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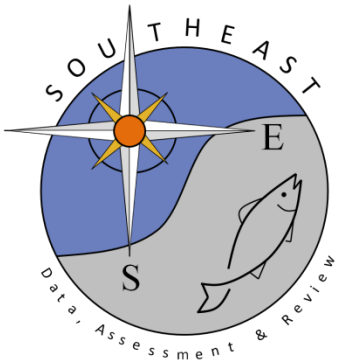

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Beverly Sauls and Dominique Lazarre

Florida Fish and Wildlife Conservation Commission
Fish and Wildlife Research Institute
Saint Petersburg, FL

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Saint Petersburg, FL

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Executive Summary

Landings in the recreational fishery for Red Snapper *Lutjanus campechanus* in the southeastern U.S. Atlantic have historically been monitored through a general survey of all saltwater fishing called the Marine Recreational Information Program, or MRIP. A majority of landings estimated through the MRIP survey were attributed to the Atlantic coast of Florida. However, the recreational fishery has been managed with an annual harvest season ranging from 0 to 9 days since 2010. In order to improve precision of fishing effort and harvest estimates over such short seasons, the state of Florida has developed specialized survey methods (Sauls et al. 2017).

This report summarizes methods and final results for specialized surveys of the private boat and charter segments of the recreational fishery operating from the east coast of Florida during the 2019 recreational season for Red Snapper in the South Atlantic. Sampling activities were conducted over two weekends in July (Friday through Sunday, July 12-14 and Friday through Saturday, July 19-20) when recreational harvest of Red Snapper was open. Prior to the season opening, a paper log-sheet was also mailed to charter vessel operators based in Florida that possess a federal permit for South Atlantic Snapper-Grouper, which was followed up the week after the season closed with telephone contacts to collect information specifically on Red Snapper fishing effort and catch. Final estimates are provided for both the private boat and charter segments of the recreational fishery.

During the 2019 season, weather conditions were favorable for offshore fishing. Similar to 2018, wave heights did not exceed one meter across the five days. High levels of boating activity were observed throughout the study region and an estimated 56,043 angler trips (SE ±9,237) targeted Red Snapper over the five days. A total of 990 private boat parties were interviewed upon returning from trips, and 81.7% reported fishing for Red Snapper. An estimated 37,750 (SE ±6,292) Red Snapper were harvested over the five-day season, and the mean length and weight of fish sampled from private boat trips was 595.54 mm (±4.40) midline length and 4.17 kg (±0.078).

For the federally permitted charter fleet, a total of 533 charter vessels in the MRIP For-Hire Survey Frame that matched a South Atlantic Snapper-Grouper permit were included in the sample frame, and 415 were selected for this survey. Of those selected, 74.0% responded and 29.0% of the total responses came from log sheets that were returned via mail. An estimated 3,227 (±218) Red Snapper were harvested during 2,899 (±181) angler trips from charter vessels over the five days. The majority (99%) of charter landings were from northeast Florida Martin County north to GA border). Captain and crew on for-hire vessels may retain the recreational bag limit, and the mean CPUE was 1.12 (±0.03) fish harvested per angler trip in northeast Florida and 0.57 (±0.12) in the Florida Keys. Red Snapper sampled from charter boats averaged 624.71 mm (±6.101) and 4.85 kg (±0.122).

The Red Snapper harvest season also provided an opportunity to collect fishery dependent biological samples, including length, weight and age structures. During 2019, biological data was collected from 1,678 Red Snapper sampled from private boats and 446 sampled from charter boats.

Section 1. Private Boat Mode

Methods

The survey design and estimation methods for private boat mode described below were developed over three prior Red Snapper seasons. Details for how methods were tested and validated, as well as results from the first three years, are described by Sauls et al. (2017).

Sample Design — Off the Atlantic coast of peninsular Florida, recreational boaters must pass through one of nine navigable inlets to access Red Snapper fishing grounds in the Exclusive Economic Zone (Figure 1.1). Recreational boat traffic through each of these egress points was monitored during the season. Each day that an inlet was sampled, boat traffic was observed during one of two time periods. The a.m. period began during local sunrise time (6:30 a.m.) and ended at 12:59 p.m., and the p.m. period began at 1:00 pm and ended at local sunset time (8:30 p.m.). Each inlet was randomly sampled at least two separate days during one a.m. and one p.m. period each weekend. This sample design ensured that recreational boat activity across the region was observed throughout each day, and that variable fishing effort in response to localized weather and offshore conditions across weekends was measured and accounted for. Matanzas Inlet is a minor egress point and was only monitored one day each weekend at the same time as the nearest major inlet (St. Augustine). A ratio adjustment was calculated and applied to St. Augustine to account for the small amount of additional effort through Matanzas Inlet.

Launch sites for private recreational boats were randomly selected for a complementary access point intercept survey over each weekend. The purpose of the intercept survey was to interview parties as they return from boating trips to determine whether they were fishing for Red Snapper, measure catch rates, and collect biological samples from harvested fish. The intercept survey also provided data that were necessary for accurately estimating fishing effort. During an assignment, each party that returned from a recreational boat trip was interviewed to determine the proportion that exited through inlets for the purpose of targeting Red Snapper and the proportion that departed before sunrise and were not accounted for in inlet boat count survey. Field procedures for conducting trip interviews with intercepted vessels are described in reports for previous years (Sauls et al. 2013, 2014).

Estimation.—

The following steps were used to estimate total fishing effort:

1) The numbers of recreational boats observed exiting through each inlet during daylight hours was expanded to generate an unadjusted seasonal estimate of boat trips in the Atlantic Ocean across all inlets;

2) The estimated number of boat trips taken by federally permitted charter vessels (see next section) was subtracted;

3) The remainder was multiplied by the proportion of private recreational boat parties and non-federally permitted charter parties that reported targeting Red Snapper during intercept survey interviews;

4) The estimated boat trips that targeted Red Snapper was adjusted to account for additional boat parties that reported exiting through inlets before sunrise to target Red Snapper; and

5) The adjusted boat trips that targeted Red Snapper was multiplied times the mean number of anglers per intercepted boat party to get the total estimated number of angler trips targeting Red Snapper.

Landings are estimated by multiplying total effort by the mean CPUE (catch per angler trip) estimated from intercept data. Intercept data are weighted proportional to fishing effort across each inlet. A description of calculations is provided in prior years' reports and in Sauls et. al 2017.

Results

Fishing effort in 2019 was high and was not impacted by the reduction to five days, down from six days in 2018 (Figure 1.2). Overall, weather was favorable for offshore fishing across the five days that the season was open in 2019. Similar to the previous year, wave heights did not exceed 1 meter during the 2019 season (Figure 1.3). A total estimated 37,750 (SE $\pm$6,292) Red Snapper were harvested by private boat anglers (Table 1.2), and 56,648 (SE $\pm$10,163) fish were discarded (Table 1.3). Overall catch per unit effort (CPUE) for landed fish was 0.674 (SE $\pm$0.017, Table 1.2) and has not varied significantly across years (Figure 1.3). Harvest rates are constrained by the one fish per person bag limit; however, discard rates have been relatively high the past two seasons (Figure 1.4), which is an indicator that anglers are catching higher numbers of fish when they are successful at locating Red Snapper. In the absence of a size limit, an increased discard rate may also indicate anglers are more selective in the fish they choose to retain. Landed fish averaged 595.54 mm fork length (SE $\pm$4.40) and 4.17 kg (SE $\pm$0.078).

