

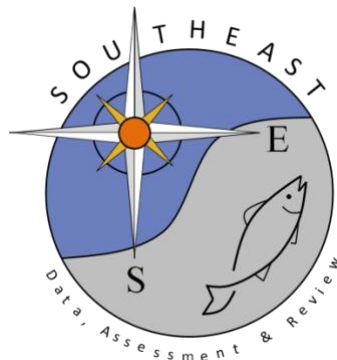
# Historical Commercial Fishery Landings of Yellowtail Snapper in Florida and the Southeastern U.S.

Steve Brown and Chris Bradshaw

SEDAR64-DW-13

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# Historical Commercial Fishery Landings of Yellowtail Snapper in Florida and the Southeastern U.S.

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## Introduction

Fishery-dependent commercial landings or harvest data from the Southeastern U.S. for yellowtail snapper are available from three primary sources: NOAA Fisheries Accumulated Landings System (ALS), Florida Marine Fisheries Trip Ticket (FL TTK), and NOAA Fisheries Coastal Logbook program (logbook). SEDAR 27A primarily compared ALS to FL TTK data for establishing commercial landings history. Similarly, this report will compare ALS, FL TTK, and logbook data as data sources for establishing appropriate commercial landings data by year, region, and gear to be included in the stock assessment model for yellowtail snapper.

## Materials and Methods

Trip level commercial harvest (trip ticket) data were extracted from the Florida Fish and Wildlife Conservation Commission's (FWC) Marine Resources Information System for available years 1985-2018. FL TTK data include trip level catch and effort data such as area fished, county landed, gear used, fisher, dealer and trip identifiers, and species and pounds landed. Although a data element since the beginning, area fished was not required until 1995, and gear was not required until late 1991. Additionally, NOAA Fisheries provided both ALS and logbook commercial landings data. ALS are summary data by year, state, county, waterbody, and gear from 1962-2018, and by state and gear from 1950-1961. Logbook data are trip level fisher logbook reports available from 1992-2018.

All three datasets were imported into SAS and data were formatted and summed by year, coast (South Atlantic or Gulf of Mexico), state, yellowtail snapper (YS) region, and gear. YS regions for this SEDAR were defined in a spreadsheet provided by Joe O'Hop (email from Julie Neer dated 6/3/19). The creation of coast and YS region for each dataset was done by first using area fished where available, then county or state landed. Each dataset was then re-exported to Microsoft Excel where direct comparisons of the summary data were made, and preliminary historical landings by year, YS region, and gear were established in pounds whole weight.

## Results and Discussion

Historical yellowtail snapper commercial landings by year and Florida coast with all other states combined show most of the harvest occurs overwhelmingly in Florida (Table 1). Between 85 and 99 percent of that harvest has come from Florida's West coast since 1962 which typically has included Monroe county (Florida Keys) landings. On average, Monroe county landings have accounted for nearly 90% of yellowtail snapper landings in Florida since 1962 (table 2).

A comparison of Florida yellowtail snapper landings by data source and coast (figure 1) shows that while ALS and FL TTK are nearly identical landings from about 1994-2018, the ALS data are of a longer time series. The difference in landings by region between ALS and FL TTK between 2009-2014 are due to a correction to area fished in the FL TTK data that has not yet been applied to the ALS landings. This correction applies to both Gulf and South Atlantic trips reported off the Dry Tortugas during those years. This should have no effect on the distribution of landings for this SEDAR since YS region 3 will include both Gulf and South Atlantic landings of the Florida Keys and Dry Tortugas. The logbook data trend similarly to both ALS and FL TTK, but are not as complete and are of a shorter time series than ALS and FL TTK. In figure 2, all three data sources trend similarly as in figure 1 when only including trips for hook and line gears. Except for the ALS area correction issue for the 2009-2014 data, both ALS and FL TTK show very similar if not identical landings from 1994-2018.

Both ALS and FL TTK exhibit nearly identical landings in both trend and level of landings for the Florida Keys from 1986-2018 (Figure 3). The logbook data are similar starting in 1996, but are less complete than either

ALS or FL TTK. Landings for the other YS regions are significantly less than the Florida Keys and combined account for less than 12% of the total yellowtail snapper landings in the Southeastern U.S..

In Florida, commercial yellowtail snapper landings in the Florida Keys accounted for 90% of the landings statewide from 1985-2018 (table 3). Preliminary effort in yellowtail snapper landings shown as number of trips indicates the majority of effort is taking place in the Florida Keys region as well. An average of 78.5% of trips harvesting yellowtail snapper occurred in the Keys. Combined with landings from Southeast Florida (primarily from waters off Broward, Palm-Beach, and Miami-Dade counties) and Southwest Florida (mostly Lee county), more than 99% of yellowtail snapper landings are coming from South Florida and the Florida Keys.

Statewide, the number of trips harvesting yellowtail snapper has been on the decline from a high of over 20,700 trips in 1989 to an average of 5,700 trips since 2010 (table 3). More specifically, the number of trips has been declining in both the Florida Keys (since 1993) and SE Florida (since 1997) where the majority of yellowtail snapper are harvested (Figure 4). But landings have increased dramatically in the Florida Keys since 2007. The number of licenses harvesting yellowtail snapper has also declined in all three regions of South Florida, particularly in the FL Keys since about 1990 (Figure 5). Additionally, a decrease in the number of federal snapper-grouper permits active in the South Atlantic has decreased as well (Figure 6). This decrease in effort with increasing landings over the same period of time could be attributed to more efficient fishing methods coupled to targeting of yellowtail snapper, and possibly a higher abundance of yellowtail during this time.

Additionally, catch per trip has increased as well. Analysis of landings data from FL TTK show that catch per trip in the Florida Keys increased gradually in the period between 1986 and 2006 ranging from 80 pounds per trip in 1987 to nearly 215 pounds per trip by 2006 (table 4, figure 7). After 2007, catch per trip in the Florida Keys increased dramatically to a high of nearly 600 pounds per trip in 2017. It was noted in SEDAR 27A that smaller increases in effort coupled to large increases in landings may have been an indication that either yellowtail snapper were more abundant, or that more efficient fishing methods were being utilized. Current estimates for 2018 indicate a decline to 500 pounds per trip. Catch per trip from Southeast Florida gradually increased to just under 180 pounds per trip in 2010 but has been in a declining trend in more recent years. Both the Southwest and Northwest regions have exhibited fluctuating trends in catch per trip with some particularly dramatic changes in NW Florida, though the level of landings there is much less than in either SW or SE Florida.

