

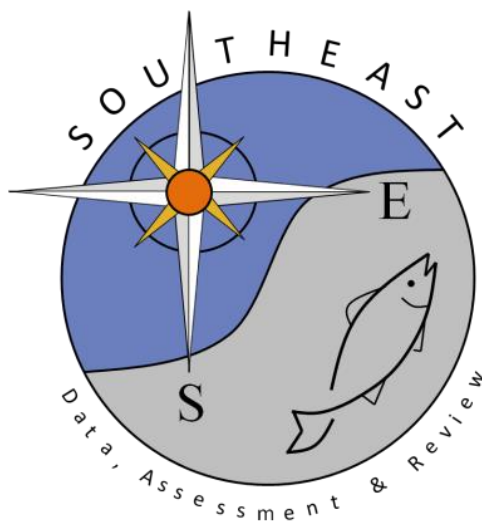
# Commercial fishery landings of queen triggerfish (*Balistes vetula*) in the United States Caribbean, 1983-2019 DRAFT

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# **Commercial fishery landings of queen triggerfish (*Balistes vetula*) in the United States Caribbean**

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June 9, 2022

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## **Introduction**

Commercial landings in the U.S. Caribbean were obtained from self-reported fisher logbook data. In the U.S. Virgin Islands logbook landings data from the islands of St. Thomas and St. John have been compiled separately from St. Croix landings. Logbook reporting began in 1974, however, landings were initially reported by gear type (e.g., net fish, hook fish, pot fish, and spear fish) and as either snapper/grouper or as other fin fish during the period 1974-1995 (McCarthy, 2012). Beginning in 1996 (St. Croix) and 1997 (St. Thomas/St. John) some landings data were reported by species group; (e.g., snappers, groupers, parrotfishes, surgeonfishes, etc.) and by gear (hook and line, gill net, SCUBA, trap, etc.). All commercial fishery data reports included species group beginning in 1998 (St. Croix) and 2000 (St. Thomas and St. John). Classification of triggerfish by species did not begin until July of 2011 in U.S. Virgin Islands; prior landings had been reported together into an unspecified triggerfish category.

Commercial fishery landings data for Puerto Rico were available for the years 1983-2019. Data were reported by species, fishing gear, and fishing center where the catch was landed. Puerto Rico commercial landings have been incompletely reported throughout the available time series (Caribbean Fisheries Data Evaluation Final Report, 2009) and expansion factors, calculated by Puerto Rico Department of Natural and Environmental Resources, have been used to estimate total landings. Estimation of commercial fishery landings of 1983–2002 used a single, island-wide, expansion factor. For the years 2003 to present, expansion factors were coast-specific (north, south, east, west). Reported landings were assigned to a coast based upon the location of the fishing center reported for a trip.

## **Methods**

Commercial landings of queen triggerfish were compiled from the self-reported logbook records from commercial fishers for each island (i.e., St. Thomas/St. John, St. Croix, and Puerto Rico). The commercial landings, in pounds, and the number of trips were estimated from 2000 to 2019 for St. Thomas/St. John, 1998–2019 for St. Croix, and 1983–2019 for Puerto Rico. For St. Thomas/St. John and St. Croix, landings were provided as queen triggerfish and unspecified triggerfish combined. The commercial landings for each island were reported by year, species, and fishing gear. Terminal year (2019) data may be incomplete and confidential data were removed from tables and figures.

For Puerto Rico, expanded landings were compiled as year-specific reported landings with a year-specific expansion factor applied. The expansion factors were estimated by year during 1983–2002, and by year and coast during 2003–2019. Based on SEDAR 57 for Spiny lobster, the expansion factor for 2005 landings was replaced with the means of 2004 and 2006 expansion factors (SEDAR 57, 2019).

In Puerto Rico, commercial landings have been reported by species throughout the time series, therefore, expanded landings were provided as queen triggerfish. For Puerto Rico, expanded landings were computed by year, species, fishing gear, and coast.

### *Gear groupings*

The fishing gears were classified into four groups, pots and traps, hook and line, diving, and other, based on gear selectivity and reported commercial landings (Table 1).

### *Outliers*

Outlier removal was conducted by using a mean and standard deviation method. We calculated the values to define outliers by gear group and island (Table 2). In Puerto Rico, fishers reported multiple trip landings in several years, therefore, we used reported landings (not expanded landings) divided by the number of trips for the outlier analysis. If the landings of queen triggerfish or triggerfishes reported on a trip were greater than three standard deviations from the mean (i.e., 99.73% quantile) they were removed from the dataset. Due to the outlier removal, the yearly commercial landings for queen triggerfish compiled in SEDAR80 may not match with previous SEDARs.

## **Results and Discussion**

### *St. Thomas and St. John, U.S. Virgin Islands*

Landings of queen triggerfish, including landings of unspecified triggerfishes from 2000 to mid-2011, were approximately 30,000-95,000 pounds per year (Table 3). Trips per year varied between approximately 1,000 and 2,200 in St. Thomas and St. John (Table 3). The highest landings, approximately 97,000 pounds, were reported during 2003. Queen triggerfish landings were reported for 46% of all trips. The reported commercial landings of queen triggerfish and the number of trips slightly declined during the second half of the time series in St. Thomas and St. John (Figure 1A-B).

The principal gear used to catch queen triggerfish in the St. Thomas and St. John commercial fishery was pots and traps, which totaled 98% of queen triggerfish landings (Table 4; Figures 2 and 3). The number of trips that caught queen triggerfish by pots and traps accounted for approximately 80% of the total trips reporting pots and traps in St. Thomas and St. John (Table 5). Trips using hook and line to catch queen triggerfish represented 1.2% of queen triggerfish landings and 7% of all hook and line trips. Hook and line trips reporting queen triggerfish have declined in recent years (Table 5; Figure 3). The diving and “other” gear groups combined accounted for 0.8% of the queen triggerfish landings and the number of trips reporting those two gear groups declined over time.

### *St. Croix, U.S. Virgin Islands*

Yearly commercial fishery landings of queen triggerfish, including landings of unspecified triggerfishes from 1998 to mid-2011, were about 3,000-38,000 pounds, and trips with Queen Triggerfish landings reported totaled 200-3,000 per year in St. Croix (Table 6). Queen triggerfish landings were reported for 21% of all trips. Reported landings in pounds for queen triggerfish peaked during 2008-2010 and declined in recent years of the time series (Table 6; Figure 1A). In St. Croix, we also observed a progressive decline in landings and the number of trips in 2011 (Figure 1A-B).

The majority of landings were reported for diving and represented 54% of queen triggerfish commercial landings (Table 7; Figure 4). The proportion of landings reported by diving increased during the second half of the time series and decreased in the final five years. The number of trips that caught queen triggerfish by diving accounted for approximately 25% of the total diving trips in St. Croix (Table 8; Figure 5). At the beginning of the time series, the gear group of pots and traps was the main gear used to catch queen triggerfish (Figures 4 and 5). The proportion of trips reporting fishing pots and traps has decreased over time and may be due to regulatory restrictions (McCarthy, 2012). Hook and line trips and landings represented 10% and 9% of the total for queen triggerfish, respectively, and have decreased over time.

### *Puerto Rico*

In Puerto Rico, commercial landings were compiled as expanded landings, species-specific and by coast. The commercial expanded landings of queen triggerfish from 1983 to 2019 were provided in Table 9. At the beginning of the time series, queen triggerfish expanded landings reached the highest point at ~143,000 pounds. The expanded landings by year after the first two years varied from 32,000 to 97,000 pounds, and the number of trips from 2,000 to 11,000 trips. Queen triggerfish landings were reported for 4% of all trips in Puerto Rico. The expanded landings time series showed periodical fluctuations (Figure 1A). The number of trips time series, however, exhibited a peak between 1995 and 2002 (Figure 1B).