References

Sauls, B. J., R.P. Cody, and A.J. Strelcheck. 2017. Survey methods for estimating Red Snapper landings in a high-effort recreational fishery managed with a small annual catch limit. North American Journal of Fisheries Management 37:302-313.

Table 1.1 Effort estimates for private boat mode ±SE.

Inlet	Number of boat parties intercepted	Mean anglers per party	Proportion of trips targeting Red Snapper	Proportion of trips departing after sunrise	Targeted boat trips	Targeted angler trips
Cumberland	52	3.69±0.195	0.867±0.062	0.810±0.061	874±370	3,226±1,373
Mayport	183	3.66±0.105	0.862±0.037	0.636±0.037	1,914±948	7,005±3,474
St Augustine	139	4.07±0.140	0.850±0.046	0.531±0.044	2,096±936	8,541±3,822
Ponce Inlet	176	3.75±0.145	0.857±0.037	0.609±0.038	2,721±1,082	10,182±4,064
Port Canaveral	274	4.07±0.099	0.946±0.019	0.596±0.030	3,715±1,334	15,199±5,467
Sebastian Inlet	87	3.65±0.155	0.843±0.051	0.642±0.053	2,331±825	8,594±3,060
Fort Pierce	34	3.43±0.374	0.414±0.092	0.857±0.094	675±240	2,316±855
St. Lucie	45	2.83±0.642	0.194±0.071	1.000±0.000	345±169	979±517
Overall	990	3.86±0.054	0.817±0.017	0.618±0.017	14,672±2,372	56,043±9,237

Table 1.2. Mean CPUE (landings per angler trip) and estimated total landings ±SE.

Inlet	CPUE	Landings (numbers of fish)	Mean weight (kg)	Landings (kg)
Cumberland	0.632 (±0.070)	2,040 (±892)		
Mayport	0.624 (±0.028)	4,372 (±2,179)		
St Augustine	0.665 (±0.038)	5,683 (±2,559)		
Ponce	0.770 (±0.035)	7,843 (±3,147)		
Port Canaveral	0.711 (±0.025)	10,810 (±3,905)		
Sebastian	0.611 (±0.057)	5,252 (±1,924)		
Fort Pierce	0.729 (±0.116)	1,689 (±672)		
St. Lucie	0.059 (±0.047)	58 (±49)		
Overall	0.674 (±0.017)	37,750 (±6,292)	4.17 (±0.078)	157,418 (±26,398)
c.v.	0.025	0.167	0.019	0.168

Table 1.3. Mean CPUE (discards per angler trip) and estimated total discards ±SE.

Inlet	CPUE	Discards (numbers of fish)
Cumberland	1.252 (±0.268)	4,038 (±1,888)
Mayport	1.002 (±0.134)	7,017 (±3,573)
St Augustine	1.229 (±0.137)	10,499 (±4,814)
Ponce	1.054 (±0.146)	10,733 (±4,495)
Port Canaveral	0.810 (±0.087)	12,311 (±4,598)
Sebastian	1.269 (±0.347)	10,902 (±4,780)
Fort Pierce	0.500 (±0.230)	1,158 (±654)
St. Lucie	0	0
Overall	1.011 (±0.073)	56,648 (±10,163)
c.v.	0.072	0.179

Table 1.4. Season length and total catch estimates for private boat mode expressed in numbers of Red Snapper during 2019, compared to previous seasons.

Year	Month(s)	Number of days	Estimated harvest $\hat{C}_{harv}(\pm s.e.)$	Estimated discards $\hat{C}_{disc}(\pm s.e.)$
2019	July	5	37,750 (±6,292)	56,648 (±10,163)
2018	August	6	30,050 (±6,256)	41,660 (±10,057)
2017	Nov.-Dec.	9	5,390 (±475)	4,331 (±561)
2014	July	8	22,013 (±2,782)	9,755 (±1,741)
2013	August	3	6,999 (±1,321)	5,033 (±1,512)
2012	Sept.	6	11,136 (±1,734)	17,587 (±9,031)

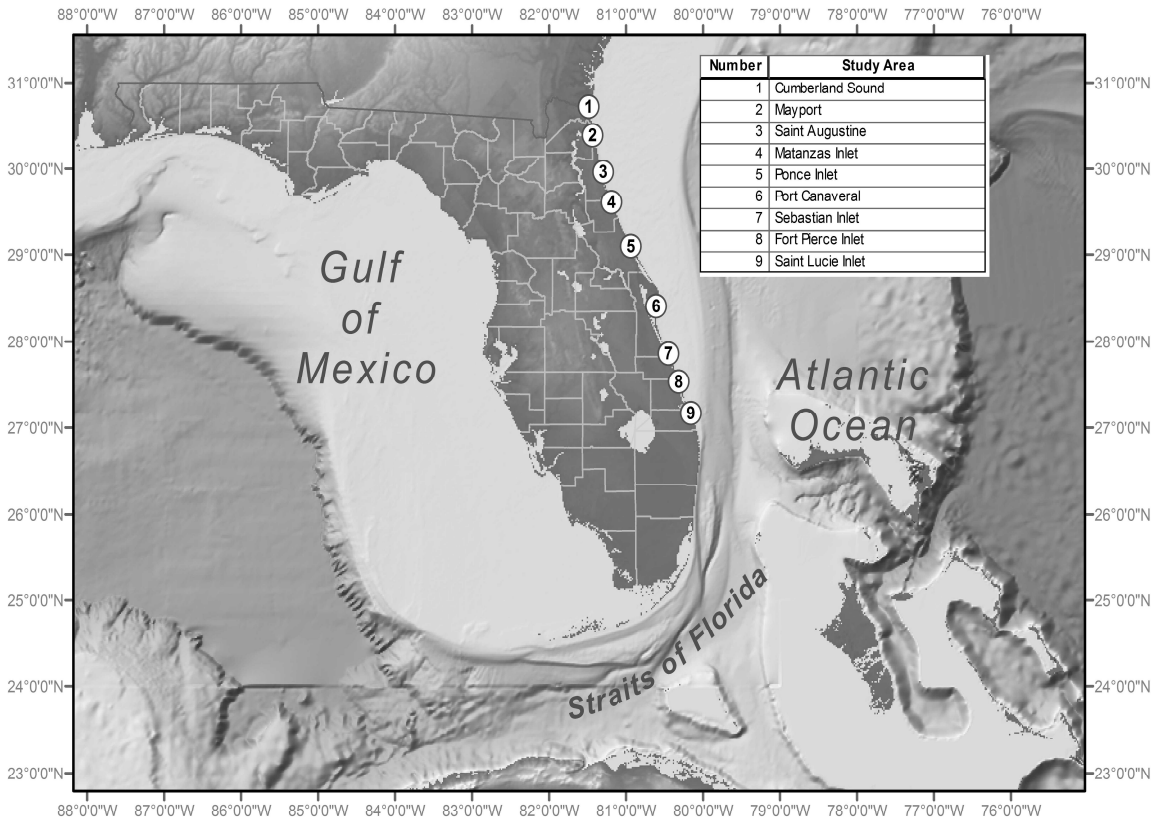


Figure 1.1. Inlets included in study area.