There was some concern for the assessment as to where most of the yellowtail snapper harvest was taking place in relation to changes in regulations for state and federal waters in the Gulf and South Atlantic. Figure 8 shows commercial yellowtail snapper landings by state and federal waters for each of the South Florida subregions from Florida trip ticket data. While area fished was always a data element on the trip ticket, it was not required to be reported until 1995. Also, early area fished coding did not separate state and federal waters initially. We consider 1996 to be a good starting year for showing landings by area fished. Yellowtail snapper landings in the Southwest region are almost exclusively from federal waters while landings from Southeast Florida tend to be more from state waters. The Florida Keys show a mixture of landings from state and federal waters with most of the fish coming from federal waters.

Using more general regional definitions to mask any confidential data from the ALS and FL TTK landings, table 5 represents current commercial yellowtail snapper landings by year, region and gear in pounds whole weight from 1962-2018.

Table 1. U.S. commercial landings (in pounds) of yellowtail snapper by Florida coast with other states combined. Data from NOAA Fisheries and FL FWC.

Year	FL West Coast	FL East Coast	Out-of-State
1950	249,900	96,500	0
1951	210,000	227,600	0
1952	215,400	174,600	0
1953	213,200	134,400	0
1954	200,100	133,700	0
1955	143,800	92,600	0
1956	163,700	100,400	0
1957	296,500	146,800	0
1958	261,300	86,500	0
1959	406,300	86,400	0
1960	527,600	98,200	0
1961	639,900	95,000	0
1962	909,800	88,300	0
1963	729,000	102,700	0
1964	896,500	144,100	0
1965	941,700	123,000	0
1966	752,500	77,700	0
1967	849,900	112,600	0
1968	1,025,300	162,900	0
1969	807,800	162,300	0
1970	986,900	209,300	0
1971	948,900	144,400	0
1972	865,500	154,700	0
1973	835,500	107,100	0
1974	937,900	104,900	0
1975	675,400	122,300	0
1976	922,300	55,400	0
1977	762,400	46,400	0
1978	830,400	40,200	0
1979	731,700	48,300	0
1980	606,438	45,017	0
1981	694,188	37,434	0
1982	1,334,831	35,884	1,358
1983	894,385	67,326	31
1984	911,608	35,697	160
1985	784,095	41,126	766
1986	1,026,456	92,318	46
1987	1,265,459	88,544	10,054
1988	1,299,430	111,936	1,210
1989	1,711,275	137,021	3,231
1990	1,627,159	128,102	352
1991	1,711,518	148,832	1,292
1992	1,675,050	176,462	4,830
1993	2,193,092	185,641	506

1994	2,037,469	168,384	434
1995	1,728,856	127,934	124
1996	1,350,073	109,127	136
1997	1,529,064	144,842	277
1998	1,398,046	126,385	177
1999	1,735,291	110,862	253
2000	1,490,704	101,016	226
2001	1,324,607	95,974	203
2002	1,315,257	94,687	755
2003	1,304,558	105,449	2,452
2004	1,377,250	102,689	706
2005	1,212,587	111,960	780
2006	1,153,822	83,061	423
2007	881,060	96,905	609
2008	1,258,882	111,120	799
2009	1,814,961	160,137	1,672
2010	1,502,395	191,557	1,449
2011	1,682,877	210,667	1,312
2012	1,937,097	170,213	1,084
2013	1,947,817	113,326	1,866
2014	1,984,270	59,010	824
2015	2,164,831	33,139	2,253
2016	2,259,559	55,347	748
2017	2,780,951	39,489	272
2018	1,955,100	24,822	743

Table 2. Monroe county (FL Keys) landings as a percent of the Florida statewide total from 1962-2018.

Year	Monroe County	Statewide	% Monroe
1962	892,700	998,100	89.4%
1963	716,600	831,700	86.2%
1964	885,400	1,040,600	85.1%
1965	915,100	1,064,700	85.9%
1966	735,000	830,200	88.5%
1967	828,800	962,500	86.1%
1968	947,700	1,188,200	79.8%
1969	755,800	970,100	77.9%
1970	915,100	1,196,200	76.5%
1971	836,100	1,093,300	76.5%
1972	741,000	1,020,200	72.6%
1973	726,700	942,600	77.1%
1974	798,600	1,042,800	76.6%
1975	591,700	797,700	74.2%
1976	810,500	977,700	82.9%
1977	653,700	808,800	80.8%
1978	735,100	870,600	84.4%
1979	656,800	780,000	84.2%
1980	535,531	651,455	82.2%
1981	639,863	731,622	87.5%
1982	1,257,985	1,370,715	91.8%
1983	846,222	961,711	88.0%
1984	861,773	947,305	91.0%
1985	762,048	825,221	92.3%
1986	991,101	1,118,774	88.6%
1987	1,234,050	1,354,016	91.1%
1988	1,259,673	1,411,366	89.3%
1989	1,639,195	1,848,305	88.7%
1990	1,576,733	1,755,261	89.8%
1991	1,673,075	1,860,350	89.9%
1992	1,594,981	1,850,852	86.2%
1993	2,135,552	2,378,313	89.8%
1994	2,005,681	2,205,051	91.0%
1995	1,696,420	1,856,806	91.4%
1996	1,335,745	1,458,799	91.6%
1997	1,523,527	1,673,603	91.0%
1998	1,393,145	1,524,370	91.4%
1999	1,726,777	1,846,119	93.5%
2000	1,500,692	1,591,912	94.3%
2001	1,318,381	1,420,654	92.8%
2002	1,310,039	1,410,125	92.9%
2003	1,294,918	1,410,177	91.8%
2004	1,372,617	1,480,041	92.7%
2005	1,209,201	1,324,612	91.3%
2006	1,148,783	1,236,987	92.9%
2007	878,227	978,082	89.8%
2008	1,257,655	1,370,089	91.8%
2009	1,812,237	1,975,533	91.7%
2010	1,501,385	1,694,057	88.6%
2011	1,679,163	1,893,636	88.7%
2012	1,892,442	2,069,485	91.4%
2013	1,940,670	2,061,217	94.2%
2014	1,933,005	2,043,302	94.6%
2015	2,146,870	2,198,334	97.7%
2016	2,237,346	2,314,725	96.7%
2017	2,765,302	2,819,733	98.1%
2018	1,918,402	1,963,363	97.7%



Table 3. Florida commercial yellowtail snapper landings (pounds and trips) by Florida region. Landings were tabulated by area fished and may not necessarily match the totals shown in Tables 1 and 2.

