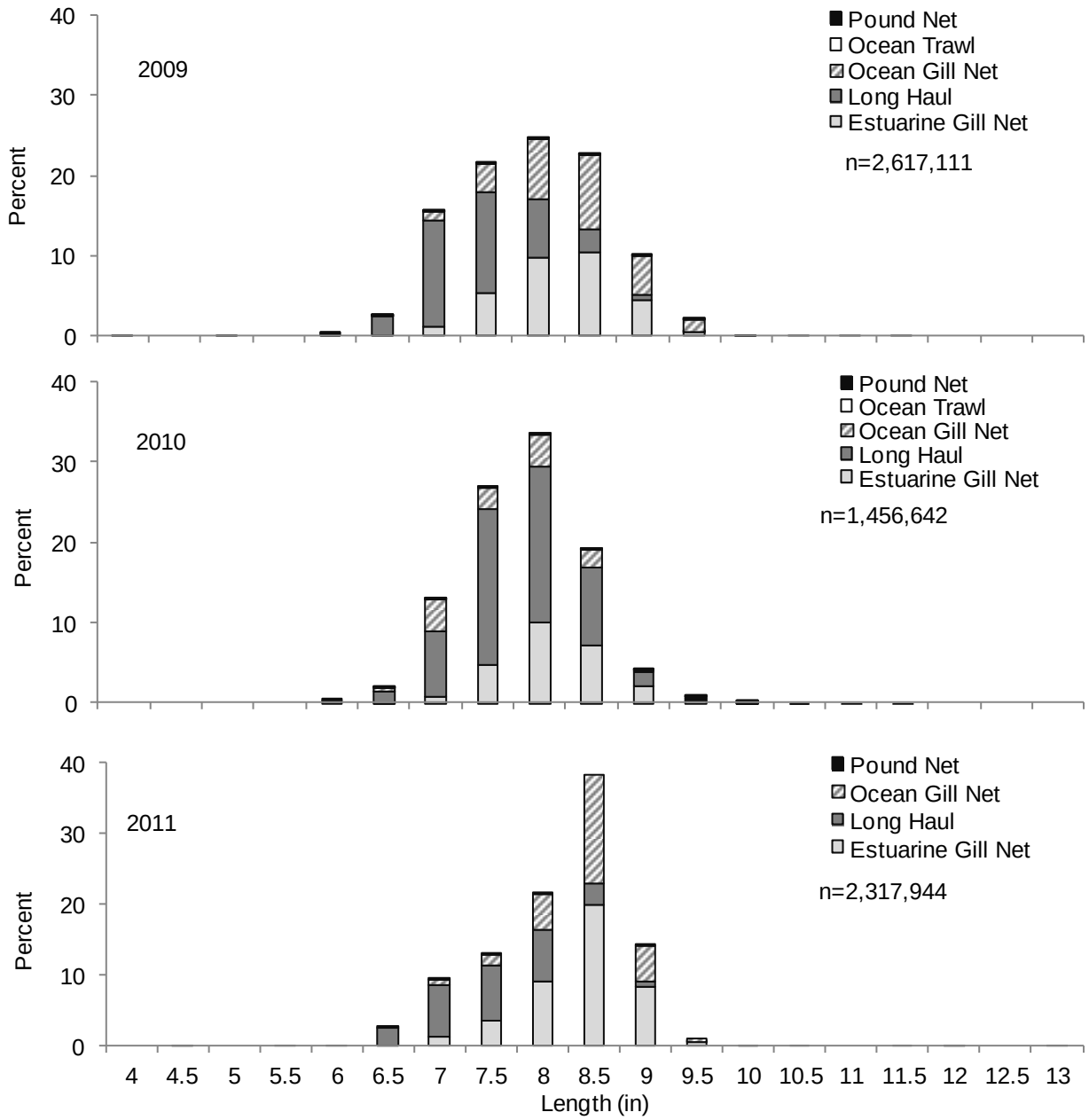


Figure 6.20 (Continued)

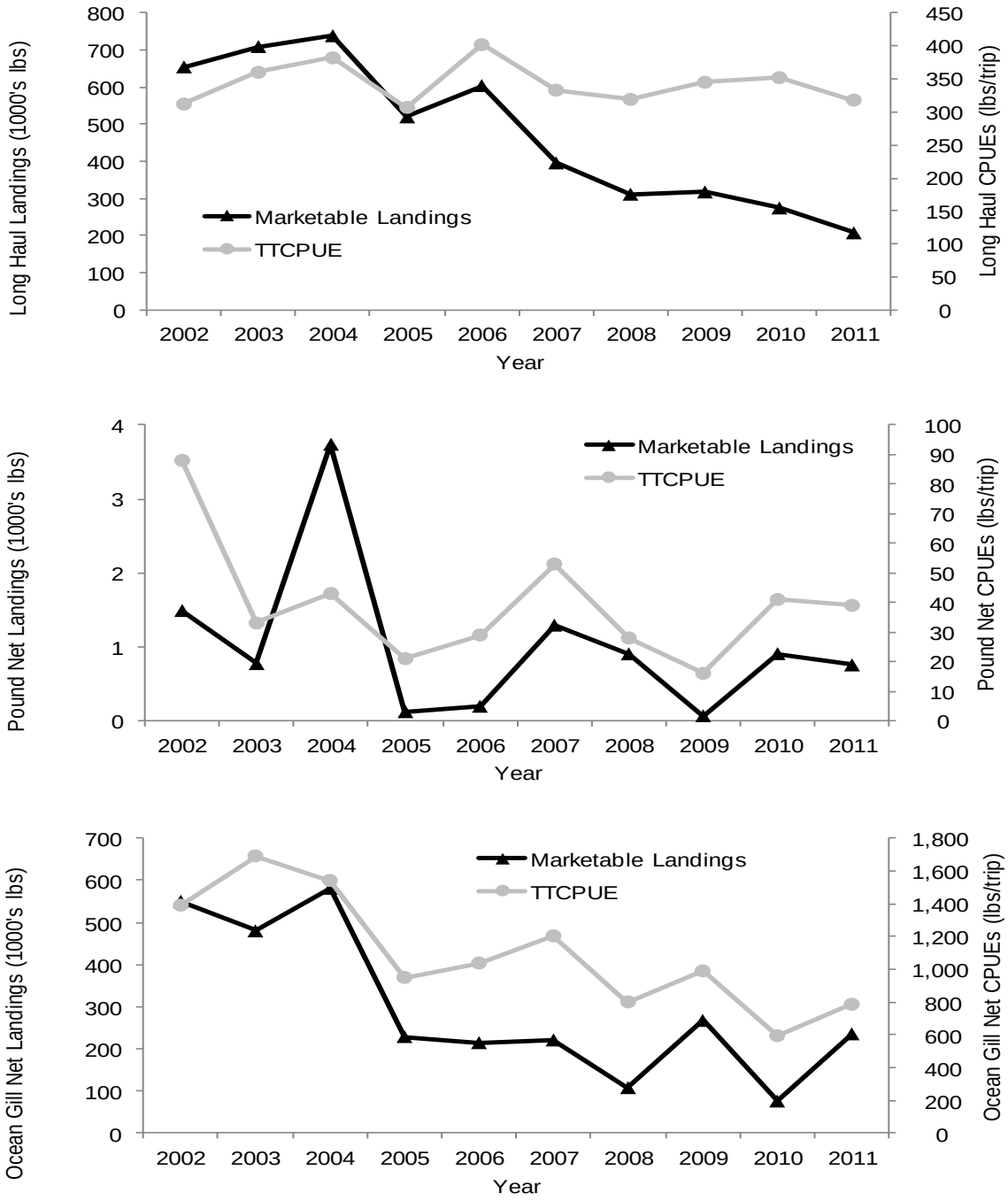
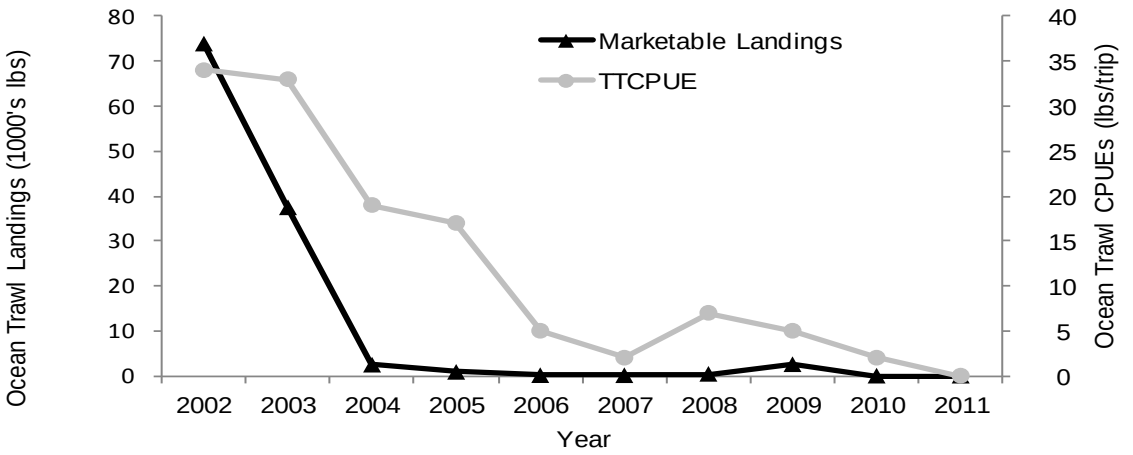
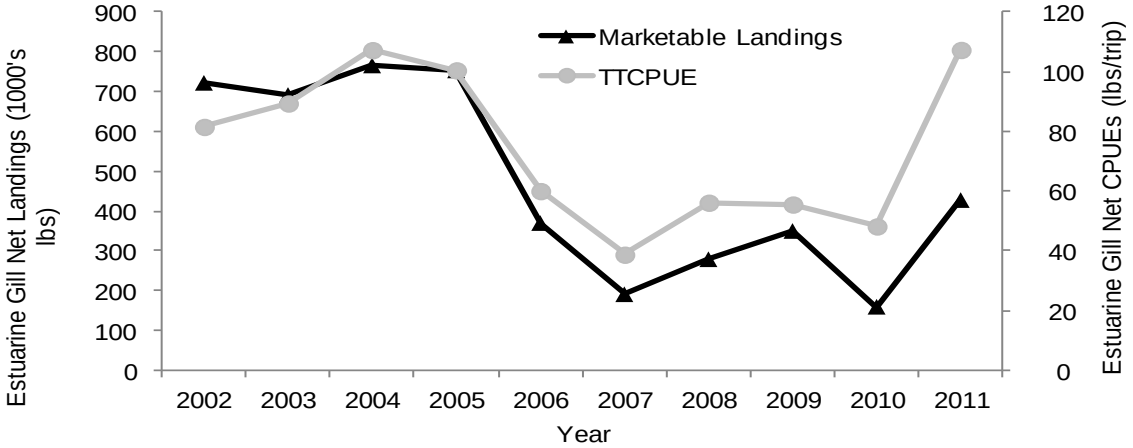


Figure 6.21 North Carolina spot (*Leiostomus xanthurus*) annual commercial landings (1000's lbs) and mean CPUE (landed catch per trip, lb) for selected fisheries and overall, 2002-2011.





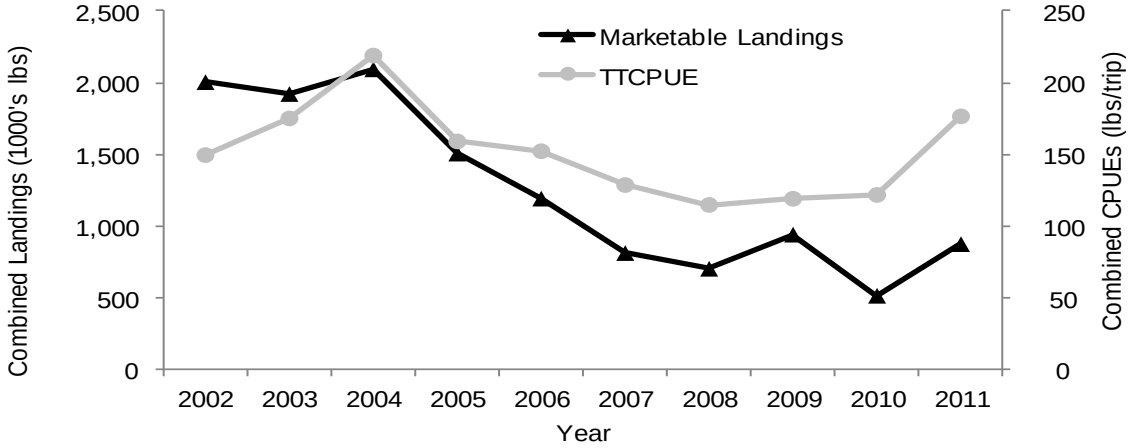


Figure 6.21 (Continued).

BLUEFISH

Background

Bluefish (*Pomatomus saltatrix*) is a pelagic migratory species inhabiting most temperate continental shelf-waters throughout the world, except the eastern Pacific. Along the Atlantic coast, they range from Nova Scotia to Florida and mix extensively during seasonal coastal migrations. Bluefish exhibit coastal migrations and generally travel in like-sized groups, moving northward in the spring and southward in the fall. During winter, large bluefish tend to remain in the Middle Atlantic Bight, with the waters off North Carolina serving as a critical wintering ground for large bluefish. Small fish move further south in winter with some fish wintering off the coast of Florida. As water temperatures increase, the spring migration north begins and spawning occurs in the South Atlantic Bight at this time. By summer, bluefish move into the Middle Atlantic Bight, although some medium size fish may remain off Florida (Shepherd et al. 2006). A second spawning occurs in the offshore waters of the Middle Atlantic Bight during summer. The result of these two spawning events is the appearance of two distinct size groups of juvenile bluefish during the fall (Able and Fahay 1998). Fish from the two spawning cohorts mix extensively during the year and constitute a single genetic stock (Graves et al. 1992). Bluefish may attain ages of 11-12 years and can exceed 3 ft in length (ASMFC 1989). The official rod and reel record is 31 lbs and a bluefish weighing 45 lbs was reportedly caught off the African coast (Anderson 1978).

Bluefish are caught along the entire east coast. They are generally the number one species landed by recreational fishermen from New England to the Mid-Atlantic region. Historically, the recreational fishery has accounted for 80-90% of the total catch, and recreational landings peaked in 1981. Commercially, bluefish are targeted in both state and EEZ waters by a variety of fishing gears, with gill nets and otter trawls being the predominant gear types. Coastwide, the commercial landings historically accounted for approximately 20% of the total catch (ASMFC 1989). Since 1985, North Carolina has had the highest commercial landings of bluefish every year, with the exception of 1994 when New Jersey was slightly higher. The North Carolina bluefish fishery occurs throughout the year with peak catches of large fish in the winter by the ocean gill net and ocean trawl fisheries, and catches of smaller fish earlier in the summer by estuarine gill nets, pound nets, beach seines and estuarine long haul seines.

Length Distribution

Table 6.10 presents the size distribution of bluefish in bait samples. Bait sizes range from 4-19 inches FL. Dominant length modes for bait weakfish by fishery were 8 to 13 inches FL for the estuarine gill net, 7 to 10 inches FL for long haul seine, 8 to 13 for ocean gill net, 10 to 14 inches FL for ocean trawl, and 6 to 10 inches FL for sciaenid pound net.

The length distribution of bluefish in the long haul seine fishery was dominated by small fish, with a few large fish landed each year. In most years, 9-17 inch bluefish accounted for the majority of the catch (Figure 6.22). The annual modal size class varied but occurred at 10-14

inches. The annual range of lengths was fairly constant with fish 9-19 inches accounting for 97-99% of the distribution, except for 2004. In 2004, an estimated 12.6% of the catch was large 28 inch bluefish.

The sciaenid and flounder pound net fisheries take small bluefish similar to the long haul fishery, but large bluefish are rarely caught. With the exceptions of 2002, 2004 and 2011, 9-14 inch size classes accounted for most of the catches (Figure 6.23). In 2002, the mode occurred at 17 inches and large fish (26-31 inches) comprised 5.1% of the catch. The mode for bluefish caught in 2004 occurred at 16 inches and 70.1% of the catch was between 13 and 19 inches with16.9% being larger fish between 20 and 31 inches. Bluefish caught in 2005 had a distribution of 27.3% for 11 inches and 13 inches. In 2011, the mode occurred at 7 inches but large fish (26-33) comprised 7.2% of the catch. Small fish were observed in 2006 and 2011 with 42.5% of the 2006 catch 6 inches and 41.9% of the 2011 catch 6-7 inches.

The ocean gill net fishery for bluefish historically has had a consistent bimodal distribution. Bimodal distributions were observed in years 2002, 2003, 2004, 2008, 2009 and 2011. The first modal group generally occurred between 12-16 inches and the second modal group from 24-27 inches (Figure 6.24). The portion of the distribution contained by each modal group varied from year to year. Smaller fish (9-16 inches) accounted for as much as 50.3% of the catch in 2002. Most medium sized fish (16-22 inches) accounted for approximately 40% of the catches. Larger fish (23-34 inches) accounted for as much as 49.4% and 62.1% in 2003 and 2005 (Figure 6.24).

The ocean trawl fishery had a distribution that encompassed the full size range (6-34 inches) since 2002 (Figure 6.25). The small group (6-15 inches) was the dominant mode in 2002, 2004 and 2007. The contribution of medium bluefish landed by the winter trawl fishery was highest in 2008 and 2011. Large bluefish fish (22 inches and greater) was highest in the 2005 winter trawl catch when it comprised 49.3% of the catch.

Bluefish captured in the estuarine gill net fishery are predominantly small to medium sized fish, with a few large fish caught in some years (Figure 6.26). Modes ranged from 13 to 14 inches, and fish lengths ranged from 9-34 inches.

Annual length distributions for bluefish combined across all fisheries (weighted by number of individuals) reflected the contribution by size of each fishery to the overall harvest. Estuarine gill nets and ocean gill nets accounted for most of the individuals. Estuarine gill nets generally dominated in the 10-18 inches group (Figure 6.27). Ocean gill nets were important contributors of all sizes of fish, and particularly to the large size range (23-30 inches) of bluefish. Their contribution of medium large sized fish (18-23 inches) increased in 2003, 2004, 2006, 2007, 2008 and 2010. Ocean gill nets were the major contributor of larger fish (>23 inches). Large bluefish in the predominant ocean gill net fishery ranged in size from 24-27 inches. Overall size distribution was generally bimodal with the first peak at small and medium bluefish and a secondary peak at large bluefish. Bait sizes ranged from 4-18 inches, with a dominant mode of 6-14 inches for most fisheries (Table 6.10).

Landings and CPUEs

Contributions of landings of marketable bluefish by the long haul seine fishery have fluctuated across the 10 year period from 2.6% to 16.6% of marketable landings (Table 6.11). Landings from 2002 to 2006 were around 60,000 lb and contributed from 2.6% to 5.9% of marketable landings. In 2003, landings decreased to 34,300 lb but still contributed to 2.6% of landings. In both 2007 and 2009 long haul seines contributed to 12.7% and 16.6% of marketable bluefish landings with 2008 only contributing 8.1%. From 2010 to 2011 marketable bluefish landings have declined from 45,200 lb to 32,100 lb. The number of long haul seine operations also declined significantly since the late 1980's, remained about the same through the late 1990's, but effort has decreased to an all time low in the most recent years, with approximately 4 active crews statewide.

CPUEs and landings of marketable bluefish in the long haul fishery fluctuated and are generally parallel for the 10 year period. The highest CPUEs of bluefish occurred in 2007 (351.9 lb/trip) and 2009 (411.6 lb/trip). Marketable landings were highest in 2009 (110,700 lb) but the number of marketable fish landed was highest in 2007 (93,000 individuals) correlating with the high CPUE's (Table 6.12; Figure 6.28).

The sciaenid and flounder pound net fisheries, on average, contributed to less than 1% (range of 0.5%-4%) of the marketable bluefish landings (Table 6.11). Increased restrictions in the estuarine gill net fisheries have increased pound net effort with marketable bluefish landings fluctuating on a yearly basis.

CPUEs and landings of marketable bluefish by the sciaenid pound net fishery show similar fluctuating trends with a high of 34.9 lb/trip in 2008 to a low of 10.0 lb/trip in 2010. The number of marketable individuals landed was highest in 2002 at 4,200 and trips taken ranged from 59 to 175 (Table 6.12; Figure 6.28).

The ocean gill net fishery has always been a major contributor to marketable bluefish landings, and comprised 9.7% to 31.2% of bluefish landed from 2002 to 2011 (Table 6.11). Essentially all bluefish taken in this fishery were marketable (Table 6.12).

CPUEs and landings of bluefish landed by ocean gill nets show similar trends, with the exception of 2002, 2007, 2008 and 2011. Landings for 2002, 2007, 2008 and 2011 ranged from 1,078,600 lb to 1,844,500 lb. Landings for the remaining 7 years ranged from 3,273,200 lb to 2,105,000 lb. The lowest CPUE occurred in 2011 (735.8 lb/trip) and the highest CPUE in 2010 (1958.9 lb/trip). In 2010, only 1200 trips were taken contributing to a high CPUE. Trips steadily declined from 2003 to 2011 from 2,170 to 1,200 (Table 6.12; Figure 6.28).

In the past the ocean winter trawl contributed to a large portion of bluefish landings, however in the past 10 years the contribution of marketable bluefish has declined (Table 6.11). The contribution of ocean winter trawl to the overall marketable bluefish landings has declined to lows in 2003, but have increased notably from 2003 (77,900 lb) to 2005 (239,800 lb). In 2006,

landings slightly decreased by 28,700 lb compared to 2005 but dramatically dropped in 2007 to 67,300 lb. From 2008 to 2011, landings fluctuated from a high of 321,600 lb to 15,400 lb. Bait bluefish was, on average, 2% by weight and 10% by number, of the ocean trawl bluefish landed (Table 6.12).

CPUEs and landings of bluefish landed by winter ocean trawls increase from 2002-2005, decrease from 2006-2007 and fluctuate from a high of 2102.2 lb/trip in 2008 to a low of 253.0 lb/trip in 2011 (Figure 6.28). In 2003 and 2007, as landings decreased and CPUE increased, larger fish were captured (19,500 and 16,500) and the number of trips made (172 and 140) to catch the fish decreased. Trips steadily decreased from 338 in 2002 to 61 in 2011.

Estuarine gill nets are the second most important gear that contributes to the total marketable landings of bluefish. Estuarine gill nets contribution rates ranged from 3.5% to 13.4% over the 10 year sampling period. Essentially all bluefish taken in this fishery were marketable (Table 6.11).

CPUE and landings of bluefish landed by estuarine gill nets show parallel trends and generally increased from 2002 to 2011 (Table 6.12; Figure 6.28). A large number of estuarine gill nets trips were taken each year during the sampling period ranging from 4,783 to 6,846. The generally marketable fishery had atypical bait landings during 2005 and 2009. The increase of bait landings during these years can be attributed to many factors including increased demand for crab bait, bycatch not purchased landings and large number of trips.

Annual landings for bluefish combined across these five fisheries (weighted by respective fishery landings) are presented in Figure 6.28. For the combined fisheries, landings generally increased from 2002-2004, but decreased from 2004-2006 and rebounded from 2007-2011. Overall trends are largely driven by trends in the ocean gill net fishery.

Management Issues

Bluefish are managed under a joint management plan collaboratively developed by the Mid-Atlantic Fishery Management Council and the Atlantic States Marine Fisheries Commission, implemented in 1990. The management measures presently include an overall annual landings quota in which 17% of the quota is allocated to the commercial fishery and 83% is allocated to the recreational fishery. The total commercial quota is divided into state specific quotas, and there may be a transfer of a portion of the recreational quota to the commercial sector is predicted recreational landings are below the annual allocation. North Carolina's commercial allocation is 32%.

The most recent stock status information indicates that bluefish are not overfished and overfishing is not occurring, based on the biological reference points developed in the 2005 stock assessment. Trends in state and Northeast Fishery Science Center data show a decreasing trend in fishing mortality, an increasing trend in population biomass, and an

increasing trend in population numbers. The stock rebuilding deadline was 2010. The stock was declared rebuilt in 2009 when the projected biomass was higher than the rebuilding target.

Table 6.10 North Carolina bluefish (*Pomatomus saltatrix*) expanded length frequency of bait samples for selected fisheries, 2002-2011; n=number of fish measured, en=expanded number of individuals in catches sampled, and number=estimated number in the landings.

Fishery/ Year	n	en	Number	Percent frequency size class (FL, inches)															
				4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Estuarine Gill Net																			
2005	174	750	16,787	-	-	-	-	-	0.8	0.5	2	9.1	29	44	10	4.1	0.1	-	-
2006	2	4	378	-	-	-	-	50	-	-	50	-	-	-	-	-	-	-	-
2007	131	315	5,714	-	-	-	-	-	0.3	0.3	40	45	5.4	3.8	1.9	1.6	1	0.3	-
2008	95	95	2,575	-	-	-	-	-	3.2	-	2.1	4.2	33	24	21	11	2.1	-	-
2009	101	2342	29,314	-	-	-	-	-	0.3	46	37	0.2	1.2	4.4	9.1	1.9	-	-	-
Long Haul																			
2002	254	9193	25,637	-	0.4	10	18	33	28	8.9	2.1	0.2	0	-	0.1	-	-	-	-
2003	88	5336	27,618	-	2.1	11	17	16	31	20	1.1	0.9	-	-	-	-	-	-	-
2004	71	7200	65,049	-	2.8	21	15	16	32	11	-	-	2	-	-	-	-	-	-
2005	132	5031	41,419	-	0.1	1.3	5.5	9.6	27	40	16	0.6	-	-	-	-	-	-	-
2006	141	7262	48,931	0.4	3.6	7.8	19	17	27	18	6.3	0.6	-	-	-	-	-	-	-
2007	166	9150	97,982	-	-	-	22	30	29	16	3.8	0.3	-	-	-	-	-	-	-
2008	98	7707	23,585	-	1.8	5.3	19	44	14	15	0.7	0.1	-	-	-	-	-	-	-
2009	171	16185	20,553	-	0.1	0.7	12	12	29	29	14	4.3	-	-	-	-	-	-	-
2010	46	4205	21,650	-	1.9	-	1.4	27	23	45	2.4	-	-	-	-	-	-	-	-
2011	18	846	8,047	-	-	-	57	14	22	6.5	-	-	-	-	-	-	-	-	-
Ocean Gill Net																			
2003	94	609	8,239	-	-	-	-	-	2.8	26	17	29	16	5.7	1.5	0.5	0.5	0.5	-
2004	1	19	274	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-
2005	23	23	193	-	-	-	-	-	-	4.3	13	26	35	17	4.3	-	-	-	-
2006	1	1	8	-	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-
2007	110	1503	2	-	-	-	-	-	0.5	71	19	2.9	1.5	1.2	0.3	1.3	1.8	0.1	-
2008	57	455	2,673	-	-	-	-	-	14	53	27	3.7	1.8	-	-	-	-	-	-
2011	7	52	2,194	-	-	-	31	46	15	7.7	-	-	-	-	-	-	-	-	-

Table 6.10 (Continued).

Fishery/ Year	n	en	Number	Percent frequency size class (FL, inches)															
				4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Ocean Trawl																			
2002	38	1556	7,475	-	-	17	14	2.7	18	18	3.4	22	5.5	-	-	-	-	-	-
2003	9	356	2,468	-	-	-	-	11	36	3.7	46	-	3.7	-	-	-	-	-	-
2004	42	1682	4,573	-	-	-	1.2	9.7	21	10	1.2	1.2	3.9	28	12	7.8	-	3.9	-
2005	8	635	2,822	-	18	-	17	-	34	16	11	4.6	-	-	-	-	-	-	-
2006	5	581	4,424	-	-	-	-	16	53	27	-	4.5	-	-	-	-	-	-	-
2007	8	1376	13,748	-	-	-	21	21	2.5	11	46	-	-	-	-	-	-	-	-
2008	2	109	341	-	-	-	-	-	21	-	-	79	-	-	-	-	-	-	-
2010	2	438	1,003	-	-	-	-	-	-	-	50	50	-	-	-	-	-	-	-
Sciaenid Pound Net																			
2002	16	321	6,933	-	22	17	11	11	17	23	-	-	-	-	-	-	-	-	-
2003	7	63	1,553	-	-	-	-	-	4.8	24	71	-	-	-	-	-	-	-	-
2005	152	2692	9,862	-	0.5	22	38	27	5.7	7.7	-	-	-	-	-	-	-	-	-
2006	78	2357	2,152	0.6	10	47	6.4	13	7.4	15	-	-	-	-	-	-	-	-	0.6
2007	92	2146	347,246	-	3.1	10	38	34	7.8	7.3	-	-	-	-	-	-	-	-	-
2008	96	1559	11,253	-	1	17	60	19	1.4	1.3	0.8	-	-	-	-	-	-	-	-
2009	15	201	6,079	-	-	17	9	40	3.5	13	16	-	-	-	-	-	-	-	-
2011	19	308	2,691	-	-	8.4	31	32	27	-	-	1.9	-	-	-	-	-	-	-

Table 6.11 North Carolina commercial landings of marketable bluefish by fishery, 2002-2011, includes landings (thousand pounds), value (thousand dollars) and contribution of fishery to NC bluefish landings.

	YEAR									
Fishery	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Long Haul										
Pounds	57.5	34.3	51.8	55.1	60.5	107.3	53.7	110.7	45.2	32.1
Value ($)	17.4	7.1	10.2	14.1	14.9	28.3	15.4	26.5	12.3	11.1
% State	4.8	2.6	3.8	5.5	5.9	12.7	8.1	16.6	6.7	7.1
Flounder Pound Net										
Pounds	3.9	0.9	2.4	1.2	0.5	0.7	1.0	0.5	0.9	0.9
Value ($)	1.1	0.2	0.5	0.3	0.1	0.1	0.3	0.1	0.3	0.3
% State	0.2	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Sciaenid Pound Net										
Pounds	4.0	1.7	2.2	0.9	1.2	2.4	4.4	2.3	1.0	2.5
Value ($)	1.0	0.4	0.4	0.2	0.3	0.5	1.4	0.7	0.3	1.1
% State	1.8	2.0	2.1	0.5	0.7	1.5	2.1	0.7	0.5	1.3
Estuarine Gill Net										
Pounds	273.0	494.5	280.6	384.7	240.8	444.6	318.9	420.3	587.3	757.5
Value ($)	77.5	108.6	54.8	94.4	59.4	103.6	96.8	125.6	185.1	298.2
% State	3.5	6.7	4.4	5.8	4.1	7.9	5.2	6.4	9.1	13.4
Ocean Gill Net										
Pounds	1,844.1	2,799.4	3,272.6	2,104.6	2,247.9	1,686.4	1,191.8	1,682.4	2,350.2	1,078.4
Value ($)	635.2	620.6	749.9	602.0	672.3	547.0	469.4	585.6	850.1	526.6
% State	16.9	27.9	31.2	21.6	27.3	24.8	19.5	20.7	22.4	9.7
Ocean Trawl										
Pounds	104.5	77.9	119.4	239.8	211.1	67.3	321.6	108.7	204.6	15.4
Value ($)	34.7	17.3	26.3	67.1	62.1	15.9	113.5	33.0	73.4	6.3
% State	1.0	0.5	0.8	1.7	1.9	0.6	4.6	1.2	2.4	0.2
Other Fisheries										
Pounds	37.0	61.5	34.0	51.3	29.2	21.1	39.1	35.2	26.7	10.6
Value ($)	9.7	13.5	7.2	12.1	6.5	5.2	11.0	11.1	8.1	4.7
% State	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
All 2002-2011										
Pounds	2,324.0	3,470.1	3,762.9	2,837.6	2,791.2	2,329.7	1,930.4	2,360.1	3,216.0	1,897.4
Value ($)	776.6	767.6	849.3	790.3	815.6	700.7	707.7	782.6	1,129.7	848.3
% State	1.4	2.5	2.8	3.5	4.1	3.6	2.7	3.4	4.5	2.7

Source: North Carolina Division of Marine Fisheries commercial landings database.
Long Haul includes: gear code 030 or 025 and non-ocean waters.
Flounder Pound Net includes: gear code 275, months October, November, December for Counties Beaufort, Carteret, Dare, Hyde, Tyrrell, and month September for Counties Beaufort, Carteret, Hyde and Tyrrell.
Sciaenid Pound Net includes: gear code 275, months May through August for Counties Dare and Hyde, and month September for Dare.
Estuarine Gill Net includes: gear code 425, 426, 427, 470, 475, 480 and all non-ocean waters.
Ocean Gill Net includes: gear code 425, 426, 427, 470, 475, 480 and Atlantic Ocean.
Ocean Trawl includes: gear codes 210 and 230, Atlantic Ocean, and months January through May and September through December.

Table 6.12 North Carolina bluefish (*Pomatomus saltatrix*) landings (weight-thousand pounds, number-thousand individuals), marketable landings per trip (CPUE weight-pounds), and total number of trips, by type for selected commercial fisheries, 2002-2011.

