

Commercial fishery landings of queen triggerfish and blue tang in the  
United States Caribbean, 1983-2011

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**Commercial fishery landings of queen triggerfish and blue tang in the United States Caribbean, 1983-2011**

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**Introduction**

In the US Caribbean, commercial landings are available from fisher logbook reports. In the US Virgin Islands logbook landings data from the islands of St. Thomas and St. John have been compiled separately from St. Croix landings during prior stock assessments. 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. 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). From July 2011, species-specific data were reported in the US Virgin Islands.

Commercial fishery landings data for Puerto Rico, also available from self-reported fisher logbooks/sales receipts, were available for the years 1983-2011. 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 have been used to estimate total landings. For the years 2003 to present, expansion factors were coast-specific (north, south, east, west). Estimation of commercial fishery landings of earlier years used a single, island-wide, expansion factor.

**Methods**

Available data for summing commercial landings of queen triggerfish and blue tang were the self-reported logbook records from commercial fishers. Landings for the islands of St. Thomas and St. John were summed separately from St. Croix landings. Puerto Rico landings were also estimated separately from the US Virgin Islands landings. In the US Virgin Islands, landings could only be provided as triggerfish (all species combined) and surgeonfish (all species combined) due to the non-species specific reporting by commercial fishers. Yearly landings data, as reported, were summed by species group and fishing gear.

Puerto Rico landings were estimated as year-specific reported landings with a year-specific expansion factor applied. Estimation of landings for the most recent years (2003-2011) included year and coast-specific expansion factors. Reported landings were assigned to coast based upon the fishing center reported for a trip. Queen triggerfish landings have been reported by species in Puerto Rico, however, blue tang landings from Puerto Rico had been reported within the species group surgeonfishes; not by species. The proportion of blue tang within the surgeonfishes species group is unknown. Expanded yearly landings were summed by species or species group, fishing gear, and coast.

**Results and Discussion**

***US Virgin Islands***

Yearly commercial fishery landings, as reported, by species group for St. Croix are provided in Table 1 and are plotted by year and gear fished in Figures 1 and 2. Landings of surgeonfishes were primarily reported from vessels

using pots/traps, diving, and nets and were usually from 30,000-50,000 pounds per year. During the final four years of the time series pots/traps and diving accounted for nearly all of the landings. Some types of net fishing (i.e., divers using nets to catch parrotfish) have been banned in the US Virgin Islands and that regulatory measure may have resulted in the reduction of surgeonfish landings beginning in 2008. Coincidental with the reduction of surgeonfish net landings, landings reported as “diving” increased during 2008-2011. Trips may not have been fully reported in the US Virgin Islands in 2011.

Triggerfish landings reported from St. Croix varied between 22,000 and 30,000 pounds per year during most years of the time series (Table 1, Figure 2). Highest landings, approximately 38,000 pounds, were reported during 2009. The majority of landings were reported for pots/traps and diving. The proportion of landings reported by diving increased during the second half of the time series.

In the commercial fishery, surgeonfish and triggerfish have been almost exclusively caught by pots/traps in St. Thomas and St. John (Figures 3 and 4). Landings of surgeonfish were of similar magnitude in St. Thomas and St. John as was reported in St. Croix; approximately 30,000-40,000 pounds per year (Table 2). Data from 2011 may be incomplete. Triggerfish landings in St. Thomas and St. John were approximately 70,000-100,000 pounds per year (Table 2), more than twice the St. Croix landings.

The number of trips that reported surgeonfish landings was summed as a measure of fishing effort and is presented by gear and year for St. Croix in Figure 5. Over the time series trap effort (trips) decreased and diving effort increased. Effort by net fishers ended by 2009, likely due to regulatory measures. Net and diving gear, however, had been frequently used together in St. Croix. Effort and landings that had been reported as net prior to 2009 may now be reported as diving.

Trips reporting triggerfish landings in St. Croix are presented summed by year and gear in Figure 6. Trips never exceeded 3,000 in a single year and were most frequently near 2,000 per year. Trips may not have been fully reported in the US Virgin Islands in 2011, therefore the apparent decrease in trips during that year may not be accurate. The proportion of trips reporting fishing pots/traps has decreased over the time series and the proportion of trips reporting diving has increased and may be due to regulatory restrictions as discussed above.

Total commercial trips reported in St. Croix numbered between 8,000 and 12,000 trips for most years (Figure 7). Data from 2011 may be incomplete. The number of trap trips decreased over the final six years of the time series. Similarly, hook and line trips decreased over time, but diving trips increased in both absolute and relative frequency over the time series. Surgeonfish and triggerfish landings were reported for approximately 14 to 38 percent of all trips.

The number of trips reporting surgeonfish landings and trips reporting triggerfish landings from St. Thomas and St. John was similar across the two species groups (Figures 8 and 9). Trips per year varied between approximately 1,700 and 2,200 with nearly all trips reported as trap trips. The number of trips per year was lower during the second half of each time series. As noted above, data from 2011 may be incomplete.

The total number of commercial fishing trips has declined over time in St. Thomas and St. John (Figure 10) and was consistently fewer than the number of trips per corresponding year in St. Croix. The number of trap trips had been similar over the time series with slightly fewer trap trips reported in 2010 (2011 data may be incomplete). Diving and net gears have been used in a minority of trips and occurred fairly consistently over time. Trips with reported hook and line gear decreased following the initial four years of the time series.

### ***Puerto Rico***

All landings for Puerto Rico are reported as expanded landings. The 2011 landings data from Puerto Rico were complete.

Blue tang have been reported within the species group surgeonfishes in Puerto Rico. Surgeonfishes have rarely been reported in Puerto Rico with never more than 500 pounds landed per year (Table 3, Figure 11). Landings of surgeonfishes were often reported by so few vessels per year as to be confidential data and those yearly landings

have not presented here. Data presented in Figure 11 were combined across all gears due to confidentiality restrictions.

In Puerto Rico queen triggerfish landings have been reported by species and are provided in Table 3 and, shown by gear and year, in Figure 12. Over the period 1983-2011, landings were initially reported primarily from pots/traps, but over time landings reported from diving and hook and line gear increased. Landings per year in Puerto Rico varied widely over the time series from approximately 33,000 to 147,000 pounds landed.

Surgeonfish effort, in number of trips reporting surgeonfish landings, is shown in Figure 13 by coast in Puerto Rico. Very few trips reported surgeonfish landings with the majority reported from eastern Puerto Rico. Ten or fewer trips were reported from other coasts. Data from western Puerto Rico could not be shown due to confidentiality constraints.

The number of trips that reported queen triggerfish landings, by year and coast, is presented in Figure 14. The numbers of trips with queen triggerfish reported had been low in the east and north during the last five years of the time series. The numbers of queen triggerfish trips reported from the south and west of Puerto Rico were higher than trips from the east and west in most years of the time series. Those patterns were observed for both the absolute numbers of trips and the relative number of trips among coasts.

Effort, in number of trips reporting surgeonfish landings, is shown by gear for Puerto Rico in Figure 15. Gear was assigned based upon the first gear reported by fishers in their commercial logbooks. Most trips with surgeonfish landings reported pots/traps as the gear used. Diving and hook and line gear were reported for very few trips. In addition, surgeonfish may have been caught using a secondary gear (e.g., pots/traps) on the reported hook and line trips.

During the period 1983 to 1994, the majority of trips reporting queen triggerfish landings used trap and pot gear. Trips reporting landings of queen triggerfish from hook and line gear were most numerous during 1995-2002, but were much less frequent beginning in 2003. Diving trips reporting queen triggerfish landings increased in frequency, both in absolute number of trips and relative to other gears, after 1992.

Total commercial fishing trips reported in Puerto Rico are shown by year and coast (Figure 17). Differences in yearly totals between the figures are due to trips fishing multiple gears being counted for each gear. Total trips in the east and north were lower beginning in 2005 than during most of the earlier years. The numbers of trips reported from the south coast were highest during the period 1995-2002. The numbers of western trips were the most consistent across years of all the regions.

