3. Commercial Fishery Statistics

Steve Brown[1], Richard Beaver[2], Ed Little[3]

[1]Florida Fish and Wildlife Research Institute, 100 Eighth Avenue SE, St. Petersburg, Florida 33701[2]

Florida Florida Fish and Wildlife Research Institute, 2796 Overseas Highway, Suite 119 Marathon, FL 33050

[3]National Marine Fisheries Service, Southeast Fisheries Science Center, Key West, FL

3.1 Overview (Group Membership, Leader, Issues)

The commercial workgroup consisted of two Florida Fish and Wildlife Conservation Commission (FWC) staff (Steve Brown and Rick Beaver), one field biologist (Ed Little) from the National Marine Fisheries Service (NMFS), and one industry representative associated with the Florida Keys Commercial Fisherman's Association (Scott Zimmerman). David Gloeckner, (NMFS Beaufort Laboratory) though not present at the Data Workshop meeting, provided valuable assistance with obtaining and using the NMFS Trip Interview Program data. Members of this work group lead by Steve Brown discussed issues such as what commercial mutton snapper data sets were available and how they were to be used, fisherman's concerns about regulations (such as FWC's elimination of trip limits on commercial trips, a need-to-know regarding future regulations which may be important with regard to fishing effort, and fisher's concerns about possible trip limits or quotas), and the selling of recreationally caught fish. It was noted that the majority of mutton snapper were probably harvested in Florida waters with little attributed to other states, and long line landings have increased in recent years in Gulf waters off South Florida and the Keys. There also seems to be a lack of commercial discard data, but members suggested that may not be an issue with long line gear since so few undersized fish are caught.

3.2 Commercial Landings

Available commercial landings data sources include historical data from the U.S. Fish Commission Report to Congress (1902-1937), the Florida Board of Conservation (1938-1962), NMFS Accumulated Landings System (ALS) (1950-2006; annual landings by state and gear), NMFS General Canvass (1962-2006; monthly dealer landings by water body and gear), NMFS logbook program (1990-2006; trip-level landings, mandatory vessel reporting), and the FWC marine fisheries trip ticket program (1986-2006; trip-level landings, mandatory dealer reporting). The U.S. Fish Commission Report data and Florida Board of Conservation data show historical landings by year and coast, but also have missing years until 1959 (Table 3.1). The NMFS General Canvass contain landings by year, water body, and gear from 1962-2006. Prior to 1997, the ALS utilized general canvass data collected monthly from seafood dealers. From 1997 to present, the ALS used FWC trip ticket data. However, there were unexplained differences (small in most years) in the total amount of reported commercial landings between the ALS and General Canvass in 1981-1985, and the ALS and FWC trip ticket data in 1986-2006 (compare Tables 3.1 and 3.2). Both the NMFS logbook data and the FWC trip ticket data contain trip level catch and effort. While the Florida trip ticket data are a longer time series, gear by trip was not required until late 1991, and area fished was not required until January of 1995, although area fished has been a data element on the trip ticket since the program began.

Commercial landings were stratified by year, month, region and gear for developing the commercial catch at age data for the assessment. It was recommended that commercial landings data from 1981-

2006 be used for the assessment since older landings are not available from other sources being used for the assessment such as the NMFS Marine Recreational Fisheries Statistics Survey and Headboat Survey. It was also recommended that commercial landings from the Florida trip ticket be used for Florida over the NMFS logbook data because it is a longer time series and includes landings of mutton snapper from state waters not otherwise captured with logbooks. A comparison of FWC trip ticket data to NMFS logbook data show that commercial landings of mutton snapper by area fished compare well between the two programs (Fig. 3.1A), and that much of the state waters hook and line data reported on the trip ticket is missing from the logbook data (Fig. 3.1B). Trip ticket data were used from 1986-2006 and the NMFS General Canvass data from 1981-1985. The NMFS ALS and logbook data were used for compilation of landings from other states, although approximately 98% of mutton snapper harvest occurs in Florida waters (Table 3.2). Data from 2001-2006 may be analyzed using the Stephens and McCall (2004) method for examination of zero trips.

Prior to having gear information on every ticket beginning in 1991, gear related to trip tickets was retrieved from the Saltwater Products (SPL) or fisher's license record initially, but many license holders indicated more than one gear on their annual license application or renewal. Additionally, the SPL was prohibited from being retained on the trip ticket by the Florida legislature when then trip ticket program was initially approved in 1983. The prohibition was later removed in 1986 and SPL numbers were included on the trip ticket record. Beginning in late 1991, trip tickets included a series of check boxes for generic gear types and a single gear code for more specific gear information.

For trip tickets with missing gear from 1986-1992, gear was assigned from the commercial fishing license application database based on a species/gear hierarchy from later years where gear was reported by trip. Target species and species groups were identified on trips where gear was reported from 1991-1994. The species-gear associations from these data were ranked from most common to least common and applied to the trip ticket data from 1986-1992. Target species and species groups were then identified on trips where gear was not reported from 1986-1992. Gear was then assigned to each trip based on matching the species-license gear association with the species-ticket gear association from the 1991-1994 data. Region designations (Fig. 3.2) include NE Florida-North Carolina, SE Florida, the Florida Keys and Dry Tortugas, SW Florida, and NW Florida-Texas. Of particular interest in this fishery is the increase in longline and other commercial gears used in areas west of the Dry Tortugas and Pully Ridge (Fig. 3.3) where some of the oldest mutton snapper observed (otolith data; Life History Section II) in this study were caught. Commercial landings were stratified by the following fisheries or gear types: hook-and-line, longline, and traps and other gears. The majority of landings were categorized as one of these gear types. Landings from trip for which the gear used for harvest was unknown were prorated among the other gears.

Statewide, total commercial and recreational harvest of mutton snapper in Florida has gradually declined since the mid-1980's (Fig. 3.4), but in recent years, landings have increased. This can probably be attributed to increased landings of commercial longline-caught fish from vessels that have moved down from the Tampa area to fish Gulf waters off the Florida Keys and Dry Tortugas (Doug Gregory, pers. comm.). Longline landings have increased in recent years, primarily off the Florida Keys and Southwest Florida (Fig. 3.5). Prior to 2001, landings by all gear types were primarily from the Keys and Southeast Florida, but landings from Southwest Florida have increased in recent years.

Mutton snapper commercial harvest figures showed a strong seasonal trend with increased landings from May-July each year prior to 1996 (Fig. 3.6; monthly data by region and gear not available prior to 1986). After 1996, a more moderate seasonal trend existed with an overall decrease in landings annually. The 16-inch size limit implemented in state waters and South Atlantic federal waters in 1994, and Gulf of Mexico federal waters in 1999 was the likely explanation for the patterns seen in the annual

landings and seasonality. Increased May-July harvest is most evident in the commercial hook-and-line fishery, even after the size limit went into effect (Fig. 3.7). Landings by longline were more evenly distributed throughout the year, but exhibit a considerable increase by month in recent years. In addition, during May and June in South Atlantic federal waters, commercial fishers are reduced to a 10-fish trip limit and so Florida East coast fishers may be shifting effort to the Gulf during that time. Burton (1997) noted that a May-June closure in 1994 on Riley's Hump west of the Dry Tortugas (Amendment 5, GMFMC 1994) caused effort to be shifted toward the months surrounding the closure, and that landings decreased during only one month of the closure period. Commercial landings by year and month for the region that included the Florida Keys and Dry Tortugas showed an increase in harvest during July with fluctuating May-June harvest in the years following the closure which agrees with earlier observations (Fig. 3.8). The increased landings in more recent years were due to increased longline harvest as hook-and-line harvest decreased after 2000. The establishment of the Tortugas South Ecological Reserve which includes Riley's Hump and waters south may have affected the overall level of commercial harvest of this species. Burton et al. (2005) noted an increase in the mutton snapper spawning aggregations within the reserve.

3.3 Commercial Discards

According to commercial data sources, the Federal logbook program is currently the only source of commercial discard data. Discard data have been collected through logbooks beginning in 2001. In that survey, there were few trips recording mutton discards. According to NMFS, only about 10-20% of logbook trips are sampled for discards. The data suggest that there were infrequent discards, but with so many trips not reporting discards, the data could be discard poor as well. It was noted by Ed Little, NMFS port sampler in lower Keys, that at least for longline vessels it may be a non-issue since they would not generally be fishing where smaller fish occur. Expert advice was given by industry (Eric Schmidt, Ft. Myers; Scott Zimmerman, Florida Keys) at the time of the data workshop that support Ed's statement, and the feeling is that mutton commercial discards have probably decreased over time. Because only a fraction of the logbooks required the reporting of discards, it may be possible to derive a ratio from the discard logbooks of the reported trips with discards of mutton snapper to the total number of trips on which the reporting of discards was required and on which mutton snapper had been caught. This ratio may be suitable for estimating the total discards of mutton snapper from all commercial reef fish trips. However, this task is left to the stock assessment scientists.

There have been some commercial fishing trips on which observers were onboard and directly observed catch and discards. Sutherland and Harper (1983) and Taylor and McMicheal (1983) observed catch and discards from the fish trap fishery of Dade and Broward Counties and Monroe and Collier Counties, respectively, from November 1979 to December 1980. Mutton snapper were among the targeted fish in this fishery and accounted for about 5.5% (by number) and 14.7% (by weight) of the observed catch in wire traps in the Dade and Broward area. Sutherland and Harper (1983) report that only 1 mutton snapper was observed to be discarded and it swam downward during the 2-minute observation period. Taylor and McMichael (1983) noted no discards of mutton snapper though they did not various trap-related injuries and death in mutton snapper either due to gas expansion, trap injury, or predation. In December 1993 through November 1994, a NMFS study (1995, report from MARFIN Grant No. 94MARFIN 17, supplement [Scott-Denton (1995)] from MARFIN Grant No. 95MFIH07, and addendum [Harper (1996)]) of the reef fish fishery observed catches from fish traps, longlines, and bandit rigs in the Gulf of Mexico and summarized Gulf Reef Fish Logbook data. Small numbers of mutton snapper were caught in the trips observed (1 from fish traps, 16 from bottom longlines, and fish from bandit rigs), and no discards of mutton snapper were recorded during this study. Recently, a study of the shark bottom longline fishery (Hale and Carlson 2007; Hale 2007 SEDAR15A-DW-xx) noted 22

mutton snapper caught on 4 out of 89 trips in South Atlantic and Gulf of Mexico waters, and 2 of those were discarded because they were cut-offs. There were no observed occurrences in the NMFS shrimp trawl characterization studies from 1992-2005 (Scott-Denton, personal communication).

3.4 Commercial Effort

Few measures of effort (number of vessels by port, number of industry personnel) were available prior to the implementation of Florida's marine fisheries trip ticket program in 1984. Fisheries can now be characterized by the number of species-specific fishers through the trip ticket program. The trip ticket includes the SPL, the wholesale or retail dealer number, date landed, county landed, time fished, days at sea, area fished, depth fished, gear used, species, size/market category, amount of catch, and unit price.

Since the early 1990's, the amount of effort in the commercial mutton snapper fishery has decreased similar to the decrease in reported commercial landings (Fig. 3.8). Both the number of trips and fishers decreased by region and by gear. Effort off the Florida Keys and Dry Tortugas accounted for 60-70% by region, and hook-and-line gear accounted for 80% of effort by gear. Conversely, statewide catch-per-trip has increased from a low of 47 pounds per trip in 1995 to 105 pounds per trip in 2006 statewide (Fig. 3.9). Statewide catch-per-trip was highly influenced by catch per trip in the Keys and Dry Tortugas with the majority of mutton snapper harvest occurring there. Catch-per-trip by longline gear has increased dramatically since 1999, but declined briefly in 2005. Catch-per-trip from trap gears has declined considerably, and has remained fairly consistent for hook-and-line gears.

3.5 Biological Sampling

3.5.1 Sampling Intensity/Age/Weight

Fishery-dependent biostatistical data from commercial catches is available through the NOAA Fisheries Trip Interview Program (TIP). Sampling of commercial catches is performed by both state and federal samplers in the Southeast region for this program. Data collected include length, weight, biological samples for aging, DNA and mercury testing, as well as catch and effort data. There were 21,242 length measurements for commercial mutton snapper available in the TIP data from 1983-2006 from the Southeast Atlantic and Gulf of Mexico regions (Table 3.4). Of those, 3,578 records included age samples which will be used with other available age-length data to estimate length at age. In addition, 1,101 records have a gutted weight and fork length associated with the sample. A regression analysis of mutton snapper measurements from commercial catches indicates a strong relationship for fork length and gutted weight (Fig. 3.11; see also Life History Section II, Table 2.12).