		Landings									
		Weight					Number				# Trips
		Total	Market		Bait	% Bait	Total	Market	Bait	% Bait	
Fishery	Year	Landed (1000s lb)	Landed (1000s lb)	CPUE (lb/trip)	Landed (1000'S lb)		Landed (1000s)	Landed (1000s)	Landed (1000s)		
Long Haul											
	2002	65.3	57.5	259.1	7.8	11.9	68.6	43.0	25.6	37.3	222
	2003	44.7	34.3	117.4	10.4	23.2	61.2	33.6	27.6	45.1	292
	2004	72.7	51.8	184.4	20.8	28.7	120.6	55.6	65.0	53.9	281
	2005	75.5	55.1	242.5	20.5	27.1	91.6	50.2	41.4	45.2	227
	2006	78.0	60.5	179.1	17.5	22.4	94.9	46.0	48.9	51.6	338
	2007	145.4	107.3	351.9	38	26.2	191.0	93.0	98.0	51.3	305
	2008	61.4	53.7	218.2	7.7	12.6	64.7	41.1	23.6	36.4	246
	2009	120.5	110.7	411.6	9.8	8.1	110.5	89.9	20.6	18.6	269
	2010	55.4	45.2	190.1	10.1	18.3	54.2	32.5	21.7	40.0	238
	2011	34.4	32.1	175.3	2.3	6.8	30.1	22.1	8.0	26.7	183
Sciaenid Pound Net											
	2002	5.8	4.0	22.9	1.7	30.3	11.2	4.2	6.9	62.1	175
	2003	2.5	1.7	21.3	0.8	33.5	3.5	1.9	1.6	44.8	79
	2004	2.2	2.2	32.0	<0.1	<0.1	2.0	2.0	<0.1	<0.1	70
	2005	3.2	0.9	16.1	2.3	70.9	10.6	0.7	9.9	93.4	59
	2006	1.8	1.2	14.2	0.7	36.4	3.6	1.5	2.2	59.5	81
	2007	74.8	2.4	22.7	72.4	96.8	350.2	2.9	347.2	99.2	106
	2008	7.3	4.4	34.9	2.9	39.8	14.6	3.3	11.3	77.3	125
	2009	4.4	2.3	27.3	2.2	48.9	8.2	2.1	6.1	74.5	83
	2010	1.0	1.0	10.0	<0.1	<0.1	0.8	0.8	<0.1	<0.1	101
	2011	3.2	2.5	21.6	0.7	21.2	3.4	0.7	2.7	79.7	117
Ocean Gill Net											
	2002	1844.5	1844.5	853.1	<0.1	0.0	343.1	343.1	<0.1	<0.1	2,162
	2003	2807.5	2799.9	1133.6	7.6	0.3	492.7	484.4	8.2	1.7	2,470
	2004	3273.3	3273.2	1477.1	0.1	<0.1	609.8	609.6	0.3	<0.1	2,216
	2005	2105.2	2105.0	1216.1	0.2	<0.1	334.2	334.0	0.2	0.1	1,731
	2006	2248.3	2248.3	1266.7	<0.1	<0.1	515.2	515.2	<0.1	<0.1	1,775
	2007	1686.7	1686.7	863.2	<0.1	<0.1	600.7	600.7	<0.1	<0.1	1,954
	2008	1194.0	1192.0	849.6	2.0	0.2	340.3	337.6	2.7	0.8	1,403
	2009	1685.9	1685.9	1124.8	<0.1	<0.1	321.3	321.3	<0.1	<0.1	1,496
	2010	2350.7	2350.7	1958.9	<0.1	<0.1	400.7	400.7	<0.1	<0.1	1,200
	2011	1079.4	1078.6	735.8	0.7	0.1	231.4	229.2	2.2	0.9	1,466

Table 6.12 (Continued)

		Landings									
		Weight					Number				# Trips
		Total	Market		Bait	% Bait	Total	Market	Bait	% Bait	
Fishery	Year	Landed (1000s lb)	Landed (1000s lb)	CPUE (lb/trip)	Landed (1000'S lb)		Landed (1000s)	Landed (1000s)	Landed (1000s)		
Ocean Trawl											
	2002	109.4	104.5	309.2	4.8	4.4	35.2	27.8	7.5	21.3	338
	2003	79.3	77.9	453.0	1.4	1.8	21.9	19.5	2.5	11.4	172
	2004	124.6	119.4	694.3	5.2	4.2	35.1	30.5	4.6	13.1	172
	2005	241.2	239.8	1205.0	1.4	0.6	50.2	47.3	2.8	5.6	199
	2006	213.1	211.1	934.0	1.9	0.9	48.5	44.1	4.4	9.1	226
	2007	73.8	67.3	480.9	6.5	8.8	30.3	16.5	13.7	45.2	140
	2008	322.0	321.7	2102.2	0.2	0.1	64.6	64.3	0.3	0.5	153
	2009	108.7	108.7	654.7	<0.1	<0.1	28.2	28.2	<0.1	<0.1	166
	2010	205.4	204.7	1515.7	0.8	0.4	46.6	45.6	1.0	2.1	135
	2011	15.4	15.4	253.0	<0.1	<0.1	2.5	2.5	<0.1	<0.1	61
Estuarine Gill Net											
	2002	273.0	273.0	42.1	0.1	<0.1	165.4	165.4	0.1	<0.1	6,489
	2003	494.6	494.6	96.2	<0.1	<0.1	358.8	358.8	<0.1	<0.1	5,140
	2004	280.6	280.6	58.7	<0.1	<0.1	179.0	179.0	<0.1	<0.1	4,783
	2005	405.3	384.7	68.7	20.5	5.1	294.4	277.6	16.8	5.7	5,599
	2006	241.2	240.9	41.0	0.3	0.1	154.7	154.3	0.4	0.3	5,867
	2007	449.3	444.6	66.0	4.7	1.0	324.8	319.0	5.7	1.8	6,731
	2008	322.6	319.0	46.6	3.6	1.1	169.3	166.7	2.6	1.5	6,846
	2009	459.8	417.1	62.4	42.6	9.3	281.4	252.1	29.3	10.4	6,680
	2010	587.4	587.4	97.8	<0.1	<0.1	367.3	367.3	<0.1	<0.1	6,004
	2011	757.6	757.6	119.7	<0.1	<0.1	474.5	474.5	<0.1	<0.1	6,216
All Fisheries											
	2002	2298.0	2283.5	225.4	14.5	0.6	623.5	583.5	40.2	6.4	10,133
	2003	3428.6	3408.4	396.6	20.3	0.6	938.1	898.2	39.9	4.3	8,594
	2004	3753.4	3727.2	464.0	26.1	0.7	946.6	876.7	69.9	7.4	8,032
	2005	2830.5	2785.5	332.7	44.9	1.6	781.0	709.8	71.1	9.1	8,372
	2006	2782.4	2762.0	314.7	20.4	0.7	816.9	761.0	55.9	6.8	8,777
	2007	2430.0	2308.3	237.1	121.5	5.0	1496.9	1032.2	464.7	31.0	9,736
	2008	1907.3	1890.7	203.3	16.5	0.9	653.5	613.1	40.4	6.2	9,300
	2009	2379.4	2324.7	253.0	54.6	2.3	749.5	693.6	55.9	7.5	9,175
	2010	3199.9	3189.0	393.6	10.9	0.3	869.6	847.0	22.7	2.6	8,102
	2011	1890.0	1886.3	221.9	3.7	0.2	741.9	728.9	12.9	1.7	8,439

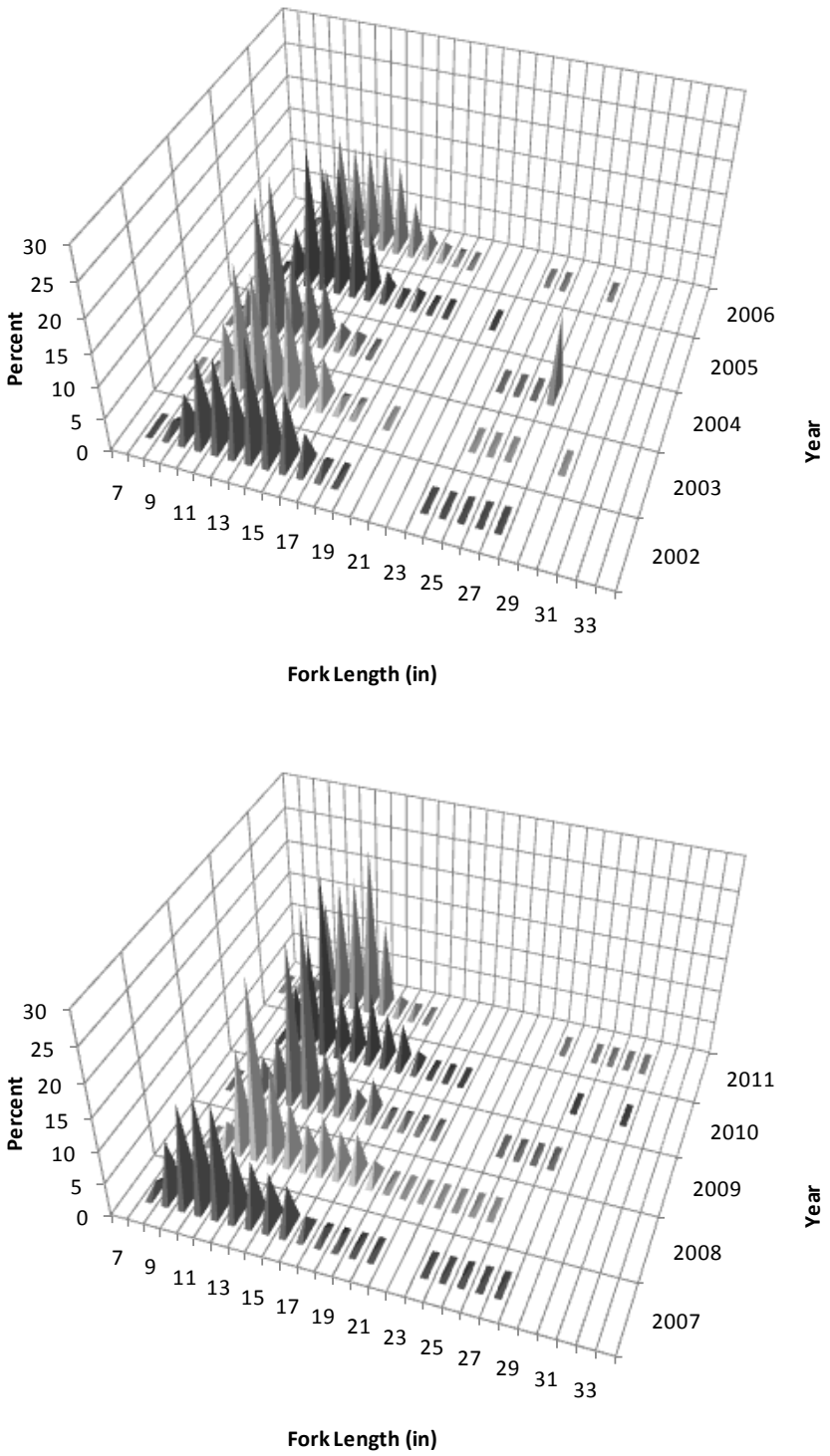


Figure 6.22 North Carolina long haul seine fishery weighted length frequency distributions for marketable bluefish (*Pomatomus saltaltrix*), 2002-2011.

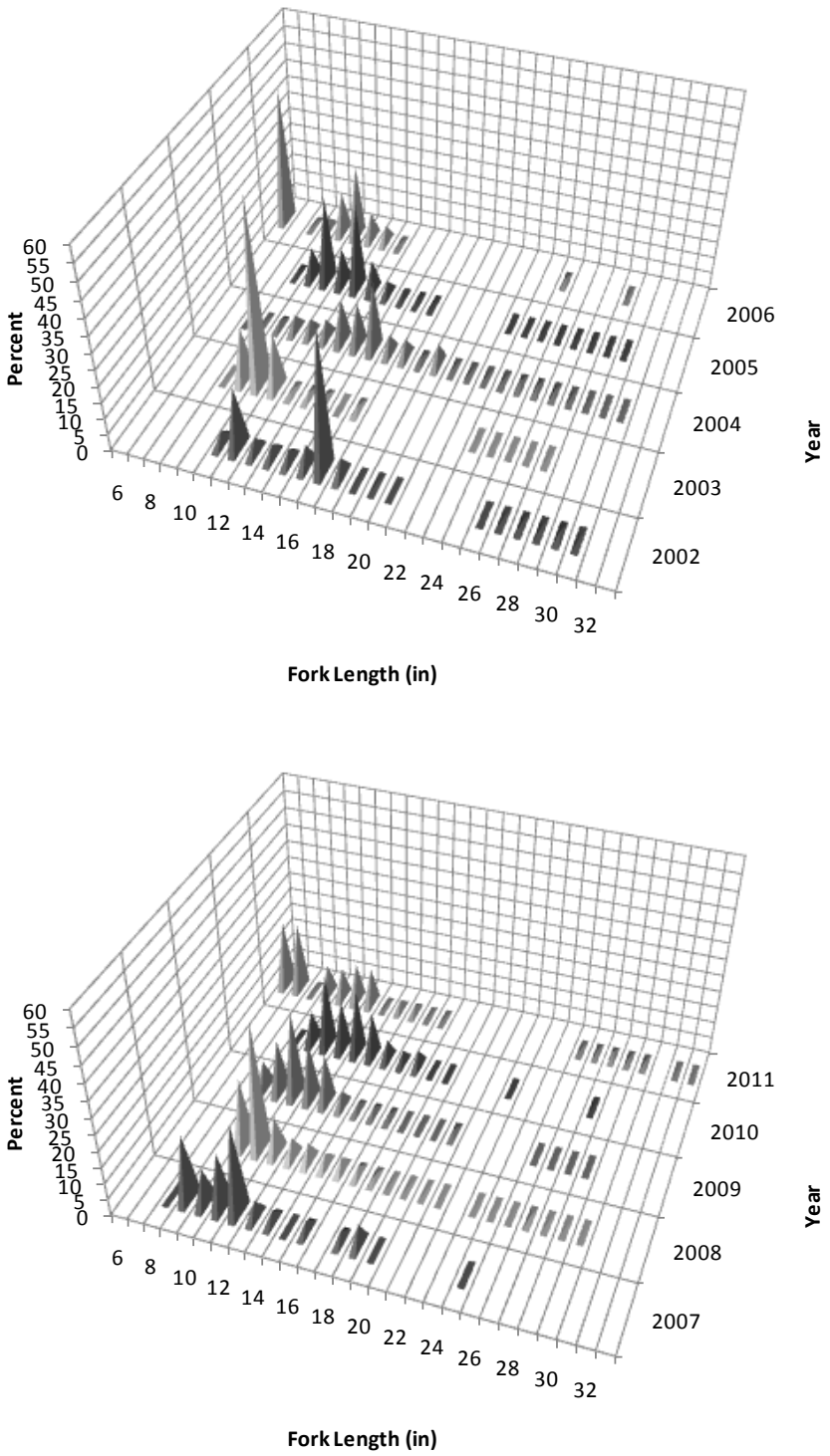
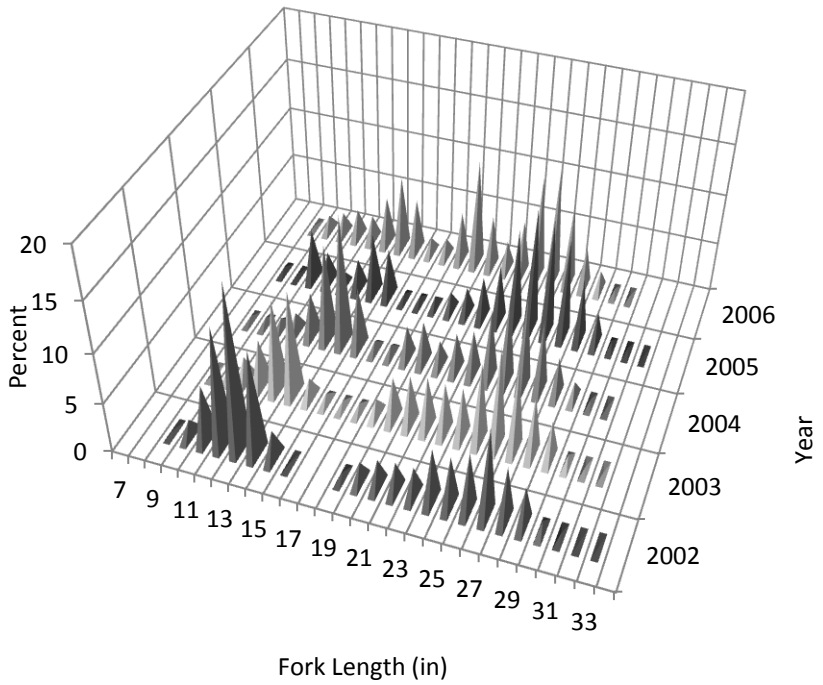


Figure 6.23 North Carolina pound net (sciaenid and flounder) fishery weighted length frequency distributions for marketable bluefish (*Pomatomus saltaltrix*), 2002-2011.



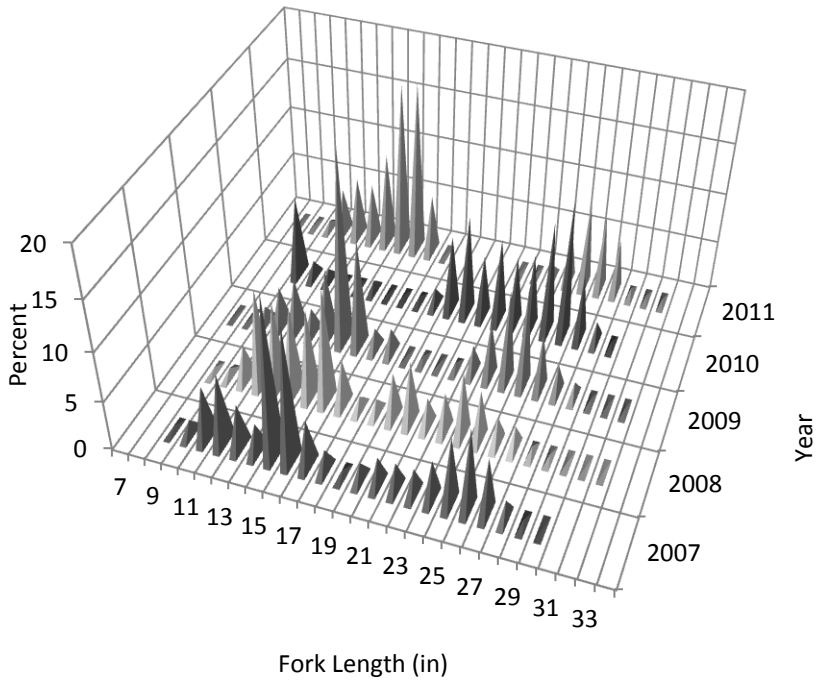
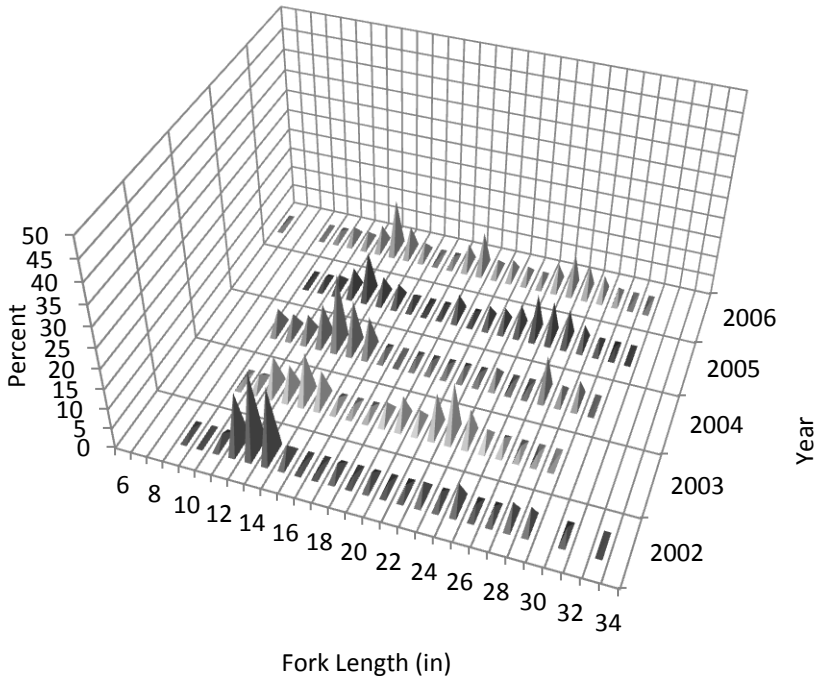


Figure 6.24 North Carolina ocean gill net fishery weighted length frequency distributions for marketable bluefish (*Pomatomus saltaltrix*), 2002-2011.



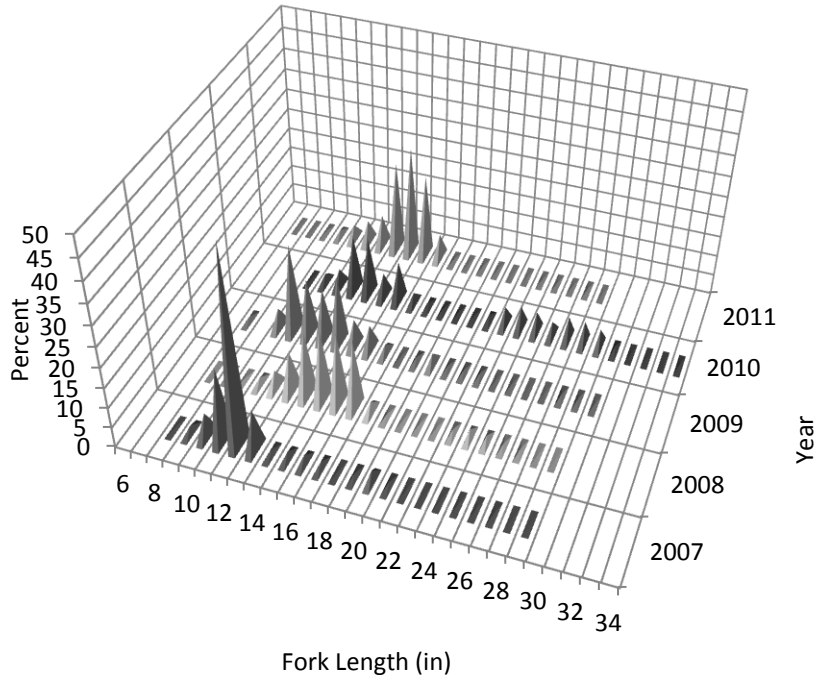
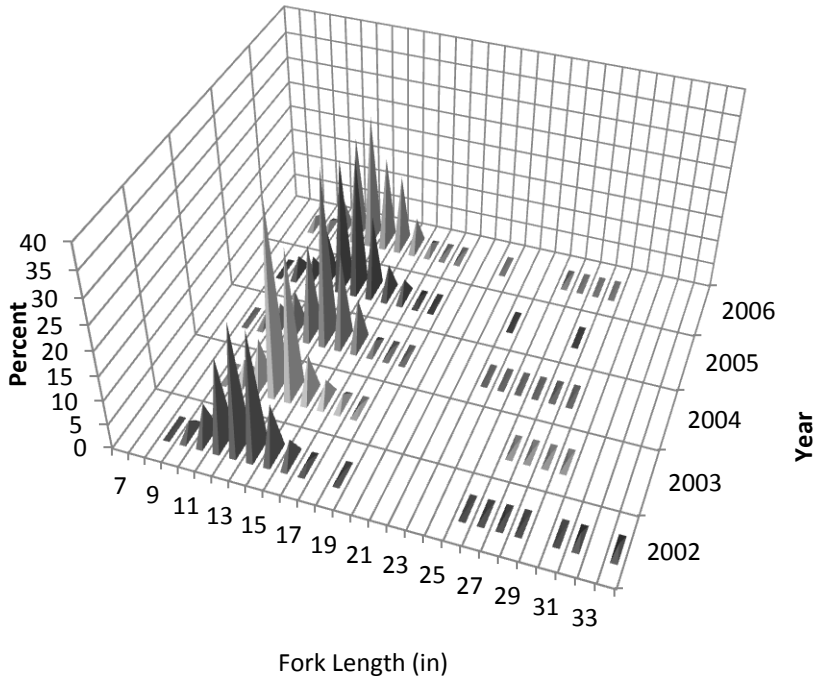


Figure 6.25 North Carolina ocean trawl fishery weighted length frequency distributions for marketable bluefish (*Pomatomus saltaltrix*), 2002-2011.



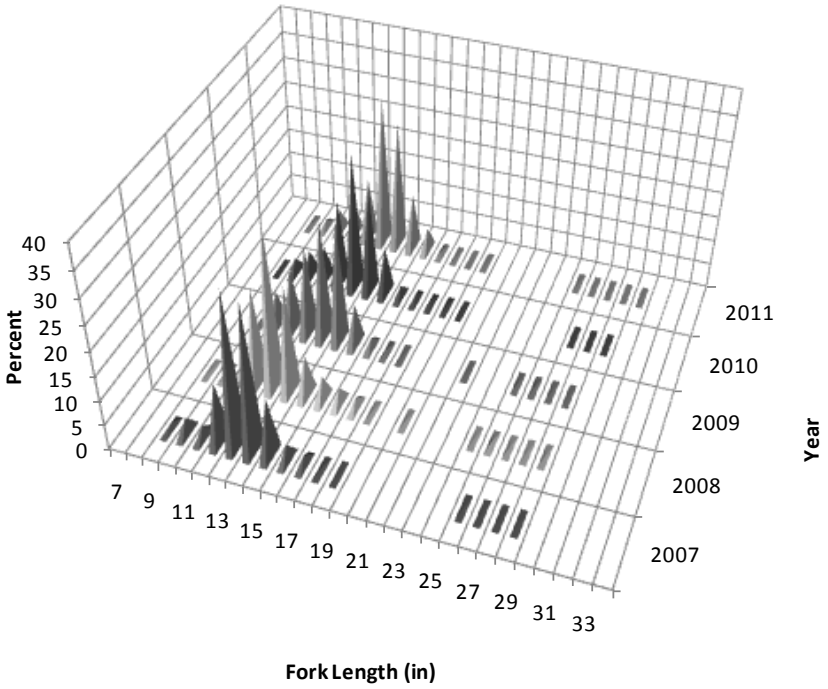


Figure 6.26 North Carolina estuarine gill net fishery weighted length frequency distributions for marketable bluefish (*Pomatomus saltaltrix*), 2002-2011.

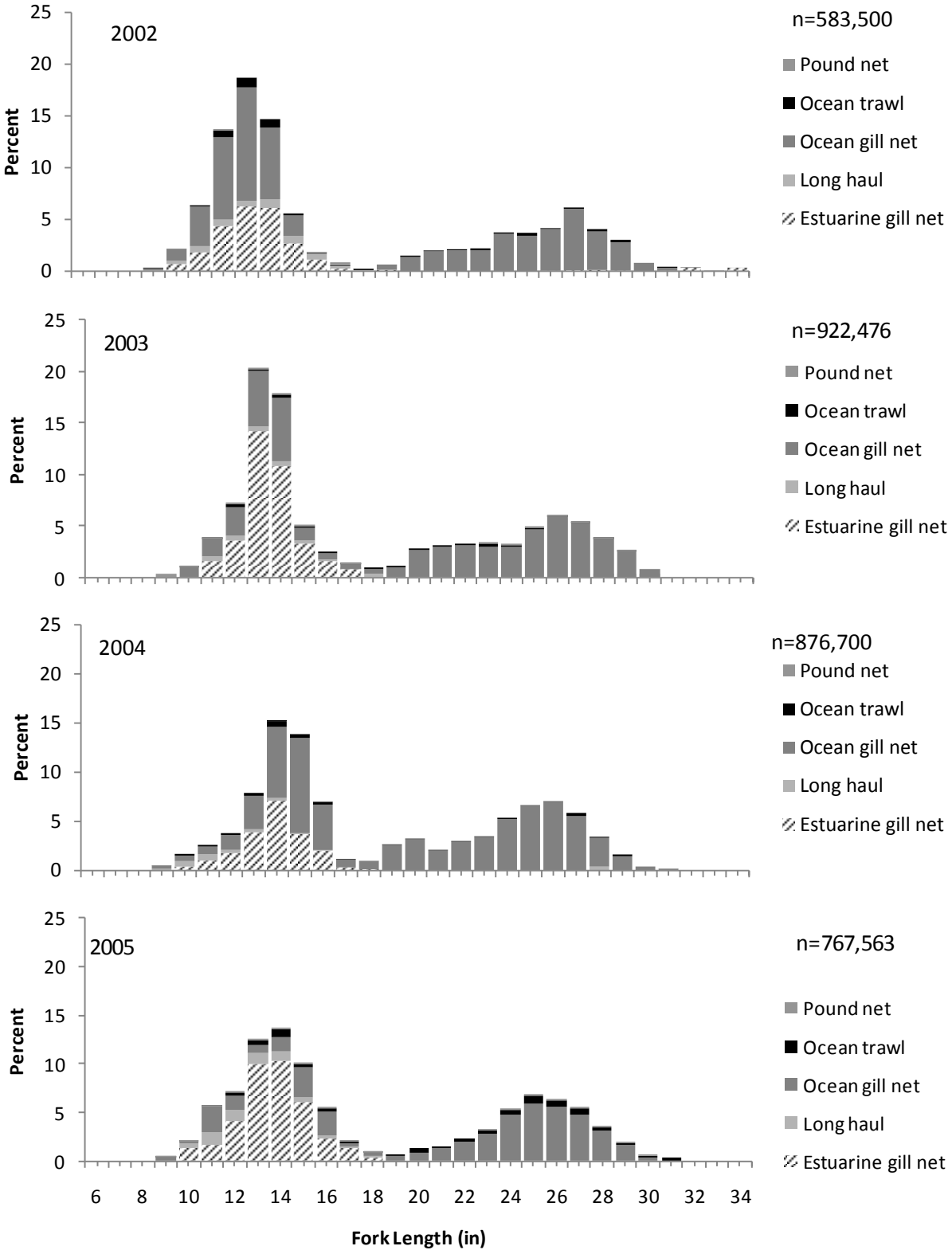


Figure 6.27 North Carolina commercial fishery weighted length frequency distributions for marketable bluefish (*Pomatomus saltatrix*), 2002-2011.

