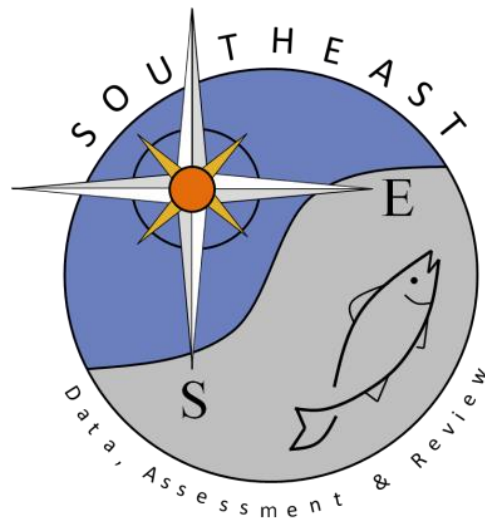


Queen Triggerfish (*Balistes vetula*) Commercial Trip Interview Program
Length Compositions – St. Croix

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Queen Triggerfish (*Balistes vetula*) Commercial Trip Interview Program Length Compositions St Croix

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1 Introduction

This document outlines the methodologies used to estimate commercial length compositions for the SEDAR 80 Caribbean Queen Triggerfish Assessment for St Croix. These compositions were estimated using the Trip Interview Program (TIP) samples through 2019.

2 Data Description

SEDAR 80 assesses all Queen Triggerfish in US Caribbean federal waters encompassing Puerto Rico, St Thomas/St John, and St Croix. Length data from the commercial fisheries of St Croix are collected by the Trip Interview Program (TIP, 1983-2019). These were compiled to estimate annual length compositions within commercial fleets.

This species is primarily measured using fork length (*FL*), with a handful of standard length (*SL*) estimates that were converted to *FL* using the equation below. Natural total length types were recorded in the TIP database beginning approximately 2011-12, coinciding with a clarification in the manual that this length type does not include any trailing tendrils and was assumed to be fork length. This assumption was validated with weight-length plots of individual fish which cannot be shown here due to the confidential nature of these data (e.g. violates the rule of 3).

$$FL = 0.97855 + 1.104 * SL$$

The TIP database is kept current and accurate with quality control measures, but occasionally there are sources of error that find their way into the main database. The minimum Queen Triggerfish length recorded throughout the US Caribbean was 24mm FL, with 6 fish under 50mm FL. These smaller samples were included but recommended to be dropped from further analyses if these samples are confirmed to be from the seafood trade only (e.g. not the live aquarium trade). Otherwise, they could represent selectivity to the various gear types. The largest queen triggerfish sample recorded was 840mm FL, and the IGFA recreational world record database includes a fish measuring 723mm (length type not specified). The Caribbean TIP database includes 5 fish above this size and can be filtered at the discretion of the lead assessment analyst.

3 Commercial Length Compositions of Landings

3.1 Length Samples

Length samples of US Caribbean Queen Triggerfish commercial landings were obtained from the TIP database maintained by the NMFS Southeast Fisheries Science Center (SEFSC). These

data were filtered to include fish landed and sampled in St Croix, and the remaining portion of the document will focus on these samples.

3.2 Fleet definitions

Fleets aggregations were explored considering gear characteristics such as depth of operation and resulting selectivity. All gears that landed more than three Queen Triggerfish since 1983 are shown within their respective fleets in Figure 1. The resulting aggregated length compositions for the final fleets are shown in Figure 2.

3.3 Length Compositions

Length compositions were estimated separately for each commercial fleet defined above. Within each fleet, Island-specific nominal length compositions were estimated using length bins of 1 cm, where for each year i and length bin j

$$LC_{i,j} = \frac{n_{i,j}}{n_i}$$

$n_{i,j}$ is the number of samples in year i and lower inclusive length bin j ; n_i is the number of samples in year i ; and $LC_{i,j}$ is the proportion of the total number of sampled fish in each year i within each lower inclusive length bin j . A minimum sample size threshold was applied annually within each strata, LC_i , where these were flagged to be excluded from further analyses if $n_i < 30$.

Number of annual commercial length samples within fleets are shown in Table 1, and the estimated number of trips, defined by the number of recorded unique interviews, are shown in Table 2. Resulting annual length compositions are shown for each fleet in Figure 3.

4 Tables

Table 1: Annual number of Queen Triggerfish length samples landed in St Croix. Length compositions may be dropped from further analyses if the fleet has $n < 30$ for that year.

