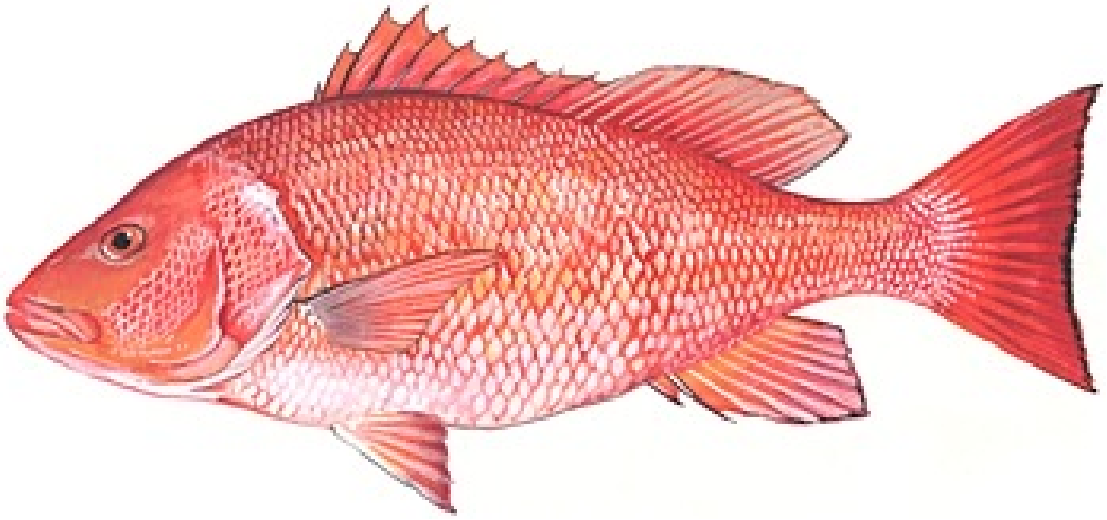
Total removals of red snapper (*Lutjanus campechanus*) in 2013 from the U.S. South Atlantic



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Introduction

This report provides 2013 estimates of the total removals (landings and dead discards) of red snapper (*Lutjanus campechanus*) from the South Atlantic Fisheries Management Council's (SAFMC) jurisdiction. These estimates were compiled for the dominant commercial and recreational fleets in the fishery and from several data sources, as described below.

Assessment Analysis History

The last benchmark stock assessment for red snapper was completed as part of SEDAR 24 in October 2010 using the Beaufort Assessment Model (BAM). The Review Panel for SEDAR 24, which included Center for Independent Experts (CIE) reviewers, concluded that the model was adequate, appropriate, and applied correctly to the red snapper stock. The base run in the SEDAR 24 report was based on a headboat index likelihood component weight of 0.11. During the review of this stock assessment by the Scientific and Statistical Committee (SSC) at their November, 2010 meeting, the SSC selected a set of equally plausible runs that applied a range of likelihood component weights for the headboat index of 0.2-0.3. Increasing the weight on the headboat index resulted in more optimistic stock status outcomes, although all runs indicated the stock was severely overfished and undergoing overfishing. The SAFMC selected the projection analysis using the headboat index weight of 0.3 for management purposes.

The SAFMC manages red snapper using an F_{MSY} proxy of $F_{30\%SPR}$. This F proxy is higher than the $F_{40\%SPR}$ proxy recommended by the SEDAR 24 review panel and the SSC. Should the SAFMC's choices of headboat weight and F_{MSY} proxy turn out to be overly-optimistic, then acceptable biological catches (ABC) summarized in this document may result in a higher risk of overfishing.

Data Sources

The total removal (landings and dead discards) estimates for the U.S. South Atlantic federal fisheries come from several different survey sources. These sources focus on particular sectors of the overall snapper-grouper fishery. Landings and discard data sources are broken out by commercial, recreational headboat, recreational charter boat, private boat, and shore modes. This report is structured along the lines of the representative data collection systems for each, with reports of additional or auxiliary data sources included as well.

Commercial Landings

Data were queried for 2013 to obtain the landings estimate for the states of Florida, Georgia, South Carolina, and North Carolina by month. These data by month or state are confidential, and therefore, only the total landings of 29,096 (lb whole weight) can be presented in this report. Based on the average weight (5.68 lb whole weight) used for computing the quotas, this commercial landings weight estimate equates to 5,123 fish.

The monthly landings estimates indicated landings occurred from May through November during 2013. Of all our fishery-dependent data, the commercial landings are thought to be the most accurate. Despite that fact, there remains the possibility of some unknown amount of unreported or misreported catch that may have occurred.