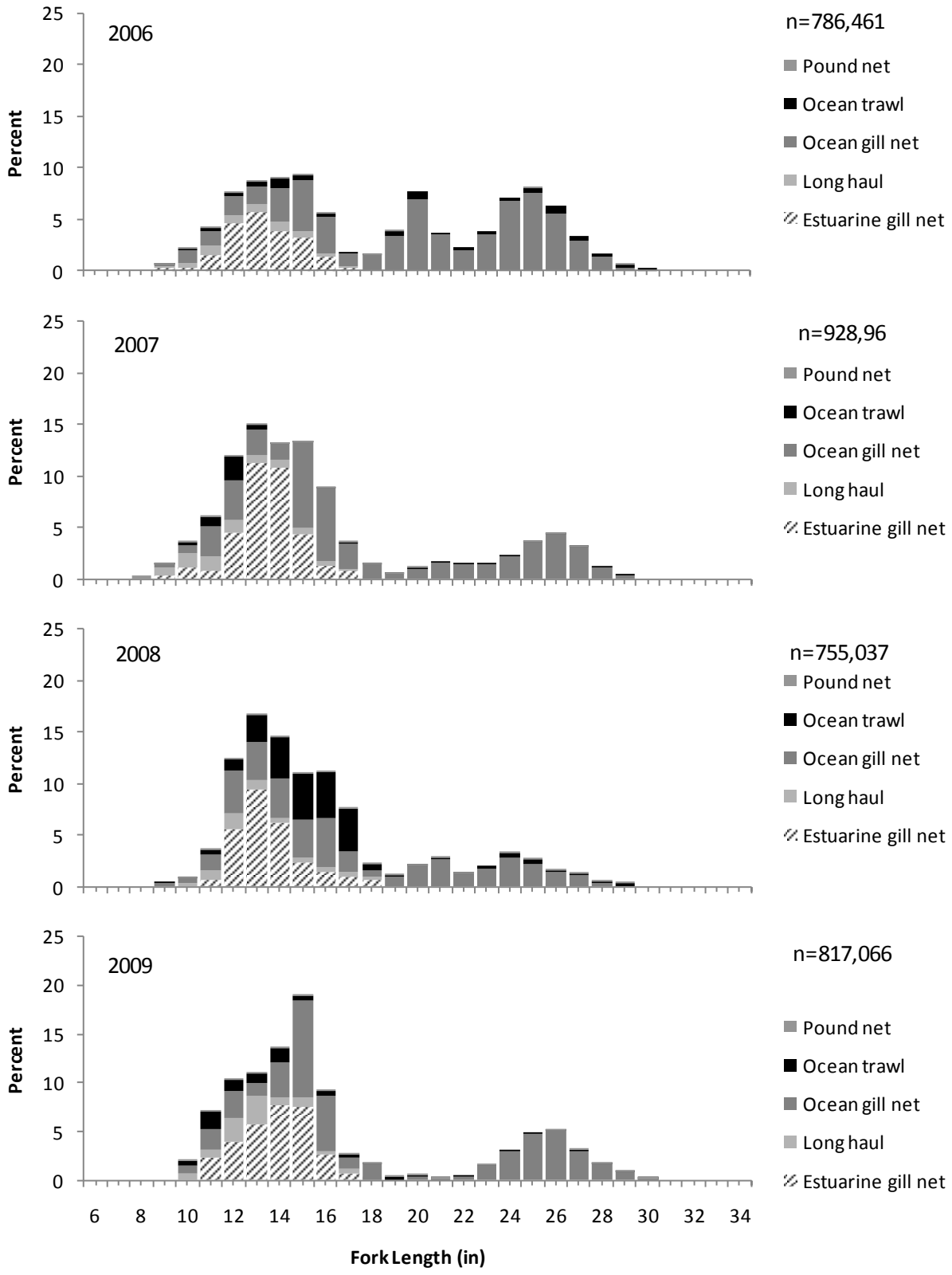


Figure 6.27 (Continued)

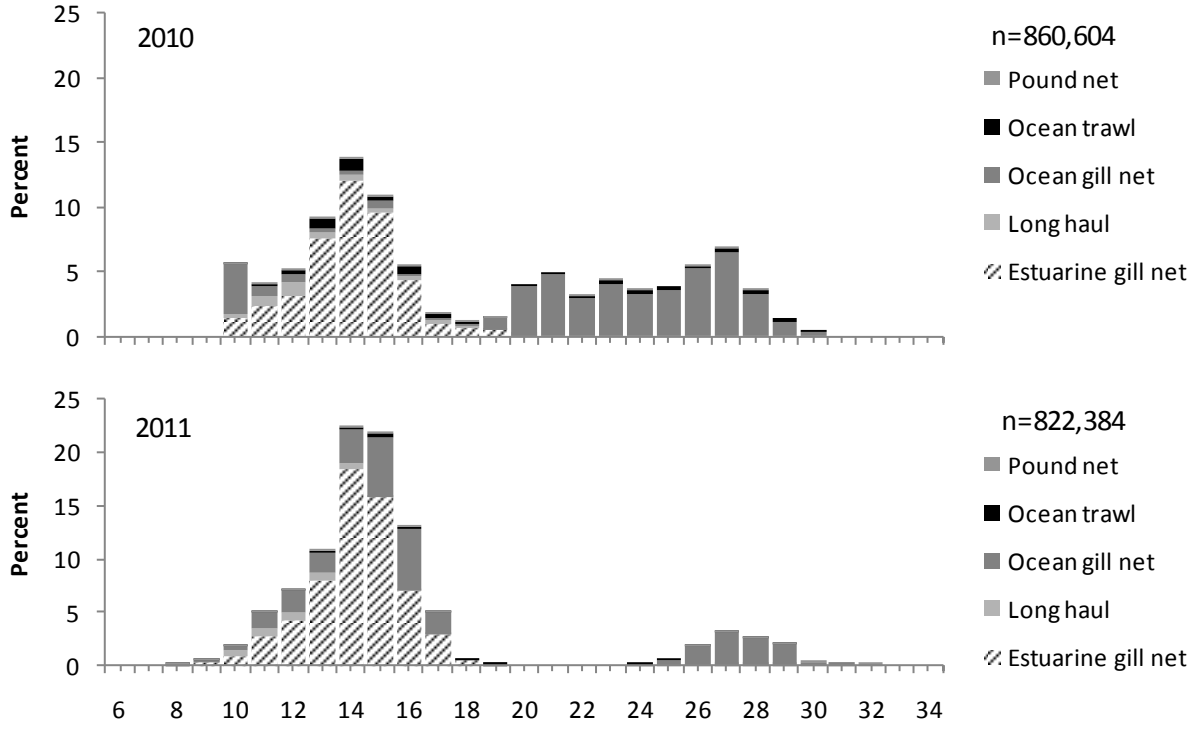


Figure 6.27 (Continued)

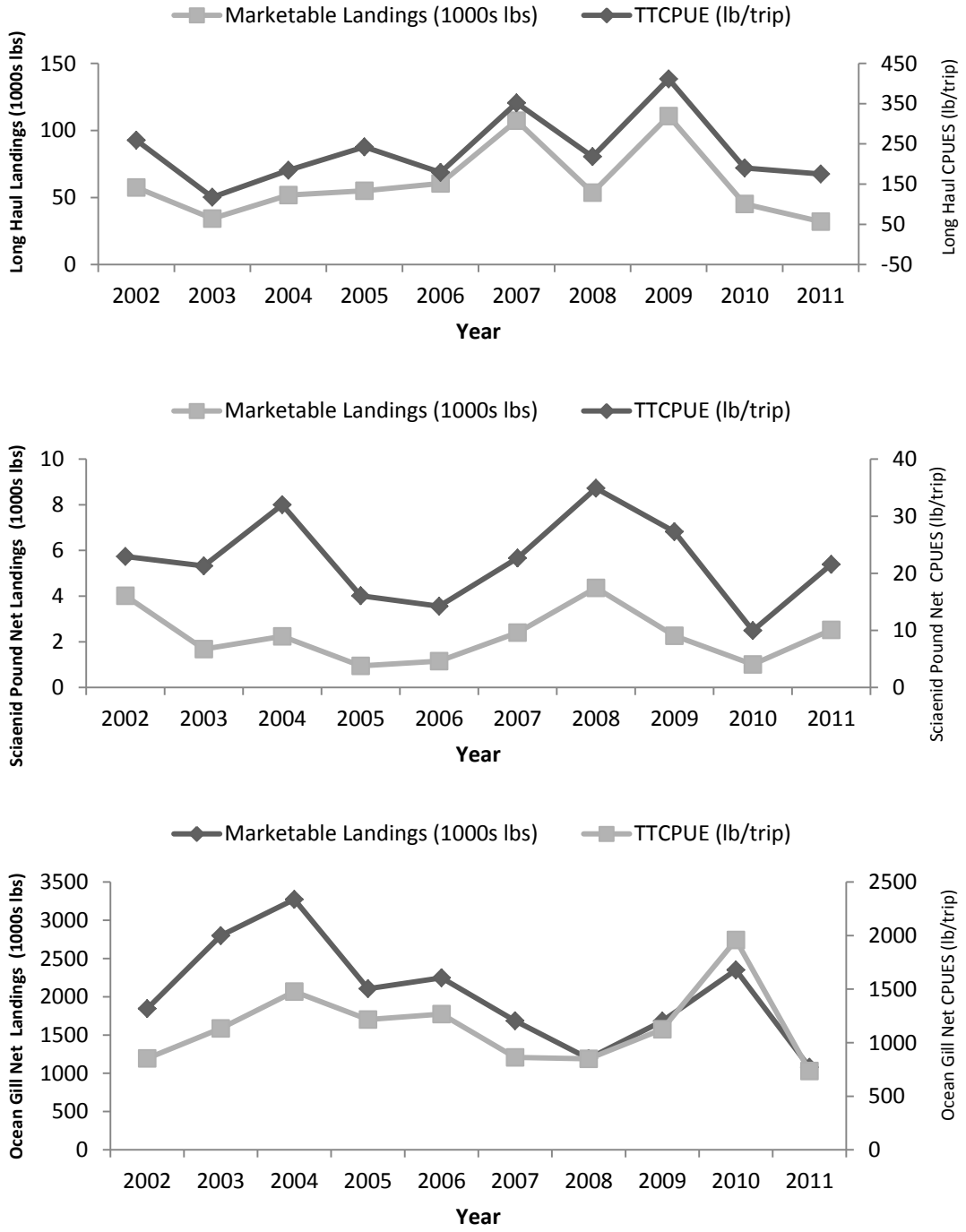
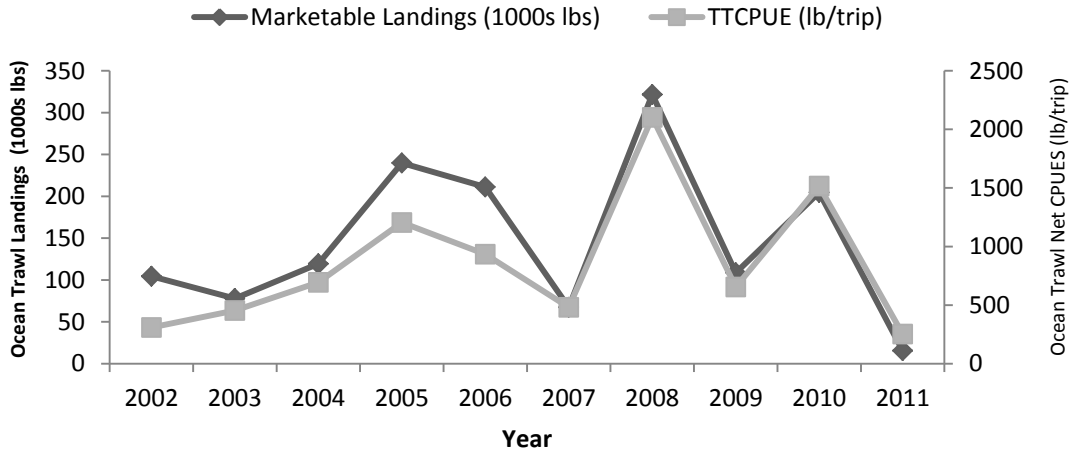
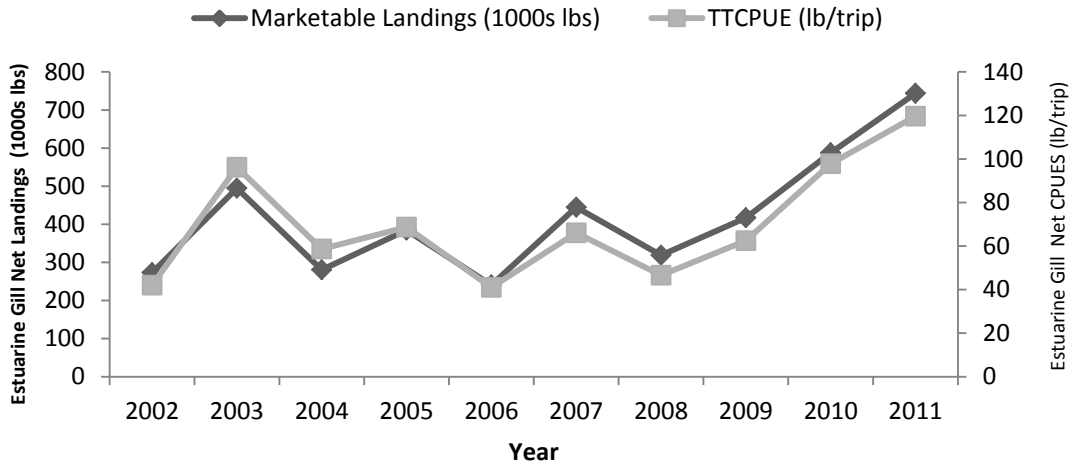


Figure 6.28 North Carolina bluefish (*Pomatomus saltatris*) annual commercial landings (1000s lbs) and mean CPUE (landed catch per trip, lb) for selected fisheries and overall, 2002-2011.





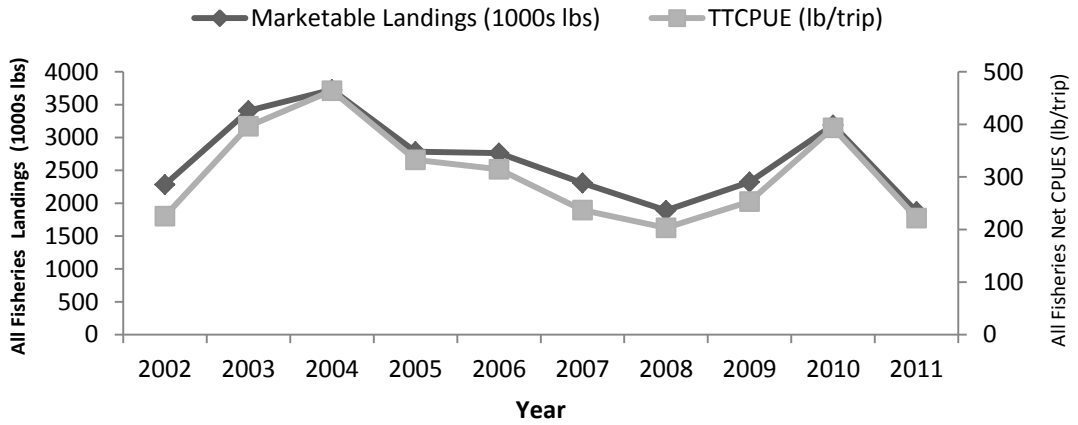


Figure 6.28 (Continued)

BLACK DRUM

Background

Black Drum (*Pogonais cromis*) is the largest member of the family Sciaenidae, reaching over 46 inches and 120 lb. The range of black drum extends along the nearshore western Atlantic coast from the Gulf of Maine to Florida, into the Gulf of Mexico, and as far south as Argentina. Variation in *mt*DNA between Gulf and Western Atlantic black drum suggest there are no subpopulations; however, a significant degree of clinal variation in *m*tDNA haplotypes was found along the Gulf of Mexico (Gold and Richardson 1991). Spawning is thought to occur in the offshore of the mid-Atlantic during the winter and early spring (Frisbie 1961; Murphy and Taylor 1989; Saucier and Baltz 1993). Annual recruitment is thought to be highly variable and dependent on natural environmental conditions (Saucier and Baltz 1993). Females are sexually mature between the ages of four and six (25-28 inches) and are prodigious, multiple spawners (Murphy and Taylor 1989; Fitzhugh et al. 1993). An average-sized female (~30 inches or 13.4 lb) may spawn 32-million eggs each year (Fitzhugh et al. 1993). At ages four and five (22-25 inches) males are mature (Murphy and Taylor 1989). The species is long-lived, reaching up to 60 years of age (Murphy et al. 1998). Black drum are 11 to 14 inches at age 1, 15 to 17 inches at age 2, and 19 to 21 inches at age 3 (Murphy and Taylor 1989; Murphy and Muller 1995; Jones and Wells 1998).

Black drum are caught as bycatch in several North Carolina commercial fisheries including the sciaenid pound net, flounder pound nets, estuarine gill net, haul seine, and summer flounder trawl fisheries. These fisheries coincide with the seasonal migration of black drum as they migrate northward and inshore during the spring and southward and offshore by the late fall. Black drum are landed year round and are most commonly abundant in the fall (October and November) and winter (February).

Length Distribution

Fishery dependent sampling for lengths was conducted in the long haul seine fishery, pound net fishery, ocean sink net fishery, ocean winter trawl fishery and the estuarine gill net fishery. For each fishery, annual length distributions (reported in inches centerline length (CL)) weighted by commercial landings (lb, semi-annually) are presented for black drum. Black drum are not commonly assigned market grades on trip tickets at most fish houses and are often categorized as “mixed”. Other market grades may be entered for trip tickets submitted electronically. However, due to the limited number of biological fish house samples expanded length frequency distributions are only presented for the “mixed” market grade.

Weighted length frequency distributions for black drum landed in the estuarine gill net fishery in 2002-2011ranged from 7 to 50 inches CL (Figure 6.29). Minimum length ranged from 7 to 11 inches CL. Maximum lengths ranged from 22 to 50 inches CL. Modal length frequency distributions were observed for most years. However, bi-modal distributions were in 2005, 2007,

and 2011. Overall, 62.7% of black drum landed in the estuarine gill net fishery were 14 to 17 inches CL.

Black drum landed in the pound net fishery in 2002-2011 (flounder and sciaenid combined) had weighted length frequency distributions ranging from 8 to 47 inches CL (Figure 6.30). Minimum length ranged from 8 to 14 inches CL. Maximum lengths ranged from 25 to 47 inches CL. Modal length frequency distributions were observed in 2002, 2003, 2004, 2006 and 2008. Bi-modal length frequency distributions were observed in 2007, 2010 and 2011. Overall, 73.8% of black drum landed in the pound net fishery range in size of 14 to 17 inches CL. However, black drum ranging in size from 8 to 11 inches CL made up 52.3% of the fish landed in 2007 and 60.7% in 2011.

Weighted length frequency distributions for black drum landed in the long haul seine fishery have been highly variable over the last 10 years (2002-2011), ranging from 6 to 24 inches CL (Figure 6.31). Minimum lengths ranged from 6 to 12 inches CL. Maximum lengths ranged from 18 to 24 inches CL. Modal length frequency distributions were observed in 2002, 2003, 2006, 2008, and 2009. Variability in the distribution of modal peaks was highly influence by sample size. Bi-modal length frequency distributions were in observed in 2010 and 2011. A large portion (66.6%) of the black drum landed in the long haul seine fishery during 2002-2006 was composed of black drum ranging in size of 10 to 14 inches CL.

Annual weighted length frequency distributions for black drum landed in the ocean gill net fishery in 2002-2011 ranged from 7 to 48 inches CL (Figure 6.32). Minimum lengths ranged from 7 to 9 inches CL. Maximum lengths ranged from 20 to 48 inches CL. Modal length frequency distributions were observed in 2002, 2005 and 2011. Bi-modal length frequency distributions were observed in 2004 and 2005. Black drum ranging in size of 8 to 10 inches CL made up a majority of the landings in 2005 (99.1%) and in 2011 (97.2%).

Due to small sample sizes it is difficult to adequately characterize the length frequency distributions for the ocean trawl fishery. Weighted length frequencies for black drum landed in the ocean trawl fishery in 2002-2011 ranged from 7 to 49 inches CL (Figure 6.33). Minimum lengths ranged from 7 to 9 inches CL. Maximum lengths ranged from 11 to 49 inches CL. Black drum 8 to 10 inches CL dominated the catch in 2005 (97.1%) and in 2011 (56.2%).

Annual length distributions for black drum combined across all fisheries (weighted by number of individuals) reflect the contribution by size of each fishery to the overall harvest (Figure 6.34). Approximately 63% of black drum landed in the estuarine gill net fishery and 74% of the fish landed in the pound net fishery were 14 to 17 inches CL, while fish 11 to 15 inches CL made up the 57% of the landings in the long haul seine fishery. Overall, the ocean fisheries landed smaller black drum (8-10 inches CL) as compared to the estuarine fisheries.

Due to small sample sizes it is not possible to characterize the length frequency distributions for black drum sold as bait in each of the fisheries (Table 6.13).

Landings, Trips, and CPUE

Overall commercial landings of marketable black drum have fluctuated over the last 10 years (Table 6.14). Landings peaked in 2002 at 497,479 lb and later fell to a 10-year low in 2005 at 44,989 lb. On average 160,314 lb of black drum are landed annually in North Carolina. Black drum landed outside of the fisheries presented in this report landed 4.5% of the marketable landings (range 2.2-7.2%; Table 6.14). Annual landings for black drum sold as bait across all five fisheries presented in this report made up less than 1% of the total landings (Table 6.15).

The estuarine gill net fishery, on average has contributed 64.1% of the marketable black drum landings (range of 42.1-79.6%; Table 6.14). On average 96,320 lb of black drum were landed annually in the estuarine gill net fishery from 2002 to 2011. Landings peaked in 2002 at 209,346 lb, dropping to a 10-year low of 28,399 lb in 2005. Landings again peaked in 2008 at 205,675 lb, declining 81.5% to 38,073 lb in 2011. The recent drop in landing observed in 2010 and 2011 is thought to be a result of stricter gill net regulations implemented in 2010 by the Beasley sea turtle lawsuit settlement agreement. During these two years, the average number of trips declined 42.0% from the 10-year average (Table 6.15). Black drum CPUEs have also fluctuated in conjunction with the landings, ranging from a low of 10 in 2005 to a high of 22 in 2002 (Figure 6.35). Estuarine gill net trips averaged 15 lb of black drum per trip from 2002 to 2011 (Table 6.15).

The flounder pound net fishery is the second largest contributor of marketable black drum, averaging 17.3% of the state's landings from 2002-2011 (range 4-48.2%; Table 6.14). Landings from the flounder pound net fishery have ranged from a high of 239,782 lb in 2002 to a low of 2,899 lb in 2005. Annual CPUEs in the flounder pound net fishery have ranged from a high of 206 in 2002 to a low of 13 in 2005 (Figure 6.35). The sciaenid pound net fishery's contribution is considerably mush less than that of the flounder pound net fishery, making up less than 1% of the total black drum landings from 2002 to 2011. Landings from the sciaenid pound net fishery ranged from a low of 179 lb in 2005 to high of 1,574 lb in 2008. The average number of trips for the 10-year period was 38 trips (Figure 6.30). Black drum CPUEs in the sciaenid pound net fishery ranged from 8 (2006, 2007, 2011) to 33 (2008), averaging 16 lb per trip from 2002 to 2011. Overall trends in CPUEs have followed the landings, exhibiting a declining trend from 2009 to 2011 (Figure 6.35).

The long haul fishery, on average, contributed 4.3% (range 1.2-10.3%) of the marketable black drum landings (Table 6.14). An average of 6,526 lb of black drum were landed annually from 2002 to 2011. Landings peaked in 2003 at 15,327 lb, dropping to a 10-year low of 675 pounds in 2005. The landings for the period of 2004-2005 were 89.0% below the 10-year average. Landings peaked again in 2008 at 12,207 lb and have exhibited a continued downward trend in the recent years (2008-2011). The number of long haul seine operations has declined over the last ten years leading to both declines in landings and CPUEs (Figure 6.35). Black drum CPUEs have ranged from a high of 176 in 2003 to a low of 17 in 2004 (Table 6.15). The average number of long haul trips for the 10-year period was 85 trips; in 2011 effort declined 38.8% from the 10-year average.

The ocean gill net fishery is the third largest contributor of marketable black drum, averaging 5.2% of North Carolina's landings from 2002 to 2011 (range 0.5-14.2%; Table 6.14). However, in 2010 and 2011 it has comprised 9.9-14.2% of the black drum landed. Landings from the ocean gill net fishery ranged from a low of 1,507 lb in 2005 to high of 9,794 lb in 2010, averaging 4,852 lb annually from 2002 to 2011. Ocean gill net trips ranged from 79 (2005) to 186 (2002), averaging 124 trips annually. While the number of ocean gill net trips has remained stable around the mean in recent years, both the landings and CPUEs have increased in recent years. Annual CPUEs in the ocean gill net fishery have ranged from a high of 63 in 2010 to a low of 14 in 2002. During the time period of 2007-2011, CPUEs increased 67.0% as compared to 2002-2006 (Figure 6.35). Ocean gill net trips landed an average of 40 lb of black drum per trip from 2002 to 2011.

The ocean trawl fishery contributed 4.2% (range of 0.8-18.0%) of the marketable black drum landings (Table 6.14). In 2005, 8,100 lb of black drum were landed, marking the fishery's largest contribution (18%) since 2002. Landings again peaked in 2007 at 9,248 lb and fell 85.9% to a 10-year low of 586 lb in 2011. On average 4,161 lb of black drum were landed annually from 2002 to 2011. Ocean trawl trips have fluctuated over time, ranging from four (2011) to 46 (2003). Trends in CPUE have followed trends in landings, with the exception of 2011 where 586 lb of black drum were landed from four trips (CPUE=147; Figure 6.35). Ocean trawl trips averaged 167 lb of black drum from 2002 to 2011.

Management Issues

The North Carolina 2011 stock status report currently lists black drum as unknown. A stock assessment has not been completed for black drum. The ASMFC formed a Black Drum Working Group in 2011 tasked with compiling data on the status of black drum from New Jersey to Florida. General trends in the fishery-dependent and independent data sources and the feasibility of developing a coastwide stock assessment were determined. The Working Group expressed concern that, although the stock has generally appeared healthy throughout time, increased fishing pressure due to more restrictive regulations on other species may negatively impact the stock. Concern for the stock has also been expressed coastwide because fishing effort has increased on the stock since the 1980s and the majority of black drum harvested are young, potentially juvenile fish. In November 2011, the ASMFC accepted the Working Group's recommendations and voted to initiate the FMP and a stock assessment concurrently. A Public Information Document was released in May 2012, outlining the ASMFC's intent to develop an interstate FMP for black drum and soliciting public input regarding issues to include in the draft FMP. North Carolina's public scoping meeting was held July 9, 2012 at the North Carolina Division of Marine Fisheries Central District Office in Morehead City. The Commission's South Atlantic/Federal Fisheries Management Board approved the Draft FMP on October 25, 2012. Public meetings will be held in early 2013. Final management options will be chosen by ASMFC during the Commission's 2013 Spring Meeting.

Currently, in North Carolina there are no regulations specific to black drum. North Carolina is the only state from New Jersey through Florida with no commercial or recreational regulations for this species. However, several regulations indirectly impact the harvest of small black drum. Bycatch Reduction Devices (BRDs) were required in all shrimp trawls in the fall of 1992 by proclamation (and by the consent of the NCMFC (15A NCAC 3J .0104). Since 1991, area restrictions and incidental finfish limits taken by shrimp and crab trawls in inside waters limit these gears from having no more than 500 pounds of finfish from December 1 through February 28 and 1,000 lb of finfish from March 1 to November 30 (15A NCAC 3J .0104(a)). Minimum mesh size restrictions in shrimp trawls (1 ½ inch tailbag) have been in effect since 1991 as well as for flynets (4 inch main body, 3 inch extension, and 1 ¾ inch tail bag) since 1997 (Proclamation FF-26-92), and the closure of ocean waters south of Cape Hatteras to the South Carolina state line for flynets in 1994 (Proclamation FF-18-94), all of which may indirectly affect the fishing impact on black drum and change the size and age distributions of the harvest.

Table 6.13 North Carolina black drum (*Pogonais cromis*) expanded length frequency of bait samples for selected fisheries, 2002-2011; n=number of fish measured, en=expanded number of individuals in catches sampled, and number=estimated number of individuals in the landings.

				Length (in)					
Fishery/Year	n	en	number	7	8	9	10	11	12
Estuarine gill net				-	-	-	-	-	-
2002	0	0	7	-	-	-	-	-	-
2003	0	0	3	-	-	-	-	-	-
2004	0	0	6	-	-	-	-	-	-
2005	0	0	3	-	-	-	-	-	-
2006	4	4	523	-	-	75.0	25.0	-	-
2007	0	0	0	-	-	-	-	-	-
2008	0	0	0	-	-	-	-	-	-
2009	0	0	3	-	-	-	-	-	-
2010	0	0	0	-	-	-	-	-	-
2011	0	0	0						
Flounder pound net									
2002	0	0	-	-	-	-	-	-	-
2003	0	0	-	-	-	-	-	-	-
2004	0	0	-	-	-	-	-	-	-
2005	0	0	-	-	-	-	-	-	-
2006	0	0	-	-	-	-	-	-	-
2007	0	0	-	-	-	-	-	-	-
2008	0	0	-	-	-	-	-	-	-
2009	0	0	-	-	-	-	-	-	-
2010	0	0	-	-	-	-	-	-	-
2011	0	0	-	-	-	-	-	-	-
Sciaenid pound net									
2002	0	0	-	-	-	-	-	-	-
2003	0	0	-	-	-	-	-	-	-
2004	0	0	-	-	-	-	-	-	-
2005	0	0	-	-	-	-	-	-	-
2006	0	0	-	-	-	-	-	-	-
2007	0	0	-	-	-	-	-	-	-
2008	0	0	-	-	-	-	-	-	-
2009	0	0	-	-	-	-	-	-	-
2010	0	0	-	-	-	-	-	-	-
2011	0	0	-	-	-	-	-	-	-
Long haul									
2002	0	0	7,197	-	-	-	-	-	-
2003	0	0	4,897	-	-	-	-	-	-
2004	0	0	259	-	-	-	-	-	-
2005	0	0	264	-	-	-	-	-	-
2006	0	0	5,432	-	-	-	-	-	-
2007	0	0	5,711	-	-	-	-	-	-
2008	0	0	4,701	-	-	-	-	-	-
2009	0	0	1,664	-	-	-	-	-	-
2010	1	55	1,192	-	-	-	-	-	-
2011	0	0	615	-	-	-	-	-	-

Table 6.13 (Continued)

Fishery/Year	n	en	number	Length (in) 7	8	9	10	11	12
Ocean gill net									
2002	0	0	65	-	-	-	-	-	-
2003	0	0	5	-	-	-	-	-	-
2004	0	0	0	-	-	-	-	-	-
2005	0	0	0	-	-	-	-	-	-
2006	1	3	0	-	100.0	-	-	-	-
2007	0	0	0	-	-	-	-	-	-
2008	0	0	40	-	-	-	-	-	-
2009	0	0	0	-	-	-	-	-	-
2010	0	0	155	-	-	-	-	-	-
2011	1	8	67	-	-	-	-	-	-
Ocean Trawl									
2002	0	0	0	-	-	-	-	-	-
2003	0	0	0	-	-	-	-	-	-
2004	0	0	0	-	-	-	-	-	-
2005	0	0	3	-	-	-	-	-	-
2006	0	0	0	-	-	-	-	-	-
2007	0	0	0	-	-	-	-	-	-
2008	0	0	0	-	-	-	-	-	-
2009	0	0	0	-	-	-	-	-	-
2010	0	0	0	-	-	-	-	-	-
2011	0	0	0	-	-	-	-	-	-

Table 6.14. North Carolina commercial landings of marketable black drum (*Pogonais cromis*) by fishery, 2002-2011, includes landings (pounds), value (thousands of dollars) and contribution of fishery to North Carolina black drum landings.

	YEAR									
Fishery	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Estuarine gill net										
Pounds	209,346	109,183	37,260	28,399	68,041	107,358	205,675	118,544	41,323	38,073
Value ($)	$46,557	$26,934	$8,359	$7,585	$20,739	$36,516	$71,664	$51,608	$19,671	$17,984
% State	42.1	73.4	59.7	63.1	54.3	72.4	68.1	79.6	59.7	68.2
Flounder pound net										
Pounds	239,782	8,913	13,027	2,899	33,380	5,957	69,451	13,212	9,951	8,090
Value ($)	$53,338	$2,199	$2,931	$777	$10,037	$2,028	$23,910	$5,750	$4,694	$3,806
% State	48.2	6.0	20.9	6.4	26.7	4.0	23.0	8.9	14.4	14.5
Sciaenid Pound Net										
Pounds	1,548	644	363	179	346	252	1,574	214	923	340
Value ($)	$344	$159	$82	$48	$104	$86	$541	$93	$443	$161
% State	0.3	0.4	0.6	0.4	0.3	0.2	0.5	0.1	1.3	0.6
Long Haul										
Pounds	9,007	15,327	765	675	6,944	12,207	8,493	7,465	2,767	1,612
Value ($)	$2,003	$3,781	$172	$181	$2,089	$4,155	$2,971	$3,266	$1,319	$763
% State	1.8	10.3	1.2	1.5	5.5	8.2	2.8	5.0	4.0	2.9
Ocean Gill Net										
Pounds	2,613	4,451	4,707	1,507	5,519	7,068	2,236	5,088	9,794	5,535
Value ($)	$581	$1,098	$1,041	$474	$1,752	$2,404	$767	$2,202	$4,584	$2,569
% State	0.5	3.0	7.5	3.3	4.4	4.8	0.7	3.4	14.2	9.9
Ocean Trawl										
Pounds	3,840	3,368	3,338	8,100	2,195	9,248	7,660	1,133	2,142	586
Value ($)	$854	$831	$746	$2,181	$689	$3,121	$2,680	$495	$991	$277
% State	0.8	2.3	5.3	18.0	1.8	6.2	2.5	0.8	3.1	1.1
Other Fisheries										
Pounds	31,344	6,900	2,986	3,229	8,789	6,141	6,910	3,339	2,294	1,571
Value ($)	$6,905	$1,702	$662	$945	$2,667	$2,010	$2,404	$1,461	$1,103	$741
% State	6.3	4.6	4.8	7.2	7.0	4.1	2.3	2.2	3.3	2.8
All (2002-2011)										
Pounds	497,479	148,785	62,445	44,989	125,214	148,231	301,998	148,994	69,194	55,807
Value ($)	$110,582	$36,704	$13,993	$12,192	$38,076	$50,320	$104,937	$64,875	$32,805	$26,301

Source: North Carolina Division of Marine Fisheries commercial landings database.
Long Haul includes: gear code 030 or 025 and non-ocean waters.
Flounder Pound Net includes: gear code 275, months October, November, December for Counties Beaufort, Carteret, Dare, Hyde, Tyrrell, and month September for Counties Beaufort, Carteret, Hyde and Tyrrell.
Sciaenid Pound Net includes: gear code 275, months May through August for Counties Dare and Hyde, and month September for Dare.
Estuarine Gill Net includes: gear code 425, 426, 427, 470, 475, 480 and all non-ocean waters.
Ocean Gill Net includes: gear code 425, 426, 427, 470, 475, 480 and Atlantic Ocean.
Ocean Trawl includes: gear codes 210 and 230, Atlantic Ocean, and months January through May and September through December.

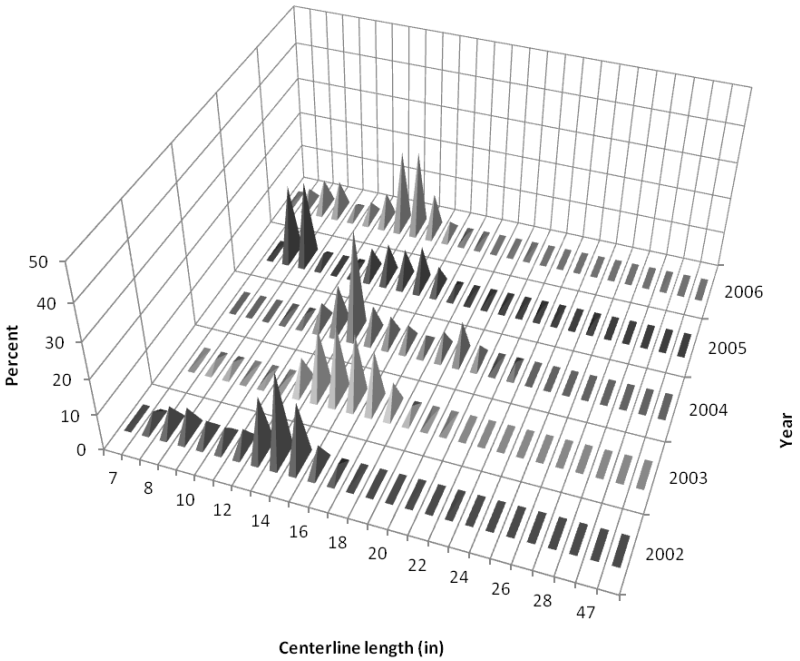
Table 6.15. North Carolina black drum (*Pogonais cromis*) landings (weight - pounds, number individuals), marketable landings per trip (CPUE weight -lb), and total number of trips, by type for selected commercial fisheries, 2002-2011.