YEAR	Hook and Line	Spear	Trap	Other
1983	73	16	156	0
1984	81	10	1,802	20
1985	52	0	829	0
1986	12	0	406	0
1987	16	0	726	0
1988	54	0	1,381	0
1989	0	0	346	0
1990	0	0	218	0
1991	0	0	102	0
1992	0	0	121	0
1993	0	0	208	0
1994	0	0	304	0
1995	0	0	109	6
1996	0	2	126	1
1997	0	0	141	0
1998	0	0	288	0
1999	1	0	180	0
2000	0	0	35	0
2001	0	0	29	4
2002	0	8	225	5
2003	0	18	1	1
2004	0	19	12	18
2005	0	25	39	2
2006	2	0	0	0
2007	0	79	42	0
2008	2	108	18	0
2009	3	213	35	0
2010	13	180	124	0
2011	4	3	22	0
2012	4	0	0	0

YEAR	Hook and Line	Spear	Trap	Other
2016	6	148	4	0
2017	15	162	0	0
2018	0	90	0	0
2019	0	42	5	0

Table 2: Approximate estimates of the number of trips that landed Queen Triggerfish in St Croix. These were distinguished by unique interview IDs and are likely an underestimate of the true number of trips sampled annually for each fleet.

YEAR	Hook and Line	Spear	Trap	Other
1983	8	7	44	0
1984	15	2	144	2
1985	9	0	64	0
1986	1	0	53	0
1987	5	0	80	0
1988	14	0	96	0
1989	0	0	42	0
1990	0	0	22	0
1991	0	0	18	0
1992	0	0	11	0
1993	0	0	19	0
1994	0	0	28	0
1995	0	0	12	4
1996	0	1	17	1
1997	0	0	23	0
1998	0	0	23	0
1999	1	0	15	0
2000	0	0	9	0
2001	0	0	7	1
2002	0	2	20	2
2003	0	2	1	1
2004	0	2	1	8

YEAR	Hook and Line	Spear	Trap	Other
2005	0	5	7	2
2006	2	0	0	0
2007	0	11	6	0
2008	2	21	6	0
2009	2	32	10	0
2010	7	36	20	0
2011	2	1	1	0
2012	1	0	0	0
2016	1	22	2	0
2017	3	25	0	0
2018	0	13	0	0
2019	0	8	2	0

5 Figures

St Croix
(N = 9,552)