Some important effort variables from TIP include gear, water body, size, depth, time of year. Ninety-eight percent of trip interviews in TIP contain water body, gear and depth information. Lengths of fish landed commercially (Table 3.5) were used to compare sizes of fish landed by year, month, region, or gear and to convert landings from pounds to numbers of fish. Traditionally, mutton snapper harvested for sale by commercial fishermen are landed gutted, and a factor of 1.11 is used to convert gutted weights to whole weights for the commercial landings of snappers in the Southeastern Atlantic and Gulf of Mexico. Lacking data for a direct comparison of weight before and after gutting, we have used the same conversion factor in this report as is used by the NMFS and other southeastern states.

Length frequency data from commercial catches of mutton snapper indicate the size distribution ranged from 232.5 - 972.5 mm maximum total length for samples taken from the Gulf of Mexico, and 230.5 - 977.1 mm maximum total length for those taken from the South Atlantic from 1985-2006. Fig. 3.12 shows length frequency distributions by coast for the time periods before and after implementation of the 12 inch and 16 inch minimum size limits for mutton snapper. The beginning year of each of the 12 and 16 inch size limit histograms is the year of implementation. Undersized fish recorded during the implementation year could have been sampled prior to the actual implementation date. Mean total length in the Gulf increased during each period, but decreased slightly in the South Atlantic after implementation of the 12" minimum size. The majority of samples were taken in the Gulf. Generally, larger fish were taken in the longline fishery for both the Gulf and South Atlantic than in the hook-and-line and trap fisheries (Fig. 3.13). Seventy percent of samples taken in the Gulf came from the longline fishery. The majority of samples in the South Atlantic were from the hook-and-line fishery.

3.5.2 Length/Age Distributions

Size (by 25 mm size class) of mutton snapper measured from commercial catches by region and gear are presented in Table 3.5, and is taken from the measurements of mutton snapper from commercial fishing trips represented in the NMFS Trip Interview Program data base. There were very few records of discards from the commercial logbooks, and no size information for discarded fish. The conversion of catch-at-length to catch-at-age is left to the stock assessment workshop participants.

3.5.3 Adequacy for characterizing catch

The task of grouping commercial catches and size frequencies into catch-at-size and catch-at-age by gears and water bodies suitable for modeling was left to the stock assessment workshop participants

3.5.4 Alternatives for characterizing discard length/age

The task of developing suitable ways of characterizing discards was left to the stock assessment workshop participants.

3.6 Commercial Catch-at-Age/Length

The task of estimating catch-at-age is left to the stock assessment workshop participants.

3.7 Comments on Adequacy of Data for Assessment Workshop

The lack of size frequency, age, discard, trip-level, gear, and water body data in the earlier years of the time series may create serious problems for the stock assessment. Even in the later portions of the time series the number of lengths measured was barely adequate for expanding the annual catch by the observed size frequencies, and only for the major gear categories used in the fishery. If distinctions between gear types and methods (i.e., different hook types, depth of fishing, etc.) is important for future assessments, additional dockside sampling will be needed to collect information from more commercial reef fish trips.

3.8 Research Recommendations

Increasing the dockside sampling of commercial catches, particularly for the longline and bandit rig fisheries will be important to monitoring the size of fish, areas and depths fished, and fishing effort for this species and other reef fish. The scarcity of otoliths in the earlier portions of the sampling time series restricts the amount of age information that could be used for assessments, and we suggest placing more emphasis on sampling otoliths for this and other reef species to aid future age-structured stock assessments. There is also a need for increasing the amount of discard information (either at-sea or from logbooks) and discard mortality data in modern stock assessments, including this species. Few discards of mutton snapper were actually noted in commercial fishermen's logbooks, and perhaps the number of fish discarded by commercial fishermen is really low. However, the relatively low frequency of discard logbooks assigned to fishermen may have also been a factor in the low number of discard records provided. Mutton snapper tend to be caught in low numbers with other reef fish species, and relatively few commercial fishing trips actually appear to target this species.

An examination of the conversion factors used to convert landed weight to whole weight should be undertaken. A comparison of the regressions in Life History Section II (Table 2.12) for gutted weight and whole weight would appear to suggest a lower percentage difference between gutted weight and whole weight at comparable sizes, perhaps as low as 2-5% rather than the 11% currently used for all snappers. However, at this time, there is not enough data to allow a direct comparison of gutted weight to whole weight and derive a suitable conversion factor and the differences suggested would be small and perhaps negligible for the stock assessment. Ultimately, if allocation between the various sectors of the fishery for mutton snapper and other reef fish are contemplated, conversion factors may become more of an issue.

There were differences noted in the commercial fisheries landings data between the ALS system, the General Canvass data, and the FWC trip ticket data. These differences should be reconciled so that each system will provide comparable numbers where appropriate.

3.9 Itemized List of Tasks for Completion Following Workshop

Commercial landings:
Provide commercial fishing effort data as number of trips and fishers by year, area and gear; also include catch per trip by gear.

- Steve Brown was given this task.

Length and age data (TIP):
Generate length frequencies by year, month, area, gear (in progress)

- Bob Muller and Joe O'Hop were given this task.

Apply length-weight regression to commercial landings to calculate numbers of fish landed

- Rick Beaver was given the task of producing length-weight regressions from the FWC Biological Sampling data and TIP length and weight data.
- Bob Muller and Joe O'Hop were given task of applying the length-weight regressions appropriately to the size-frequency data generated from the commercial sampling, and to produce catch-at-size matrices by year and gear.

Back-calculate missing weights (in progress)

- Bob Muller and Joe O'Hop were given this task.

Calculate length-at-age distributions (in progress)

- Bob Muller and Joe O'Hop were given the task of taking the catch-at-length matrices and producing catch-at-size matrices for the assessment models.

3.10 Literature Cited

Burton, M.L. 1997. The effect of spawning season closures on landings of two reef associated species. Proc. Gulf. Caribb. Fish. Inst. 50:896-918.

Burton, M.L., K.J. Brennan, R.C. Munoz, R.O. Parker Jr. 2005. Preliminary evidence of increased spawning aggregations of mutton snapper (*Lutjanus analis*) at Riley's Hump two years after establishment of the Tortugas South Ecological Reserve. Fish. Bull. 103: 404-410.

Florida Board of Conservation. 1938-1962. Summary of Florida Commercial Marine Landings. Tallahassee, FL.

FWC (Florida Fish and Wildlife Conservation Commission). 1986-2006. Marine Fisheries Trip Ticket Program. St. Petersburg, FL.

NMFS (National Marine Fisheries Service). 1962-1985. Accumulated Landings System. NMFS, Washington, D.C.

NMFS (National Marine Fisheries Service). 1991-2006. Commercial Logbook Program. NMFS, Washington, D.C.

NMFS (National Marine Fisheries Service). 1995. Characterization of the reef fish fishery of the Eastern U.S. Gulf of Mexico. Report to the Gulf of Mexico Fishery Management Council Reef Fish Management Committee. Key West, Florida. July 17-18, 1995. NMFS Galveston and Miami Laboratories.

Stephens, A. and A. MacCall. 2004. A multispecies approach to subsetting logbook data for purposes of estimating CPUE. Fish. Res. 70:299-310.

Sutherland, D.L. and D.E. Harper. 1983. The wire fish-trap fishery of Dade and Broward Counties, Florida. December 1979-September 1980. Florida Marine Research Publications Number 40. 21 pp.

Taylor, R.G. and R.H. McMichael, Jr. 1983. The wire fish-trap fisheries in Monroe and Collier counties, Florida. Florida Marine Research Publications Number 39. 19pp.

3.11 Tables

Table 3.1. Mutton snapper commercial landings (in kilograms, whole weight), 1902-2005 (U.S. Fish Commission Report to Congress, 1902-1937; Florida State Board of Conservation, 1938-1962; NOAA Fisheries Accumulated Landings System (ALS) 1950 – 2006; **in black**), and NMFS General Canvass (1962-2006). Landings for 1981-1985 (**in green**) were taken from the NMFS General Canvass data, and data for 1986-2006 (**in blue**) were from FWC marine fisheries trip tickets.

Year	Atlantic	Gulf	Total	Year	Atlantic	Gulf	Total
1900				1943			122,551
1901				1944			87,890
1902	2,150	12,837	14,987	1945			115,481
1903				1946			149,356
1904				1947			28,339
1905				1948			73,430
1906				1949			55,797
1907				1950	24,766	9,843	34,609
1908				1951			83,461
1909				1952	63,503	19,958	83,461
1910				1953	37,739	20,230	57,969
1911				1954			40,869
1912				1955	48,081	16,103	64,183
1913				1956	24,086	16,783	40,869
1914				1957			61,643
1915				1958			92,397
1916				1959	16,103	35,244	51,347
1917				1960	23,950	42,592	66,542
1918	109,351	6,396	115,747	1961	20,865	40,778	61,643
1919				1962	27,987	64,410	92,397
1920				1963	37,784	53,388	91,172
1921				1964	29,302	60,917	90,220
1922				1965	29,166	49,895	79,061
1923	55,837	12,803	68,640	1966	37,557	37,376	74,933
1924				1967	17,645	66,996	84,640
1925				1968	24,948	75,342	100,289
1926				1969	34,700	61,416	96,116
1927	58,468	14,686	73,154	1970	73,391	106,231	179,623
1928		15,694		1971	81,964	124,375	206,339
1929	82,047	20,298	102,345	1972	90,220	108,000	198,220
1930	69,869	32,207	102,076	1973	131,406	117,390	248,795
1931	10,886	5,291	16,177	1974	91,535	116,573	208,108
1932	88,716	3,425	92,140	1975	62,278	117,707	179,985
1933				1976	55,384	107,365	162,749
1934			90,220	1977	81,601	85,865	167,466
1935				1978	106,218	101,278	207,496
1936	65,544	9,525	75,070	1979	56,245	98,719	154,965
1937				1980	62,271	91,475	153,746
1938			176,121	1981	50,420	96,711	147,131
1939			105,501	1982	32,867	132,250	165,117
1940			77,050	1983	21,789	126,445	148,234
1941				1984	19,245	93,505	112,750
1942			70,445	1985	7,352	92,893	100,246

Table 3.1. (continued)

Year	Atlantic	Gulf	Total	Year	Atlantic	Gulf	Total
1986	**71,602**	**114,803**	**186,405**	**1997**	**29,987**	**101,702**	**131,689**
1987	**81,713**	**168,573**	**250,286**	**1998**	**31,102**	**128,783**	**159,885**
1988	**75,106**	**130,284**	**205,390**	**1999**	**22,820**	**90,664**	**113,484**
1989	**84,646**	**164,754**	**249,400**	**2000**	**15,976**	**76,068**	**92,044**
1990	**64,833**	**141,755**	**206,588**	**2001**	**21,313**	**83,209**	**104,522**
1991	**59,434**	**159,554**	**218,988**	**2002**	**20,623**	**84,222**	**104,845**
1992	**31,780**	**149,630**	**181,410**	**2003**	**19,421**	**101,502**	**120,922**
1993	**51,836**	**149,566**	**201,402**	**2004**	**15,206**	**141,654**	**156,860**
1994	**35,028**	**126,550**	**161,578**	**2005**	**15,816**	**90,318**	**106,134**
1995	**28,249**	**100,327**	**128,576**	**2006**	**8,037**	**118,424**	**126,461**
1996	**27,178**	**104,660**	**131,838**				

Table 3.2. Mutton snapper commercial landings (in kilograms, whole weight) by state for the South Atlantic and Gulf of Mexico. Source: NOAA Fisheries Accumulated Landings System (ALS) 1981 – 2006).

