

Review of Standardized Bycatch Reporting Methodology for the South Atlantic and Joint Fishery Management Plans



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Executive Summary

All fishery management plans (FMP) must identify the required standardized procedure or procedures to collect, record, and report bycatch data in a consistent manner for the fishery. The South Atlantic Fishery Management Council (South Atlantic Council) has specified standardized bycatch reporting methodologies (SBRM) for all its South Atlantic and Joint FMPs. A final rule, effective on February 17, 2017, requires Councils to explain how the current SBRMs meet the statutory purpose of a SBRM based on an analysis of four required considerations:

1. Bycatch characteristics
2. Feasibility of methodology (cost, technical, operational)
3. Data uncertainty
4. Data use for assessing amount and type.

The Councils, in consultation with the National Marine Fisheries Service (NMFS), must review the current SBRMs within five years of the final rule's effective date (by February 21, 2022), and must conduct follow up reviews at least once every five years. A workgroup consisting of individuals from the NMFS Southeast Regional Office, NMFS Southeast Fisheries Science Center, and the South Atlantic and Gulf of Mexico Fishery Management Councils, using the four criteria outlined in the final rule, has analyzed the current SBRMs in this document. The information included in this document constitutes the review required by the SBRM final rule.

1 Background

The National Marine Fisheries Service (NMFS), including the Southeast Regional Office and Southeast Fisheries Science Center, is responsible for the conservation, management, and protection of marine resources and their habitat in the exclusive economic zone (EEZ) of the southeastern United States. NMFS works cooperatively with the South Atlantic Fishery Management Council (South Atlantic Council [from North Carolina through eastern Florida including the Atlantic side of the Florida Keys]), Gulf of Mexico Fishery Management Council (Gulf Council [from Texas through western Florida]), and Caribbean Fishery Management Council (Puerto Rico and the U.S. Virgin Islands) to accomplish regional fisheries management goals. In combination, the Councils and NMFS currently have 14 different fishery management plans (FMP), many of which manage diverse species complexes such as reef fish or corals as a unit. Two of the FMPs are jointly managed by the South Atlantic Council and Gulf Council.

1.1 What is bycatch and standardized bycatch reporting methodology?

Under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), bycatch is defined as fish that are harvested in a fishery, but are not sold or kept for personal use. Bycatch includes economic discards of fish that are caught but discarded because of low market value due to size, sex, or quality, or for other economic reasons. Bycatch also includes regulatory discards, which are fish that are discarded because regulations do not allow fishermen to retain the fish. For example, bycatch can result from prohibitions intended to reduce or eliminate directed fishing pressure on vulnerable stocks or species. In other cases, bycatch results from regulations such as size limits designed to protect spawning individuals or those that have not yet had a chance to grow to marketable size and/or spawn. For protected species, bycatch is a type of “take,” which can include capturing, collecting, harming, harassing, hunting, killing, pursuing, shooting, trapping, or wounding any species protected by the Marine Mammal Protection Act (MMPA) or the Endangered Species Act (ESA), or attempting to engage in any such conduct. While “take” is generally prohibited for protected species under the MMPA and ESA, prohibitions on take may be exempted in some circumstances so that fishing can continue, so long as conservation objectives are still met. For example, the MMPA includes a program to authorize and manage the taking of marine mammals incidental to commercial fishing operations.

The Magnuson-Stevens Act states that FMPs shall: “Establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority—(A) minimize bycatch; and (B) minimize the mortality of bycatch which cannot be avoided.” With regard to bycatch reporting, the Magnuson-Stevens Act National Standard 9 Guidelines, at 50 C.F.R. § 600.350(d)(1) states: “A review and, where necessary, improvement of data collection methods, data sources, and applications of data must be initiated for each fishery to determine the amount, type, disposition, and other characteristics of bycatch and bycatch mortality in each fishery for purposes of this standard and of section 303(a)(11) and (12) of the Magnuson-Stevens Act.”

FMPs developed by the Councils and NMFS must include a standardized methodology to collect, record, and report to NMFS data on bycatch in each fishery. The standardized methodology allows NMFS to assess the amount and type of bycatch occurring in the fishery. The methodology should include required processes for collecting, recording, and reporting data on bycatch, it should be standardized for each fishery, and it must be designed and operated within available funding levels. There are a variety of standardized methods for monitoring bycatch. The most appropriate methods depend on the conservation and management objectives of the fishery, the data uncertainty associated with the standardized bycatch reporting methodology (SBRM), and feasibility and cost of collecting the data.

The NMFS SBRM final rule (“final rule”) was effective February 21, 2017 (82 FR 6317, January 19, 2017). The SBRM final rule defines “*standardized reporting methodology*” as “an established procedure or procedures used to collect, record, and report bycatch data in a fishery, which may vary from one fishery to another, but must provide a consistent approach for collecting, recording, and reporting bycatch data within a fishery.” As long as the bycatch reporting methodology is consistent for all the participants in that fishery (or sector of said fishery), then the methodology would be considered to be “standardized.” The purpose of this document is to review SBRMs that are currently in place for fisheries in the South Atlantic Council’s jurisdiction, including jointly managed FMPs, according to the criteria established in the final rule.

1.2 Criteria for Reviewing SBRMs

The SBRM final rule established national requirements and guidance for establishing and reviewing SBRMs. The final rule requires that an FMP identify the required standardized procedure or procedures used to collect, record, and report bycatch data in a consistent manner for a fishery. The final rule also requires that a Council and NMFS analyze the following when establishing or reviewing SBRMs: (1) the characteristics of the bycatch occurring in the fishery, (2) the feasibility of the methodology from cost, technical and operational perspectives, (3) the uncertainty of the data resulting from the methodology, and (4) how the data resulting from the methodology are used to assess the amount and type of bycatch occurring in the fishery. Recognizing that there may be a need to adjust how an SBRM is implemented, this rule also directs Councils to consider how the implementation of an SBRM may be adjusted while still meeting its purpose and suggests that a Council should provide guidance to NMFS on how to adjust the implementation of the SBRM consistent with the FMP.

SBRM Review Criteria

1. Bycatch characteristics
2. Feasibility of methodology (cost, technical, operational)
3. Data uncertainty
4. Data use for assessing amount and type

All FMPs must be consistent with this final rule by conducting a review of the existing FMPs within five years of the effective date of the rule.¹ After the initial review of SBRMs for consistency with this rule, Councils should thereafter conduct a review, in consultation with NMFS, of their existing standardized reporting methodologies at least every five years. The review should provide information to determine whether or not an FMP needs to be amended. The SBRM final rule applies only to the Magnuson-Stevens Act definition of fish bycatch. This definition encompasses species of fish, sea turtles, and coral. Marine mammals and sea birds are not considered to be fish and will not be addressed in this review.

Characteristics of the bycatch occurring in the fishery

When evaluating an SBRM, the final rule indicates that a Council must consider information about the characteristics of bycatch in the fishery when available, including, but not limited to, the amount of bycatch occurring in the fishery, the importance of bycatch in estimating the fishing mortality of fish stocks, and the effect of bycatch on ecosystems. In concert, these considerations will design the most appropriate reporting methodology (i.e., SBRM) for a specific fishery or fishery sector. The amount of bycatch may vary from one fishery or fishery sector to another and depend on how the fishery operates, including fleet size, gear types used, gear selectivity, fishing effort, fishing location, and market conditions. The importance of bycatch in estimating the fishing mortality will depend on the amount of bycatch occurring in the fishery and the level of uncertainty associated with those bycatch data. For example, if bycatch represents a very small fraction of total fishing mortality estimates, it may be less important if there is a lot of uncertainty around the bycatch data than if the bycatch is a substantial portion of fishing mortality. Information about the effect of bycatch on the ecosystem could also affect the choices that a Council makes about establishing or amending its SBRM. The rule also recognizes that other factors may be relevant to establishing a standardized reporting methodology including the overall magnitude and/or economic impact of the fishery. This means that when establishing or reviewing an SBRM, it may be appropriate for a Council to consider the value of a fishery to a community and how the uncertainty associated with the bycatch data and the use of the bycatch data in developing conservation and management measures could affect decisions that impact that value.

Feasibility of the SBRM methodology

The final rule requires that an SBRM be feasible from cost, technical, and operational perspectives. Data collection, reporting, and recording procedures can be expensive and be logistically challenging to design and implement. The rule indicates that it is reasonable and appropriate for a Council to analyze issues of feasibility when considering or reviewing an SBRM and to ultimately choose a methodology that is feasible (i.e., capable of being implemented) from cost, technical, and operational perspectives. As a Council is designing an SBRM, there may be some predictable feasibility constraints that can be reasonably expected to arise on a periodic basis that may require adjustment of the implementation of the established SBRM, but that over time does not undermine the SBRM described in the FMP. For example, the level of funding for observer coverage may vary from year to year and a Council may need to

¹ The effective date of the final rule is February 21, 2017 (82 FR 6317, January 19, 2017). Reviews should be completed by February 21, 2022.

consider approaches for prioritizing resources in the case of a funding shortfall. Thus, there may be some predictable feasibility constraints that can be reasonably expected to arise on a periodic basis that may require adjustment of the implementation of the established SBRM, but that over time does not undermine the SBRM described in the FMP.

Data uncertainty resulting from the SBRM methodology

The final rule requires that a SBRM be designed so that the uncertainty associated with the resulting bycatch data can be described, quantitatively or qualitatively. The rule recognizes that different degrees of data uncertainty may be appropriate for different fisheries. Understanding the uncertainty of the bycatch data will assist Councils in developing conservation management measures that, to the extent practicable minimize bycatch, and minimize the mortality of bycatch. For example, a Council may choose to adopt measures that are more conservation-based in instances where bycatch data are a large component of fishing mortality and are highly uncertain.

Data use to assess amount and type of bycatch

The SBRM final rule requires a Council to consider how the data resulting from a SBRM are used to assess the amount and type of bycatch occurring in the fishery. The SBRM final rule clarifies that bycatch assessment procedures are not part of a standardized reporting methodology; however, a Council does need to describe the procedure or procedures used to assess the amount and type of bycatch as a part of the standardized reporting methodology identified in a FMP. The SBRM proposed rule (81 FR 9413, February 25, 2016) indicated that there are several steps leading to the development of conservation and management measures to minimize bycatch and bycatch mortality to the extent practicable. First, bycatch data are collected, recorded, and reported pursuant to an SBRM. Second, bycatch data from an SBRM, as well as other information about the fishery, are used to assess (i.e., evaluate or estimate) the amount and type of bycatch in a fishery. Third, bycatch assessments, evaluations, or estimates are used, sometimes in conjunction with the stock assessment process, to inform Councils as they develop conservation and management measures to minimize bycatch and bycatch mortality to the extent practicable. The final rule indicates that activities to collect, record, and report bycatch data in a fishery are connected to, but distinct from, the methods used to assess bycatch and the development of measures to minimize bycatch or bycatch mortality. This distinction will help clarify the key policy choices and objectives associated with establishing a reporting methodology, and not confuse those choices with statistical and technical approaches for estimating bycatch that are inherently scientific and data dependent, with the policy choices associated with developing measures to minimize bycatch.

Although bycatch assessment is not part of the standardized reporting methodology, bycatch assessment must be considered. The final rule states that a Council must consult with its Scientific and Statistical Committee and the regional NMFS science center, as appropriate, on reporting methodology design considerations such as data elements, sampling designs, sample sizes, and reporting frequency. Information provided through the consultation process will enable a Council to develop a standardized reporting methodology that incorporates scientific input and that will provide data that can be used to assess the amount and type of bycatch occurring in the fishery. In the design of an SBRM, the Council should also consider the

scientific methods and techniques available to collect, record, and report bycatch data that could improve the quality of bycatch estimates.

1.3 Overview of Bycatch Reporting

The southeast region of the U.S. contains predominantly multi-species fisheries, with relatively high commercial and recreational fishing pressure. Commonly used fishing gear types include handlines, electric rigs, longlines, trolling rigs, traps, trawls, gillnets, and spear. Angler targeting and management regulations such as size, trip, and bag limits may produce relatively high levels of discards in both the recreational and commercial sectors. Table 1.3.1 specifies the various reporting programs applicable to each fishery management unit.

Table 1.3.1. Discard reporting programs by region and fishery management unit. “X” denotes direct, and “n/a” indicates not applicable, “\” denotes indirect discard coverage and “n/a” indicates not applicable.

Fishery Management Unit	Recreational						Commercial	
	Headboat Observer	MRIP / FES	LDNR	TPWD	FWC	Headboat Survey	Commercial Observer	Discard Logbook
<i>South Atlantic</i>								
Snapper-Grouper	X	X	n/a	n/a	n/a	X	\	X
Dolphin Wahoo	X	X	n/a	n/a	n/a	X	\	X
Coral and Coral Reefs	n/a	n/a	n/a	n/a	n/a	n/a	\	X
Shrimp	n/a	n/a	n/a	n/a	n/a	n/a	X	n/a
Golden Crab	n/a	n/a	n/a	n/a	n/a	n/a	n/a	X
Sargassum	n/a	n/a	n/a	n/a	n/a	n/a	X	X
<i>Joint South Atlantic and Gulf</i>								
Coastal Migratory Pelagics	X	X	X	X	n/a	X	\	X
Spiny Lobster	n/a	n/a	n/a	n/a	X	n/a	n/a	X

MRIP – Marine Recreational Information Program

FES – Fishing Effort Survey

LDNR – Louisiana Department of Natural Resources

TPWD – Texas Parks and Wildlife Department

FWC – Florida Fish and Wildlife Commission

1.3.1 Atlantic Coastal Cooperative Statistics Program Bycatch Module

The Atlantic Coastal Cooperative Statistics Program (ACCSP) is a cooperative state-federal program to design, implement and conduct marine fisheries statistics data collection programs and to integrate those data into a single data management system throughout the Atlantic. NMFS, U.S. Fish and Wildlife Service, the Councils, and the Atlantic coastal states are partners in this initiative. The ACCSP Bycatch, Releases, and Protected Species Interactions (hereafter called Bycatch Module) monitoring program includes sampling of all fishing sectors for living

marine resources in estuarine, inshore, and offshore waters. Reporting of protected species interactions and managed species data currently are the highest priorities under the bycatch monitoring program of the ACCSP.

The bycatch standards of the ACCSP Bycatch Module listed in Appendix A include both quantitative and qualitative components. To date, this Bycatch Module has not been fully funded or implemented. However, many of these standards are components of current data collection programs that collect bycatch information in the South Atlantic. Targeted at-sea sampling programs (“observer”) and collection of bycatch data through established fisherman self-reporting systems comprise the primary methods used to quantify bycatch. Sea turtle stranding and entanglement networks are the primary sources of qualitative information for bycatch. Technologies such as electronic monitoring systems are in development or in use for the commercial and recreational sectors (including the for-hire component) on the Atlantic coast.

1.3.2 Recreational Reporting Programs

Marine Recreational Information Program / Fishing Effort Survey

The Marine Recreational Information Program (MRIP) is a state-regional-federal partnership that develops, improves, and implements a network of surveys to estimate total recreational fishing catch and effort. Through these surveys, anglers and captains report the number of recreational fishing trips taken and the number of fish caught to NMFS and state and regional partners. In 1979, the Marine Recreational Fishery Statistics Survey (MRFSS) was established to estimate the impact of recreational fishing on marine resources. In 2008, MRIP replaced MRFSS to meet increasing demand for more precise, accurate, and timely recreational catch estimates.

Until 2013, recreational catch, effort, and participation were estimated through a suite of independent but complementary surveys: telephone surveys of households and for-hire vessel operators that collected information about recreational fishing activity, and an angler intercept survey that collected information about the fish that were caught. In 2013, NMFS implemented a new Access Point Angler Intercept Survey to remove sources of potential bias from the sampling process. In 2015, NMFS launched a new mail-based household Fishing Effort Survey (FES) to improve efficiency and minimize the risk of error in private boat and shore effort estimates.

In the southeast region, MRIP covers both coastal Atlantic states from Maine to Florida and Gulf of Mexico coastal states from Florida to Louisiana. MRIP provides estimated landings and discards for six 2-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. Catch data are collected through dockside angler intercept surveys of completed, recreational fishing trips and effort data are collected using mail-based surveys.

The MRFSS/MRIP/FES² system classifies recreational catch into three categories: Type A - Fishes that were caught, landed whole, and available for identification and enumeration by the interviewers; and Type B - Fishes that were caught but were either not kept or not available for identification. Type B1 - Fishes that were caught and filleted, released dead, given away, or disposed of in some way other than Types A or B2. Type B2 - Fishes that were caught and released alive, represent bycatch information for the private angler component of the recreational sector. Some pilot studies have collected information on protected species but these data are not routinely collected through the MRIP survey.