Overall, the expanded landings were reported primarily by pots and traps, accounting for 56% of queen triggerfish landings (Table 10). The time series of the expanded landings by gear group indicated a decrease in pots and traps and an increase in diving and hook and line gear groups over time (Figure 6). The diving and hook and line accounted for 24% and 16% of queen triggerfish landings, respectively. The number of trips time series showed a substantial increase in hook and line trips during 1995-2002 (Figure 7). The diving trips increased in number since 1993 and exceeded trips of pots and traps during the second half of the time series.

For Puerto Rico only, queen triggerfish landings were compiled by coast, and the inland category was excluded from the analysis, therefore, the information in Tables 12 and 13 do not add up to the total from Table 9. The expanded landings by coast showed that the majority of queen triggerfish landings were reported in the west of the island (Table 12). The west, south, east, and north accounted for 37%, 34%, 19%, and 10% of the queen triggerfish expanded landings, respectively. The commercial expanded landings time series exhibited periodical fluctuations (Figure 8). Queen triggerfish commercial trips have been reported primarily in the west and represented 4% of all the trips reported in the west region (Table 13). The number of trips by coast since 2003 has been low in the east and the north (Figure 9).

## **Literature Cited**

- McCarthy, K.J. 2012. Commercial fishery landings of queen triggerfish and blue tang in the United States Caribbean, 1983-2011. SEDAR30-AW-04. SEDAR, North Charleston, SC. 15 pp.
- SEDAR. 2009. Caribbean Fisheries Data Evaluation, Final report. SEDAR Procedures Workshop 3. 195 pp.
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Table 1. The classification of the commercial logbook gears into gear groups for the U.S. Virgin Islands and Puerto Rico.

U.S. Virgin Islands				Puerto Rico			
Pots and traps	Hook and line	Diving	Other	Pots and traps	Hook and line	Diving	Other
Traps	Hook and line	Spear or hand	Combined gears	Pots and traps, fish	Long lines, bottom	By hand, diving gear	Gill nets, other
		Diving	Unknown	Pots and traps, spiny lobster	Hook and line, bottom	Spears	Trammel nets
			Nets		Hook and line		Haul seines
					Troll lines		Cast nets
					Hand line		Combined gears

Table 2. Commercial landings of queen triggerfish in pounds equal to three standard deviations from the mean (i.e., 99.73% quantile) by gear group and island used for the outlier analysis. Trips with landings greater than the indicated value, by island and gear, were removed from the analysis dataset.

Gear	Outliers of Landings (lb)		
	St. Thomas & St. John	St. Croix	Puerto Rico
Pots and traps	225	70	165
Diving	43	70	100
Hook and line	144	50	181
Other	130	80	104



Table 3. Commercial landings of queen triggerfish in pounds and the number of trips with reported queen triggerfish landings in St. Thomas and St. John are provided in the columns labeled TF. Also provided are the total commercial landings (all species) in pounds and number of trips reported yearly in St. Thomas and St. John.

Year	St. Thomas & St. John TF		St. Thomas & St. John	
	Landings (lb)	Trips (n)	Total Landings (lb)	Total Trips (n)
2000	70,398	2,204	617,874	5,283
2001	80,253	2,284	755,247	5,929
2002	94,490	2,244	819,047	5,811
2003	96,796	2,273	812,436	5,429
2004	85,937	2,246	801,710	4,966
2005	76,462	2,096	743,436	4,891
2006	68,885	2,072	789,822	5,228
2007	72,082	1,924	708,638	4,768
2008	83,841	1,971	690,350	4,493
2009	78,929	1,920	709,080	4,655
2010	78,825	1,768	641,748	3,881
2011	56,316	1,484	468,675	3,013
2012	45,891	1,387	392,581	2,426
2013	44,566	1,185	348,272	1,971
2014	48,851	1,163	414,511	2,028
2015	48,060	1,062	394,075	2,106
2016	52,458	1,388	433,055	2,470
2017	39,365	1,341	344,405	1,987
2018	41,979	1,261	346,801	1,813
2019	32,788	986	312,444	1,631
Total	1,297,171	34,259	11,544,207	74,779

Table 4. Commercial landings in pounds reported by year and gear group for queen triggerfish (TF) in St. Thomas and St. John. Confidential data were removed.

Year	St. Thomas & St. John TF Landings (lb)			
	Pots and traps	Hook and line	Diving	Other
2000	68,415	1,575	408	
2001	78,322	1,247	374	310
2002	92,437	1,173	617	264
2003	94,634	1,605	427	130
2004	84,701	1,105		35
2005	75,594	623		140
2006	65,693	676	565	1,951
2007	69,441	780	267	1,594
2008	82,418	529		
2009	77,209	823	597	301
2010	77,136	740	81	868
2011	55,117	721	136	343
2012	45,244	477	169	
2013	44,115	337	114	
2014	48,097	572		
2015	47,154	853		
2016	51,546	866	46	
2017	38,905	379		
2018	41,863	99		
2019	32,645	140		
Total	1,270,685	15,319	5,205	5,963

Table 5. Commercial trips reporting landings of queen triggerfish (TF) by year and gear group and the total number of commercial trips (all species) reported by year and gear group in St. Thomas and St. John. Confidential data were removed.

Year	St. Thomas & St. John TF Trips (n)				St. Thomas & St. John Total Trips (n)			
	Pots and traps	Diving	Hook and line	Other	Pots and traps	Diving	Hook and line	Other
2000	2,005	44	155		2,528	229	1,958	568
2001	2,073	35	159	17	2,655	322	2,445	507
2002	2,038	42	154	10	2,628	375	2,286	522
2003	2,076	30	155	12	2,732	317	1,874	506
2004	2,116		112	7	2,719	139	1,567	541
2005	1,983		90	17	2,703	116	1,446	626
2006	1,865	30	89	88	2,577	178	1,687	786
2007	1,746	15	92	71	2,436	183	1,452	697
2008	1,880		50		2,520	159	1,273	541
2009	1,791	40	75	14	2,380	149	1,490	636
2010	1,649	11	87	21	2,182	124	1,082	493
2011	1,346	21	91	26	1,757	162	773	321
2012	1,285	28	74		1,546	94	621	165
2013	1,137	13	35		1,358	59	473	81
2014	1,091		51		1,335	65	463	165
2015	993		60		1,332	75	583	116
2016	1,292	14	82		1,426	123	792	129
2017	1,280	22	39		1,159	151	525	152
2018	1,236		18		1,016	149	472	176
2019	964		21		977	40	439	175
Total	31,846	438	1,689	286	39,966	3,209	23,701	7,903

Table 6. Commercial landings of queen triggerfish in pounds and the number of trips with reported queen triggerfish landings in St. Croix are provided in the columns labeled TF. Also provided are the total commercial landings (all species) in pounds and number of trips reported yearly in St. Croix.

