SEDAR 73-WP16: My Fish Count Data for Red Snapper

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INTRODUCTION/BACKGROUND

Private recreational fishing is an important component of the recreational sector that fishes for snapper grouper species in the South Atlantic region. Despite its importance, data on private recreational fishing trips targeting snapper grouper species are limited. This has resulted in fishermen's dissatisfaction with the estimates of recreational catch and release and associated management. Recreational anglers reporting their catch through an electronic app can help improve data on recreational fisheries as well as improve anglers' trust in fisheries management.

MyFishCount (MFC) is a self-reporting platform that enables anglers to report their catch electronically developed by South Atlantic Fishery Management Council, Angler Action Foundation, and Elemental Methods in partnership with Atlantic Coastal Cooperative Statistics Program and National Marine Fisheries Service.

MFC grew from a web portal created to test electronic recreational reporting during the November 2017 red snapper mini season in the South Atlantic region. The mobile phone app was tested during early 2018 and released in June 2018 in time for the 2018 red snapper mini season. Since then, the app and web portal have been updated based on user comments.

The process to create an account, create a trip report, data structure, and data fields are described in Collier et al. (2019). Data are entered in three sections: trip start, catch information, and trip end. Most of the required data fields are drop-down lists (typically five or more options) or clickable boxes (generally less than five options) to reduce data entry error and increase consistency among users.

Data collected through MFC are expected to be very valuable to fishery scientists and managers. Over 700 accounts and 1,900 trip reports have been created since MFC started to July 31, 2020. Information includes data on: on departure location, target species, port type, number of anglers, days of week fished, length of time to report, length of fish, catch rates, and fishing location (see MyFishCount Reporting Results for more results). Some of the interesting results include:

- Vessels leaving from private ports (docks, marinas, and boat ramps) tended to have more anglers than vessels leaving from public ports,
- Fishing on Friday was more commonly reported than fishing on Sunday during mini-seasons,
- Most abandoned trips took less than 1 minute to report and completed trips took 1 to 19 minutes to report,
- Length of fish was provided for approximately 30% of the reported fish,
- Lengths reported through MFC tended to be larger than lengths reported through Marine Recreational Information Program, and
- Catch rates were similar between MFC reports and Florida's Fish and Wildlife Conservation Commission Red Snapper Mini-Season estimate in 2018.

Electronic reporting programs, like MFC, can provide timely and non-biased information on recreational fisheries (Jiorle et al 2016). Electronic reporting programs have been developed in the Gulf of Mexico and Mid-Atlantic regions and others are being considered for managing data-limited species. Besides reporting landings, MFC users can voluntarily report on a variety of aspects of their fishing trip including:

number of fish released, size (weight or length) of fish kept or released, location of catch, depth fished, where the fish was hooked, hook type, release treatment, and reason for releasing fish.

METHODS

These data are for Private trips that occurred from 2017 (the beginning of the MFC time series) to July 31st of 2020. The data were downloaded on August 1st of 2020. Most of the Red Snapper data comes from the mini-seasons, but not all of it. The data were filtered to retain private recreational trips (charter, headboat, and test trips removed). Both completed and active trips were included in this analysis.

Kept Fish Comparisons

Analyses were performed to compare the kept fish from the MyFishCount (MFC) data to certain SEDAR data and to the Marine Recreational Information Program (MRIP) data to see if the MFC data is similar to the length distribution for Red Snapper observed in MRIP. These analyses served as tests of validity for the MFC data. Comparisons were done between the SEDAR and MFC weight at length data and between the MRIP and MFC length frequency distributions. The length data from MFC was all converted to fork length (FL) using the length-length relationship from SEDAR 41 in order to make the dataset consistent and compatible with the MRIP dataset. The MRIP data was filtered to use only actual observed lengths and omitted imputed lengths. A Student's t-Test was used to test if there was any difference between the MFC and the SEDAR 41 weight at length data. This method was also used to look at the difference between the central tendency of the MFC and MRIP length distributions. A Kolmogorov-Smirnov test (KS) was used to test whether the distributions of the two length distributions were significantly different.

Released Fish Data

There are a number of variables reported in conjunction with releases in the MFC data including: length, weight, depth, release treatment, release reason, hook type, and hook position. Below are graphics depicting all of these variables. The factors are not filtered for mini-seasons or any other factors.

RESULTS & DISCUSSION

Kept Fish Comparisons

The first analysis was to compare the MFC weight at length data to that from a previous SEDAR assessment (*Figure 1*). There were 136 data points from the MFC data available to construct the length-weight relationship and comparre it to that from SEDAR 41. The resultant trend line for the MFC weight at length data is very similar to that from the SEDAR 41 assessment (*Figure 1*). No significant difference was found between the two datasets (Student's T value = 0.939).

The second analysis was to compare the length frequency distribution of the kept fish from the mini-seasons for overlapping years between the MFC data and the MRIP data. Data for 2017-2019 were used,

since those were the overlapping years of the two datasets. This analysis was done for the Private mode only in MFC, to make the two datasets more comparable. The two length frequencies are very similar, with a few more smaller size classes showing up in the MRIP data and a few more larger size classes showing up in the MFC data (*Figure 2*).). No significant difference was found between the central tendencis of the two datasets (Student's T value = 0.767). There was also no difference found between the two distributions of the datasets (KS value = 0.945).

These two analyses show that the self-reported MFC data are comparable to the survey design estimates developed from MRIP data. Since the length data of kept fish in the platform are similar to survey desing estimates, the length distribution for released Red Snapper in MFC could provide a reasonable estimate of the length distribution for released Red Snapper in the private recreational fishery.

Figure 3 , *Figure 4,* and *Table 1* show the length and weight frequencies of the MFC data, respectively. They show most of the released fish are small, which is unsurprising since most data are coming from the mini-seasons. These data can be filtered for just mini-seasons and just those times outside of the mini-seasons as well for analyses if requested.