Southeast Region Headboat Survey/Headboat Observer

The Southeast Region Headboat Survey (SRHS) is administered by the Beaufort Laboratory of the NMFS Southeast Fisheries Science Center (SEFSC). The SRHS samples recreational headboats, wherein fishermen pay by the “head” and boats typically carry more than six passengers. The survey has operated along the southeast U.S. Atlantic since 1972 and in the Gulf of Mexico since 1986. The SRHS data consist of trip-level logbook records submitted by captains and biological samples collected dockside by professional port agents. Fitzpatrick et al. (2017) documents the history, protocols, and methodological changes over time to the SRHS.

The SRHS requires collection of bycatch data in electronic logbooks and from observed trips. Electronic fishing records for headboats must be submitted at weekly intervals (or intervals shorter than a week if notified by the Science and Research Director) by 11:59 p.m., local time, the Tuesday following a reporting week. A North Carolina headboat pilot study attempted to collect information on sea turtle interactions, but these data are not routinely collected through the survey.

Observers in the SRHS collect information about numbers and total weight of individual fish species caught, total number of passengers, total number of anglers, location fished (identified to a 10 mile by 10 mile grid), trip duration (half, $\frac{3}{4}$, full or multi-day trip), species caught, and numbers of released fish with their disposition (dead or alive). Observers are placed on 9.5% out of North Carolina, 1.4% out of South Carolina, 3.5% out of Georgia, and 1.5% out of east Florida. The SRHS estimates landings and discards for headboats in the U.S. South Atlantic and Gulf of Mexico from required logbooks.

Southeast For-Hire Electronic Reporting Program

All federal South Atlantic Snapper-Grouper, Atlantic Coastal Migratory Pelagics (CMP), and Atlantic Dolphin Wahoo Charter/Headboat Permit Holders are required to submit weekly electronic reports beginning January 4, 2021. All federal Gulf of Mexico Reef Fish and/or CMP Charter/Headboat Permit holders are required to electronically report fishing effort and landings starting January 5, 2021. The requirement is for fishermen to report all fish caught in all areas. If a permit holder has both a Gulf of Mexico and a South Atlantic/Atlantic permit (known as a dual permit holder), that permit holder must meet the requirements of both permits, even if the vessel does not fish in the Gulf of Mexico. Complying with Gulf Mexico requirements will also satisfy South Atlantic/Atlantic requirements for dual permit holders. The purpose of this new

² Data on sea turtles is excluded.

reporting program is to provide more accurate and reliable fisheries information about catch, effort, and discards from federally permitted for-hire vessels.

Louisiana Department of Wildlife and Fisheries Creel Survey

Beginning in 2014, the Louisiana Department of Wildlife and Fisheries (LDWF) replaced MRIP in their state with a quota monitoring survey designed to estimate the number of select reef fish landed in Louisiana. Dockside interviews are conducted by state personnel at sites commonly reporting offshore species. Biologists ask fishermen questions regarding where they fished, the length of their trip, the number and species of fish thrown back, etc.

(<https://www.wlf.louisiana.gov/page/lacreel>). To estimate fishing effort of private anglers, LDWF personnel contact a random portion of those anglers holding a Louisiana Recreational Offshore Landing Permit by phone and/or e-mail on a weekly basis. Permit holders are asked if they fished offshore, how many trips were taken the previous week, if they landed at a public site, what time they returned to the dock, and whether they fished on a paid charter. The randomly selected permit holders are notified by e-mail each Wednesday of their selection to be surveyed. Those selected permit holders had the option to answer the effort survey questions by reply e-mail. If an e-mail is not received, they are contacted by phone. Charter captains holding a Louisiana Recreational Offshore Landing Permit are also contacted by LDWF weekly to collect information on the total number of red snapper caught the previous week. Charter captains have the option to respond via e-mail prior to LDWF personnel contacting them via phone. Estimated landings for fish species are produced based on observed catch rates, average weights, and estimated fishing effort (as adjusted for persons not possessing an offshore landing permit). No information on protected species interactions is collected through this program.

Texas Parks and Wildlife Department

The Texas Parks and Wildlife Department (TPWD) creel survey generates estimates of fish landings in numbers for private/rental boats and charter vessels fishing off Texas. During a coastal creel survey, fishermen are asked about the area fished and the number of hours spent fishing that day, how many fish were caught, the size of harvested and released fish, what types of gear and bait were used to catch the retained fish, and the targeted species and level of satisfaction with the trip (<https://tpwd.texas.gov/fishboat/fish/didyouknow/coastal/creel.phtml>). Landings are reported in numbers by high (May 15-November 20) and low-use time periods (November 21-May 14), area fished (state versus federal waters), and mode of fishing (private versus charter). To convert TPWD landings in numbers to landings in pounds, average lengths by mode, wave, and area fished are converted to weights using a length-weight conversion formula. No information on protected species interactions is collected through this program.

Florida Fish and Wildlife Conservation Commission

The Florida Fish and Wildlife Conservation Commission (FWC) monitors recreational landings of red snapper and spiny lobster. It also runs the State Reef Fish Survey (SRFS), which is a specialized recreational fishing survey that provides information on reef fish stocks throughout Florida. The SRFS relies on two methods to collect data from private boats using a mail survey and in person interviews. Anglers returning from trips where they fished for reef fish may be interviewed where biologists collect information on the numbers and types of fish landed and

released, as well as the size, weight, and age of harvested fish. The SRFS runs side by side with MRIP. More information on SRFS can be found at:

<https://myfwc.com/research/saltwater/fishstats/srfs/program/>. No information on protected species interactions is collected through this program.

1.3.3 Commercial Reporting Programs

Commercial Logbook Program

In 1992, the SEFSC initiated a logbook program for vessels with a federal permit for snapper-grouper. The program was expanded in 1999 to include CMP species. The types of information required to be reported includes information on the quantity (reported in pounds) caught for each species, the area of catch, the type and quantity of gear, the date of departure and return, the dealer and location (county and state where the trip is unloaded), the duration of the trip (time away from dock), an estimate of the fishing time, and the number of crew. The purpose of the program is to provide a consistent data collection methodology for vessels that have federal permits in the Southeast Region. Golden crab has a separate logbook. However, a logbook program is not in place for South Atlantic shrimp or spiny lobster.

In 2001, a separate bycatch reporting logbook was added for Gulf of Mexico reef fish, South Atlantic snapper-grouper, CMP, and highly migratory species (HMS) permits to include numbers on the average size of discarded fish by species, including sea turtles and other ESA-listed fish species. A random sample of 20% of all commercial permit holders within a gear type are selected; fishermen are not selected for the next four years after they submit a discard form for a year. Therefore, over a five-year period, 100% of permit holders in these fisheries will have been required to report in one of the five years. Non-reporting is a known issue – captains can send back a form that indicates ‘no discards’ and still be in compliance, and this trend has been increasing in the South Atlantic. This also happens in the Gulf but at a lower rate (5-10% of trips). To accurately determine discards, these non-reporters are eliminated from the computations of discard rates. Estimates of total discards for a fishery are made by calculating a species-specific mean discard rate for the vessels reporting discards and applying that rate to the calculated total effort reported by the fishery to the coastal logbook program. In addition to reporting discards, information is collected on interactions with ESA-listed species through the discard logbook.

Observer Programs

NMFS deploys fishery observers to collect catch and bycatch data from U.S. commercial fishing and processing vessels. Annually 47 different fisheries nationwide are monitored by observer programs logging over 77,000 observer days at sea. NMFS has been using observers to collect fisheries data from 1972 to the present. Observers have monitored fishing activities on all U.S. coasts, collecting data for a range of conservation and management issues. Observer programs provide the majority of bycatch data for protected species.

NMFS coordinates observer program management through its Office of Science and Technology/National Observer Program (NOP). The NOP seeks to support observer programs and increase their usefulness to the overall goals of NMFS. Improvements in data collection,

observer training, and the integration of observer data with other research are among the important issues that the NOP works to achieve on a national level. Most commercial observer programs have coverages derived as a percentage of reported effort in the previous year. Five observer programs operate out of the Southeast Region, including the Pelagic Longline Observer Program, Gulf of Mexico Reef Fish Observer Program (Bottom Longline and Vertical Line), Shark Bottom Longline Observer Program that includes the Shark Research Fishery, Shrimp Trawl Observer Program, and Southeast Coastal Gillnet Observer Program (formerly the HMS Shark Gillnet Observer Program). Reduction in shark gillnet effort allowed NMFS to expand observer coverage starting in 2005 to other gillnet fisheries (e.g., drift gillnet, sink gillnet for Spanish mackerel, strike gillnet for king mackerel, bluefish) in the Southeast Region (Mathers et al., 2020). Sharks are not managed by the Councils in the Southeast Region. Table 1.3.1 lists South Atlantic and joint South Atlantic/Gulf fisheries with observer coverage and Table 1.3.2 outlines observer coverage in those fisheries.

Table 1.3.2. Current observer coverage in Southeast Region fisheries.

Fishery	Observer Coverage? (Yes or No)	Current or Recent Level of Coverage (Observed Days)
South Atlantic		
Snapper-Grouper Recreational	Y (Headboat; NMFS)	For headboats*, observers are placed on 9.5% out of NC, 1.4% out of SC, 3.5% out of GA, and 1.5% out of east FL.
Snapper-Grouper Longline	N	
Snapper-Grouper Handline	Y (limited)	57 sea days 2014-2015.
Dolphin Wahoo Recreational	Y Headboat (NMFS)	Observers* are placed on 9.5% of headboats out of NC, 1.4% out of SC, 3.5% out of GA, 1.5% out of east FL, and 2% out of west FL.
Dolphin Wahoo Longline	Y (limited/indirect NMFS)	Some longline catch targeting dolphin is captured by observers for HMS.
Dolphin Wahoo Trolling	Y (limited NMFS)	
Shrimp	Y (NMFS)	~1% of penaeid shrimp and <1% of rock shrimp fisheries have observer coverage. 300 days.
Golden Crab	N	
Coral	N	
Sargassum	Y	There is no Sargassum harvest currently.
Joint SA / Gulf		
CMP Recreational	Y (Headboat; NMFS)	Observers are placed on 9.5% of headboats out of NC, 1.4% out of SC, 3.5% out of GA, 1.5% out of east FL, and 2% out of west FL.
CMP Gulf	Y (limited NMFS)	CMP gillnet is now in the MMPA rotation for observers.
CMP South Atlantic	Y (limited)	
Spiny Lobster	N	
South Atlantic and Gulf		
Recreational headboat	Y	Observers are placed on 9.5% out of NC, 1.4% out of SC, 3.5% out of GA, 1.5% out of east FL, and 2% out of west FL.
Recreational private	N	
Recreational charter	Y	None

* These coverage levels are headboat sector as whole and not FMP fishery specific levels.

2 Fishery Management Plan for the Snapper-Grouper Fishery of the South Atlantic Region

2.1 Standardized Bycatch Reporting Requirement

The South Atlantic Fishery Management Council (South Atlantic Council) manages snapper-grouper species in federal waters of the South Atlantic from North Carolina to the Florida Keys. The initial standardized bycatch reporting methodology (SBRM) for the Fishery Management Plan (FMP) for the Snapper-Grouper Fishery of the South Atlantic Region (Snapper-Grouper FMP) was implemented through the final rule for the Comprehensive Sustainable Fishery Act Amendment (Amendment 11 to the Snapper-Grouper FMP; SAFMC 1998, 64 FR 59126, November 2, 1999). The SBRM includes the reporting requirements as specified in the Atlantic Coastal Cooperative Statistics Program (ACCSP).

The South Atlantic Council subsequently revised the fishery-specific SBRMs for snapper-grouper through the final rule for Amendment 15B to the Snapper-Grouper FMP (Amendment 15B; 74 FR 58902, December 16, 2009). Amendment 15B revised the Snapper-Grouper FMP SBRM to be:

- Adopt the ACCSP Release, Discard and Protected Species Module (Bycatch Module) as the preferred methodology. Until this module is fully funded, require the use of a variety of sources to assess and monitor bycatch, including observer coverage on vessels, logbooks, electronic logbook, video monitoring, Marine Recreational Fisheries Statistics Survey (MRFSS; now Marine Recreational Information Program [MRIP]), state cooperation, and grant funded projects.
- After the ACCSP Bycatch Module is implemented, continue the use of technologies to augment and verify observer data. Require that commercial vessels with a snapper-grouper permit, for-hire vessels with a for-hire permit, and private recreational vessels if fishing for snapper-grouper species in the exclusive economic zone (EEZ), if selected, shall use observer coverage, logbooks, electronic logbooks, video monitoring, or any other method deemed necessary to measure bycatch.

The bycatch standards of the ACCSP Bycatch Module listed in Appendix A include both quantitative and qualitative components. These standards are components of current data collection programs that collect bycatch information in the South Atlantic.

2.2 Current Bycatch Reporting

For the commercial sector, the vessel reporting requirement is achieved through logbooks. Fishermen with Commercial South Atlantic Unlimited Snapper-Grouper or 225-lb Trip Limit Snapper-Grouper Permits, who are selected by the Science and Research Director (SRD), are required to maintain and submit fishing records through the Southeast Fisheries Science Center (SEFSC) Commercial Logbook. Discard data are collected using the Supplemental Discard Logbook that is sent to a 20% stratified random sample of the active commercial permit holders in the fishery. In addition to the number of self-reported discards per trip and gear, the SEFSC

Supplemental Discard Logbook attempts to quantify the reason why discarding occurs using four codes.³ Fishermen can specify multiple reasons for a species discarded on the same trip and gear.

- 1) Regulation – Not legal size: Animals that would have been sold, however local or federal size limits forbid it.
- 2) Regulation – Out of season: Animals that would have been sold, however the local or federal fishing season is closed.
- 3) Regulation – Other: Animals that would have been sold, however a local or federal regulation other than size or season, forbids it (Other than size or season; i.e., protected species, not properly permitted).
- 4) Market conditions: Animals that have no market value (rotten, damaged).

Limited observer coverage of the commercial snapper-grouper fishery was conducted through cooperative grants and research projects. Approximately 750 sea days were observed over the duration of these programs 2006 to 2016 (GSAFF 2008, 2010, 2013, 2016).

For the recreational sector, estimates of discards from private recreational and charter fishermen are collected through the MRIP/Fishing Effort Survey (FES). The Southeast Region Headboat Survey, which includes limited headboat observer sampling, collects discard information from headboat vessels. In addition, in January 2021, NMFS implemented the Southeast For-Hire Electronic Reporting Program, which implemented mandatory electronic reporting of for-hire vessel catch and effort data for over 3,000 vessels in the Gulf of Mexico and Atlantic. The purpose of this program is to provide more accurate and reliable fisheries information about for-hire catch, effort, and discards.

2.3 Characteristics of Bycatch

2.3.1 Amount and Type of Bycatch

Commercial Sector

The South Atlantic snapper-grouper fishery is characterized by moderately high discards, especially of black sea bass, vermilion snapper, and red porgy (Table 2.3.1.1 and Figure 2.3.1.1). Most discards originate from handline/electric rig and trap gear, with some discards from trolling gear and relatively low discards from longline and diving gear. Trap/pot gear show high levels of discarded black sea bass, which is the targeted species of this gear type, but low levels of bycatch for other species. It is possible that trip-level reporting leads to the relatively high discard estimates from trolling gear; these may be sets using another gear type (i.e., handline/electric rig) on a trip declared as a trolling gear trip. The ratio of commercial landings to commercial discards is not compared because commercial landings are reported in pounds and discards are reported in numbers of fish.

³ More information on the discard logbook is available here <https://www.fisheries.noaa.gov/about/southeast-fisheries-science-center>.

Table 2.3.1.1. Top ten species with mean estimated South Atlantic commercial discards (number of fish) during snapper-grouper trips (defined as trips with >50% of landings from snapper-grouper stocks), sorted from largest to smallest, by gear, for the 2015-2019 period.

