

Appendix E. **(DRAFT)**

1 Bycatch Practicability Analysis (BPA)

1.1 Population Effects for the Bycatch Species

Background

Bycatch is defined as fish harvested in a fishery, but not sold or retained for personal use. This definition includes both economic and regulatory discards and excludes fish released alive under a recreational catch-and-release fishery management program. Economic discards are generally undesirable from a market perspective because of their species, size, sex, and/or other characteristics. Regulatory discards are fish required by regulation to be discarded, but also include fish that may be retained but not sold.

Regulatory Amendment 22 to the Fishery Management Plan (FMP) for the Snapper Grouper Fishery of the South Atlantic Region (Regulatory Amendment 22) considers revising the annual catch limits (ACLs) and optimum yield (OY) for gag and wreckfish, and modifying the recreational bag limit for gag within the aggregate bag limit. There are 59 species in the snapper grouper fishery management unit (FMU), many of which co-exist with each other, and are encountered by fishers.

Most of the species in the snapper grouper FMU, including gag and wreckfish, are taken with hook-and-line gear (see **Chapter 3**) by both the commercial and recreational sectors. An update to the SEDAR 10 (2006) gag stock assessment conducted in 2014 (SEDAR 10 Update 2014) demonstrated that commercial fleets for gag are predominately handline and diving (spear fishing), and smaller contributors included longline (typically less than 1% of the combined total with the handline fleet). Because of the small number of participants in the wreckfish fishery, most years of landings data are confidential, therefore this BPA includes non-confidential landings and discard information for species in the snapper grouper FMU, in addition to the two species (gag and wreckfish) considered in Regulatory Amendment 22 (**Table 1**).

Wreckfish

The commercial fishery for wreckfish (*Polyprion americanus*) occurs over a complex bottom feature that has over 100 m of topographic relief, known as the Charleston Bump, that is located 130-160 km southeast of Charleston, South Carolina, off the southeastern United States (Sedberry et al. 2001). Fishing occurs at water depths of 450-600 m. Vertical hook-and-line gear consisting of 1/8 inch cable and a terminal rig (around 23 kg of weight), with 8-12 hooks baited with squid, is deployed from hydraulic reels to target wreckfish.

Wreckfish landings are available from 1988-1990 (by calendar year) from NOAA Fisheries Service general canvas files and by fishing year from 1991/1992 thru 2010/2011 from fishermen logbooks. Landings for 2001/2002 through 2008/2009 are confidential because there were fewer than three vessels that fished wreckfish during those years and/or fewer than three dealers purchased wreckfish in those years. See Amendment 20A to the Snapper Grouper FMP (SAFMC 2012b) for more details on historical landings.

There is very little information on bycatch in the wreckfish portion of the snapper grouper fishery; however, the mortality rate of any released wreckfish is likely to be 100%, because the fish are typically harvested in waters deeper than 300 m (Machias 2003; SAFMC 1991). In the wreckfish commercial fishery, barrelfish (*Hyperoglyphe perciformes*) and red bream (*Beryx decadactylus*) are caught incidental to wreckfish (Goldman and Sedberry 2010; Friess and Sedberry 2011) and are likely sold or used for personal consumption. Goldman and Sedberry (2010) reports other species caught by commercial wreckfish fishermen on vertical lines with baited hooks from 400 to 800 m depth, on and around Charleston Bump include: splendid alfonsino (*Beryx splendens*), conger eel (*Conger oceanicus*), gulper shark (*Centrophorus granulosus*), roughskin dogfish (*Cirrhigaleus asper*), and shortspine dogfish (*Squalus mitsukurii*). It is unknown if all these species are retained by commercial wreckfish fishermen. Red bream landings in the southeastern United States are not currently monitored, and the species is not under federal management since it is caught in very small numbers in the commercial wreckfish portion of the snapper grouper fishery (Friess and Sedberry 2011).

Because of the depth at which the wreckfish commercial fishery operates and the gear used, not all of the protected species known to occur in the South Atlantic interact with the wreckfish fishery (see **Section 3.2** of this amendment for details). Sea turtles are vulnerable to capture in the vertical hook-and-line gear used in the wreckfish commercial fishery, and there may be impacts to the critical habitat designated for the North Atlantic right whale. The impacts of the wreckfish fishery on sea turtles were evaluated in the biological opinion on the entire South Atlantic snapper grouper fishery (NMFS 2006). The biological opinion concluded the entire South Atlantic snapper grouper fishery (including the wreckfish component) was likely to adversely affect sea turtles, but not jeopardize their continued existence. The biological opinion also concluded the continued authorization of the fishery would not affect Endangered Species Act (ESA)-listed marine mammals and is not likely to jeopardize the continued existence of any other ESA-listed species.

Therefore, as noted in **Section 3.2** and above, there is very little information available to determine the effects on bycatch and bycatch mortality that results from the commercial wreckfish fishery in the South Atlantic under current regulations.