Released Fish Data

Table 1 and *Figure 5* shows the depth of capture/release of the released Red Snapper. The depth bin 61-90 feet has the highest number of discards, followed by the 91-120 foot depth bin. This information can be paired with the information in Table *3* and *Figure 6*, which shows the percent of fish that were treated before release (descended, vented, or both), to get the percent of fish that were treated before release by depth bin (Table *4*, *Figure 7*). This analysis shows that although people were releasing more fish at shallower depths, they were treating fish for signs of barotrauma at a higher percentage at deeper depths. It should be noted that information on barotrauma is provided to all MFC users and may therefore bias the usage of descending devices high. The high percentage of people descending or venting fish is corroborated by work done by Curtis et al. 2019, which found 76% of respondents were likely to descend all or most of their fish.

Hook type (Table *5*, *Figure 8*) and hook placement (*Figure 9*) are also data reported by users. The data suggests that the vast majority of released Red Snapper are caught on circle hooks, specifically non-offset circle hooks, and almost all of the released Red Snapper were hooked in the jaw. The use of non-offset circle hooks is corroborated by Sauls et al. 2015 during SEDAR 41, which found that anglers on charter boats off of Northeastern Florida were mostly using non-offset circle hooks to catch Red Snapper. However, not to the degree as the MFC data shows. This paper also corroborates the findings of the MFC data in terms of hook placement. Sauls et al. 2015 found that the majoritty of the non-offset circle hooks were hooked in the jaw or lip.

The final analysis done was to look at the percent of released fish by the reason for release (Table *6*, *Figure 10*). The data suggest that most anglers released Red Snapper because they were over their bag limit, followed by the fact that they were too small despite there not being a size limit. It should be noted that almost all of the data for this analysis came from within the mini-seasons.

CONCLUSION

More comparisons are needed to determine which data collected through self-reported data systems accurately reflect the recreational fishery. Based on comparison between MFC data and the most recent SEDAR assessment and that from the MRIP survey, it appears that the MFC data was comparable enough to draw conclusions on the length of kept and released fish. Length of fish has been similar in other studies where they compared legnths of fish in self-reported apps compared to design-based estimates (Jiorle et al. 2016).

There is a wide range of additional information regarding released fish within the MFC dataset, including length and weight frequencies, depth of releases, release treatment, hook type used and hook placement, and even the reason an angler released a fish but need further verification to ensure the accuracy of the reported data. These data may have implications for size of private trip releases and release mortality.

LITERATURE CITED

Curtis, JM, AK Tompkins, AJ Loftus, and GW Stunz. 2019. Recreational Angler Attitudes and PerceptionsRegarding the Use of Descending Devices in Southeast Reef Fish Fisheries. Marine and Coastal Fisheries, 11: 506-518.

Jiorle, RP, RNM Ahrens, and MS Allen. 2016. Assessing the Utility of a Smartphone App for Recreational Fishery Catch Data. Fisheries, 41: 758-766.

Sauls, B, A Gray. C Wilson, and K Fitzpatrick. 2015. Size Distribution, Release Condition, and Estimated Discard Mortality of Red SnapperObserved in For-Hire Recreational Fisheries in the South Atlantic. SEDAR 41-DW33. SEDAR, North Charleston, SC. 16 pp.

Tables

Table 1. Length and weight frequencies of released Red Snapper from the MFC data.

Length Bin	Count of Len Rel	Len Frequency of Rel	Weight Bins	Count of Wgt Rel	Wgt Frequency of Rel
8	3	0.009174312	0	24	0.130434783
9	2	0.006116208	1	1	0.005434783
10	21	0.064220183	2	15	0.081521739
11	4	0.012232416	3	15	0.081521739
12	20	0.06116208	4	14	0.076086957
13	22	0.067278287	5	22	0.119565217
14	25	0.076452599	6	4	0.02173913
15	21	0.064220183	7	10	0.054347826
16	34	0.103975535	8	11	0.059782609
17	12	0.036697248	9	4	0.02173913
18	22	0.067278287	10	20	0.108695652
19	11	0.033639144	11	2	0.010869565
20	22	0.067278287	12	5	0.027173913
21	8	0.024464832	13	3	0.016304348
22	13	0.039755352	14	6	0.032608696
23	4	0.012232416	15	7	0.038043478
24	13	0.039755352	16	2	0.010869565
25	28	0.085626911	17	3	0.016304348
26	9	0.027522936	18	3	0.016304348
27	5	0.01529052	19	3	0.016304348
28	6	0.018348624	20	2	0.010869565
29	3	0.009174312	21	2	0.010869565
30	5	0.01529052	22	0	0
31	0	0	23	1	0.005434783
32	0	0	24	0	0
33	2	0.006116208	25	1	0.005434783
34	3	0.009174312	26	0	0
35	1	0.003058104	27	1	0.005434783
36	4	0.012232416	28	0	0
37	1	0.003058104	29	0	0
38	0	0	30	1	0.005434783
39	0	0	31	0	0
40	1	0.003058104	32	0	0
41	1	0.003058104	33	0	0
42	0	0	34	0	0
43	1	0.003058104	35	0	0

Length Bin	Count of Len Rel	Len Frequency of Rel	Weight Bins	Count of Wgt Rel	Wgt Frequency of Rel
			36	0	0
			37	0	0
			38	0	0
			39	0	0
			40	2	0.010869565

Table 2. Percent of released Red Snapper by depth bin (feet) from the MFC data.

Depth (ft)	% Releases
0-30	0.4%
31-60	13.2%
61-90	47.7%
91-120	28.3%
121-150	1.9%
151-300	8.5%

Table 3. Percent of released Red Snapper by release treatment from the MFC data.