Stock	Diver	Stock	Handline / Electric	Stock	Longline	Stock	Trap / Pot	Stock	Troll
Gray Snapper	133	Vermilion Snapper	23,324	Red Grouper	176	Black Sea Bass	25,581	Black Sea Bass	1,114
Hogfish	57	Red Porgy	20,337	Snowy Grouper	157	Triggerfishes	1,507	Grunts	66
Black Grouper	28	Red Snapper	16,805	Blueline Tilefish	32	Vermilion Snapper	662	King Mackerel	34
Ocean Triggerfish	10	Black Sea Bass	7,797	Greater Amberjack	26	Gray Triggerfish	407	White Grunt	24
Mutton Snapper	8	Yellowtail Snapper	7,278	Red Snapper	20	White Grunt	207	Gag	19
Red Grouper	5	Gray Triggerfish	3,966	Red Porgy	18	Grunts	161	Dolphin	16
Yellow Jack	2	Triggerfishes	2,652	Triggerfishes	5	Red Porgy	94	Black Grouper	13
Yellowtail Snapper	2	Almaco Jack	2,004	Golden Tilefish	2	Red Snapper	65	Rock Sea Bass	6
Groupers	1	Blue Runner	1,956	Amberjacks	1	Gag	23	Triggerfishes	5
King Mackerel	1	Greater Amberjack	1,510	Blackfin Snapper	1	Red Grouper	6	Greater Amberjack	3

Source: SEFSC Coastal Logbook (accessed May 2020) and Discard Logbook (accessed May 2020). Note: Commercial gray triggerfish includes the "triggerfishes, unclassified" category.

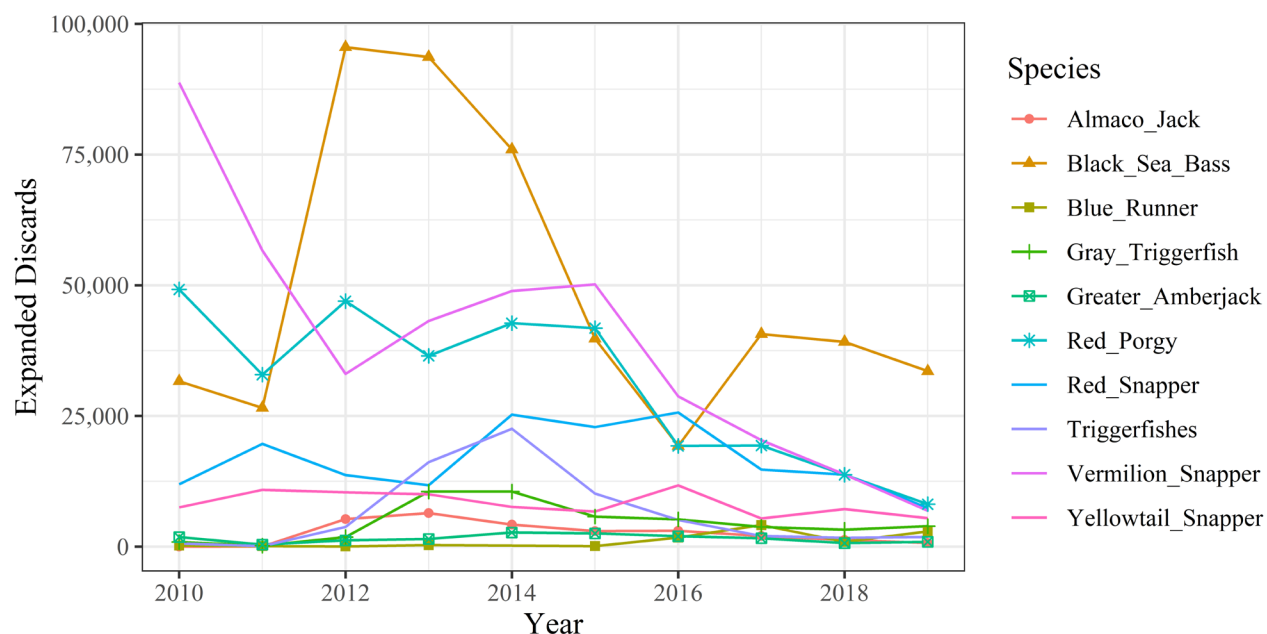


Figure 2.3.1.1. Expanded self-reported commercial discards (numbers of fish) for the top ten species discarded during snapper-grouper trips (defined as trips with >50% of landings from snapper-grouper stocks) from 2010-2019 for all gear.

Source: SEFSC Coastal Logbook (accessed May 2020) and Discard Logbook (accessed May 2020).

Of the four discard codes, regulations (i.e., not legal size and out of season) was the most common reason selected for the most commonly discarded snapper-grouper species based on self-reported discards (Table 2.3.1.2). The minimum size limit appears to be the primary driver of commercial discards for black sea bass, gag, gray snapper, gray triggerfish, greater amberjack, and yellowtail snapper. Out of season appears to be the primary driver of discards for almaco jack, red porgy, red snapper, and vermilion snapper.

The commercial sector of the South Atlantic snapper-grouper fishery infrequently incidentally captures sea turtles, Nassau grouper, and smalltooth sawfish. A 2016 biological opinion on the fishery describes the best available information on past and present interactions with endangered and threatened species (NMFS 2016).

Table 2.3.1.2. The percentage of unexpanded discards for each discard reason out of the total number of self-reported discards reported to the Supplemental Discard Logbook for the top ten snapper-grouper species discarded in the South Atlantic from 2015 through 2019. Some percentages may not sum to 100% due to rounding.

Species	Not Legal Size	Out of Season	Other Regulations	Market Conditions
Almaco Jack	4%	72%	7%	17%
Black Sea Bass	99%	0%	0%	0%
Gag	78%	20%	0%	2%
Gray Snapper	91%	0%	0%	8%
Gray Triggerfish	59%	39%	1%	0%
Greater Amberjack	77%	20%	3%	1%
Red Porgy	19%	78%	2%	0%
Red Snapper	2%	78%	20%	0%
Vermilion Snapper	43%	50%	7%	0%
Yellowtail Snapper	92%	6%	2%	0%

Sources: SEFSC Supplemental Commercial Discard Logbook (May 2020).

Recreational Sector

From 2015 through 2019, the most discarded species on trips capturing a snapper-grouper species was black sea bass for all three modes (Table 2.3.1.3). Red snapper, tomtate, yellowtail snapper, and grunt species were in the top ten for all modes. Recreational discards of several snapper-grouper species are higher than the landings for certain modes of fishing (Table 2.3.1.4). Red snapper, black sea bass, red grouper, and tomtate discards are many times higher than their landings across all modes. Across most of the snapper-grouper species, the magnitude of private mode discards is much higher compared to the headboat or charter modes.

Table 2.3.1.3. From 2015 through 2019, the top ten species with discards reported on trips capturing a snapper-grouper species by recreational mode. Species are sorted by number of total discards for each mode from 2015-2019.

Rank	HEADBOAT		CHARTER		PRIVATE	
	Species	Discards (N)	Species	Discards (N)	Species	Discards (N)
1	Black Sea Bass	2,362,007	Black Sea Bass	1,464,909	Black Sea Bass	40,129,026
2	Vermilion Snapper	461,562	Red Snapper	601,973	Gray Snapper	21,989,786
3	Tomtate	327,379	Yellowtail Snapper	529,770	Pinfish	10,632,466
4	White Grunt	294,025	Tomtate	472,005	Red Snapper	9,907,110
5	Yellowtail Snapper	278,821	Vermilion Snapper	416,724	Yellowtail Snapper	6,926,752
6	Red Snapper	258,627	Gray Snapper	275,171	Tomtate	6,619,263
7	Gray Triggerfish	183,024	Mutton Snapper	149,472	Hardhead Catfish	5,036,604
8	Blue Runner	121,476	Blue Runner	133,872	Grunt (family)	4,961,629
9	Grunts (unidentified)	99,496	Grunt (family)	128,757	Atlantic Croaker	4,675,997
10	Atlantic Sharpnose Shark	90,504	Greater Amberjack	112,017	Gray Triggerfish	3,828,858

Sources: MRIP FES data from SEFSC Recreational ACL Dataset (September 2020); Headboat data from SEFSC Headboat Logbook CRNF files (expanded; July 2020).

Table 2.3.1.4. South Atlantic snapper-grouper headboat, charter, and private mean annual estimates of landings and discards (2015-2019). Headboat and MRIP (charter and private) landings and discards are in numbers of fish.

Species	HEADBOAT			CHARTER			PRIVATE		
	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)
Almaco Jack	8,345	1,683	20%	12,752	2,921	23%	70,012	237,235	339%
Atlantic Spadefish	278	424	152%	3,665	3,700	101%	40,126	29,227	73%
Banded Rudderfish	10,794	2,548	24%	2,927	898	31%	3,856	7,302	189%
Bar Jack	240	42	18%	66	581	883%	4,868	7,341	151%
Black Grouper	1,804	3,530	196%	1,804	3,530	196%	18,073	33,116	183%
Black Sea Bass	48,095	472,401	982%	37,817	288,186	762%	484,547	7,953,343	1,641%
Black Snapper	5	45	862%	0	0	0%	0	0	0%
Blackfin Snapper	976	130	13%	2	0	0%	146	0	0%
Blueline Tilefish	2,230	185	8%	21,267	4,034	19%	24,431	2,885	12%
Coney	96	135	141%	58	108	188%	347	1,829	526%
Cubera Snapper	15	2	11%	127	0	0%	1,085	2,367	218%
Dog Snapper	62	7	11%	11	0	0%	3,781	226	6%
Gag	679	805	118%	2,387	2,257	95%	21,664	57,088	264%
Golden Tilefish	131	10	8%	2,435	0	0%	12,254	0	0%
Goliath Grouper	1	378	47,205%	0	362	—	0	16,078	—
Gray Snapper	54,939	9,833	18%	33,295	55,035	165%	1,317,308	4,397,957	334%
Gray Triggerfish	39,606	36,605	92%	53,395	19,237	36%	306,482	765,772	250%
Graysby	2,249	3,961	176%	776	179	23%	24,770	41,416	167%
Greater Amberjack	3,757	3,555	95%	24,570	22,404	91%	69,007	128,035	186%
Hogfish	114	177	155%	291	2	1%	155,051	6,655	4%
Jolthead Porgy	6,165	368	6%	6,193	292	5%	59,814	0	0%
Knobbed Porgy	4,689	527	11%	473	0	0%	3,493	2,521	72%
Lane Snapper	33,366	9,116	27%	8,088	7,996	99%	225,357	481,695	214%

Species	HEADBOAT			CHARTER			PRIVATE		
	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)
Lesser Amberjack	255	76	30%	331	167	51%	68	38	55%
Mahogany Snapper	129	65	50%	0	0	0%	1,572	0	0%
Margate	490	64	13%	0	40	—	3,103	598	19%
Misty Grouper	6	0	3%	19	0	0%	0	0	0%
Mutton Snapper	15,939	15,516	97%	24,579	29,894	122%	208,691	576,812	276%
Nassau Grouper	2	19	1,192%	0	7	—	0	1,398	—
Queen Snapper	427	1	0%	0	0	0%	0	4,394	—
Red Grouper	2,577	8,675	337%	3,282	8,902	271%	53,718	142,866	266%
Red Hind	172	132	77%	35	104	299%	614	1,892	308%
Red Porgy	12,095	12,765	106%	14,248	8,922	63%	109,050	83,622	77%
Red Snapper	2,461	51,725	2,102%	6,033	120,395	1,996%	211,833	1,981,423	935%
Rock Hind	1,961	1,914	98%	208	17	8%	4,193	3,665	87%
Sailor's Choice	946	528	56%	246	8	3%	40,754	14,674	36%
Sand Tilefish	865	1,859	215%	305	4,280	1,404%	7,053	40,383	573%
Saucereye Porgy	37	1	3%	28	0	0%	0	0	0%
Scamp	1,554	1,044	67%	3,174	193	6%	2,775	1,458	53%
Scup	11,451	1,637	14%	334	0	0%	1,311	154	12%
Silk Snapper	700	45	6%	1,966	4	0%	4,680	2,810	60%
Snowy Grouper	501	4	1%	1,936	165	9%	2,536	599	24%
Speckled Hind	2	23	950%	0	20	—	249	0	0%
Tomtate	44,536	65,476	147%	13,456	94,401	702%	439,869	1,323,853	301%
Vermilion Snapper	128,029	92,312	72%	73,407	83,345	114%	435,534	661,292	152%
Warsaw Grouper	0	0	0%	0	0	0%	0	0	0%
White Grunt	149,852	58,805	39%	26,450	8,944	34%	517,265	350,516	68%

Species	HEADBOAT			CHARTER			PRIVATE		
	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)
Whitebone Porgy	5,083	1,720	34%	3,475	325	9%	25,948	3,740	14%
Wreckfish	0	0	0%	0	0	0%	0	0	0%
Yellowedge Grouper	157	0	0%	420	0	0%	910	0	0%
Yellowfin Grouper	6	3	45%	0	0	0%	0	0	0%
Yellowmouth Grouper	11	0	3%	0	0	0%	0	0	0%
Yellowtail Snapper	134,139	55,764	42%	239,421	105,954	44%	1,002,876	1,385,351	138%

Sources: MRIP FES data from SEFSC Recreational ACL Dataset (September 2020); Headboat data from SEFSC Headboat Logbook CRNF files (expanded; July 2020).

The recreational sector of the South Atlantic snapper-grouper fishery infrequently incidentally captures sea turtles, Nassau grouper, and smalltooth sawfish. A 2016 biological opinion on the fishery describes the best available information on past and present interactions with endangered and threatened species (NMFS 2016).

2.3.2 Importance of Bycatch in Estimating Fishing Mortality / Effect of Bycatch on Ecosystems

The ecological effects of bycatch mortality are the same as fishing mortality from directed fishing efforts. If not properly managed and accounted for, either form of mortality could potentially reduce stock biomass to an unsustainable level. Release mortality rates for the snapper-grouper fishery are widely variable species to species and sector to sector, and are dependent on fishing mode (Table 2.3.2.1). For instance, recreational discards of red snapper in the South Atlantic are a main driver in the overfishing determination for the stock (SEDAR 73 2021). However, discard mortality estimates for snapper-grouper species are variable and highly uncertain. This is particularly true for the commercial fishery where few studies of discard mortality are available.

Table 2.3.2.1. Release mortality rates of select recreationally and commercially important snapper-grouper species from recent stock assessments.

Species	Fishery	Release mortality	Data Source
Black Sea Bass	Recreational	13.7%	SEDAR 56 (2018)
Black Sea Bass	Commercial Trap/Pot (2007- present)	48.3%	SEDAR 56 (2018)
Black Sea Bass	Commercial Vertical Line	19%	SEDAR 56 (2018)
Gag	Recreational	25%	SEDAR 10 Update (2014)
Gag	Commercial	40%	SEDAR 10 Update (2014)
Gray Triggerfish	Recreational & Commercial	12.5%	SEDAR 41 (2016)
Greater Amberjack	Recreational & Commercial	20%	SEDAR 59 (2020)
Red Porgy	Recreational	41%	SEDAR 60 (2020)
Red Porgy	Commercial	53%	SEDAR 60 (2020)
Red Snapper	Recreational - Private	39%	SEDAR 73 (2021)
Red Snapper	Recreational - Charter & Headboat	41%	SEDAR 73 (2021)
Red Snapper	Commercial	48%	SEDAR 73 (2021)
Vermilion snapper	Recreational	38%	SEDAR 55 (2018)
Vermilion snapper	Commercial	41%	SEDAR 55 (2018)
Yellowtail snapper	Recreational	15%	SEDAR 64 (2020)
Yellowtail snapper	Commercial	12.5%	SEDAR 64 (2020)

It is likely that most mortality is a function of hooking and handling of the fish when the hook is being removed. Regulatory Amendment 29 to the Snapper-Grouper FMP (SAFMC 2020) required descending devices be on board all commercial, for-hire, and private recreational vessels while fishing for or possessing snapper-grouper species; the use of non-offset, non-stainless steel circle hooks when fishing for snapper-grouper species with hook-and-line gear and natural baits north of 28° N latitude; and all hooks be non-stainless steel when fishing for

snapper-grouper species with hook-and-line gear and natural baits throughout South Atlantic federal waters. The South Atlantic Council also implemented an extensive outreach and public education program, which along with its citizen science initiative is promoting best fishing practices for all the species it manages. The goal of these regulations is to reduce discard mortality for snapper-grouper species.