Recently Implemented and in-Progress Amendments

This BPA includes landings and discard information for species in the snapper grouper FMU, in addition to the two species (gag and wreckfish) considered in Regulatory Amendment 22 (**Table 1**). Actions and alternatives in Regulatory Amendment 22 for gag and wreckfish are closely associated with those in other amendments that have recently been implemented or could be implemented by the end of 2015-2016, and are briefly discussed below. For more details on the history of management for species in the Snapper Grouper FMP, including changes in size limits, trip limits, seasonal closures, etc., refer to **Appendix D**.

Amendment 31 (Joint South Atlantic/Gulf of Mexico Generic Headboat Reporting Amendment) to the Snapper Grouper FMP required that all federally-permitted headboats on the South Atlantic report their landings information electronically, and on a weekly basis in order to improve the timeliness and accuracy of harvest data. The proposed rule published in the *Federal Register* on September 27, 2013. The final rule published on December 27, 2013, and regulations became effective on January 27, 2014.

Regulatory Amendment 15 (SAFMC 2013a), in part, modified the commercial AM for gag so that only the commercial sector for gag will close when the gag commercial ACL is met or projected to be met. The ACLs and AMs for all other shallow water grouper species remain unchanged. Regulatory Amendment 15 (SAFMC 2013a) also reduced the gag commercial ACL to account for projected gag discard mortality from commercial trips that target co-occurring species (i.e., red grouper and scamp) after the gag commercial ACL is met and harvest is prohibited. The final rule for Regulatory Amendment 15 to the Snapper Grouper FMP (Regulatory Amendment 15) published in the *Federal Register* on August 13, 2013 (78 FR 49183), with an effective date of September 12, 2013.

Regulatory Amendment 21 to the Snapper Grouper FMP modified the definition of the overfished threshold for red snapper, blueline tilefish, gag, black grouper, yellowtail snapper, vermilion snapper, red porgy, and greater amberjack. The purpose of Regulatory Amendment 21 was to prevent snapper-grouper stocks with low natural mortality rates from frequently alternating between overfished and rebuilt conditions due to natural variation in recruitment and other environmental factors. The proposed rule published on August 1, 2014, and the comment period ended on September 3, 2014. The final rule for Regulatory Amendment 21 published in the *Federal Register* on October 7, 2014 (79 FR 60379), with an effective date of November 6, 2014.

The Joint South Atlantic/Gulf of Mexico Generic Dealer Reporting Amendment has been approved for Secretarial Review by the Gulf of Mexico and South Atlantic Fishery Management Councils. This amendment is intended to improve the timeliness and accuracy of fisheries data reported by permitted dealers. The amendment creates one dealer permit for all federally-permitted dealers in the southeast region. Previously, no dealer permit was required for all snapper grouper species. Requiring dealers to report landings data electronically each week will improve in-season quota monitoring efforts, which will increase the likelihood that AMs could be more effectively implemented prior to ACLs being exceeded. The notice of availability of the amendment and the proposed rule published on December 19, 2013, and January 2, 2014, respectively. The final rule published in the *Federal Register* on April 9, 2014 (79 FR 19490) with an effective date of August 7, 2014.

At their December 2013 meeting, the Council began development of Regulatory Amendment 21 to the Snapper Grouper FMP, which would consider redefining the minimum stock size threshold for species, including gag, with small natural mortality rates. The Council approved Regulatory Amendment 21 at their March 2014 meeting. The proposed rule published on August 1, 2014, and the comment period ended on September 3, 2014. The final rule for Regulatory Amendment 21 published in the *Federal Register* on October 7, 2014 (79 FR 60379), with an effective date of November 6, 2014.

The Council requested development of Regulatory Amendment 14 to the Snapper Grouper FMP at their September 2013 meeting. Options included in Regulatory Amendment 14, in part, include modifications of the gag trip limit. The Council approved Regulatory Amendment 14 at their September 2013 meeting. The proposed rule was published in the *Federal Register* on April 25, 2014, with a comment period ending May 27, 2014 (79 FR 22936). The final rule published on November 7, 2014 with an effective date on December 8, 2014.

The Joint Commercial Logbook Reporting Amendment would require electronic reporting of landings information by federally-permitted commercial vessels, which would increase the timeliness and accuracy of landings data.

The Joint Charter Boat Reporting Amendment would require charter vessels to regularly report their landings information electronically. Including charter boats in the recreational harvest reporting system would further improve the agency's ability to monitor recreational catch rates in-season.