Year	St. Croix TF		St. Croix	
	Landings (lb)	Trips (n)	Total Landings (lb)	Total Trips (n)
1998	24,800	2,017	661,159	8,755
1999	23,474	1,758	684,016	8,796
2000	22,360	1,824	806,255	10,080
2001	29,335	2,256	1,005,224	12,338
2002	33,456	2,548	1,114,504	13,785
2003	26,159	2,099	994,843	11,774
2004	27,244	2,290	1,035,329	11,798
2005	26,717	2,218	1,150,490	11,994
2006	25,787	2,108	1,339,263	12,751
2007	27,440	2,197	1,226,993	11,776
2008	32,618	2,388	1,038,800	9,647
2009	38,179	2,833	940,775	9,043
2010	29,866	2,101	720,832	7,576
2011	25,671	1,792	645,020	5,922
2012	21,068	1,509	511,745	4,040
2013	13,750	1,058	469,896	3,725
2014	8,551	638	398,856	3,139
2015	8,952	571	379,839	2,683
2016	9,757	618	433,874	2,901
2017	8,474	500	389,504	2,558
2018	3,867	200	107,333	891
2019	3,010	212	114,982	953
Total	470,531	35,735	16,169,532	166,925

Table 7. Commercial landings in pounds reported by year and gear group for queen triggerfish (TF) in St. Croix. Confidential data were removed.

Year	St. Croix TF Landings (lb)			
	Pots and traps	Diving	Hook and line	Other
1998	13,395	4,559	2,152	4,695
1999	14,759	3,116	2,637	2,963
2000	10,360	7,351	2,188	2,462
2001	11,284	9,401	3,898	4,752
2002	12,808	10,390	5,746	4,513
2003	7,637	11,299	5,167	2,056
2004	9,255	10,027	5,249	2,713
2005	6,601	14,453	3,206	2,458
2006	5,533	14,676	3,351	2,227
2007	6,667	14,603	2,207	3,963
2008	6,260	23,915	562	1,881
2009	4,880	30,139	1,285	1,876
2010	5,296	22,889	596	1,085
2011	5,762	19,550	312	
2012	4,175	16,812	81	
2013	2,386	11,186	178	
2014	1,329	7,171	51	
2015	2,024	6,856	72	
2016	1,219	6,668	554	1,316
2017	1,194	5,825	585	870
2018	246	3,470	137	
2019	1,012	1,580	285	133
Total	134,080	255,934	40,495	40,023

Table 8. Commercial trips reporting landings of queen triggerfish (TF) by year and gear group and the total number of commercial trips (all species) reported by year and gear group in St. Croix. Confidential data were removed.

Year	St. Croix TF Trips (n)				St. Croix Total Trips (n)			
	Pots and traps	Diving	Hook and line	Other	Pots and traps	Diving	Hook and line	Other
1998	1,165	313	191	348	2,344	2,116	2,855	1,440
1999	1,089	218	215	236	2,044	2,413	3,286	1,053
2000	980	452	195	197	2,154	3,422	3,590	914
2001	1,000	578	319	359	2,247	4,381	4,566	1,144
2002	1,160	645	425	318	2,451	4,696	5,643	995
2003	801	754	376	168	1,857	4,520	4,512	885
2004	876	786	389	239	1,896	4,905	4,141	856
2005	813	922	278	205	1,873	5,163	4,057	901
2006	690	926	310	182	1,640	5,979	4,267	865
2007	701	974	195	327	1,378	5,384	3,990	1,024
2008	636	1,560	64	128	1,154	5,022	3,026	445
2009	498	2,046	160	129	1,048	4,799	2,763	433
2010	424	1,535	71	71	977	4,106	2,078	415
2011	441	1,317	30		863	2,916	1,646	497
2012	293	1,206	10		632	2,244	877	287
2013	240	802	16		630	1,816	818	461
2014	125	506	7		431	1,358	793	557
2015	142	419	10		375	1,173	689	446
2016	92	429	44	53	363	1,184	830	524
2017	74	351	44	31	266	1,038	778	476
2018	17	173	8		111	436	238	106
2019	51	124	30	7	110	528	269	46
Total	12,308	17,036	3,387	3,004	26,844	69,599	55,712	14,770

Table 9. Commercial landings of queen triggerfish in pounds and the number of trips with reported queen triggerfish landings in Puerto Rico are provided in the columns labeled QTF. Also provided are the total commercial landings (all species) in pounds and number of trips reported yearly in Puerto Rico.

Year	Puerto Rico QTF		Puerto Rico	
	Landings (lb)	Trips (n)	Total Landings (lb)	Total Trips (n)
1983	142,844	5,646	6,415,916	171,119
1984	121,875	6,573	5,345,542	168,604
1985	82,080	5,169	5,096,132	167,223
1986	39,069	3,015	3,376,477	96,326
1987	42,245	2,310	2,773,648	63,914
1988	44,379	1,992	3,592,632	66,265
1989	57,969	2,904	4,487,167	85,697
1990	54,700	3,090	4,262,478	95,147
1991	59,659	4,444	4,815,563	145,233
1992	42,148	3,091	3,406,820	98,279
1993	59,200	4,305	4,156,060	127,451
1994	64,859	4,409	4,228,722	141,417
1995	84,103	9,950	5,185,097	242,159
1996	86,193	11,076	5,018,541	268,221
1997	79,476	10,623	4,874,888	260,707
1998	76,462	10,029	4,413,145	224,789
1999	60,960	10,800	4,254,714	279,033
2000	67,389	7,828	5,676,374	242,232
2001	82,921	8,319	4,972,866	238,822
2002	58,792	8,122	3,801,314	239,134
2003	67,276	3,348	4,229,207	103,862
2004	96,381	3,649	4,005,567	81,594
2005	53,892	3,027	2,744,850	66,835
2006	44,015	2,665	2,416,424	61,293
2007	32,364	2,037	2,165,952	53,654
2008	55,982	2,187	3,440,843	52,215
2009	47,005	2,376	2,851,771	55,477
2010	45,566	2,015	2,813,644	48,414
2011	50,106	2,854	2,049,358	57,454
2012	75,693	2,873	2,728,565	59,996
2013	63,932	3,593	1,891,832	65,223
2014	71,536	3,801	2,326,154	70,248
2015	71,329	4,001	2,365,524	71,044
2016	65,874	3,403	2,364,028	64,938
2017	39,657	2,128	1,762,749	46,691
2018	52,308	2,928	2,401,319	57,859
2019	55,631	3,618	2,465,088	68,635
Total	2,395,872	174,198	135,176,971	4,507,204

Table 10. Commercial landings in pounds reported by year and gear group for queen triggerfish (QTF) in Puerto Rico.

Year	Puerto Rico QTF Landings (lb)			
	Pots and traps	Diving	Hook and line	Other
1983	127,426	6,652	7,726	1,039
1984	105,849	4,805	9,639	1,581
1985	69,639	2,941	8,286	1,214
1986	30,095	3,627	4,497	851
1987	32,505	3,287	5,341	1,112
1988	29,220	7,827	6,623	709
1989	39,663	8,108	8,804	1,394
1990	38,235	5,806	8,612	2,047
1991	36,541	9,322	11,876	1,920
1992	25,782	4,898	10,263	1,205
1993	31,642	12,573	12,368	2,617
1994	36,867	8,244	11,672	8,077
1995	39,197	12,059	24,932	7,914
1996	43,766	12,970	24,521	4,935
1997	36,145	13,946	20,890	8,495
1998	35,492	17,029	17,751	6,188
1999	30,190	14,076	13,336	3,359
2000	32,040	16,026	15,482	3,840
2001	41,412	19,884	17,424	4,201
2002	28,867	15,194	12,310	2,420
2003	37,840	16,535	10,971	1,929
2004	59,407	22,131	12,433	2,410
2005	30,265	15,064	6,762	1,801
2006	23,513	13,172	6,297	1,034
2007	15,815	11,377	4,274	899
2008	19,921	15,944	17,957	2,160
2009	19,562	18,800	6,374	2,269
2010	17,713	16,766	9,219	1,868
2011	22,544	20,335	6,641	587
2012	37,498	28,242	8,358	1,596
2013	25,653	30,812	6,223	1,244
2014	31,867	31,723	6,715	1,231
2015	26,674	34,320	7,219	3,115
2016	23,538	33,546	6,479	2,312
2017	16,485	17,303	4,369	1,500
2018	21,115	25,115	5,026	1,052
2019	20,607	29,519	4,408	1,097
Total	1,340,591	579,978	382,081	93,223



Table 11. Commercial trips reporting landings of queen triggerfish (QTF) by year and gear group and the total number of commercial trips (all species) reported by year and gear group in Puerto Rico.