2.4 Feasibility of the SBRM Methodology

The South Atlantic Council adopted the ACCSP Bycatch Module as the basis for the FMP's SBRMs and further clarified the SBRMs through Amendment 15B to the FMP. The ACCSP Bycatch Module has not been fully funded. In the absence of fully funding the module, the SBRM specified in Amendment 15B requires the use of a variety of sources to assess and monitor bycatch, including observer coverage on vessels, paper logbooks, electronic logbook, video monitoring, MRFSS (now MRIP/FES), state cooperation, and grant funded projects. The outlined methods would provide some of the necessary information to quantify all bycatch effects on the fishery. Electronic reporting is now in place for the federally permitted for-hire sector and the South Atlantic Council plans to develop an amendment that if implemented would require electronic logbooks for the commercial sector. These new technologies could improve timeliness of bycatch reporting.

Feasibility

What is the feasibility of the bycatch reporting methodology from cost, technical and operational perspectives?

The SBRM currently in use for the commercial sector of the fishery consists of randomly selected, mandatory discard logbooks. The SBRM currently in use for the recreational sector of the fishery consists of limited headboat observer coverage, mandatory for-hire logbooks, and port sampling and mail surveys through MRIP/FES. These SBRMs implemented and in use are feasible from a cost, operational, and technical standpoint.

2.5 Data Uncertainty Resulting from the SBRM

The uncertainty of the bycatch data resulting from the SBRM has been considered in stock assessments for species managed through the Snapper-Grouper FMP. Further, uncertainty of recreational landings are provided by MRIP.

Commercial discard levels are computed based on data collected through self-reported logbooks. Assignment of discards to a gear type is based on the species comprising greater than 50% of the reported landings on the trip as determined by the fisher. It is noted that only one gear type can be listed per species on a trip; errors in form completion or gear assignment may lead to some odd results when expanding to the fishery as a whole. Data uncertainty in self-reported discard rates

Data Uncertainty

Can the uncertainty associated with bycatch data be described, quantitatively or qualitatively?

can be quite high, particularly for species that are caught in large numbers (reported discards are often rounded; e.g., 10, 20, etc. discards), are difficult to identify (e.g., sharks), or are of little economic interest (particularly of bycatch species); with coefficient of variation routinely exceeding 100%, and discards are not always identified to species.

For the snapper-grouper fishery, a simple random sample of 20% of all commercial permit holders within a gear type are selected to report discard information. Non-reporting is a known issue – captains can send back a form that indicates ‘no discards’ and still be in compliance, and this trend has been increasing in the South Atlantic. Reporting rates vary by gear and target species, but the percentage of ‘no discards’ reports when the discard logbook program began were 30-40%. In more recent years, the percentage of ‘no discards’ has increased to 60-70%. To better estimate discards, some non-reporters are eliminated from the computations of discard rates. Discard data from those vessels for which a discard of any species was not reported for the entire year are removed from discard estimation analyses. Discard data from vessels with ‘no discards’ reports submitted much more frequently than the fleet average reporting of ‘no discards’ (>2 standard deviations from the mean) are also removed from discard analyses. Estimates of total discards for a species are made by calculating a species-specific mean discard rate for the vessels reporting discards and applying that rate to the calculated total effort reported by the fishery to the coastal logbook program.

A randomly selected comprehensive observer program, as recommended by the ACCSP Bycatch Module, has not been implemented for the commercial sector in the South Atlantic, thus estimation of commercial bycatch and discards is reliant upon self-reported data. Limited South Atlantic observer data, however, have been collected since 2018. Some pilot observer survey work was also completed in 2012 and 2014. It is noted that side-by-side comparisons of self-reported discard data from reef fish fishermen in the Gulf of Mexico and the Gulf of Mexico Reef Fish Observer Program have consistently indicated that discard rates estimated from the self-reported data are lower than those estimated from the observer reported data (SEDAR 2014; Smith et al. 2018).

For the recreational sector, estimates of discards from private recreational and charter fishermen are collected through MRIP, which includes dockside surveys. The Southeast Region Headboat Survey, which includes limited headboat observer sampling, collects discard information from headboat vessels. As of January 2021, NMFS Southeast For-Hire Electronic Reporting Program requires mandatory electronic reporting of for-hire vessel catch data, including discards, for all charter vessels and headboats. These self-reported data are expected to improve information on discards from charter and headboat vessels in both the South Atlantic and the Gulf of Mexico. All data sources have a level of uncertainty because not all recreational fishermen are surveyed.

Table 2.5.1. Mean annual proportional standard error (PSE) of discards (B2) for selected species in the South Atlantic estimated by the MRIP-FES Survey from 2015-2019.

Species	Charter	Private
Black Sea Bass	19.8	11.5
Gray Snapper	30.0	16.4
Gray Triggerfish	29.5	28.6
Red Snapper	34.2	28.5
Yellowtail Snapper	48.2	23.5

Source: <https://www.fisheries.noaa.gov/data-tools/recreational-fisheries-statistics-queries>

2.6 Data Used to Assess Bycatch

The SBRM provides the bycatch data for the region that are routinely used in many aspects of fishery management. The SEFSC uses these data in stock assessments to incorporate bycatch into estimates of total fishing mortality. For example, new information on lower release mortality rates from increased descending device usage was incorporated into the most recent stock assessment for South Atlantic red snapper (SEDAR 73 2021). When available, the size composition of discards/bycatch is used to better inform assessment models of fishing mortality by size or age and for bycatch estimation in weight. Bycatch data are used to estimate impacts on ESA-listed species and to authorize amount of allowable incidental take. The South Atlantic Council uses SBRM-derived bycatch information to assess if new management measures are necessary, to develop measures, and/or to evaluate the potential impacts of measures. The South Atlantic Council's Scientific and Statistical Committee uses this information as they review the status of the fisheries and develops acceptable biological catch recommendations. Bycatch data are used to evaluate the effects of the fishery on ESA-listed species under Section 7 of the ESA. All aspects of fishery management in the region that have bycatch implications use data from the SBRM.

Data Use

How are the data resulting from a SBRM used to assess the amount and type of bycatch occurring in the fishery?

3 Fishery Management Plan for the Dolphin and Wahoo Fishery of the Atlantic

3.1 Standardized Bycatch Reporting Requirement

The South Atlantic Fishery Management Council (South Atlantic Council) manages dolphin and wahoo in federal waters of the Atlantic from Maine to the Florida Keys. The original Fishery Management Plan (FMP) for the Dolphin and Wahoo Fishery of the Atlantic (Dolphin Wahoo FMP) implemented a standardized bycatch reporting methodology (SBRM) for the fishery (SAFMC 2003). The Dolphin Wahoo FMP states, “The standardized reporting methodology includes vessel reporting and other aspects of the ACCSP. The data collection program to quantify finfish discard and release data for headboat fisheries will be an at-sea observer program. The data collection program to quantify finfish discard and release data for charterboat fisheries will be the Marine Recreational Fishery Statistics Survey (MRFSS) intercept survey and at-sea observers, where feasible. Reporting of protected species interactions is required for both headboat and charterboat fisheries.”

3.2 Current Bycatch Reporting

The vessel reporting requirement is achieved through logbooks. Fishermen with Commercial Atlantic Dolphin Wahoo Permits, who are selected by the Science and Research Director (SRD), are required to maintain and submit fishing records through the Southeast Fisheries Science Center (SEFSC) Commercial Logbook. Discard data are collected using the Supplemental Discard Logbook that is sent to a 20% simple random sample of the active commercial permit holders in the fishery. In addition to the number of self-reported discards per trip and gear, the SEFSC Supplemental Discard Logbook attempts to quantify the reason why discarding occurs using four codes.⁴ Fishers can specify multiple reasons for a species discarded on the same trip and gear.

- 1) Regulation – Not legal size: Animals that would have been sold, however local or federal size limits forbid it.
- 2) Regulation – Out of season: Animals that would have been sold, however the local or federal fishing season is closed.
- 3) Regulation – Other: Animals that would have been sold, however a local or federal regulation other than size or season, forbids it (Other than size or season; i.e., protected species, not properly permitted).
- 4) Market conditions: Animals that have no market value (rotten, damaged).

Fishermen that participate in the pelagic longline portion of the commercial dolphin wahoo sector are indirectly sampled by the Pelagic Longline Observer Program.

⁴ More information on the discard logbook is available here <https://www.fisheries.noaa.gov/about/southeast-fisheries-science-center>.

For the recreational sector, estimates of discards from private recreational and charter fishermen are collected through the Marine Recreational Information Program (MRIP)/Fishing Effort Survey (FES). The Southeast Region Headboat Survey, which includes limited headboat observer sampling, collects discard information from headboat vessels. In addition, in January 2021, the National Marine Fisheries Service (NMFS) implemented the Southeast For-Hire Electronic Reporting Program, which implemented mandatory electronic reporting of for-hire vessel catch and effort data for over 3,000 vessels in the Gulf of Mexico and Atlantic. The purpose of this program is to provide more accurate and reliable fisheries information about for-hire catch, effort, and discards.

3.3 Characteristics of Bycatch

3.3.1 Amount and Type of Bycatch

Commercial Sector

From 2015 through 2019, annual commercial landings of dolphin averaged 799,125 pounds (lbs) whole weight (ww) and wahoo averaged 64,511 lbs ww. Commercial discards were estimated annually using the SEFSC Commercial Logbook and Supplemental Discard Logbook (accessed May 2020) for all Atlantic trips. A discard rate in numbers of fish per unit of effort was calculated, by species and gear, and that rate was expanded to the total effort in the fishery by gear. When discards for dolphin and wahoo are examined for the previous ten years a relatively small number of discards are reported annually (Figure 3.3.1.1). It is difficult to compare the ratio of commercial landings to discards because commercial landings are reported in weight and discards are reported in numbers of fish. However, based on the information available, very little discarding of dolphin or wahoo was occurring on average from 2015 through 2019. The majority of discarded dolphin occurred on trips using handline or electric gear and the majority of discarded wahoo occurred on trips using trolling gear.

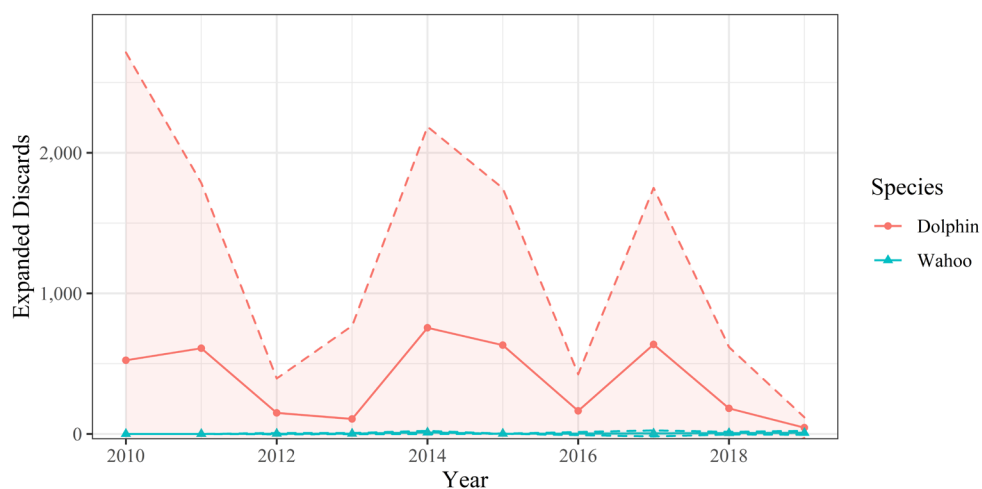


Figure 3.3.3.1. Annual expanded discard estimates for dolphin and wahoo (number of fish) by year from 2010 through 2019 with 95% confidence interval (dotted line). Source: SEFSC Supplemental Commercial Discard Logbook (May 2020).

Dolphin wahoo trips were defined as trips with >50% of landings from dolphin and wahoo stocks. From 2015 through 2019, the dolphin wahoo fishery in the Atlantic had 3,221 trips for all gear types combined in the SEFSC Commercial Logbook. The dolphin wahoo fishery is characterized by a low amount of discards for all species, with discards only occurring on a very small percentage of dolphin wahoo trips (Table 3.3.1.1).

Table 3.3.1.1. From 2015 through 2019, the mean annual number of discards with 95% confidence interval and the percent of dolphin wahoo trips reporting discard by species for dolphin wahoo trips only. Only species with discards reported on dolphin wahoo trips were included and discards represent numbers of fish.

Species	Mean Annual Discards with 95% Confidence Interval	Percent of Dolphin Wahoo Trips Reporting Discards
Dolphin	296 (447-182)	6%
Black Sea Bass	163 (346-26)	1%
Red Snapper	97 (194-24)	1%
Vermilion Snapper	47 (83-20)	1%
King Mackerel	41 (71-19)	1%
Blueline Tilefish	40 (104-0)	<1%
Gray Triggerfish	32 (77-0)	<1%
Yellowtail Snapper	29 (70-0)	<1%
Triggerfishes	23 (60-0)	<1%
Little Tunny	21 (37-8)	<1%
Bank Sea Bass	18 (48-0)	<1%
Banded Rudderfish	16 (41-0)	<1%
Gag	15 (30-4)	1%
Red Porgy	15 (30-4)	<1%
Almaco Jack	9 (22-0)	<1%
Tomtate	7 (19-0)	<1%
Scamp	2 (4-1)	<1%
Goliath Grouper	1 (4-0)	<1%
Rock Hind	1 (3-0)	<1%
Wahoo	1 (1-0)	<1%
Black Grouper	1 (1-0)	<1%

Source: Commercial discard estimates and trips are expanded from the SEFSC Supplemental Commercial Discard Logbook (May 2020).

Of the four discard codes, regulations (i.e., not legal size and other) was the most common reason selected for dolphin and wahoo, depending on the species, based on the number of self-reported discards (Table 3.3.1.2). The 20-inch minimum fork length off Florida, Georgia, and South Carolina appears to be the primary driver of discards for dolphin, but for wahoo it was not determined what regulation was driving discards.

Sea turtles can be incidentally caught in the longline component of the dolphin wahoo fishery. The highly migratory species (HMS) pelagic longline biological opinion (NMFS 2020b) determined the HMS pelagic longline fishery is not likely to adversely affect the following

Endangered Species Act-listed species: any Atlantic sturgeon distinct population segment (DPS), the Atlantic salmon Gulf of Maine DPS, and the smalltooth sawfish U.S. DPS.

Table 3.3.1.2. The percentage of unexpanded discards for each discard reason out of the total number of self-reported discards reported to the Supplemental Discard Logbook in the Atlantic from 2015 through 2019.

Species	Not Legal Size	Out of Season	Other Regulations	Market Conditions
Dolphin	80.1%	0%	16.1%	3.8%
Wahoo	15.4%	0%	61.5%	23.1%

Sources: SEFSC Supplemental Commercial Discard Logbook (May 2020).

Recreational Sector

Recreational discards of dolphin and wahoo are much lower than the landings for all modes of fishing (Table 3.3.1.3). From 2015 through 2019, the private mode had the highest estimated annual recreational landings and discards of dolphin and wahoo. From 2015 through 2019, the other most discarded species on trips capturing dolphin or wahoo varied by mode, but black sea bass, red snapper, vermilion snapper, and blue runner were in the top ten for all three modes (Table 3.3.1.4). Recreational discards of other species on trips capturing dolphin or wahoo species are also highest in the private mode.

Table 3.3.1.3. Atlantic dolphin wahoo headboat, charter, and private mean estimates of landings and discards (2015-2019).

Species	HEADBOAT			CHARTER			PRIVATE		
	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)
Dolphin	3527	416	13%	228,456	14,145	6%	1,865,572	684,060	37%
Wahoo	132	9	7%	12,487	9	<1%	75,258	4,292	6%

Sources: SEFSC Recreational MRIP-FES ACL Dataset (September 2020), SEFSC Headboat Logbook CRNF files (expanded; July 2020).

Table 3.3.1.4. From 2015 through 2019, the top ten species with discards reported on trips capturing a dolphin or wahoo by recreational mode. Species are sorted by number of total discards for each mode.

Rank	HEADBOAT		CHARTER		PRIVATE	
	Species	Discards (N)	Species	Discards (N)	Species	Discards (N)
1	Black Sea Bass	59,327	Vermilion Snapper	44,431	Tomtate	963,191
2	Vermilion Snapper	41,519	Black Sea Bass	39,572	Black Sea Bass	733,531
3	Tomtate	27,141	Red Porgy	31,461	Vermilion Snapper	675,379
4	Atlantic Sharpnose Shark	19,784	Red Snapper	19,769	Little Tunny	655,237
5	Blue Runner	13,147	Blue Runner	17,230	Blue Runner	598,930
6	Gray Triggerfish	13,088	Sailfish	14,951	Almaco Jack	595,637
7	Red Snapper	12,722	Gray Triggerfish	13,033	Gray Triggerfish	443,089
8	Red Porgy	9,878	Greater Amberjack	12,023	Red Snapper	403,538
9	Spottail Pinfish	5,339	Little Tunny	11,789	Amberjack Genus	338,552
10	Mutton Snapper	4,854	Jack Genus	9,463	Grunt Family	331,166

Sources: Recreational MRIP-FES survey data, available at https://www.st.nmfs.noaa.gov/st1/recreational/MRIP_Survey_Data/. [Accessed October 2, 2020], SEFSC Headboat Logbook CRNF files (expanded; July 2020).