Commercial fishing trips with trap/pot gear or net gear reported were fewest during the years 2004 to 2011 (Figure 18). The yearly frequency of diving trips was similar across the years 1995-2011. Prior to 1995 trips reporting diving varied in frequency among years. Frequency of hook and line trips was fairly consistent during the final six years of the time series, but were more numerous during the years 1995-2002. The relative proportion of total trap trips to trips reporting other gears was lower than the proportion of trap trips reporting queen triggerfish landings to other gears with queen triggerfish landings. The proportion of total hook and line trips and net trips to other gears was higher than the proportion of hook and line trips and net trips reporting queen triggerfish landings. Traps and pots remain an important gear, along with diving since the late 1990s, in the queen triggerfish fishery. For the Puerto Rican commercial fishery as a whole, however, the number of trap/pot trips has been relatively low over the last eight years compared to the numbers of diving and hook and line trips.

### **Literature cited**

-----, 2009. Caribbean fisheries data evaluation, Final report. SEDAR Procedures Workshop 3. pp. 195.

**Table 1.** St. Croix reported commercial landings (no expansion factors applied) by species group, 1998-2011.

<b>Year</b>	<b>Surgeonfishes</b>	<b>Triggerfishes</b>
1998	41,040	24,940
1999	34,596	23,647
2000	36,992	22,815
2001	44,249	29,522
2002	54,632	33,906
2003	42,039	26,902
2004	47,570	27,334
2005	48,853	26,717
2006	51,062	25,908
2007	48,625	27,440
2008	38,127	32,413
2009	37,274	38,735
2010	29,035	30,511
2011	31,556	25,286
<b>Total</b>	<b>585,649</b>	<b>396,074</b>

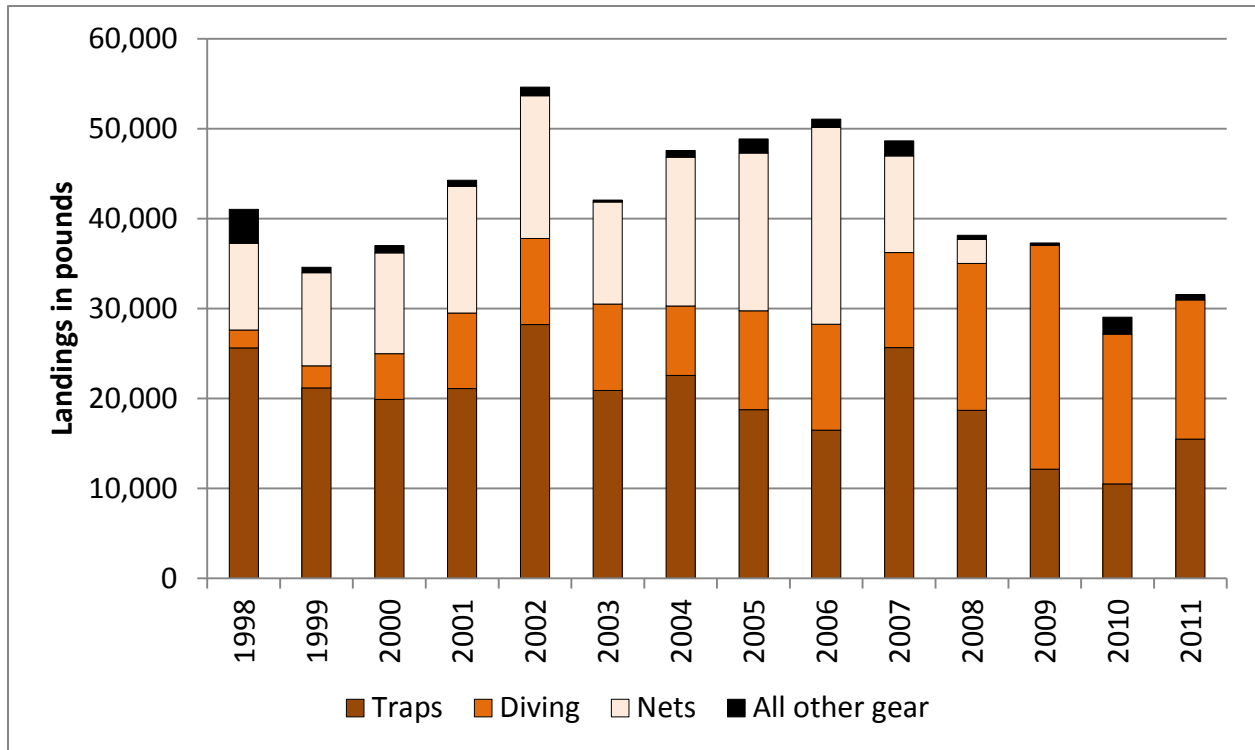
**Table 2.** St. Thomas and St. John reported commercial landings (no expansion factors applied) by species group, 2000-2011.

<b>Year</b>	<b>Surgeonfishes</b>	<b>Triggerfishes</b>
2000	31,215	72,090
2001	36,550	82,688
2002	41,305	97,543
2003	42,121	101,523
2004	45,806	87,420
2005	40,076	76,462
2006	39,040	70,120
2007	37,633	72,642
2008	37,385	84,131
2009	31,718	79,469
2010	31,927	79,555
2011	16,640	30,555
<b>Total</b>	<b>431,415</b>	<b>934,196</b>

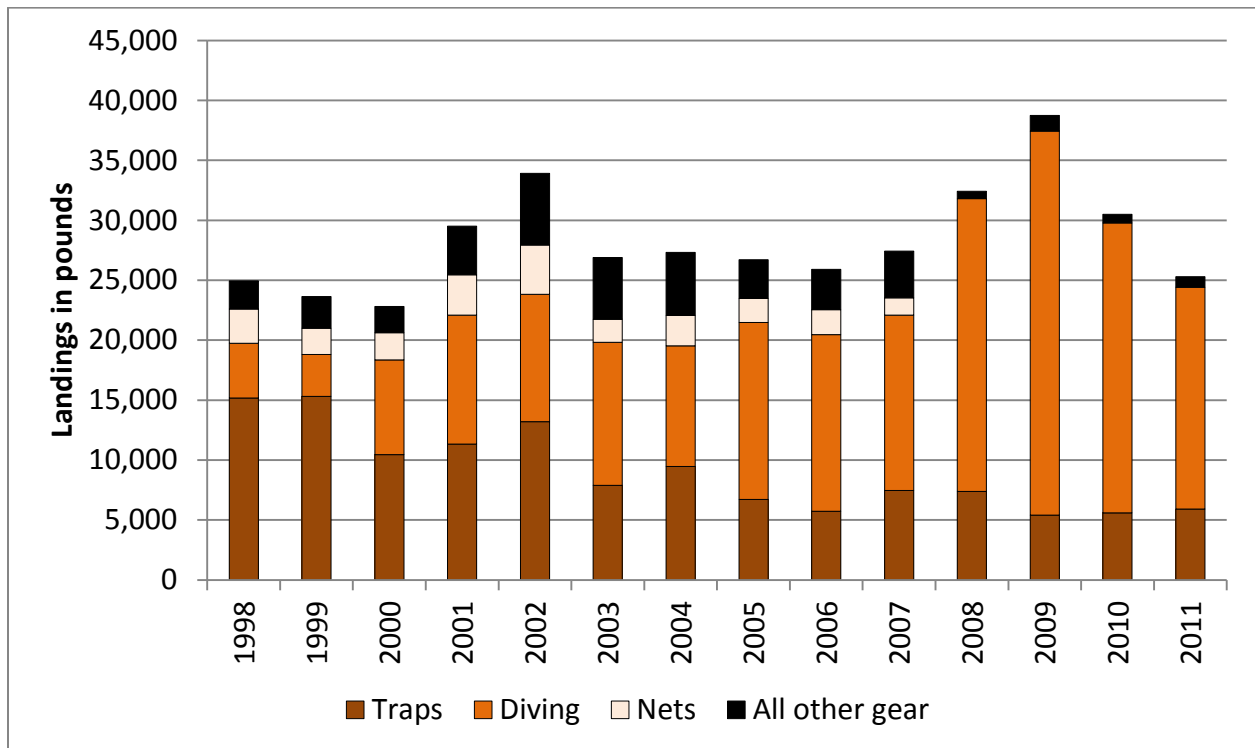
**Table 3.** Puerto Rico expanded commercial landings by species, 1983-2011. Note, blue tang have not been reported by species; the species group surgeonfishes includes blue tang and landings of that species group are provided here. Surgeonfish landings for many years may not be presented due to confidentiality constraints.