		Landings									
		Weight					Number				# Trips
		Total	Market		Bait	%Bait	Total	Market	Bait	%Bait	
Fishery	Year	Landed (pounds)	Landed (pounds)	CPUE	Landed (pounds)		Landed	Landed	Landed		
Estuarine gill net											
	2002	209,355	209,346	22	9	<1	104,296	104,289	7	<1	9,373
	2003	109,185	109,183	17	2	<1	35,305	35,302	3	<1	6,608
	2004	37,264	37,260	12	4	<1	11,641	11,635	6	<1	3,225
	2005	28,401	28,399	10	2	<1	14,111	14,108	3	<1	2,774
	2006	68,359	68,041	11	318	<1	44,494	43,971	523	<1	5,991
	2007	107,358	107,358	15	0	<1	57,097	57,097	0	<1	7,357
	2008	205,675	205,675	21	0	<1	111,862	111,862	0	<1	9,758
	2009	118,546	118,544	15	2	<1	45,171	45,168	3	<1	8,003
	2010	41,323	41,323	12	0	<1	13,393	13,393	0	<1	3,487
	2011	38,073	38,073	11	0	<1	22,297	22,297	0	<1	3,477
Sciaenid pound net											
	2002	1,548	1,548	31	0	0	2,350	2,350	-	0	50
	2003	644	644	26	0	0	183	183	-	0	25
	2004	363	363	13	0	0	-	-	-	0	29
	2005	179	179	11	0	0	31	31	-	0	16
	2006	346	346	8	0	0	290	290	-	0	45
	2007	252	252	8	0	0	76	76	-	0	32
	2008	1,574	1,574	33	0	0	505	505	-	0	48
	2009	214	214	10	0	0	50	50	-	0	22
	2010	923	923	13	0	0	216	216	-	0	72
	2011	340	340	8	0	0	343	343	-	0	44
Long haul											
	2002	9,079	9,008	77	71	<1	7,300	7,197	103	1	117
	2003	15,348	15,330	176	18	<1	4,959	4,897	62	1	87
	2004	765	765	17	0	0	259	259	0	0	45
	2005	677	675	23	2	<1	269	264	5	2	29
	2006	6,945	6,945	45	0	0	5,432	5,432	0	0	155
	2007	12,209	12,209	115	0	0	5,711	5,711	0	0	106
	2008	8,497	8,495	79	2	<1	4,706	4,701	5	<1	107
	2009	7,466	7,466	95	0	0	1,664	1,664	0	0	79
	2010	2,905	2,768	40	137	5	1,502	1,192	310	21	70
	2011	1,612	1,612	31	0	0	615	615	0	0	52
Ocean gill net											
	2002	2,642	2,613	14	29	1	213	148	65	31	186
	2003	4,453	4,451	30	2	<1	1,483	1,478	5	0	148
	2004	4,707	4,707	50	0	0	131	131	0	0	94
	2005	1,507	1,507	19	0	0	1,845	1,845	0	0	79

Table 6.15 (Continued)

		Landings									
		Weight					Number				# Trips
		Total	Market		Bait	%Bait	Total	Market	Bait	%Bait	
Fishery	Year	Landed (pounds)	Landed (pounds)	CPUE	Landed (pounds)		Landed	Landed	Landed		
	2006	5,519	5,519	39	0	0	565	565	0	0	142
	2007	7,068	7,068	57	0	0	1,138	1,138	0	0	124
	2008	2,254	2,236	20	18	1	732	692	40	5	113
	2009	5,088	5,088	61	0	0	648	648	0	0	83
	2010	9,862	9,794	63	68	1	1,243	1,088	155	12	156
	2011	5,548	5,535	49	13	<1	4,383	4,316	67	2	114
Ocean Trawl											
	2002	3,840	3,840	98	0	0	640	640	0	0	39
	2003	3,368	3,368	73	0	0	979	979	0	0	46
	2004	3,338	3,338	139	0	0	190	190	0	0	24
	2005	8,102	8,100	386	2	<1	16,464	16,461	3	<1	21
	2006	2,195	2,195	56	0	0	149	149	0	0	39
	2007	9,248	9,248	250	0	0	556	556	0	0	37
	2008	7,660	7,660	383	0	0	1,051	1,051	0	0	20
	2009	1,133	1,133	60	0	0	236	236	0	0	19
	2010	2,142	2,142	74	0	0	41	41	0	0	29
	2011	586	586	147	0	0	-	-	-	-	4
Flounder pound net											
	2002	239,782	239,782	206	0	0	-	-	-	0	1,156
	2003	8,913	8,913	25	0	0	-	-	-	0	348
	2004	13,027	13,027	27	0	0	-	-	-	0	482
	2005	2,899	2,899	13	0	0	-	-	-	0	224
	2006	33,380	33,380	59	0	0	-	-	-	0	559
	2007	5,957	5,957	16	0	0	-	-	-	0	370
	2008	69,451	69,451	89	0	0	-	-	-	0	781
	2009	13,212	13,212	34	0	0	-	-	-	0	394
	2010	9,951	9,951	21	0	0	-	-	-	0	473
	2011	8,090	8,090	18	0	0	-	-	-	0	449
Fisheries combined											
	2002	226,464	226,355	23	109	<1	114,799	114,624	175	<1	9,765
	2003	132,998	132,976	19	22	<1	42,909	42,839	70	<1	6,914
	2004	46,437	46,433	14	4	<1	12,221	12,215	6	<1	3,417
	2005	38,866	38,860	13	6	<1	32,720	32,709	11	<1	2,919
	2006	83,364	83,046	13	318	<1	50,930	50,407	523	1	6,372
	2007	136,135	136,135	18	0	0	64,578	64,578	0	0	7,656
	2008	225,660	225,640	22	20	<1	118,856	118,811	45	<1	10,046
	2009	132,447	132,445	16	2	<1	47,769	47,766	3	<1	8,206
	2010	57,156	56,951	15	205	<1	16,395	15,930	465	3	3,814
	2011	46,159	46,146	13	13	<1	27,638	27,571	67	<1	3,691

Source: NCDMF commercial landings database and NCDMF fishery biological database. Bait quantity estimate obtained from ratio of market to bait in fish house samples. Does not include discards at sea.



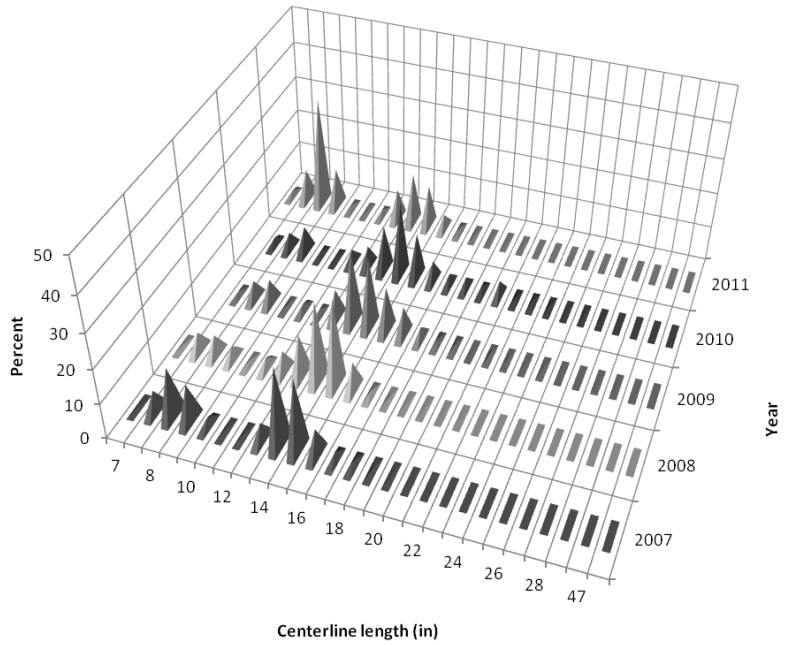


Figure 6.29. North Carolina estuarine gill net fishery weighted length frequency distributions for marketable black drum (*Pogonais cromis*), 2002-2011.

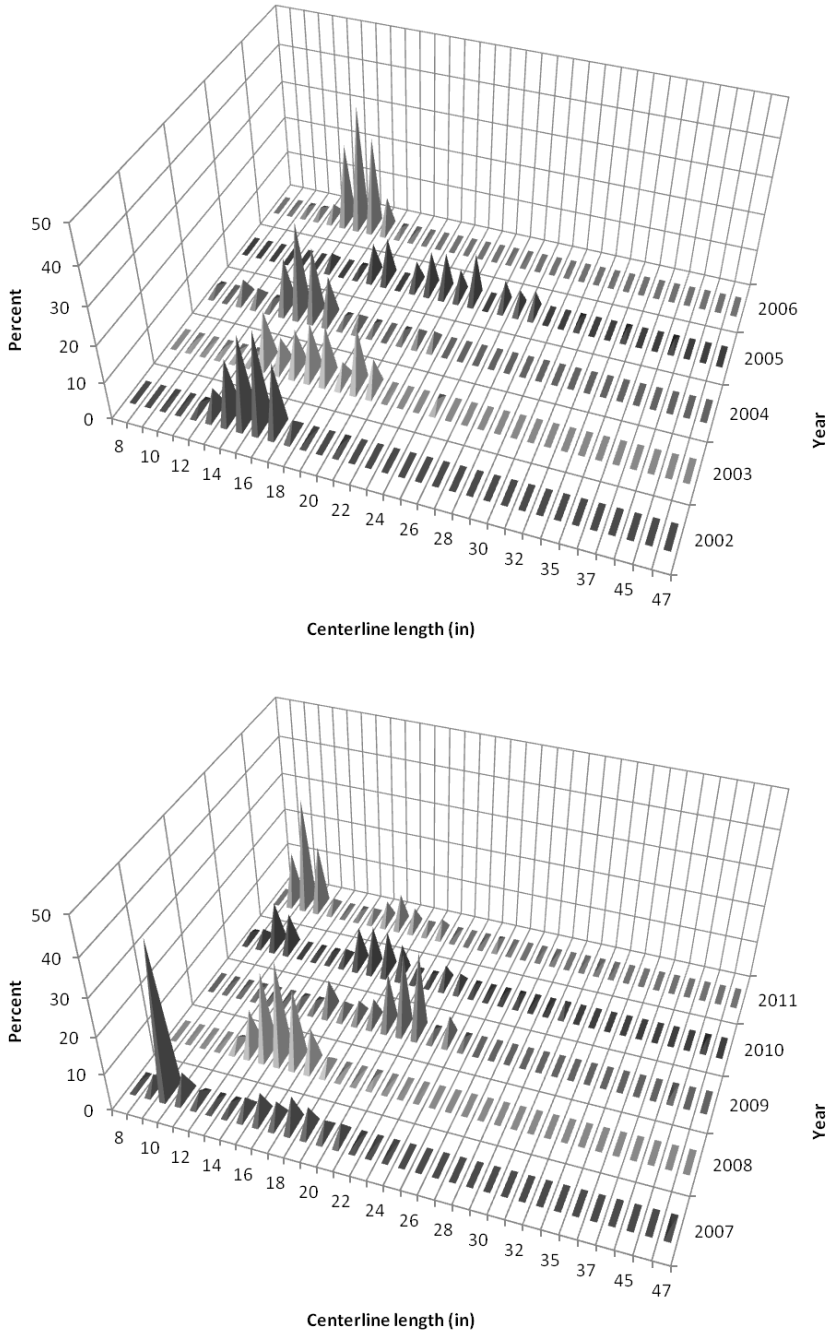


Figure 6.30. North Carolina estuarine pound net fishery weighted length frequency distributions for marketable black drum (*Pogonais cromis*), 2002-2011.

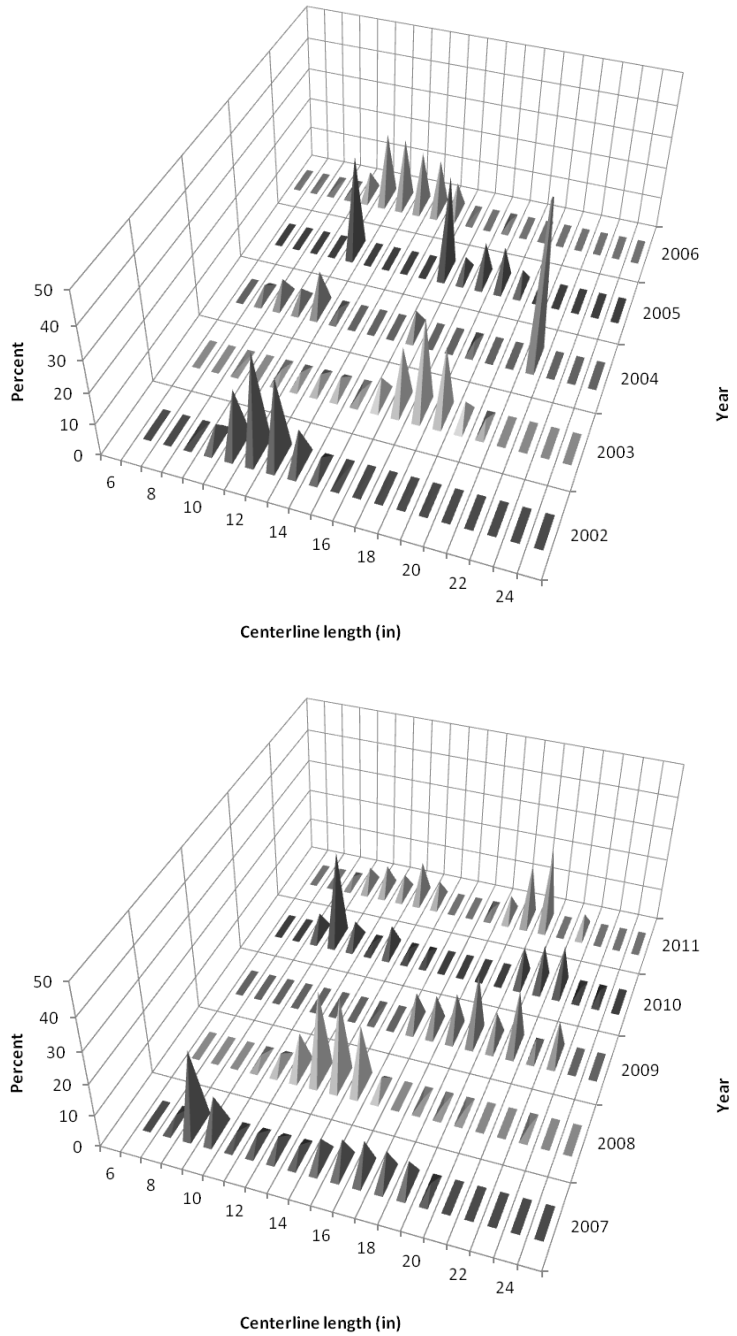


Figure 6.31. North Carolina estuarine long haul seine fishery weighted length frequency distributions for marketable black drum (*Pogonais cromis*), 2002-2011.

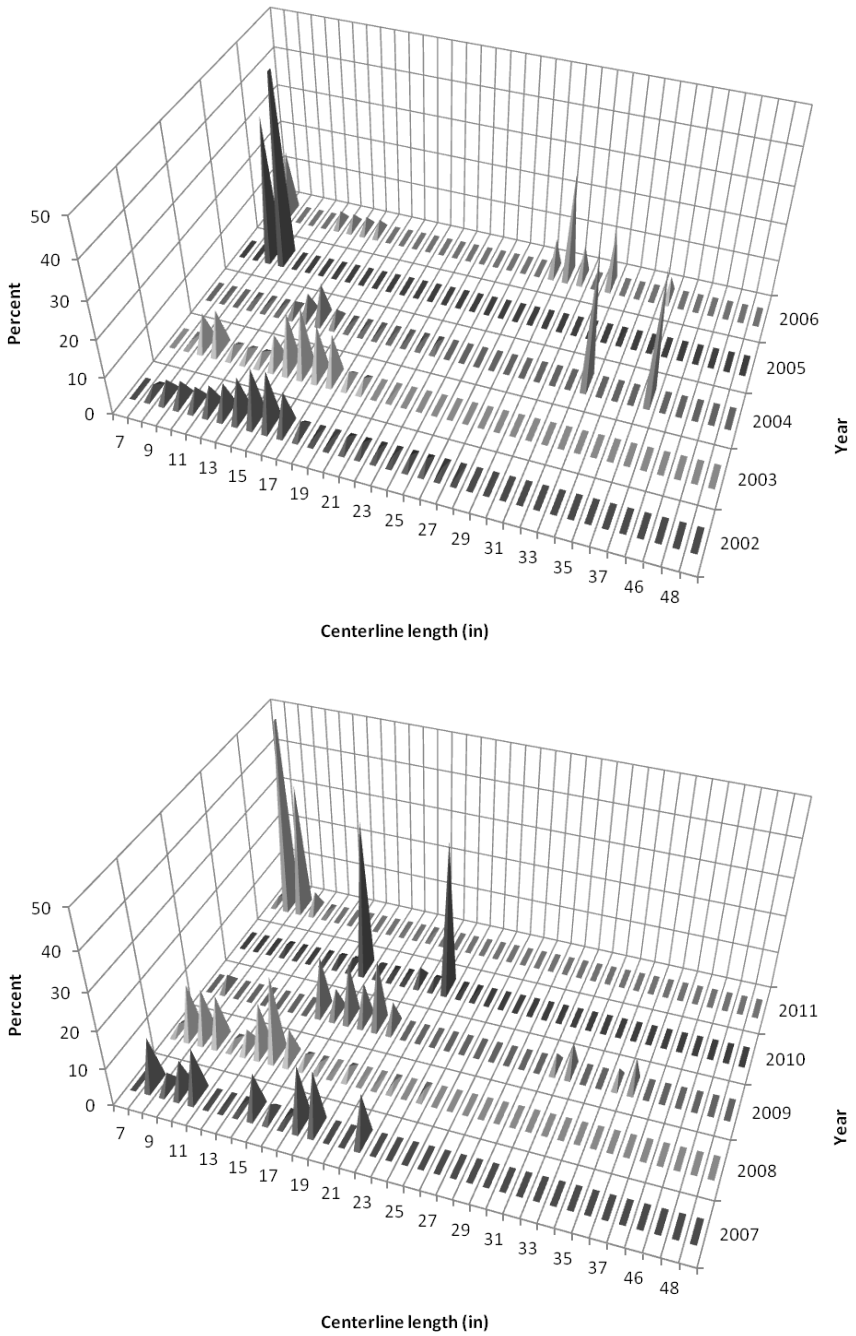
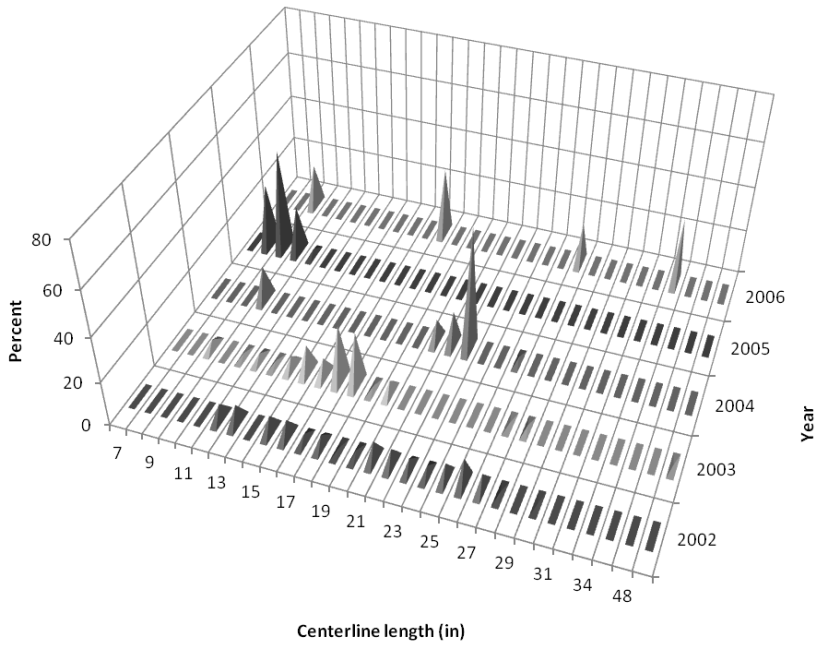


Figure 6.32. North Carolina ocean gill net fishery weighted length frequency distributions for marketable black drum (*Pogonais cromis*), 2002-2011.



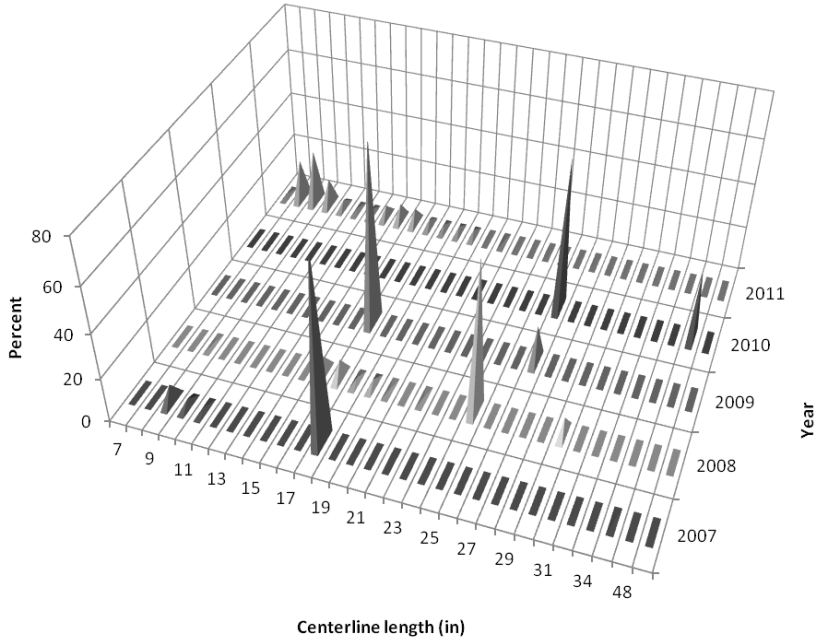


Figure 6.33. North Carolina ocean trawl fishery weighted length frequency distributions for marketable black drum (*Pogonais cromis*), 2002-2011.

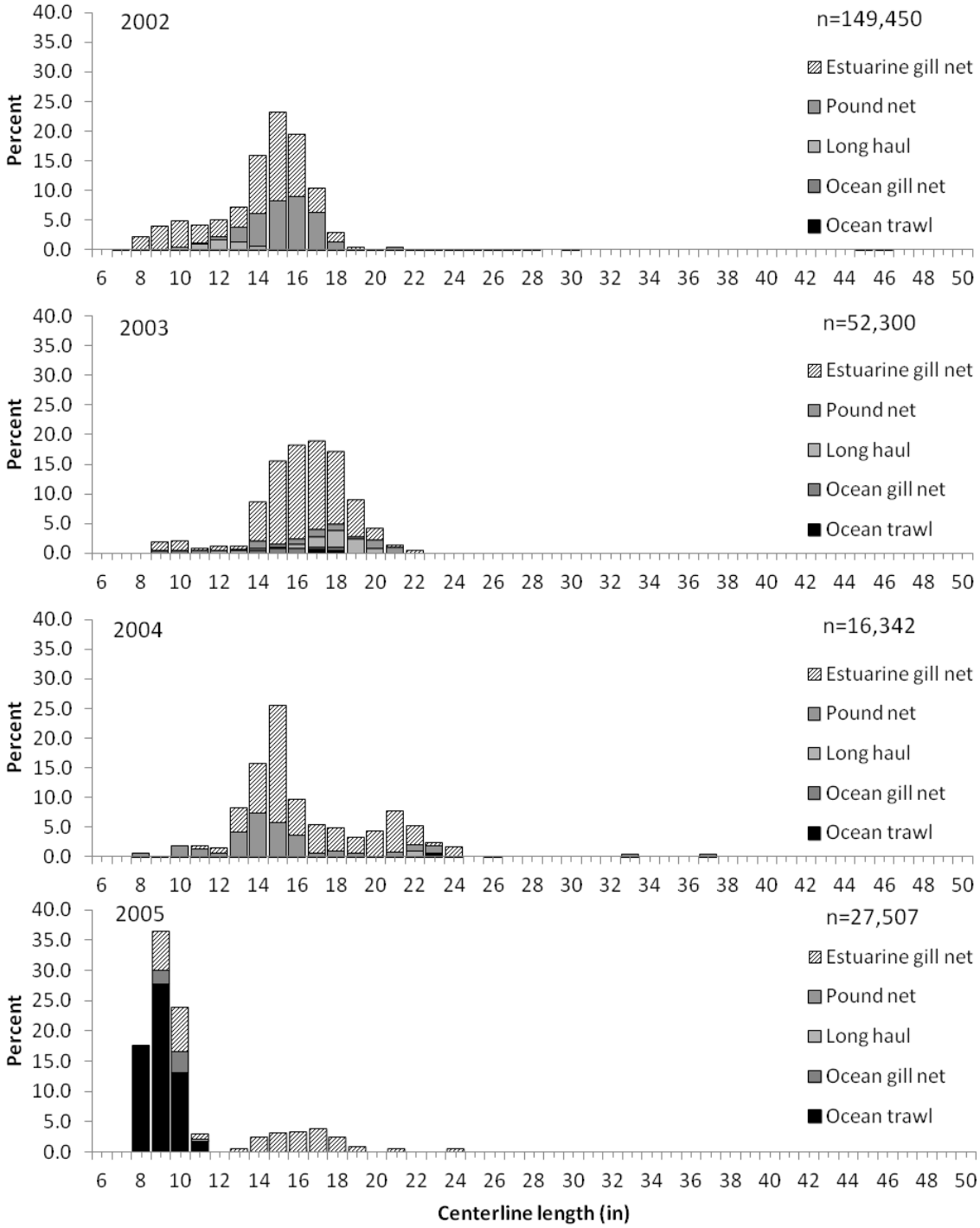


Figure 6.34. North Carolina commercial fishery weighted length frequency distributions for marketable black drum (*Pogonais cromis*), 2002-2011.

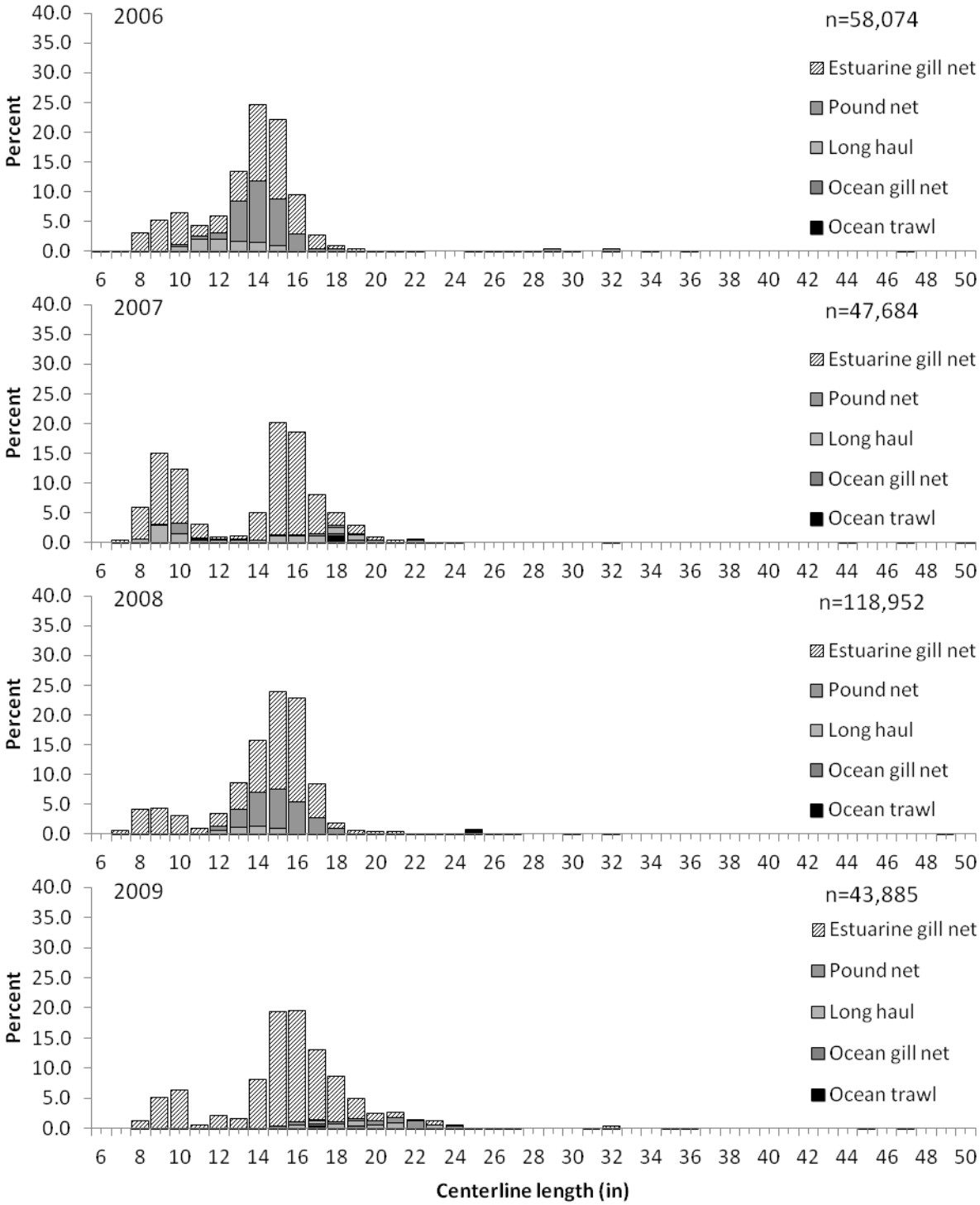


Figure 6.34 (Continued).

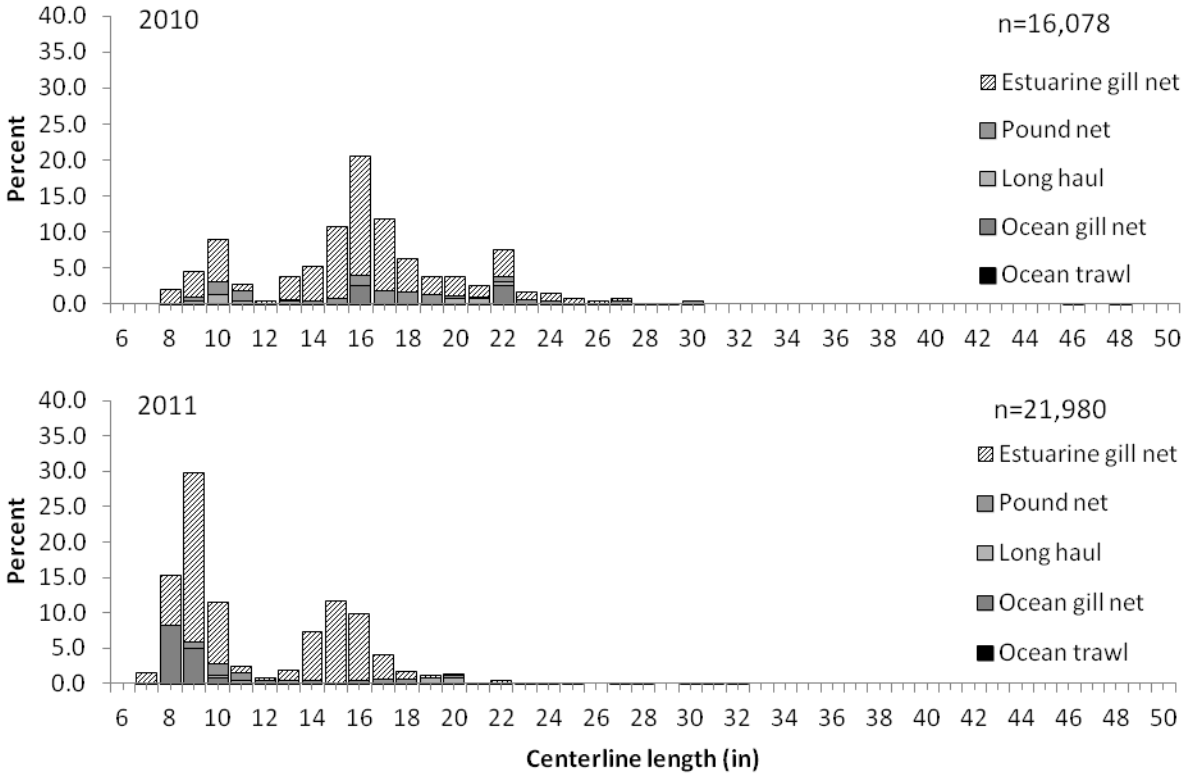


Figure 6.34 (Continued).

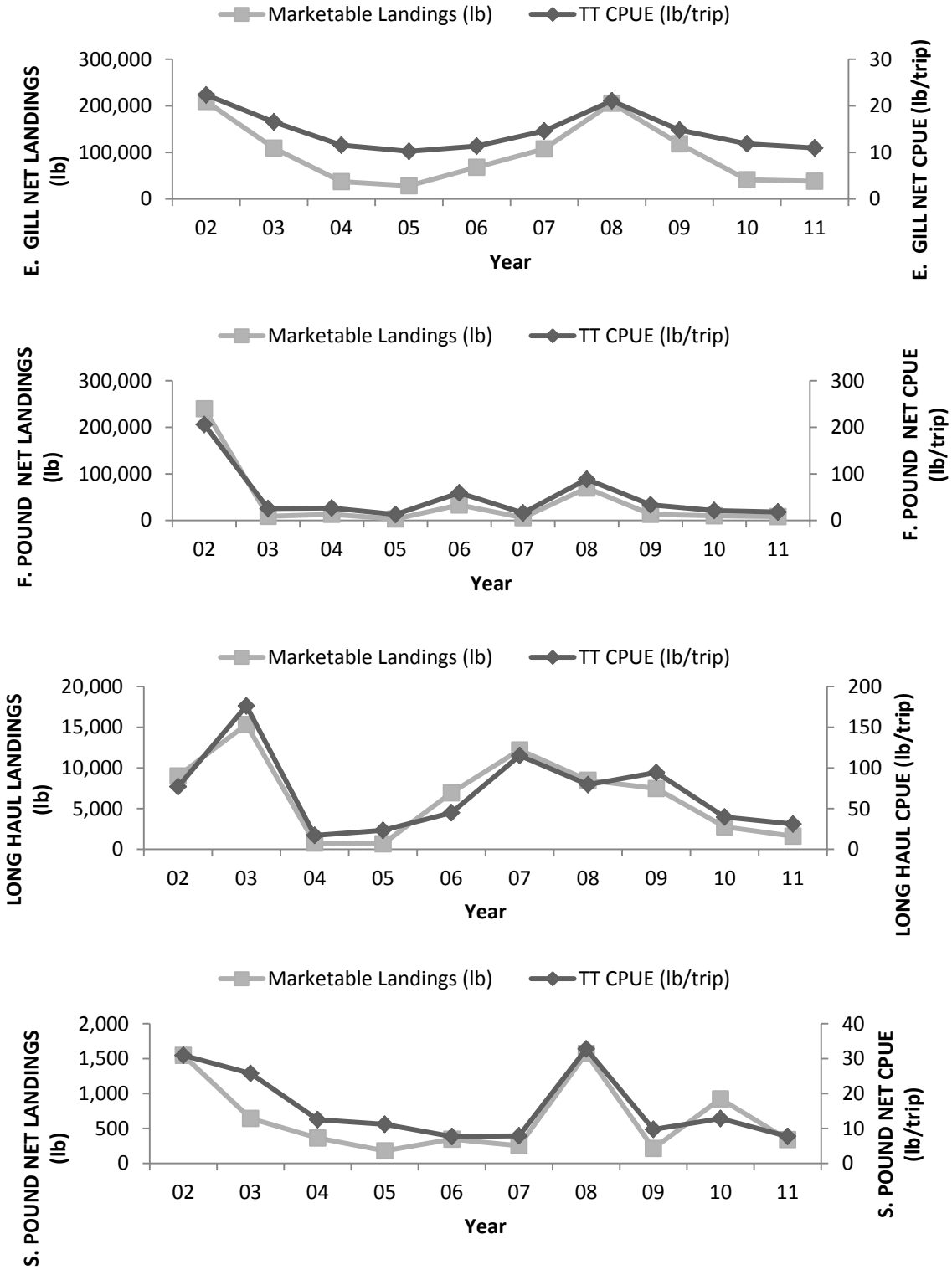


Figure 6.35. North Carolina black drum (*Pogonais cromis*) annual commercial landings (pounds) and mean CPUE (landed catch per trip, lb) for estuarine gill net, sciaenid pound net and long haul seine fisheries, 2010-2011.