3.3.2 Importance of Bycatch in Estimating Fishing Mortality / Effect of Bycatch on Ecosystems

The ecological effects of bycatch mortality are the same as fishing mortality from directed fishing efforts. If not properly managed and accounted for, either form of mortality could potentially reduce stock biomass to an unsustainable level. Dolphin and wahoo are pelagic and migratory, interacting with various combinations of species groups at different levels on a seasonal basis. Vertical hook-and-line gear, the gear predominantly used to harvest dolphin by the recreational sector does little damage to physical or biogenic habitats. Release mortality rates are unknown for most managed species, including dolphin and wahoo, but recent research determined a median mortality rate of 25% for discarded dolphin in the Atlantic (Rudershausen et al., 2019). It is likely that most mortality is a function of hooking and handling of the fish when the hook is being removed. Because dolphin are not long lived species (up to 4 years), the species is highly productive, and bycatch and discarding is low, bycatch is unlikely to have a significant effect on the health of dolphin.

3.4 Feasibility of the SBRM

For the Dolphin Wahoo FMP the standardized reporting methodology includes vessel reporting and other aspects of the ACCSP.

The data collection program to quantify finfish discard and release data for headboat fisheries will be an at-sea observer program. The data collection program to quantify finfish discard and release data for charterboat fisheries will be the Marine Recreational Fishery Statistics Survey (MRFSS) intercept survey and at-sea observers, where feasible. Reporting of protected species interactions is required for both headboat and charterboat fisheries. Electronic reporting is now in place for the federally permitted for-hire sector and the South Atlantic Council is exploring electronic logbooks for the commercial sector. These new technologies could improve timeliness of bycatch reporting.

Feasibility

What is the feasibility of the bycatch reporting methodology from cost, technical and operational perspectives?

The SBRM currently in use for the commercial sector of the fishery consists of randomly selected, mandatory discard logbooks. The SBRM currently in use for the recreational sector of the fishery consists of limited headboat observer coverage, mandatory for-hire logbooks, and port sampling and mail surveys through MRIP/FES. These SBRMs implemented and in use are feasible from a cost, operational, and technical standpoint.

3.5 Data Uncertainty Resulting from the SBRM

The uncertainty of the data resulting from the SBRM has been evaluated through analyses associated with framework and FMP amendments implementing the Dolphin Wahoo FMP. Uncertainty associated with recreational landings is also provided by MRIP.

Data Uncertainty

Can the uncertainty associated with bycatch data be described, quantitatively or qualitatively?

Commercial discard levels are computed based on data collected through self-reported logbooks. Assignment to a gear type is based on greater than 50% of the reported landings on the trip attributed to a particular gear as determined by the fisher. It is noted that only one gear type can be listed per species on a trip; errors in form completion or gear assignment may lead to some odd results when expanding to the fishery as a whole. Data uncertainty in self-reported discard rates can be quite high, particularly for species that are caught in large numbers (reported discards are often rounded; e.g., 10, 20, etc. discards), are difficult to identify (e.g., sharks), or are of little economic interest (particularly of bycatch species); with coefficient of variation routinely exceeding 100%, and that discards are not always identified to species.

For the dolphin wahoo fishery, a simple random sample of 20% of all commercial permit holders within a gear type are selected. Non-reporting is a known issue – captains can send back a form that indicates ‘no discards’ and still be in compliance, and this trend has been increasing in the South Atlantic. Reporting rates vary by gear and target species, but the percentage of ‘no discards’ reports when the discard logbook program began were 30-40%. In more recent years, the percentage of ‘no discards’ has increased to 60-70% and is particularly high for trolling vessels where reports of no discards may exceed 70%. To better estimate discards, data from some non-reporters are eliminated from the computations of discard rates. Discard data from those vessels for which a discard of any species was not reported for the entire year are removed from discard estimation analyses. Discard data from vessels with ‘no discards’ reports submitted much more frequently than the fleet average reporting of ‘no discards’ (>2 standard deviations from the mean) are also removed from discard analyses. Estimates of total discards for a species are made by calculating a species-specific mean discard rate for the vessels reporting discards and applying that rate to the calculated total effort reported by the fishery to the coastal logbook program.

A randomly selected comprehensive observer program, as recommended by the ACCSP Bycatch Module, is currently not available for the commercial sector in the South Atlantic, thus estimation of commercial bycatch and discards is reliant upon self-reported data. Limited South Atlantic observer data, however, have been collected since 2018. Some pilot observer survey work was also completed in 2012 and 2014. It is noted that side-by-side comparisons of self-reported discard data from reef fish fishermen in the Gulf of Mexico and the Gulf of Mexico Reef Fish Observer Program data have consistently indicated that discard rates estimated from the self-reported data are lower than those estimated from the observer reported data (SEDAR 2014; Smith et al. 2018).

For the recreational sector, estimates of discards from private recreational and charter fishermen are collected through MRIP, which includes dockside surveys. The Southeast Region Headboat Survey, which includes limited headboat observer sampling, collects discard information from headboat vessels. As of January 2021, NMFS Southeast For-Hire Electronic Reporting Program requires mandatory electronic reporting of for-hire vessel catch data, including discards, for all charter vessels and headboats. This self-reported data is expected to improve data on discards from charter and headboat vessels in both the South Atlantic and the Gulf. All data sources have a level of uncertainty because not all recreational fishermen are surveyed (Table 3.5.1).

Table 3.5.1. Mean annual proportional standard error (PSE) of Atlantic dolphin and wahoo discards (B2) estimated by the MRIP-FES Survey from 2015-2019.

Species	Charter	Private
Dolphin	36.7	29.7
Wahoo	103	88.6

Source: <https://www.fisheries.noaa.gov/data-tools/recreational-fisheries-statistics-queries>.

3.6 Data Used to Assess Bycatch

The SBRM provides the bycatch data for the region that is routinely used in many aspects of fishery management. The Councils use SBRM-derived bycatch information to assess if new management measures are necessary, to develop measures, and/or to evaluate the potential impacts of measures. The South Atlantic Council's Scientific and Statistical Committee uses this information as they review the status of the fisheries and develop acceptable biological catch recommendations. Bycatch data are used to evaluate the effects of the fishery on ESA-listed species under Section 7 of the ESA. All aspects of fishery management in the region that have bycatch implications use data from the SBRM.

Data Use

How are the data resulting from a SBRM used to assess the amount and type of bycatch occurring in the fishery?

4 Fishery Management Plan for Coral, Coral Reefs, and Live/Hard Bottom Habitats of the South Atlantic Region

4.1 Standardized Bycatch Reporting Requirement

The South Atlantic Fishery Management Council (South Atlantic Council) manages coral in federal waters of the Atlantic from North Carolina to the Florida Keys. The final rule for the Comprehensive Sustainable Fishery Act Amendment (Amendment 5 to the Coral FMP; SAFMC 1998, 64 FR 59126, November 2, 1999) implemented a standardized bycatch reporting methodology (SBRM) for the Fishery Management Plan (FMP) for Coral, Coral Reefs, and Live/Hard Bottom Habitats of the South Atlantic Region (Coral FMP). The SBRM is defined as “reporting requirements as specified in the Atlantic Coastal Cooperative Statistics Program”, which is included in Appendix A.

4.2 Current Bycatch Reporting

All directed harvest of corals is prohibited in the South Atlantic, and all harvested coral must be returned to the sea immediately. If there is incidental take of corals, selected commercial fishermen with Snapper-Grouper, Dolphin Wahoo, and/or a Coastal Migratory Pelagics Permit must report bycatch in logbooks (20% of all commercial permit holders within a gear type).

4.3 Characteristics of Bycatch

All directed harvest of corals is prohibited in the South Atlantic, and all harvested coral must be returned to the sea immediately. Coral, coral reefs, and live/hard bottom habitats are protected from fishery interactions (bottom longline, bottom trawl, trap/pot) through designation of habitat areas of particular concern (HAPC) and essential fish habitat. Fishing in areas of known coral aggregations is limited to gear types that do not interact with the bottom. Bycatch is considered to be low in HAPCs because of low to zero fishing effort (SAFMC 2013).

4.4 Feasibility of the SBRM

All directed harvest of corals is prohibited in the South Atlantic, and all harvested coral must be returned to the sea immediately. Current bycatch reporting required for other fisheries is appropriate and feasible for reporting any incidentally caught corals.

4.5 Data Uncertainty / Data Used Resulting from the SBRM

Due to no directed harvest and protected areas in place to minimize interactions with coral and coral habitat, bycatch is considered low to zero; thus very little to no data are collected on bycatch of corals in the South Atlantic.

5 Fishery Management Plan for the Golden Crab Fishery of the South Atlantic Region

5.1 Standardized Bycatch Reporting Requirement

The South Atlantic Fishery Management Council (South Atlantic Council) manages golden crab in federal waters of the Atlantic from North Carolina to the Florida Keys. The standardized bycatch reporting methodology (SBRM) for the Fishery Management Plan (FMP) for the Golden Crab Fishery of the South Atlantic Region (Golden Crab FMP) was implemented through the final rule for the Comprehensive Sustainable Fishery Act Amendment (Amendment 2 to the Golden Crab FMP; SAFMC 1998, 64 FR 59126, November 2, 1999). The SBRM is defined as “reporting requirements as specified in the Atlantic Coastal Cooperative Statistics Program”, which is provided in Appendix A.

5.2 Current Bycatch Reporting

In November 1995, a voluntary logbook program for the golden crab fishery was initiated by National Marine Fisheries Service. The Golden Crab Trip Report Logbook program became mandatory when regulations for the Golden Crab FMP went into effect on October 28, 1996. Regulations require that all fishers that have been issued a federal vessel permit for the golden crab fishery in the South Atlantic region must complete and submit a logbook form for each fishing trip on which golden crab are caught. All reporting must be done on log forms that are provided by the Southeast Fisheries Science Center (SEFSC) and must be returned to the SEFSC for data processing. A component of this logbook is reporting of discarded species.

Currently, golden crab fishermen are required to carry observers if selected. The number of permit holders has declined from 34 in 1996 to 11 in 2021. There is currently no active observer coverage.

5.3 Characteristics of Bycatch

The Golden Crab FMP (SAFMC 1995) indicates there is not a great deal of bycatch in the golden crab fishery. All female crabs and male crabs weighing less than 1.5 pounds are discarded. On most trips this amounts to a very low number of discarded crabs (20-25 per trawl; SAFMC 2009). A study conducted by Perry et al. (1995) in the northern Gulf of Mexico indicated that bycatch was dominated by isopods and this has been confirmed through conversations with industry (SAFMC 2009). Other species taken were majid crab, portunid crabs, hagfish, deepwater shark, and hake. Bycatch from an observed South Atlantic golden crab trip with approximately 100 traps in the 1990s consisted of 2-3 large isopods and one Jonah crab. The Golden Crab Commercial Logbook mean self-reported discards from 2009-2013 were 1,473 pounds/year of exclusively "Mollusca, other" which are believed to be deep-sea isopods. Landings by year cannot be tabulated due to confidentiality (fewer than three vessels reporting in

each year). The fishery operates in very deep water and traps do not utilize buoy lines; hence, there are no known protected species bycatch issues in the golden crab fishery.

5.4 Feasibility of the SBRM / Data Uncertainty / Data Used Resulting from the SBRM

The SBRM is defined as “reporting requirements as specified in the Atlantic Coastal Cooperative Statistics Program” (Appendix A). The SBRM requirements of mandatory logbook reporting and reporting of discard as well as carrying observers if selected is feasible from a cost, operational, and technical standpoint. Discard reports may not be reliable given that few participants (~10%) in the fishery appear to report any discards. However, discarding and bycatch appears to be low. Because of the low number of participants and low amount of bycatch in the fishery, observer coverage does not appear to be necessary at this time. Bycatch data are used to evaluate the effects of the fishery on ESA-listed species under Section 7 of the ESA.

6 Fishery Management Plan for the Shrimp Fishery of the South Atlantic Region

6.1 Standardized Bycatch Reporting Requirement

The South Atlantic Fishery Management Council (South Atlantic Council) manages shrimp in federal waters of the South Atlantic from North Carolina to the Florida Keys. The final rule for the Comprehensive Sustainable Fishery Act Amendment (Amendment 4 to the Shrimp FMP; SAFMC 1998, 64 FR 59126, November 2, 1999) implemented the standardized bycatch reporting methodology (SBRM) for the Fishery Management Plan (FMP) for the Shrimp Fishery of the South Atlantic Region (Shrimp FMP). The SBRM is defined as “reporting requirements as specified in the Atlantic Coastal Cooperative Statistics Program (ACCSP).” Appendix A includes the reporting requirements of the ACCSP bycatch module.

The final rule for Amendment 6 to the Shrimp FMP revised the SBRM to be: “Adopt the ACCSP Release, Discard and Protected Species Module as the preferred methodology. Until this module is fully funded, require the use of a variety of sources to assess and monitor bycatch including observer coverage on shrimp vessels, logbooks, state cooperation, grant funded projects, and federal penaeid shrimp permits” (SAFMC 2004, 70 FR 73383, December 12, 2005).

6.2 Current Bycatch Reporting

The vessel reporting requirement for the fishery is achieved through logbooks, observer coverage, and vessel monitoring systems (VMS). The owner or operator of a vessel with a federal shrimp permit that fishes for shrimp in the South Atlantic or in adjoining state waters, or that lands shrimp in an adjoining state, must provide information for any fishing trip, as requested by the Science and Research Director (SRD), including, but not limited to, vessel identification, gear, effort, amount of shrimp caught by species, shrimp condition (heads on/heads off), fishing areas and depths, and person to whom sold. A vessel for which a federal Commercial South Atlantic Penaeid Shrimp permit, Commercial South Atlantic Rock Shrimp permit, or Commercial South Atlantic Rock Shrimp – Carolina Zone permit has been issued must carry a National Marine Fisheries Service (NMFS)-approved observer, if the vessel's trip is selected by the SRD for observer coverage. The Southeast Fisheries Science Center (SEFSC) allocates 20% of the total general shrimp observer funds distributed annually for at-sea observers on shrimp vessels to the South Atlantic. Approximately 1% of penaeid shrimp and <1% of rock shrimp trips (698 days from 2011-2016; Scott-Denton et al. 2020) have observer coverage. An owner or operator of a vessel that has been issued a limited access endorsement for South Atlantic rock shrimp or a Commercial Vessel Permit for Rock Shrimp (South Atlantic EEZ) must ensure that such vessel has an operating VMS approved by NMFS for use in the South Atlantic rock shrimp fishery on board when on a trip in the South Atlantic. A VMS includes an operating mobile transmitting unit on the vessel and a functioning communication link between the unit and NMFS as provided by a NMFS-approved communication service provider. The VMS collects effort data for the rock shrimp portion of the fishery. Additional bycatch

information is collected in conjunction with grant-funded programs and through state-collected data.

In the South Atlantic, commercial shrimp effort is monitored via trip ticket data for use in protected resources bycatch estimates. The ACCSP Bycatch Module requires mandatory reporting of protected species interactions for the ACCSP commercial reporting system and for-hire vessels. The ACCSP Bycatch Module also incorporates information from sea turtle stranding and entanglement networks and establishes mandatory reports from real time reporting programs. The SEFSC cooperates with states in their effort to monitor shrimp fishing effort. The SEFSC also coordinates the Sea Turtle Strandings and Salvage Network and maintains a database of all sea turtle strandings in the Gulf of Mexico and Atlantic. The SEFSC uses observer data, strandings data, and other data to monitor sea turtle mortalities resulting from fishery interactions.