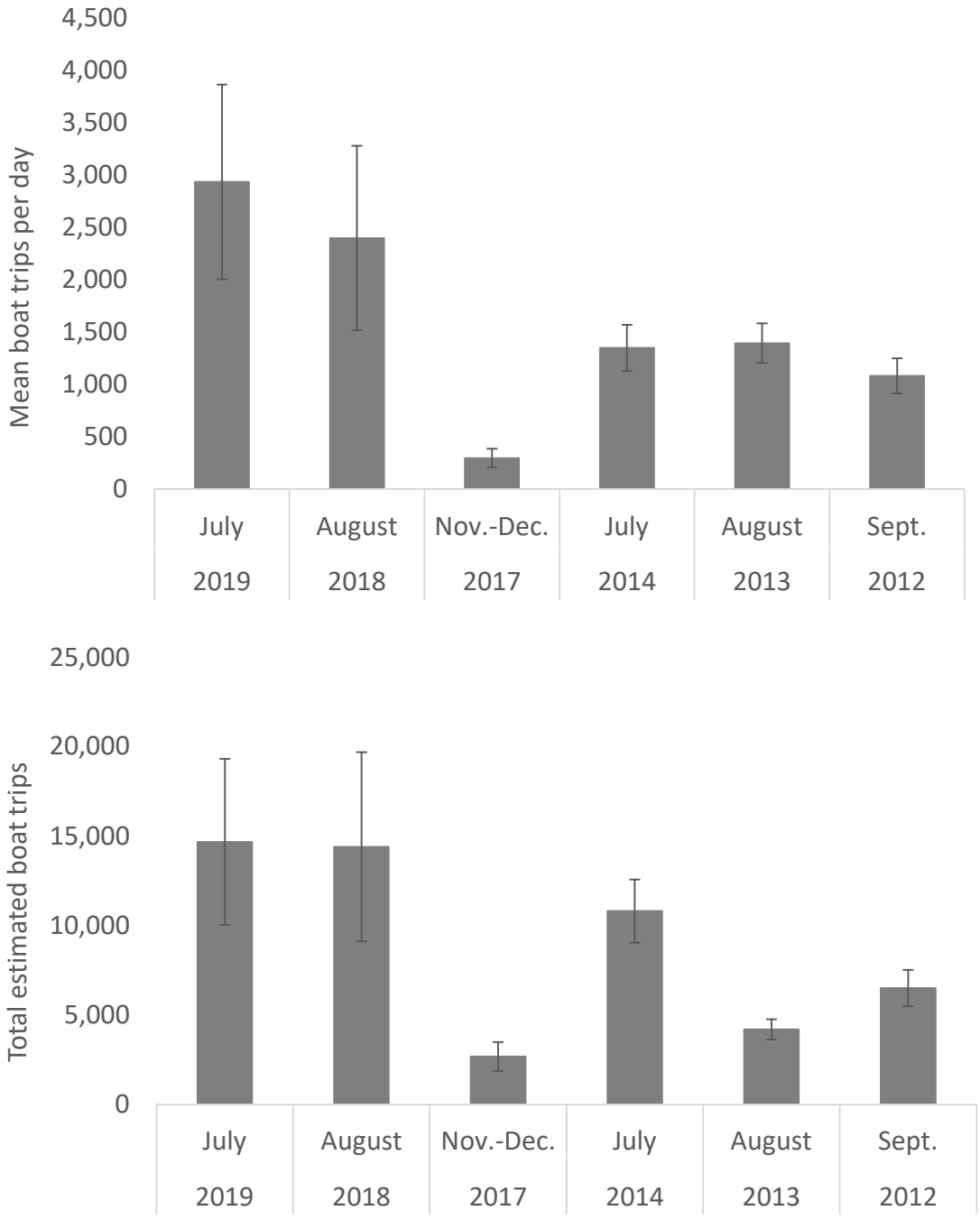


Figure 1.2. Mean boat parties per day that targeted Red Snapper during the harvest season (top panel), and total estimated boat trips (bottom). Effort has increased in the two most recent years that the survey was conducted (2018-2019). Low effort in 2017 was attributed to poor weather conditions for offshore fishing in November and December.

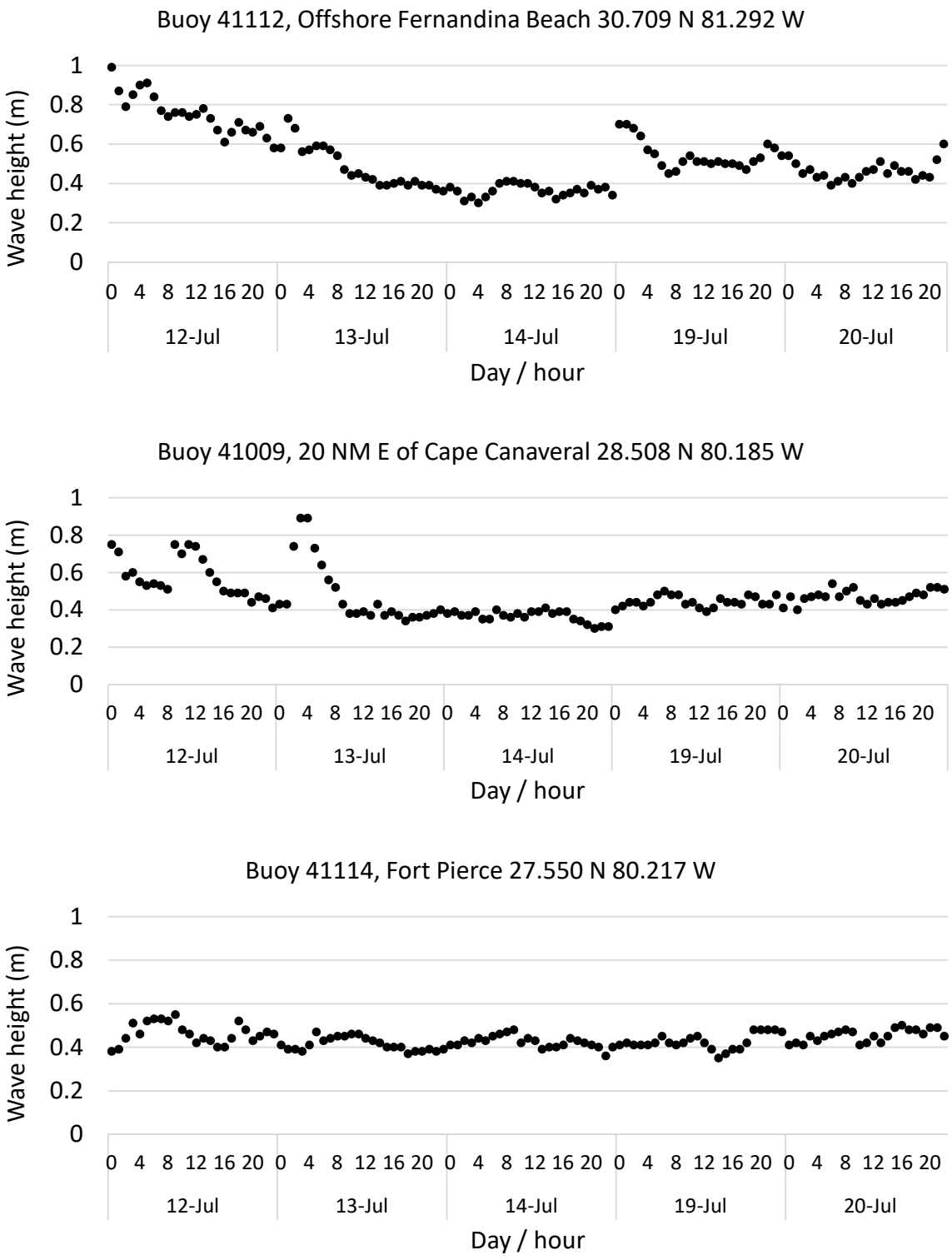


Figure 1.3. Hourly wave heights during the 2019 South Atlantic Red Snapper season. Source: NOAA Weather Buoy data, https://www.ndbc.noaa.gov/maps/Southeast.shtml