Year	Florida East	Florida West	Georgia	Louisiana	No. Carolina	So. Carolina	Grand Total
1981	52,760	96,711					149,471
1982	33,713	132,250					165,963
1983	23,566	126,445					150,012
1984	33,800	93,505			234		127,539
1985	28,074	92,503			576		121,153
1986	75,442	109,742			504	515	186,202
1987	84,602	164,475			1,882	474	251,433
1988	77,180	124,633				522	202,335
1989	75,260	158,290			669	384	234,603
1990	67,967	137,117	59		433	236	205,813
1991	63,748	154,354			877	137	219,117
1992	32,171	139,324			755	250	172,500
1993	53,899	146,136			1,256	63	201,354
1994	36,833	123,818	569		918	83	162,222
1995	34,956	92,674			1,149		128,778
1996	31,665	99,251			860	72	131,849
1997	30,303	100,669			617	134	131,723
1998	34,990	124,248			644	821	160,703
1999	27,118	85,028		20	581	746	113,494
2000	15,647	75,194		36	307	899	92,083
2001	21,400	82,517			193	477	104,586
2002	21,603	82,206		138	192	868	105,008
2003	18,494	100,555		215	670	1,169	121,104
2004	13,342	141,370		42	730	1,505	156,988
2005	13,626	89,704			932	1,966	106,228
2006	8,517	118,066			682	2,059	129,324

Table 3.3. Commercial landings (kilograms) of mutton snapper by region and year, hook and line gears. Source data: NOAA Fisheries General Canvass (1981-1985), FWC trip ticket (1986-2006). Landings for which gear was unknown were prorated among all gears.

Hook and Line Gears

	Kilograms					
Year	Northeast	Southeast	Keys	Southwest	Northwest	Total
1981	10,292	33,010	37,509	9,153	7,897	97,861
1982	16,610	13,609	57,202	2,751	13,601	103,771
1983	4,955	12,455	55,680	11,542	6,002	90,633
1984	13,987	2,126	55,282	5,079	2,918	79,392
1985	4,859	947	53,456	2,559	4,874	66,695
1986	34,884	17,355	39,885	5,116	2,231	99,472
1987	35,587	18,969	67,978	6,029	3,264	131,827
1988	28,374	12,061	55,701	7,042	1,467	104,645
1989	12,950	18,455	68,891	7,621	2,464	110,382
1990	3,319	23,636	69,082	4,539	5,166	105,742
1991	3,918	30,120	66,600	7,948	4,574	113,161
1992	3,125	23,599	71,026	4,215	1,553	103,518
1993	5,017	43,152	69,658	7,903	3,301	129,032
1994	7,066	24,635	75,095	8,243	2,443	117,482
1995	8,130	16,155	58,890	3,818	2,486	89,479
1996	3,775	21,496	59,881	4,435	3,014	92,602
1997	4,862	23,254	60,267	3,861	1,388	93,632
1998	6,107	21,432	61,757	2,953	2,183	94,431
1999	7,274	13,253	34,641	3,097	1,861	60,126
2000	5,334	8,899	28,382	2,484	1,069	46,168
2001	4,138	14,073	32,259	3,533	728	54,731
2002	5,522	12,576	35,564	2,732	963	57,357
2003	4,803	12,157	40,533	1,607	1,115	60,214
2004	5,096	8,717	42,949	3,770	649	61,181
2005	6,385	8,437	28,357	2,996	490	46,665
2006	2,497	4,591	30,209	4,148	391	41,836

Table 3.3 continued. Commercial landings (kilograms) of mutton snapper by region and year, longline gear. Source data: NOAA Fisheries General Canvass (1981-1985), FWC trip ticket (1986-2006). Landings for which gear was unknown were prorated among all gears.

Longline Gear

	Kilograms					
Year	Northeast	Southeast	Keys	Southwest	Northwest	Total
1981	0	0	25,628	1,741	1,030	28,399
1982	0	0	40,790	507	1,875	43,172
1983	0	0	28,619	2,985	9,016	40,620
1984	158	0	14,358	5,342	3,380	23,237
1985	0	0	14,038	4,708	6,566	25,313
1986	2,406	8,256	25,885	5,396	11,567	53,511
1987	3,565	4,026	48,769	10,169	17,124	83,655
1988	31	3,460	22,786	10,803	14,755	51,834
1989	98	6,961	51,928	3,807	14,659	77,454
1990	3,755	5,370	31,749	9,931	9,936	60,741
1991	1,127	8,572	47,575	7,012	10,885	75,170
1992	1,265	1,782	25,672	7,237	10,309	46,265
1993	17	212	9,073	9,829	8,148	27,278
1994	45	47	4,274	4,866	6,676	15,908
1995	535	636	6,286	6,235	3,558	17,249
1996	269	0	5,920	7,710	5,368	19,267
1997	235	2	8,380	13,454	2,955	25,025
1998	744	229	13,983	8,763	10,072	33,791
1999	523	37	11,814	8,398	11,831	32,603
2000	467	147	10,466	9,956	11,865	32,901
2001	369	27	15,119	11,030	14,627	41,171
2002	45	15	12,337	15,014	8,304	35,715
2003	45	112	16,944	14,018	19,077	50,196
2004	9	186	53,914	21,273	13,918	89,300
2005	0	11	31,982	12,778	9,768	54,539
2006	0	230	47,937	28,342	4,693	81,202

Table 3.3 continued. Commercial landings (kilograms) of mutton snapper by region and year, fish trap gear. Source data: NOAA Fisheries General Canvass (1981-1985), FWC trip ticket (1986-2006). Landings for which gear was unknown were prorated among all gears.

Trap Gear

	Kilograms					
Year	Northeast	Southeast	Keys	Southwest	Northwest	Total
1981	0	7,094	12,271	0	0	19,365
1982	0	2,649	14,819	0	0	17,468
1983	0	4,379	10,891	0	0	15,270
1984	0	2,955	6,001	198	0	9,153
1985	0	1,539	5,205	128	0	6,872
1986	125	4,005	16,662	816	178	21,786
1987	159	13,738	8,851	462	64	23,275
1988	36	22,210	7,957	347	16	30,565
1989	49	44,038	10,254	434	53	54,829
1990	153	27,013	3,674	1,390	274	32,503
1991	97	14,611	11,286	347	48	26,388
1992	34	533	24,770	291	87	25,716
1993	3	1,037	39,555	225	0	40,820
1994	0	1,385	22,751	667	23	24,826
1995	0	1,592	16,369	936	10	18,906
1996	0	798	16,931	199	17	17,945
1997	0	897	10,162	131	75	11,265
1998	0	1,117	27,911	36	0	29,064
1999	0	478	18,270	4	0	18,752
2000	0	717	9,510	842	14	11,083
2001	0	1,823	3,667	81	142	5,713
2002	0	1,677	7,416	172	141	9,406
2003	0	1,603	7,133	3	57	8,796
2004	0	742	3,671	58	61	4,532
2005	0	304	1,627	204	8	2,143
2006	0	386	1,374	82	0	1,842

Table 3.3 continued. Commercial landings (kilograms) of mutton snapper by region and year, Other gears. Source data: NOAA Fisheries General Canvass (1981-1985), FWC trip ticket (1986-2006). Landings for which gear was unknown were prorated among all gears.

Other Gears

	Kilograms					
Year	Northeast	Southeast	Keys	Southwest	Northwest	Total
1981	24	0	972	510	0	1,507
1982	0	0	0	0	706	706
1983	0	0	1,663	48	0	1,711
1984	20	0	817	132	0	968
1985	7	0	845	514	0	1,366
1986	2,776	1,794	4,774	1,559	732	11,636
1987	4,802	866	3,138	1,904	821	11,530
1988	8,076	859	6,474	2,762	175	18,345
1989	867	1,228	2,972	1,508	161	6,736
1990	137	1,450	2,779	2,967	269	7,602
1991	198	792	2,190	736	354	4,269
1992	554	888	1,951	2,472	46	5,911
1993	374	2,025	1,162	496	215	4,272
1994	831	1,020	1,104	200	206	3,361
1995	449	753	1,598	116	25	2,941
1996	207	633	1,172	10	3	2,025
1997	134	603	1,019	9	0	1,766
1998	247	1,227	1,109	17	0	2,599
1999	192	1,063	693	0	55	2,003
2000	73	338	1,415	0	65	1,891
2001	333	550	1,898	17	109	2,906
2002	311	477	1,496	0	83	2,367
2003	304	397	914	0	101	1,716
2004	119	337	1,214	23	154	1,847
2005	162	517	2,029	0	79	2,787
2006	56	277	1,209	0	39	1,581

Table 3.4 Number of measurements (NMFS SEFSC Trip Interview Program) of mutton snapper by region and year for commercial gears, 1981-2006. Data marked in blue represent cells with fewer than 30 lengths measured.

	Commercial, Hook & Line			Commercial, Long Line			Commercial, Traps & Other Gears		
Region	Atlantic (Northeast & Southeast)	Florida Keys	Gulf (Northwest & Southwest)	Atlantic (Northeast & Southeast)	Florida Keys	Gulf (Northwest & Southwest)	Atlantic (Northeast & Southeast)	Florida Keys	Gulf (Northwest & Southwest)
1981	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1982	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1983	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1984	**7**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**
1985	**24**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**
1986	**17**	**0**	**0**	**0**	**9**	**5**	**0**	**12**	**0**
1987	**26**	**0**	**0**	**23**	**22**	**0**	**3**	**0**	**0**
1988	**29**	44	**0**	49	**11**	**0**	**9**	**2**	**0**
1989	**12**	128	**1**	**7**	**0**	**0**	**11**	181	**0**
1990	42	122	**3**	111	73	**9**	**2**	481	**0**
1991	70	340	**26**	**13**	102	46	**8**	83	**2**
1992	303	272	**8**	**0**	323	**24**	60	155	**0**
1993	154	192	**23**	**0**	163	56	21	102	**0**
1994	171	126	**8**	**1**	231	118	43	142	**0**
1995	136	337	**26**	**6**	124	60	**3**	123	**0**
1996	151	54	77	**0**	66	54	**0**	196	**0**
1997	307	205	63	**1**	149	249	**13**	231	**0**
1998	448	125	39	**1**	739	523	**14**	217	**15**
1999	472	68	135	**0**	1165	654	57	163	**0**
2000	488	144	**27**	**0**	504	642	90	146	**3**
2001	517	90	74	**0**	561	278	57	76	31
2002	386	120	60	**0**	368	189	48	124	**11**
2003	341	66	**14**	**0**	582	196	**21**	178	**0**
2004	108	89	**18**	**0**	447	231	**1**	69	**0**
2005	135	52	**11**	**0**	213	318	**7**	**17**	**0**
2006	65	47	**20**	**0**	389	221	**1**	**15**	**0**

Table 3.5. Commercial Fisheries - Hook-and-line gears, Northwest Region, dockside measurements (TIP) by year and 25 mm size class [Total Length (max.)] Source: NMFS Trip Interview Program (TIP).

TL(max) class mid-points (mm)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
237.5														8											8
262.5														11											11
287.5														2											2
487.5											1		1								1		1		4
512.5											1														1
562.5											1					1									2
587.5							1				2		1												4
612.5											1		1												2
637.5													2				1			1				1	5
662.5											2							1					1		4
687.5											3														3
712.5											2		1			1									4
737.5											2											1			3
812.5											1														1
837.5											1				1				1						3
Total	0	0	0	0	0	0	1	0	0	0	17	0	6	21	1	2	1	1	1	1	1	1	2	1	57

Table 3.5 continued. Commercial Fisheries - Hook-and-line gears, Southwest Region, dockside measurements (TIP) by year and 25 mm size class [Total Length (max.)]