Year	Florida West		Florida Keys		Florida East		Total Florida		Percent in FL Keys	
	Pounds	Trips	Pounds	Trips	Pounds	Trips	Pounds	Trips	Pounds	Trips
1985	33,475	237	789,014	10,778	31,986	820	854,475	11,835	92.3%	91.1%
1986	34,625	390	1,027,503	10,798	57,132	1,372	1,119,260	12,560	91.8%	86.0%
1987	34,167	532	1,239,650	15,496	80,794	1,668	1,354,611	17,696	91.5%	87.6%
1988	41,969	645	1,269,852	15,106	99,273	1,784	1,411,094	17,535	90.0%	86.1%
1989	66,853	699	1,652,836	17,705	131,536	2,304	1,851,225	20,708	89.3%	85.5%
1990	51,299	495	1,575,344	16,284	130,545	2,132	1,757,188	18,911	89.7%	86.1%
1991	38,830	504	1,607,026	14,594	215,869	3,524	1,861,725	18,622	86.3%	78.4%
1992	79,568	513	1,535,108	14,498	236,836	3,645	1,851,512	18,656	82.9%	77.7%
1993	57,346	571	2,068,476	15,200	252,911	3,768	2,378,733	19,539	87.0%	77.8%
1994	31,381	550	1,903,381	13,440	270,743	3,947	2,205,506	17,937	86.3%	74.9%
1995	38,344	387	1,587,849	11,457	230,597	3,932	1,856,790	15,776	85.5%	72.6%
1996	28,535	306	1,195,418	9,402	235,145	3,814	1,459,097	13,522	81.9%	69.5%
1997	17,730	238	1,305,918	9,555	350,257	4,743	1,673,906	14,536	78.0%	65.7%
1998	6,801	126	1,223,837	8,096	293,793	3,230	1,524,431	11,452	80.3%	70.7%
1999	20,031	192	1,538,243	7,813	287,868	2,936	1,846,142	10,941	83.3%	71.4%
2000	6,742	167	1,369,105	6,537	215,873	2,527	1,591,720	9,231	86.0%	70.8%
2001	6,125	150	1,194,726	6,708	219,287	2,407	1,420,138	9,265	84.1%	72.4%
2002	2,994	112	1,163,630	6,505	240,911	2,602	1,407,536	9,219	82.7%	70.6%
2003	6,123	113	1,145,762	6,606	253,370	2,370	1,405,255	9,089	81.5%	72.7%
2004	4,701	116	1,244,995	6,323	230,243	2,182	1,479,939	8,621	84.1%	73.3%
2005	4,655	145	1,132,732	5,826	187,160	1,827	1,324,546	7,798	85.5%	74.7%
2006	6,123	162	1,110,833	5,168	119,926	1,345	1,236,882	6,675	89.8%	77.4%
2007	3,102	67	858,063	4,822	116,801	1,348	977,965	6,237	87.7%	77.3%
2008	4,616	68	1,262,021	5,269	103,362	1,110	1,369,999	6,447	92.1%	81.7%
2009	2,937	93	1,823,760	5,601	148,400	1,285	1,975,097	6,979	92.3%	80.3%
2010	603	38	1,527,954	4,755	165,397	952	1,693,953	5,745	90.2%	82.8%
2011	4,422	94	1,766,938	4,748	122,184	938	1,893,544	5,780	93.3%	82.1%
2012	13,063	116	1,963,369	4,582	130,859	1,055	2,107,291	5,753	93.2%	79.6%
2013	10,737	90	1,979,483	4,547	70,923	816	2,061,143	5,453	96.0%	83.4%
2014	9,916	171	1,963,397	4,701	69,946	949	2,043,260	5,821	96.1%	80.8%
2015	12,866	283	2,081,364	4,431	103,724	800	2,197,954	5,514	94.7%	80.4%
2016	14,374	361	2,205,231	5,017	95,301	843	2,314,905	6,221	95.3%	80.6%
2017	14,183	470	2,741,163	4,594	65,080	616	2,820,426	5,680	97.2%	80.9%
2018	21,025	496	1,900,221	3,821	58,661	564	1,979,907	4,881	96.0%	78.3%

Table 4. Yellowtail snapper catch per trip by YS region from Florida trip ticket data.

Year	NE Florida Nassau-Brevard	SE Florida Indian River-Miami-Dade	Florida Keys	SW Florida Collier-Citrus	NW Florida Levy-Escambia	Total Florida
1985	12.5	39.2	73.2	82.9	1341.0	72.2
1986	25.6	42.0	95.2	89.5	49.6	89.1
1987	10.5	49.7	80.0	64.4	27.4	76.5
1988	10.3	56.6	84.1	64.9	86.9	80.5
1989	15.6	57.9	93.4	95.9	5.6	89.4
1990	21.3	62.1	96.7	104.6	11.8	92.9
1991	8.3	62.4	110.1	77.2	56.2	100.0
1992	19.9	66.7	105.9	156.2	72.3	99.2
1993	24.1	68.1	136.1	101.3	6.9	121.7
1994	53.6	68.9	141.6	58.4	14.7	123.0
1995	27.9	59.3	138.6	102.4	58.3	117.7
1996	35.5	62.2	127.1	80.6	273.5	107.9
1997	29.1	74.5	136.7	74.8	70.0	115.2
1998	42.1	92.0	151.2	48.1	129.9	133.1
1999	18.5	100.0	196.9	101.3	166.1	168.7
2000	13.2	87.6	209.4	42.2	21.5	172.4
2001	27.9	94.0	178.1	37.3	95.8	153.3
2002	16.6	94.8	178.9	26.8	26.5	152.7
2003	12.7	108.1	173.4	51.9	94.5	154.6
2004	18.8	106.8	196.9	32.8	161.1	171.7
2005	7.8	103.8	194.4	33.5	13.7	169.9
2006	13.5	90.4	214.9	36.1	69.8	185.3
2007	8.4	89.0	177.9	46.5	30.0	156.8
2008	45.3	94.1	239.5	74.4	11.1	212.5
2009	12.1	119.1	325.6	32.8	17.0	283.0
2010	59.6	179.5	321.3	15.9		294.9
2011	10.7	132.7	372.1	41.1	134.5	327.6
2012	15.1	126.7	428.5	112.5	117.3	366.3
2013	44.7	88.1	435.3	123.3	4.4	378.0
2014	20.6	75.6	417.7	60.0	2.6	351.0
2015	8.1	135.5	469.7	46.3	8.1	398.6
2016	7.8	118.4	439.6	41.7	4.3	372.1
2017	4.0	107.8	596.7	31.7	4.4	496.6
2018	8.8	106.4	497.3	43.5	2.2	405.6