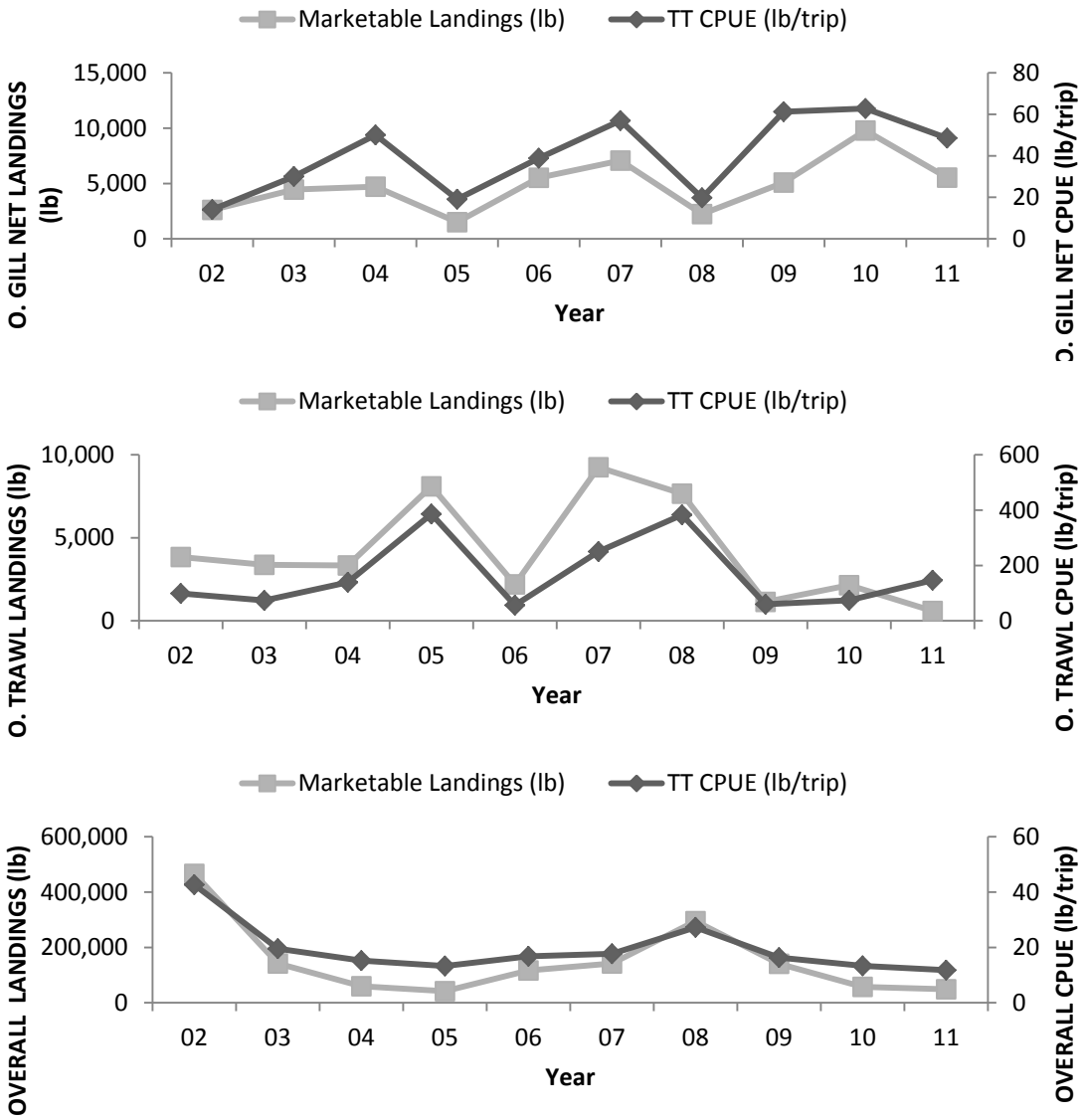


Figure 6.35 (Continued).

KINGFISHES

Background

The kingfishes are members of the family Sciaenidae, commonly known as drums, and include three species: southern (*Menticirrhus americanus*), Gulf (*M. littoralis*), and northern kingfishes (*M. saxatilis*). The distribution of the kingfishes varies by species and extends from Gulf of Maine southward to Sao Paulo, Brazil. The area of greatest abundance of kingfishes varies by species. Southern and Gulf kingfishes are most common south of Cape Lookout from North Carolina to Florida (Bearden 1963, Smith and Wenner 1985). Northern kingfish are most common north of North Carolina. Spawning occurs from spring through fall some distance from shore in continental shelf waters (Bearden 1963, Hoese 1973). Recruitment of young-of-the-year to estuarine and nearshore ocean waters occurs over an extended period but generally peaks in the spring (Bearden 1963, Smith and Wenner 1985, Harding and Chittenden 1987). Most individuals mature during their second summer (age 1), at lengths of 13-24 cm (5-9 inches) for males and 19-29 cm (7-11 inches) for females (Bearden 1963, Smith and Wenner 1985, Harding and Chittenden 1987, Collier in prep).

Kingfishes are primary harvested in the fall/winter ocean sink net fishery off North Carolina. The fishery coincides with the seasonal migration of kingfishes. During the fall, kingfishes migrate offshore and southward. During the spring, kingfishes migrate inshore and northward. Kingfishes are also exploited by shrimp trawls and ocean trawls (flynet). The ocean trawl harvest decreased since the fishery was restricted to north of Cape Hatteras.

Length Distribution

Fishery dependent sampling for lengths was conducted in the long haul seine fishery, pound net fishery, ocean sink net fishery, ocean trawl fishery and the estuarine gill net fishery. For each North Carolina fishery, annual length distributions (reported in total length TL) weighted by commercial landings are presented for southern kingfish. Kingfish are not commonly assigned market grades on trip tickets at most fish houses and are often categorized as “mixed”. Other market grades may be entered for trip tickets submitted electronically. However, due to the limited number of biological fish house samples, expanded length frequencies could not be generated for the other market grades. Expanded length frequencies are only presented for the “mixed” market grade.

Weighted length frequency distributions for southern kingfish landed in the estuarine gill net fishery in 2002-2011 ranged from 7.5 to 18.5 inches (Figure 6.35). The annual minimum length ranged from 7.5 to 11 inches. The annual maximum length ranged from 15 to 18.5 inches. The annual modal length frequency ranged from 10.5 to 13 inches. Overall, the majority of southern kingfish landed in the estuarine gill net fishery were 10 to 13 inches.

Southern kingfish landed in the pound net fishery (flounder and sciaenid combined) in 2002-2011 had weighted length frequency distributions ranging from 7 to 18 inches (Figure 6.36).

Minimum lengths ranged from 7 to 9.5 inches. Maximum lengths ranged from 13.5 to 18 inches. Modal length frequency ranged from 9 to 13.5 inches. Overall, the majority of southern kingfish landed in the pound net fishery range in size of 9 to 11.5 inches. The sample size for southern kingfish from the pound net fishery is minimal. Additional samples are needed to more fully characterize the pound-net fishery.

Southern kingfish landed in the long haul seine fishery in 2002-2011 had weighted length frequency distributions ranging from 7 to 18 inches (Figure 6.37). Minimum lengths ranged from 7 to 8 inches. Maximum lengths ranged from 14 to 18 inches. Modal length frequency distributions ranged from 9.5 to 12 inches. The overall size distribution of southern kingfish shifted to smaller fish from 2002 to 2007. Since 2007, the size distribution was larger especially in 2010 and 2011. A majority of southern kingfishes were 9.5 to 11 inches.

Annual weighted length frequency distributions for southern kingfish in the ocean gill net fishery ranged from 7 to 17.5 inches (Figure 6.38). Minimum lengths ranged from 7 to 9 inches. Maximum lengths ranged from 14.5 to 17.5 inches. Most years had a modal length frequency of 11 inches. In 2002, the modal length was 12 inches. Southern kingfish between 10.5 and 12 inches made up the majority of the catch (79%).

Weighted length frequencies for southern kingfish landed in the ocean trawl fishery in 2002-2011 ranged 7.5 to 16.5 inches (Figure 6.39). Minimum lengths ranged from 7.5 to 10.5 inches. Maximum lengths ranged from 14 to 16.5 inches. Due to small sample sizes it is difficult to adequately characterize southern kingfish length frequency distributions for the ocean trawl fishery.

The overall length distribution for marketable size southern kingfish varied only slightly from year to year in 2002-2011. The modal size for southern kingfish was 11 inches except in 2002, 2006, and 2011 (Figure 6.40). The modal size during these years was slightly higher, ranging from 11.5 to 12 inches. The majority of the fish were harvested in the ocean gill net fishery.

Due to small sample sizes it is not possible to characterize the length frequency distributions for southern kingfish sold as bait in each of the fisheries. Usually, one or fewer samples were measured per year. Therefore, the samples did not likely represent the overall kingfish length distribution or kingfish species composition for bait.

Landings and CPUE

The long haul seine fishery accounted for 1.7 to 7.7% of the marketable North Carolina kingfish landings in 2002-2011 (Table 6.16). Landings and CPUE (weight and number) for kingfish by fishery are presented in Table 6.17 and Figure 6.41 (weight only). Long haul seine landings exhibited an increase from 2002 to 2003. From 2004 to 2007, there was a slight decreasing trend in landings and CPUE. Annual landings alternated between high landings and CPUEs in 2008 and 2010 and moderate values in 2009 and 2011.

The sciaenid pound net fishery is a minor contributor to the marketable North Carolina kingfish landings, 0.1% or less in all years (Table 6.16). The landings and CPUEs had a peak in 2007 and then decreased in 2008 and 2009. Since 2009, there was an increasing trend in landings and CPUEs (Table 6.17 and Figure 6.41).

Ocean gill nets were typically the single largest contributor to landings of marketable kingfish over the last 10 years. Annual contributions fluctuated from a high of 75.7% in 2003 to a low of 48.2% in 2008 (Table 6.16). Ocean gill net landings exhibited a general upward trend from 2005 to 2010 followed by a dramatic decline in landings and CPUE (Figure 6.41). Essentially all kingfish taken in this fishery were marketable.

The ocean winter trawl fishery is a minor contributor to the marketable North Carolina kingfish landings ranging from 0.1% to 6.0% (Table 6.16). The ocean trawl landings and CPUEs increased from a low in 2003 to a high in 2008 (Table 6.17 and Figure 6.41). Since 2008 the ocean trawl landings of kingfish declined, reaching an all time low in 2011.

The estuarine gill net fishery's annual contribution to weakfish landings was variable, ranging from 5.2% to 23.2% of the total (Table 6.1616). There was a slight increasing trend in landings and CPUE of kingfish in the estuarine gill net fishery, including two notable spikes in 2008 and 2011 (Figure 6.41). Essentially all kingfish taken in this fishery were marketable.

Annual landings and CPUEs for weakfish combined across these five fisheries (weighted by respective fishery landings,) are presented in Figure 6.41. The annual landings and CPUEs declined from 2003 to 2005 and then generally increased from 2005 to 2010. The 2011 annual landings and CPUE were below the 10 year average.

Management Issues

The North Carolina 2012 stock status report described the kingfishes stock status as unknown. No stock assessment has been approved for kingfishes although trends in abundance were summarized for the ASMFC South Atlantic Board. The age-specific trends for southern kingfish in the SEAMAP fishery independent survey indicated the population of southern kingfish was increasing in the South Atlantic Bight (SAB) and overall trends in the Pamlico Sound Survey indicated the population increased in North Carolina from 2002 to 2005 (NCDMF 2007). Sufficient data were lacking to determine trends in population abundance for Gulf and northern kingfishes based on the SEAMAP trawl survey. Additionally, commercial and recreational landings indicated increasing trends in landings until 2011.

A coastwide FMP has not been initiated for kingfishes. However, kingfishes are included in the North Carolina IJA FMP because past research indicated a single unit stock in the South Atlantic for southern kingfish (Smith and Wenner 1985). Southern kingfish are generally the indicator for the complex because more data are available for that species compared to Gulf and northern kingfishes. New research completed on fishery management plan research recommendation indicates stock structure in southern kingfish along the Atlantic Coast is based

on morphological markers and shape and growth patterns (Collier in prep). Therefore, state management might be most appropriate for kingfishes to address regional fisheries and stock abundance. The goal of the 2007 NCDMF Kingfish FMP was to determine the status of the stock and ensure the long-term sustainability for the kingfishes stock in North Carolina (NCDMF 2007). The objectives were to:

- Develop an objective management program that provides conservation of the resource and sustainable harvest in the fishery.
- Ensure that the spawning stock is of sufficient capacity to prevent recruitment overfishing.
- Address socio-economic concerns of all user groups.
- Restore, improve, and protect critical habitats that affect growth, survival, and reproduction of the North Carolina stock of kingfishes.
- Evaluate, enhance, and initiate studies to increase our understanding of kingfishes' biology and population dynamics in North Carolina.
- Promote public awareness regarding the status and management of the North Carolina kingfishes stock.

The NCDMF Kingfish FMP recommended proclamation authority for the NCDMF Director, established triggers for reinitiating the fishery management plan, and amended a current rule (NCDMF 2007). The proclamation authority gave the Director authority to specify season, area, quantity, means/method, and size for the taking of kingfishes. The triggers that could be used to specify a management restriction for kingfishes were based on biological monitoring, landings data, and survey data. The amended rule was changed so that the wording was consistent with the intent of the regulation. With no biological reference points or harvest limits, it is difficult to determine the sustainability of the kingfish stocks.

Currently, no regulations directly govern fishing practices for kingfishes in North Carolina. However, several regulations indirectly impact the harvest of small kingfishes. The regulation (15A NCAC 3M .0162) limiting the scrapfish (bait) catch to 5,000 lbs per vessel per day had an indirect effect, because the species complex is a bycatch of the scrapfish landed by North Carolina commercial fishing gears. Bycatch Reduction Devices (BRDs) were required in all shrimp trawls in the fall of 1992 by proclamation (and by the consent of the NCMFC (15A NCAC 3J .0104). Since 1991, area restrictions and incidental finfish limits taken by shrimp and crab trawls in inside waters limit these gears from having more than 500 pounds of finfish from December 1 through February 28 and 1,000 pounds of finfish from March 1 to November 30 (15A NCAC 3J .0104(a)). The bycatch of finfish in shrimp and crab trawls cannot exceed the weight of shrimp and crabs combined. An additional 300 lbs of kingfish are allowed in trawls south of Bogue Inlet from December 1 to March 31. Minimum mesh size restrictions in shrimp trawls (1 ½" tailbag) have been in effect since 1991 as well as for flynets (4" main body, 3" extension, and 1 3/4" tail bag) since 1997 (Proclamation FF-26-92), and ocean waters south of Cape Hatteras to the South Carolina state line were closed for flynets in 1994 (Proclamation FF-18-94) These regulations may indirectly affect the fishing impact on kingfishes and change the size and age distributions of the harvest.

Table 6.16 North Carolina commercial landings of marketable kingfishes (*Menticirrhus spp.*) by fishery, 2002-2011, includes landings (pounds), value and contribution of fishery to North Carolina kingfish landings.

	YEAR									
Fishery	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Estuarine gill net										
Pounds	40,398	38,551	29,354	26,538	54,259	57,829	150,501	62,111	57,066	112,779
Value	$39,302	$38,074	$25,476	$24,339	$53,417	$56,422	$133,482	$67,684	$61,856	$120,652
% State	6.50%	5.90%	5.20%	9.00%	9.70%	7.10%	16.30%	8.60%	6.40%	23.20%
Pound Net										
Pounds	107	87	50	191	418	608	247	99	338	395
Value	$104	$86	$43	$175	$411	$592	$219	$108	$367	$423
% State	0.00%	0.00%	0.00%	0.10%	0.10%	0.10%	0.00%	0.00%	0.00%	0.10%
Long Haul										
Pounds	10,766	29,291	28,868	22,739	19,053	20,682	39,008	20,898	45,913	25,256
Value	$10,474	$28,928	$25,070	$20,813	$18,751	$20,129	$34,578	$22,860	$49,795	$27,019
% State	1.70%	4.50%	5.10%	7.70%	3.40%	2.50%	4.20%	2.90%	5.20%	5.20%
Ocean Gill Net										
Pounds	427,910	494,190	379,517	215,016	410,515	577,910	443,859	521,373	669,588	316,492
Value	$416,360	$488,120	$329,569	$196,922	$404,010	$562,400	$393,553	$570,056	$724,733	$338,279
% State	69.00%	75.70%	66.90%	72.60%	73.40%	70.70%	48.20%	72.20%	75.50%	65.00%
Ocean Trawl										
Pounds	9,239	3,785	4,515	8,346	10,530	23,566	55,064	21,129	28,945	276
Value	$9,808	$4,053	$3,872	$8,027	$10,337	$22,544	$47,129	$23,125	$29,456	$295
% State	1.50%	0.60%	0.80%	2.80%	1.90%	2.90%	6.00%	2.90%	3.30%	0.10%
Other Fisheries										
Pounds	131,317	86,731	125,356	23,434	64,666	136,993	232,441	96,314	84,991	31,655
Value	$127,806	$85,659	$108,423	$21,456	$63,640	$133,325	$206,187	$105,167	$92,170	$33,745
% State	21.20%	13.30%	22.10%	7.90%	11.60%	16.80%	25.20%	13.30%	9.60%	6.50%
All										
Pounds	619,737	652,636	567,659	296,263	559,440	817,588	921,120	721,924	886,841	486,853
Value	$603,854	$644,920	$492,452	$271,731	$550,566	$795,412	$815,149	$789,000	$958,377	$520,413

Source: North Carolina Division of Marine Fisheries commercial landings database.
Long Haul includes: gear code 030 or 025 and non-ocean waters.
Pound Net includes: gear code 275.
Estuarine Gill Net includes: gear code 425, 426, 427, 470, 475, 480 and all non-ocean waters.
Ocean Gill Net includes: gear code 425, 426, 427, 470, 475, 480 and Atlantic Ocean.
Ocean Trawl includes: gear codes 210 and 230, Atlantic Ocean, and months January through May and September through December.

Table 6.17. North Carolina kingfish *(Menticirrhus spp.)* landings by weight (pounds) and number of individuals, marketable CPUE (lb/trip), bait landings weight (pounds) and numbers, and total number of trips, for selected commercial fisheries, 2002-2011. ND=not determined.

	Weight				Number			# Trips
	Total	Market	CPUE	Bait	Total	Market	Bait	
Year	Landed (pounds)	Landed (pounds)	(lb/trip)	Landed (pounds)	Landed	Landed	Landed	
Estuarine gill net								
2002	40,398	40,398	26	ND	42,614	42,614	ND	1,583
2003	38,551	38,551	18	ND	43,951	43,951	ND	2,110
2004	29,354	29,354	15	ND	42,745	42,745	ND	2,020
2005	26,538	26,538	11	ND	36,998	36,998	ND	2,512
2006	54,259	54,259	18	ND	68,683	68,683	ND	3,005
2007	57,829	57,829	23	ND	83,491	83,491	ND	2,554
2008	150,501	150,501	43	ND	232,736	232,736	ND	3,470
2009	62,111	62,111	18	ND	88,939	88,939	ND	3,454
2010	57,066	57,066	20	ND	82,724	82,724	ND	2,835
2011	112,779	112,779	42	ND	181,290	181,290	ND	2,714
Pound net								
2002	107	107	2	ND	122	122	ND	62
2003	87	87	3	ND			ND	34
2004	50	50	1	ND	69	69	ND	34
2005	191	191	5	ND	342	342	ND	41
2006	418	418	5	ND	654	654	ND	85
2007	608	608	7	ND	259	259	ND	83
2008	247	247	5	ND	88	88	ND	47
2009	99	99	4	ND	18	18	ND	28
2010	338	338	5	ND			ND	65
2011	395	395	8	ND	43	43	ND	52
Long haul								
2002	10,766	10,766	71	ND	62,053	62,053	ND	152
2003	29,291	29,291	129	ND	59,841	59,841	ND	227
2004	28,868	28,868	120	ND	71,167	71,167	ND	241
2005	22,739	22,739	108	ND	55,204	55,204	ND	211
2006	19,053	19,053	77	ND	61,809	61,809	ND	246
2007	20,682	20,682	107	ND	121,500	121,500	ND	194
2008	39,008	39,008	197	ND	168,350	168,350	ND	198
2009	20,898	20,898	117	ND	121,757	121,757	ND	179
2010	45,913	45,913	231	ND	77,222	77,222	ND	199
2011	25,256	25,256	143	ND	42,414	42,414	ND	177
Ocean gill net								
2002	427,910	427,910	199	ND	598,899	598,899	ND	2,150
2003	494,190	494,190	217	ND	826,311	826,311	ND	2,273
2004	379,517	379,517	180	ND	611,799	611,799	ND	2,103
2005	215,016	215,016	155	ND	355,223	355,223	ND	1,388
2006	410,515	410,515	258	ND	664,633	664,633	ND	1,591
2007	577,910	577,910	305	ND	997,901	997,901	ND	1,895

Table 6.17. Continued.

	Landings							
	Weight				Number			# Trips
	Total	Market	CPUE	Bait	Total	Market	Bait	
Year	Landed (pounds)	Landed (pounds)	(lb/trip)	Landed (pounds)	Landed	Landed	Landed	
2008	443,859	443,859	283	ND	727,458	727,458	ND	1,567
2009	521,373	521,373	346	ND	872,664	872,664	ND	1,505
2010	669,588	669,588	473	ND	1,187,571	1,187,571	ND	1,415
2011	316,492	316,492	248	ND	532,342	532,342	ND	1,276
Ocean trawl								
2002	9,239	9,239	113	ND	22,492	22,492	ND	82
2003	3,785	3,785	69	ND	5,207	5,207	ND	55
2004	4,515	4,515	72	ND	7,644	7,644	ND	63
2005	8,346	8,346	190	ND	21,109	21,109	ND	44
2006	10,530	10,530	130	ND	44,435	44,435	ND	81
2007	23,566	23,566	210	ND	40,975	40,975	ND	112
2008	55,064	55,064	656	ND	106,577	106,577	ND	84
2009	21,129	21,129	166	ND	46,814	46,814	ND	127
2010	28,945	28,945	376	ND	85,508	85,508	ND	77
2011	276	276	28	ND	635	635	ND	10
Fisheries combined								
2002	488,420	488,420	121	ND	726,180	726,180	ND	4,029
2003	565,905	565,905	120	ND	935,310	935,310	ND	4,699
2004	442,303	442,303	99	ND	733,424	733,424	ND	4,461
2005	272,829	272,829	65	ND	468,876	468,876	ND	4,196
2006	494,775	494,775	99	ND	840,214	840,214	ND	5,008
2007	680,595	680,595	141	ND	1,244,126	1,244,126	ND	4,838
2008	688,679	688,679	128	ND	1,235,209	1,235,209	ND	5,366
2009	625,610	625,610	118	ND	1,130,192	1,130,192	ND	5,293
2010	801,850	801,850	175	ND	1,433,025	1,433,025	ND	4,591
2011	455,197	455,197	108	ND	756,724	756,724	ND	4,229

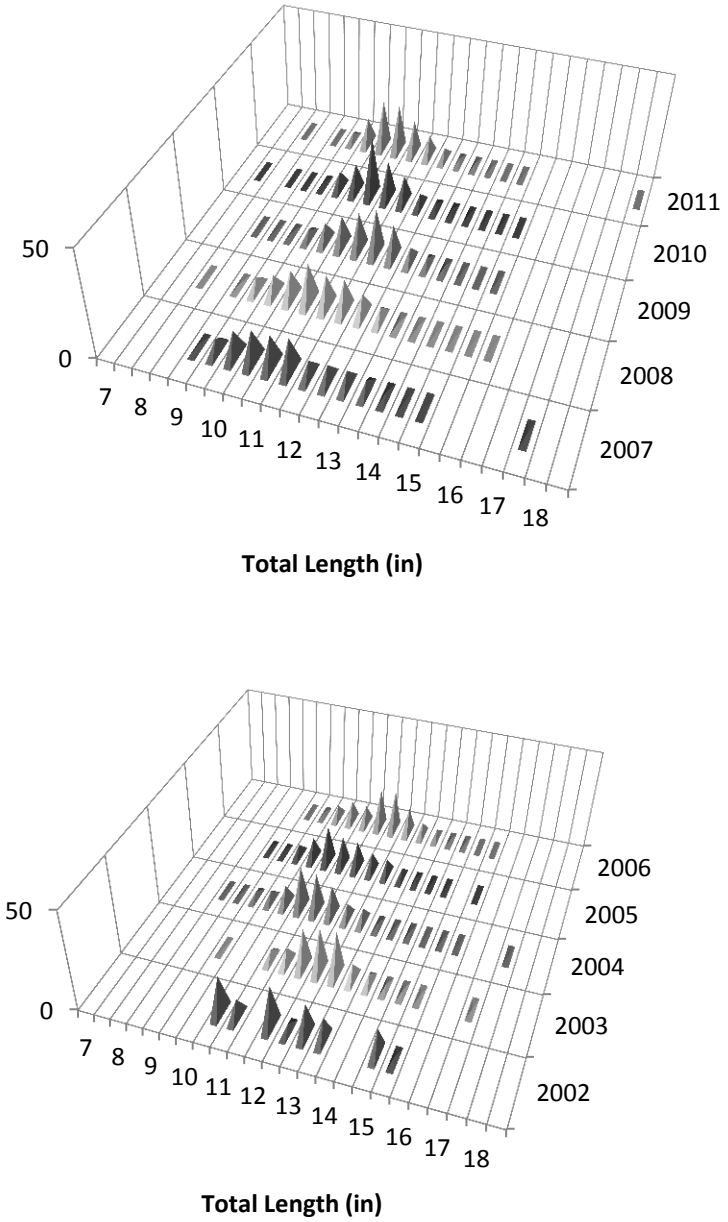
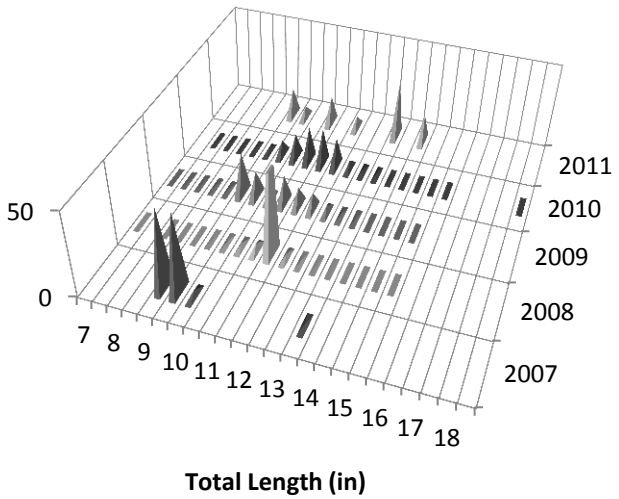


Figure 6.35. North Carolina estuarine gill net fishery weighted length frequency distributions for marketable southern kingfish (*Menticirrhus americanus*), 2002-2011.



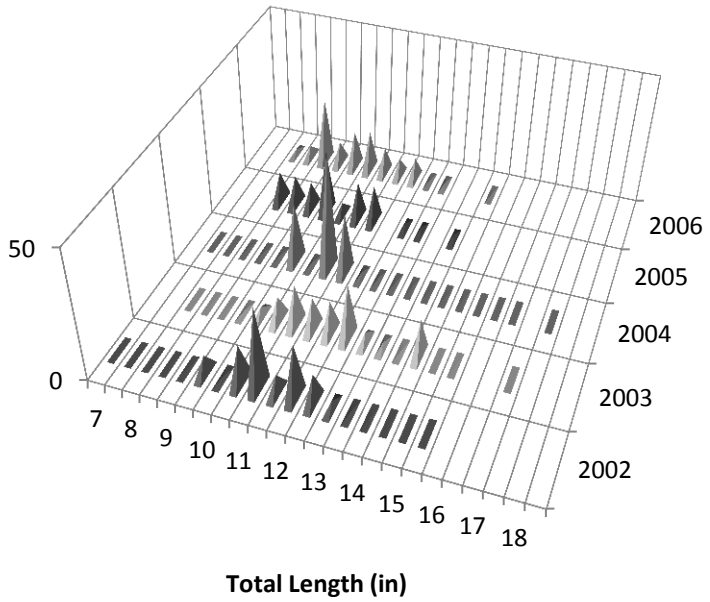
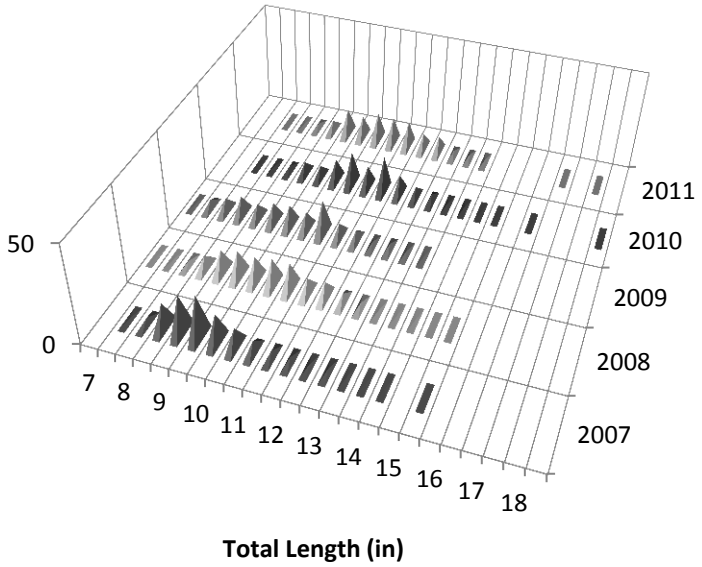


Figure 6.36. North Carolina flounder and sciaenid pound net (combined) fisheries fishery weighted length frequency distributions for marketable southern kingfish (*Menticirrhus americanus*), 2002-2011.



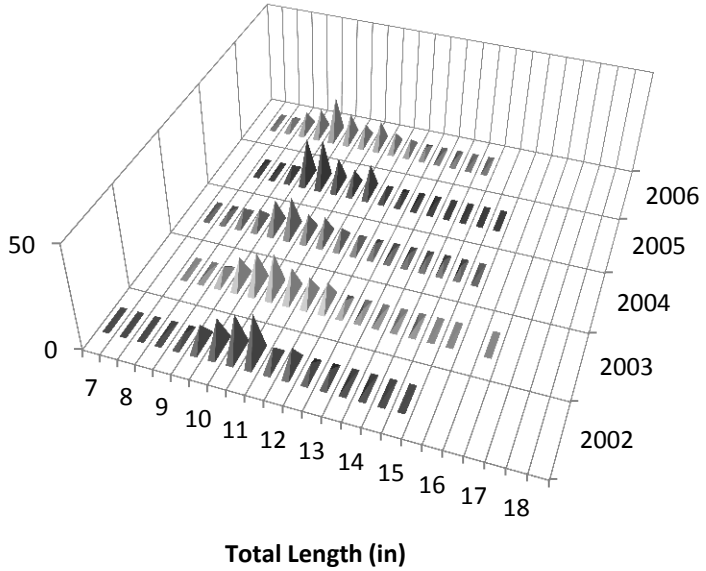
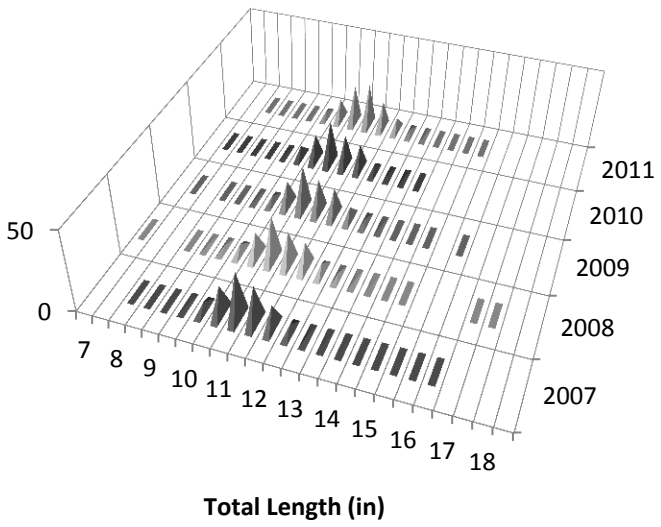


Figure 6.37. North Carolina long haul fishery weighted length frequency distributions for marketable southern kingfish (*Menticirrhus americanus*), 2002-2011.