TL(max) class mid-points (mm)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
287.5									1																1
312.5									3																3
337.5									1																1
362.5									3				1												4
387.5															1										1
412.5													2		1		1		1						5
437.5														2		3			4			2			11
462.5												2	2	2	4		1	1	3	4					19
487.5											1	1		2	1		3		3	8		1	2		22
512.5								1		1				2	6	2	6	1	4	2		1	1	1	28
537.5									1					5	7	5	4	1	5	4		1	1	1	35
562.5									2	1		1		3	3	1	10	2	6	2					31
587.5													3	2	6	2	3	5	4	3			2	2	32
612.5											1	2	1	6	6	2	10	2	6	3	2			2	43
637.5									2				2	5	7	2	11	3	6	5	1	1	1	1	47
662.5										1	1			2	3	4	9		6	5	1	3	1	2	38
687.5								1	3	1	1		2	4	4	3	7	1	2	7	1	2	1	1	41
712.5									1	1		1		5	3	3	5		7	4	4			1	35
737.5													4	1	2		9	1	4	1	1	1		1	25
762.5												1	1	3	3		9	1	4	2				1	25
787.5														1	1	1	14	3	3	2	1	2			28
812.5									1	1			1	1	2	1	10	2	1	1				1	22
837.5									1	1				4		2	13	1	2	1	1	1		2	29
862.5									7		2		1	3	1	2	4		1	1				2	24
887.5								1		1				3	1	3	3	2	1	3		1			19
912.5																1	1				1	1			4
937.5																				1				1	2
1112.5																	1								1
Total	0	0	0	0	0	0	0	3	26	8	6	8	20	56	62	37	134	26	73	59	13	17	9	19	576

Table 3.5 continued. Commercial Fisheries - Hook-and-line gears, Florida Keys Region, dockside measurements (TIP) by year and 25 mm size class [Total Length (max.)]

TL(max) class mid-points (mm)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
262.5										2						1									3
287.5							4		3	3															10
312.5						1	14	1	7	17	1	6			1	1									49
337.5						4	17		13	15	10	5		1		1									66
362.5						4	15	4	33	12	10	3			3										84
387.5						2	16	8	33	9	10	4	80				3								165
412.5						2	14	6	15	1	11	5	76	1	7	3		3		2	2		6	3	157
437.5						1	9	3	8	5	11	6	34	3	8	5	5	4	4	4	9	3	1	4	127
462.5						2	6	7	12	13	8	2	22	5	6	7	1	5	7	9	3	5	1	2	123
487.5							6	2	12	18	7	8	22	1	7	3	1	7	3	6	2	5	1	3	114
512.5						1	5	6	12	18	7	7	12	2	5	3	1	3	5	8	4	3	3	2	107
537.5						1	1	7	12	13	14	6	9	2	4	5	3	9	7	11	5	6	2	4	121
562.5						3	1	11	20	18	13	3	8	2	13	3	1	6	7	7	4	2	2		124
587.5							4	9	6	11	9	7	5	3	11	5	3	4	6	12	1	2	2	1	101
612.5						5	1	7	21	17	7	8	3	5	21	8	4	5	8	8	9	4	3	3	147
637.5						4	5	15	18	16	8	8	4	4	24	15	3	17	9	7	3	4	2	5	171
662.5						3	4	12	41	5	16	12	1	8	32	11	8	13	6	12	6	4	7	2	203
687.5						6	3	9	25	17	11	9	6	3	22	17	9	20	8	6	6	18	5	5	205
712.5						2	2	3	13	17	15	6	6	3	14	16	6	11	4	8	5	15	4	7	157
737.5						1		6	12	15	5	9	7	4	15	4	4	15	5	9	2	10	4		127
762.5								4	8	21	9	4	11		5	8	7	8	6	2	1	5	3		102
787.5						1	1	2	8	4	3	5	9	5	6	4	2	9	2	5	2	2	3	3	76
812.5									4	5	2	2	11	1	1	2	3	2	1			1			35
837.5									3		4		8			1	3	1	1	1	2		1	3	28
862.5									1		1		3					1	1	1			2		10
887.5						1						1					1	1		2					6
912.5																1									1
937.5																1									1
962.5														1											1
Total	0	0	0	0	0	44	128	122	340	272	192	126	337	54	205	125	68	144	90	120	66	89	52	47	2621

Table 3.5 continued. Commercial Fisheries - Hook-and-line gears, Southeast Region, dockside measurements (TIP) by year and 25 mm size class [Total Length (max.)]

TL(max) class mid-points (mm)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
237.5																						1			1
262.5																			1			1			2
287.5										2							1	7	1	1					12
312.5						1				6						1		3	3						14
337.5										7	3					5		1	6		1	1			24
362.5								2		17	4	4			3	7	6	13	8	2		1			67
387.5								3		21	4	5	1		9	21	14	45	21	20	6	2	2		174
412.5								10	1	32	1	9	5	6	18	58	23	68	85	47	15	5	10	1	394
437.5								4		28	3	8	4	9	19	36	24	42	61	42	33	5	9	3	330
462.5								2	2	28	3	18	2	18	23	50	32	25	69	44	40	7	10	1	374
487.5								1	1	29	2	17	2	13	31	36	20	24	58	43	47		5		329
512.5								1	1	18	4	17	3	17	26	15	23	20	31	23	29	1	3	1	233
537.5										8	2	6	2	12	16	20	14	14	28	28	23	5	2		180
562.5						1				11	8	5	5	6	17	32	10	10	15	28	4		4		156
587.5						2				17	3	3	3	4	21	18	12	4	16	24	15		1		143
612.5									1	8	3	10	5	4	15	15	15	11	7	16	4	1	1		116
637.5										9	1	6	1	8	21	12	8	8	7	10	6		2		99
662.5						2				9	2	10		6	17	15	11	4	10	12	7	1	1		107
687.5						1				4	5	4	2	4	9	9	4	3	6	9	8				68
712.5						1				8	12	8		1	9	12	2	5	8	2	4		1		73
737.5										2	5	3		1	5	8	5	5	8	6	1				49
762.5						1				3	4	2	2		3	7	2	1	2	1		1			29
787.5						1					1					3	1	3	1		1				11
812.5									1	1		1		1	4	1	2	1	1	1					14
837.5															1		2	4		1					8
862.5										2								1		1					4
912.5																		1							1
962.5																		1							1
Total						10		23	7	270	70	136	37	110	267	381	231	324	453	361	244	32	51	6	3013

Table 3.5 continued. Commercial Fisheries - Hook-and-line gears, Northeast Region, dockside measurements (TIP) by year and 25 mm size class [Total Length (max.)]

TL(max) class mid-points (mm)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
237.5																					1				1
262.5																1	1								2
287.5																4	1								5
312.5										1						2	1								4
337.5																2									2
362.5																	1								1
387.5							1							1		1		2							5
412.5											1	2		1	1		2	6		1		1			15
437.5												3				1	1	4	1	1					11
462.5								1	1		1					1	1	3	1		2	1	2		14
487.5								1	1		1	3	4			5	1	1	1		2		1	1	22
512.5				1			2		3				4			3	2	3	1	2	3	1	3		28
537.5					1			2	7	2	1		4			1	7	2	5		4	1	2		39
562.5								1	9	5	1		11		1	2	5	5	7	3	3	1	7	1	62
587.5								1	8	2	4		4	1	1	1	6	9	1		4	5	5	2	54
612.5		1							7	2	5		6	1	1	1	7	6	1	1	6	4	5	4	58
637.5		2						2	7	6	8	1	5	1	5	2	8	15	1	2	9	7	3	4	88
662.5		1	2	1	1			1	3	3	11	4	8	3	5	8	9	6	4	3	8	1	6	4	92
687.5			1	1		2		2	1	2	8	1	10	3	5	5	15	17	4	2	3	6	2	2	92
712.5				3	6			1	4	3	13	5	8	7	3	4	22	15	4	2	6	4	7	4	121
737.5		1	1	1	6	1	1		3	2	10	4	7	3	3	4	19	9	8	4	7	5	8	7	114
762.5	1	1	2	4	7	7	1	2		1	10	1	13	4	5	4	38	17	7		4	5	6	6	146
787.5			6	1	3	5	4	2	1	2	2	5	4	8	5	2	31	15	4		9	9	4	8	130
812.5		1	8	3	2	2	2	1	3	2	6	5	8	3	4	8	32	15	8		13	11	9	7	153
837.5			2			2	1	1	1		1	1	2	2		3	22	6	3	4	4	8	9	7	79
862.5			1	2					3		1		1	2	1	2	6	7	3		5	5		1	40
887.5								1	1								3	1			1	1	3	1	12
912.5			1																		1		1		3
937.5																					2				2
962.5																							1		1
1012.5														1											1
Total	1	7	24	17	26	19	12	19	63	33	84	35	99	41	40	67	241	164	64	25	97	76	84	59	1397

Table 3.5 continued. Commercial Fisheries - Longline gear, Northwest Region, dockside measurements (TIP) by year and 25 mm size class [Total Length (max.)]

TL(max) class mid-points (mm)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
462.5												1				1							1		2
487.5																2					1				3
512.5																3			2				1		6
537.5												1		1		4	1			1			1	1	10
562.5														1		9	2			1		3		1	17
587.5														2	1	2	2		2			2	1	3	15
612.5												1	1			6						1	2	4	15
637.5													1		1	15	2	1	4					4	28
662.5															3	10			1				2	4	20
687.5													3	2		4	2		7				3		21
712.5										2				1		7	4		2	1			2	2	21
737.5											1			1	2	6	3	1	2	1	1		1		19
762.5													2	2		2	2		1		1		1	5	16
787.5								1					1	4		5	1		2			1	3	1	19
812.5								2		1			2	4		21			1		2		2	1	36
837.5								2		1				7		20	2		1	1	1		3	2	40
862.5								1						3		12		1	2	1			1	2	23
887.5													1			1		1	1				2		6
912.5								1								1	1		1				1	1	6
937.5																								1	1
Total	0	0	0	0	0	0	0	7	0	4	1	3	11	28	7	131	22	4	29	6	6	7	26	32	324

Table 3.5 continued. Commercial Fisheries - Longline gear, Southwest Region, dockside measurements (TIP) by year and 25 mm size class [Total Length (max.)]

TL(max) class mid-points (mm)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
387.5																1									1
437.5																2	1	1		2		1	1		8
462.5											1		1			1	9	2		1	1	5	4	6	31
487.5											1	1	1		2	6	13	10	3	3		4	9	6	59
512.5				1							2		1	1	3	10	20	12	5	7	2	9	10	6	89
537.5								1	2	1		3	3		8	13	34	19	5	5	8	9	19	7	137
562.5									5	1	1	1	2		9	13	34	34	6	11	4	10	29	11	171
587.5									1	2		3	2	1	6	18	36	31	8	11	4	5	22	13	163
612.5									1		7	5	7	2	6	13	36	28	9	9	8	17	22	11	181
637.5									1	1	1	1	2	2	13	15	38	41	12	16	8	16	24	15	206
662.5									3	2	4	8	8	1	17	23	51	53	21	15	11	15	21	14	267
687.5									4		8	6	6	2	20	20	33	54	16	12	9	10	24	11	235
712.5									2	3	7	5	1	2	32	22	41	49	28	6	15	14	17	10	254
737.5				2					4	1	5	5	3		22	23	40	47	18	12	18	20	19	11	250
762.5									5	2	6	14	1	3	26	33	30	35	24	7	11	13	23	10	243
787.5									4	1	1	14	4	3	29	27	44	42	25	11	21	15	12	10	263
812.5									4		3	13	4		21	38	50	56	27	9	15	13	5	11	269
837.5				2				1	6	3		14		3	16	42	46	47	15	16	17	12	6	10	256
862.5									3	1	3	14	2	3	8	40	46	44	16	15	15	17	5	10	242
887.5										1	4	6	1	1	3	26	19	18	7	7	13	12	9	12	139
912.5									1		1	1		1	1	4	6	13	2	4	5	4	7	4	54
937.5												1		1		2	4	2	1	2	5	3	4	1	26
962.5										1							1		1	1					4
1087.5																				1					1
Total	0	0	0	5	0	0	0	2	46	20	55	115	49	26	242	392	632	638	249	183	190	224	292	189	3549

Table 3.5 continued. Commercial Fisheries - Longline gear, Florida Keys Region, dockside measurements (TIP) by year and 25 mm size class [Total Length (max.)]