<b>Year</b>	<b>Surgeonfishes</b>	<b>Queen Triggerfish</b>
1983		147,333
1984		123,607
1985		82,811
1986		41,387
1987	39	51,140
1988		49,322
1989		64,896
1990		56,042
1991	471	60,835
1992	173	46,221
1993		63,605
1994		73,006
1995		97,152
1996	317	89,521
1997		93,872
1998		82,659
1999		63,607
2000		72,711
2001	28	87,910
2002		62,187
2003		69,611
2004		97,721
2005		122,423
2006		44,237
2007		33,409
2008		56,715
2009		47,782
2010		48,455
2011		51,032
<b>Total</b>	<b>1,106</b>	<b>2,081,209</b>

**Figure 1.** Yearly commercial landings of surgeonfishes as reported (no expansion factors applied) on fisher logbooks from St. Croix by gear and year.

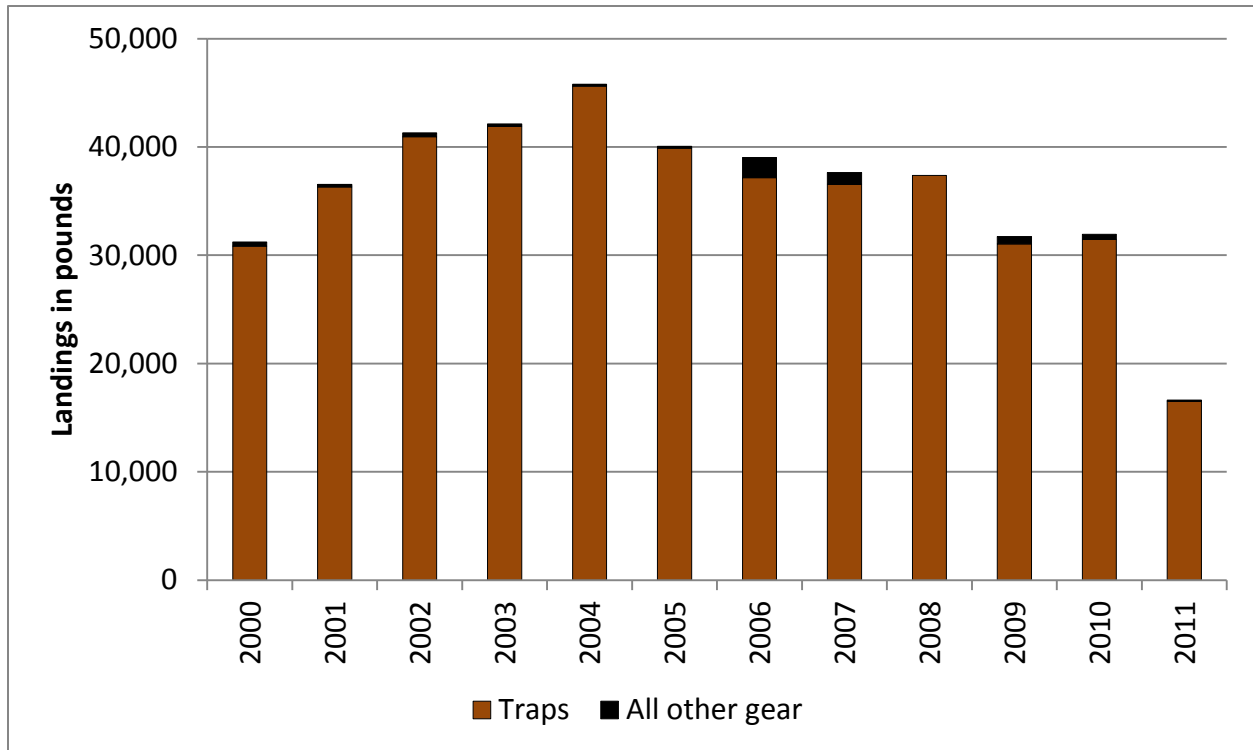


**Figure 2.** Yearly commercial landings of triggerfishes as reported (no expansion factors applied) on fisher logbooks from St. Croix by gear and year.