At their June 2012 meeting, the Council further discussed Amendment 22 to the Snapper Grouper FMP to consider measures such as a tag program to allow harvest of red snapper as the stock rebuilds. Scoping of Amendment 22 was conducted during January and February 2011. At their September 2012 meeting, the Council stated their intent to further develop Amendment 22 in 2013 focusing on a recreational tag program for red snapper, golden tilefish, snowy grouper and wreckfish. In June 2013, the Council changed the focus of Amendment 22 to a recreational tag program to monitor harvest of species with small ACLs. The amendment will be discussed at their December 2014 Council meeting.

The Council initiated development of the Comprehensive Accountability Measure (AM) and Dolphin Allocation Amendment at their September 2013 meeting. In December 2013, the South Atlantic Council changed the range of actions to only include AMs for snapper grouper species and golden crab, and sector allocations for dolphin. The Council reviewed drafts of the amendment at the December 2013, March 2014, and June 2014 meetings. Public hearings took place in August 2014, and the Council is scheduled to take final action in December 2014.

Amendment 26 (Comprehensive Ecosystem-Based Amendment 3) to the Snapper grouper FMP is proposing changes to the bycatch data collection programs in all the fisheries in the South Atlantic. The South Atlantic Council will discuss this amendment in December 2014.

During 2009-2013, total commercial landings for gag were higher than the recreational sector (private and for-hire (charterboat/headboat) categories combined)). The number of gag discarded was much higher for the recreational sector than the commercial sector (**Table 1**).

Commercial Sector

During 2009-2013, regulations (50 C.F.R. § 622.176) required participants in the South Atlantic snapper grouper fishery who were selected by the Science and Research Director (SRD) to maintain and submit a fishing record on forms provided by the SRD. Fishermen in the snapper grouper fishery were also required to submit logbooks with trip and effort information. For gag

in Regulatory Amendment 22, commercial landings (pounds whole weight, lbs ww) during 2009-2013 were dominated by XX followed by XXX (Table 1). Commercial discards during 2009-2013 were highest for XXX followed by XXX (Table 1). For snapper grouper species not considered in Regulatory Amendment 22, commercial landings were also high for XXXX (Table 1).

Information from commercial logbook, commercial observer, headboat, logbook, recreational, survey, and fishery-independent data were used to evaluate similarities in spatial and temporal patterns of fisheries exploitation in the southeastern U.S. Atlantic Ocean for species in the SAFMC Snapper Grouper FMP (Table 2). While XXX is most closely associated XXX, all four species considered in Regulatory Amendment 22 occur together and are often caught on the same trip (see Section 3.2.2 of Regulatory Amendment 22 and Table 2 of this BPA).

Currently, discard data are collected using a supplemental form that is sent to a 20% stratified random sample of the active permit holders in the snapper grouper fishery. However, in the absence of any observer data, there are concerns about the accuracy of logbook data in collecting bycatch information. 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. Actions that could help resolve some of these issues are currently being considered in an amendment being developed by the South Atlantic Fishery Management Council (South Atlantic Council) and the Gulf of Mexico Fishery Management Council (Gulf of Mexico Council), which would allow for commercial logbook data (including discard information) to be entered electronically.

Release mortality estimates for the commercial sector compiled from the most recent stock assessments (as available) using Southeast Fishery Science Center's (SEFSC) SEDAR process are: XXX; 40% gag (SEDAR 10, 2006b);. See the "Finfish Bycatch Mortality" and "Practicability of Management Measures in Directed Fisheries Relative to their Impact on Bycatch and Bycatch Mortality" sections of this BPA for more details.

Recreational Sector

For the recreational sector during 2009-2013, estimates of the number of recreational discards were available from Marine Recreational Fisheries Statistical Survey (MRFSS) and the NMFS Southeast Headboat Survey. The MRFSS system classified recreational catch into three categories:

- Type A - Fishes that were caught, landed whole, and available for identification and enumeration by the interviewers.
- 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.

Recent improvements have been made to the MRFSS program, and the program is now called the Marine Recreational Information Program (MRIP). Beginning in 2013, samples were drawn from a known universe of fishermen rather than randomly dialing coastal households. Other improvements have been and will be made that should result in better estimating recreational catches and the variances around those catch estimates. MRIP methods have been used to recalculate previous MRFSS estimates dating back to 1986.

During 2009-2013, information for charter trips came from two sources. Charter vessels for the snapper grouper fishery were selected to report by the SRD to maintain a fishing record for each trip, or a portion of such trips as specified by the SRD, and on forms provided by the SRD. Harvest and bycatch information was monitored by MRFSS/MRIP. Since 2000, a 10% sample of charter vessel captains were called weekly to obtain trip level information, such as date, fishing location, target species, etc. In addition, the standard dockside intercept data were collected from charter vessels and charter vessel clients were sampled through the standard random digital dialing of coastal households. Precision of charter vessel effort estimates has improved by more than 50% due to these changes (Van Voorhees et al. 2000).