Commercial Discards

Commercial discards were calculated for vertical line (handline and electric reel) vessels in the U.S. South Atlantic using the commercial logbooks. These self-reported logbooks are largely unverified. The annual discard estimate from these logbooks is computed using a delta-lognormal model to compute year-specific discard rates, which were then applied to total effort to calculate annual discards for the period 2002-2013. The value of total discards computed for 2013 is 24,284 red snapper. Data included in the calculation were filtered to remove records from fishers who reported "no discards" of any species for 75% or more of reported trips during years with four or more trips reported by the fisher. This data filter was necessary due to consistent non-reporting of discards by some fishers. The fact that this step is necessary indicates the potential bias due to under-reporting, particularly for discard information from self-reported data.

A potential rationale for under-reporting discards lies in the management regulations themselves. In the case of red snapper, the ABC was based on total removals and the management accountability measures are based on the ABC. This establishes a link between reported discards and the accountability measures, which dictate the opening and closing of the fishery, creating an incentive for under-reporting discards. That incentive may be enhanced by the lack of appropriate validation or verification. The degree to which this potential incentive for under-reporting might be affecting red snapper data is unclear. Despite the filtering of data to remove consistent non-reporting of discards, concerns about the potential bias of the remaining records still remain. In addition, there are other commercial fishing gears (e.g. longline and traps) that likely capture red snapper that are not considered in this discard summary. For those reasons, it is likely that estimates of commercial discards in this report represent a lower bound for the true value.

The SEDAR 24 report contains fleet-specific discard mortality rates that were used to compute the number of dead fish based on total releases. In the case of commercial caught fish the discard mortality rate of 0.48 was used. When applied to the data in this report, the estimate of total dead discards is 0.48 * 24,284 = 11,656 dead fish.

Recreational Headboat Landings and Discards

The Southeast Region Headboat Survey (SRHS) estimates landings and discards for headboats in the U.S. South Atlantic and Gulf of Mexico. The estimates are computed from required, self-reported logbooks. The estimates of landings from the SRHS are not verified by dockside sampling, although occasionally red snapper were observed during the SRHS biological sampling on trips for which the captain has reported "none" in their logbook; in those instances the catch reports are edited to reflect the observed landing. The best estimate of total landings

from headboats is 1,520 fish. Using the SEDAR 24 discard mortality rate of 0.41 on for-hire vessels, the best estimate of dead discards from headboats is 0.41 * 46,740 = 19,163 dead fish.

Recreational Charter Boat, Private Boat, and Shore Mode: Landings and Discards

During SEDAR 24, Marine Recreational Fisheries Statistics Survey (MRFSS) estimates for charter boats and private recreational boats were used in the stock assessment and projections. MRFSS estimates were recalculated as part of the Marine Recreational Improvement Program (MRIP); however, recalculated estimates for red snapper did not vary consistently in either direction (estimates increased some years and decreased other years) and for consistency with SEDAR 24, MRFSS estimates are reported here for 2013. The MRFSS covers coastal Atlantic states from Maine to Florida and provides estimated catch per unit effort, total effort, landings, and discards for six two-month periods (waves) each year. The survey provides estimates for three recreational fishing modes: shore based fishing, private and rental boat fishing, and for-hire charter and guide fishing. The MRFSS estimates in this report were provided by the SEFSC Miami Laboratory.

The MRFSS design incorporates three complementary survey methods for estimating catch and effort. Catch data are collected through dockside angler intercept surveys of completed, recreational fishing trips. Effort data are collected using two telephone surveys. The Coastal Household Telephone Survey (CHTS) uses random digit dialing of coastal households to obtain from anglers detailed information about the previous two months of recreational fishing trips. The weekly For-Hire Survey interviews charter boat operators (captains or owners) to obtain the trip information with a one-week recall period. These effort data and estimates are aggregated to produce the wave estimates. Catch rates from dockside intercept surveys are combined with estimates of effort from telephone interviews to estimate total landings and discards by wave, mode, and area fished (inland, state, and federal waters). Because the MRFSS collects information at the wave level, a short duration (e.g. two extended weekends) opening is not ideal for accurate estimation of catch.