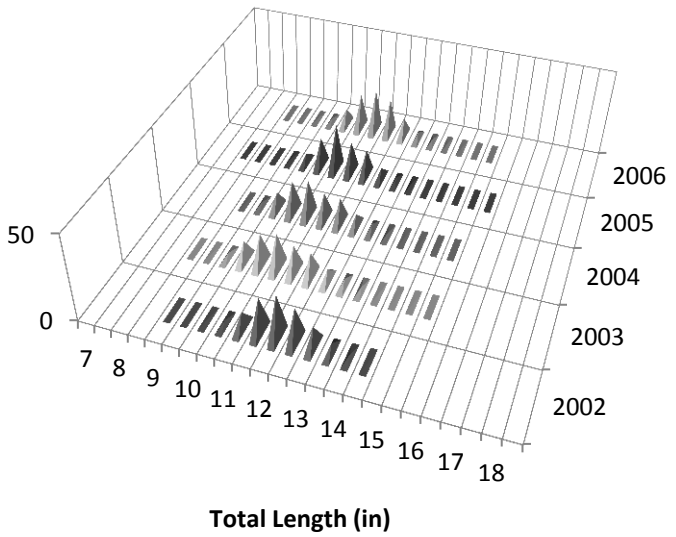
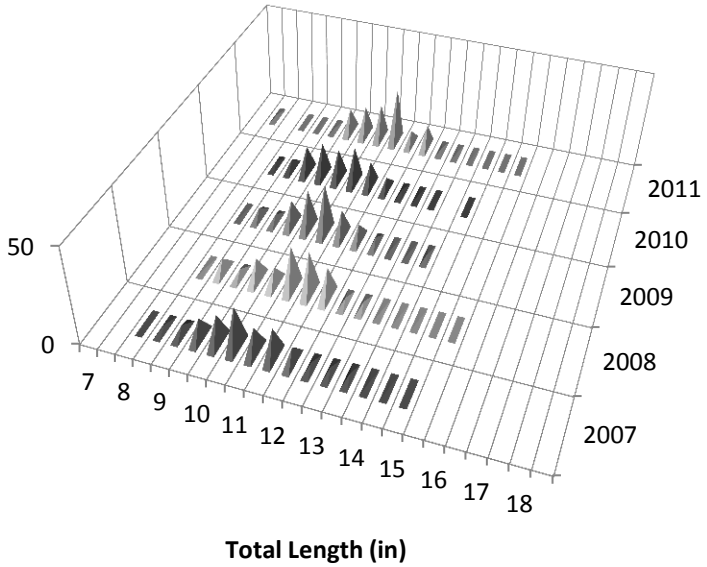


Figure 6.38. North Carolina ocean gill net weighted length frequency distributions for marketable southern kingfish (*Menticirrhus americanus*), 2002-2011.



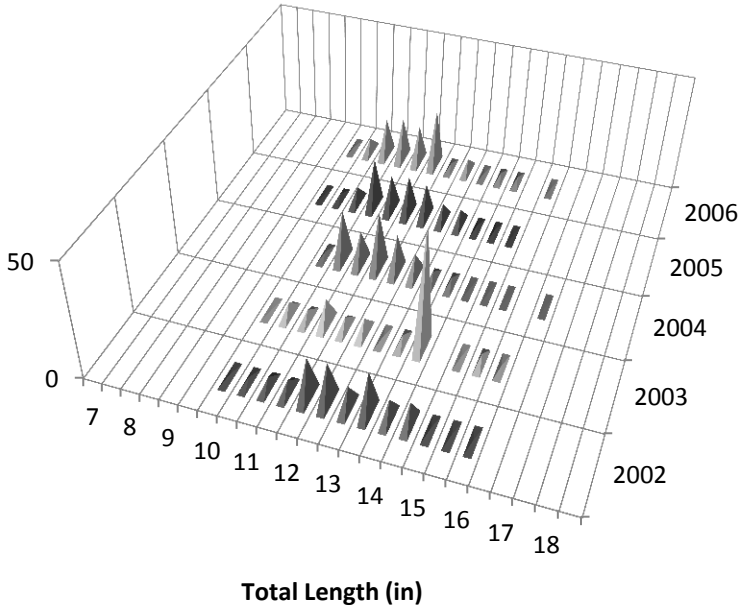


Figure 6.39. North Carolina ocean trawl fishery weighted length frequency distributions for marketable southern kingfish (*Menticirrhus americanus*), 2002-2011.

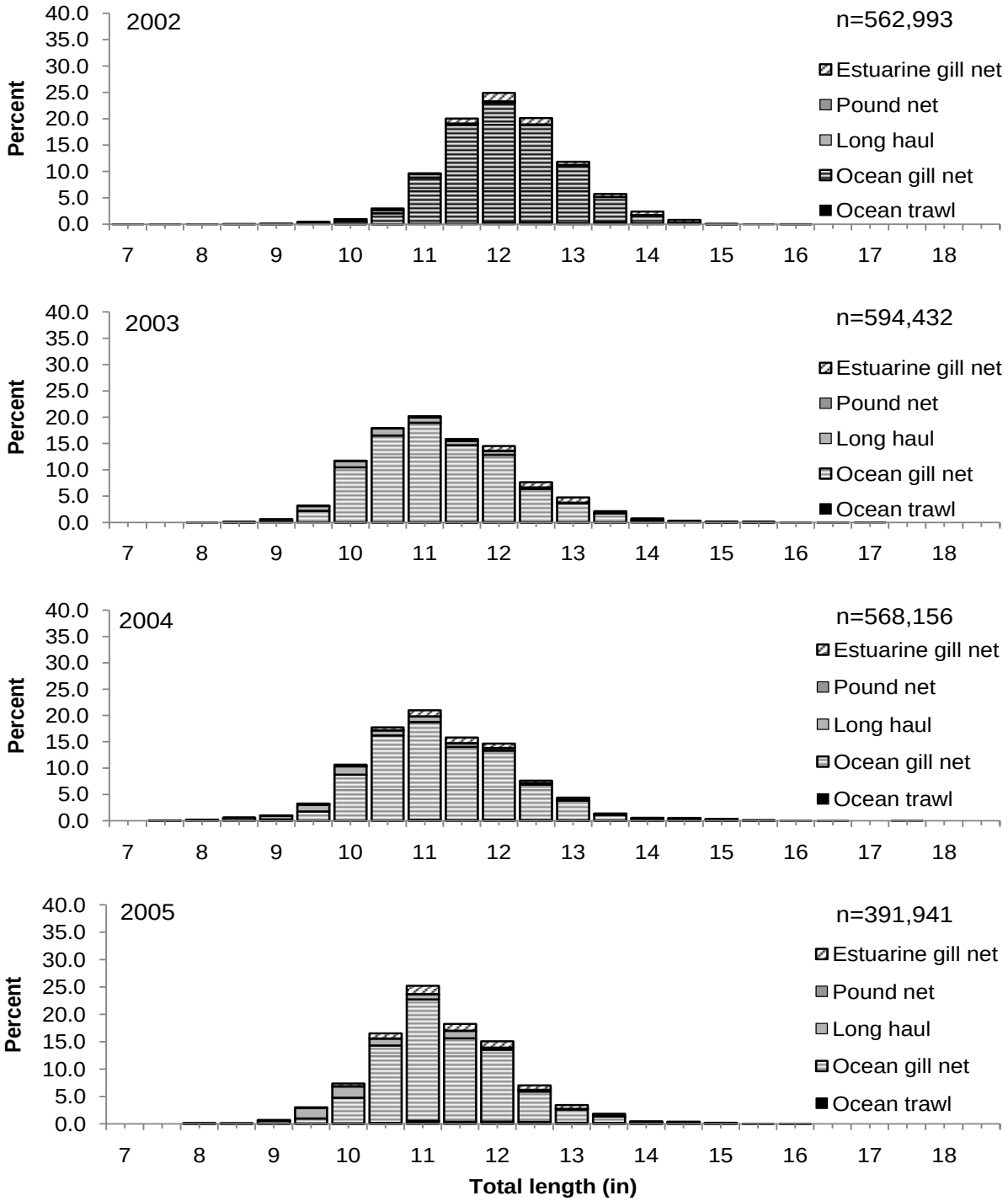


Figure 6.40. North Carolina commerical fishery weighted length frequency distributions for marketable southern kingfish (*Menticirrhus americanus*), 2002-2011.

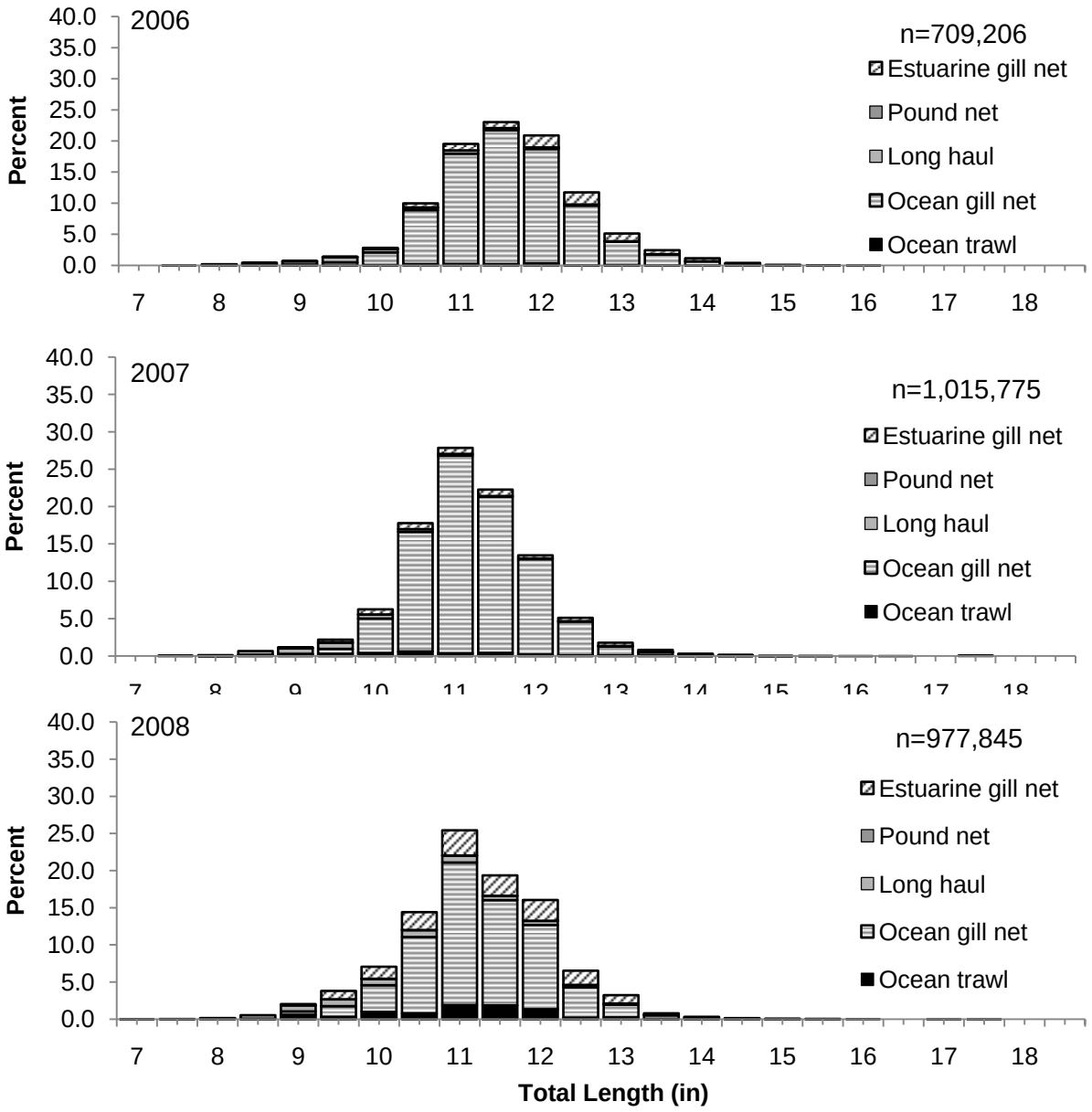
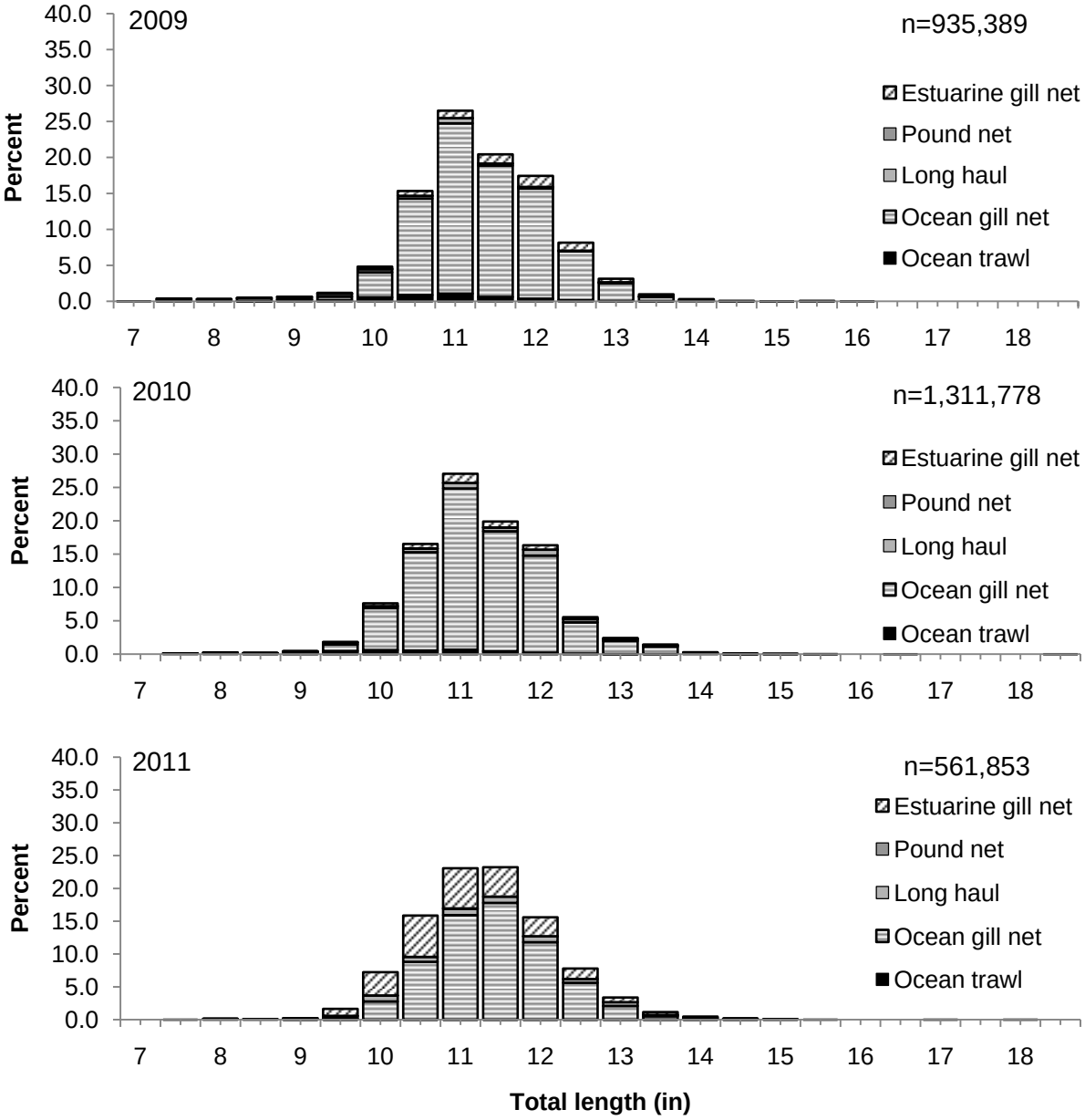


Figure 6.40 Continued.



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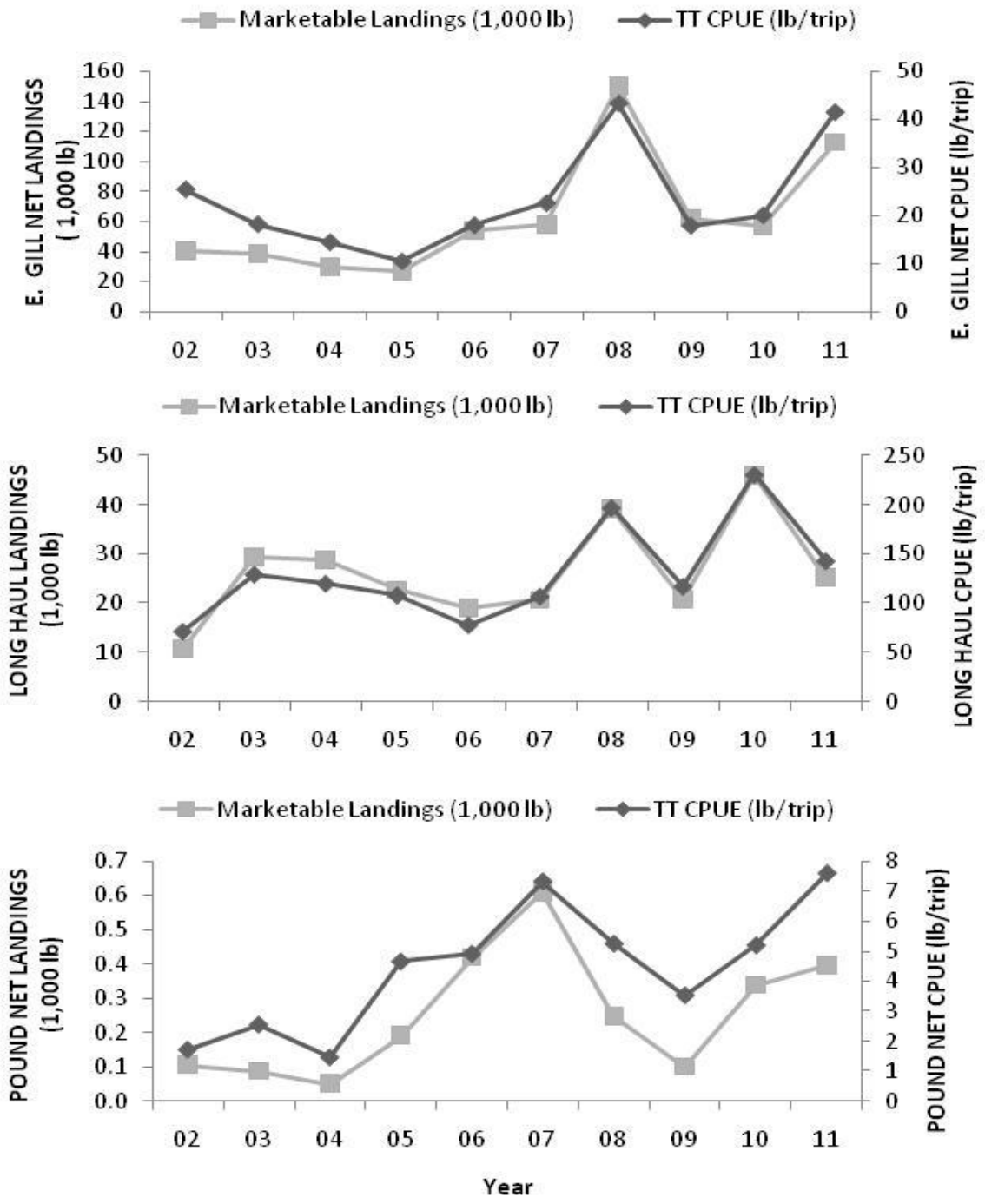


Figure 6.41. North Carolina kingfish (*Menticirrhus spp.*) annual commercial landings and CPUE (lb/trip) for selected fisheries and overall, 2002-2011.

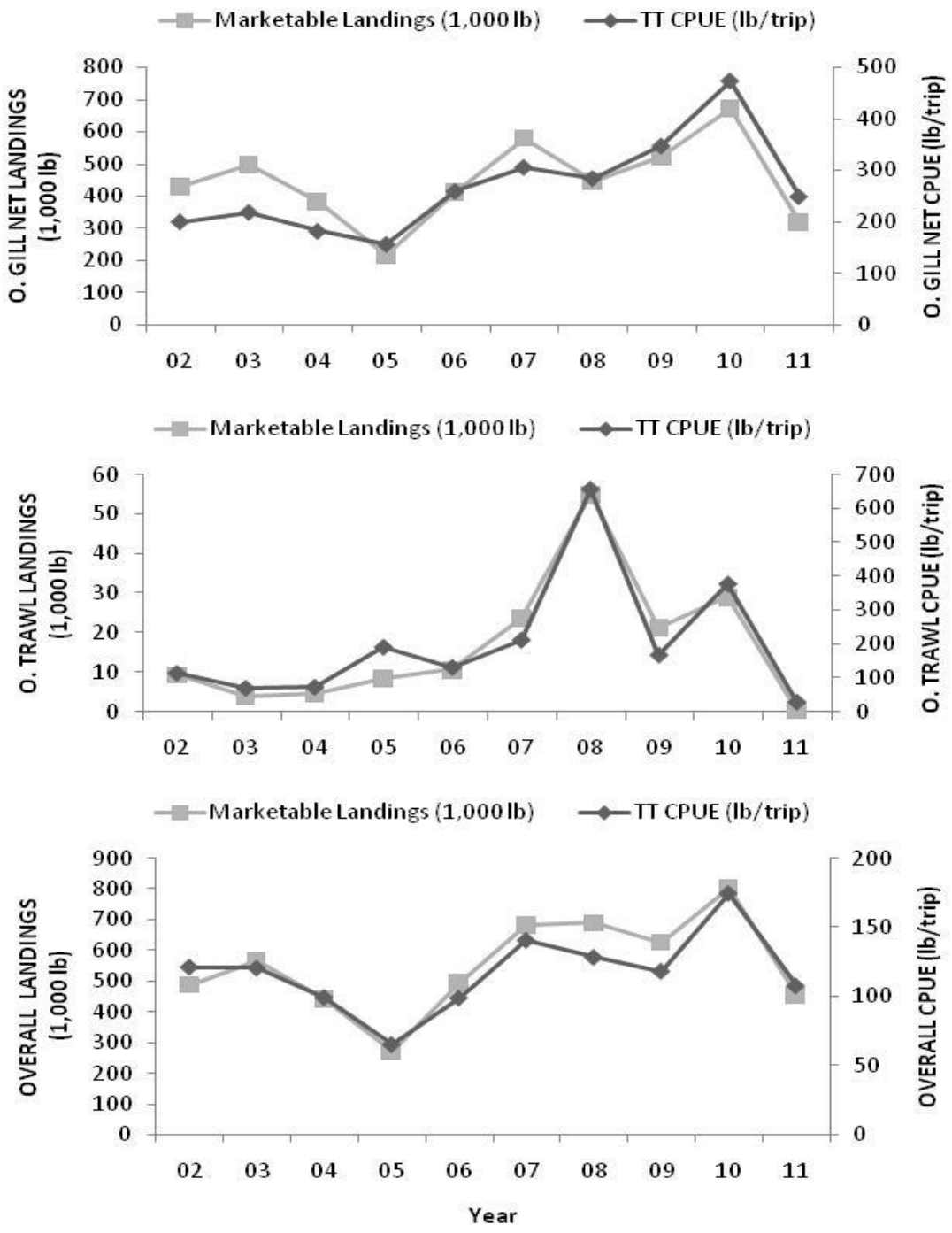


Figure 6.41. Continued

SUMMER FLOUNDER

Background

Summer flounder (*Paralichthys dentatus*) are found in estuarine and coastal waters from Nova Scotia to the east coast of southern Florida (Leim and Scott 1966; Gutherz 1967). Detailed information on distribution, migration and life history are presented in Monaghan (1997). A recent paper on stock identification supports earlier studies that suggest Cape Hatteras as a zoogeographic barrier for summer flounder stocks and suggests northern and southern groups should be considered functional stocks (Burke et al. 2000).

Length Distribution

Sampled summer flounder total lengths were used to expand length frequencies for each fishery to the total landings recorded by the NC Trip Ticket Program (NCTTP). The NCTTP does not differentiate among the three flounder species harvested in North Carolina. Instead, the flounder species ratio from the sampled catches was used to estimate landings to the species level. The ocean or 'winter' trawl fishery contributed over 99% of the summer flounder landed commercially in North Carolina from 2002 to 2011 (Table 6.18). The remaining one percent of summer flounder was incidentally caught in other commercial fisheries. Because the ocean trawl was the only fishery that caught significant numbers of summer flounder, length frequency trends will only be discussed here for ocean trawls.

Weighted length frequencies shifted slightly during the time period of this study (2002-2012). The percentage of fish in size classes 16 inches and less decreased from 66% in 2002 to below 60% in all subsequent years, with the smallest percentage in 2008 (47%) with 2011 increasing to 56% (Figure 6.42). The modal size class was 15 inches for most years, but increased to 16 inches from 2008 to 2009. Since 1997, the minimum size limit for summer flounder has been 14 inches (35.6 cm). In all years 2002 to 2011, the percentage of fish landed below 14 inches was less than 5%, and less than 3% after 2004. The percentage of fish in the largest classes (20 inches and above) also increased to 8% since 2002. In 2003-2011, the percentage of fish in in the 20 inch size class ranged from 12-16%. The range of lengths for summer flounder was 10 to 32 inches, with one 43 inch fish measured in 2011 (Figure 6.42).

CPUE and Landings

Landings and catch per unit effort (CPUE) of summer flounder caught in the ocean trawl fishery and landed in North Carolina were directly impacted by commercial quotas and trip limits for many years. Summer flounder landings in North Carolina were reflective of the State's 27.4% allocation of the coastwide commercial quota for each year 2002-2011. The quota was relatively low in 2007-2010 compared to previous years but increased considerably in 2011. North Carolina ocean trawl vessels usually land 90% or more of summer flounder within the state, but also offload summer flounder in other states. The annual quota for summer flounder

has fluctuated since 2002 and landings of summer flounder in North Carolina ports have been within 10% of the annual quota limit, except in 2005 and 2011 when landings were 18% and 40% under the quota, respectively. In 2005 and 2011, significant landings of summer flounder were made in other states. Landings of summer flounder in North Carolina decreased from 2010 to 2011 (Table 6.18), but 35% of landings were transferred to other states in 2011 due to unsafe conditions for vessels to travel through Oregon Inlet to offload their fish in their usual port at Wanchese, NC. The CPUEs were not compared for the ocean trawl fishery due to the impact of quotas and trip limits. Summer flounder landed in other fisheries were incidental catches, which limits the analysis of CPUE trends in these fisheries. Trends in landings and CPUE for the period 1972 to 1994 (prior to the quota system) were discussed in a past completion report for this grant (Monaghan 1997). All fisheries besides ocean trawl that landed summer flounder in 2002-2012 were not targeted fisheries and contributed less than one percent to the total landings of summer flounder with no clear trends. Landings of summer flounder had an ex-vessel value ranging from $5.2 to $8.4 million in 2002 to 2011 (Table 6.18). The annual value of summer flounder landings peaked in 2006 but did not decline as substantially as landings in 2007-2011.

Management Issues

The North Carolina Marine Fisheries Commission (NCMFC) and NCDMF have implemented a number of management measures for summer flounder. These were precipitated by a concern within the state of North Carolina, the Mid-Atlantic Fishery Management Council (MAFMC), and the Atlantic States Marine Fisheries Commission (ASMFC) over the decline of the summer flounder stock. Summer flounder are managed in federal and state waters by a joint MAFMC/ASMFC fisheries management plan (FMP). Amendment 16 to the Summer Flounder, Scup, and Black Sea Bass FMP was released in 2007. The FMP manages the unit stock, from Maine to the North Carolina/South Carolina border, by recreational and commercial harvest limits, mesh and size regulations, seasons, and permit requirements. The commercial harvest is controlled by an annual unit stock quota that is allocated among the states based on historical landings of summer flounder by each state. The quota is used in conjunction with a 5½ inch (14 cm) minimum mesh size for otter trawls and a 14 inch minimum fish size.

The federal Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006, requires the summer flounder stock be rebuilt by January 1, 2013. The 2012 stock assessment found that the stock was not overfished and overfishing was not occurring in 2011 (Terceiro 2012). The summer flounder 2009 year class was estimated to be about 40% above average, the largest since 1986. The commercial quota was kept relatively low for 2007-2010, but was raised considerably in 2011 based on the improved stock status. However, the 2010 and 2011 year classes were estimated to be below average and the quota was reduced in 2012 to insure that overfishing does not occur again.

Table 6.18. North Carolina commercial landings of marketable summer flounder (*Paralichthys dentatus*) by fishery, 2002-2011, includes landings (thousands of pounds), value (thousands of dollars) and contribution of fishery to North Carolina summer flounder landings.

	Year									
Fishery	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Flounder pound net										
Pounds	10.8	4.1	0.9	1.0	0.4	1.1	4.2	8.0	8.6	7.3
Value ($)	17.2	7.4	1.5	2.0	0.9	2.7	9.6	16.0	19.3	16.7
% State	0.3	0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.3	0.3	0.3
Long haul seine										
Pounds	0.1	<0.1	<0.1	0.1	0.0	0.7	0.7	0.3	0.0	0.1
Value ($)	0.1	<0.1	<0.1	0.1	0.0	1.6	1.6	0.6	0.0	0.2
% State	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ocean gill net										
Pounds	0.6	1.1	1.5	1.1	0.0	<0.1	0.0	2.4	1.2	0.0
Value ($)	0.9	1.9	2.3	2.0	0.0	0.1	0.0	4.5	2.5	0.0
% State	0.0	0.0	0.0	0.0	0.0	<0.1	0.0	0.1	<0.1	0.0
Ocean trawl										
Pounds	4,111.8	3,556.7	4,824.8	4,056.2	3,948.0	2,661.1	2,399.5	2,850.8	3,304.0	2,849.9
Value ($)	6,082.4	5,984.1	7,591.1	7,486.1	8,379.9	6,343.2	5,221.3	5,498.7	7,088.9	6,127.5
% State	99.6	99.7	99.7	99.7	99.8	99.7	99.5	99.4	99.4	99.6
Sciaenid pound net										
Pounds	0.5	2.2	9.9	8.1	5.3	0.0	0.0	0.0	0.0	0.0
Value ($)	0.8	3.7	15.9	14.8	11.6	0.0	0.0	0.0	0.0	0.0
% State	<0.1	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0
Estuarine gill net										
Pounds	3.8	3.5	2.9	2.2	3.2	6.6	7.6	6.8	9.1	3.5
Value ($)	5.5	5.8	4.4	4.0	6.7	15.3	16.3	13.0	19.4	7.6
% State	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.2	0.3	0.1
Crab trawl										
Pounds	0.1	0.1	0.1	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0
Value ($)	0.1	0.1	0.1	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0
% State	<0.1	<0.1	<0.1	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0
Other fisheries										
Pounds	0.1	0.1	0.1	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0
Value ($)	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
% State	<0.1	<0.1	<0.1	<0.1	<0.1	0.0	0.0	0.0	0.0	0.0
All										
Pounds	4,127.8	3,567.9	4,840.2	4,068.7	3,957.0	2,669.5	2,412.1	2,868.3	3,322.9	2,860.8
Value ($)	6,107.2	6,003.2	7,615.5	7,509.1	8,399.3	6,363.0	5,248.8	5,532.7	7,130.2	6,152.0
% State	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: North Carolina Division of Marine Fisheries commercial landings database and biological database.

Flounder Pound Net data includes gear 275: Beaufort, Carteret, Hyde and Tyrell counties in September to December and Dare county in October to December. Sciaenid Pound Net data includes gear 275: Dare and Hydecounties for May to August and Dare County for September. Long Haul Seine data includes gears 030 and 025 in estuarine waters only. Ocean Gill Net includes gears 425,426,427,470,475 and 480 in the Atlantic Ocean. Estuarine Gill Net includes gears 425,426,427,470,475 and 480, estuarine waters only. Ocean Trawl includes gears 210 and 230 in the Atlantic Ocean, January-May and September-December. Crab Trawl includes gear 205.

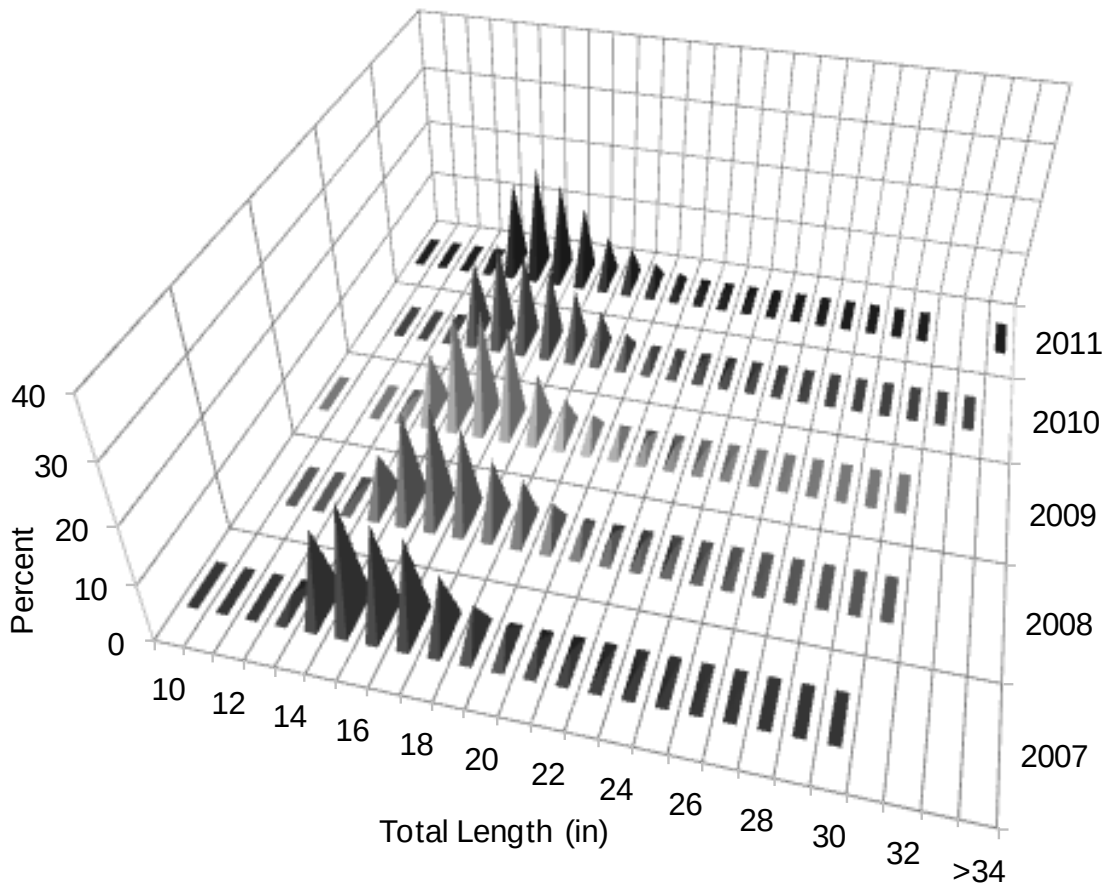


Figure 6.42. North Carolina ocean trawl weighted length frequency distributions for marketable summer flounder (*Paralichthys dentatus*), 2002-2011.