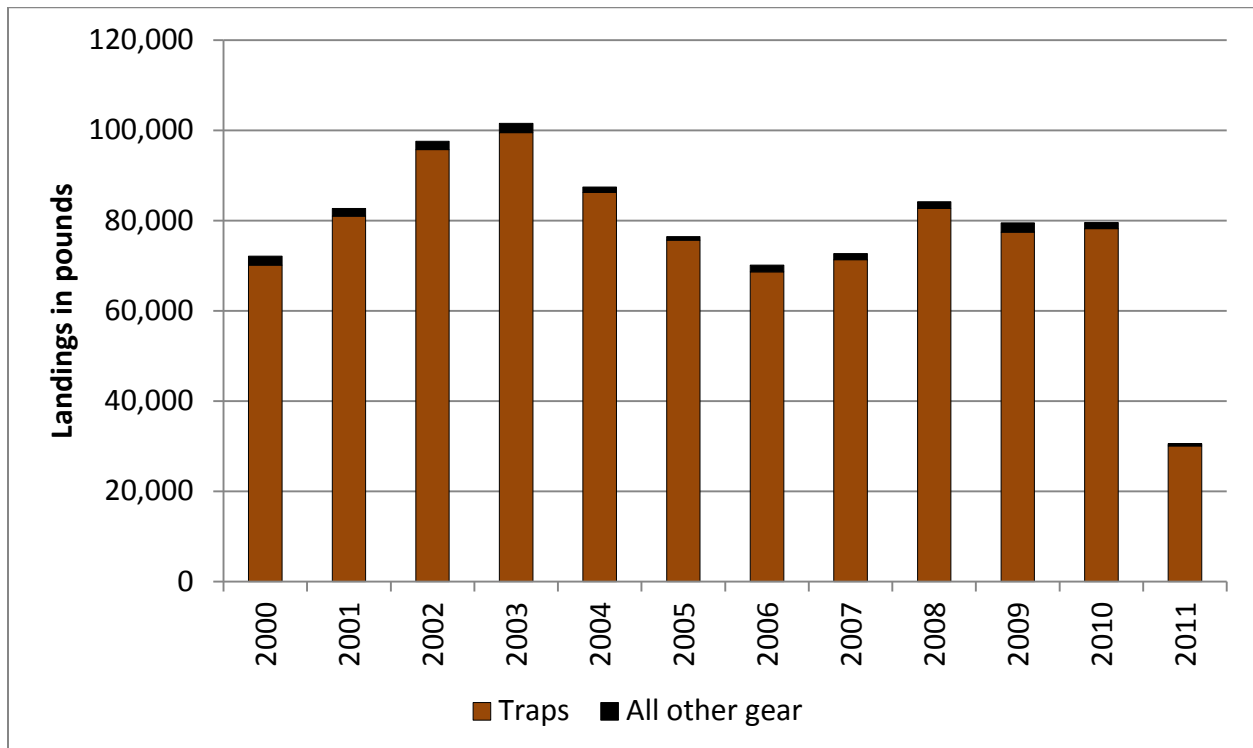




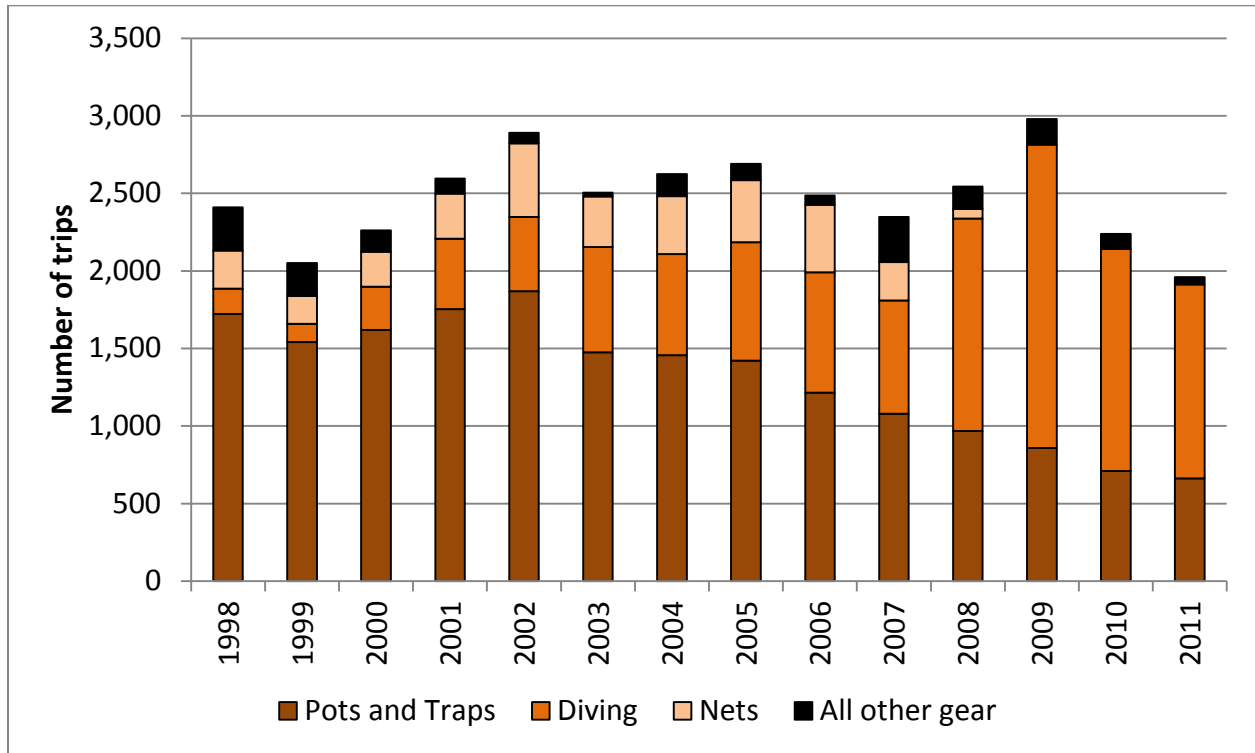
**Figure 3.** Yearly commercial landings of surgeonfishes as reported (no expansion factors applied) on fisher logbooks from St. Thomas and St. John by gear and year.



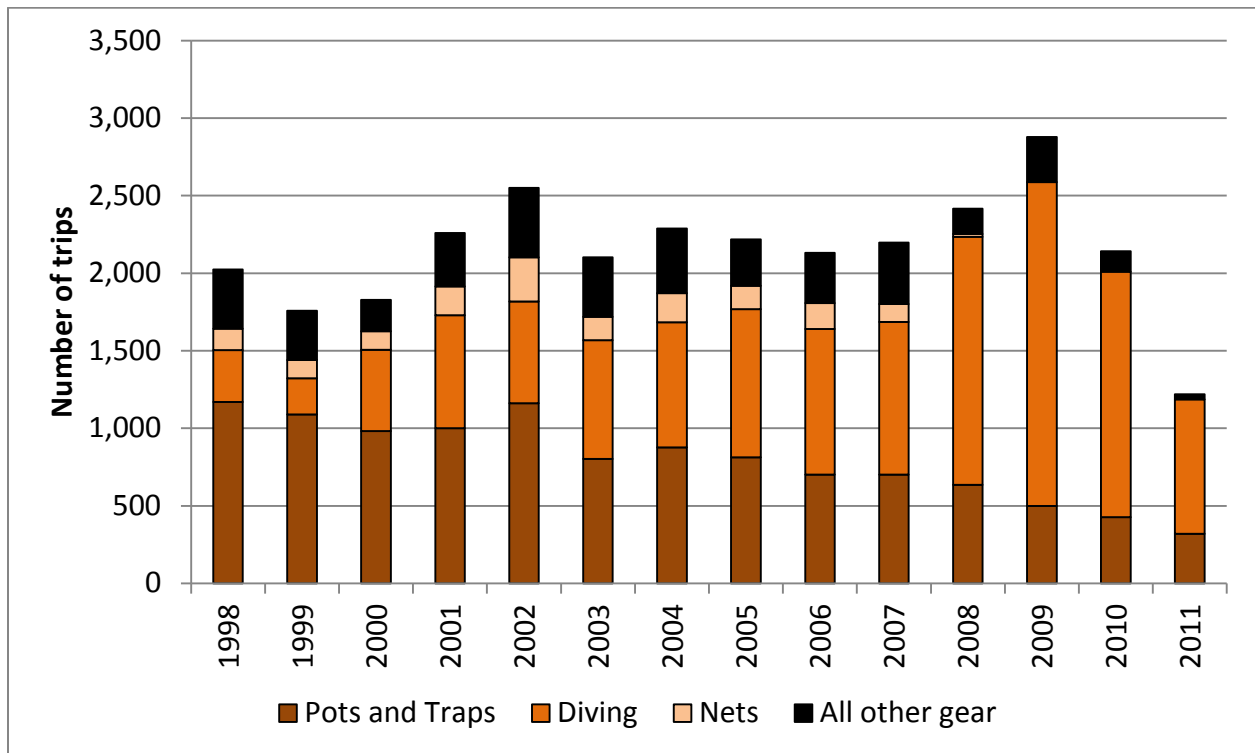
**Figure 4.** Yearly commercial landings of triggerfishes as reported (no expansion factors applied) on fisher logbooks from St. Thomas and St. John by gear and year.



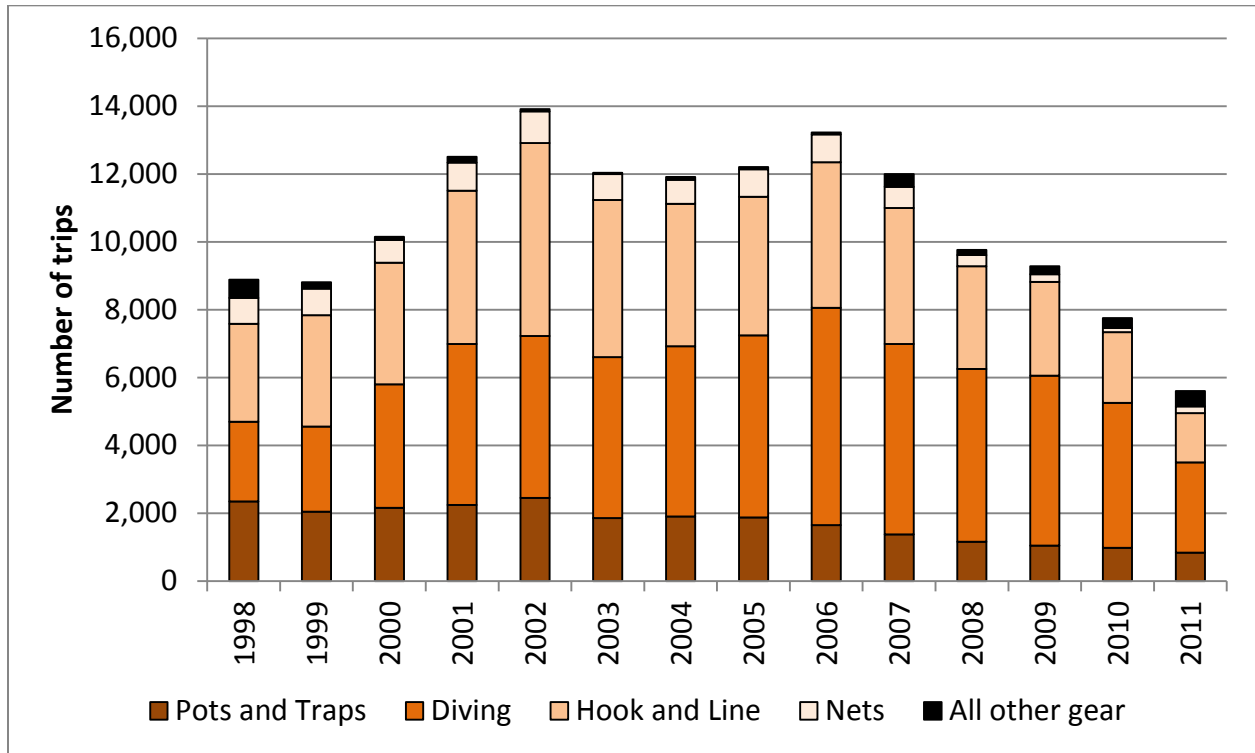
**Figure 5.** St. Croix reported commercial fishing trips with surgeonfish landings by gear and year.