6.3 Characteristics of Bycatch

6.3.1 Amount and Type of Bycatch

Most bycatch in the shrimp fishery are discards of no value to the vessel, with a limited amount being regulatory discards. NMFS (1998) indicated that without the use of bycatch reduction devices (BRD), about 51% of the southeastern penaeid shrimp trawl catch was composed of finfish, 18% commercial shrimp species, 13% non-commercial shrimp/crustaceans, and 18% non-crustacean invertebrates. Total fish reduction varies with BRD design, with significant reduction rates noted for Spanish mackerel, weakfish, croaker, and spot. Data from recent (2011-2016) observer coverage in the South Atlantic penaeid shrimp fishery shows similar results to NMFS (1998), with 63% of catch consisting of finfish (Figure 6.3.1.1). A total of 56 species were identified on observed penaeid shrimp trips, but that is an underestimate of unique species as observers aggregate many species groups and only identify a few organisms to the species level (Scott-Denton et al. 2020). For discarded species, clusters of significantly high catch per unit effort were detected primarily off North Carolina (Scott-Denton et al. 2020).

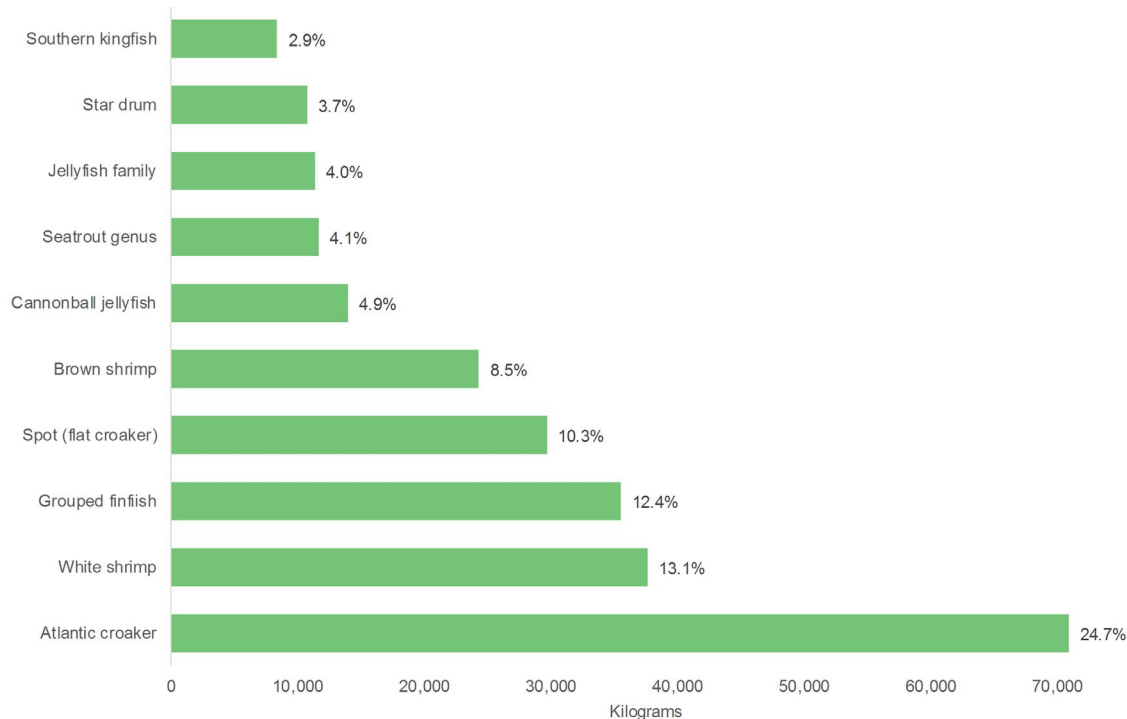


Figure 6.3.1.1. Species-level characterization in the South Atlantic penaeid shrimp fishery, based on mandatory observer coverage of the U.S. southeastern shrimp fishery from January 2011 through December 2016. Source: Scott-Denton et al. 2020.

Data from observer coverage (2011-2016) in the rock shrimp fishery shows 40% of catch consisting of finfish and 17% consisting of other invertebrates (Figure 6.3.1.2). Differences in bycatch composition between the penaeid and rock shrimp fisheries is likely due to depth fished (rock shrimp harvested in much deeper water). A total of 32 species were identified on observed rock shrimp trips (Scott-Denton et al. 2020).

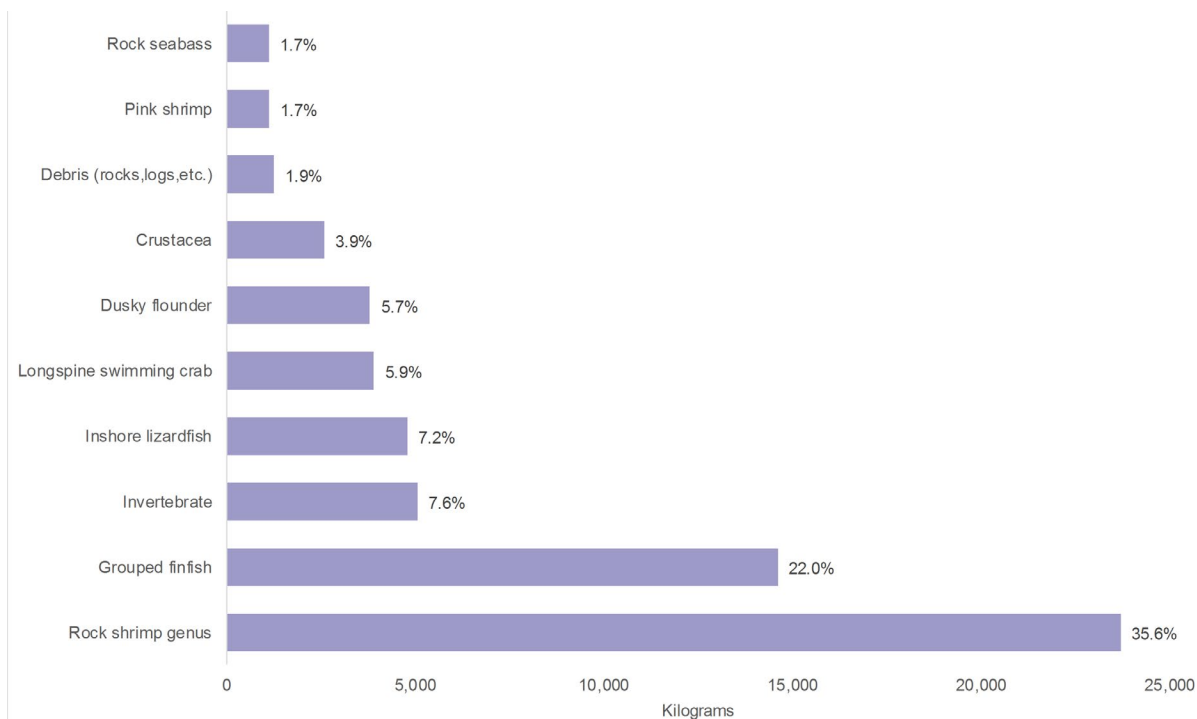


Figure 6.3.1.2. Species-level characterization in the South Atlantic rock shrimp fishery, based on mandatory observer coverage of the U.S. southeastern shrimp fishery from January 2011 through December 2016. Source: Scott-Denton et al. 2020.

Shrimp trawl vessels are a major source of mortality for some Endangered Species Act (ESA)-listed species in the southeast, including sea turtles, Atlantic sturgeon, and smalltooth sawfish. Federal regulations under the ESA require most shrimp trawlers to have a NMFS-approved turtle excluder device (TED) installed in each net rigged for fishing to provide for the escape of sea turtles (68 FR 8456; February 21, 2003). The use of TEDs appears to have had a significant beneficial impact on the survival and recovery of some sea turtle species. TEDs have also been found to reduce total bycatch of finfish and sharks (Raborn et al. 2012). A 2021 biological opinion on the fishery describes the best available information on past and present interactions with endangered and threatened species (NMFS 2021).

6.3.2 Importance of Bycatch in Estimating Fishing Mortality / Effect of Bycatch on Ecosystems

The ecological effects of bycatch mortality are the same as fishing mortality from directed fishing efforts. If not properly managed and accounted for, either form of mortality could potentially reduce stock biomass to an unsustainable level. The discarded bycatch of fish and invertebrates in the penaeid shrimp trawl fishery is highly variable according to season and area. Shrimp trawl gear can affect the abundance of species that are targeted by other fisheries. Ecologically, we are only beginning to understand the impact of discard mortality in disrupting food chains and altering population dynamics. Unfortunately, little is known about the status of finfish and invertebrate species that are present in shrimp trawl bycatch in the greatest numbers.

None of these species have undergone (or are likely to undergo) formal stock assessments because most are not targeted in commercial or recreational fisheries.

6.4 Feasibility of the SBRM

The South Atlantic Council adopted the ACCSP Bycatch Module as the basis for the Shrimp FMP's SBRMs. Until this module is fully funded, the SBRM requires the use of a variety of sources to assess and monitor bycatch including observer coverage on shrimp vessels, logbooks, state cooperation, grant funded projects, and federal penaeid shrimp permits.

The Bycatch Module has not been fully funded. The adopted permitting and data collection requirements in the Shrimp FMP provides information to quantify bycatch effects on the fishery. All shrimp trawl vessels are required to provide information on fishing effort and incidental take of protected species through logbooks. Moving commercial logbooks to an electronic format is being explored by the South Atlantic Council. However, shrimp trawl logbooks are not useful in reporting bycatch of species that are caught in large numbers. Logbook programs in the shrimp trawl fishery are better utilized in recording information on infrequently caught species and providing estimates of total effort by area and season that can then be combined with observer data to estimate total bycatch.

The SEFSC allocates 20% of the total general shrimp observer funds distributed annually for at-sea observers on shrimp vessels to the South Atlantic. Approximately 1% of penaeid shrimp and <1% of rock shrimp trips (698 days from 2011-2016) have observer coverage. Data collected from at-sea observer programs are considered to be the most reliable method for estimating bycatch if coverage is adequate to avoid large sampling errors and there is little "observer effect" (where fishing operations are altered in the presence of an observer). Unfortunately, observer programs are expensive and most funds have been used in the Gulf of Mexico due to the much larger size of the fleet and concerns about red snapper bycatch. Additional bycatch information is collected in conjunction with grant-funded programs such as MARFIN and Cooperative Research Program and through state-collected data.

The South Atlantic Council is exploring electronic logbooks for the commercial sector. Additionally, an electronic logbook program is currently in place in the Gulf of Mexico and passively records fishing effort. Adopting electronic reporting in the South Atlantic could improve timeliness of bycatch reporting.

The SBRM currently in use for the commercial sector of the fishery consists of randomly selected, mandatory observer coverage and logbooks. These SBRMs implemented and in use are feasible from a cost, operational, and technical standpoint.

Feasibility

What is the feasibility of the bycatch reporting methodology from cost, technical and operational perspectives?

6.5 Data Uncertainty Resulting from the SBRM

The uncertainty of the data resulting from the SBRM has been evaluated through analyses associated with FMP amendments implementing the Shrimp FMP. Data collected from at-sea observer programs are considered to be the most reliable method for estimating bycatch if coverage is adequate to avoid large sampling errors and there is little “observer effect” (where fishing operations are altered in the presence of an observer). When observer data are combined with reliable estimates of total fishing effort that can be inexpensively obtained from logbooks, bycatch rates from observer data can be used to more reliably estimate total bycatch levels in a fishery.

Data Uncertainty

Can the uncertainty associated with bycatch data be described, quantitatively or qualitatively?

A statistically valid subset of vessels, determined from the universe of vessels identified through the requirement for a federal shrimp permit, would be required to complete a logbook that included information on vessel and gear detail. For each tow, information would be recorded on date, location, time, catch in pounds and nature of catch (tails or heads on). In addition, information would be collected on protected species interactions. The key advantage of logbooks is the ability to use them to cover all fishing activity relatively inexpensively. Biases associated with logbooks primarily result from inaccuracy in reporting of species that are caught in large numbers or are of little economic interest (particularly of bycatch species), and from low compliance rates. Therefore, logbook programs are more useful in recording information on infrequently caught species and providing estimates of total effort by area and season that can then be combined with observer data to estimate total bycatch.

6.6 Data Used to Assess Bycatch

The SBRM provides the bycatch data for the region that is routinely used in many aspects of fishery management. For Gulf of Mexico species stock assessments, the SEFSC uses discard mortality data collected from the Gulf of Mexico shrimp fishery to incorporate bycatch into estimates of total fishing mortality. For example, estimates of red snapper dead discards from the Gulf of Mexico shrimp fishery are included in the red snapper assessment. I’m not sure if the South Atlantic assessments have estimates of bycatch from the shrimp fishery that are included in assessments of finfish.

Data Use

How are the data resulting from a SBRM used to assess the amount and type of bycatch occurring in the fishery?

The Councils use SBRM-derived bycatch information to assess if new management measures are necessary, to develop measures, and/or to evaluate the potential impacts of measures. The South Atlantic Council’s Scientific and Statistical Committee uses this information as they review the status of the fisheries and develop acceptable biological catch recommendations. Bycatch data

are used to evaluate the effects of the fishery on ESA-listed species under Section 7 of the ESA. All aspects of fishery management in the region that have bycatch implications use data from the SBRM.

Outside of the South Atlantic Council process, the Atlantic States Marine Fisheries Commission (ASMFC) also considers or uses SBRM-derived bycatch information in stock assessments and annual monitoring efforts for Atlantic croaker, spot, and weakfish. Specifically for Atlantic croaker and spot, two of the most prominent species bycaught by the shrimp fishery, these data will be important for future stock assessments and management responses to the Traffic Light Approach analysis, used to annually monitor the fisheries for each species and initiate management actions when necessary.

7 Fishery Management Plan for the Sargassum Fishery of the South Atlantic Region

7.1 Standardized Bycatch Reporting Requirement

The South Atlantic Fishery Management Council (South Atlantic Council) manages *Sargassum* in federal waters of the South Atlantic from North Carolina to the Florida Keys. The original Fishery Management Plan (FMP) for the Sargassum Fishery of the South Atlantic Region (Sargassum FMP; 84 FR 57375, October 3, 2003) implemented a standardized bycatch reporting methodology (SBRM) for the fishery (SAFMC 2002). The Sargassum FMP requires 100% observer coverage. When observer coverage is required, an owner or operator must advise the Southeast Fisheries Science Center in writing not less than 5 days in advance of each trip of departure and expected landing information.

7.2 Current Bycatch Reporting

The Sargassum FMP requires 100% observer coverage.

7.3 Characteristics of Bycatch

Since the final rule published, there has been no harvest of *Sargassum*. As such, there is no bycatch.

7.4 Feasibility of the SBRM

At the time of implementation of the Sargassum FMP, there was only one vessel in the fishery. Requiring an observer will allow National Marine Fisheries Service (NMFS) and the South Atlantic Council to determine if any additional vessels intend to operate. If additional individuals enter the fishery, data will need to be collected from those individuals. Estimates of all species captured are to be provided in an annual SAFE report to be prepared by NMFS.

The South Atlantic Council considered requiring logbooks but concluded the observer could collect the necessary data. In addition, the South Atlantic Council considered requiring vessel permits but concluded the 100% observer requirement and notification process would adequately identify vessels intending to harvest *Sargassum*. If harvest were allowed, the SBRM would be feasible from a cost, operational, and technical standpoint.

7.5 Data Uncertainty / Data Used from the SBRM

Due to no current directed harvest of *Sargassum*, no data are collected on bycatch of *Sargassum* in the South Atlantic.

8 Fishery Management Plan for Coastal Migratory Pelagic Resources in the Gulf of Mexico and Atlantic Region

8.1 Standardized Bycatch Reporting Requirement

The South Atlantic Fishery Management Council (South Atlantic Council) and Gulf of Mexico (Gulf) Fishery Management Council (Gulf Council) jointly manage coastal migratory pelagic (CMP) species (i.e., king mackerel, Spanish mackerel, and cobia in the Gulf) in federal waters from Texas to New York. The South Atlantic Council's jurisdiction extends from the east coast of Florida through New York for king mackerel and Spanish mackerel. The South Atlantic Council's jurisdiction for cobia includes only the east coast of Florida, with Atlantic waters north of Florida being managed by ASMFC and the National Marine Fisheries Service (NMFS). The Gulf Council's jurisdiction extends from the west coast of Florida through the southern border of Texas. The standardized bycatch reporting methodology (SBRM) for the Fishery Management Plan (FMP) for Coastal Migratory Pelagic Resources in the Gulf of Mexico and Atlantic Region (CMP FMP) was implemented through the final rule for the Comprehensive Sustainable Fishery Act Amendment (Amendment 11 to the CMP FMP; SAFMC 1998, 64 FR 59126, November 2, 1999). The SBRM includes the reporting requirements as specified in the Atlantic Coastal Cooperative Statistics Program (ACCSP).