Release Treatment	% Releases
Descending Device	23.2%
Vented	28.9%
Descending Device and Vented	1.2%
Descended or Vented	53.3%
Other	6.6%
Not treated	40.0%

Table 4. Percent of Red Snapper that have been treated for barotrauma (descended and/or vented) by depth bin (ft) from MFC data.

Depth Bin (ft)	% Treated Releases
31-60	4.4%
61-90	33.6%
91-120	45.1%
121-150	4.4%
151-300	12.4%

Table 5. Percent of Red Snapper kept, released, and caught by hook type from the MFC data.

Hook Type	% Kept	% Released	% All Caught
Artificial Bait	2.6%	1.8%	2.2%
Non-offset Circle Hook	71.6%	69.4%	70.5%
Non-offset J-Hook	2.6%	0.5%	1.5%
Offset Circle Hook	20.3%	28.3%	24.5%
Offset J-Hook	2.0%	0.0%	0.9%
Spearfishing	0.3%	0.0%	0.1%
Other	0.6%	0.0%	0.3%

Table 6. Percent of Red Snapper released by release reason from the MFC data.

Release Reason	% Releases
Not Desired	10.1%
Over Bag Limit	36.0%
Over Bag Limit For me	2.2%
Shark damage	0.2%
Too Big	0.2%
Too Small	26.3%
Other	15.0%
Not Specified	0.6%

Figures

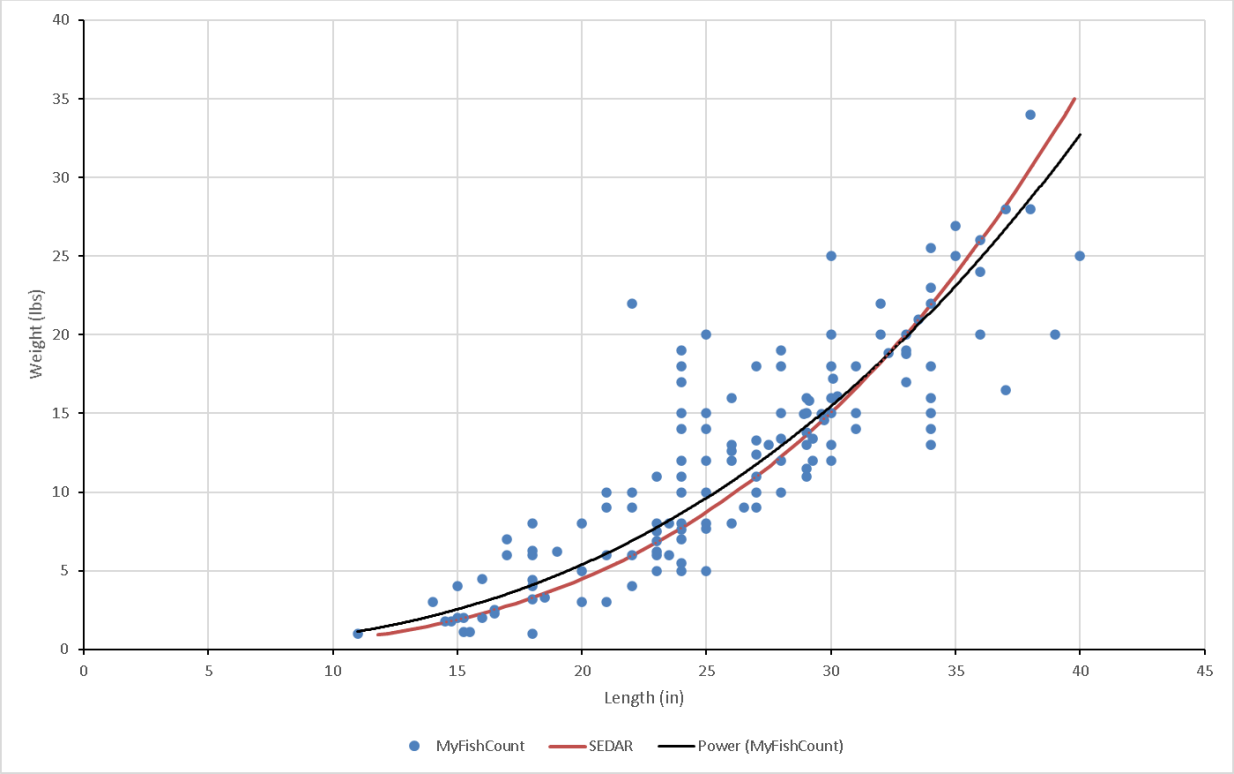

Figure 1. Weight at length from the MFC data and trend lines for weight at length from both the MFC data and from SEDAR 41.