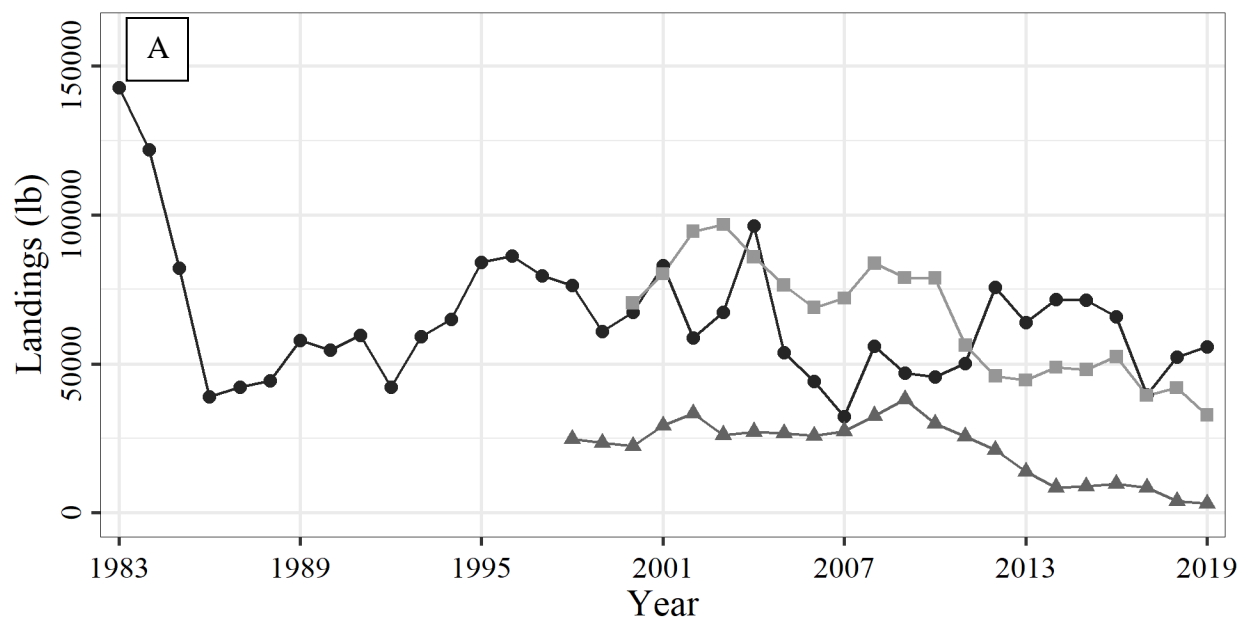
Year	Puerto Rico QTF Trips (n)				Puerto Rico Total Trips (n)			
	Pots and traps	Diving	Hook and line	Other	Pots and traps	Diving	Hook and line	Other
1983	4,242	720	615	69	72,658	41,066	37,517	19,878
1984	4,868	590	1,033	82	74,314	40,903	35,020	18,367
1985	3,608	406	1,001	154	75,673	22,009	44,761	24,780
1986	1,867	588	458	102	38,741	16,656	25,078	15,851
1987	1,657	304	291	58	28,731	9,843	16,003	9,337
1988	1,217	451	280	44	24,776	11,096	19,588	10,805
1989	1,999	421	383	101	37,102	12,780	24,597	11,218
1990	1,858	241	461	530	41,344	9,901	26,310	17,592
1991	2,577	352	1,092	423	56,527	16,027	44,814	27,865
1992	1,701	324	880	186	33,995	10,883	35,028	18,373
1993	1,829	1,229	1,051	196	40,635	18,486	45,961	22,369
1994	2,172	790	1,087	360	39,926	21,196	51,074	29,221
1995	4,021	1,504	3,631	794	74,104	31,034	94,648	42,373
1996	5,385	1,452	3,567	672	91,462	34,471	94,922	47,366
1997	4,197	1,785	3,640	1,001	73,368	32,863	96,673	57,803
1998	3,613	2,449	3,411	556	64,305	39,020	83,553	37,911
1999	4,122	3,017	2,929	732	76,695	45,091	101,655	55,592
2000	3,235	1,668	2,055	870	61,103	36,461	88,967	55,701
2001	3,845	1,846	2,100	528	67,366	36,471	84,360	50,625
2002	3,576	1,962	2,233	351	67,903	38,551	81,361	51,319
2003	1,744	950	513	141	30,641	19,331	34,558	19,332
2004	1,617	1,446	471	115	23,561	21,486	23,704	12,843
2005	1,205	1,353	383	86	17,587	18,906	21,831	8,511
2006	1,065	1,259	228	113	15,712	20,382	17,771	7,428
2007	781	1,022	156	78	11,795	19,567	15,404	6,888
2008	784	1,097	192	114	10,717	19,758	14,760	6,980
2009	900	1,159	207	110	12,674	21,726	13,781	7,296
2010	837	837	243	98	10,896	18,104	13,823	5,591
2011	863	1,673	267	51	10,314	25,737	16,127	5,276
2012	928	1,562	273	110	11,362	25,498	16,030	7,106
2013	1,180	1,984	347	82	11,853	29,004	17,473	6,893
2014	1,283	2,022	377	119	13,428	28,142	21,463	7,215
2015	1,303	2,089	411	198	14,640	27,544	21,172	7,688
2016	1,056	1,842	324	181	13,581	25,149	19,470	6,738
2017	726	1,092	228	82	9,256	18,189	14,646	4,600
2018	770	1,807	255	96	9,035	25,700	17,530	5,594
2019	1,049	2,215	270	84	12,396	27,668	22,269	6,302
Total	79,680	47,508	37,343	9,667	1,380,176	916,699	1,453,702	756,627

Table 12. Commercial landings in pounds reported by year and coast for queen triggerfish (QTF) in Puerto Rico. Confidential data were removed by excluding the inland category.