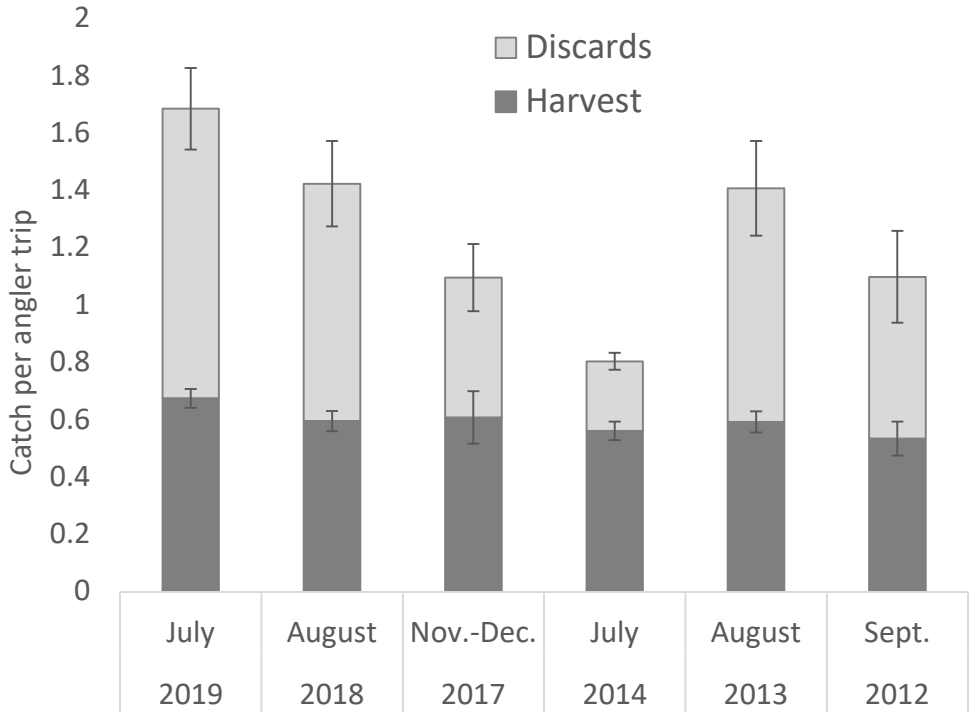


Figure 1.4. Mean catch per unit effort across years. Numbers of fish harvested per angler has remained steady, and is constrained by the one fish per person bag limit. Higher discard rates in recent years indicate anglers are catching more fish when they are successful at finding them.

Section 2: Charter Mode

Methods

Mail / Telephone Survey —The FWC maintains a list of active charter vessels that is used as the sample frame from which the MRIP For-Hire Telephone Survey (FHTS) weekly draw (10% of active vessels) is selected. For this survey, charter vessels in the wave 4, 2019, of the FHTS sample frame were matched to a list of charter vessels with a valid federal permit to harvest Snapper-Grouper species in the South Atlantic. This permit is required to harvest Red Snapper from the EEZ adjacent to the east coast of Florida. Charter vessels that do not possess a federal permit are more effectively monitored through the MRIP survey, since they may harvest legal sized Red Snapper year-round in state waters. However, this is rare due to the 20" size limit and distribution of larger fish farther offshore, outside state jurisdiction (particularly in northeast Florida). All vessels in the FHTS sample frame with a South Atlantic Snapper-Grouper permit were selected for this survey, with the exception of vessels that were randomly selected by MRIP to participate in the FHTS during the weeks the South Atlantic Red Snapper season was open.

The week before the July fishing season opened, each selected vessel was sent a letter describing the intent of FWC staff to collect catch and effort data for charter trips targeting or harvesting Red Snapper (Appendix 1). The letter explained that captains could participate in the survey by completing and returning the enclosed log sheet or, if no log sheet was received, FWC staff would attempt to contact them by telephone at the end of the Red Snapper season. The log sheets were printed on waterproof paper to encourage captains to bring the log sheet underway to improve the accuracy of responses, and a pre-paid postage envelope was also provided to encourage prompt return of the log sheet. The logs provided space to record trip and catch level data for up to three trips that targeted Red Snapper on each day of the South Atlantic season, including: number of anglers, number of passengers, trip origin (state and county), distance from shore and depth fished, dock to dock hours, hours fished, and numbers of Red Snapper harvested and released (Appendix 2). Each vessel representative was called up to five times, or until a successful contact was made or their mailed log sheet was received. Vessels that did not return the log sheet or that could not be contacted by the fifth call attempt were marked as non-contacts for the fishing season.

Catch and Effort Estimation – Survey responses were used to estimate the total number of charter boat trips that targeted Red Snapper, charter angler trips that targeted Red Snapper, and numbers of fish harvested and discarded by all active federally permitted charter vessels during the July 2019 South Atlantic Red Snapper fishing season. The formula used to calculate the total boat trips, angler trips, and numbers of fish harvested and released for each region and month is:

$$\hat{Y} = \sum_{i=1}^{n} w_h \, y_{h,i} \qquad (2.1)$$

Where $y_{h,i}$ corresponds with the total number of boat trips, anglers, or fish reported by respondent *i* in region *h* during the two weekends when Red Snapper harvest was open, and w_h is a sample weight, calculated as:

$$W_h = {}^{N_h}/_{n_h} \qquad (2.2)$$

Where N_h is the total number of federally permitted active charter vessels in region *h*, and n_h is the total number of vessels in region *h* that responded to the survey. The SAS procedure, PROC SURVEYMEANS, was used for this estimation (Appendix 3), and the variance is calculated using the Taylor Series method (SAS Institute Inc., 2008).

The northeast region included counties on the Atlantic coast of Florida north of Palm Beach County, where Red Snapper are most likely to be targeted, the southeast region included southern counties where the species is rarely encountered, and Monroe County was a separate region (Table 2.1). Charter vessels on the Gulf coast of Florida that carry the S. Atlantic Snapper – Grouper permit were also surveyed as a separate region during the July fishery opening to determine if any participate in the short seasonal opening (Table 2.1).

Estimated catch and effort were not adjusted for permitted vessels that are not included in the survey because they were not identified as active charter vessels in the FHTS frame. However, any such vessels also would have been counted as private boats during inlet boat counts (described in Section 1 above). Thus, it would be inappropriate to also account for under-coverage in the charter survey. Charter fishing effort and catch reported by respondents in this survey were not independently validated in the field.

Undercoverage Adjustment – Off-frame charter vessels were encountered during surveys described in section 1, and data collected from these vessels was included in expansions for total effort and catch in the private boat fishery. Thus, no adjustments for under-coverage were necessary in the mail and phone survey of federally permitted charter vessels in the NE region. In the Keys, where private anglers rarely target Red Snapper in the EEZ, no special field surveys are conducted and no information on off-frame charter vessels is available. However, the charter fishery in Keys is a minor portion of total recreational landings for Red Snapper on the east coast of Florida, and any under-coverage is expected to be small.