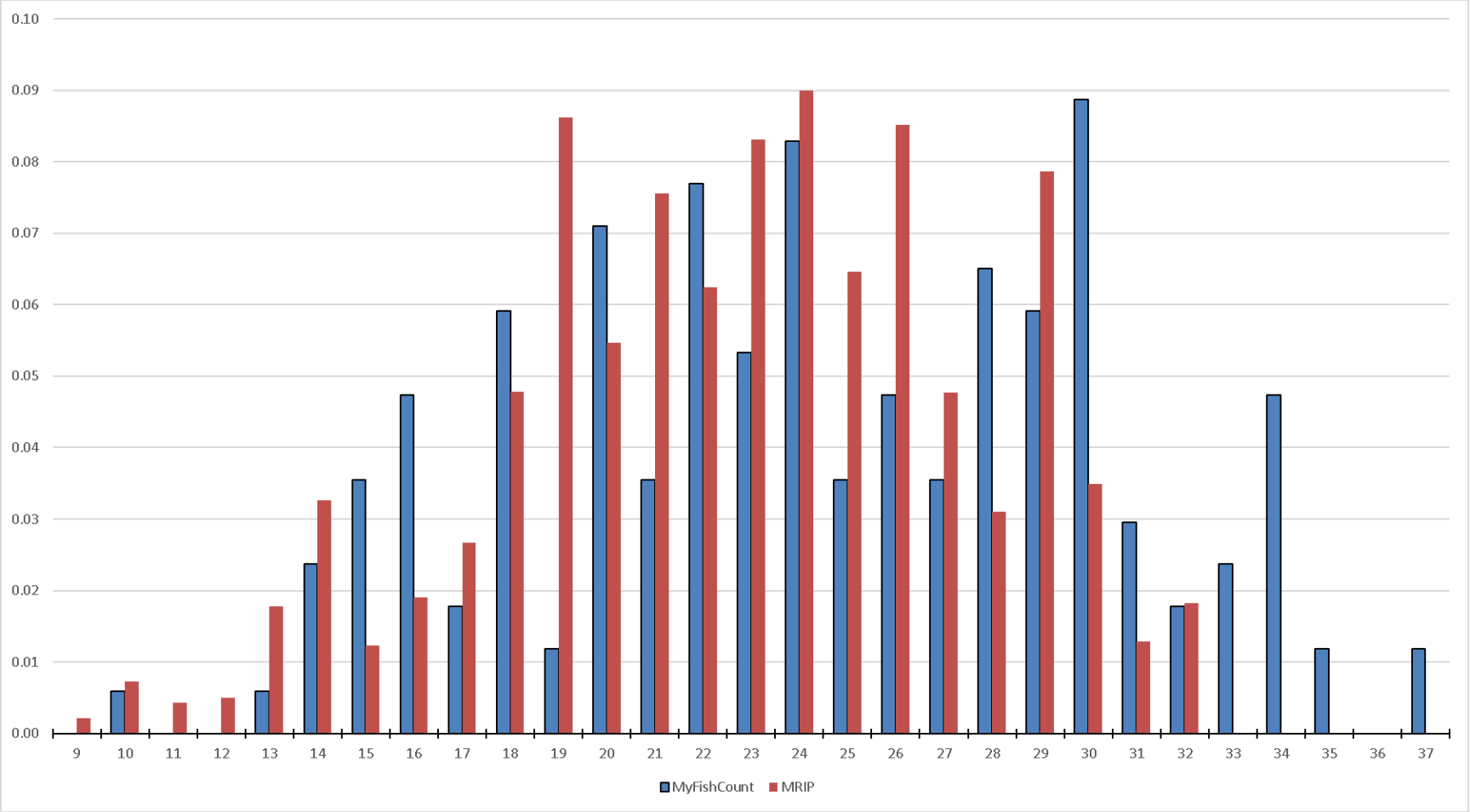

Figure 2. Length frequency of MRIP measured vs. MFC fish from Private mode during the mini-seasons 2017-2019.