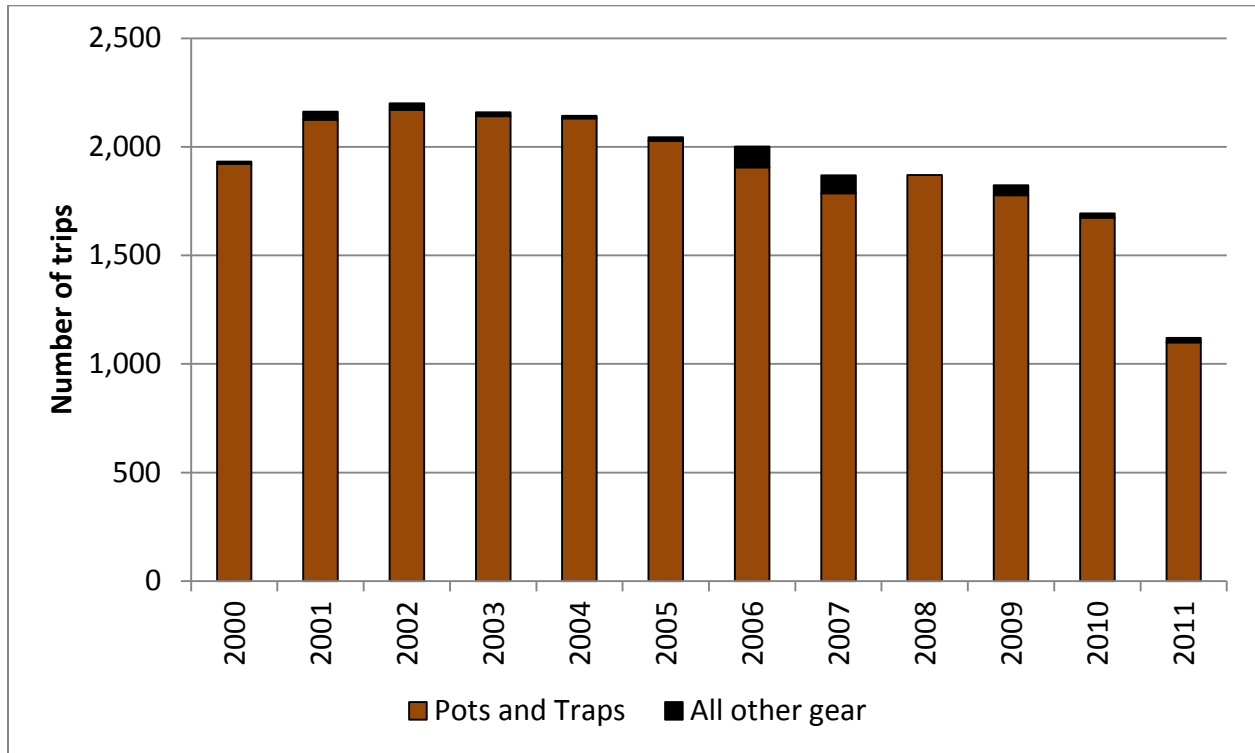
**Figure 6.** St. Croix reported commercial fishing trips with triggerfish landings by gear and year.



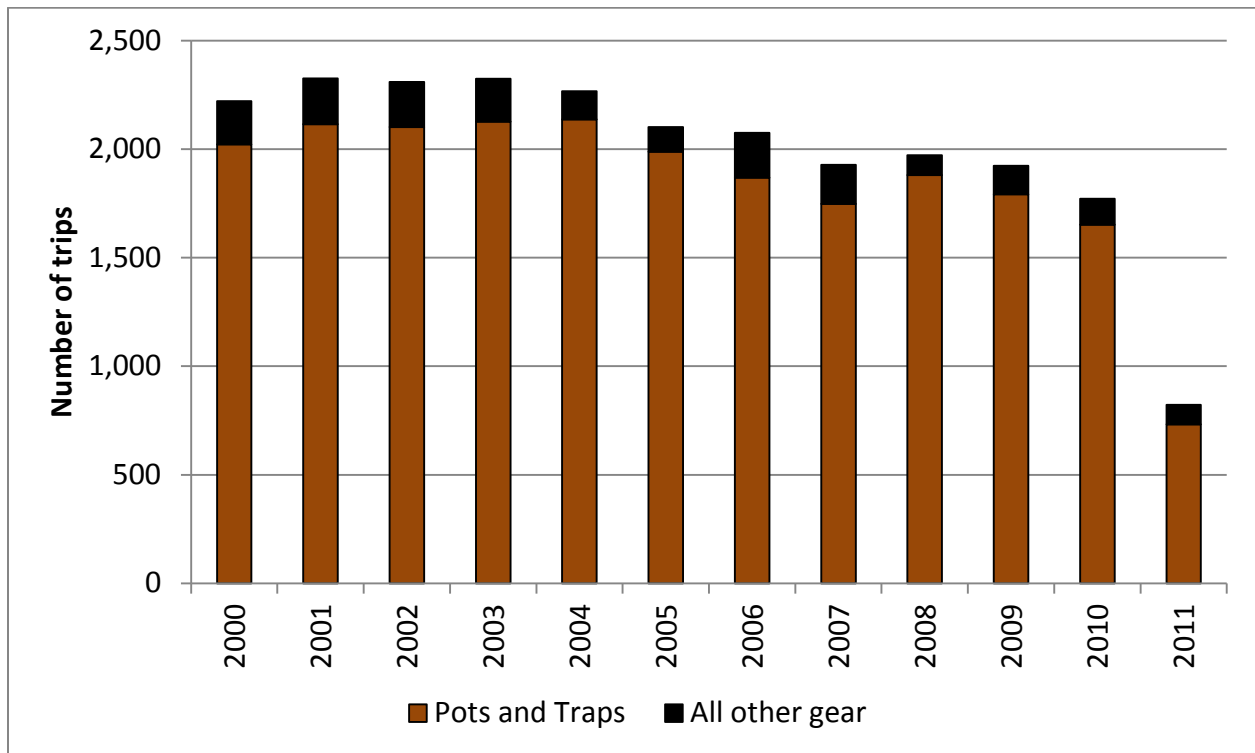
**Figure 7.** St. Croix total reported commercial fishing trips by gear and year.