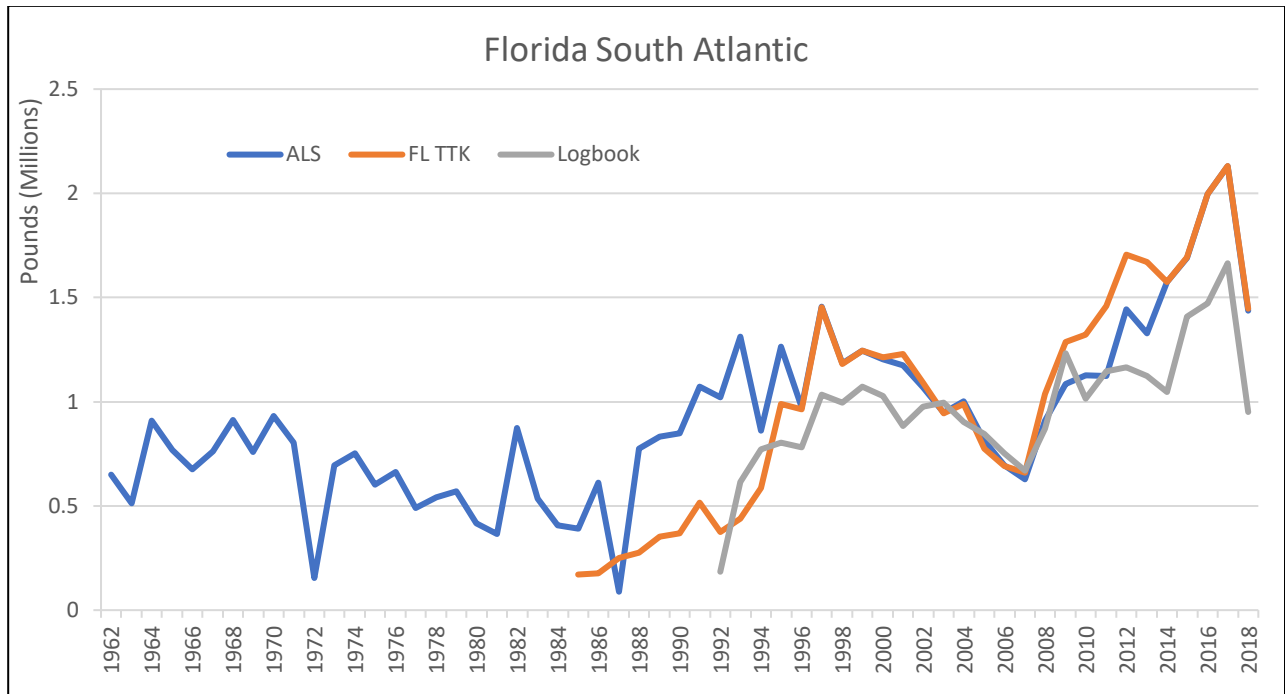
Table 5. U.S. Southeast commercial yellowtail snapper landings (whole pounds) by year, region, and gear. Data from NOAA Fisheries ALS (yellow) and FL Trip Ticket (green).

Year	Region by Gear							
	FL Gulf of Mexico		FL Keys		FL South Atlantic		Out-of-State	
	H&L	Other	H&L	Other	H&L	Other	H&L	Other
1962	17,100		892,700		88,300			
1963	12,400		716,600		102,700			
1964	10,400		885,400		144,100		700	
1965	17,000		915,900		123,000		8,800	
1966	1,700		745,700		77,700		5,100	
1967			849,300		112,600		600	
1968			1,025,000		162,900		300	
1969			807,500		162,300		300	
1970			986,900		209,300			
1971	100		948,600		144,400		200	
1972	589,800		275,600		154,700		100	
1973	21,800		813,500		107,100		200	
1974	28,200		909,200		104,900		500	
1975	17,500		657,700		122,300		200	
1976	29,300		893,000		55,400			
1977	11,600		750,800		46,400			
1978	15,200		833,200	2,600	17,000	2,600		
1979	58,900		609,300	81,100	30,700			
1980	35,979	2,014	525,097	62,648	25,717			
1981	27,396		652,540	29,694	21,992			
1982	51,701		1,287,777	5,809	25,428		1,358	
1983	26,929		865,519	16,618	28,113	24,532	31	
1984	37,254		857,119	17,235	35,296	401	12	148
1985	13,124	198	718,847	32,113	60,820	119	766	
1986	17,471	17,154	608,186	419,317	35,517	21,615	46	
1987	18,138	136	1,247,185	1,383	75,063	13,494	8,353	318
1988	25,231	173	1,218,183	39,063	98,267	31,633	26	
1989	59,980	1,439	1,585,008	55,448	117,492	30,290	1,879	
1990	41,493	795	1,536,655	40,992	114,174	21,152	134	218
1991	21,710	1,372	1,630,109	37,856	155,631	13,672	1,243	49
1992	78,875	693	1,495,350	39,758	235,469	1,368	4,827	12
1993	47,609	9,737	1,911,737	156,739	235,653	17,258	454	54
1994	30,304	1,077	1,811,735	91,646	260,762	9,981	414	20
1995	36,702	1,642	1,528,688	59,162	227,147	3,450	84	40
1996	26,507	2,028	1,158,819	36,599	231,681	3,463	145	20
1997	16,848	882	1,268,681	37,237	344,787	5,470	230	47
1998	6,447	354	1,177,292	46,546	287,381	6,411	166	
1999	18,363	1,668	1,494,992	43,251	282,623	5,245	141	123
2000	6,385	357	1,346,558	22,547	212,247	3,626	226	
2001	5,142	983	1,192,509	2,216	218,943	344	642	4

2002	2,457	537	1,159,472	4,158	240,493	418	3,157	7
2003	5,558	565	1,144,728	1,033	252,997	373	2,454	
2004	4,684	17	1,243,834	1,160	230,162	81	695	11
2005	4,533	122	1,131,715	1,017	186,745	415	772	8
2006	5,977	145	1,110,201	632	119,735	191	416	8
2007	3,098	3	853,443	4,620	116,756	45	567	42
2008	4,615	1	1,255,458	6,563	103,134	228	782	20
2009	2,830	107	1,822,814	947	148,232	168	1,353	319
2010	596	7	1,525,772	2,181	165,392	5	1,176	273
2011	4,413	9	1,766,022	915	121,568	616	572	733
2012	13,007	57	1,960,463	2,906	130,464	394	656	449
2013	10,731	6	1,973,924	5,559	70,772	151	1,725	141
2014	9,881	36	1,958,699	4,698	69,485	461	828	17
2015	12,399	467	2,078,140	3,224	103,267	457	546	1,724
2016	13,878	496	2,204,120	1,111	95,244	57	699	50
2017	13,322	861	2,739,383	1,779	64,809	272	282	4
2018	20,772	253	1,899,479	742	58,557	104	746	13