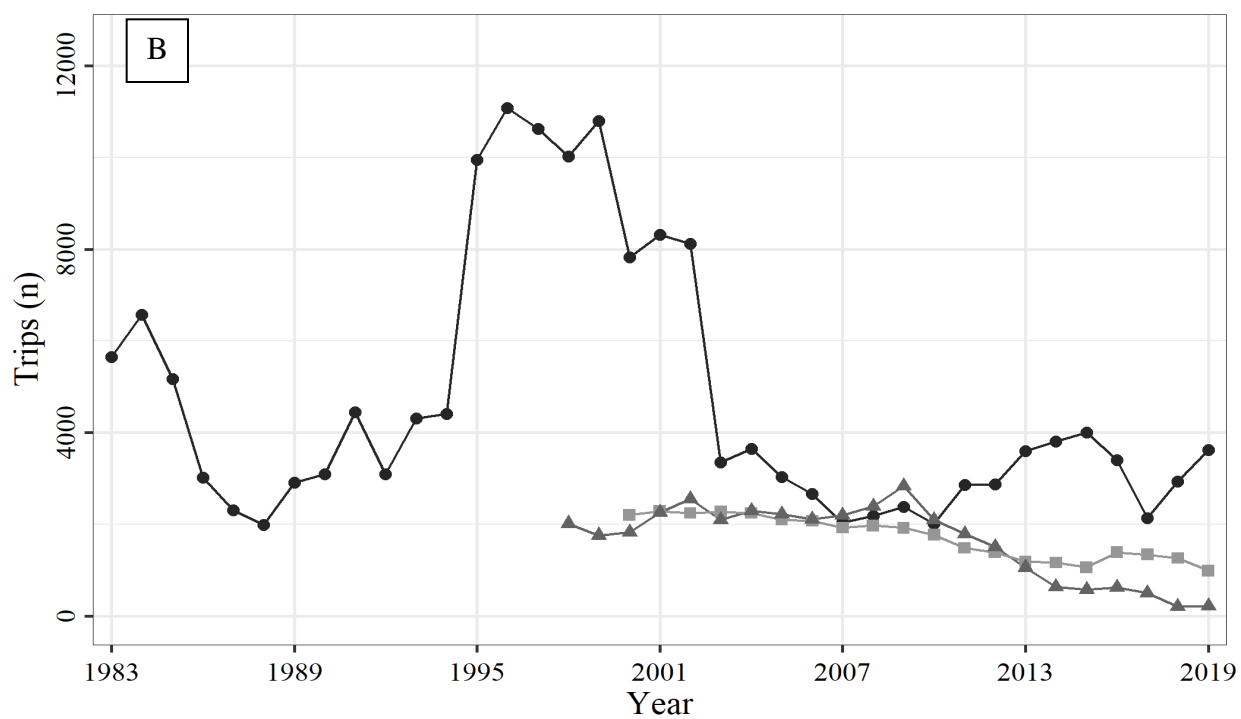
Year	Puerto Rico QTF Landings (lb)			
	West	South	East	North
1983	81,587	33,438	23,656	4,164
1984	63,998	27,310	24,692	5,875
1985	40,688	16,854	20,648	3,891
1986	16,524	9,452	9,841	3,252
1987	12,579	14,328	12,887	2,452
1988	20,020	11,705	9,396	3,257
1989	20,814	17,176	14,786	5,192
1990	21,369	20,518	7,298	5,516
1991	23,206	18,620	7,602	10,231
1992	14,225	16,645	3,880	7,398
1993	20,340	20,128	9,745	8,987
1994	19,530	26,469	10,870	7,991
1995	22,721	32,086	10,128	19,168
1996	24,982	30,079	18,417	12,715
1997	27,109	23,471	14,256	14,640
1998	24,210	26,335	14,119	11,797
1999	18,313	23,042	12,417	7,188
2000	18,767	24,479	17,230	6,914
2001	16,304	31,079	27,031	8,506
2002	16,424	17,860	18,206	6,301
2003	25,100	26,530	8,958	6,688
2004	25,378	51,926	13,305	5,773
2005	18,599	23,529	7,379	4,385
2006	13,379	15,617	11,497	3,523
2007	13,675	12,201	4,744	1,743
2008	17,064	16,256	4,392	18,270
2009	24,458	11,936	7,130	3,481
2010	24,173	10,855	4,097	6,441
2011	19,627	22,061	5,375	3,044
2012	23,470	37,768	7,092	7,362
2013	26,887	27,720	6,377	2,895
2014	25,048	29,634	12,561	4,293
2015	26,477	24,734	16,490	3,612
2016	17,844	20,027	23,031	4,953
2017	13,197	10,911	6,629	8,852
2018	16,862	17,712	13,977	3,687
2019	21,882	16,743	11,870	4,988
Total	876,829	817,234	452,008	249,427

Table 13. Commercial trips reporting landings of queen triggerfish (QTF) by year and coast and the total number of commercial trips (all species) reported by year and coast in Puerto Rico. Confidential data were removed by excluding the inland category.

Year	Puerto Rico QTF Trips (n)				Puerto Rico Total Trips (n)			
	West	South	East	North	West	South	East	North
1983	909	2,115	2,248	374	45,093	65,919	41,531	18,576
1984	900	2,265	2,708	700	46,011	60,581	42,379	19,633
1985	1,462	1,283	1,905	519	58,785	49,124	41,387	17,927
1986	976	530	1,006	503	32,276	27,102	22,947	14,001
1987	628	619	828	235	20,297	17,057	16,717	9,843
1988	743	668	397	184	26,319	20,691	11,763	7,492
1989	1,024	796	760	324	34,450	25,358	17,168	8,721
1990	1,276	908	573	333	35,493	33,667	14,406	11,581
1991	1,240	1,473	765	966	38,056	52,542	24,774	29,861
1992	1,084	957	385	665	28,466	28,703	15,238	25,872
1993	1,143	1,392	777	993	31,559	31,745	36,676	27,471
1994	1,211	1,736	488	974	32,541	52,912	16,461	39,503
1995	2,576	3,165	2,019	2,190	51,559	87,874	41,969	60,757
1996	3,128	2,763	3,717	1,468	68,453	91,359	67,742	40,667
1997	3,780	1,831	2,975	2,037	78,755	72,362	56,816	52,774
1998	3,948	2,899	1,356	1,826	66,654	84,154	31,475	42,506
1999	3,895	3,422	1,772	1,711	74,150	109,153	45,982	49,748
2000	2,416	2,899	1,529	984	56,143	107,631	40,788	37,670
2001	1,639	2,916	2,519	1,245	45,606	86,048	55,285	51,883
2002	2,172	2,529	2,464	957	49,484	99,777	52,110	37,763
2003	1,024	1,183	844	297	29,112	39,989	19,984	14,777
2004	1,747	1,026	712	164	31,837	26,248	15,837	7,672
2005	1,686	827	434	80	29,599	20,515	11,381	5,340
2006	1,395	818	410	42	28,033	20,706	9,369	3,185
2007	1,130	666	195	46	23,270	21,008	6,318	3,058
2008	1,147	714	248	78	23,752	18,716	6,532	3,215
2009	1,265	864	192	55	24,490	23,152	5,422	2,413
2010	1,155	667	134	59	21,648	18,926	4,892	2,946
2011	1,806	744	205	99	27,057	18,882	6,874	4,562
2012	1,524	749	402	198	25,171	17,207	10,884	6,733
2013	1,685	1,255	496	156	25,111	22,072	11,665	6,367
2014	1,753	1,359	487	202	28,113	21,997	12,133	7,998
2015	1,755	1,250	808	187	27,271	20,370	15,061	8,328
2016	1,368	1,089	796	148	25,593	18,076	14,770	6,461
2017	926	699	314	183	20,099	12,785	8,211	5,416
2018	1,559	802	354	209	28,666	14,199	8,471	6,373
2019	1,823	934	663	190	32,064	15,301	13,051	8,101
Total	60,898	52,812	38,885	21,581	1,371,036	1,553,908	874,469	707,194