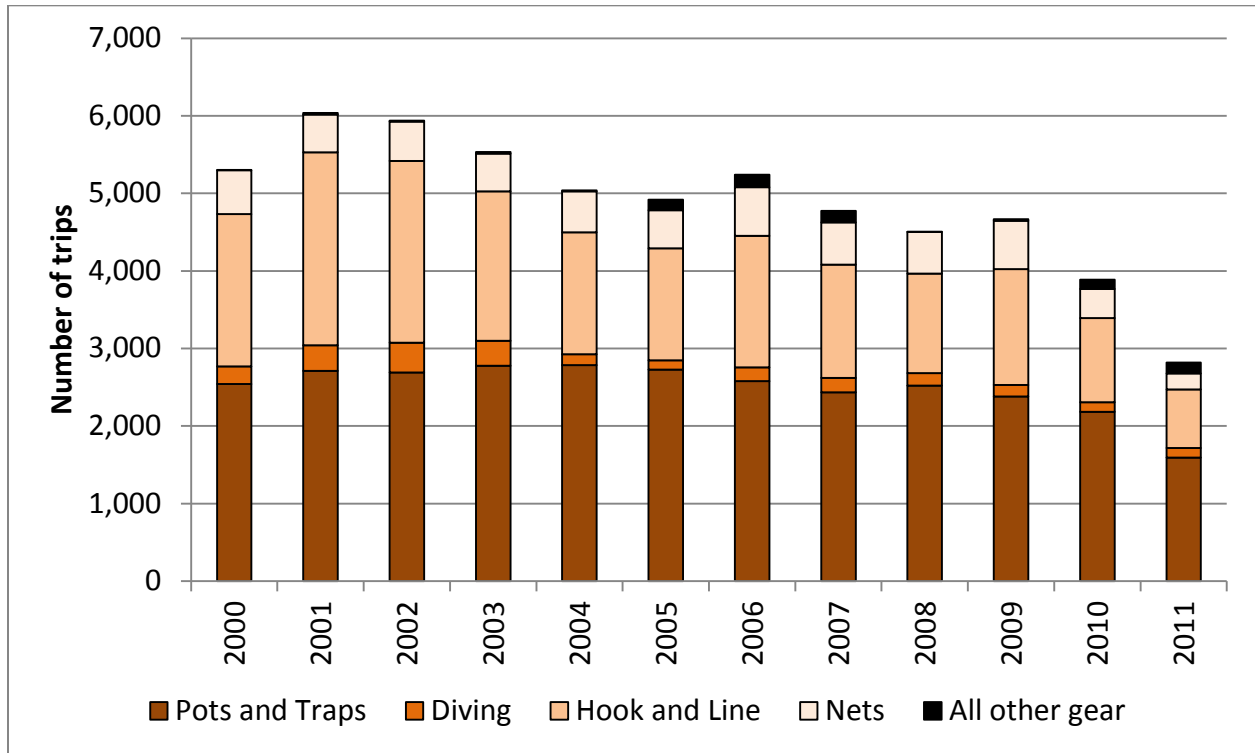
**Figure 8.** St. Thomas and St. John reported commercial fishing trips with surgeonfish landings by gear and year.



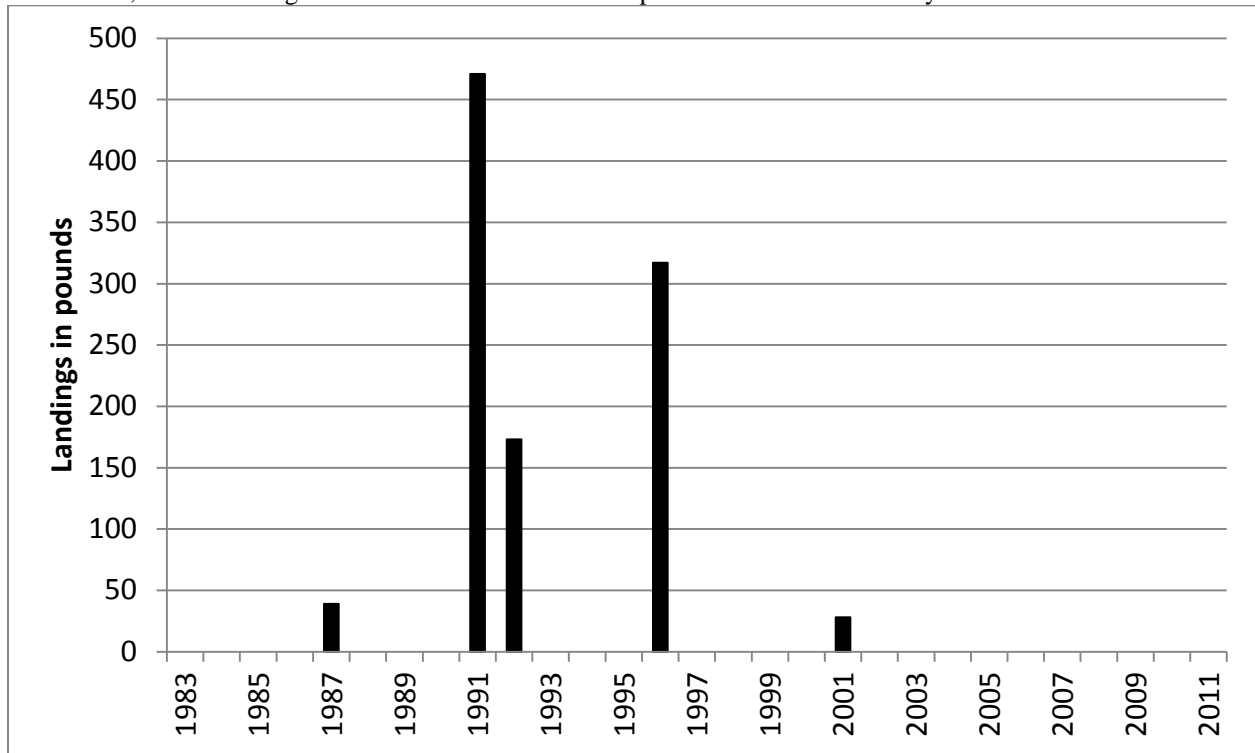
**Figure 9.** St. Thomas and St. John reported commercial fishing trips with triggerfish landings by gear and year.



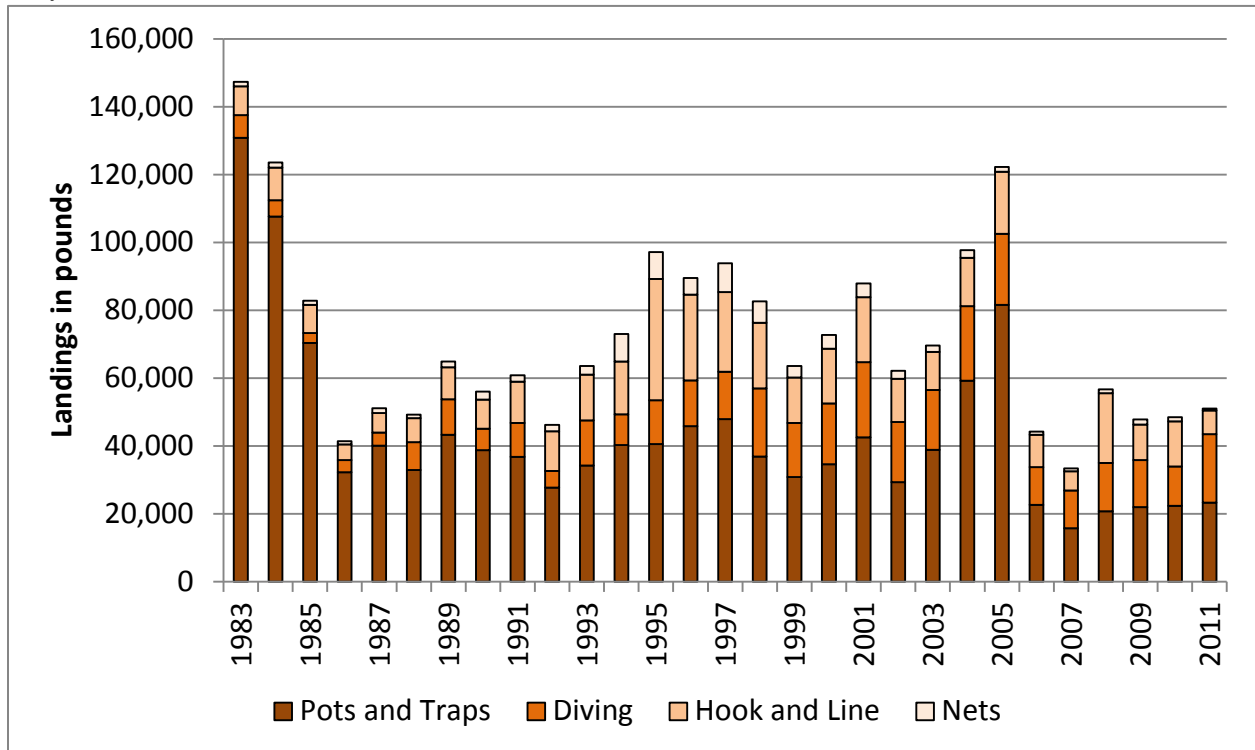
**Figure 10.** St. Thomas and St. John total reported commercial fishing trips by gear and year.