8.2 Current Bycatch Reporting

For the commercial sector, the vessel reporting requirement is achieved through logbooks. Fishermen with a Commercial Spanish Mackerel, King Mackerel, and/or Gillnet for King Mackerel Permit, who are selected by the Science and Research Director (SRD), are required to maintain and submit fishing records through the Southeast Fisheries Science Center (SEFSC) Commercial Logbook. Discard data are collected using the Supplemental Discard Logbook that is sent to a 20% stratified random sample of the active commercial permit holders in the fishery. In addition to the number of self-reported discards per trip and gear, the SEFSC Supplemental Discard Logbook attempts to quantify the reason why discarding occurs using four codes.⁵ Fishermen can specify multiple reasons for a species discarded on the same trip and gear.

- 1) Regulation – Not legal size: Animals that would have been sold, however local or federal size limits forbid it.
- 2) Regulation – Out of season: Animals that would have been sold, however the local or federal fishing season is closed.
- 3) Regulation – Other: Animals that would have been sold, however a local or federal regulation other than size or season, forbids it (Other than size or season; e.g., protected species, not properly permitted).
- 4) Market conditions: Animals that have no market value (rotten, damaged).

⁵ More information on the discard logbook is available here <https://www.fisheries.noaa.gov/about/southeast-fisheries-science-center>.

There is no commercial observer program for the federal CMP fishery; however, the gillnet component is observed indirectly via the Southeast Gillnet Observer Program. Observers are deployed on any active fishing vessel reporting shark drift gillnet effort. In 2005, this program also began to observe sink gillnet fishing for sharks along the southeastern U.S. coast. The program now covers all anchored (sink, stab, set), strike, or drift gillnet fishing, regardless of species targeted, from Florida to North Carolina and in the Gulf year-round. Some additional observer coverage for gillnet (~10%) is conducted by the North Carolina Division of Marine Fisheries, primarily during the fall flounder fishery in Pamlico Sound. South Carolina, Georgia, and Florida prohibit the use of gillnets, with limited exceptions, in state waters.

For the recreational sector, estimates of discards from private recreational and charter fishermen are collected through the Marine Recreational Information Program (MRIP)/Fishing Effort Survey (FES). MRIP/FES replaced Marine Recreational Fisheries Statistics Survey. The Southeast Region Headboat Survey, which includes limited headboat observer sampling, collects discard information from headboat vessels. In addition, in January 2021, NMFS implemented the Southeast For-Hire Electronic Reporting Program, which implemented mandatory electronic reporting of for-hire vessel catch data for over 3,000 vessels in the Gulf of Mexico and South Atlantic. The purpose of this program is to provide more accurate and reliable fisheries information about for-hire catch, effort, and discards.

8.3 Characteristics of Bycatch

8.3.1 Amount and Type of Bycatch

Commercial Sector

Mean commercial landings (2015-2019) of Gulf CMP species were highest from trolling gear (44%), handline gear (25%), and net gear (18%). Mean commercial landings (2015-2019) of Atlantic CMP species were highest from trolling (58%) and net gear (39%). Other gear types, including handline gear, represent 3% of the Atlantic CMP landings.

The Gulf CMP fishery is characterized by low discards of CMP and other species (Table 8.3.1.1 and Figure 8.3.1.1). Most discards are from trolling gear. The Atlantic CMP fishery is also characterized by relatively low discards for all species (Table 8.3.1.1 and Figure 8.3.1.1). Discard levels from gillnet, handline, and trolling gear are roughly equivalent. The ratio of commercial landings to commercial discards is not compared, because commercial landings are reported in pounds and discards are reported in numbers of fish; however, commercial discards appear to be very low relative to landed commercial catch for both regions.

Table 8.3.1.1. Top ten species categories with mean estimated commercial discards (number of fish) during CMP trips (defined as trips with >50% of landings from CMP stocks), sorted from largest to smallest, by gear, for the 2015-2019 period. Data are provided separately for the two regions because observer coverage and management measures for the two regions are determined separately.

A. Gulf of Mexico

Species Category	Gillnet	Species Category	Handline	Species Category	Trolling
American Shad	272	Red Snapper	136	King Mackerel	725
Sharks Unclassified	108	King Mackerel	128	Crevalle Jack	216
Grass Porgy	74	Spanish Mackerel	94	Red Snapper	141
Sea Catfishes	50	Bluefish	80	Sharks Unclassified	97
Bonnethead Shark	29	Gray Triggerfish	76	Little Tunny	64
Grunts Unclassified	29	Yellow Jack	62	Blacktip Shark	60
Ladyfish	26	Crevalle Jack	58	Cobia	44
Weakfish	25	Blue Runner	47	Red Drum	25
Blacktip Shark	15	Bony Fish	24	Amberjacks	19
		Unclassified			
Red Grouper	13	Sharks	20	Greater Amberjack	15
		Unclassified			

B. Atlantic

Species Category	Gillnet	Species Category	Handline	Species Category	Trolling
Menhaden	7,117	King Mackerel	1,238	King Mackerel	2,787
Sharks Unclassified	337	Red Snapper	527	Sandbar Shark	225
Rudderfish	289	Vermilion Snapper	249	Red Snapper	185
Porgies Unclassified	217	Red Porgy	142	Amberjacks	163
				Unclassified	
Rays Unclassified	206	Black Sea Bas	117	Sharks Unclassified	154
Bony Fish	196	Sharks Unclassified	102	Atlantic Sharpnose	107
Unclassified					
Atlantic Sharpnose	192	Grunts Unclassified	101	Barracudas	105
Bluefish	118	Blue Runner	95	Little Tunny	91
Skates Unclassified	82	Barracudas	88	Remoras	82
		Snappers			
Sandbar Shark	75	Unclassified	85	Cobia	56

Source: SEFSC Coastal Logbook (accessed May 2020) and Discard Logbook (accessed May 2020).

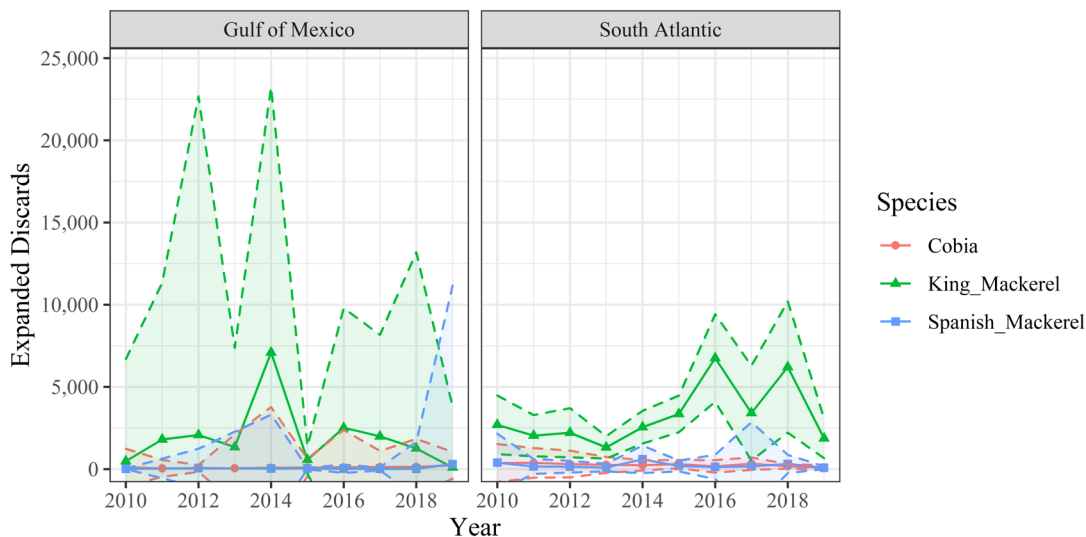


Figure 8.3.1.1. Annual expanded discard estimates for CMP species (number of fish) by year and region from 2010 through 2019 with 95% confidence interval (dotted line). Source: SEFSC Coastal Logbook (accessed May 2020) and Discard Logbook (accessed May 2020).

Of the four discard codes, not legal size and market conditions were the most common reasons selected for CMP species based on the number of self-reported discards, depending on the species and region (Table 8.3.1.2). The minimum size limit appears to be the primary driver of commercial discards for all CMP species in the Gulf and for Spanish mackerel in the Atlantic. Market conditions appear to be the primary driver of discards for South Atlantic king mackerel. Commercial harvest in the CMP fishery results in the occasional bycatch of sea turtles, Atlantic sturgeon, and smalltooth sawfish. However, incidental take of protected species, including sea turtles, is a rare occurrence (Mathers et al., 2020). The 2015 biological opinion on the CMP fishery describes the best available information on past and present interactions (NMFS 2015).

Table 8.3.1.2. The percentage of unexpanded discards for each discard reason out of the total number of self-reported discards reported to the Supplemental Discard Logbook in the Gulf and Atlantic for CMP species (2015-2019).

A. Gulf of Mexico

Species	Not Legal Size	Out of Season	Other Regulations	Market Conditions
Cobia	78%	0%	13%	8%
King Mackerel	65%	32%	2%	0%
Spanish Mackerel	77%	0%	17%	6%

B. Atlantic

Species	Not Legal Size	Out of Season	Other Regulations	Market Conditions
King Mackerel	28%	0%	19%	53%
Spanish Mackerel	90%	0%	9%	1%

Source: SEFSC Supplemental Commercial Discard Logbook (May 2020).

Recreational Sector

From 2015 through 2019, the other most discarded species on trips capturing a CMP species in the Gulf was red snapper for both headboat and charter modes (Table 8.3.1.3). From 2015 through 2019, the most discarded species on trips capturing a CMP species in the Atlantic was black sea bass for headboat and charter modes (Table 8.3.1.3). In both regions, red snapper, blue runner, gray triggerfish and Spanish mackerel were in the top ten for most modes. Recreational discards of CMP species are much lower than the landings for most modes of fishing (Table 8.3.1.4); however, private and charter discards of cobia are relatively high. Across all of the CMP species, the magnitude of private mode discards is much higher compared to the headboat or charter modes.

Table 8.3.1.3. From 2015 through 2019, the top ten species with discards reported on trips capturing a CMP species by recreational mode and region. Species are sorted by number of total discards for each mode from 2015-2019.

A. Gulf of Mexico

Rank	HEADBOAT		CHARTER		PRIVATE	
	Species	Discards (N)	Species	Discards (N)	Species	Discards (N)
1	Red Snapper	135,074	Red Snapper	879,641	Spotted Seatrout	10,183,221
2	Gray Triggerfish	102,231	Gray Triggerfish	737,277	Ladyfish	6,469,167
3	Red Grouper	52,792	Spanish Mackerel	399,356	Spanish Mackerel	6,031,247
4	White Grunt	37,405	Red Grouper	354,287	Red Snapper	5,545,785
5	Vermilion Snapper	36,140	Spotted Seatrout	281,654	Gray Snapper	3,165,484
6	Tomtate	26,812	White Grunt	256,977	White Grunt	2,631,791
7	Gag	15,837	Blue Runner	243,670	Hardhead Catfish	2,310,774
8	Black Sea Bass	13,881	Gray Snapper	193,107	Blue Runner	2,034,310
9	Sand Perch	9,956	Hardhead Catfish	190,490	Pinfish	1,982,762
10	Greater Amberjack	8,588	Gag	182,702	Scaled Sardine	1,851,526

Note: Charter and private modes do not include data from LA and TX.

B. Atlantic

Rank	HEADBOAT		CHARTER		PRIVATE	
	Species	Discards (N)	Species	Discards (N)	Species	Discards (N)
1	Black Sea Bass	324,333	Black Sea Bass	236,568	Spanish Mackerel	3,369,596
2	Vermilion Snapper	185,112	Red Snapper	205,024	Bluefish	3,331,048
3	Tomtate	140,512	Spanish Mackerel	118,850	Black Sea Bass	2,909,537
4	Red Snapper	107,809	Vermilion Snapper	93,064	Red Snapper	2,169,789
5	Gray Triggerfish	64,802	Grunt Family	84,404	Vermilion Snapper	1,232,790
6	Blue Runner	62,187	Blue Runner	78,253	Tomtate	1,113,810
7	Atlantic Sharpnose Shark	43,445	King Mackerel	65,233	Little Tunny	1,093,830
8	Yellowtail Snapper	28,277	Bluefish	64,602	King Mackerel	1,058,777
9	Mutton Snapper	28,075	Tomtate	57,117	Blue Runner	935,603
10	Red Porgy	22,821	Greater Amberjack	55,667	Gray Triggerfish	803,369

Sources: MRIP FES survey data available at <https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads>; Headboat data from SEFSC Headboat Logbook CRNF files (expanded; July 2020).

Table 8.3.1.4. CMP headboat, charter, and private mean annual estimates of landings and discards (2015-2019) by region. Headboat and MRIP (charter and private) landings and discards are in numbers of fish.

A. Gulf of Mexico

Species	HEADBOAT			CHARTER			PRIVATE		
	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)
Cobia	618	254	41%	6,196	6,909	112%	58,902	145,552	247%
King Mackerel	9,655	153	2%	120,167	35,690	30%	325,221	159,107	49%
Spanish Mackerel	2,438	98	4%	249,887	79,871	32%	1,173,804	1,208,243	103%

B. Atlantic

Species	HEADBOAT			CHARTER			PRIVATE		
	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)	Landings (N)	Discards (N)	Ratio (D:L)
King Mackerel	10,658	1,503	14%	84,702	13,047	15%	489,817	211,757	43%
Spanish Mackerel	6,308	1,059	17%	131,520	23,769	18%	846,372	673,919	80%

Sources: MRIP FES data from SEFSC Recreational ACL Dataset (September 2020); Headboat data from SEFSC Headboat Logbook CRNF files (expanded; July 2020).

8.3.2 Importance of Bycatch in Estimating Fishing Mortality/Effect of Bycatch on Ecosystems

The ecological effects of bycatch mortality are the same as fishing mortality from directed fishing efforts. If not properly managed and accounted for, either form of mortality could potentially reduce stock biomass to an unsustainable level. Ecosystem interactions among CMP species in the marine environment are poorly known. The three species are migratory, interacting in various combinations of species groups at different levels on a seasonal basis. With the current state of knowledge, it is difficult to evaluate the potential ecosystem-wide impacts of these species interactions, or the ecosystem impacts from the limited mortality estimated to occur from mackerel fishing effort. However, there is very little bycatch in the Spanish mackerel portion of the CMP fishery with gillnet gear, and the king mackerel portion of the CMP fishery is also associated with a low level of bycatch. Release mortality rates for the CMP fishery are widely variable depending on species and fishing mode ranging from 5% for cobia in the Gulf to 100% for the Atlantic king mackerel commercial gillnet sector (Table 8.3.2.1).

Table 8.3.2.1. Release mortality rates of CMP species from recent stock assessments.

Species	Region	Fishery	Release mortality	Data Source
Cobia	Gulf of Mexico	Recreational	5%	SEDAR 28 Update (2019)
Cobia	Gulf of Mexico	Commercial	5%	SEDAR 28 Update (2019)
King Mackerel	Gulf of Mexico & Atlantic	Recreational Private & Charter	20%	SEDAR 38 Update (2019)
King Mackerel	Gulf of Mexico & Atlantic	Recreational Headboat	22%	SEDAR 38 Update (2019)
King Mackerel	Gulf of Mexico	Commercial Handline	25%	SEDAR 38 Update (2019)
King Mackerel	Atlantic	Commercial Handline	20%	SEDAR 38 Update (2019)
King Mackerel	Atlantic	Commercial Gillnet	100%	SEDAR 38 Update (2019)
Spanish Mackerel	Gulf of Mexico & Atlantic	Recreational	20%	SEDAR 28 (2013)
Spanish Mackerel	Gulf of Mexico & Atlantic	Commercial Handline	10%	SEDAR 28 (2013)

8.4 Feasibility of the SBRM

The SBRM for the CMP FMP includes the reporting requirements as specified in the ACCSP. Electronic reporting is now in place for the federally permitted for-hire sector and the South Atlantic Council is exploring electronic logbooks for the commercial sector. These new technologies could improve timeliness of bycatch reporting.

The SBRM currently in use for the commercial sector of the fishery consists of randomly selected, mandatory discard logbooks. The SBRM currently in use for the recreational sector of the fishery consists of limited headboat observer coverage, mandatory for-hire logbooks, and port sampling and mail surveys through MRIP/FES. These SBRMs implemented and in use are feasible from a cost, operational, and technical standpoint.