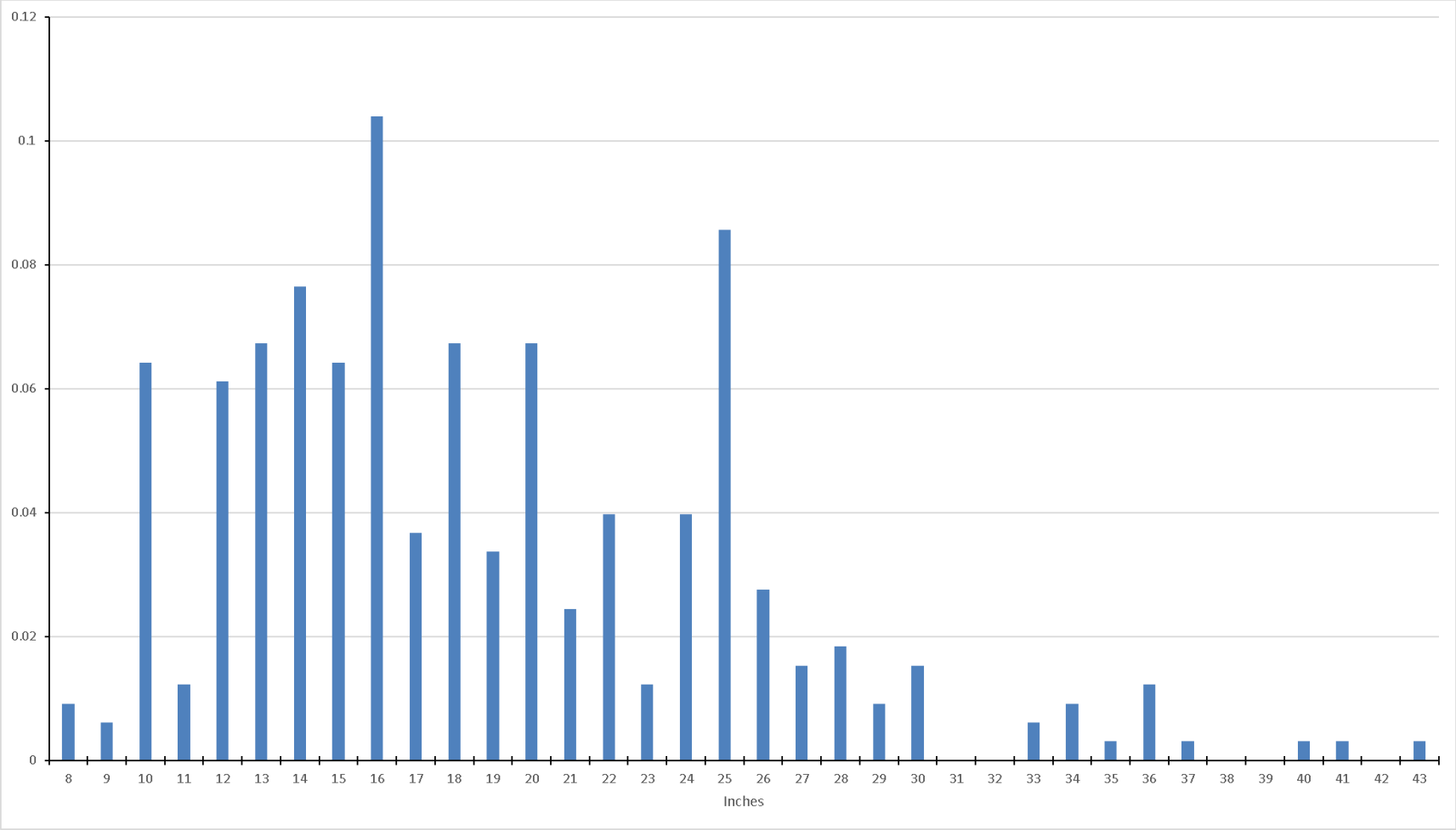

Figure 3. Length frequency of released fish from the MFC data.

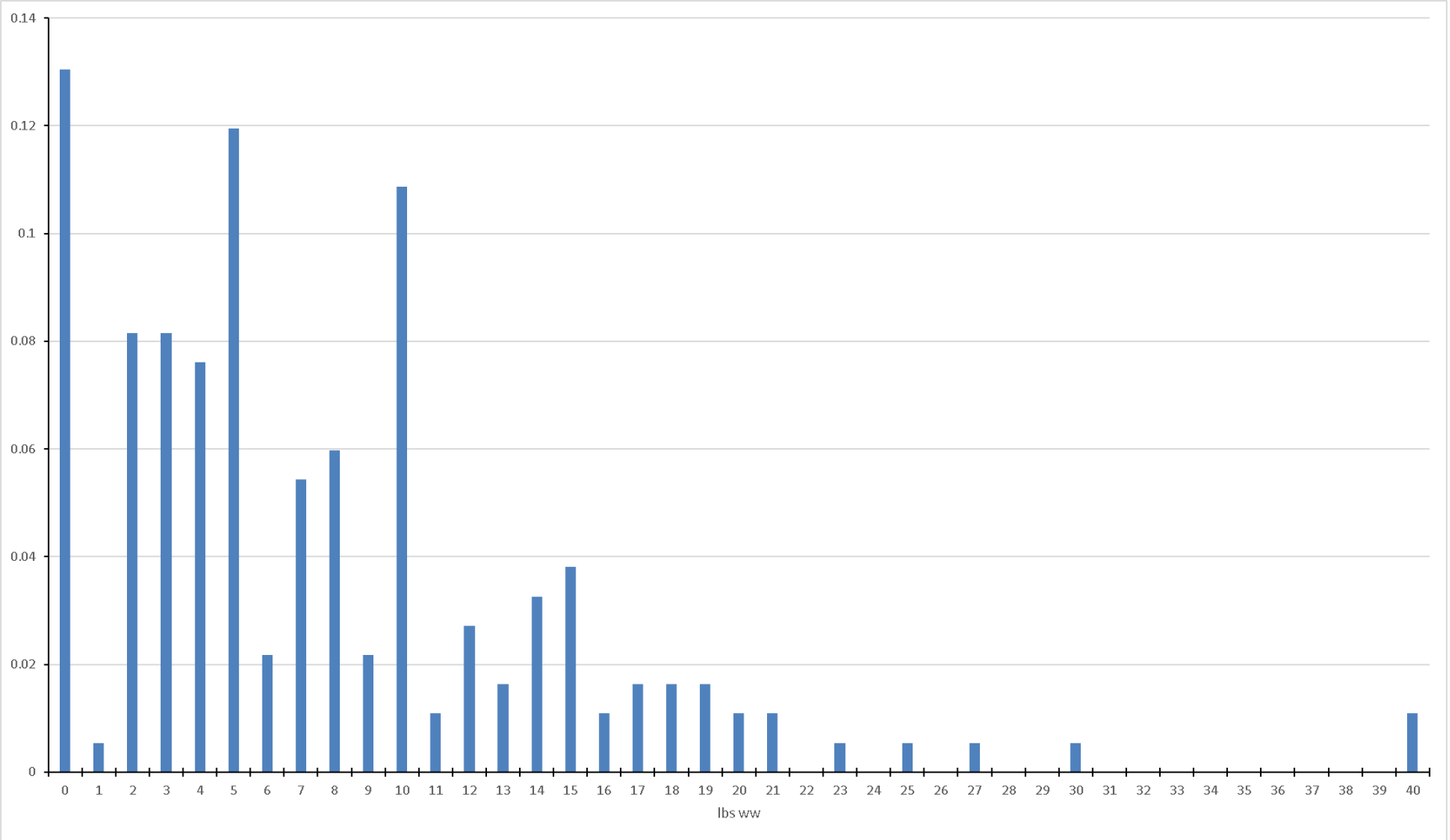

Figure 4. Weight frequency of released fish from the MFC data.