Figure 1. A comparison of Florida commercial yellowtail snapper landings by data source for a) South Atlantic and b) Gulf of Mexico.

a) South Atlantic



b) Gulf of Mexico

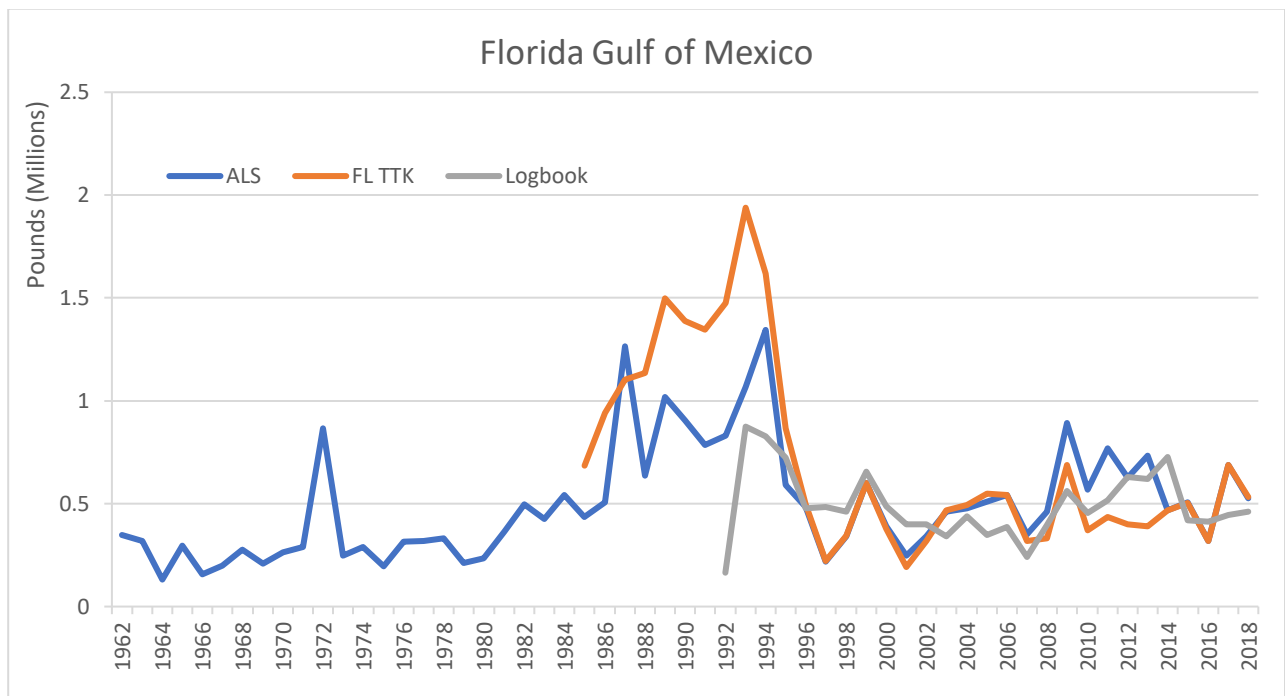
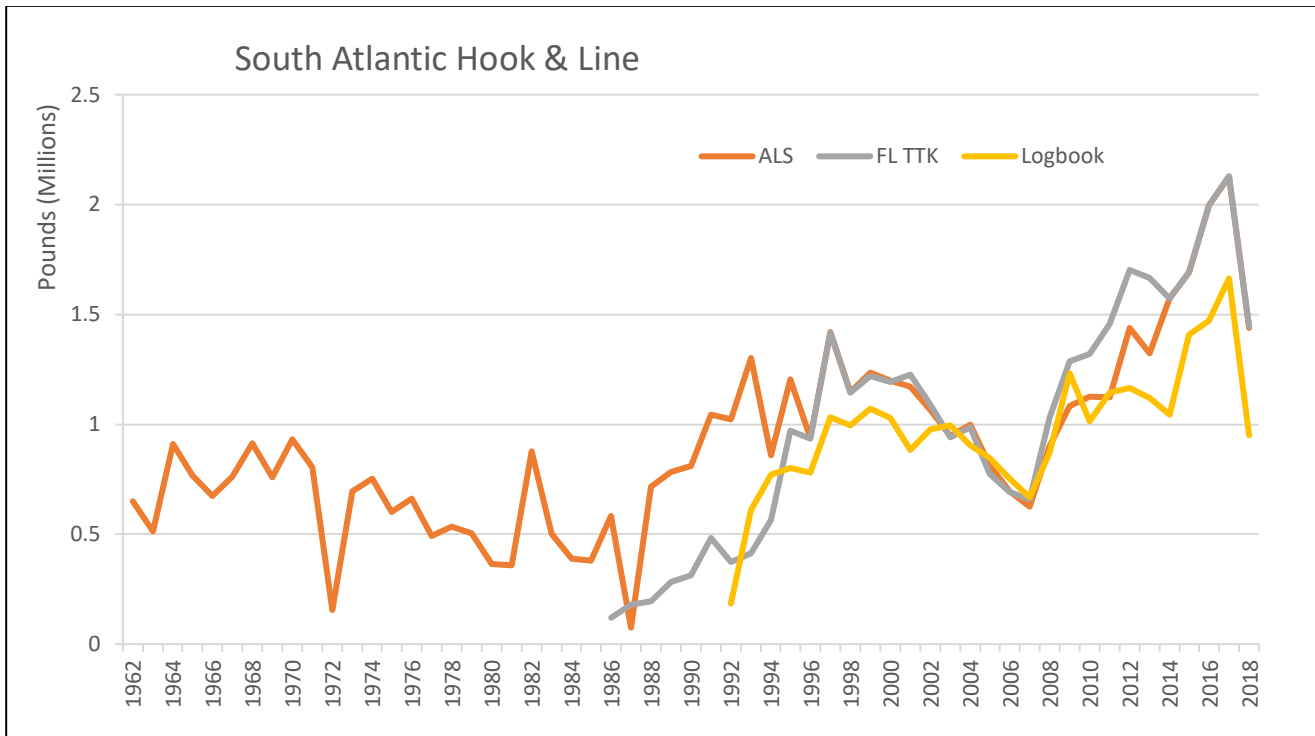


Figure 2. A comparison of Florida commercial yellowtail snapper landings by data source for hook and line gears for a) South Atlantic and b) Gulf of Mexico.