Harvest from headboats was monitored by NMFS-SEFSC Beaufort Laboratory. Collection of discard data began in 2004. Daily catch records (trip records) were filled out by the headboat operators, or in some cases by NMFS approved headboat samplers based on personal communication with the captain or crew. Headboat trips were subsampled for data on species lengths and weights. Biological samples (scales, otoliths, spines, reproductive tissues, and stomachs) were obtained as time allowed. Lengths of discarded fish were occasionally obtained but these data were not part of the headboat database.

During 2009-2013, private recreational landings and subsequent discards (numbers of fish, N) for species in Regulatory Amendment 13 were dominated by XXX (**Table 1**). In the for-hire category, charterboats landed mostly XX, followed by XXX (**Table 1**). However, discards in the charterboat category were highest for XX, followed by XXX (**Table 1**). As mentioned in the background portion of this BPA, actions in Regulatory Amendment 15 (2013a) are expected to reduce bycatch and discards of gag. For headboats, landings were highest for XX, followed by XX; while discards were disproportionately higher for XX, followed by XX (**Table 1**). For snapper grouper species not included in Regulatory Amendment 22, landings and discards in all recreational categories were high for XXX (**Table 1**). Most of these species are also included in the top five species associated with the two species considered in Regulatory Amendment 22 (**Table 2**).

Release mortality estimates for species in the recreational sector compiled from the most recent SEDAR stock assessments (as available) are 25% gag (SEDAR-10 2006b); Despite the high number of black sea bass discarded (**Table 1**), discard mortality during 2008-2012 is estimated to be small due to low release mortality rates.

Table 1. Mean headboat, MRIP (charter and private), and commercial estimates of landings and discards of snapper grouper species in the South Atlantic (2008-2012). Headboat, MRIP (charter and private) landings are in numbers of fish (N); commercial landings are in pounds whole weight (lbs ww). Discards represent numbers of fish that were caught and released alive. Species considered in Regulatory Amendment 22 are in boldface.

Species	HEADBOAT			MRIP CHARTER			MRIP PRIVATE			COMMERCIAL	
	Catch (N)	Landings (N)	Discards (N)	Catch (N)	Landings (N)	Discards (N)	Catch (N)	Landings (N)	Discards (N)	Landings (lbs ww)	Discards (N)
Almaco jack	3,576	3,337	240	3,858	2,592	1,266	9,416	3,688	5,728	204,422	869
Atlantic spadefish	158	128	30	236	188	48	267,887	110,718	157,169	26,936	0
Banded rudderfish	19,008	16,651	2,357	5,634	3,159	2,475	13,703	6,847	6,855	60,615	142
Bank sea bass	5,788	5,788	0	2,913	691	2,222	10,413	2,393	8,020	387	4
Bar jack	290	230	59	261	76	186	11,222	2,805	8,417	4,111	17
Black grouper	1,622	315	1,307	9,755	1,422	8,334	31,487	7,760	23,727	50,001	2,006
Black sea bass	629,922	166,255	463,667	250,778	63,803	186,974	2,873,854	275,845	2,598,008	486,316	29,772
Black snapper	0	0	0	0	0	0	0	0	0	213	7
Blackfin snapper	119	51	68	101	101	0	1,843	1,843	0	1,616	1
Blue runner	22,821	17,484	5,337	25,885	11,601	14,284	1,325,020	610,399	714,621	227,946	854
Blueline tilefish	3,085	3,013	73	18,503	18,055	448	8,569	8,324	245	370,077	244
Coney	121	70	51	37	33	4	1,314	1,100	214	34	0
Cottonwick	17	17	0	0	0	0	148	148	0	0	0
Cubera snapper	377	359	17	4	4	0	2,907	2,631	275	5,060	0
Dog snapper	92	64	28	57	57	0	954	822	133	395	0
Gag	15,489	10,214	5,276	19,365	2,983	16,382	131,170	21,430	109,740	495,064	9,490
Golden tilefish	0	0	0	493	493	0	3,123	3,123	0	421,923	26