Results and Discussion: Charter Mode

The 2019 South Atlantic Red Snapper season marked the third year that a dual mail / phone survey was used to collect trip level data from the federal for-hire fleet. Unlike the 2017 season that occurred during November and December, the 2018 and 2019 seasons occurred during summer months, with comparable weather conditions and season lengths. The survey was distributed to 77.8% of the known, active charter vessels with a valid federal South Atlantic Snapper-Grouper permit. While the overall response rate remains high, 74%, the response rates from regions on the east coast of Florida were lower than in prior years of the survey (Table 2.2). The biggest decrease in response rate was observed in southeast Florida declining from 81.6% in 2018 to 68.3% in 2019. In this region, there was an increase in the number of vessels that needed to be called five times, with no successful contacts made during those attempts (Figure 2.1). The highest proportion of responses continued to come from surveys sent to vessels registered in West Florida. Few federally permitted vessels with home ports on the west coast of Florida participated in the South Atlantic Red Snapper season, requiring these vessels only to respond ‘No’ to survey questions, a minor inconvenience to complete the survey. Additionally, providing two modes for

reporting continues to allow high participation from charter representatives, with an overall mail and phone response rate of 29% and 71%, respectively. (Figure 2.1).

Before generating catch and effort estimates, the length frequency distribution of vessel lengths of the full charter vessel population was compared to the vessel lengths of the respondents and participants to determine if the latter groups are representative of the full charter population. The vessel length distributions of the full charter population and respondents appear to have similar shape and are likely representative (Figure 2.2). The length distribution observed in 2019 shows a shift in the number of smaller vessels, with fewer vessels in the 20 ft length bin with active permits or participating as compared to 2017 and 2018.

Estimates of boat trips, angler trips, harvest, and discards were generated for Region 1 (NEFL – Nassau to Martin Counties), Region 3 (Florida Keys - Monroe County), and Region 4 (WFL – Escambia to Collier Counties); no trips were reported by respondents from Region 2 (SEFL – Palm Beach to Miami-Dade). During the 2019 season, an estimated 3,227 (±218) Red Snapper were harvested during 584 (±33) boat trips. The highest charter participation was reported in northeast Florida, accounting for 99.1% of the red snapper harvested and 97.8% of the boat trips (Table 2.2). While estimates were provided for Regions 3 and 4, these estimates were based on five and two reported trips, respectively. The number of harvested Red Snapper estimated in these two regions, 28 (±17) was 78.6% lower than the harvest estimated for those regions in 2018.

Each vessel provided trip level information about the depth and distance from shore where fishing occurred during charter trips (Table 2.4). Vessels from Region 1 reported the most charter trips, with an average reported fishing depth of 29.8 meters and distance from shore of 22.2 miles. The handful of trips reported from the Florida Keys reported fishing depths ranging from 46-305 meters, with an average distance from shore of 33.3 miles. The two trips reported by a vessel registered to Region 4 (West Florida) occurred in Monroe County (Florida Keys), accounting for an average fishing depth of 43.3 meters, at a distance from shore of 5 miles.

Charter vessels without federal permits were not included in this survey; however, when fishing in state waters they must abide by the 20” size limit. Legal sized fish are rare in state waters off the northeast coast of Florida, where Red Snapper are most abundant, although legal sized fish could be targeted in state waters off Dade and Monroe Counties during the South Atlantic season. However, given that state waters are open year-round there is no incentive for state vessels to target Red Snapper during the short South Atlantic season. In 2017 and 2018, the MRIP did not intercept any Red Snapper harvested by charter anglers during any wave from state waters off the Atlantic coast of Florida. For these reasons, it is unlikely that charter landings were missed by not including state vessels in this survey.

During the 2019 South Atlantic Red Snapper season, there were 108 charter fishing trips intercepted by Fisheries Dependent Monitoring staff. These included charter vessels fishing for federal and state-managed species other than Red Snapper. The majority of the vessels intercepted, 73% (60 vessels), could be matched to a vessel in the For-Hire Telephone Survey (FHTS) sample frame. The list of federally permitted vessels is used along with other sources to routinely update charter vessel information in the FHTS sample frame; however, new vessels may not be added to the list unless they are confirmed to be actively charter fishing and all necessary location and

contact information is obtained. Charter vessels that participate in the Red Snapper season and are not listed as active in the FHS sample frame are accounted for in effort and catch estimates for the private recreational (non-charter) fishery described in section 1, thus a correction to account for under-coverage is not necessary. However, there is a need to validate the accuracy of self-reported data from active charter vessels with federal permits that were selected to report during the Red Snapper Season.

This year, an attempt was made to cross-validate the self-reported fishing effort provided in the mailed logs / phone calls from the charter survey with the trip data collected directly from charter vessels intercepted at boat ramps and marinas. A total of 34 vessels sampled at boat ramps and marinas were also selected for the charter survey. While most vessels intercepted in the field provided self-reported data about their trips, 9 vessels were unable to be reached to obtain trip reports. Trip reports from the remaining 25 intercepted vessels (accounting for 36 fishing trips) provided an opportunity to validate self-reported data and evaluate the under-reporting rate associated with the South Atlantic Red Snapper season opening (Figure 2.3). Trip data from 28 of the trips intercepted in the field, 77.78%, matched the reports provided by vessels in the charter survey. There were 6 intercepted trips, 16.67%, that could not be conclusively matched to self-reported fishing trips in the charter survey. Reported trips were likely matches for intercepted trips, but time (e.g. trip reported for a full day, when vessel was intercepted at noon) or date (trip times match, but trip dates do not match the day the vessel was intercepted) mismatches could not be logically resolved. The remaining 5.56% (2 fishing trips), were not reported in the logs (e.g. the vessel reported they did not fish), though these vessels were sampled in the field. These data suggest that under-reporting is ~ 6%. There was no way to measure over-reporting (operator reported a trip when a vessel was validated not fishing), which could potentially offset under-reporting. In future seasons, additional work will be done to improve standardization of names and registration numbers to attempt automated cross-referencing between databases and validate self-reported trip data through a separate method designed to measure both under and over-reporting.

Table 2.1. Regional groupings of coastal counties used for generating catch and effort estimates.

Region	Coastal Counties
Northeast	Nassau, Duval, Clay, St. Johns, Flagler, Volusia, Brevard, St. Lucie, Martin
Southeast	Palm Beach, Broward, Miami-Dade
Keys	Monroe
West Florida	Escambia, Santa Rosa, Okaloosa, Walton, Bay, Gulf, Franklin, Wakulla, Taylor, Dixie, Levy, Citrus, Hernando, Pasco, Pinellas, Hillsborough, Manatee, Sarasota, Charlotte, Lee, Collier

Table 2.2. Survey frame, summary of responses via mail and phone, and response rates by region.

Region	Charter Vessels	Total Selected	Number of Mail Responses	Number of Phone Responses	Response Rate
Northeast	166	138	34	61	0.688
Southeast	51	41	4	24	0.683
Keys	189	139	20	76	0.691
West Florida	127	97	31	57	0.907
Overall	*533*	*415*	*89*	*218*	*0.740*

Table 2.3 Summary of effort and catch estimates for the federally permitted charter fleet from Region 1 (NEFL), Region 3 (Keys), and Region 4 (West Florida), for the 2019 South Atlantic Red Snapper season.