TL(max) class mid-points (mm)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
337.5									1																1
412.5				1				1	1						1	1		1							6
437.5								1							1	3	3	1			4	1			14
462.5									4	1	2	1	4			4	14	3	2	2	4	3		2	46
487.5				1					2	1	3	4	2	1	2	7	16	9	6	5	11	9	1	4	84
512.5					1				4	7	3	4	2		4	14	28	7	8	3	13	11	5	6	120
537.5									1	7	3	3	4	2	3	20	46	15	18	11	12	20	15	8	188
562.5								3	2	11	9	8	8	4	3	21	55	20	16	4	18	26	12	20	240
587.5						1		3	8	17	7	9	10	2	6	37	56	19	26	20	27	22	11	22	303
612.5						1		6	10	24	6	20	6	5	3	34	70	35	18	23	25	29	19	25	359
637.5					3			7	14	42	8	15	9	2	4	33	70	24	34	20	18	29	19	30	381
662.5				1	2			7	12	60	17	28	18	4	8	40	78	35	60	35	32	44	18	23	522
687.5				1	1			12	8	49	15	25	3	7	8	47	86	35	31	27	32	28	17	37	469
712.5					2			6	9	58	24	23	12	3	8	58	96	30	51	47	41	31	16	28	543
737.5					5			5	9	25	23	17	9	3	4	78	90	40	46	18	40	26	19	40	497
762.5					5	1		3	7	8	19	16	8	3	7	63	68	45	49	35	37	21	12	28	435
787.5					2	3		3	4	5	12	17	6	6	13	50	76	46	36	19	48	24	7	28	405
812.5					1	3		4	3	3	5	17	6	13	17	59	74	53	38	25	40	40	13	29	443
837.5				5		1		5	2		6	8	10	5	15	63	82	43	50	26	52	29	14	22	438
862.5						1		3	1	4		11	3	5	22	60	93	33	34	24	52	26	6	16	394
887.5								1		1		3	4	1	9	33	46	8	24	16	47	14	4	8	219
912.5								1			1	1			9	12	14		12	8	20	9	4	9	100
937.5								2				1			2	2	4	2	2		6	5		4	30
962.5																					2		1		3
1062.5																					1				1
Total	0	0	0	9	22	11	0	73	102	323	163	231	124	66	149	739	1165	504	561	368	582	447	213	389	6241

Table 3.5 continued. Commercial Fisheries - Longline gear, Southeast Region, dockside measurements (TIP) by year and 25 mm size class [Total Length (max.)]

TL(max) class mid-points (mm)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
<NONE>																									

Table 3.5 continued. Commercial Fisheries - Longline gear, Northeast Region, dockside measurements (TIP) by year and 25 mm size class [Total Length (max.)]

TL(max) class mid-points (mm)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
462.5								4					2												6
487.5								1					1												2
512.5								5								1									6
537.5								3																	3
562.5								13																	13
587.5								9	1																10
612.5							1	13	1						1										16
637.5								8																	8
662.5		1					1	11																	13
687.5					1	1	1	10																	13
712.5					4	3		17				1	1												26
737.5		2			4	4		6	1																17
762.5					8	16	2	3	3				1												33
787.5		1			3	14	1	2	3				1												25
812.5		1			2	5		2	3																13
837.5		2				3	1	2	1																9
862.5					1	3		1																	5
887.5								1																	1
Total	0	7	0	0	23	49	7	111	13	0	0	1	6	0	1	1									219

Table 3.5 continued. Commercial Fisheries –Traps and other gears, Northwest Region, dockside measurements (TIP) by year and 25 mm size class [Total Length (max.)]

TL(max) class mid-points (mm)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
<NONE>																									

Table 3.5 continued. Commercial Fisheries – Fish Trap and Other Gears, Southwest Region, dockside measurements (TIP) by year and 25 mm size class [converted to Total Length (max.)]

TL(max) class mid-points (mm)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
412.5																			2						2
437.5																			1						1
462.5																			2						2
487.5																			3						3
512.5																			4						4
537.5																			2						2
562.5																			5						5
587.5																			4	2					6
612.5																			1	3					4
637.5																			3	2					5
662.5																			3	2					5
687.5																				1					1
762.5																			1	1					2
987.5									1																1
Total	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	31	11	0	0	0	0	43

Table 3.5 continued. Commercial Fisheries – Traps and other gears, Florida Keys Region, dockside measurements (TIP) by year and 25 mm size class [Total Length (max.)]

TL(max) class mid-points (mm)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
287.5																			1						1
312.5							1	2		1								1							5
337.5							28	27		1															56
362.5							21	42		1						3	2	6							75
387.5							21	55	4	6	3			4	1	5	2	14			2				117
412.5							19	59		11	1	5	1	14	7	14	3	15	3	1	17			6	176
437.5							11	47	4	10		14	1	17	10	14	2	10	1	2	9			2	154
462.5				1			6	34	7	13	1	6	4	12	6	10	5	8	1	1	6	1		2	124
487.5				1			2	18	7	6	6	6	5	8	12	9	2	7	4	3	2	2	2	1	103
512.5							7	19	9	13	3	3	3	8	6	6	4	7	3	7	9	1		1	109
537.5							4	13	6	6	4	1	3	14	7	5	3	8	1	7	4	1			87
562.5				1			2	11	6	12	8	4	4	9	4	7	3	4	4	4	5	3		2	93
587.5							8	16	8	2	4	5	2	16	11	4	4	4	2	8	11	3			108
612.5							9	15	9	4	5	7	4	6	13	12	6	7	6	5	11	2			121
637.5							9	18	9	5	3	12	4	9	17	12	14	4	4	12	12	6			150
662.5							7	13	5	3	6	16	7	16	16	17	17	4	6	12	15	2			162
687.5				1			11	18	2	10	13	18	13	20	23	32	36	7	5	20	13	4			246
712.5							10	12	1	5	15	14	37	11	21	21	24	6	9	5	13	6	1		211
737.5							2	14	3	6	9	9	15	16	25	23	25	4	5	10	16	7			189
762.5								14	2	4	11	6	7	5	13	12	8	1	3	9	7	10			112
787.5				2			1	15		13	6	8	6	3	17	7	1		5	5	10	8			107
812.5								8	1	11	4	2	5	2	4		1	1	2	5	7	4			57
837.5				3				4		2			1	2	5	2	1		4	4	2	7			37
862.5				2				1		6			1	2	3	1			5	1	3	1			26
887.5				1				1							2	1			1		3	1			10
912.5															1				1		1				3
962.5								1																	1
1012.5								1																	1
Total	0	0	0	12	0	0	179	478	83	151	102	136	123	194	224	217	163	118	76	121	178	69	3	14	2641

Table 3.5 continued. Commercial Fisheries – Traps and other gears, Southeast Region, dockside measurements (TIP) by year and 25 mm size class [Total Length (max.)]

TL(max) class mid-points (mm)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
<NONE>																									

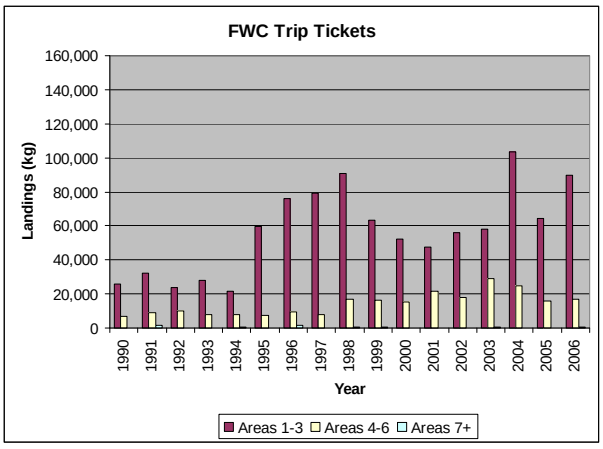
Table 3.5 continued. Commercial Fisheries – Traps and other gears, Northeast Region, dockside measurements (TIP) by year and 25 mm size class [Total Length (max.)]

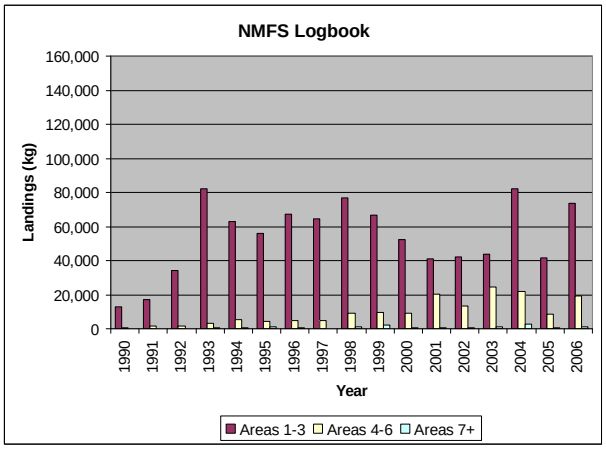
TL(max) class mid-points (mm)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
512.5																				1					1
637.5																				1					1
662.5									1																1
762.5									1																1
Total	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	4

3.12 Figures

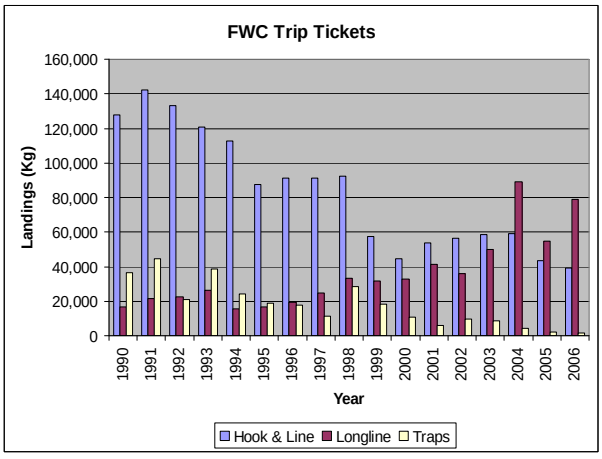
Figure 3.1. Comparison of FWC trip ticket and NMFS logbook commercial mutton snapper landings by (A) area fished and (B) gear used. Landings by area are less than landings by gear because area fished was not on every trip ticket and commercial landings from the NMFS statistical areas in the South Atlantic (areas 748 [Marathon] to 722 [Jacksonville]) were not included in part (A).

(A)





(B)



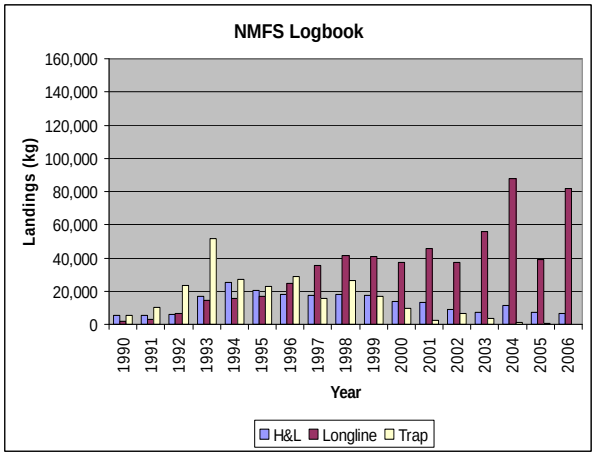


Figure 3.2. Map of Southeastern United States, South Atlantic Ocean, and Gulf of Mexico showing regional divisions used for SEDAR 15A.