a) South Atlantic



b) Gulf of Mexico

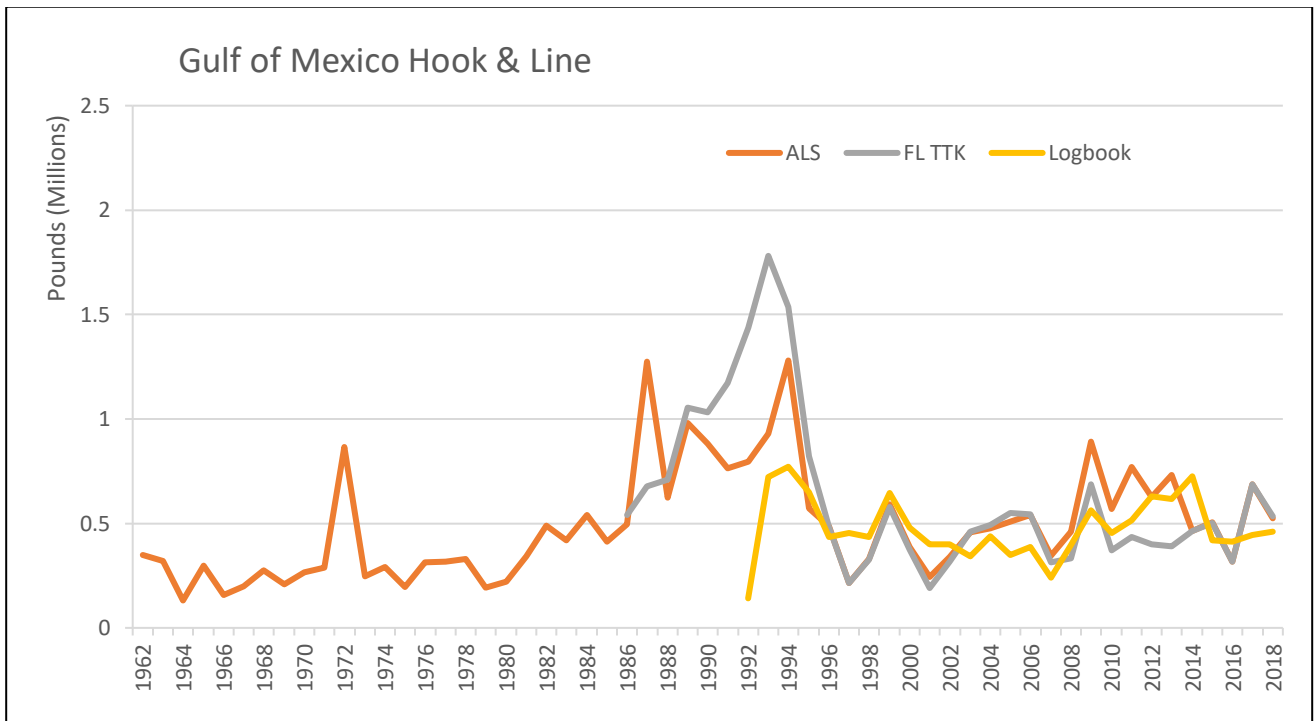


Figure 3. A comparison of Florida commercial yellowtail snapper landings by data source for the seven proposed YS subregions.

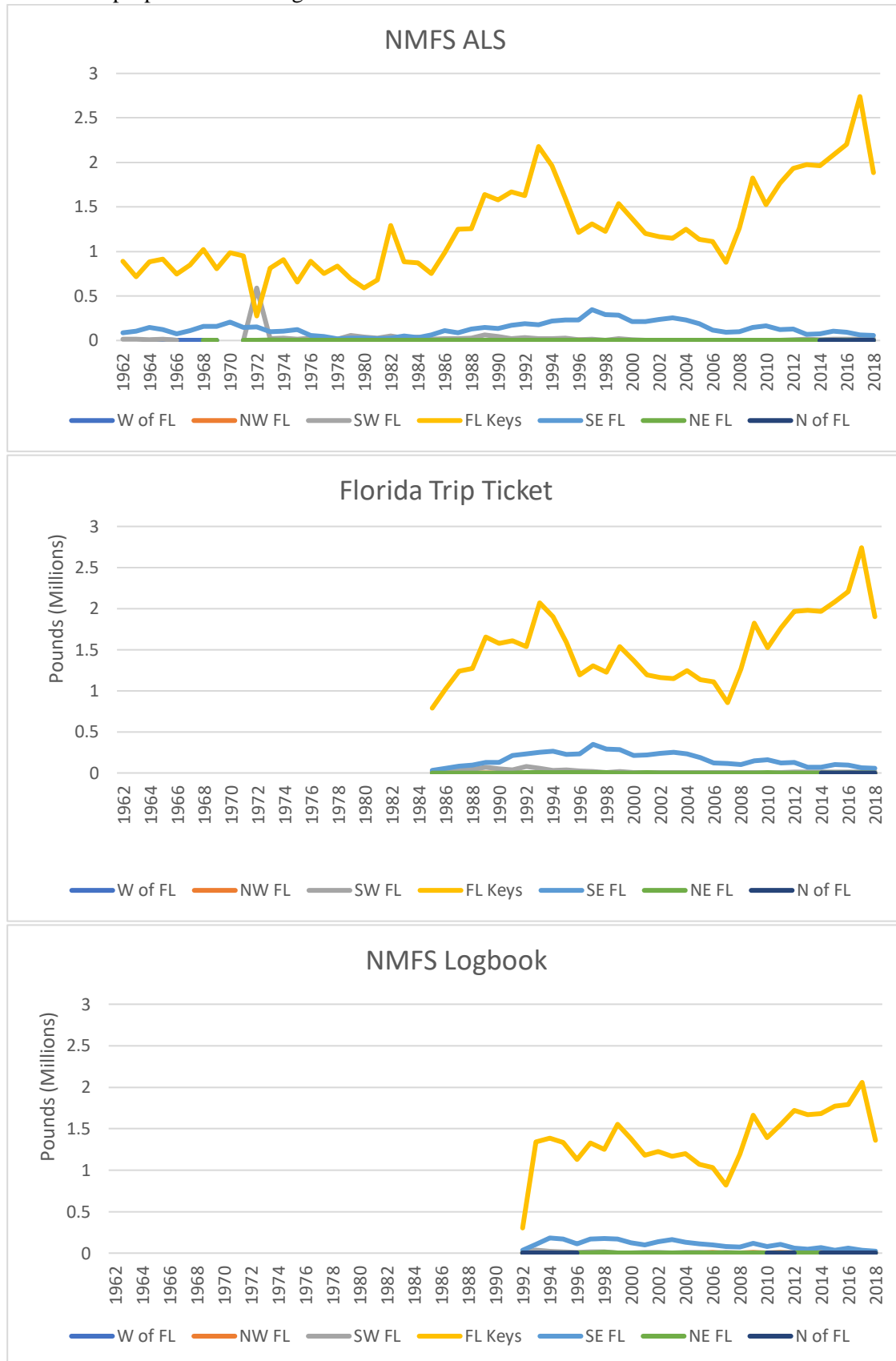


Figure 4. Number of commercial yellowtail snapper trips and landings by region in South Florida.