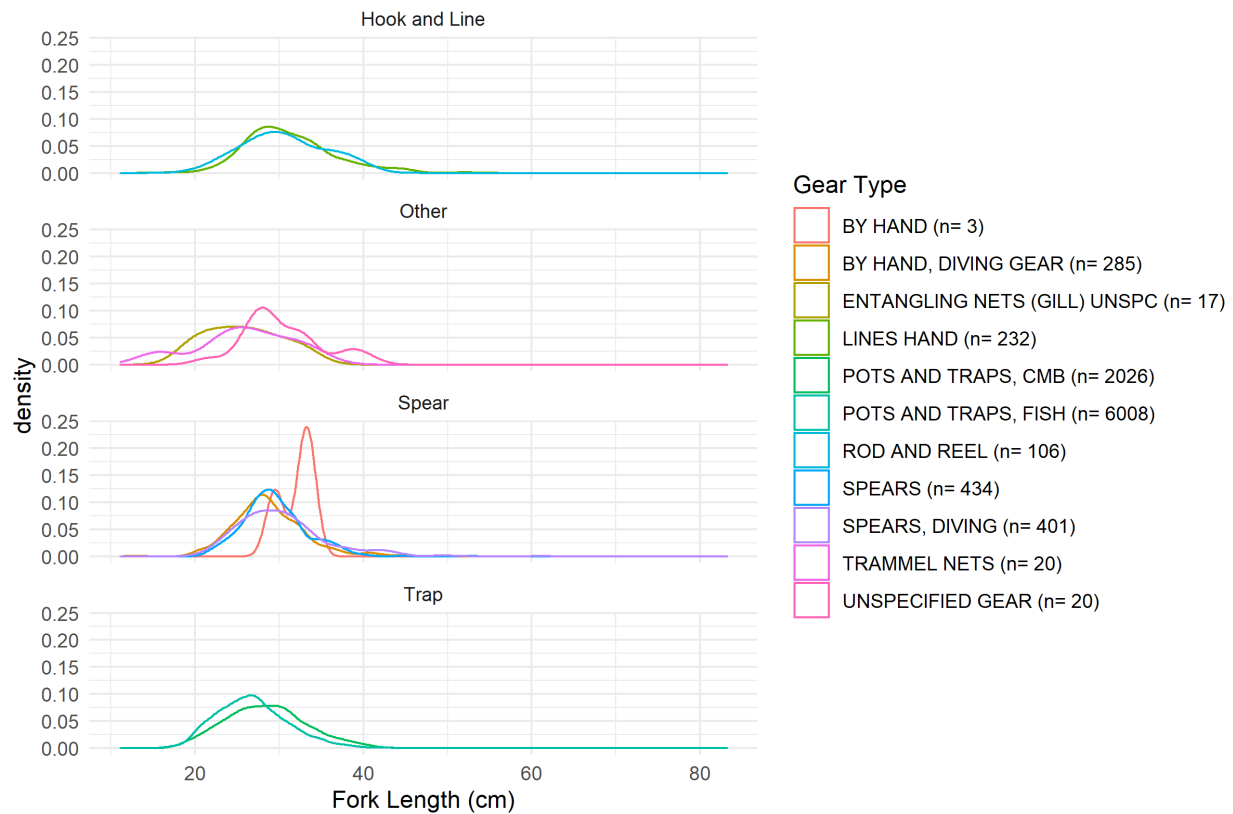


Figure 1: Gear aggregations defined for Queen Triggerfish landed in St Croix all years combined. The “Hook and Line” fleet displayed nearly identical agreement within gears. The “Spear” fleet included all diving gears, and subtle differences observed in the length compositions are due to low sample sizes in BY HAND. Lobster and fish traps were sufficiently similar and were aggregated as a single Trap fleet.

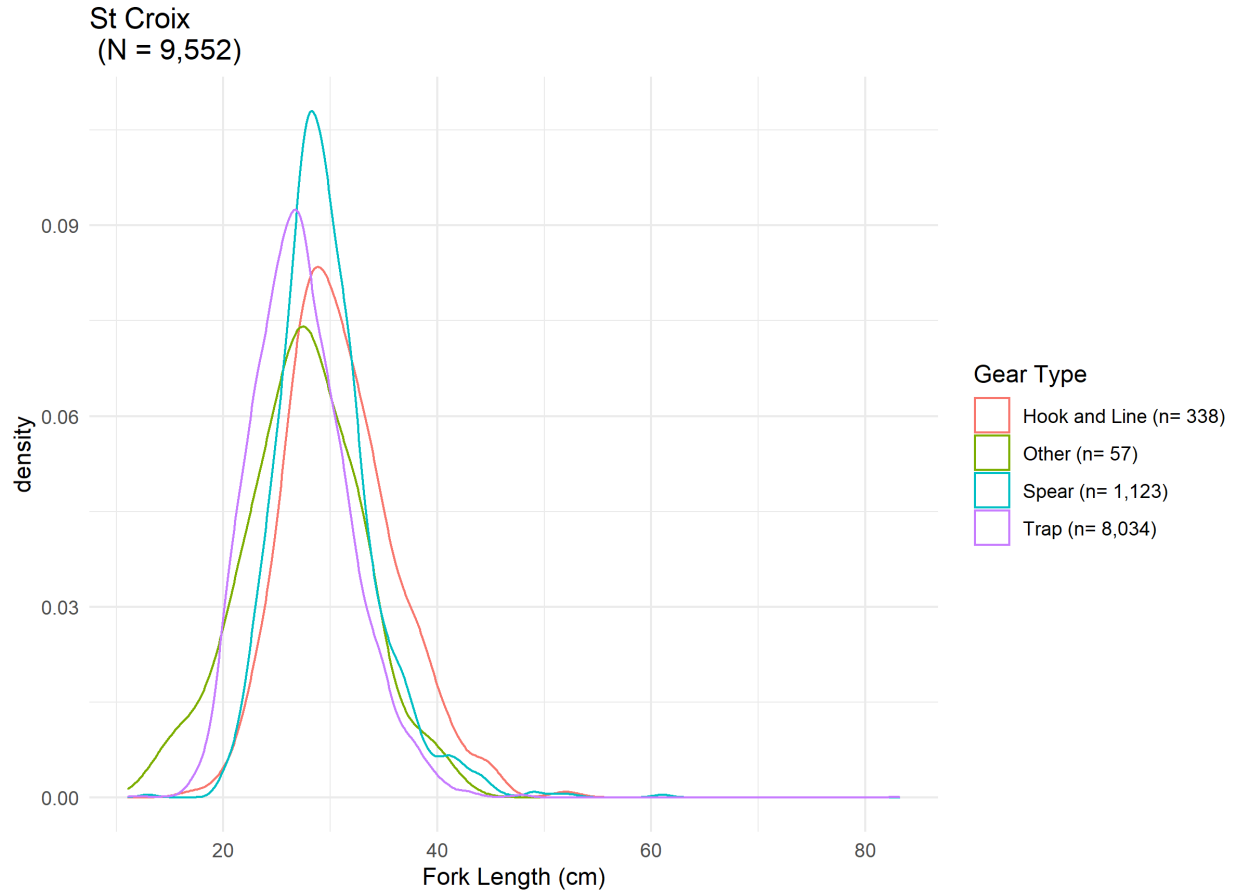


Figure 2: Length compositions of Queen Triggerfish landed in St Croix aggregated by fleet. Overall, the “Hook and Line” fleet landed the largest fish, followed by “Spear”, “Other”, and “Trap” fleet landing the smallest fish.