Recognizing the limitations of MRFSS to provide reliable catch estimates for short openings, data from South Carolina Department of Natural Resources Charter Logbook Program, Georgia Department of Natural Resources phone interviews, and Florida Fish and Wildlife Conservation Commission red snapper monitoring program (Sauls et al. 2014) were used in this report. As was done in the 2012 version of this report, the higher of the values from the state program or MRFSS were used in each state-mode-wave cell. The only overlap cells in which both MRFSS and any of the state surveys were non-zeros occurred in wave 4 in the state of Florida for both the charter and private modes (Table 1).

It is clear that some of the estimates are biased low due to few or no intercepts. At the same time an estimate based on a single intercept, scaled up by the effort from that wave, may be too high. It is unclear for a given intercept which way the mis-estimation may go. The FL study was limited to just the fishery opening, and hence their estimates of discards are certainly an underestimate for wave 4 and to the degree that out of season harvest occurs, may represent an underestimate of landings as well. In the 2012 report the FL study landings served a role of

filling in for obvious under-reporting (zero values) from the MRFSS. In this case there is a potential over-estimation issue with the MRFSS survey values in wave 4 for FL for private boats.

Not reported here due to time constraints is the number and type of intercepts upon which the MRFSS estimates in wave 4 are based upon. Further examination of the intercept data might provide some insight into the reliability of the estimate. It should be noted that the MRFSS is in practice an unbiased survey and that any error we see in the data is simply observation error likely due to low sample sizes.

At this point the best estimates for private and charter boat landings and discards in wave 4 cannot be discerned between the MRFSS estimates and the FL study estimates. Therefore both sets of estimates are presented in this report as plausible final landings and discard estimates.

Summary of Landings and Discards

Based on the methods discussed above from the various data collection programs and accounting for sector specific discard mortality rates, the final estimates are summarized in Table 2 below.

The uncertainty from all these data sources is quite high. Confidence intervals are not reported here because of the difficulty in combining data sources from different estimation designs. We simply note that the uncertainty is high, and likely higher than estimates typically seen for other snapper-grouper species. What may be of more concern for these estimates is possible bias, which unfortunately is largely unknown.

Table 1. Summary of MRFSS and state survey estimates of red snapper landings and discards from 2013 from the charter and private boat sectors.

		LANDINGS (N) AB1				DISCARDS (N) B2			
		CHARTER		PRIVATE		CHARTER		PRIVATE	
		MRFSS	State Survey	MRFSS	State Survey	MRFSS	State Survey	MRFSS	State Survey
State	Wave								
NC	1								
	2								
	3					305		279	
	4					358			
	5					20			
	6								
NC Total						**682**		**279**	
SC	1								
	2						21		
	3						165		
	4		17				173	1168	
	5		1				104		
	6						9		
SC Total			**18**				**472**	**1168**	
GA	1								
	2								
	3								
	4		28		41	306			13
	5					270		5368	
	6								
GA Total			**28**		**41**	**577**		**5368**	**13**
FLE	1					601			
	2							14104	
	3							7886	
	4	1151	971	20435	3993	457	1494	24902	3144
	5	73				6752		34411	
	6					177			
FLE Total		**1224**	**971**	**20435**	**3993**	**7987**	**1494**	**81303**	**3144**

Table 2. Summary of estimates of U.S. South Atlantic landings and discards for red snapper in the 2013 calendar year. Two possible landings and discard estimates are shown for recreational private and charter boat modes, one using the MRFSS estimates, the other using the FL study for wave 4 estimates.

Sector	Landings (numbers)	Landings (whole pounds)	Discards (numbers)	Dead Discards (numbers)	Total Removals (numbers)
Commercial	5,123	29,096	24,284	11,656	16,779
Recreational Headboat	1,520	-	46,740	19,163	20,683
Recreational Charter Boat (MRFSS)	1,270	-	9,718	3,984	5,254
Recreational Charter Boat (FL Study)	1,090	-	10,755	4,410	5,500
Recreational Private Boat (MRFSS)	20,476	-	88,131	34,371	54,847
Recreational Private Boat (FL Study)	4,034	-	66,373	25,885	29,919
Total Recreational (MRFSS)	23,266	-	144,589	57,518	80,784
Total Recreational (FL Study)	6,644	-	123,868	49,458	56,102
Total All Sectors (MRFSS)	28,389	-	168,873	69,174	97,563
Total All Sectors (FL Study)	11,767	-	148,152	61,114	72,881

Citation

Sauls, B., R. Cody, B. Cermak, O. Ayala, and K. Kowal. 2014. South Atlantic red snapper (*Lutjanus campechanus*) monitoring in Florida for the 2013 season. Final Report submitted to National Marine Fisheries Service, Southeast Regional Office, St. Petersburg, Florida, 43 pp.