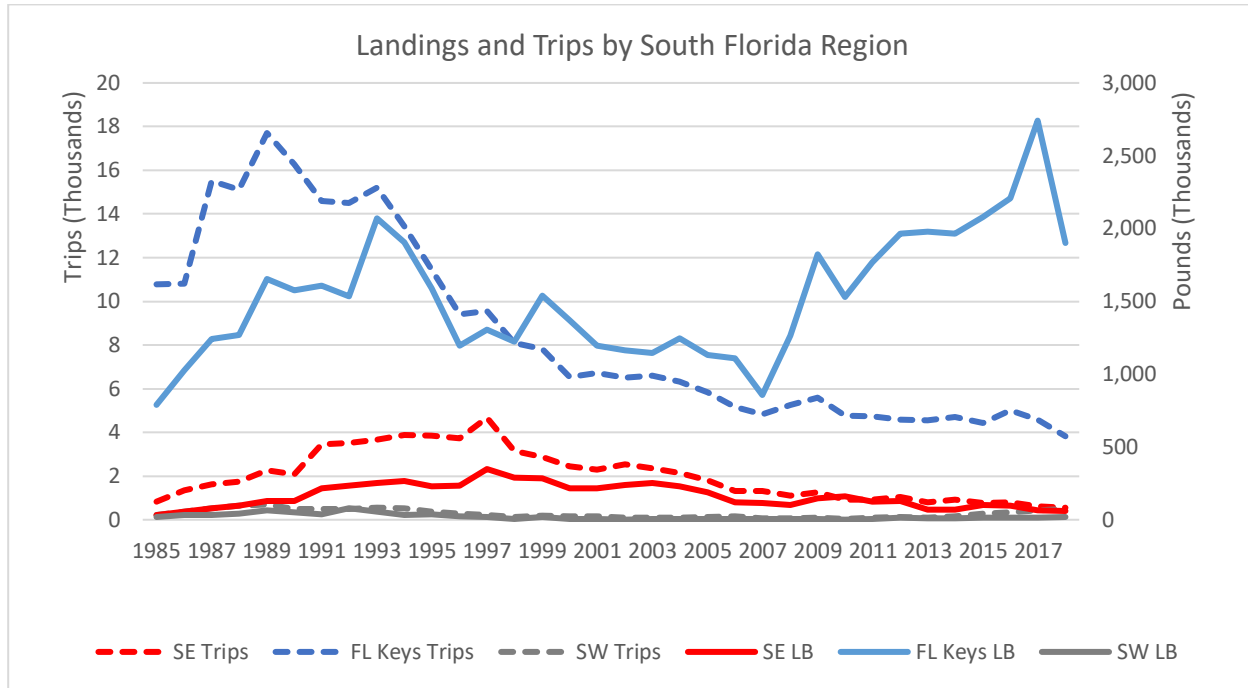


Figure 5. Number of licenses and landings by region in South Florida from commercial yellowtail snapper trips.

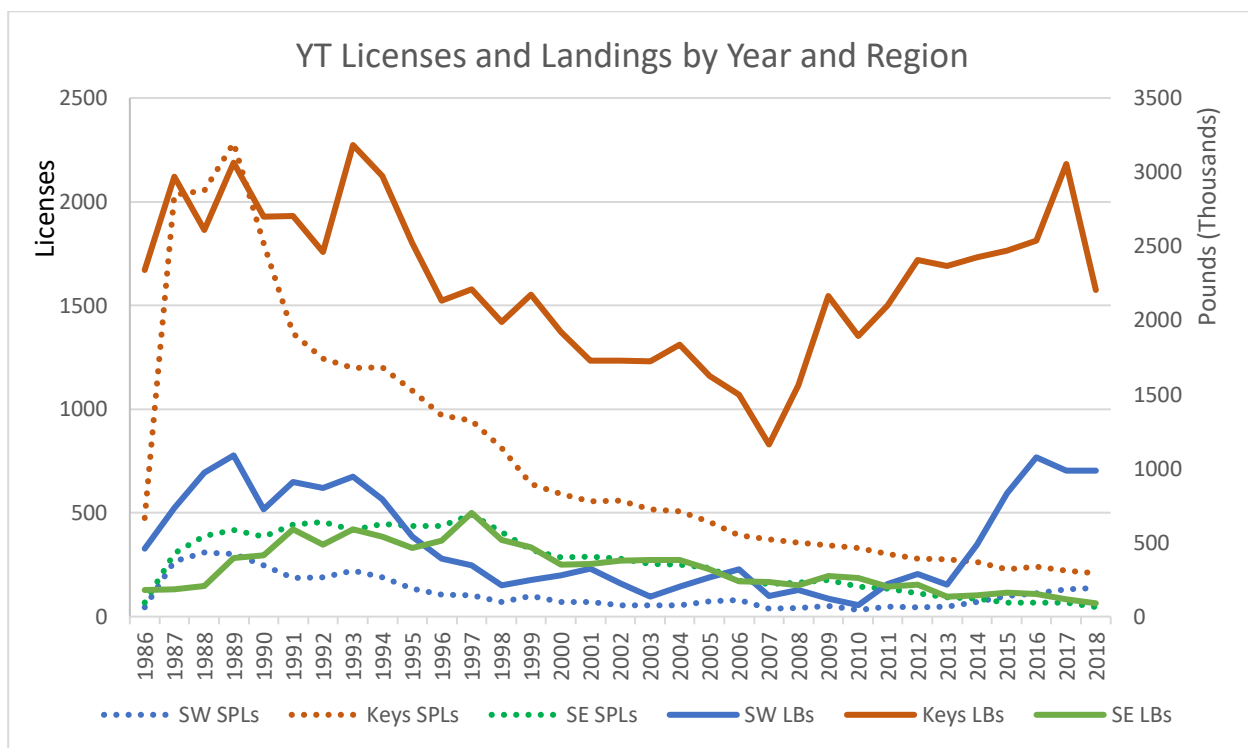




Figure 6. Active South Atlantic snapper-grouper permits by year.