Feasibility

What is the feasibility of the bycatch reporting methodology from cost, technical and operational perspectives?

8.5 Data Uncertainty Resulting from the SBRM Methodology

The uncertainty of the data resulting from the SBRM has been evaluated through analyses associated with framework and FMP amendments implementing the CMP FMP. Uncertainty in recreational landings is provided by MRIP.

Commercial discard levels are computed based on data collected through self-reported logbooks. Assignment to a gear type is based on the fishery comprising greater than 50% of the reported landings on the trip as determined by the fisher. It is noted that only one gear type can be listed per species on a trip; errors in form completion or gear assignment may lead to some odd results when expanding to the fishery as a whole. Data uncertainty in self-reported discard rates can be quite high, particularly for species that are caught in large numbers (reported discards are often rounded; e.g., 10, 20, etc. discards), are difficult to identify (e.g., sharks), or are of little economic interest (particularly of bycatch species); with coefficient of variation routinely exceeding 100%, and that discards are not always identified to species.

For the CMP fishery, a simple random sample of 20% of all commercial permit holders within a gear type are selected. Non-reporting is a known issue – captains can submit a form that indicates ‘no discards’ and still be in compliance, and this trend has been increasing in the South Atlantic. Reporting rates vary by gear and target species, but the percentage of ‘no discards’ reports when the discard logbook program began were 30-40%. In more recent years, the percentage of ‘no discards’ has increased to 60-70% and is particularly high for trolling vessels where reports of no discards may exceed 70%. To better estimate discards, data from some non-reporters are eliminated from the computations of discard rates. Discard data from those vessels for which a discard of any species was not reported for the entire year are removed from discard estimation analyses. Discard data from vessels with ‘no discards’ reports submitted much more frequently than the fleet average reporting of ‘no discards’ (>2 standard deviations from the mean) are also removed from discard analyses. Total discards for a species are estimated by calculating a species-specific mean discard rate for the vessels reporting discards and applying that rate to the calculated total effort reported by the fishery to the coastal logbook program.

A randomly selected comprehensive observer program, as recommended by the ACCSP Bycatch Module, is not currently available for the commercial sector in the South Atlantic, thus estimation of commercial bycatch and discards is reliant upon self-reported data. Limited South Atlantic observer data, however, have been collected since 2018. Some pilot observer survey work was also completed in 2012 and 2014. It is noted that side-by-side comparisons of Gulf of Mexico self-reported discard data from reef fish fishermen in the Gulf of Mexico and the Gulf of Mexico Reef Fish Observer Program data have consistently indicated that discard rates estimated from the self-reported data are lower than those estimated from the observer reported data (SEDAR 2014; Smith et al. 2018).

Data Uncertainty

Can the uncertainty associated with bycatch data be described, quantitatively or qualitatively?

For the recreational sector, estimates of discards from private recreational and charter fishermen are collected through MRIP, which includes dockside surveys. The Southeast Region Headboat Survey, which includes limited headboat observer sampling, collects discard information from headboat vessels. As of January 2021, NMFS Southeast For-Hire Electronic Reporting Program requires mandatory electronic reporting of for-hire vessel catch data, including discards, for all charter vessels and headboats. This self-reported data is expected to improve data on discards from charter and headboat vessels in both the South Atlantic and the Gulf. All data sources have a level of uncertainty because not all recreational fishermen are surveyed.

Table 8.5.1. Mean annual proportional standard error (PSE) of CMP discards (B2) by region estimated by the MRIP-FES Survey from 2015-2019.

Region	Species	Charter	Private
Gulf of Mexico	Cobia	32.2	24.1
Gulf of Mexico	King Mackerel	26.9	29.2
Gulf of Mexico	Spanish Mackerel	23.8	22.3
Atlantic	King Mackerel	31.7	23.8
Atlantic	Spanish Mackerel	24.4	25.5

Source: <https://www.fisheries.noaa.gov/data-tools/recreational-fisheries-statistics-queries/>

8.6 Data Used to Assess Bycatch

The SBRM provides the bycatch data for the region that is routinely used in many aspects of fishery management. The Southeast Fisheries Science Center uses these data in stock assessments to incorporate bycatch into estimates of total fishing mortality. When available, the size composition of discards/bycatch is used to better inform assessment models of fishing mortality by size or age and for bycatch estimation in weight. The Councils (and ASMFC for Atlantic Spanish mackerel) use SBRM-derived bycatch information to assess if new management measures are necessary, to develop measures, and/or to evaluate the potential impacts of measures. The South Atlantic Council's Scientific and Statistical Committee uses this information as they review the status of the fisheries and develop acceptable biological catch recommendations. Bycatch data are used to evaluate the effects of the fishery on ESA-listed species under Section 7 of the ESA. All aspects of fishery management in the region that have bycatch implications use data from the SBRM.

Data Use

How are the data resulting from a SBRM used to assess the amount and type of bycatch occurring in the fishery?

9 Fishery Management Plan for Spiny Lobster in the Gulf of Mexico and South Atlantic

9.1 Standardized Bycatch Reporting Requirement

The South Atlantic Fishery Management Council (South Atlantic Council) and Gulf of Mexico Fishery Management Council (Gulf Council) jointly manage spiny lobster in federal waters from Texas through North Carolina. The commercial fishery for spiny lobster and most of the recreational fishery occur off South Florida, primarily in the Florida Keys. The standardized bycatch reporting methodology (SBRM) for the Fishery Management Plan (FMP) for Spiny Lobster in the Gulf of Mexico and the South Atlantic (Spiny Lobster FMP) was implemented through the final rule for the Comprehensive Sustainable Fishery Act Amendment (Amendment 6 to the Spiny Lobster FMP; SAFMC 1998, 64 FR 59126, November 2, 1999). The SBRM includes the reporting requirements as specified in the Atlantic Coastal Cooperative Statistics Program (ACCSP).

9.2 Current Bycatch Reporting

Commercial landings and discards are monitored by the Florida Fish and Wildlife Conservation Commission (FWC) and the National Marine Fisheries Service Southeast Fisheries Science Center (SEFSC). Spiny lobster recreational landings are monitored by FWC. SEFSC coordinates the Sea Turtle Strandings and Salvage Network (STSSN) and maintains a database of all sea turtle strandings in the Gulf of Mexico and Atlantic.

9.3 Characteristics of Bycatch

9.3.1 Amount and Type of Bycatch

Commercial Sector

The commercial component of the fishery is prosecuted primarily by traps, but some commercial fishers harvest spiny lobster by SCUBA diving and a small percentage (1-2%) use bully nets or hoop nets, primarily in state waters, to harvest lobsters. Studies have documented low bycatch and bycatch mortality of finfish by the commercial trap fishery for both wooden and plastic traps (Matthews and Donahue 1997, Matthews et al. 2005). Most of the finfish caught in commercial spiny lobster traps are juveniles and all escape within 48 hours (Matthews and Donahue 1997). However, the type of trap used by fishermen was important, as wire reinforced traps caught more fish than wooden traps when fished in the same area. In addition, wire traps— which were used only in deep waters where no other types of traps were used— caught 10 times more fish than other types of traps (Matthews et al. 2005). Stone crabs were the most dominant species caught in two studies of lobster traps (Matthews and Donahue 1997, Matthews et al. 2005). Legal sized snapper and grouper were observed in approximately 0.5% of observed traps. In studies of deeper waters (>23.5 m) that were often in the federal exclusive economic zone, porgies, lionfish, and grunts were the most common bycatch species (Akins et al. 2012, Lazarre et al.

2013). Lionfish bycatch has become increasingly more common in deeper water lobster traps since this species was first documented in Florida Keys waters in 2009. The total discard rate of finfish and invertebrates for the spiny lobster fisheries is generally between 8-15% and it is unlikely any one species comprises more than 5% of the catch (Seafood Watch 2015). Mortality of commercially and recreationally important finfish is negligible (Matthews and Donahue 1997).

Ghost fishing, which occurs when lost or abandoned traps continue to capture and cause lethal or sub-lethal impacts to lobster and bycatch species, is also a source of bycatch mortality. Uhrin et al. (2014) surveyed the waters around the Florida Keys and estimated that there were approximately 85,548 (SD 23,387) ghost fishing lobster traps. Although biodegradable escape vents are required for lobster traps, Butler and Matthews (2015) determined that new wooden traps used in the fishery remained intact and continued to fish for over a year after being lost, resulting in an estimated 637,622 (SD 74,367) dead lobsters in ghost traps in Florida each year. This averages about 10% of the commercial catch per lobster season (2,721,554 kg; FWC 2017). Butler and Matthews (2015) suggested that the critical point for lobsters confined in a trap is approximately 2 weeks, after which mortality risk is very high. Lobster mortality is also high due the practice of baiting traps with live, sublegal sized lobsters, which not only attract other lobsters, but are themselves subjected to similar long-term confinement and starvation effects (Matthews 2001, Butler and Matthews 2015).

The commercial spiny lobster trap fishery, as it currently operates, may adversely affect sea turtles, coral, and smalltooth sawfish, but is not likely to jeopardize their continued existence. In particular, leatherback sea turtles can be entangled in trap buoy line as the species forages in the water column. Also, loggerhead sea turtles are known to interact with traps on the bottom; however, recent research did not find differences in entanglement related strandings for the species from peak trap effort in the 1990s to much reduced effort today (Adimey et al, 2014). Protected areas where use of traps is prohibited reduces incidence of trap interactions with protected coral species. A 2009 biological opinion on the fishery describes the best available information on past and present interactions with endangered and threatened species (NMFS 2009).

Recreational Sector

The recreational component of the fishery harvests spiny lobster by SCUBA diving typically using allowable equipment, such as tickle sticks and hand nets, and the required underwater measuring devices to meet minimum size limit requirements. In the recreational fishery, bycatch primarily consists of undersized spiny lobsters. Because the gear types used by SCUBA divers and snorkelers targeting spiny lobster are considered highly selective for spiny lobster, very little bycatch of non-target species is expected in the recreational sector of the spiny lobster fishery. Parsons and Eggleston (2005) demonstrated that recreational sport-divers can increase the frequency of injured lobsters, alter shelter choice behavior, and increase predation-induced mortality of injured lobsters.

9.3.2 Importance of Bycatch in Estimating Fishing Mortality / Effect of Bycatch on Ecosystems

The ecological effects of bycatch mortality are the same as fishing mortality from directed fishing efforts. If not properly managed and accounted for, either form of mortality could potentially reduce stock biomass to an unsustainable level. Stone crab caught in lobster traps are usually sold and recorded as commercial landings. Mortality of commercially and recreationally important finfish is negligible (Matthews and Donahue 1997). Little is known about the status of many finfish (e.g., grunts, cowfish, porgies) and invertebrate (e.g., spider crabs, urchins) species that are bycatch in lobster traps in the greatest numbers. None of these species have undergone (or are likely to undergo) formal stock assessments, because most are not targeted in commercial or recreational fisheries.

9.4 Feasibility of the SBRM

The SBRM for the Spiny Lobster FMP includes the reporting requirements as specified in the ACCSP. The commercial vessel reporting requirement is achieved through logbooks and monitoring of discards, which are included in the ACCSP bycatch standards are logbooks and discard reporting. The SBRMs implemented and in use are feasible from a cost, operational, and technical standpoint.

9.5 Data Uncertainty / Data Used Resulting from the SBRM

The uncertainty of the data resulting from the SBRM has been evaluated through analyses associated with framework and FMP amendments implementing the Spiny Lobster FMP. Bycatch levels are low for both sectors. Bycatch data are used to evaluate the effects of the fishery on ESA-listed species under Section 7 of the ESA.

10 List of Interdisciplinary Plan Team Members

Table 10.1. List of IPT members.

Name	Agency / Division	Title
Myra Brouwer	SAFMC	Deputy Executive Director for Management/Fishery Biologist
Chip Collier	SAFMC	Deputy Executive Director for Science/Fishery Biologist
Rick DeVictor	SERO/SF	South Atlantic Branch Chief
Shepherd Grimes	NOAA GC	General Counsel
Frank Helies	SERO/SF	IPT Lead/Fishery Biologist
Jennifer Lee	SERO/PR	Fishery Biologist
Daniel Luers	SERO/SF	Fishery Biologist
Kevin McCarthy	SEFSC	Fishery Biologist
John McGovern	SERO/SF	Assistant Regional Administrator
Roger Pugliese	SAFMC	Fishery Biologist
Jeff Pulver	SERO/SF	Data Analyst
Mike Schmidtke	SAFMC	IPT Lead/Fishery Biologist
Monica Smit-Brunello	NOAA GC	General Counsel

SAFMC = South Atlantic Fishery Management Council, SERO = Southeast Regional Office, SF = Sustainable Fisheries Division, PR = Protected Resources Division, NOAA = National Oceanic and Atmospheric Administration, GC = General Counsel, SEFSC=Southeast Fisheries Science Center

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Appendix A. Atlantic Coastal Cooperative Statistics Program (ACCSP) Bycatch, Releases, and Protected Species Module

The bycatch, releases, and protected species interactions monitoring program⁶ (referred to here as bycatch) includes quantitative and qualitative data collection components. These components are outlined by sector below.

Commercial:

The quantitative component includes: mandatory at-sea observers and mandatory and voluntary reporting of releases and discards through the catch and effort trip ticket systems. Qualitative data collection includes: sea turtle and marine mammal stranding and entanglement reporting networks, beach bird surveys, port sampling to verify reporting on fishermen trip reports, and real-time reporting programs (mandatory reports). Commercial vessels should be required to carry at-sea observers as a condition of permitting in commercial fisheries. Reporting of protected species interactions and releases and discards of managed species are the highest priorities under this module. Reporting of protected species interactions (including threatened species and protected finfish species) is mandatory. Reporting of non-protected species releases and discards through the catch and effort reporting system is voluntary. Federal statutes require that marine mammal interactions involving incidental injury or mortality must be reported within 48 hours after return from a trip or within 48 hours of occurrence for non-vessel trips. All partners should develop outreach and training programs to improve reporting accuracy by fishermen.

The ACCSP developed minimum data elements, an extensive set of sampling protocols, and quality control/assurance procedures for at-sea observer programs. The ACCSP and program partners will conduct approved training programs for all new at-sea observers, and will provide certification of qualifications. Non-verified observer data should be made available for data entry 1-7 days after the trip return date. Finalized data should be provided 45 days after the last day of the month for which data was collected. Data collected on mandatory trips sampled by At-Sea Observer Programs are not confidential, since the data are observed by an agent of a partner and are not submitted by a person. Observed data on a voluntary trip are confidential. A Bycatch, Releases, and Protected Species Interactions Committee will recommend priorities for commercial fisheries, using data collected through the monitoring programs and other information. The highest priority for bycatch monitoring of commercial fisheries is fisheries with probable or proven high discards and/or releases. This process will be linked with setting of biological data collection priorities by the Biological Review Panel.

⁶ https://www.accsp.org/wp-content/uploads/ACCSP_StandardsandAppendices2012_Final05082012.pdf/

Recreational:

The quantitative component includes: collection of the numbers of released and discarded finfish through existing recreational intercept surveys and collection of release and discard information on protected species through add-ons to existing recreational telephone surveys. Qualitative data collection includes: sea turtle and marine mammal stranding and entanglement reporting networks and additions to existing recreational telephone and intercept surveys for finfish species in high incidence areas and/or the addition of special questions to both surveys.

The ACCSP developed minimum data elements, and quality control/assurance procedures for existing recreational surveys. Data collected on mandatory trips sampled by At-Sea Observer Programs are not confidential, since the data are observed by an agent of a Partner and are not submitted by a person. Observed data on a voluntary trip are confidential. A Bycatch, Releases, and Protected Species Interactions Committee will recommend priorities for commercial fisheries, using data collected through the monitoring programs and other information. The highest priority for bycatch monitoring of commercial fisheries is fisheries with probable or proven high discards and/or releases. This process will be linked with setting of biological data collection priorities by the Biological Review Panel.

For hire:

The data collection program to quantify finfish discard and release data for head boat fisheries will be an at-sea observer program. The data collection program to quantify finfish discard and release data for charter boat fisheries will be the MRFSS intercept survey and at-sea observers, where feasible. Reporting of protected species interactions is required for both head boat and charter boat fisheries. Qualitative monitoring for the for-hire fisheries will include the same standards described for the commercial and recreational programs. Information on finfish bycatch is currently collected for charter and head boats through the MRFSS intercept sampling, and is reported by head boat operators on the Southeast Logbooks. Observer sampling of head boats is expected to be implemented as part of the new MRFSS for-hire methodology in 2003.