SOUTHERN FLOUNDER

Background

Southern flounder (*Paralichthys lethostigma*) are found in riverine, estuarine, and coastal waters from Virginia south to the Loxahatchee River on the Atlantic coast of Florida (Gilbert 1986). This species has not been collected from waters surrounding the southern tip of Florida, but is found on the Gulf coast of Florida starting at the Caloosahatchee River estuary and around the Gulf of Mexico to northern Mexico (Ginsburg 1952; Gutherz 1967; Hoese and Moore 1977; Gilbert 1986). Metamorphosing larvae and early juvenile southern flounder (0.5-1 inches Standard Length) collected from the Newport River and North River estuaries feed primarily on mysids, amphipods, and calanoid copepods (Burke 1995). As they grow larger (6-8 inches TL), finfish dominate the diet of southern flounder (Stokes 1977; Wenner et al. 1990). Southern flounder grow rapidly during the first two years of life, reaching 10.5-13 inches TL at age one and 14-17 inches TL at age two (Stokes 1977, Music and Pafford 1984; Wenner et al. 1990). Female southern flounder have a higher growth rate than males (Wenner et al. 1990). In North Carolina, the oldest female southern flounder collected was nine, and the oldest male was six (Takade-Heumacher and Batsavage 2009).

Length Distribution

Sampled southern flounder TLs were used to expand length frequencies for each fishery to the total landings recorded by the NCTTP. The NCTTP does not differentiate among the three flounder species harvested in North Carolina. Instead, the flounder species ratio from the sampled catches was used to estimate landings to the species level.

The weighted length distributions for southern flounder landed in the flounder pound net fishery from 2002 to 2011 ranged from 10 to 29 inches, but varied annually (Figure 6.43). The majority of southern flounder caught in this fishery were between 13 and 18 inches. The distributions from 2002 to 2004 reflect the 13-inch (33 cm) minimum size limit for flounder which was in place until 2005 (Figure 6.43). The percent frequency in the 13-inch size class decreased sharply in 2005 following the increase of the minimum size limit to 14 inches (35.6 cm) while the frequency of the 14-inch size class was generally higher in 2005-2011. The most frequent size class was the 15-inch in four of the seven years from 2005 to 2011. The length frequency distribution in 2011 differed from the preceding years, with the most frequent size class being 16-inch followed by 17-inch as the second most common. The shift in 2011 length frequencies toward larger size classes had not occurred since 2002 in this fishery.

The weighted length distributions for southern flounder landed in the estuarine gill net fishery ranged from 10 to 31 inches in 2002-2011 (Figure 6.44). The majority of southern flounder caught in this fishery were between 13 and 17 inches. The frequency distribution for this fishery

was remarkably stable in 2002-2011 with one major shift. In 2002-2004, the modal size class was 14-inch, 13-inch was second most frequent followed by 15-inch. However, in 2005-2011 the modal size class was 14-inch, with 15-inch next most common followed by 16-inch. This change was due to the increased minimum size limit (14 inches) in 2005. The 13-inch size class decreased in frequency from over 20% in 2002-2004 to less than 10% in 2005-2010 and less than 5% in 2011. The slightly higher percentage of shorter fish in estuarine gill nets, compared to the flounder pound net fishery, may be due to fishing this gear throughout the year as opposed to only in the fall when flounder pound nets are active and larger southern flounder are migrating to the ocean.

Relatively few samples were taken from the remaining fisheries that landed southern flounder. Weighted length distributions for the sciaenid pound net fishery were highly variable from year to year (Figure 6.45). Lengths ranged from 11 to 32 inches with the majority between 14 and 18 inches. Length distributions for the long haul fishery ranged from 11 to 27 inches and the distribution shifted toward larger size classes since 2006 (Figure 6.46). Lengths for the ocean gill net fishery ranged from 11 to 29 inches. In most years 2002-2007, 14 and 15 inch size classes were the most frequent in the ocean gill net fishery while in 2011 size classes 14, 15 and 16 inches were all similar in frequency (Figure 6.47). The ocean trawl fishery caught southern flounder in 2002, 2004 and 2006 only, showing similar length distributions (Figure 6.48). The lengths in the ocean trawl fishery ranged from 12 to 32 inches with the majority between 13 and 17 inches with the 14-inch size class most frequent. The ocean trawl and ocean gill net fisheries contributed some of the largest southern flounder sampled; these fish were caught in the near shore flounder trawl fishery targeting summer flounder and the large mesh anchored gill net fishery targeting monkfish.

Weighted length frequencies for southern flounder were primarily derived from fish house samples of the estuarine gill net fishery and the flounder pound net fishery (Figure 6.49). The long haul seine, sciaenid pound net, ocean gill net fisheries contributed minimally to the overall length frequency distribution with the ocean trawl fishery contributing no samples for most years. The estuarine gill net fishery dominated the overall weighted length frequencies, and this is the main reason for modal size classes from the overall length distributions for the various southern flounder fisheries being 13-14 inches in 2002-2004 and 14-15 inches in 2005-2011. The shift of modal size classes from 13-14 inches to 14-15 inches in the overall length frequencies is a reflection of a change in the minimum size limit in 2005 from 13 inches to 14 inches. Estuarine gill net was by far the main source of southern flounder in the 13-15 inch size classes, however in the size classes of 17 inches and above, flounder pound net also contributed a large percentage of the fish. In 2002 and 2011 flounder pound net contributed higher percentages than estuarine gill net for 17-19 inch size classes. In 2011, the 16 inch size class contributed an unusually high amount of fish, due to the flounder pound net fishery. The other fisheries contributed very small percentages to the length distributions. In 2009, sciaenid pound nets had a slightly higher than normal contribution to the length distribution.

Commercial CPUE and Landings

Southern flounder were landed primarily by the estuarine gill net fishery (57-75%) in 2002-2011 (Table 6.19). The percentage of total landings taken by estuarine gill nets increase after 2002, then decreased in 2010 and 2011. The number of estuarine gill net trips landing southern flounder ranged from 11,414 to 23,849 in 2002-2011 (Table 6.20). The most annual trips occurred in 2002, then remained fairly stable until 2010 and 2011 when the trips declined by 37% and 52%, respectively, compared to 2002. The catch per unit effort (CPUE) of southern flounder by estuarine gill nets was highest in 2002 (75 lb/trip), (Table 6.20 and Figure 6.50). Estuarine gill net CPUE ranged was 57-75 lb/trip from 2002-2011. Estuarine gill net CPUE remained relatively stable in 2002 to 2009, with 2008 nearly as high as 2002, then decreased somewhat in 2010-2011. The decline in southern flounder landings, trips and CPUE for estuarine gill nets in 2010 and 2011 are likely due to regulatory changes in May 2010 (to reduce interactions with protected species and large mesh gill nets) that caused effort to decrease by 40% from 2009. Landings of southern flounder by estuarine gill nets tracked CPUE until 2010-2011, when landings fell much more steeply than CPUE (Figure 6.50).

The flounder pound net fishery was the dominant source of southern flounder landings for the state until 1994. Landings from the flounder pound net fishery contributed 23-40% to overall southern flounder landings in 2002-2011 (Table 6.19). The percentage of overall southern flounder landings taken by flounder pound nets decreased after 2002, then increased in 2010 and 2011. This fishery has contributed less than estuarine gill nets to overall southern flounder landings since 1994, but may be increasing in relative importance once again primarily due to regulatory changes for estuarine gill nets. The number of flounder pound net trips landing southern flounder was highest in 2002 (1,473 trips), then declined slightly and remained fairly consistent (913-1,222 trips) in 2003-2011 (Table 6.20). Flounder pound net CPUE was highest in 2002 (854 lb/trip), but decreased by 36% from 2002 to 2003 then remained relatively stable through 2011; landings followed a very similar pattern (Table 6.20 and Figure 6.50). CPUEs and landings were relatively low in 2009-2011, ranging from 411 to 422 lb/trip.

The only fisheries in addition to flounder pound nets and estuarine gill nets that contributed more than one percent of landings of southern flounder in any year were sciaenid pound nets and crab trawls. The crab trawl fishery contributed 12% of southern flounder landings in 1985 (Monaghan 1997), but declined to less than 1% in 2006-2011 (Table 6.19). Sciaenid pound nets stayed relatively consistent at 1-2% of southern flounder landings except in 2007 when it was 0.4% and in 2008 when this fishery contributed nearly 3% of landings. Trips by the sciaenid pound net fishery that landed southern flounder ranged from 82 to 235 trips/year in 2002-2011 (Table 6.20). The sciaenid pound net fishery CPUE peaked in 2008 in contrast to CPUEs for all other fisheries for southern flounder (which peaked in 2002), then declined greatly and landings closely tracked CPUEs (Table 6.20 and Figure 6.50). The annual CPUEs for the sciaenid

pound net fishery had a large range of 73 to 521 lb/trip for 2002-2011. The relatively high southern flounder CPUEs in the sciaenid pound net fishery may be the result of inadvertently including flounder pound net catches in the CPUE calculation due to the definition of flounder pound nets used in this report (See Section 5, Flounder Pound Net Fishery). Trips by the long haul seine fishery that landed southern flounder ranged from 57 to 154 trips/year. The long haul seine fishery CPUE decreased greatly from 2002 to 2003, then varied until 2009-2011 when CPUEs were low (Table 6.19 and Figure 6.50). Landings followed the same pattern as CPUEs for this fishery.

Overall southern flounder landings were highest in 2002 (3.2 million lb), then decreased greatly in 2003 and remained relatively consistent until an increase in 2008 followed by a sharp decrease in 2010 and the lowest annual landing in 2011 (1.1 million lb) (Table 6.19 and Figure 6.50). The overall landings most closely followed estuarine gill net landings trends because this fishery had the highest landings of southern flounder. Estuarine gill net trips consistently comprised 93-95% of overall trips landing southern flounder in 2002-2009, but in 2010 and 2011 to approximately 90% of trips (Table 6.20). Overall trips followed the same trend as estuarine gill net trips because this fishery had the vast majority of trips landing southern flounder. Overall CPUE for southern flounder decreased greatly from 2002 to 2003, similar to flounder pound net CPUE trends (Table 6.20 and Figure 6.50). Overall CPUEs from 2003 to 2011 were fairly consistent, similar to CPUEs for both flounder pound nets and estuarine gill nets except that the latter decreased in 2010 and 2011. Overall CPUEs were driven primarily by flounder pound nets CPUE because they are so much higher in magnitude than estuarine gill net CPUEs. Overall landings closely tracked CPUEs except in 2010 and 2011 where landings declined considerably and CPUEs did not decrease. The annual value of southern flounder landings displayed a different trend than landing weights. The value ranged from $2.4 million to $5.2 million with the peak in 2008. The value stayed relatively high in 2009 and only decreased in 2010 and 2011 when landings dropped greatly.

Variations in fishing effort within each target fishery can confound trends in commercial southern flounder CPUE. Pound net effort varies greatly among fishermen. A pound net trip consists of one to twenty or more nets soaked one to seven or more days. The result is a high degree of uncertainty in the annual pound net CPUE calculation and comparisons made among years for this fishery. In comparison, estuarine gill net landings are generally made after a single day fishing trip so the effort measurement used in the CPUE calculation was much more consistent, especially in 2010 and 2011 when regulations required nets to be retrieved each morning with a much more limited soak time. The difference in trip definitions also partially explains why the magnitude of the CPUEs for the pound net fisheries are relatively high compared to estuarine gill nets. Also, CPUE for gears that are only fished during the peak of the flounder migration may be higher than gears that are fished throughout the year due to a greater concentration of southern flounder in the fishing area. Gear specific changes in regulations can also impact CPUE from year to year. Hurricanes and other weather events can also greatly impact the

annual CPUE of flounder pounds nets and estuarine gill nets if they reduce fishing effort during the peak of the southern flounder migration. Therefore, direct comparisons cannot be made between CPUEs for flounder pound nets and estuarine gill nets.

Southern flounder landings do not include unclassified paralichthid flounder landings. Some of the unclassified paralichthid flounder landings come from fisheries not sampled by NCDMF. The shrimp trawl fishery was the only major flounder fishery not sampled. Since this fishery often operates where southern flounder are caught, the actual southern flounder landings were likely greater than those displayed in Table 6.19. Overall landings of unclassified paralichthids ranged from 75 to 152 thousand lb per year having no obvious trends, with the peak in 2010 (Table 6.21). However, shrimp trawl contributions to the total unclassified paralichthids landed decreased considerably from 37% in 2002 to 5% in 2011. Similar to the value of southern flounder landings, the value of unclassified paralichthids increased in recent years, but did not decline in 2010 or 2011. In 2002-2005 the annual value never exceeded $200,000. In 2006-2011 the annual value never went below $200,000 and reached a peak of $325,400 in 2010.

Management Issues

The North Carolina Marine Fisheries Commission (NCMFC) approved the North Carolina Southern Flounder Fishery Management Plan (FMP) in February 2005. The FMP implemented management measures to rebuild the stock within 10 years (2015) and still allow the commercial and recreational fisheries to occur. The 2004 southern flounder stock assessment determined that the southern flounder stock in North Carolina is overfished and overfishing is occurring. Several management measures were implemented that had an impact on the commercial flounder fisheries. These included increasing the minimum size limit for paralichthid flounders in internal waters from 13 inches to 14 inches TL, a commercial seasonal closure in internal waters from December 1 to 31, maintaining the 200-yard limit between gill nets and active pound nets statewide except in the Albemarle Sound (excluding tributaries) for August 15-November 30 where the minimum distance is 500 yards, requiring the incorporation of escape panels with 5½-inch (14 cm) stretched mesh in all flounder pound nets statewide and continuing the rule requiring a minimum distance of 1,000 yards between flounder pound nets (NCDMF 2005). As of 2008, there had not been a significant reduction in commercial or recreational harvest, commercial landings in that year were the highest since 2002 and recreational harvest was the highest since 2004.

An updated stock assessment for southern flounder was completed in 2009 (Takade-Heumacher and Batsavage 2009). This assessment found that the stock remained overfished and overfishing was occurring. The draft Amendment 1 to the Southern Flounder FMP was developed soon after, but was not finalized. In 2010 and 2011, commercial southern flounder landings decreased greatly, likely a result of regulations implemented for the estuarine gill net fishery to reduce interactions with sea turtles. The NCMFC preferred management strategy for

the commercial fisheries, adopted in November 2012, keeps in place key gear construction and use requirements initially enacted to reduce interactions with protected species measures that are expected to make the necessary reductions and rebuild the southern flounder stock. These regulations include limits on the length of large mesh gill nets and allow these nets to be set only during certain nights of the week. The draft Amendment 1 is expected to be finalized in 2013 and a new stock assessment is planned for 2014 to determine the status of the southern flounder stock prior to the 2015 rebuilding deadline.

Table 6.19. North Carolina commercial landings of southern flounder (*Paralichthys lethostigma*) by fishery, 2002-2012, includes landings (thousands of pounds), value (thousands of dollars) and contribution of fishery to North Carolina southern flounder landings.

	Year									
Fishery	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Flounder Pound Net										
Pounds	1,258.0	497.5	577.6	402.3	556.5	459.3	586.8	502.0	523.3	431.9
Value ($)	2,006.3	891.2	1,001.5	826.9	1,263.0	1,183.7	1,327.7	999.3	1,176.7	991.5
% State	39.6	24.2	25.3	23.0	25.8	24.0	24.4	22.8	35.5	39.3
Long Haul Seine										
Pounds	5.1	2.4	0.6	0.7	2.0	0.6	3.6	0.8	0.6	0.3
Value ($)	7.4	3.7	1.0	1.2	4.2	1.5	7.8	1.6	1.2	0.5
% State	0.2	0.1	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0
Ocean Gill Net										
Pounds	1.0	0.5	1.5	0.4	16.5	3.0	0.0	0.0	0.0	2.0
Value ($)	1.4	0.8	2.4	0.7	35.0	7.1	0.0	0.0	0.0	4.3
% State	0.0	0.0	0.1	0.0	0.8	0.2	0.0	0.0	0.0	0.2
Ocean Trawl										
Pounds	0.4	0.0	0.5	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Value ($)	0.6	0.0	0.8	0.0	0.8	0.0	0.0	0.0	0.0	0.0
% State	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sciaenid Pound Net										
Pounds	29.6	20.6	38.2	22.0	31.0	7.6	70.3	39.1	17.2	11.6
Value ($)	121.1	44.7	34.9	61.0	40.4	18.1	155.1	75.5	36.8	26.0
% State	0.9	1.0	1.7	1.3	1.4	0.4	2.9	1.8	1.2	1.1
Estuarine Gill Net										
Pounds	1,797.3	1,457.7	1,590.9	1,283.4	1,528.5	1,431.0	1,720.5	1,635.2	926.2	647.2
Value ($)	2,605.2	2,377.6	2,442.0	2,307.1	3,169.2	3,339.7	3,691.7	3,117.2	1,978.6	1,385.6
% State	56.5	70.9	69.6	73.4	70.8	74.7	71.6	74.2	62.8	58.8
Crab Trawl										
Pounds	30.2	38.7	41.7	15.9	1.7	1.4	0.8	14.3	3.6	5.4
Value ($)	42.2	60.9	62.4	27.6	3.3	3.2	1.8	26.7	7.2	10.7
% State	0.9	1.9	1.8	0.9	0.1	0.1	0.0	0.6	0.2	0.5
Other Fisheries										
Pounds	57.7	37.7	36.5	23.5	20.9	13.9	21.5	13.3	3.2	1.8
Value ($)	81.8	60.1	54.1	40.2	41.3	31.8	44.8	25.0	6.7	4.0
% State	1.8	1.8	1.6	1.3	1.0	0.7	0.9	0.6	0.2	0.2
All										
Pounds	3,179.3	2,055.0	2,287.7	1,748.2	2,157.4	1,916.8	2,403.5	2,204.7	1,474.1	1,100.2
Value ($)	4,866.0	3,439.0	3,599.1	3,264.7	4,557.2	4,585.0	5,228.9	4,245.2	3,207.3	2,422.6
% State	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: North Carolina Division of Marine Fisheries commercial landings database and biological database.

Flounder Pound Net data includes gear 275: Beaufort, Carteret, Hyde and Tyrell counties in September to December and Dare county in October to December. Sciaenid Pound Net data includes gear 275: Dare and Hydecounties for May to August and Dare County for September. Long Haul Seine data includes gears 030 and 025 in estuarine waters only. Ocean Gill Net includes gears 425,426,427,470,475 and 480 in the Atlantic Ocean. Estuarine Gill Net includes gears 425,426,427,470,475 and 480, estuarine waters only. Ocean Trawl includes gears 210 and 230 in the Atlantic Ocean, January-May and September-December. Crab Trawl includes gear 205.

Table 6.20. Southern flounder (*Paralichthys lethostigma*) landings by weight (pounds) and number, marketable landings (weight and numbers) per trip (CPUE) and the number of trips, by selected commercial fisheries, 2002-2011.

		Pounds		Number		
Fishery	Year	Landed	CPUE (lb/trip)	Landed	CPUE (number/trip)	Number of trips
Estuarine gill net	2002	1,797,282	75	1,094,100	46	23,849
	2003	1,457,735	69	943,667	45	21,161
	2004	1,590,904	75	930,436	44	21,099
	2005	1,283,355	68	746,010	39	19,004
	2006	1,528,494	71	826,937	38	21,575
	2007	1,430,986	63	814,405	36	22,622
	2008	1,720,462	73	968,765	41	23,493
	2009	1,635,248	69	920,125	39	23,691
	2010	926,169	61	482,997	32	15,134
	2011	647,216	57	349,744	31	11,414
Flounder pound net	2002	1,258,009	854	575,224	391	1,473
	2003	497,485	545	256,815	281	913
	2004	577,617	538	290,441	270	1,074
	2005	402,264	413	197,291	202	975
	2006	556,534	545	249,000	244	1,022
	2007	459,334	399	224,681	195	1,150
	2008	586,833	534	297,463	271	1,098
	2009	502,000	411	241,981	198	1,222
	2010	523,333	445	241,639	205	1,176
	2011	431,874	422	186,814	182	1,024
Long haul	2002	5,096	33	3,640	24	154
	2003	2,356	20	850	7	118
	2004	649	6	627	6	107
	2005	700	9	574	7	81
	2006	1,971	19	986	10	103
	2007	626	6	338	3	102
	2008	3,591	24	1,878	13	149
	2009	831	8	541	5	105
	2010	581	6	307	3	94
	2011	260	5	167	3	57
Sciaenid pound net	2002	29,598	127	16,604	71	233
	2003	20,602	196	14,372	137	105
	2004	38,215	425	14,590	162	90
	2005	22,018	269	12,414	151	82
	2006	30,984	287	15,004	139	108
	2007	7,557	74	4,307	42	102
	2008	70,338	521	32,875	244	135
	2009	39,083	208	25,700	137	188
	2010	17,201	73	9,011	38	235
	2011	11,574	74	5,354	34	157
Fisheries combined	2002	3,089,985	120	1,689,568	66	25,709
	2003	1,978,177	89	1,215,704	55	22,297
	2004	2,207,385	99	1,236,094	55	22,370
	2005	1,708,337	85	956,289	47	20,142
	2006	2,117,982	93	1,091,927	48	22,808
	2007	1,898,503	79	1,043,731	44	23,976
	2008	2,381,224	96	1,300,981	52	24,875
	2009	2,177,162	86	1,188,347	47	25,206
	2010	1,467,284	88	733,954	44	16,639
	2011	1,090,924	86	542,079	43	12,652

Table 6.21. North Carolina commercial landings of unclassified paralichthid flounders* by fishery, 2002-2012, includes landings (thousands of pounds), value (thousands of dollars) and contribution of each fishery to North Carolina unclassified paralichthid flounder landings.

	Year									
Fishery	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Shrimp Trawl										
Pounds	49.4	25.7	25.1	5.5	26.0	22.2	25.1	19.7	10.7	5.4
Value ($)	69.1	40.9	36.6	9.1	53.0	50.5	52.2	36.5	21.7	11.0
% State	36.6	25.5	21.7	7.4	23.1	18.1	20.8	16.4	7.0	4.6
Other Fisheries										
Pounds	85.5	75.1	90.3	69.4	86.8	100.0	95.9	100.5	141.2	112.8
Value ($)	121.2	118.9	136.5	119.9	174.1	231.0	200.3	189.4	303.7	254.4
% State	63.4	74.5	78.3	92.6	76.9	81.9	79.2	83.6	93.0	95.4
All										
Pounds	134.9	100.8	115.3	75.0	112.8	122.2	121.0	120.2	151.9	118.2
Value ($)	190.3	159.8	173.1	129.0	227.1	281.5	252.4	225.9	325.4	265.4
% State	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: North Carolina Division of Marine Fisheries commercial landings database and biological database.

* Unclassified flounder includes summer, southern and Gulf flounders that could not be assigned a fishery due to a lack of biological data. Only the fisheries listed in this table landed unclassified flounder in 2002-2011.

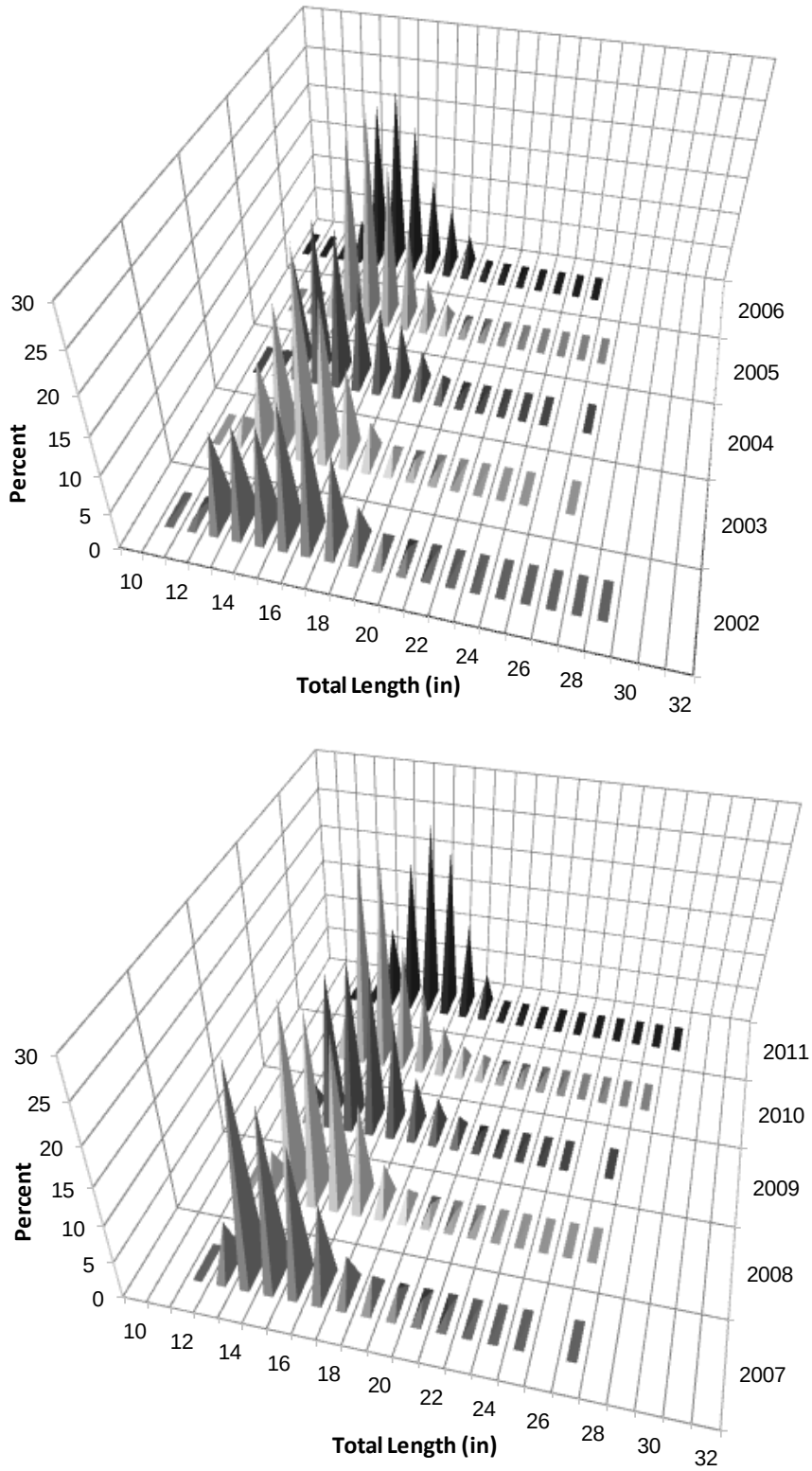


Figure 6.43 North Carolina flounder pound net fishery weighted length frequency distributions for marketable southern flounder (*Paralichthys lethostigma*), 2002-2011.

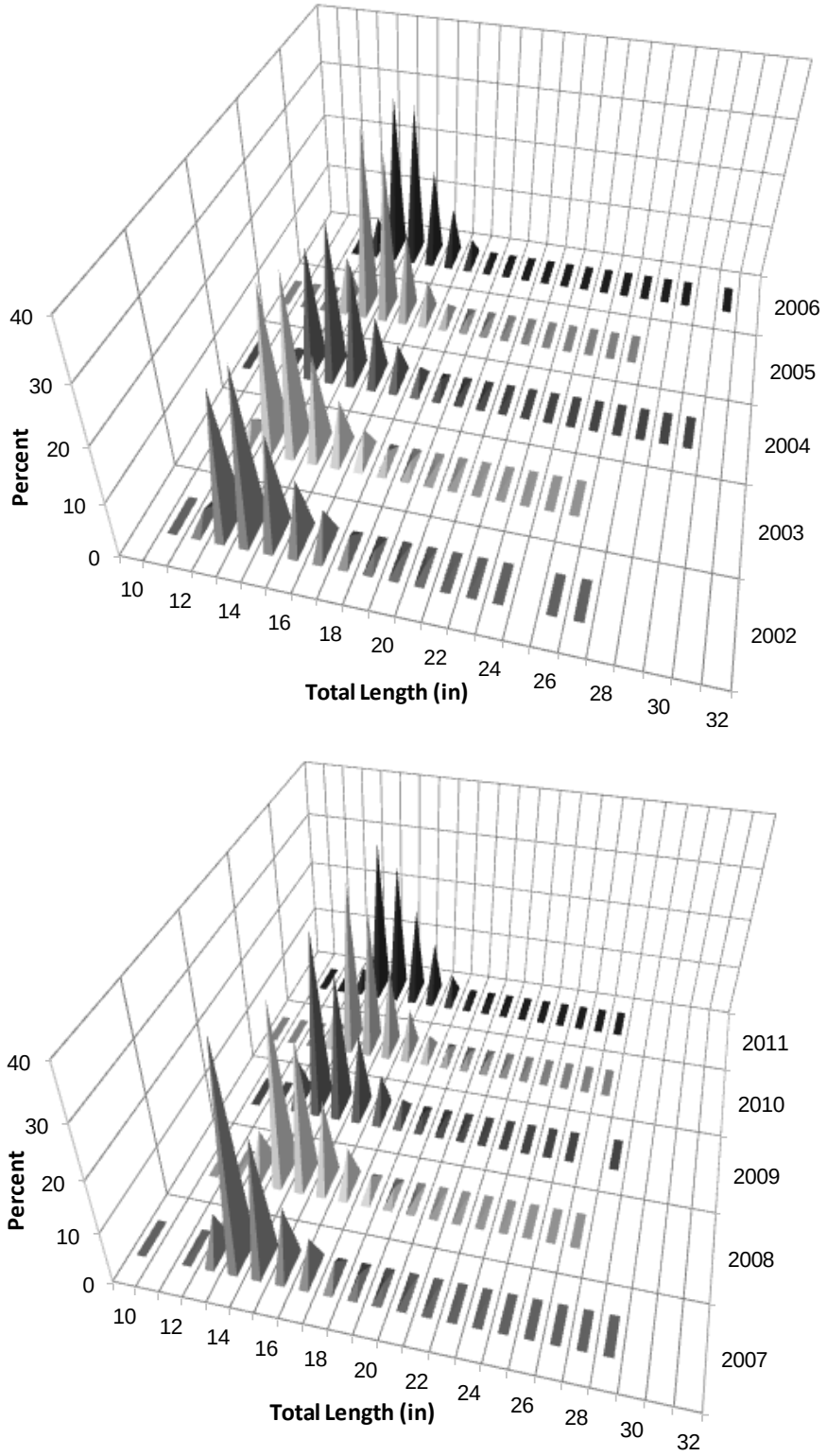
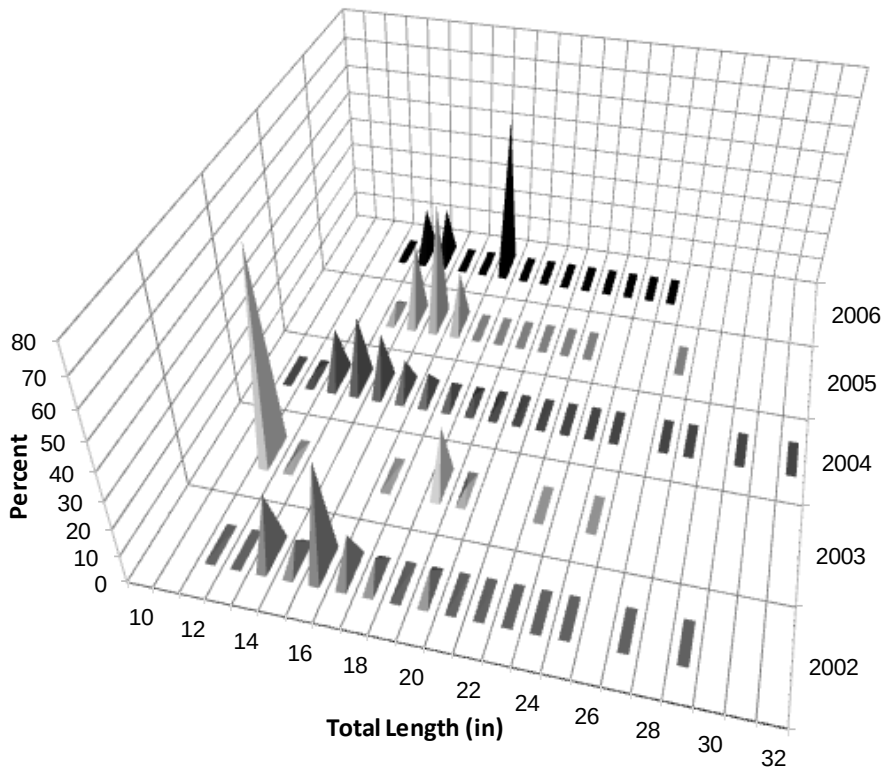


Figure 6.44. North Carolina estuarine gill net fishery weighted length frequency distributions for marketable southern flounder (*Paralichthys lethostigma*), 2002-2011.