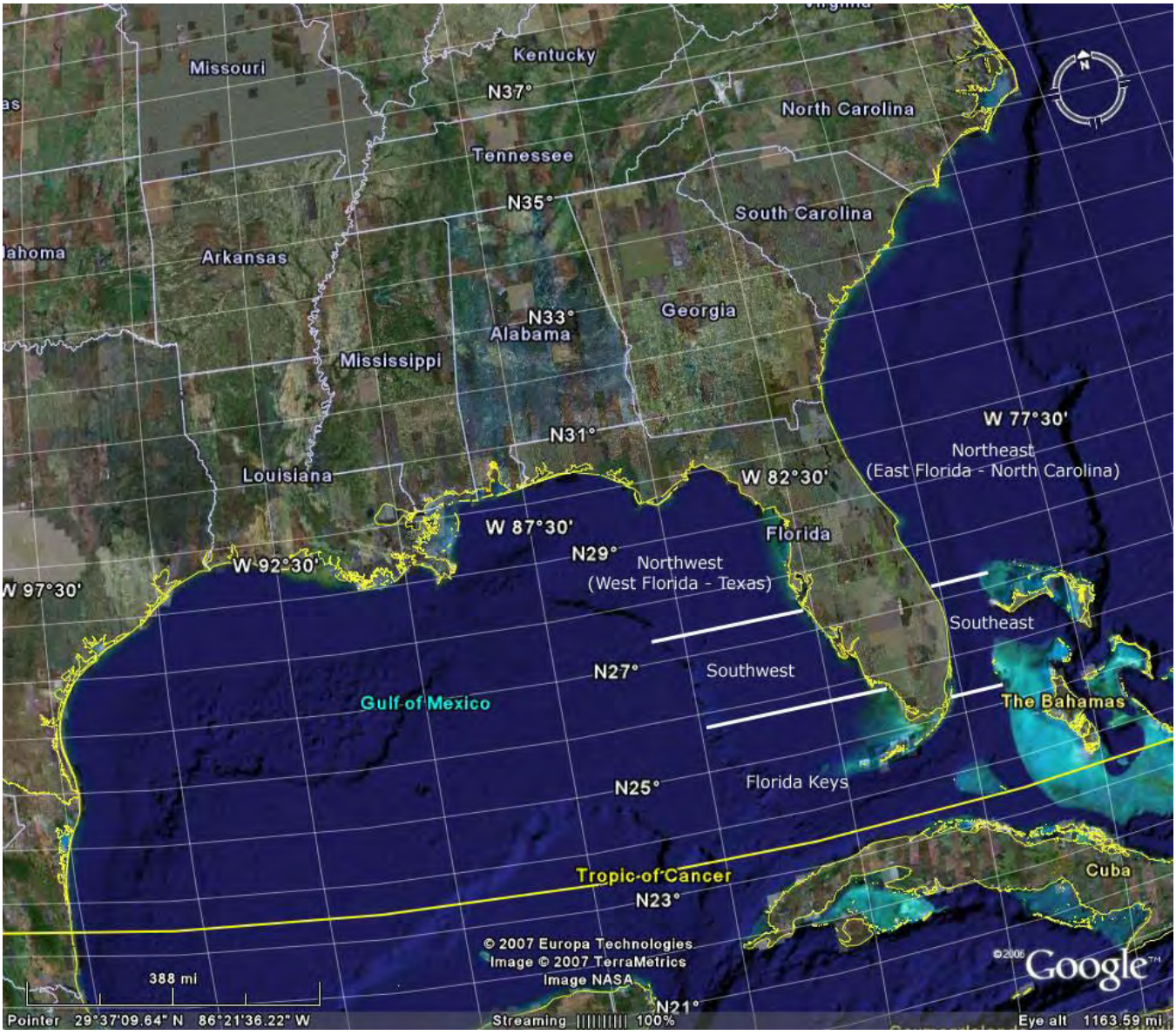


Figure 3.3 Location of Dry Tortugas, Pulley Ridge, and Florida Middle Grounds in relation to land features of the Florida Peninsula and depth contours.

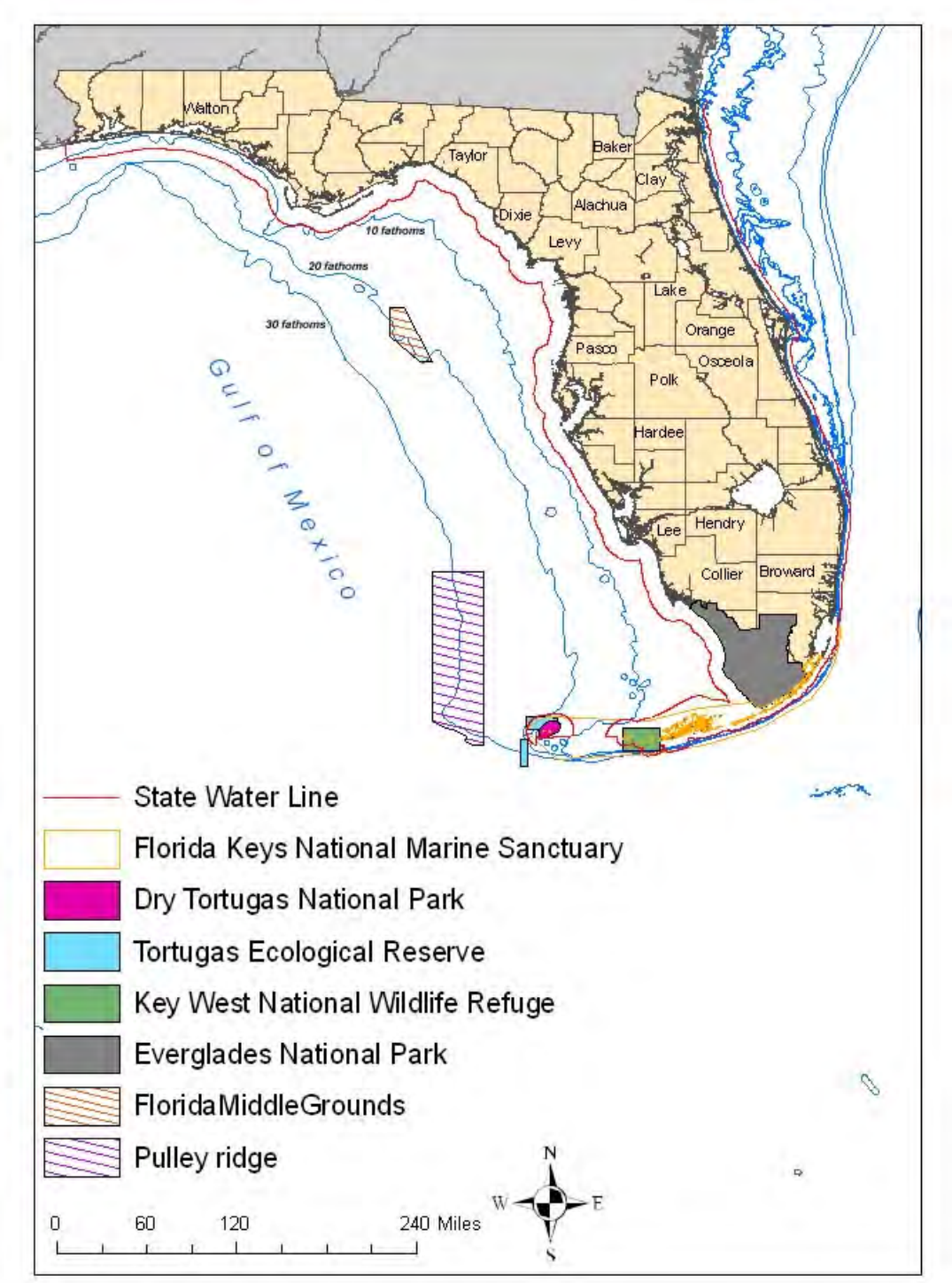


Figure 3.4. Commercial and recreational harvest of mutton snapper in Florida. Source data: NMFS SEFSC General Canvass 1981-1985, FWC trip ticket 1986-2006, NMFS SEFSC Headboat Survey, NMFS Marine Recreational Fishery Statistics Survey (post-stratified, bootstrapped size frequencies and regressions of whole weight vs length)

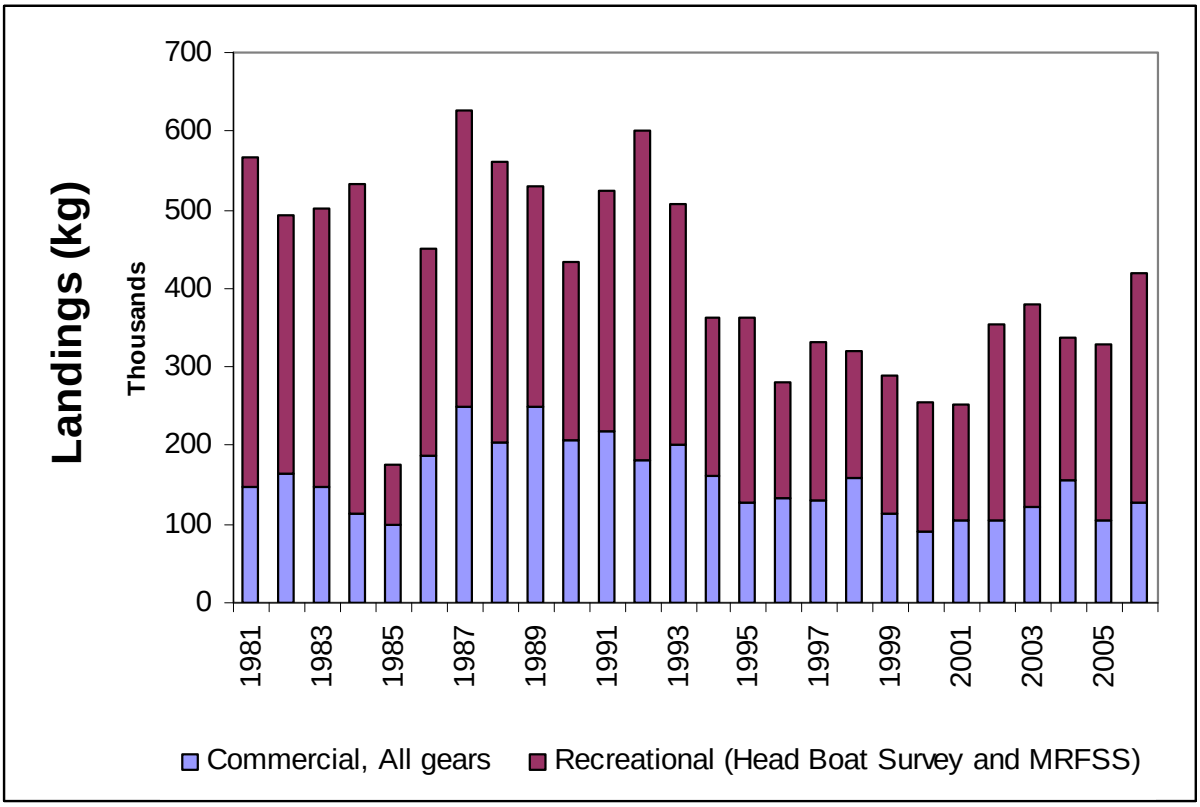


Figure 3.5. Florida commercial mutton snapper harvest by year, region, and gear.

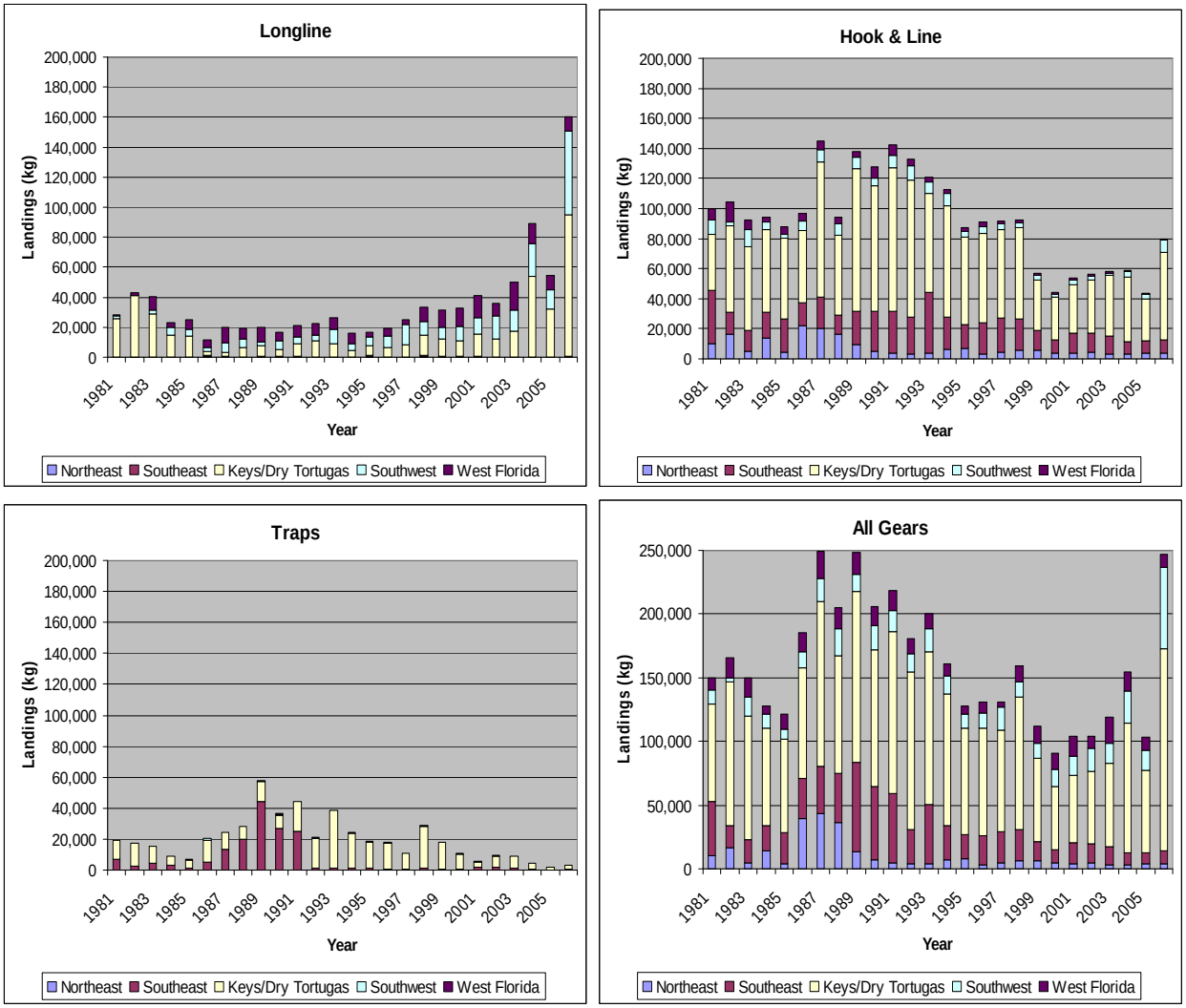


Figure 3.6. Statewide seasonality of commercial mutton snapper landings in Florida.