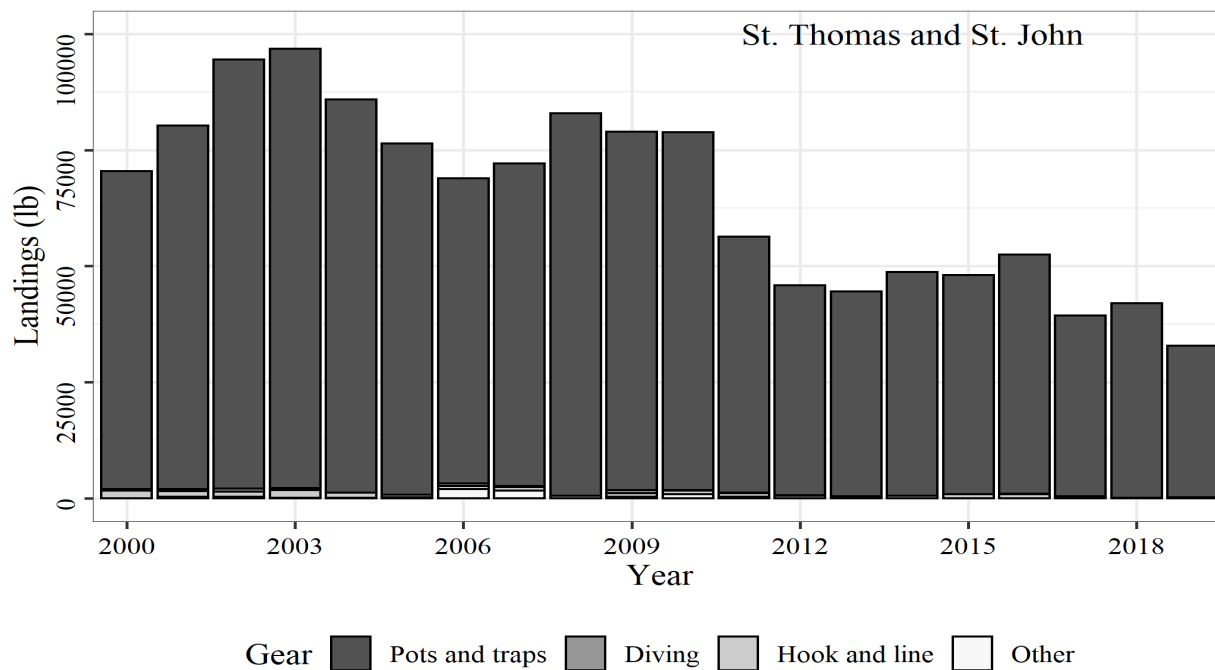


Island ● Puerto Rico ▲ St. Croix ■ St. Thomas and St. John



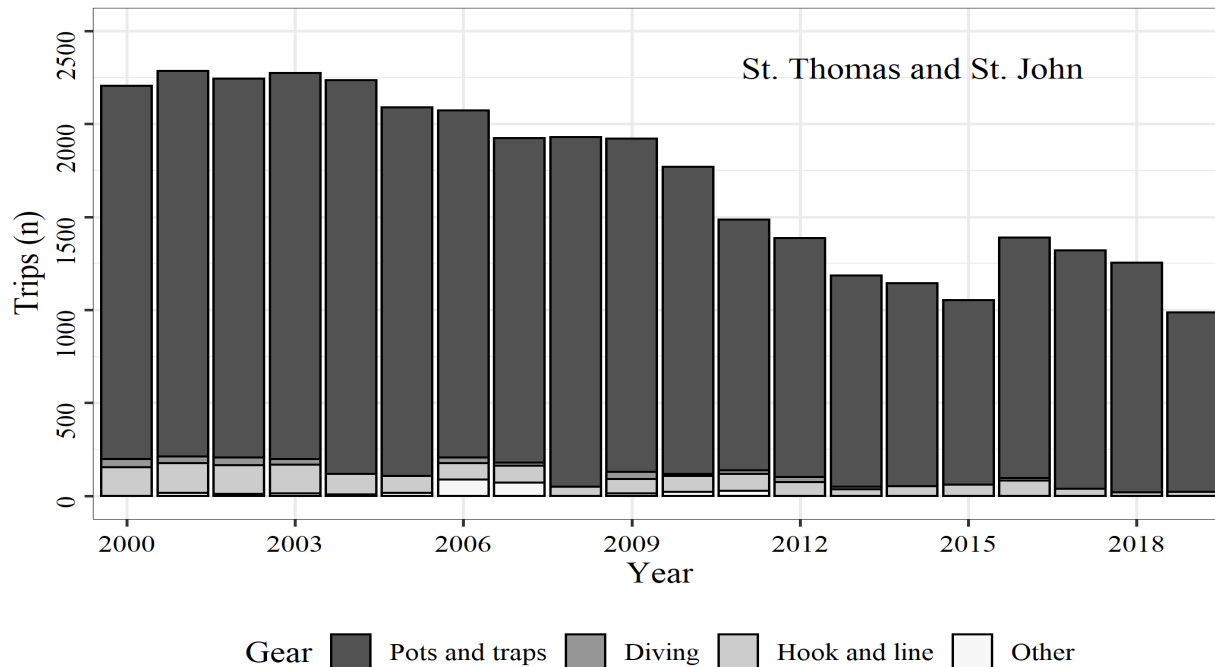
Island ● Puerto Rico ▲ St. Croix ■ St. Thomas and St. John

Figure 1. The commercial landings (A) and number of trips reporting queen triggerfish landings (B) time series in St. Thomas and St. John, St. Croix, and Puerto Rico.



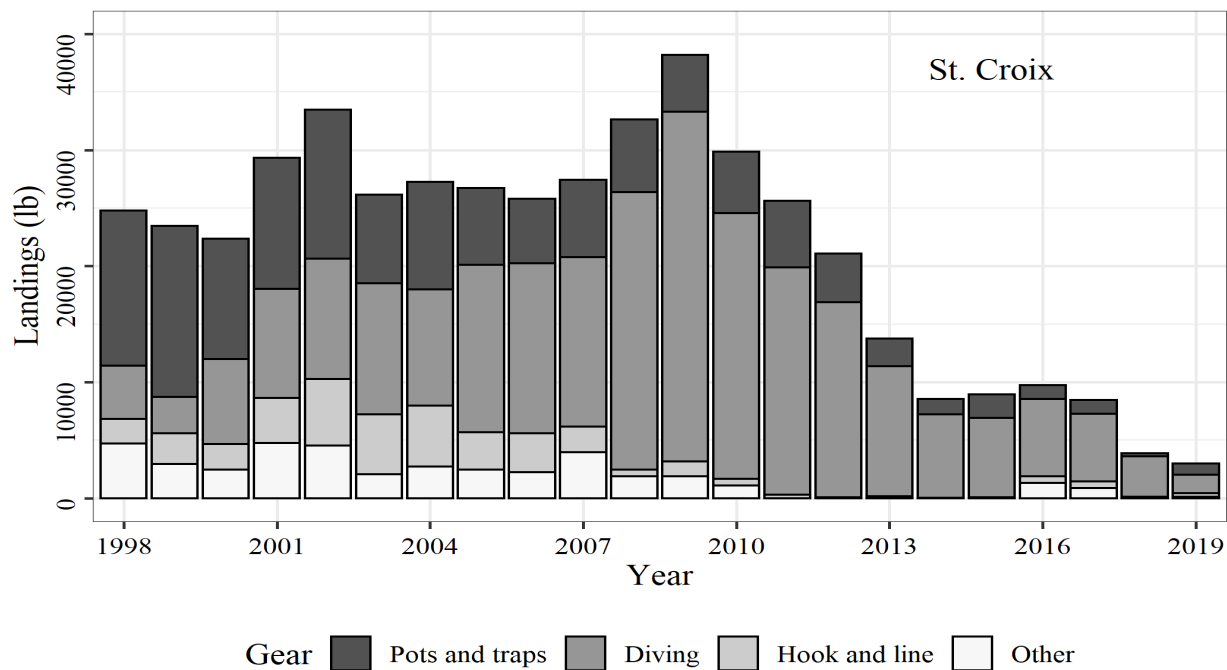
Confidential data were removed from the plot.  
Total landings (lb) of confidential data is 1432.