Species	HEADBOAT			MRIP CHARTER			MRIP PRIVATE			COMMERCIAL	
	Catch (N)	Landings (N)	Discards (N)	Catch (N)	Landings (N)	Discards (N)	Catch (N)	Landings (N)	Discards (N)	Landings (lbs ww)	Discards (N)
Gray snapper	46,371	40,624	5,747	5,220	5,024	196	1,434,333	229,482	1,204,852	113,992	40,381
Gray triggerfish*	67,258	55,192	12,066	39,155	32,706	6,449	226,603	110,045	116,558	400,273	2,097
Graysby	3,001	2,041	960	1,049	919	131	10,074	3,049	7,025	192	29
Greater amberjack	6,614	4,710	1,904	25,898	20,209	5,689	58,129	22,383	35,746	859,929	3,353
Hogfish	260	169	91	32	29	3	30,321	27,550	2,770	45,169	55
Jolthead porgy	7,050	6,913	137	2,232	2,232	0	12,594	11,869	725	3,853	11
Knobbed porgy	5,584	5,439	145	832	832	0	6,838	6,398	441	23,726	1
Lane snapper	23,340	20,227	3,112	11,993	8,882	3,111	166,037	42,246	123,791	3,526	210
Lesser amberjack	22	17	6	12	12	0	393	393	0	17,044	34
Longspine porgy	3	3	0	0	0	0	460	290	170	0	0
Mahogany snapper	32	30	2	0	0	0	35	35	0	30	0
Margate	856	662	195	265	206	59	9,512	3,559	5,952	3,725	30
Misty grouper	0	0	0	0	0	0	0	0	0	971	1
Mutton snapper	17,683	13,996	3,687	31,630	18,609	13,021	294,792	111,060	183,732	74,212	1,636
Ocean triggerfish	473	473	0	363	285	77	7,366	3,454	3,912	0	0
Queen snapper	0	0	0	1	1	0	0	0	0	3,734	107
Red grouper	11,559	1,629	9,930	9,138	3,647	5,491	81,675	31,172	50,503	367,462	3,610
Red hind	383	313	70	86	86	0	2,588	928	1,660	9,865	88
Red porgy	41,064	23,659	17,405	20,579	12,733	7,845	38,282	24,793	13,489	169,468	27,818
Rock hind	2,150	1,509	642	132	92	40	4,087	908	3,179	15,839	14

Species	HEADBOAT			MRIP CHARTER			MRIP PRIVATE			COMMERCIAL	
	Catch (N)	Landings (N)	Discards (N)	Catch (N)	Landings (N)	Discards (N)	Catch (N)	Landings (N)	Discards (N)	Landings (lbs ww)	Discards (N)
Rock sea bass	0	0	0	415	177	238	11,477	4,287	7,190	453	49
Sailors choice	123	123	0	732	23	709	32,818	14,324	18,494	0	0
Sand tilefish	1,712	895	817	4,053	484	3,568	23,983	6,091	17,891	0	238
Saucereye porgy	228	228	1	0	0	0	1,034	1,034	0	0	0
Scamp	5,602	3,195	2,407	4,631	2,771	1,860	8,852	5,108	3,745	221,922	2,204
Schoolmaster	344	344	0	2	2	0	7,251	4,427	2,824	181	0
Scup	11,364	9,531	1,833	246	219	28	1,086	596	490	0	0
Silk Snapper	1,371	1,249	122	1,379	1,209	171	1,141	153	988	11,379	8
Snowy grouper	123	72	50	1,684	1,388	295	969	550	419	85,047	273
Tomtate	119,474	49,453	70,021	19,269	11,868	7,401	331,321	84,819	246,502	212	2,441
Vermilion snapper	282,092	176,802	105,290	63,968	41,150	22,818	169,085	70,051	99,034	1,010,587	38,174
White grunt*	179,271	144,826	34,445	42,015	34,665	7,349	419,442	193,338	226,104	126,477	348
Whitebone porgy	4,836	4,577	258	1,833	1,784	49	11,919	10,710	1,209	14	31
Yellowedge grouper	7	4	3	27	27	0	44	44	0	16,080	13
Yellowfin grouper	20	14	5	0	0	0	97	97	0	3,780	6
Yellowmouth grouper	22	17	5	15	15	0	0	0	0	290	0
Yellowtail snapper	134,179	100,724	33,454	199,283	134,871	64,412	967,208	362,141	605,067	1,123,532	90,695

Sources: MRIP data from SEFSC Recreational ACL Dataset (May 2013), Headboat data from SEFSC Headboat Logbook CRNF files (expanded; May 2013), Commercial landings data from SEFSC Commercial ACL Dataset (July 10, 2013) with discard estimates from expanded SEFSC Commercial Discard Logbook (Jun 2013).

Note: Estimates of commercial discards are highly uncertain and are for vertical line gear only.

*Commercial gray triggerfish includes "triggerfishes, unclassified" category; commercial white grunt includes "grunts, unclassified" category.

Goliath grouper, Nassau grouper, Warsaw grouper, Speckled hind, and Red snapper are excluded from Table 1 since they are prohibited species, and landings records are not available for all the years 2007-2011. Wreckfish landings are confidential.

Table 2. Top five associated stocks and level of association (parenthesis) for 35 snapper grouper species evaluated in **Table A6 of Appendix O** in the Comprehensive ACL Amendment (SAFMC 2011b), including the two species considered in Regulatory Amendment 22(boldface). Species groups were evaluated using cluster association matrix with life history weighted equal to maximum from fishery data.