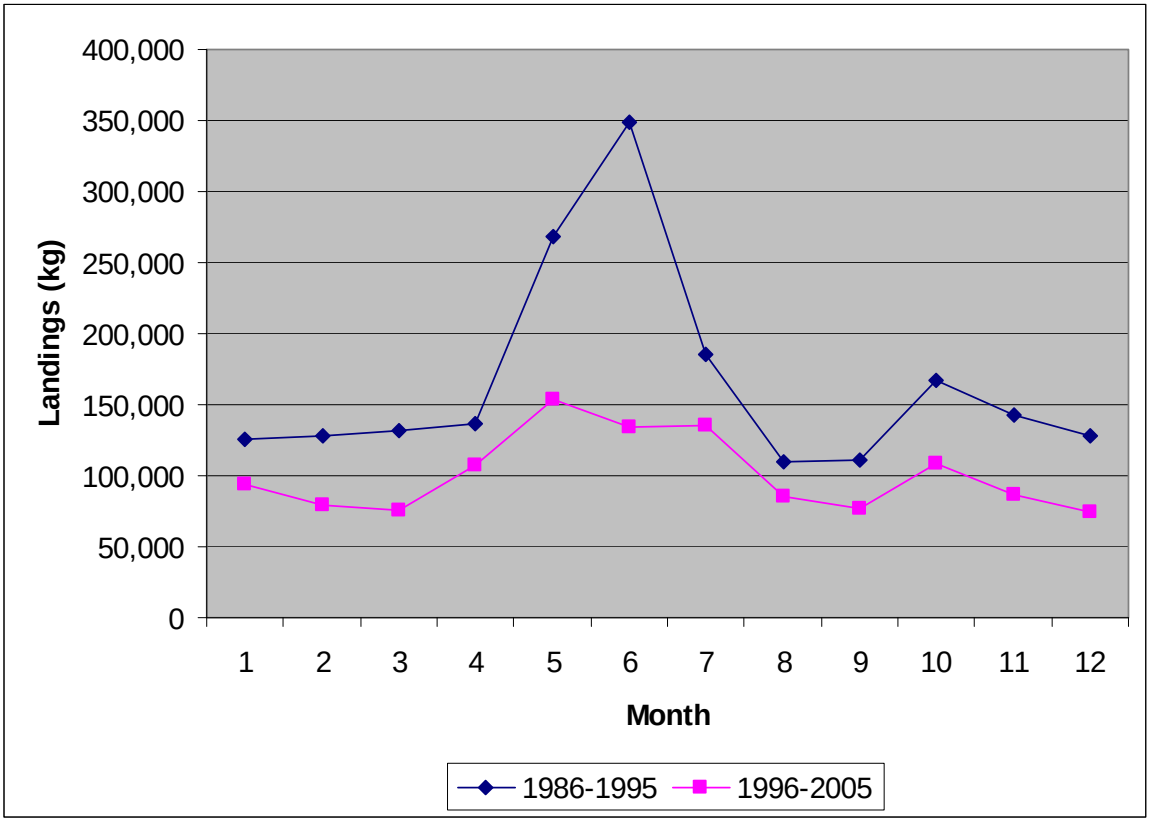
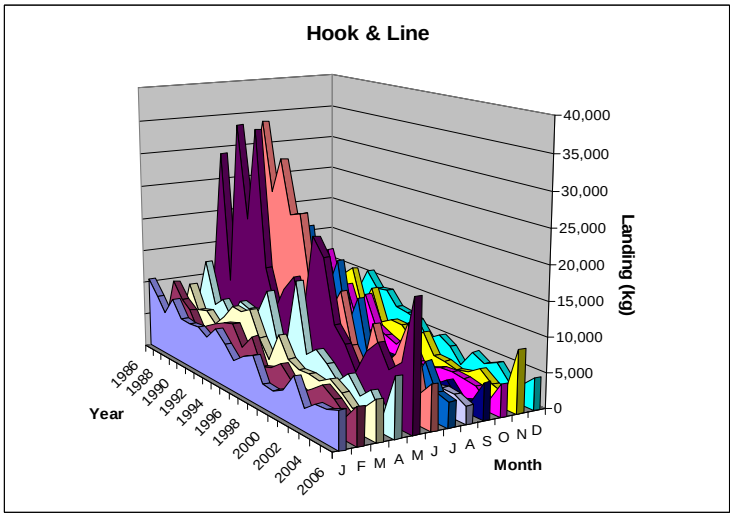


Figure 3.7. Commercial mutton snapper landings by year and month for hook and line, and longline fisheries.



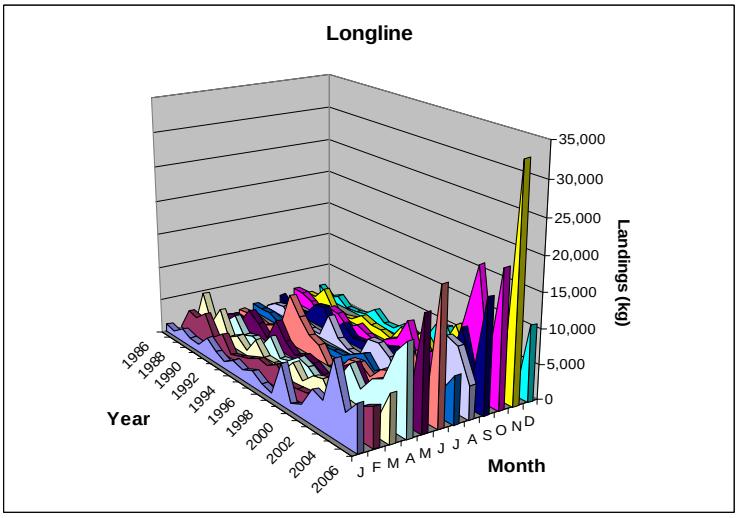


Figure 3.8. Mutton snapper commercial harvest by year and month from the Florida Keys and Dry Tortugas.

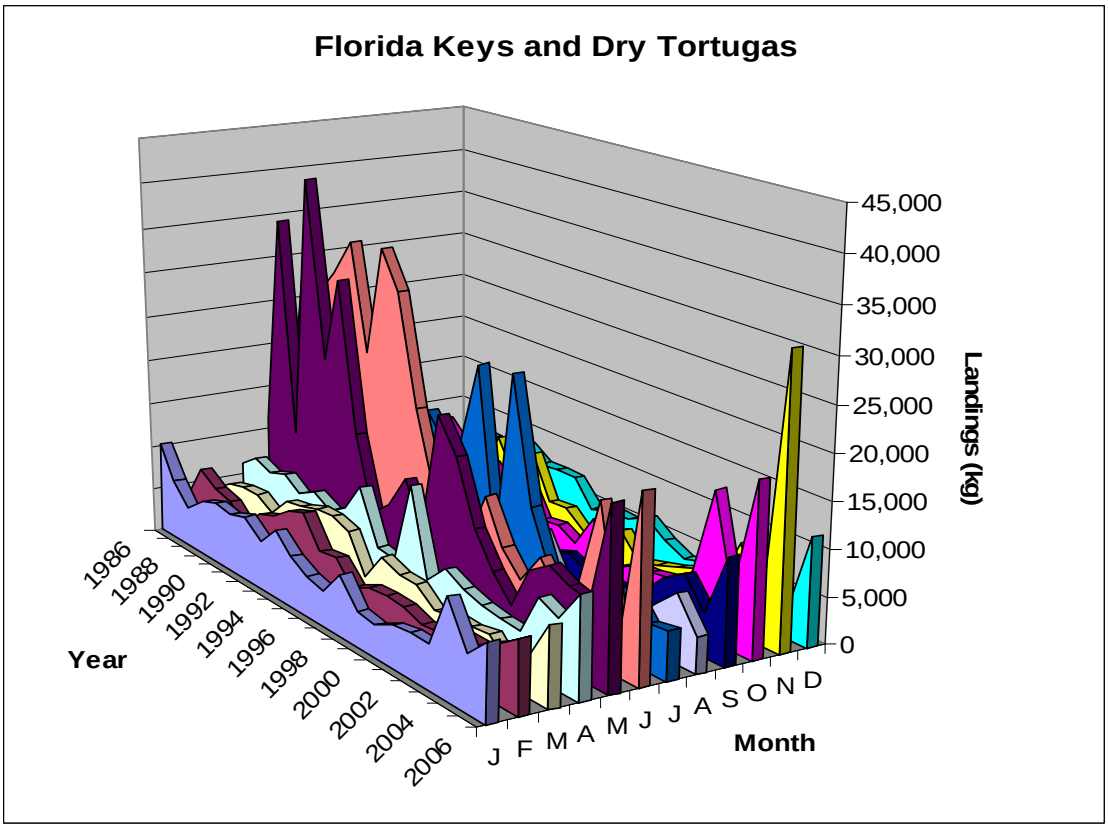


Figure 3.9. Effort as number of trips and fishers in the commercial mutton snapper fishery by region and by gear.