Variable	Region	Estimate	S.E.	Var	C.V.
Boat Trips	Northeast	571	33	1066	0.057
	Keys	10	5	21	0.462
	West Florida	3	2	3	0.554
	Overall	*584*	*33*	*1089*	*0.056*
Angler Trips	Northeast	2848	180	32437	0.063
	Keys	39	19	347	0.473
	West Florida	12	6	41	0.554
	Overall	*2899*	*181*	*32825*	*0.062*
Harvest	Northeast	3199	218	47417	0.068
	Keys	28	17	281	0.609
	West Florida	0	0	0	-
	Overall	*3227*	*218*	*47698*	*0.068*
CPUE	Northeast	1.129	0.026	0.001	0.023
	Keys	0.700	0.577	0.333	0.824
	West Florida	0.000	0.000	0.000	-
	Overall	*1.12*	*0.02797*	*0.000782*	*0.025*
Discards	Northeast	4908	589	346352	0.120
	Keys	0	0	0	-
	West Florida	0	0	0	-
	Overall	*4908*	*589*	*346352*	*0.120*

Table 2.4 Summary of reported depth and distance from shore for charter fishing trips occurring during the 2019 South Atlantic Red Snapper Season.

Region	Boat Trips	Depth (m)		Distance From Shore (mi)	
		Mean	*S.E.*	*Mean*	*S.E.*
Northeast	327	29.8	10.90	22.2	9.41
Keys	5	139.0	110.04	33.3	29.25
West Florida	2	43.3	-	5.0	-
Overall	334	*34.3*	*30.65*	*22.6*	*11.45*

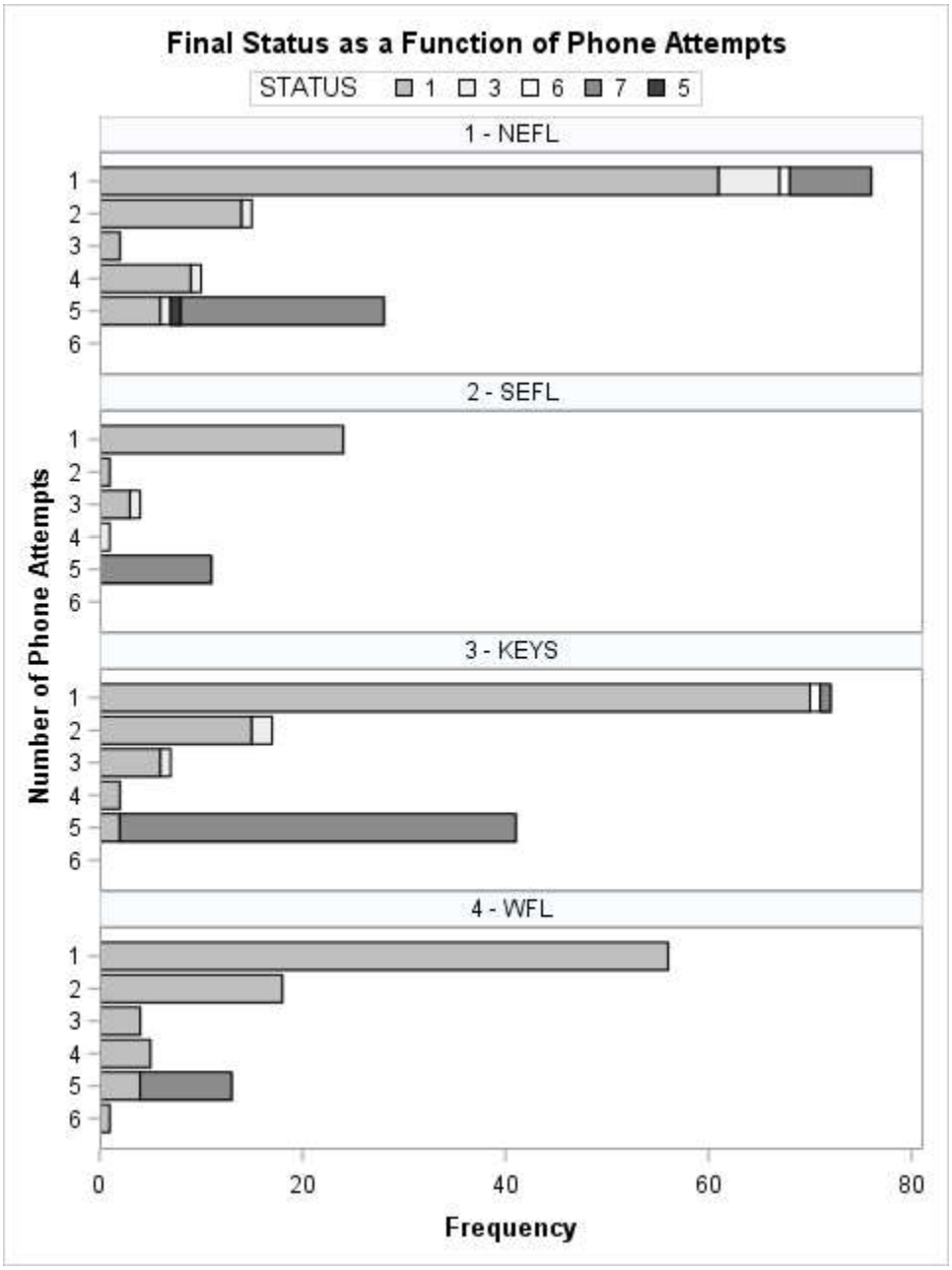
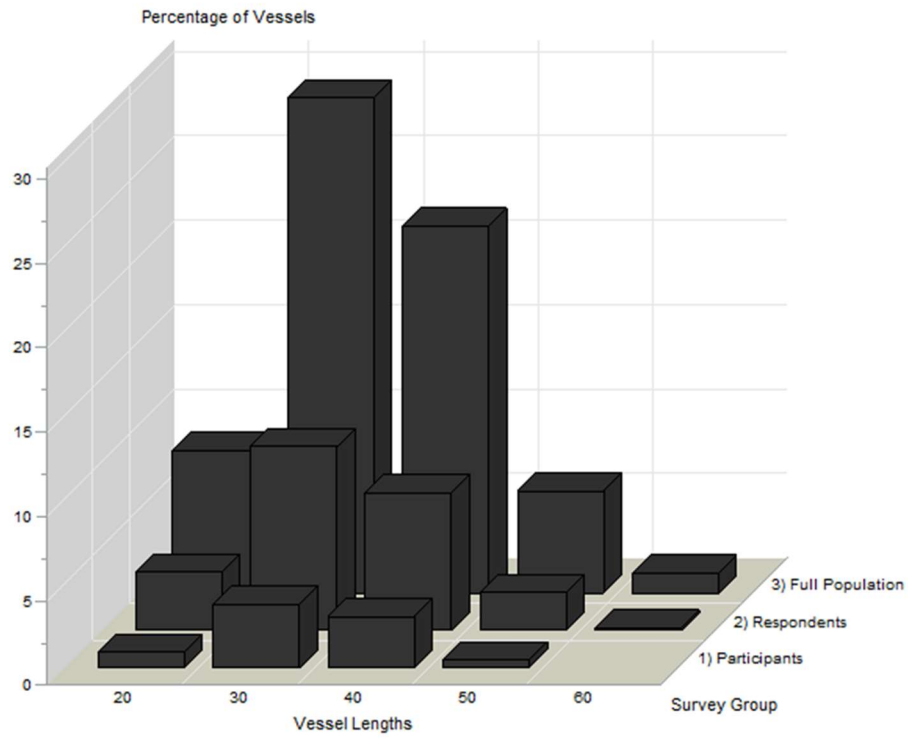


Figure 2.1 Frequency of attempted phone calls to federally permitted charter representatives, as a function of the status after the final call. Status Codes: 1=Complete interview, 2=Incomplete, but all key questions answered, 3=Refusal, 4=Language barrier, 5=Mid-Interview refusal, 6=Ineligible, 7=Unable to Contact, 8=Inactive.