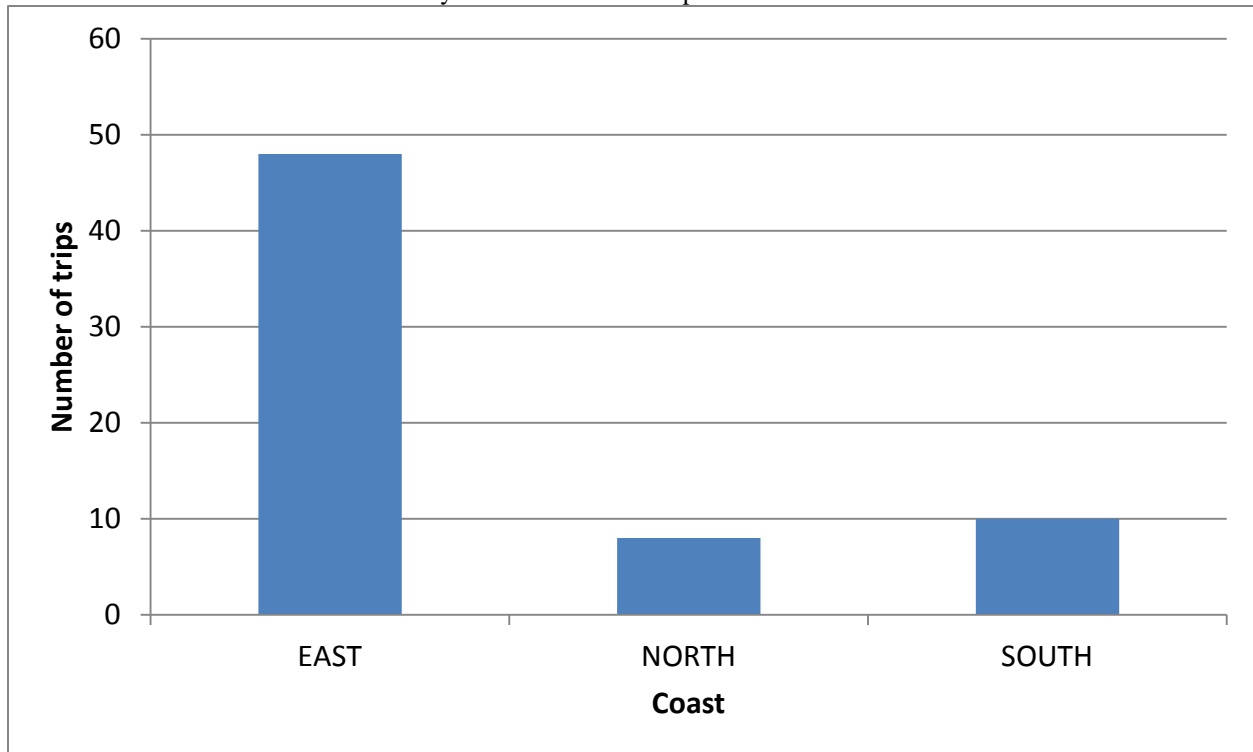
**Figure 11.** Puerto Rico yearly commercial fishery expanded landings of surgeonfishes reported for all gears, 1983-2011. Note, data from all gears combined due to small sample sizes and confidentiality constraints.



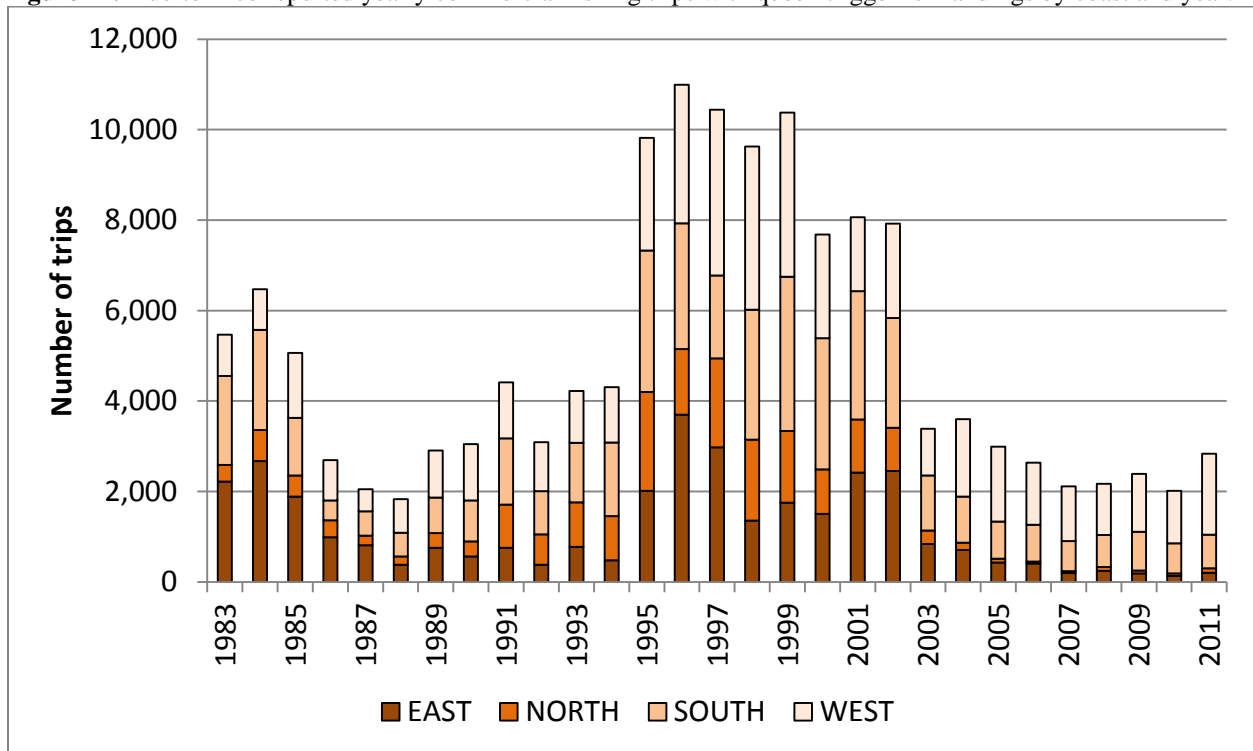
**Figure 12.** Puerto Rico yearly commercial fishery landings of queen triggerfish, expansion factors applied, by gear and year.



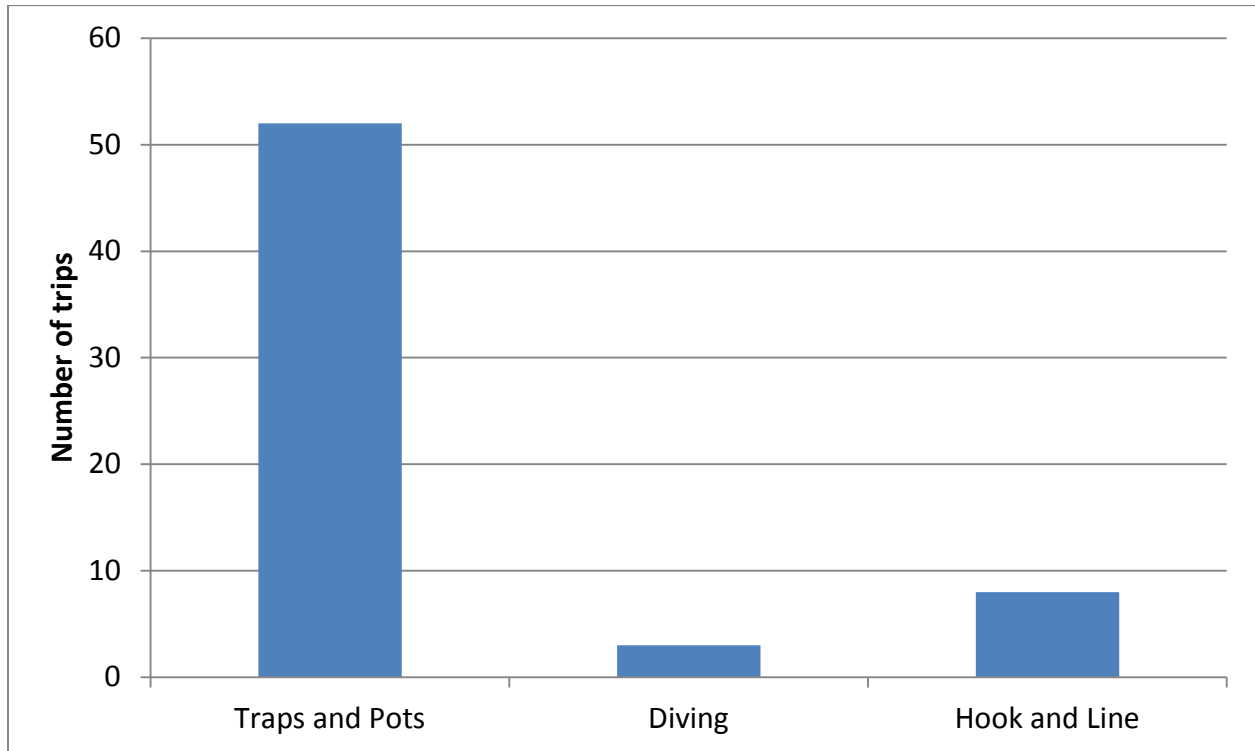
**Figure 13.** Puerto Rico reported commercial fishing trips with surgeonfish landings, 1983-2011, by coast. Note: trips reporting surgeonfish from the west coast of Puerto Rico could not be presented due to confidentiality constraints. Data were combined across years due to small sample sizes.