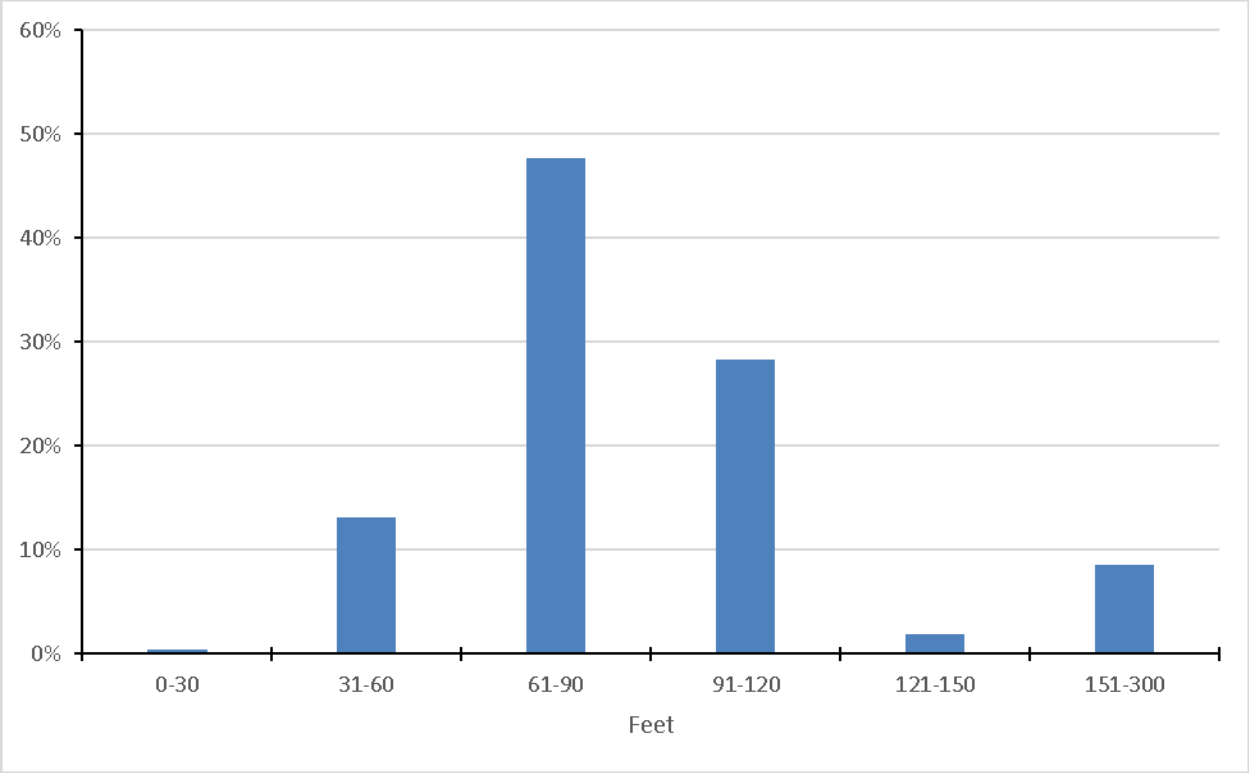

Figure 5. Percent of released fish by depth bin from the MFC data.

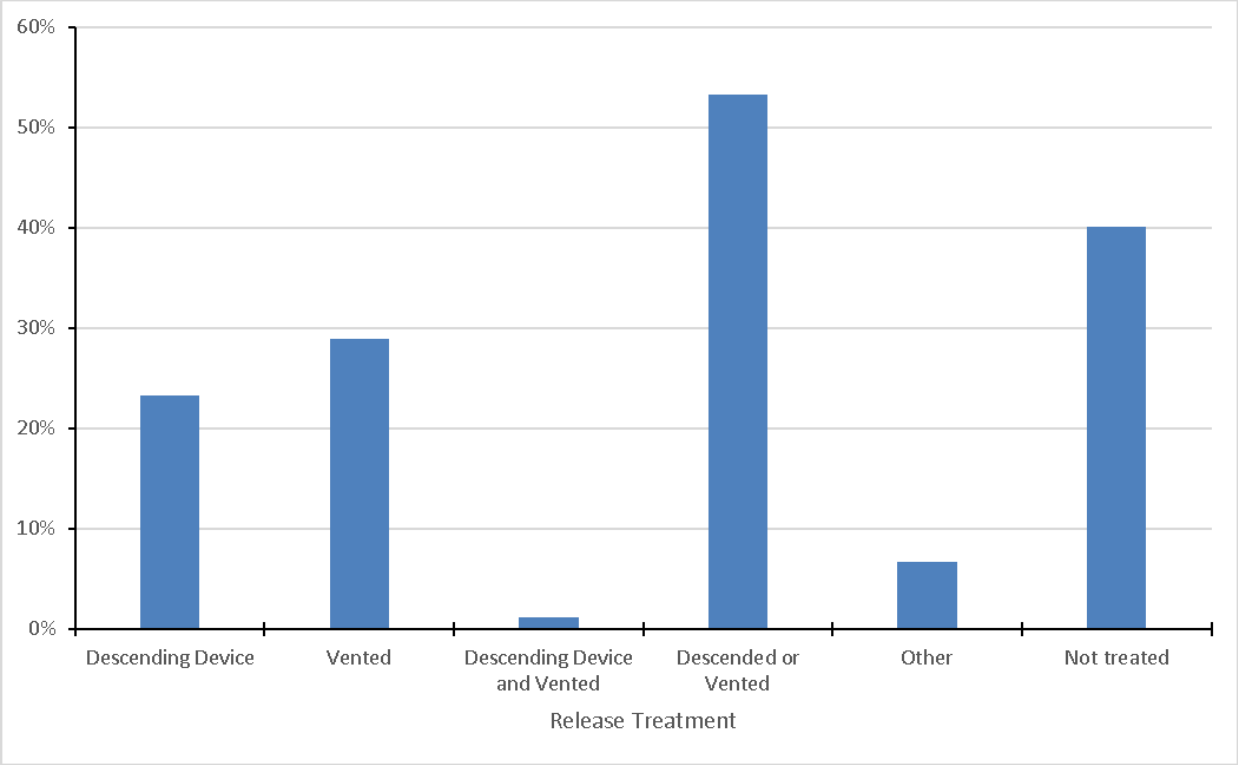

Figure 6. Percent of released fish by release treatment from the MFC Data.