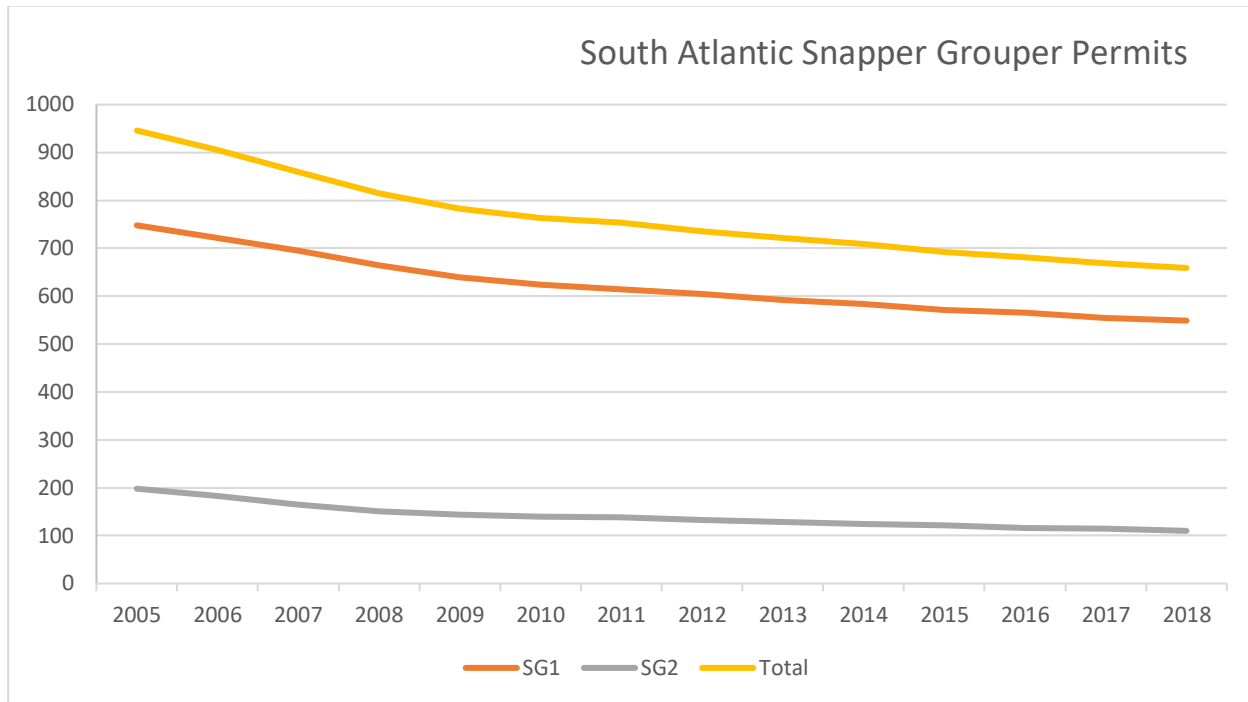


Figure 7. Yellowtail snapper catch per trip by YS region from Florida trip ticket data.

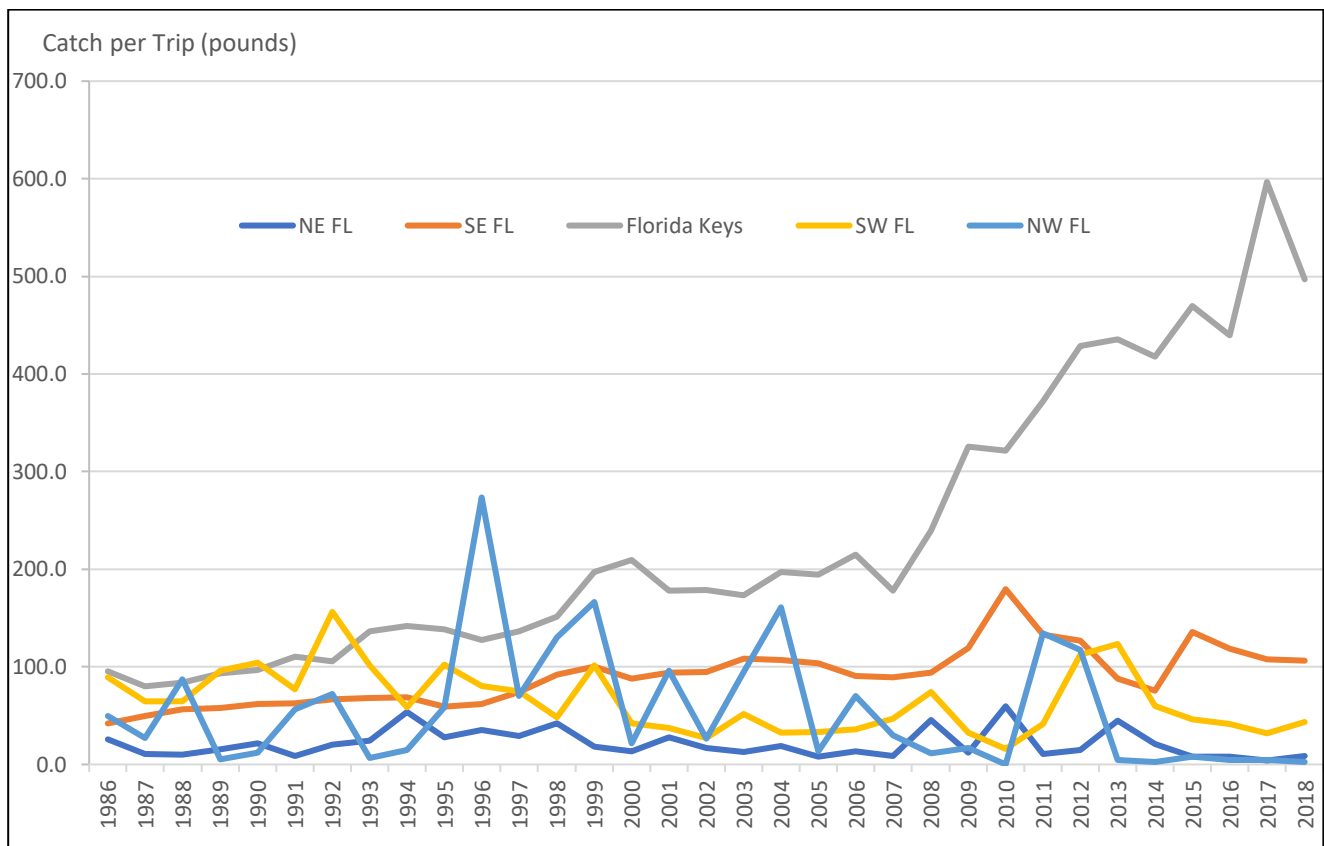


Figure 8. Commercial yellowtail snapper landings by region and state-federal waters zone.