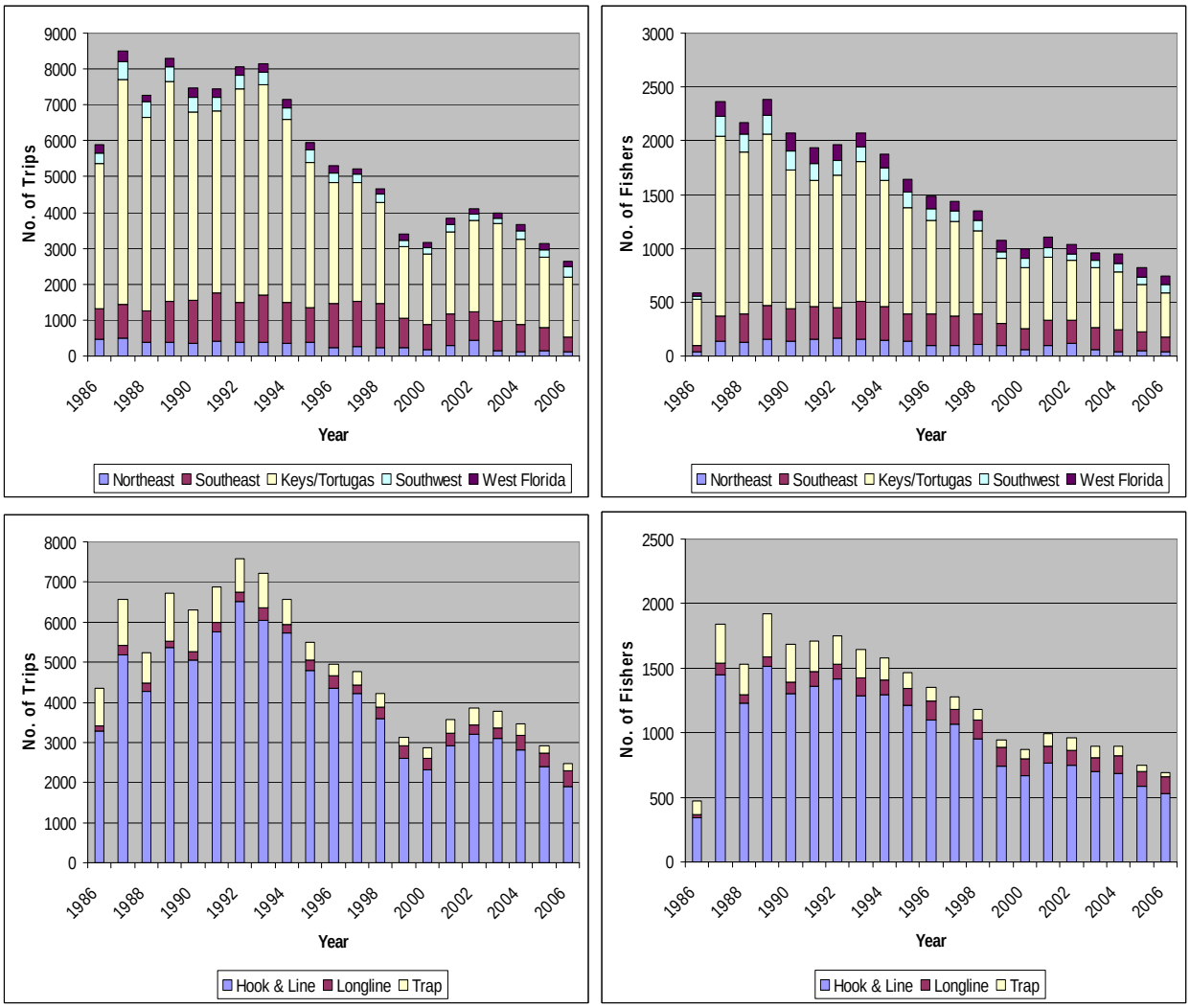


Figure 3.10. Catch per trip in the commercial mutton snapper fishery by region, and by gear.

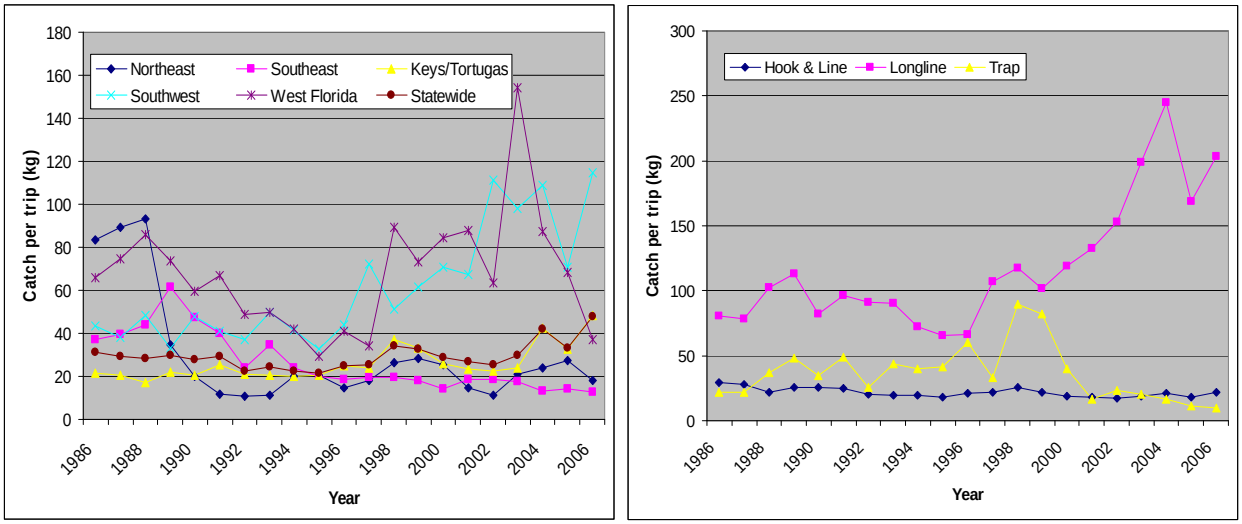


Figure 3.11. Regression of mutton snapper gutted weight-fork length data from commercial fishery samples (NMFS SEFSC Trip Interview Program), 1985-2006.

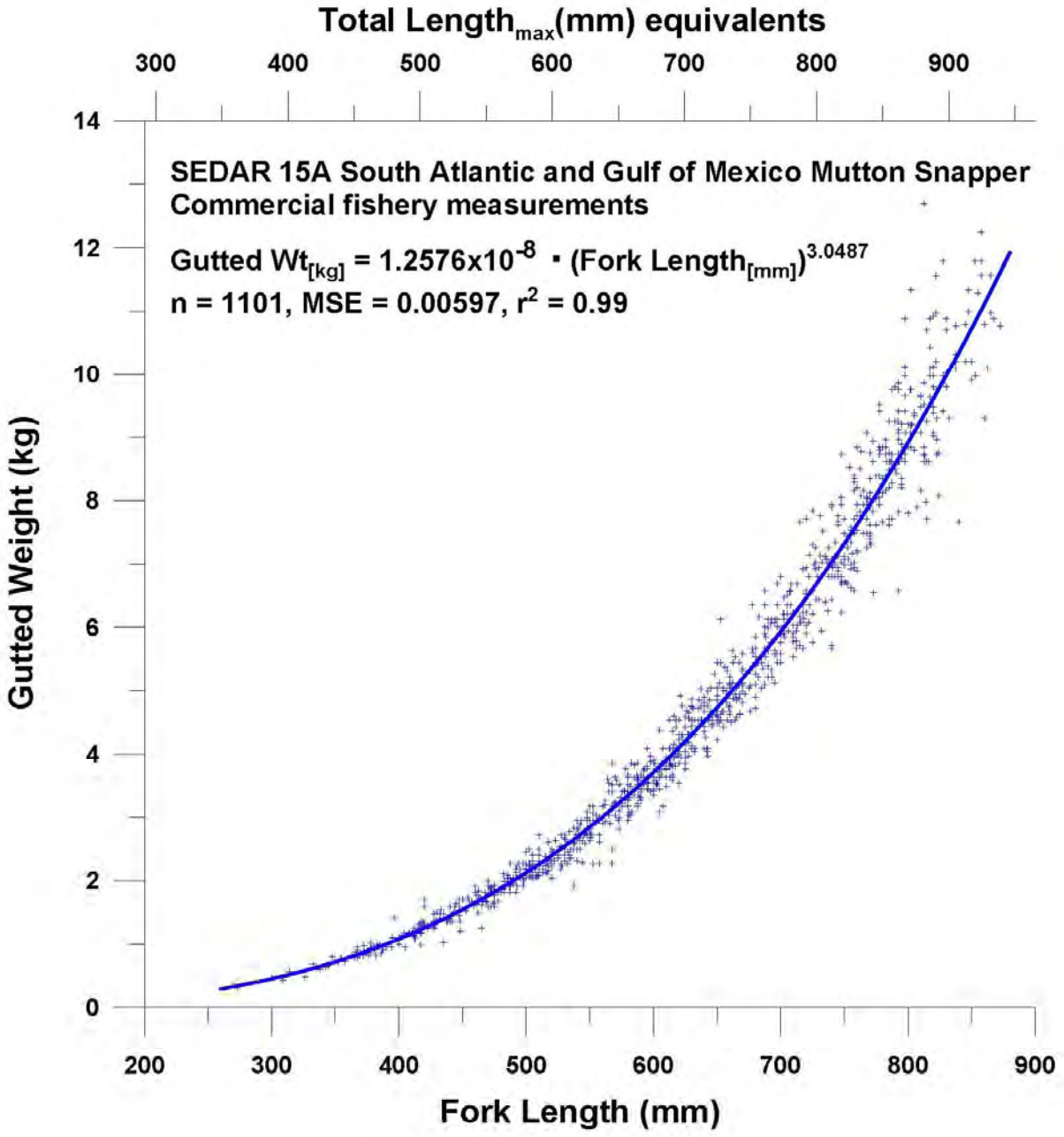


Figure 3.12. Commercial mutton snapper lengths in relation to size limit implementation by coast, 1985-2006.

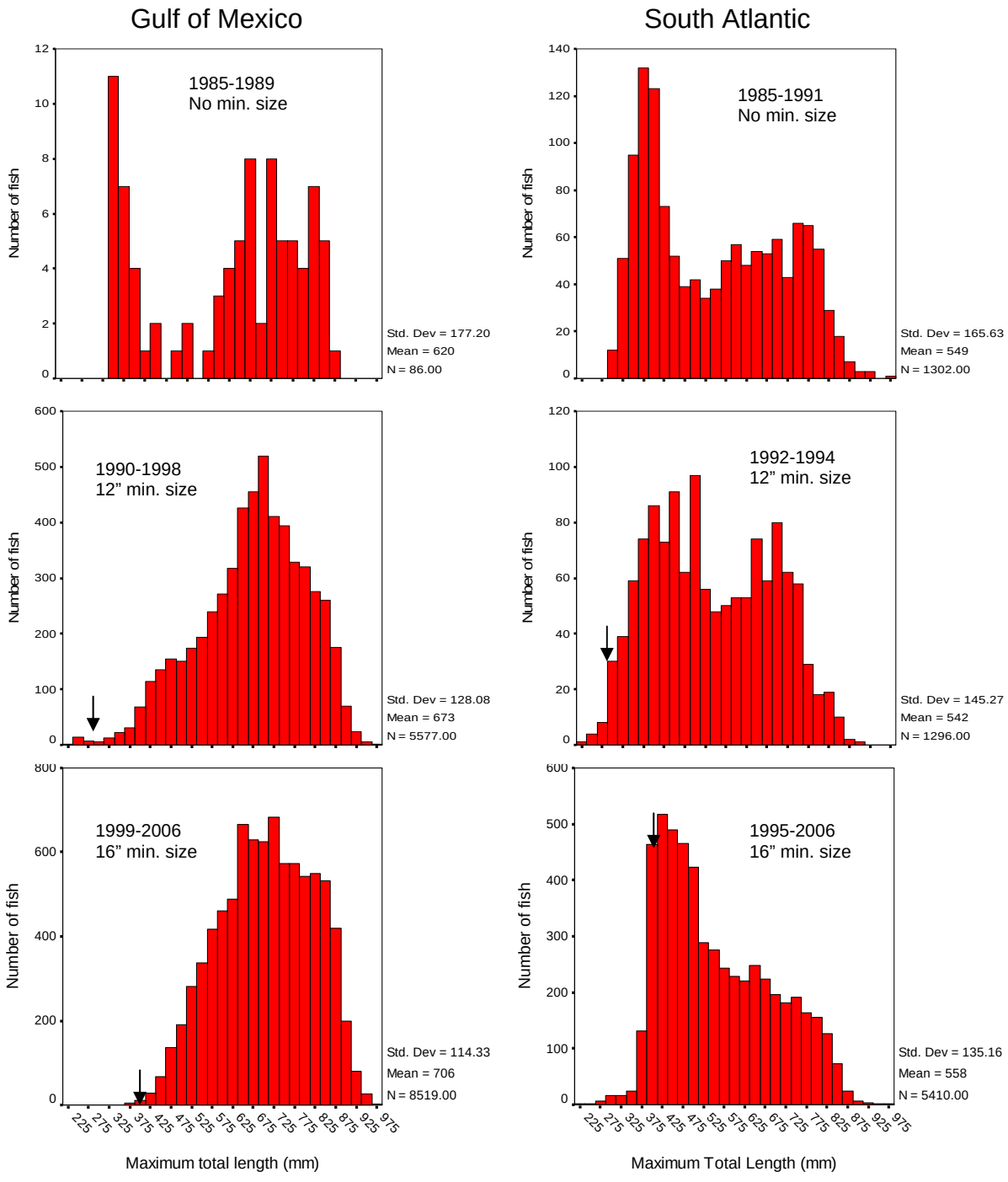


Figure 3.13. Commercial mutton snapper lengths by coast and gear, 1985-2006.