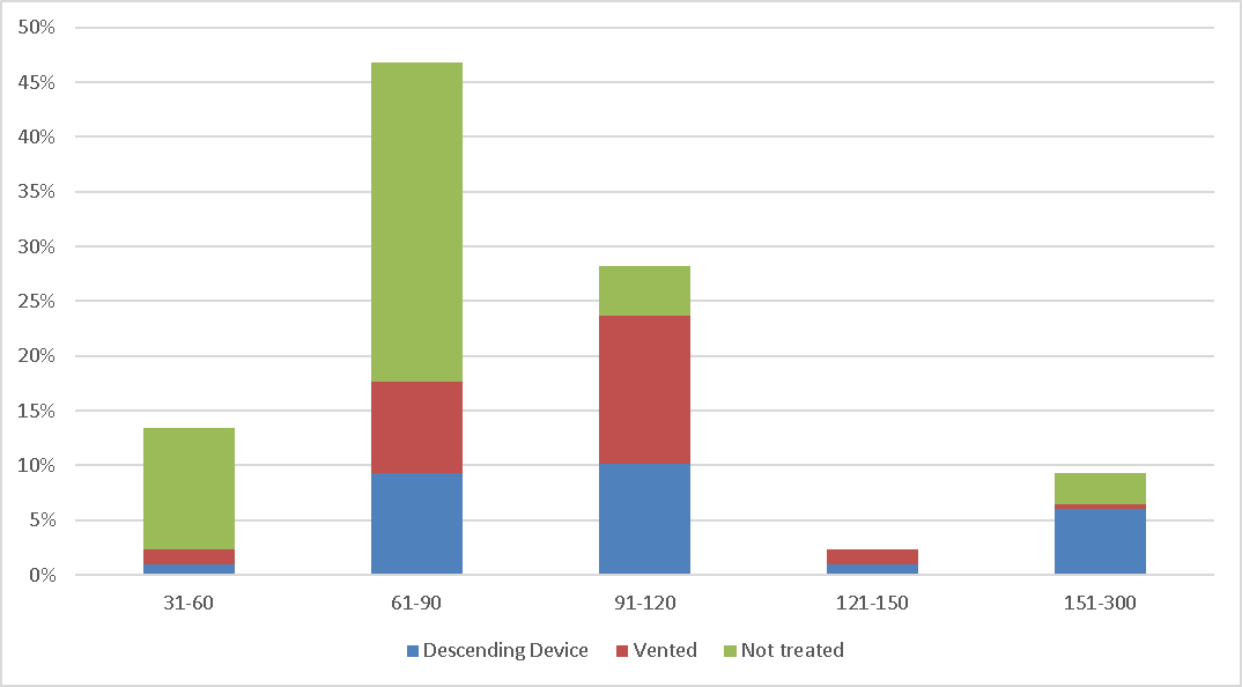

Figure 7. Percent of released fish by release treatment (descended, vented, not treated) and by depth bin from the MFC Data.

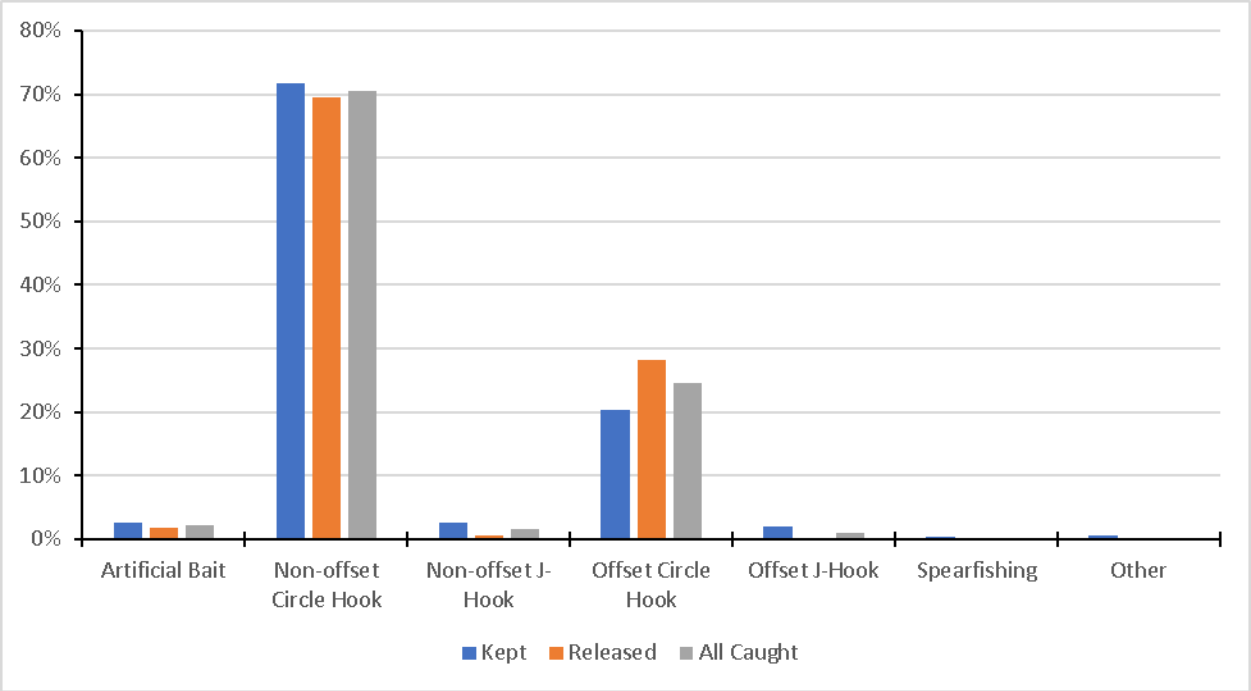

Figure 8. Percent of released fish caught by hook type from the MFC Data.