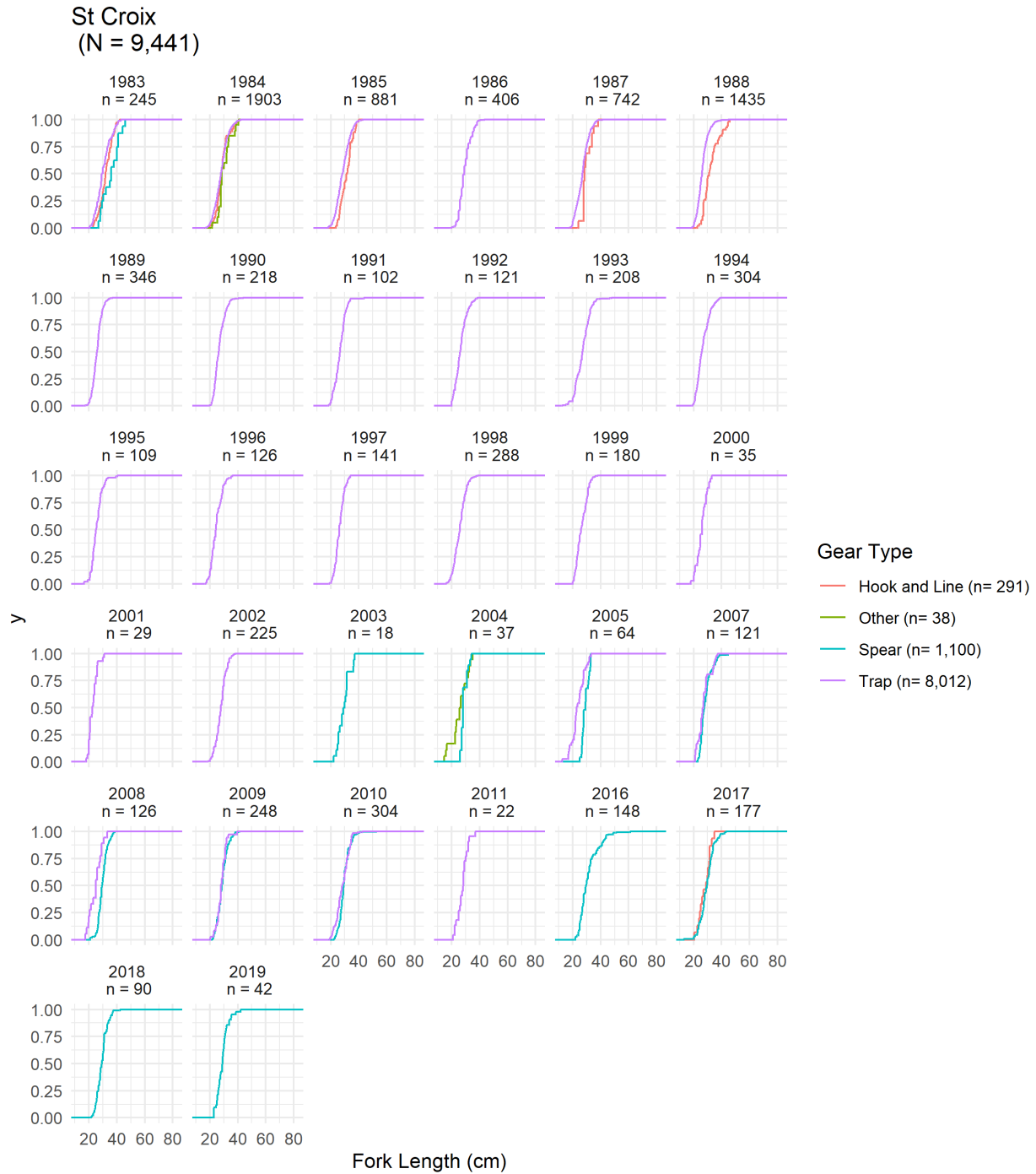


Figure 3: Annual cumulative length distributions of Queen Triggerfish landed in St Croix. Fleets with less than 15 samples in any year were excluded from these figures to conservatively protect confidentiality (and therefore sample sizes presented here do not match the other Tables or Figures presented in this report). Years with less than 15 samples may be included in the final model at the discretion of the lead assessment analyst.