A



B.

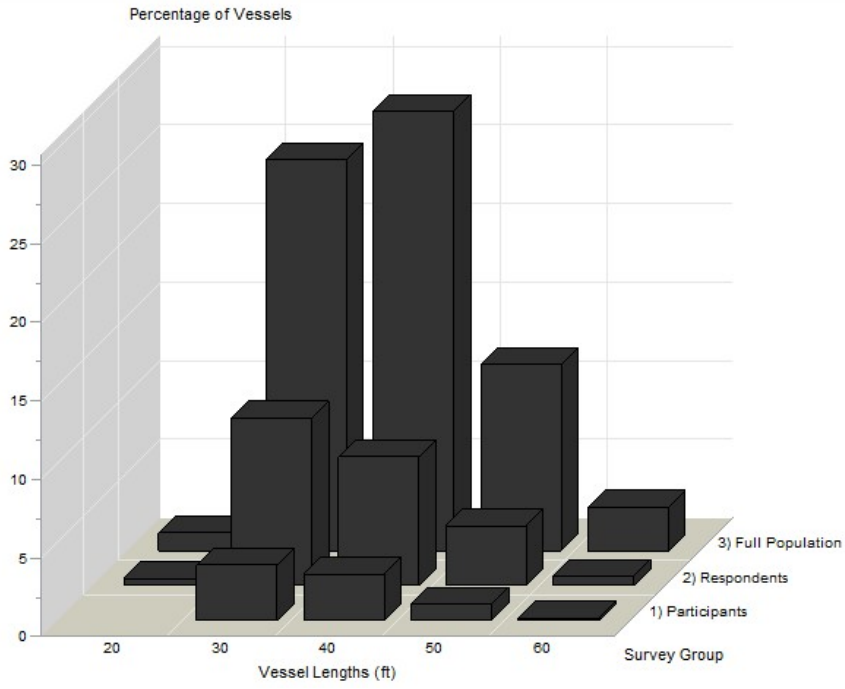


Figure 2.2 Percentage of vessels in 10 ft. length bins for three charter vessel groups: Full Population – Vessels with active federal South Atlantic Snapper-Grouper permits, Respondents – Vessels that responded to the survey, and Participants – Vessels that responded to the survey and conducted Red Snapper trips during the 2018 (A) and 2019 (B) South Atlantic Red Snapper fishing seasons.

Section 3. Biological Sampling

Methods

The Red Snapper harvest season provides an opportunity to collect fishery dependent biological samples. During the 2019 season, age structures were collected from fish sampled during intercept surveys at sites where predominantly private recreational boats land catch (described above in Section 1). During interviews with fishing parties, all available Red Snapper were measured (at midline in mm), weighed (kg), and one otolith was extracted. Priority was given to collecting the left otolith, and this was done to quickly process fish so they could be returned to anglers.

In addition, fish were sampled from private boat and charter fishing parties as part of a three-year pilot study to test methods for collecting biological data that are representative of the recreational fishery on the east coast of Florida. The study began in 2017 and is funded through MARFIN (award number NA16NMF4330163). The survey design includes year-round, stratified random sampling of offshore landing sites clustered around egress points along the east coast of the Florida peninsula. Snappers, groupers, and other managed species are targeted for collection of biological data. Additional MARFIN assignments were issued at sites where charter vessels land catch to increase samples collected from this segment of the recreational fishery, and assignments were also conducted at sites with private boat mode pressure as originally scheduled to supplement data collected during the Red Snapper intercept survey.

To account for varied sampling rates across inlets in the study area, sample weights were calculated. For private boat catch, sample weights were calculated for each inlet as:

$$W_h = {\hat{C}_h}/{n_h} \qquad (3.1)$$

where $\hat{C}_h$ is the estimated landings for inlet h (reported in Table 1.3), and n is the number of fish sampled in inlet h (reported in results section below). Sample weights for each inlet were used to calculate an overall weighted mean for fork length (in mm) and kilograms for landed fish (using the survey means procedure in SAS). The sample weights for fish in each 1 cm length bin were also summed and divided by the sum of all sample weights (equal to total estimated landings) to calculate the weighted proportion of fish in each size category.

Red Snapper otoliths were assigned a unique sample number and associated data entered into the central database for fishery dependent biological samples housed at FWRI. Data are stored on a secure network that is routinely backed up. Otoliths collected during the 2018 season will be sectioned and aged in house at FWRI's Age and Growth Lab. Otoliths from fish sampled by the state of Georgia were also shipped to FWRI for processing. All resulting biological data will be shared with analysts from the NMFS Southeast Fisheries Science Center for the next SEDAR stock assessment update. Resulting ages for fish sampled during the 2017 season are also presented.

Results

Biological Samples collected during 2019

Sample sizes for numbers of Red Snapper measured, weighed, and sampled for age and growth during 2019 are provided in Table 3.1. The mean length and weight for Red Snapper sampled from private boat trips and charter trips that were not included in the charter survey was 595.54 ±4.399 mm fork length and 4.17 ±0.078 kg. The weighted length frequency of fish harvested by private boat anglers is shown in Figure 3.1. Red Snapper sampled from charter boats that were included in the charter survey averaged 624.71 mm (±6.101) and 4.848 kg (±0.122). The length frequency of fish harvested by charter boat anglers is also shown in Figure 3.1.

Table 3.1. Numbers of fish sampled for length, weight and otoliths from private boat trips (intercept surveys and MARFIN combined) and charter boat trips (intercept surveys and MARFIN combined). Numbers in parenthesis indicate additional fish sampled during intercept surveys from vessels that were not included in charter survey, and were thus included in the catch estimate for private boats.

PRIVATE BOAT			
Inlet	Number of Length Samples	Number of Weight Samples	Number of Otolith Samples
Cumberland	57	50	56
Mayport	211	211	208
St. Augustine	371	336	354
Ponce Inlet	335	290	301
Port Canaveral	626	611	620
Sebastian Inlet	63	63	58
Fort Pierce Inlet	14	14	14
St. Lucie Inlet	1	1	1
Total	*1678*	*1576*	*1612*
CHARTER BOAT			
Cumberland	27	11	26
Mayport	0	0	0
St. Augustine	167	105	165
Ponce Inlet	41	34	35
Port Canaveral	178	161	165
Sebastian Inlet	33	19	32
Fort Pierce Inlet	0	0	0
St. Lucie Inlet	0	0	0
Total	*446*	*330*	*423*