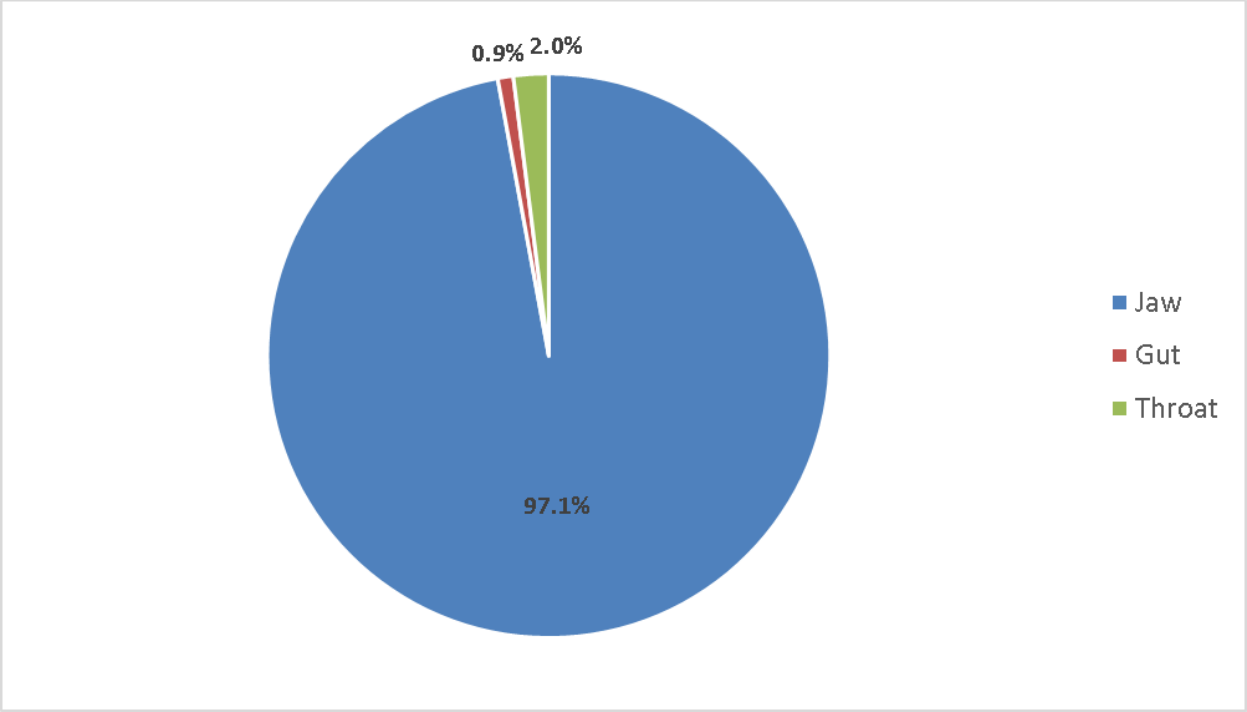

Figure 9. Percent of released fish by position hooked from the MFC Data.

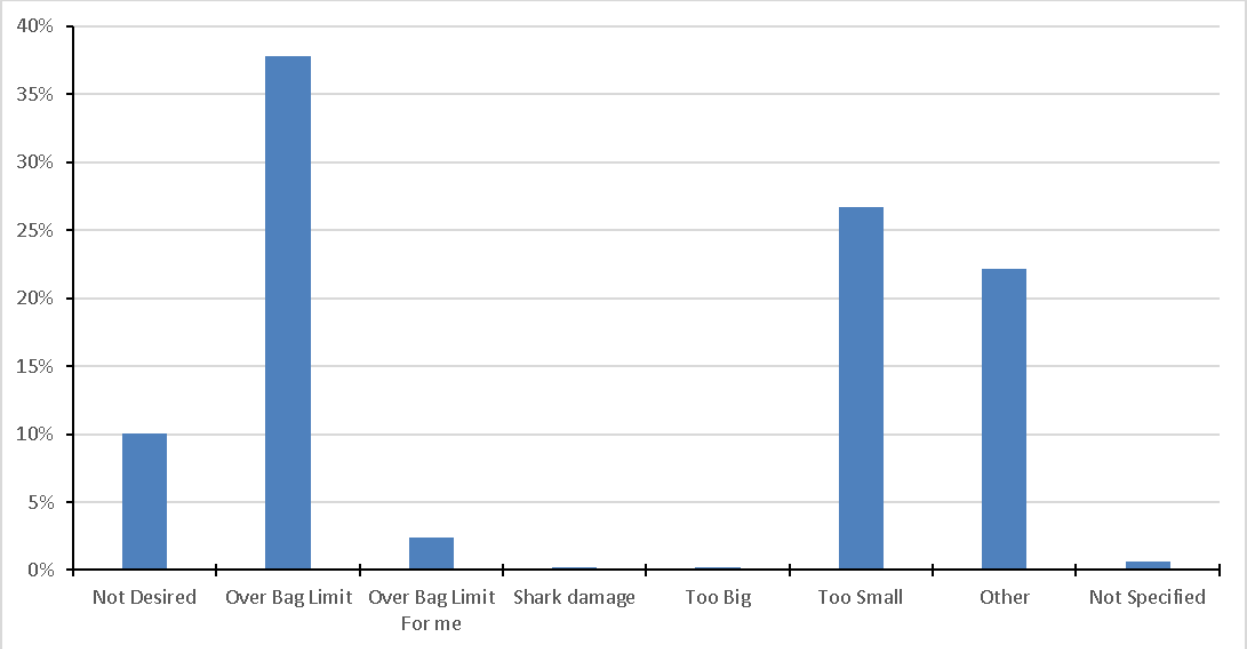

Figure 10. Percent of released fish by reason for release from the MFC Data.