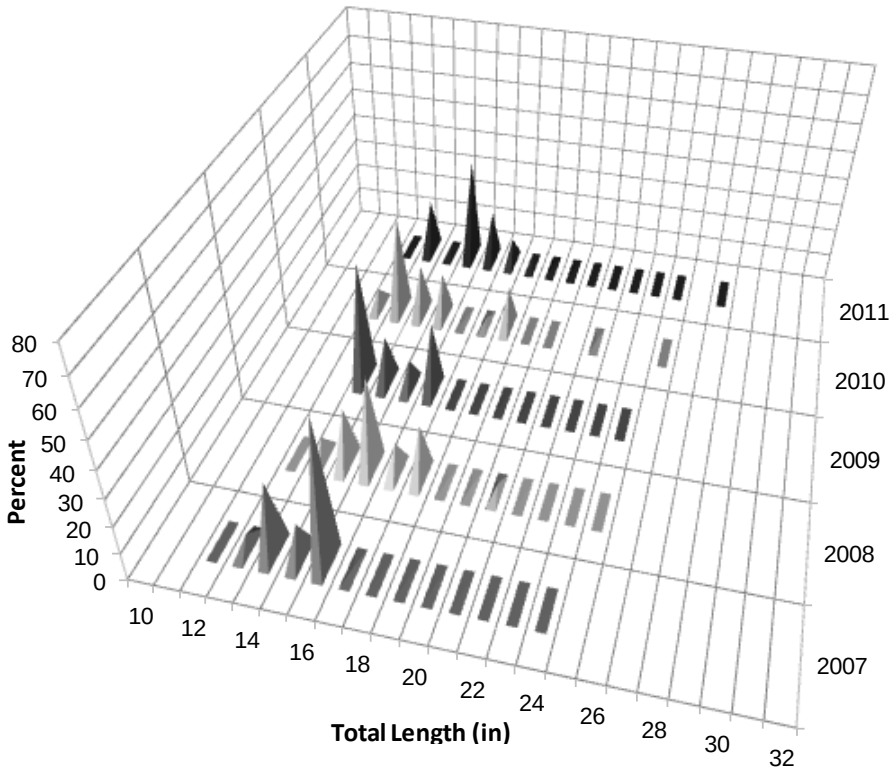


Figure 6.45. North Carolina sciaenid pound net fishery weighted length frequency distributions for marketable southern flounder (*Paralichthys lethostigma*), 2002-2011.

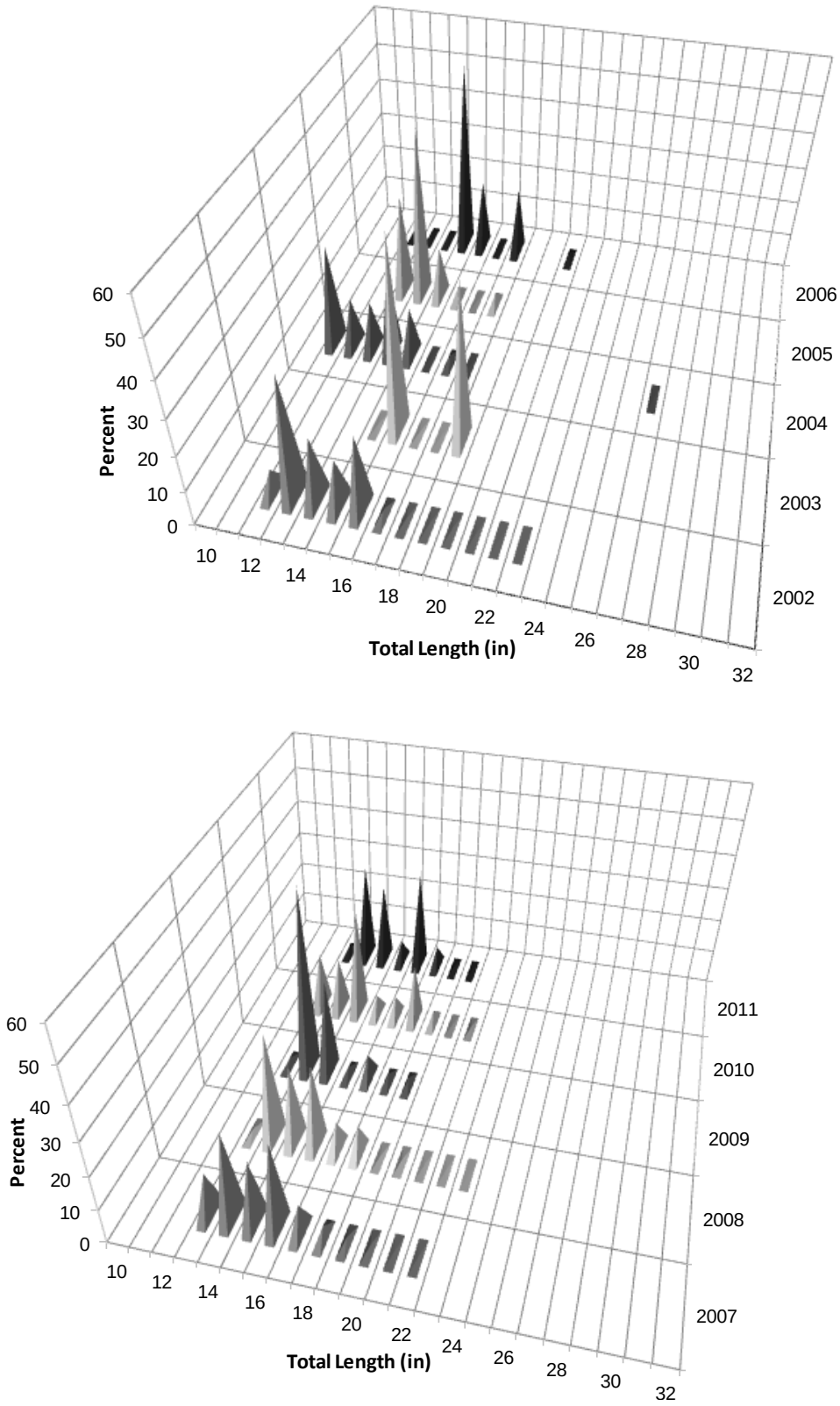


Figure 6.46. North Carolina long haul fishery weighted length frequency distributions for marketable southern flounder (*Paralichthys lethostigma*), 2002-2011

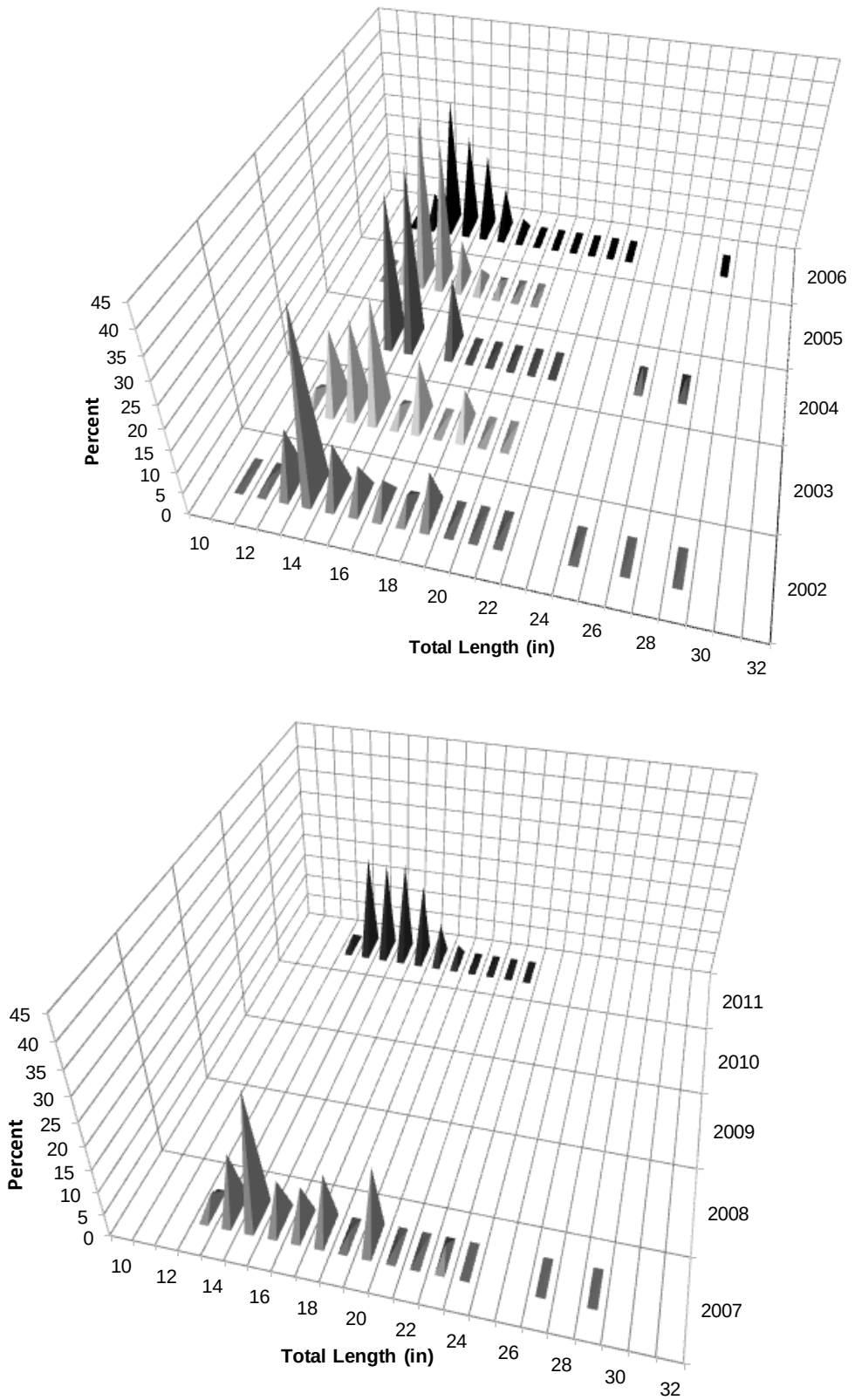


Figure 6.47. North Carolina ocean gill net fishery weighted length frequency distributions for marketable southern flounder (*Paralichthys lethostigma*), 2002-2011.

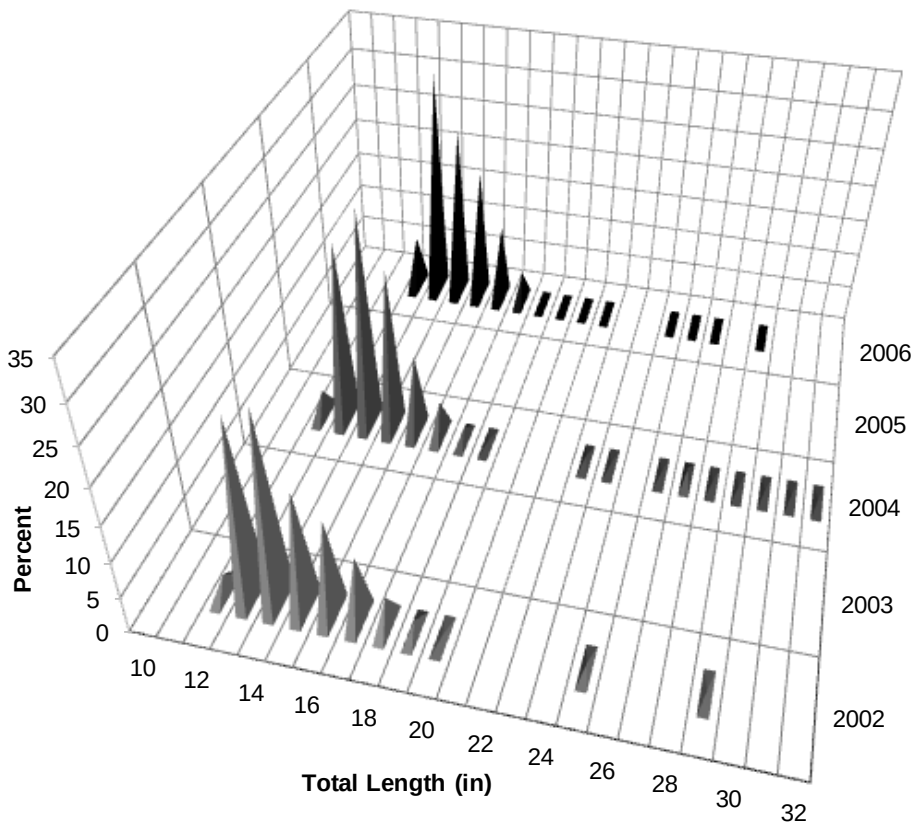


Figure 6.48. North Carolina ocean trawl fishery weighted length frequency distributions for marketable southern flounder (*Paralichthys lethostigma*), 2002-2006. No lengths for this species were sampled from this fishery in 2007-2011.

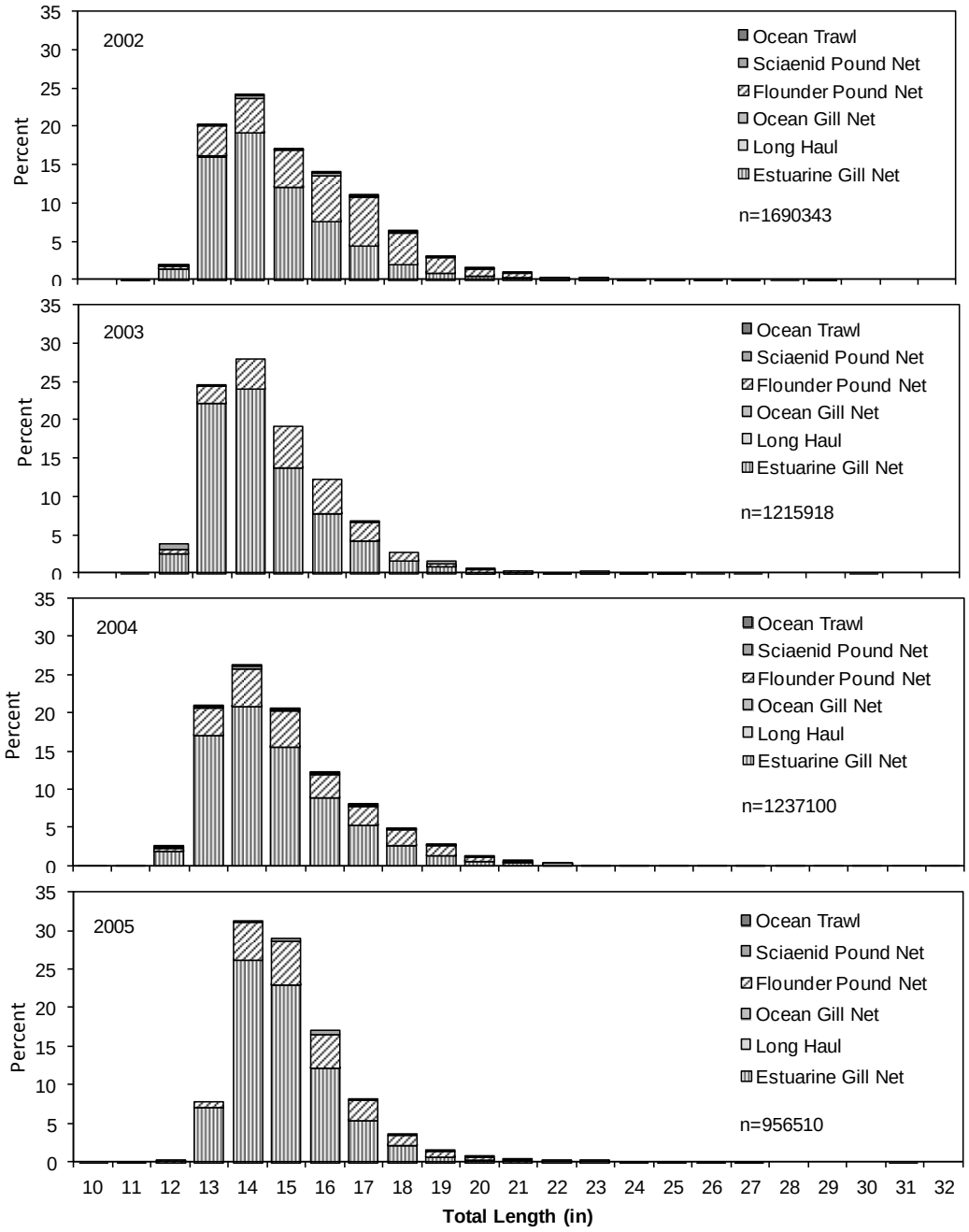


Figure 6.49. North Carolina commercial fishery weighted length frequency distributions for marketable southern flounder (*Paralichthys lethostigma*), 2002-2011.

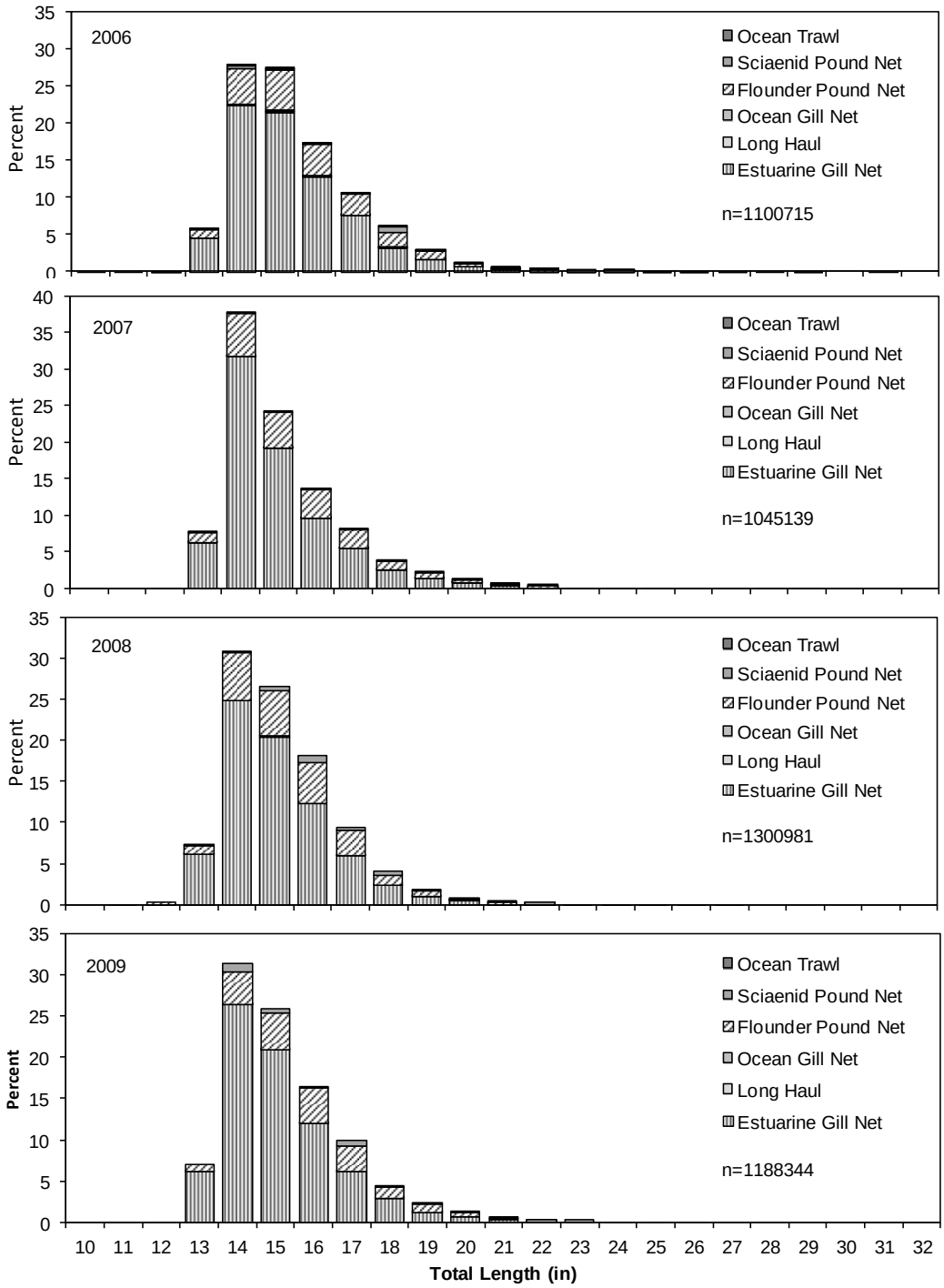


Figure 6.49. (Continued).

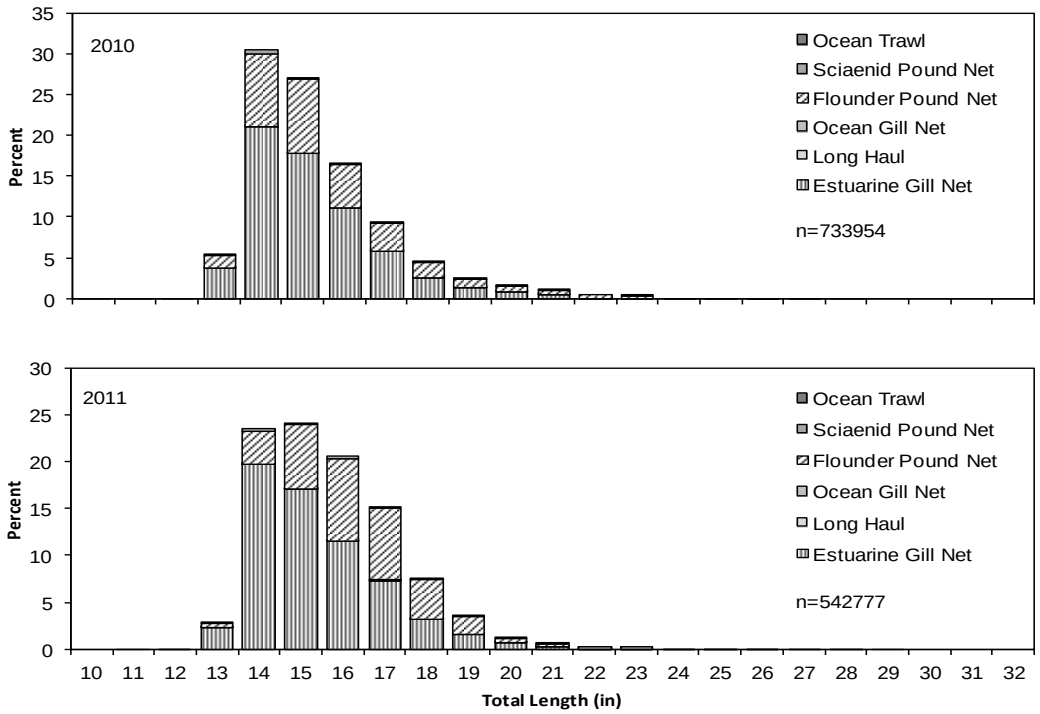


Figure 6.49. (Continued).

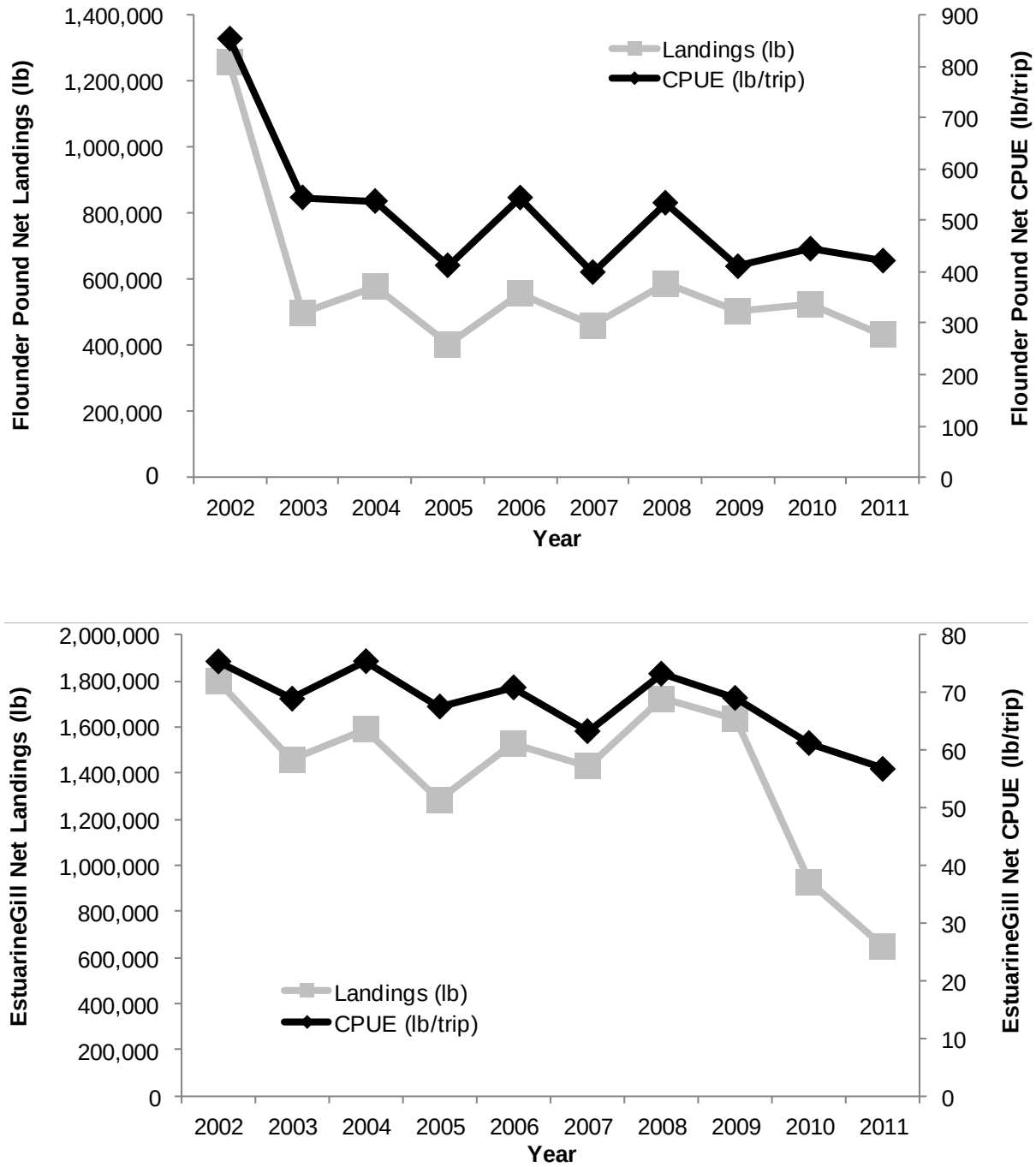


Figure 6.50 North Carolina southern flounder (*Paralichthys lethostigma*) annual commercial landings (lb) and CPUE (pounds per trip) for selected fisheries and overall, 2002-2011.

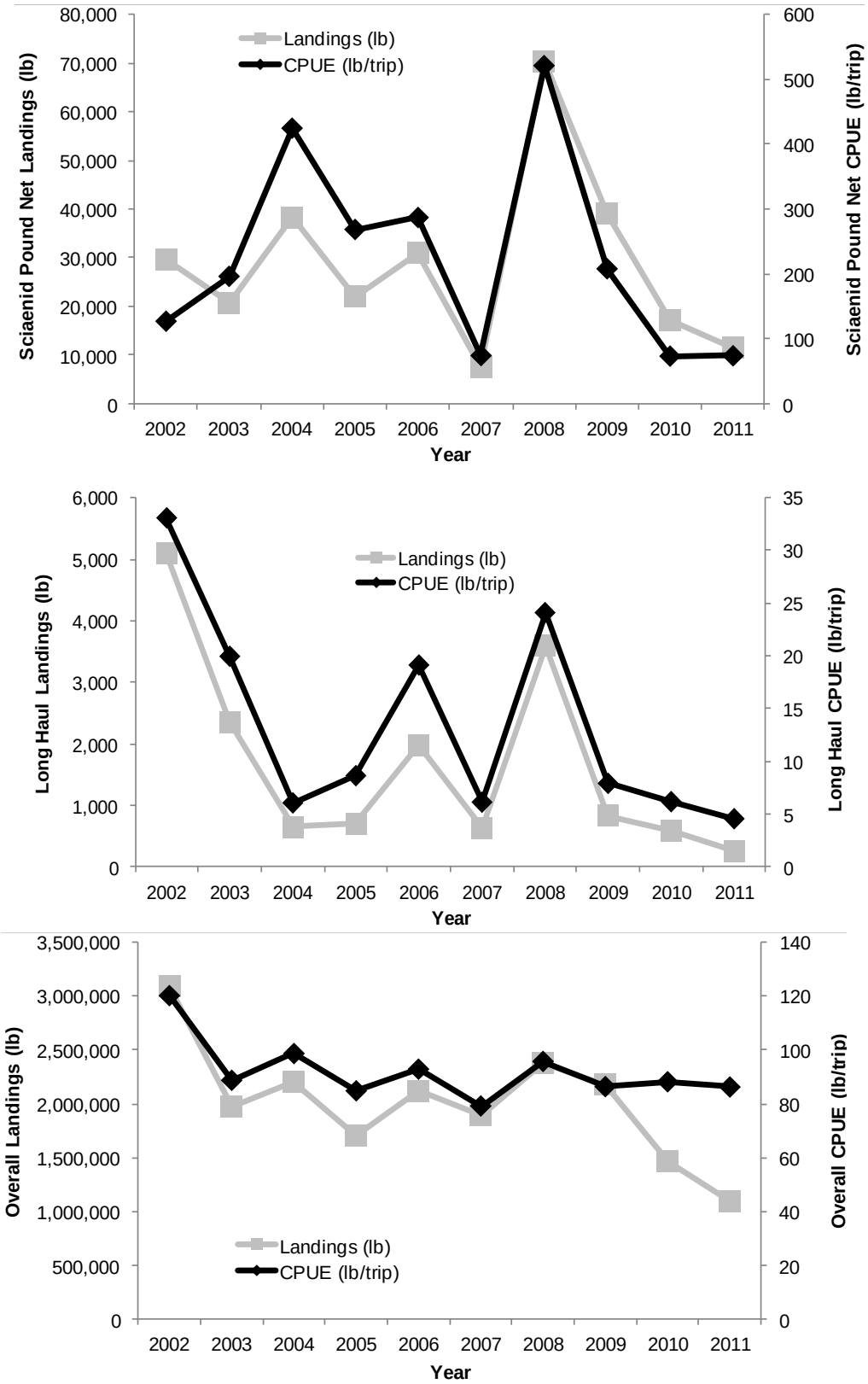


Figure 6.50. (Continued).

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STATE OF NORTH CAROLINA COMMERCIAL FINFISHERIES, 2007-2012

Final Performance Report for Award Number NA07NMF4070047

November 2012
SECTION 7

RECOMMENDATIONS AND ACKNOWLEDGMENTS

by

North Carolina Division of Marine Fisheries

RECOMMENDATIONS

Many North Carolina fish stocks (e.g., southern and summer flounder, weakfish, bluefish, red drum, Atlantic croaker, spot) are managed either by fishery management plans under the guidance of the Atlantic States Marine Fisheries Commission, Mid-Atlantic or South Atlantic Fisheries Management Councils or individual state plans. Stock assessments are conducted by the technical and scientific committees of the organizations to determine the status of the stocks and recommend necessary harvest control strategies. The data collected by this study are primary input parameters to any mathematical analysis of fish stock dynamics and these stock assessments are the foundation of any management action. The continued development and expansion of the 30-year database for this study allows the NCDMF and other agencies to monitor changes in age composition and mortality rates of the stocks and help to determine if overfishing is occurring. Determination of overfishing has become even more critical with the 2012 legislative action (Session Law 2012-190) that modified General Statute 143B-289.52 as follows "A supermajority of the Commission shall be six members. A supermajority shall be necessary to override recommendations from the Division of Marine Fisheries regarding measures needed to end overfishing or to rebuild overfished stocks." The following recommendations should be considered by the Fishery Dependent Subcommittee of the NCDMF Biological Review Team in order to ensure the utility of data gathered by this study.

1. This study will have to be supported solely with state funds since federal funding no longer exists for this program. The NCDMF should plan for dedicated state resources for the program. These state funds should be used for data management and analysis support as well as for additional field staff and operations. In lieu of the outgoing federal grant reporting requirements, the fisheries management supervisory staff that oversee this study need to ensure that comparable 3-5 year "completion reports" for the ongoing study are produced.

2. The implementation of a fully random stratified design for fish house sampling would improve the statistical validity of the results. Improved allocation of fish house sampling proportional to the trip ticket strata fishing effort (trips) is needed. Sampling effort in the estuarine gill net fishery should be modified to be more appropriately distributed among the different gill net configurations and component fisheries. All significant sources of catch (by gear, area and time) need to be sampled. Sampling should be maintained for all ongoing fisheries, even those at low levels of effort such as the sciaenid pound net, beach seine, and long haul seine fisheries.

3. Adequate samples of hard parts across all size classes are needed for age-length analysis for all assessed species. Additional individual fish lengths and weights are needed for all market grades to provide valid mean weights at age by fishery. Continued emphasis on acquiring scrap fish samples is needed. Species and fishery leads should set quarterly sampling goals and initiate sample tracking tools that reduce the likelihood of missed data.

4. Landings, sampling protocol, and actual field methods should be reviewed annually to ensure consistency across fisheries and areas to maximize sampling efficiency and account for fluctuations within fisheries, such as changes in targeted species, gear modifications, responses to regulations, and spatial expansion or shrinkage of the fisheries. Changes to fish house sampling protocols in the Albemarle Sound area should be considered in order to have consistent protocols across the state.

5. Fisheries and species leads should run the edit and analysis programs developed for this report on an annual basis in order to identify and correct any data errors on the biological database and meet the NCDMF strategic plan objective of having data for all biological programs complete, correct and uploaded for a year by April of the following year. These same individuals should insure that all analysis programs for this report are kept and organized on the DMF LAN for future reference. A post report lessons learned "memo" is needed to provide the blueprint for future section authors.

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