Figure 2. Commercial landings of queen triggerfish in pounds reported by year and gear group in St. Thomas and St. John. Confidential data were removed.



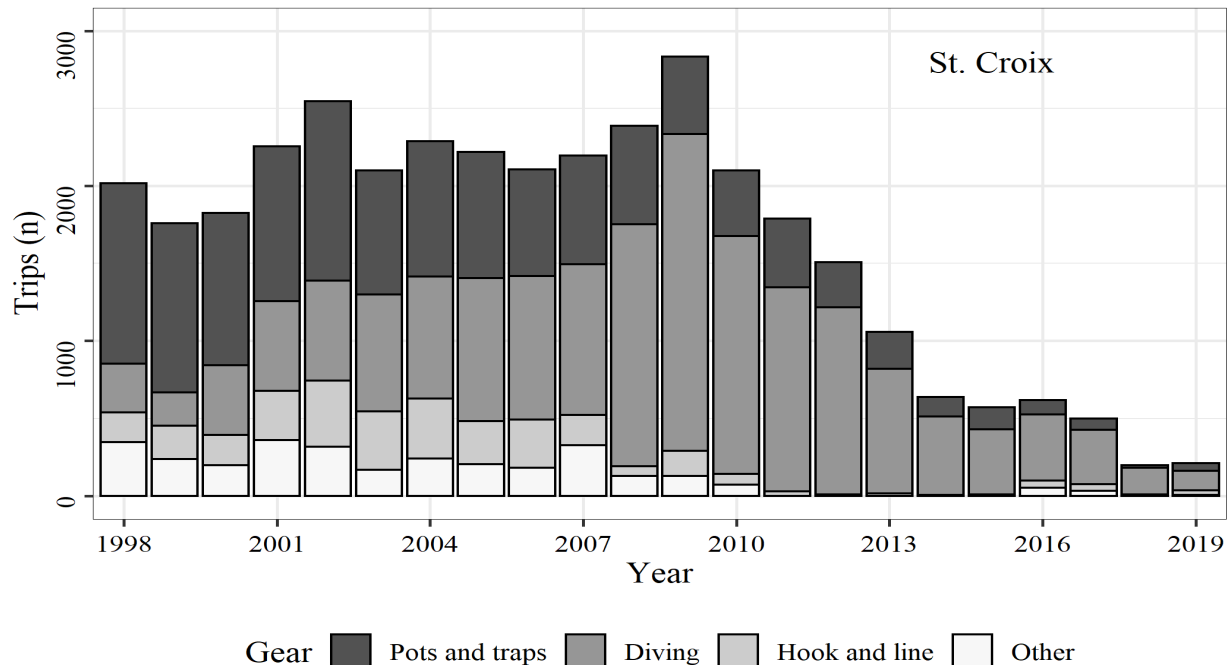
Confidential data were removed from the plot.  
Total number of trips of confidential data is 118.

Figure 3. Number of trips reporting queen triggerfish landings, by year and gear group in St. Thomas and St. John. Confidential data were removed.



Confidential data were removed from the plot.  
Total landings (lb) of confidential data is 61.

Figure 4. Commercial landings of queen triggerfish in pounds reported by year and gear group in St. Croix. Confidential data were removed.



Confidential data were removed from the plot.  
Total number of trips of confidential data is 6.

Figure 5. Number of trips reporting queen triggerfish landings by year and gear group in St. Croix. Confidential data were removed.

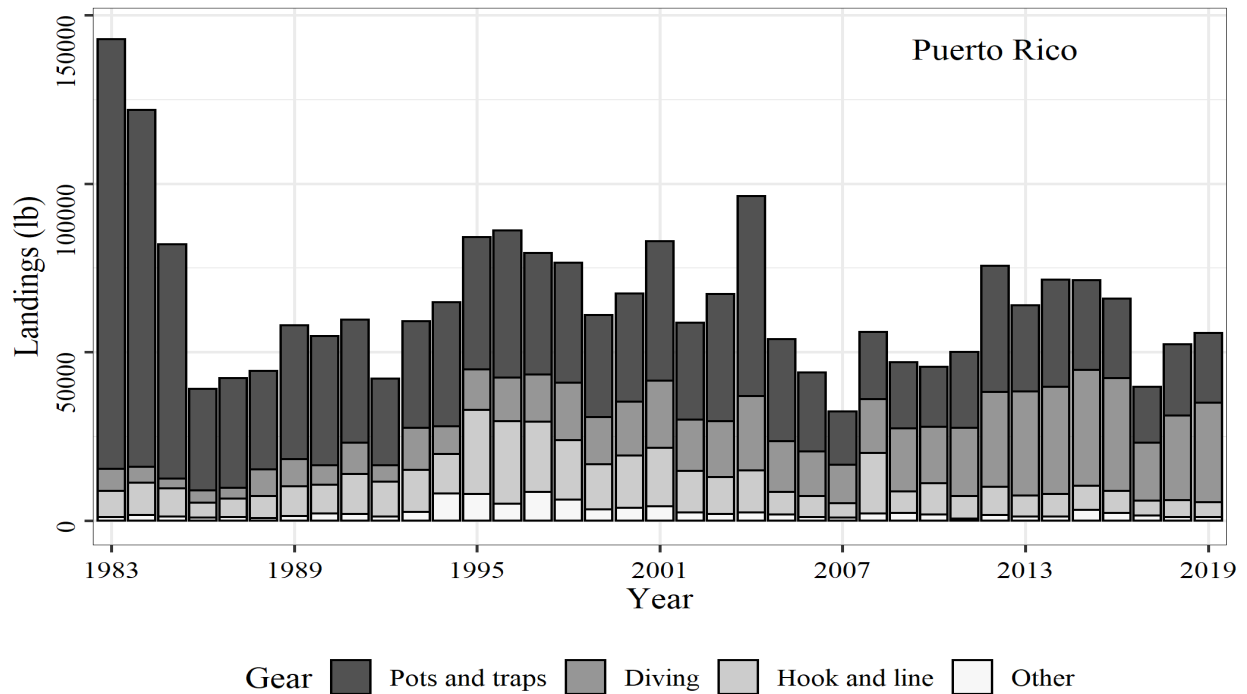


Figure 6. Commercial landings in pounds reported by year and gear group for queen triggerfish in Puerto Rico.