COMMON NAME	1	2	3	4	5
yellowedge grouper	snowy grouper (.4)	blueline tilefish (.24)	warsaw grouper (.17)	tilefish (.07)	silk snapper (.04)
snowy grouper	blueline tilefish (.55)	yellowedge grouper (.23)	warsaw grouper (.09)	tilefish (.06)	silk snapper (.05)
blueline tilefish	snowy grouper (.56)	yellowedge grouper (.21)	sand tilefish (.1)	scamp (.1)	tilefish (.01)
tilefish	gag (.31)	silk snapper (.23)	snowy grouper (.19)	yellowedge grouper (.12)	blueline tilefish (.11)
wreckfish	silk snapper (.21)	warsaw grouper (.18)	yellowedge grouper (.12)	bar jack (.06)	tomtate (.06)
silk snapper	yellowfin grouper (.34)	tilefish (.15)	wreckfish (.08)	snowy grouper (.07)	warsaw grouper (.03)
warsaw grouper	speckled hind (.18)	yellowedge grouper (.15)	silk snapper (.07)	snowy grouper (.06)	tilefish (.05)
speckled hind	scamp (.19)	yellowfin grouper (.14)	warsaw grouper (.12)	nassau grouper (.07)	knobbed porgy (.05)
yellowfin grouper	speckled hind (.29)	silk snapper (.27)	red hind (.11)	nassau grouper (.08)	yellowedge grouper (.04)
nassau grouper	yellowfin grouper (.12)	yellowedge grouper (.11)	speckled hind (.08)	goliath grouper (.08)	black grouper (.07)
gag	red grouper (.24)	red snapper (.23)	gray triggerfish (.23)	white grunt (.09)	red porgy (.08)
red grouper	gag (.2)	scamp (.13)	white grunt (.12)	gray snapper (.1)	lane snapper (.1)
scamp	red porgy (.2)	greater amberjack (.17)	red grouper (.15)	speckled hind (.11)	gag (.08)
black grouper	yellowtail snapper (.26)	almaco jack (.16)	gray snapper (.14)	black sea bass (.07)	lane snapper (.06)
goliath grouper	black grouper (.24)	gray snapper (.1)	lane snapper (.1)	yellowedge grouper (.08)	warsaw grouper (.07)
banded rudderfish	almaco jack (.3)	red porgy (.09)	greater amberjack (.09)	scamp (.08)	knobbed porgy (.07)
greater amberjack	scamp (.21)	almaco jack (.2)	red snapper (.11)	vermilion snapper (.08)	gray triggerfish (.08)
almaco jack	banded rudderfish (.18)	black grouper (.16)	greater amberjack (.13)	vermilion snapper (.1)	gray triggerfish (.1)
red porgy	gray triggerfish (.23)	scamp (.19)	vermilion snapper (.18)	tomtate (.08)	gag (.07)
gray triggerfish	vermilion snapper (.38)	gag (.21)	lane snapper (.12)	red porgy (.1)	white grunt (.05)
vermilion snapper	gray triggerfish (.45)	tomtate (.18)	red porgy (.14)	lane snapper (.07)	gag (.04)
red snapper	gag (.33)	greater amberjack (.14)	vermilion snapper (.13)	red porgy (.08)	scamp (.07)
black sea bass	tomtate (.2)	knobbed porgy (.12)	whitebone porgy (.09)	black grouper (.09)	vermilion snapper (.08)
red hind	rock hind (.24)	jolthead porgy (.15)	red grouper (.11)	whitebone porgy (.08)	tomtate (.08)
rock hind	red hind (.28)	knobbed porgy (.27)	jolthead porgy (.24)	bar jack (.06)	white grunt (.04)
knobbed porgy	rock hind (.26)	jolthead porgy (.17)	white grunt (.1)	scamp (.08)	black sea bass (.07)

COMMON NAME	1	2	3	4	5
whitebone porgy	tomtate (.55)	red hind (.13)	almaco jack (.07)	greater amberjack (.06)	banded rudderfish (.04)
jolthead porgy	white grunt (.21)	rock hind (.19)	red hind (.17)	sand tilefish (.16)	knobbed porgy (.12)
tomtate	whitebone porgy (.38)	vermilion snapper (.33)	red hind (.08)	black sea bass (.08)	gray triggerfish (.02)
white grunt	jolthead porgy (.23)	red grouper (.13)	gray triggerfish (.1)	knobbed porgy (.09)	gag (.09)
sand tilefish	jolthead porgy (.33)	bar jack (.19)	blueline tilefish (.11)	yellowtail snapper (.1)	knobbed porgy (.04)
bar jack	sand tilefish (.24)	jolthead porgy (.1)	knobbed porgy (.08)	rock hind (.08)	nassau grouper (.06)
gray snapper	lane snapper (.58)	yellowtail snapper (.37)	red porgy (.05)	warsaw grouper (.)	silk snapper (.)
lane snapper	gray snapper (.62)	gray triggerfish (.17)	yellowtail snapper (.11)	vermilion snapper (.06)	whitebone porgy (.02)
yellowtail snapper	gray snapper (.45)	black grouper (.19)	lane snapper (.19)	sand tilefish (.09)	red porgy (.05)

Sources: [SERO-LAPP-2010-06](#).