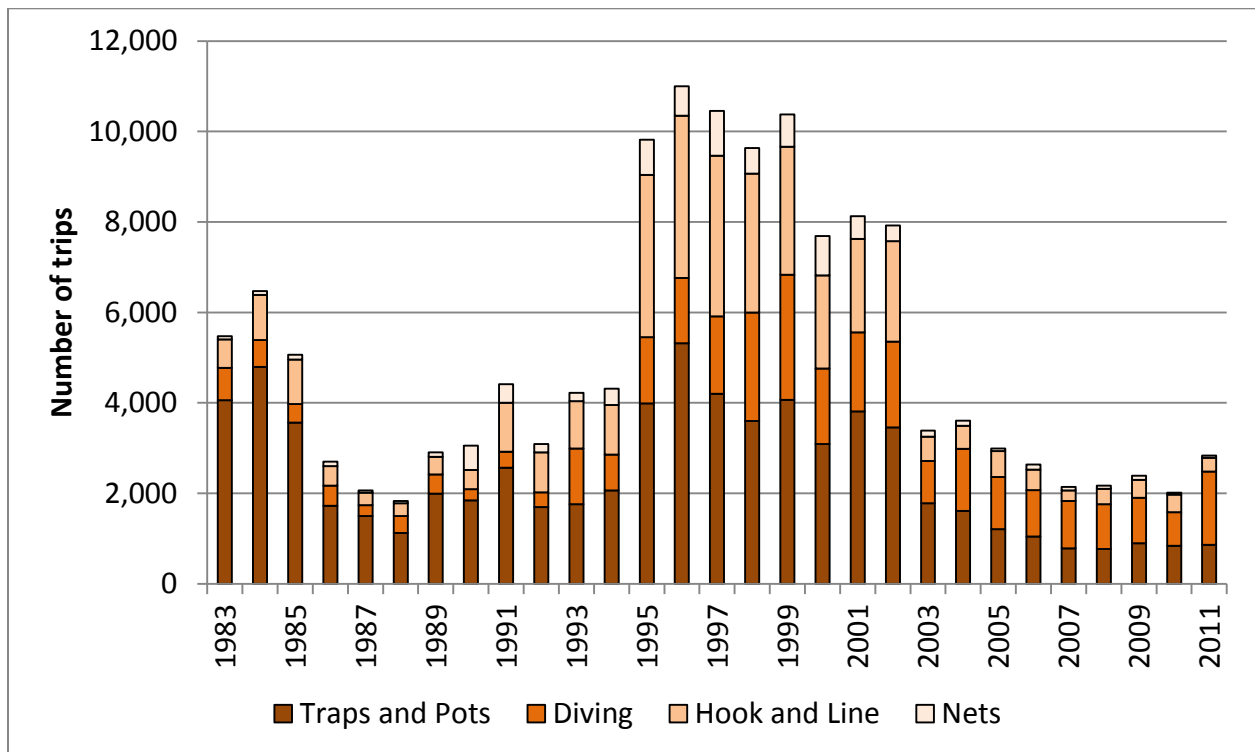
**Figure 14.** Puerto Rico reported yearly commercial fishing trips with queen triggerfish landings by coast and year.



**Figure 15.** Puerto Rico reported commercial fishing trips with surgeonfish landings, 1983-2011, by gear. Data were combined across years due to small sample sizes.

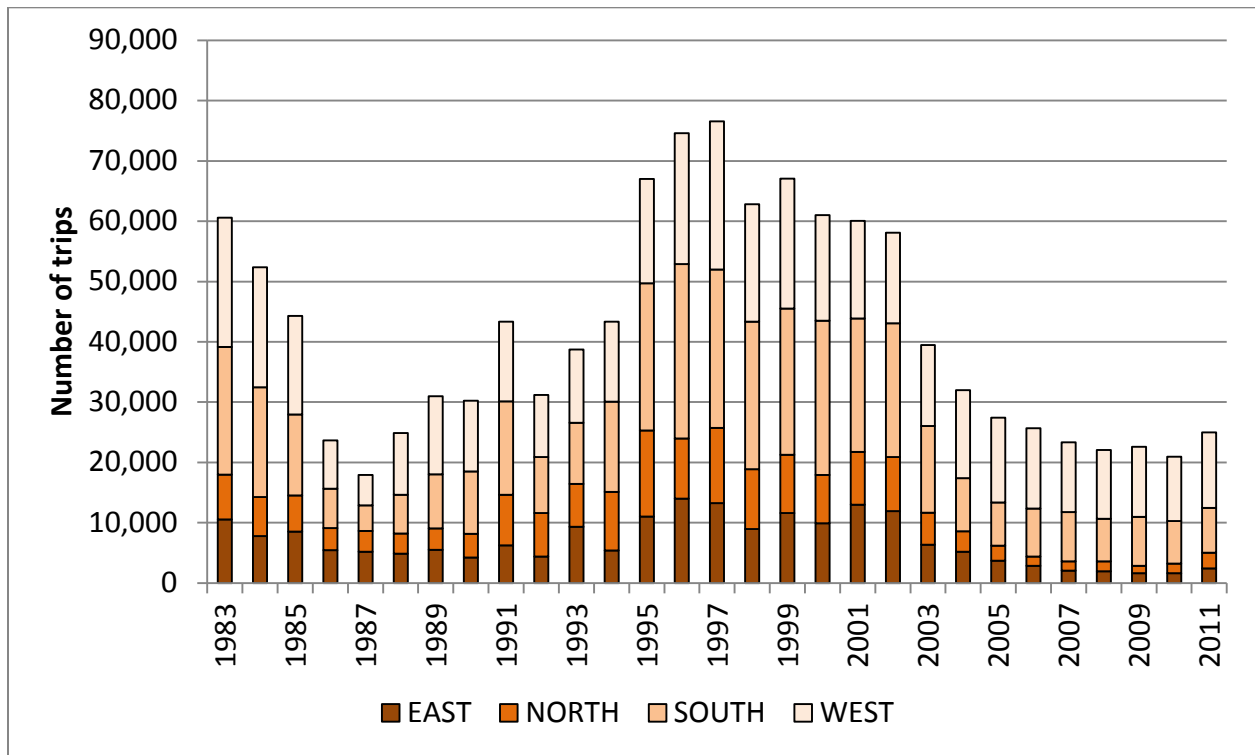


**Figure 16.** Puerto Rico reported yearly commercial fishing trips with queen triggerfish landings by gear and year.





**Figure 17.** Puerto Rico total reported commercial fishing trips by coast and year.



**Figure 18.** Puerto Rico total reported commercial fishing trips by gear and year.