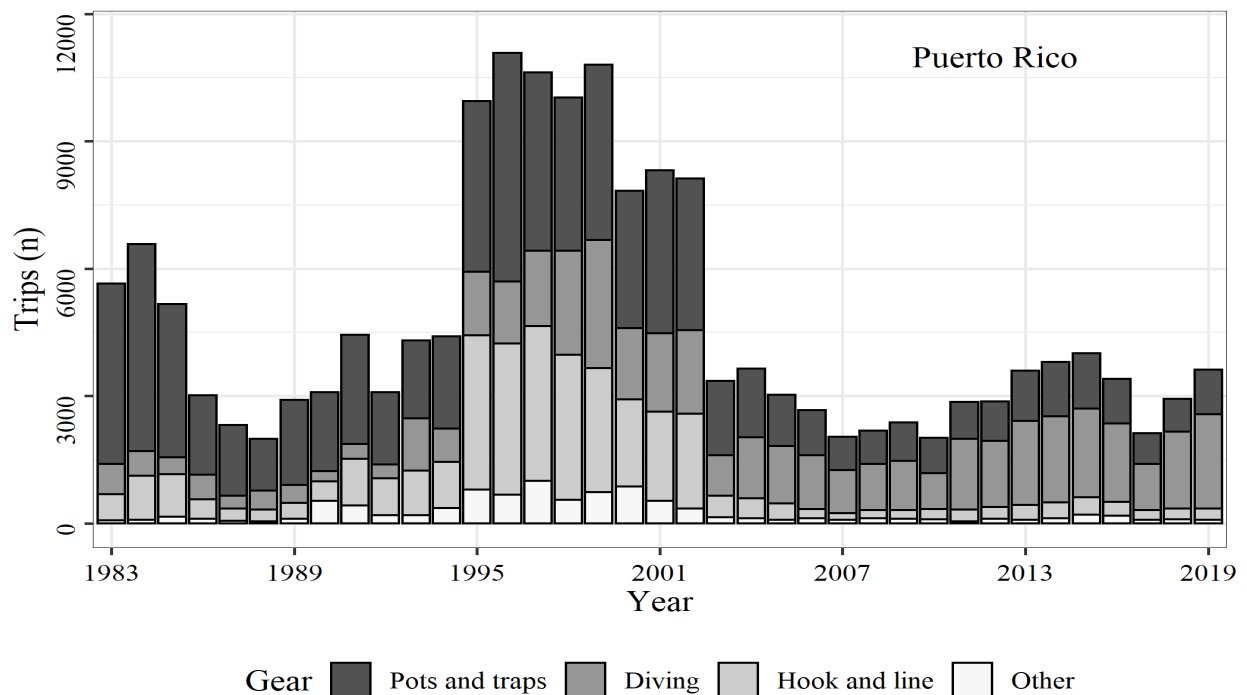


Figure 7. Number of trips reporting queen triggerfish landings by year and gear group in Puerto Rico.

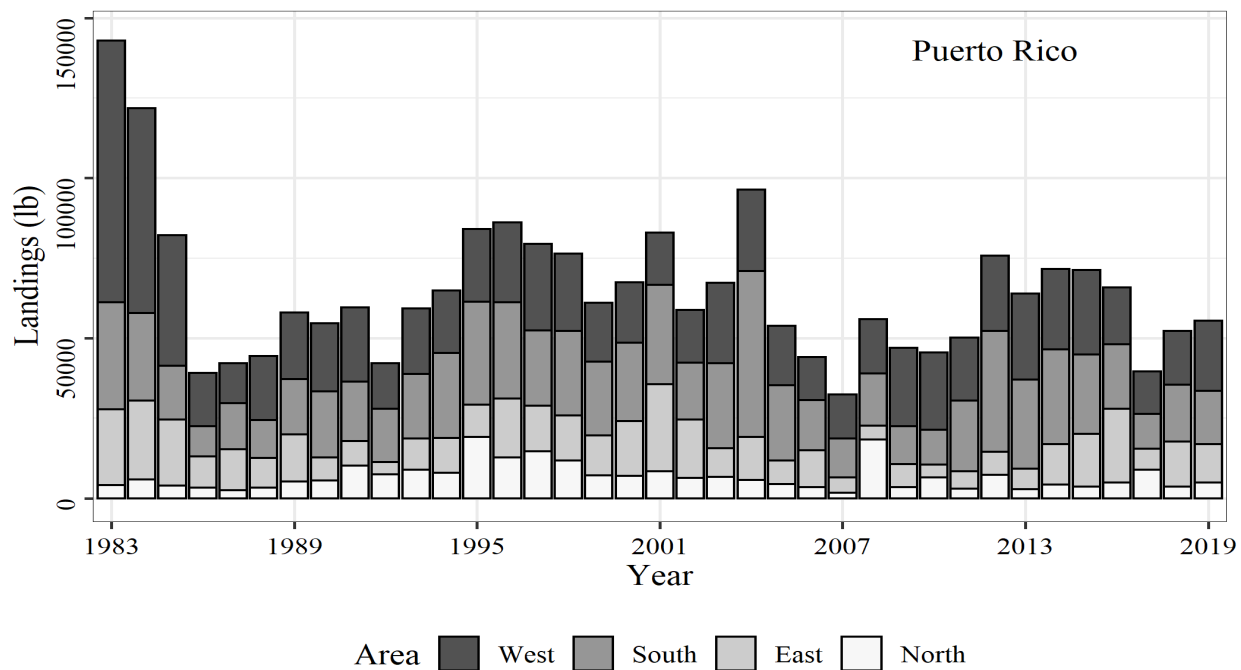


Figure 8. Commercial landings in pounds reported by year and coast for queen triggerfish in Puerto Rico. Confidential data were removed by excluding the inland category.

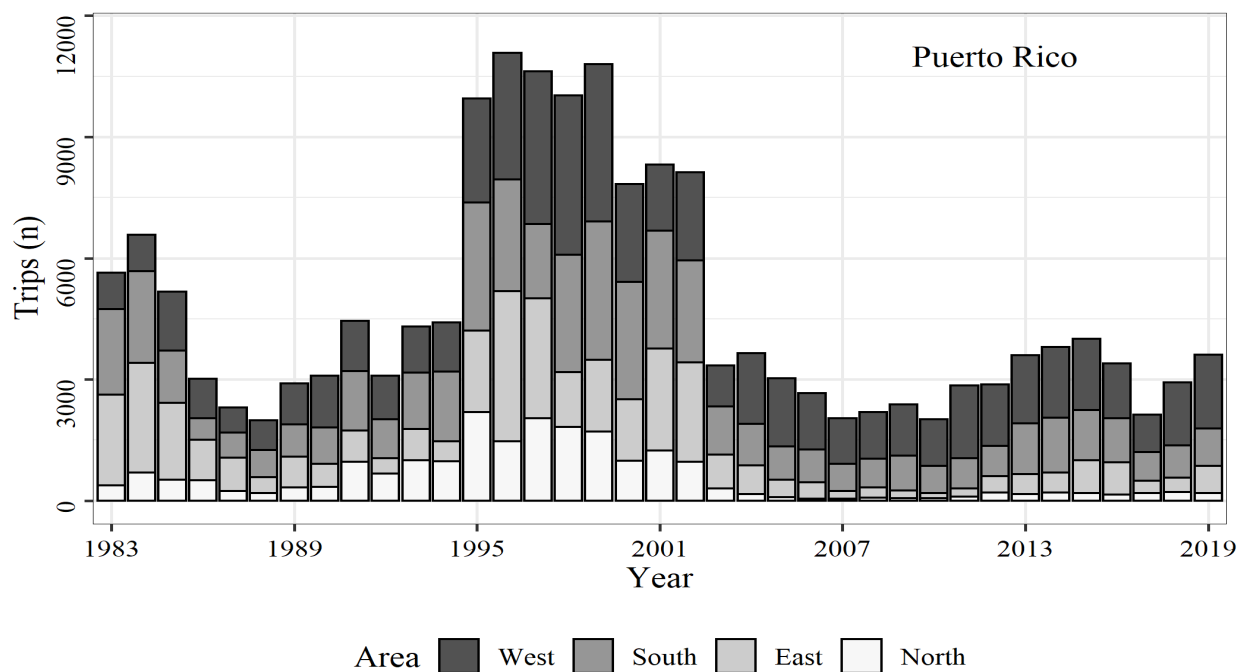


Figure 9. Number of trips reported by year and gear group for queen triggerfish in Puerto Rico. Confidential data were removed by excluding the inland category.