Finfish Bycatch Mortality

Recent SEDAR assessments for gag and wreckfish in Regulatory Amendment 22 include estimates of release mortality rates based on published studies. Stock assessment reports can be found at <http://www.sefsc.noaa.gov/sedar/>.

SEDAR-10 (2006b) estimated release mortality rates of 40% and 25% for gag taken by commercial and recreational fishermen, respectively. A tagging study conducted by McGovern et al. (2005) indicated recapture rates of gag decreased with increasing depth. The decline in recapture rate was attributed to depth-related mortality. Assuming there was no depth-related mortality at 0 m, McGovern et al. (2005) estimated depth related mortality ranged from 14% at 11-20 m (36-65 feet) to 85% at 71-80 m (233-262 feet). McGovern et al. (2005) estimated a release mortality rate of 50% at 50 m, which is similar to the findings of Rudershausen et al. (2007). Rudershausen et al. (2007) concluded minimum size limits are effective for gag in the shallower portions of their depth range. Overton et al. (2008) reported post-release mortality for gag as 13.3%. The data workshop for SEDAR-33, which is under development, has proposed a lower release mortality rate for gag (Nick Farmer pers.com. Southeast Regional Office).

Practicability of Management Measures in Directed Fisheries Relative to their Impact on Bycatch and Bycatch Mortality

The snapper grouper fishery represents many species occupying the same location at the same time. Species most closely associated with directed fisheries for gag and wreckfish are red grouper, black grouper, red hind, rock hind, yellowmouth grouper, yellowfin grouper, coney, and graysby (**Table 2**, [SERO-LAPP-2010-06](#)). Descriptions of other South Atlantic Council-managed species may be found in Volume II of the Fishery Ecosystem Plan (SAFMC 2009) available at: <http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx>. In the wreckfish commercial fishery, barrelfish (*Hyperoglyphe perciformes*) and red bream (*Beryx decadactylus*) are caught as bycatch (Goldman and Sedberry 2011). Other species collected by Goldman and Sedberry (2011) on vertical lines with baited hooks from 400 to 800 m depth, on and around Charleston Bump were: splendid alfonsino (*Beryx splendens*), conger eel (*Conger oceanicus*), gulper shark (*Centrophorus granulosus*), roughskin dogfish (*Cirrhigaleus asper*), and shortspine dogfish (*Squalus mitsukurii*). Fishermen could harvest one of these species and return co-occurring species to the water as “regulatory discards” (e.g., if the fish are under the size limit) or if undesirable; However, a portion of the discarded fish would not survive due to the depths at which these fish are caught.

Alternatives under **Action 1** propose to revise the ACLs and OY for gag, and are not expected to affect major changes in bycatch. Need to update with alternatives XXX.

Alternatives in Action 2 would modify the recreational bag limit for gag within the aggregate bag limit. Need to update with alternatives XXX.

Alternatives in Action 3 would revise the ACLs and OY for wreckfish. Need to update with alternatives XXX.

1.2 Ecological Effects Due to Changes in the Bycatch

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 and subsequently disrupt the ecological function of a species within the ecosystem. Stock assessments for gag and wreckfish have taken expected bycatch into consideration when specifying the overfishing limit and acceptable biological catch upon which ACLs for those species are based.

As summarized in **Section 1.1** of this BPA, most actions in Regulatory Amendment 22 are not expected to result in significant changes in bycatch of gag or wreckfish, or co-occurring species. Modifying the trip limit for gag is expected to XXX. ACLs and AMs are in place for these species to ensure overfishing does not occur, and expected bycatch has been taken into consideration when specifying catch levels. Modifying fishing seasons, reducing trip limits, and establishing new AMs would add further assurance that overfishing does not occur. Additionally, as stated in **Chapter 3**, and analyzed in detail in **Chapter 4**, the biological (and consequently ecological) effects due to changes in the bycatch would likely be negligible.

1.3 Changes in the Bycatch of Other Fish Species and Resulting Population and Ecosystem Effects

Regulatory Amendment 22 is not expected to affect major changes in bycatch of other fish species. While Regulatory Amendments 18 (2013b) and 19 (2013c) increase the ACLs for vermilion snapper and black sea bass, AMs are in place to ensure that overfishing does not occur. Regulatory Amendment 15 (2013a) reduced the commercial trip limit for gag, and modified the gag AM to only close the commercial sector for gag (not other shallow water grouper species as well). Additionally, the amendment also reduced the gag commercial ACL to account for dead discards that could occur after the gag commercial ACL is met when fishermen target co-occurring grouper species. Therefore, bycatch and discards of closely associated species such as red grouper, black grouper, red hind, rock hind, yellowmouth grouper, yellowfin grouper, coney, and graysby are not expected to be affected by the proposed actions in Regulatory Amendment 22.