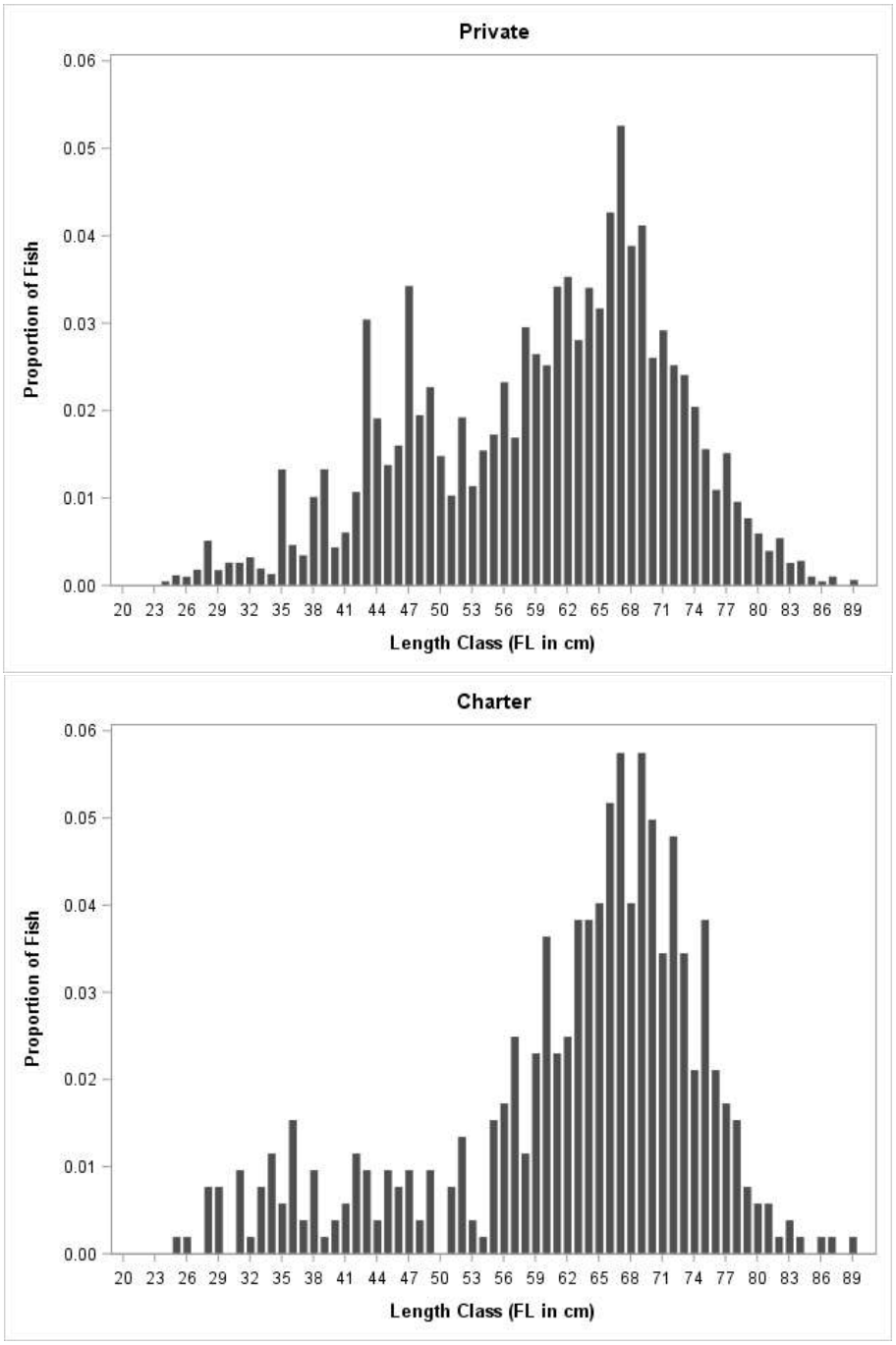


Figure 3.1 Size distribution of harvested Red Snapper sampled from private boat (top) and charter boat rips (bottom) during 2019. Samples for private boats are weighted proportional to total estimated landings for each inlet.

Appendix 1. Letter sent to federally permitted charter representatives the week prior to the South Atlantic Red Snapper season opening.

FWC RED SNAPPER SURVEY

Fish and Wildlife Research Institute
100 Eighth Avenue SE
St. Petersburg, Florida
33701-5020
Voice: 727-896-8626
Fax: 727-823-0166
Hearing/speech-impaired:
800-955-8771 (T)
800-955-8770 (V)
MyFWC.com/Research

July 3, 2019

Dear Florida Charter Vessel Operator;

The 2019 federal red snapper recreational fishery in the South Atlantic will be open for five days, over two weekends, July 12, 13, 14 and July 19, 20. The state of Florida is requesting your assistance so that we can collect more precise information on the numbers of charter trips and numbers of red snapper harvested during this short season. You are receiving this letter because our records show that you have a valid South Atlantic Headboat/Charter Snapper-Grouper permit. Enclosed is a log sheet printed on waterproof paper that may be used to keep track of your charter fishing activity during the 2019 federal red snapper recreational season. You may respond to this survey in one of two ways:

1. At the close of the federal red snapper season, return the completed log sheet using the self-addressed postage-paid envelope. If your charter business is not offering charter fishing trips in the Atlantic Ocean during the 2019 season, simply record this information at the top of the log sheet and mail it to us at your earliest convenience.

2. After July 20th, an FWC biologist will contact you by telephone to conduct a short interview and collect information about your charter fishing activity during the red snapper season. If you have already mailed your log sheet to FWC when you receive our call, please let the caller know and we will not contact you again.

We are collecting this additional information because the regular dockside intercept survey (when FWC biologists interview charter customers at the dock) was not designed to precisely estimate landings over very short fishing seasons. Therefore, your assistance during this special season is requested to ensure that we collect the best data possible to assess the federal red snapper season. Results from this survey will be shared directly with federal fishery managers for use in monitoring landings during the 2019 season and stock assessment updates for red snapper.

FWC will also be conducting dockside surveys with charter boat and private recreational anglers as they return from red snapper fishing trips. Biologists will ask for permission to weigh and measure fish and collect samples to determine the age of each fish. The recreational harvest season offers our only opportunity to collect this vital information for use in future stock assessments. To learn more about these efforts, please visit our website. A copy of the report produced last year is available at http://myfwc.com/research/saltwater/fishstats/recreational-fisheries/atlantic-results/. Please feel free to contact myself or Beverly Sauls at (727) 896-8626 or FishStats@MyFWC.com if you have any questions or concerns. Thank you for your cooperation.

Sincerely,

Dominique Lazarre

Dominique Lazarre
Associate Research Scientist

Appendix 2. Log sheet sent to federally permitted charter representatives the week prior to the South Atlantic Red Snapper season opening.

Florida - Red Snapper Survey Log **Vessel Name:** **Vessel Number:**

Did you participate in the 2019 South Atlantic Red Snapper Season (Trips where you kept, released or tried to catch Atlantic Red Snapper)? YES NO

If you circled yes above, please complete the log sheet below. Only report trips where Atlantic Red Snapper were ***targeted, harvested, or released at sea.***

Please return all completed log sheets with the self-addressed postage-paid envelope provided. Thank you for your participation.

Date	Day of Week	Trip No.	Trip Type (Charter, Headboat, or Other)	No. of Anglers	No. in Party	Origin of Trip		Miles from Shore (range)	Miles from Shore (majority of trip)	Depth Fished (majority of trip)	Time Trip Started (24hr)	Time Trip Ended (24hr)	Time Spent Fishing (nearest half-hr)	No. of Atlantic Red Snapper Kept	No. of Atlantic Red Snapper Released
						State	County								
7/12/2019	FRI	1													
7/12/2019	FRI	2													
7/12/2019	FRI	3													
7/13/2019	SAT	1													
7/13/2019	SAT	2													
7/13/2019	SAT	3													
7/14/2019	SUN	1													
7/14/2019	SUN	2													
7/14/2019	SUN	3													
7/19/2019	FRI	1													
7/19/2019	FRI	2													
7/19/2019	FRI	3													
7/20/2019	SAT	1													
7/20/2019	SAT	2													
7/20/2019	SAT	3													

Please write any additional comments about the season or your trips below or on the back of this sheet.