1.4 Effects on Marine Mammals and Birds

Under Section 118 of the Marine Mammal Protection Act (MMPA), NMFS must publish, at least annually, a List of Fisheries (LOF) that places all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals that occurs in each fishery. Of the gear utilized within the snapper grouper fishery, only the black sea bass pot is considered to pose an entanglement risk to marine mammals. The southeast U.S. Atlantic black sea bass pot sector is included in the grouping of the Atlantic mixed species

trap/pot fisheries, which the proposed rule for the 2013 LOF classifies as a Category II (78 FR 53336, August 29, 2013). Gear types used in these sectors are determined to have occasional incidental mortality and serious injury of marine mammals. For the South Atlantic snapper grouper fishery, the best available data on protected species interactions are from the SEFSC Supplementary Discard Data Program (SDDP) initiated in July of 2001. The SDDP sub-samples 20% of the vessels with an active permit. Since August 2001, only three interactions with marine mammals have been documented in the snapper grouper fishery; each was taken by handline gear and each released alive (McCarthy SEFSC database). The longline and hook and line gear components of the snapper grouper fishery in the South Atlantic are classified in the 2013 LOF (78 FR 23708; April 22, 2013) as Category III fisheries. Category II means that there is a remote likelihood or no known incidental mortality and serious injuries of marine mammals.

Although the black sea bass pot sector can pose an entanglement risk to large whales due to their distribution and occurrence, sperm, fin, sei, and blue whales are unlikely to overlap with the black sea bass pot sector operated within the snapper grouper fishery since it is executed primarily off North Carolina and South Carolina in waters ranging from 70-120 feet deep (21.3-36.6 meters) and these whales generally occur further offshore. However, the November 1 through April 30 closure to the pot sector in Regulatory Amendment 19 (SAFMC 2013c) will further reduce the potential risk to protected species as this is the calving season for right whales in the South Atlantic. In addition, the potential risk to protected species has likely been reduced with implementation of Amendment 18A to the Snapper Grouper FMP (SAFMC 2012), which established 32 black sea bass pot endorsements, limited the number of pots that can be fished to 35, and required that pots be returned to shore at the conclusion of a trip. Regulatory Amendment 14 to the Snapper Grouper FMP (SAFMC 20XX), in part, modified the recreational fishing year for black sea bass, modified the recreational AM for black sea bass, and modified the trip limit for gag and black sea bass. There are no documented interactions between the black sea bass pot sector and large whales.

The Bermuda petrel and roseate tern occur within the action area. Bermuda petrels are occasionally seen in the waters of the Gulf Stream off the coasts of North and South Carolina during the summer. Sightings are considered rare and only occurring in low numbers (Alsop 2001). Roseate terns occur widely along the Atlantic coast during the summer but in the southeast region, they are found mainly off the Florida Keys (unpublished U.S. Fish and Wildlife Service data). Interaction with fisheries has not been reported as a concern for either of these species.

Fishing effort reductions have the potential to reduce the amount of interactions between the fishery and marine mammals and birds. Although, the Bermuda petrel and roseate tern occur within the action area, these species are not commonly found and neither has been described as associating with vessels or having had interactions with the snapper grouper fishery. Thus, it is believed that the snapper grouper fishery is not likely to negatively affect the Bermuda petrel and the roseate tern.

1.5 Changes in Fishing, Processing, Disposal, and Marketing Costs

The actions in Regulatory Amendment 22 to revise the ACLs and OY for gag and wreckfish, and modify the recreational bag limit for gag within the aggregate bag limit would be expected to affect the cost of fishing operations for gag and wreckfish. It is likely that all four states (North Carolina, South Carolina, Georgia, and Florida) would be affected by actions in the amendment if implemented through rulemaking. Additionally, factors such as waterfront property values, availability of less expensive imports, etc. may affect economic decisions made by recreational and commercial fishermen who target these species.

Economic effects of the actions proposed in Regulatory Amendment 22 are addressed in **Chapter 4**, as well as **Appendices G** (Regulatory Impact Review) and **H** (Regulatory Flexibility Act Analysis).

1.6 Changes in Fishing Practices and Behavior of Fishermen

Actions proposed in Regulatory Amendment 22 could result in a modification of fishing practices by commercial and recreational fishermen. However, as discussed in **Sections 1.1** and **1.2** of this BPA, the magnitude of discards is not expected to be significantly affected by the proposed actions. It is difficult to quantify any of the measures in terms of reducing discards until bycatch has been monitored over several years. Commercial and recreational bycatch information is collected by NMFS, and that information will continue to be analyzed to determine what changes, if any, have taken place in terms of fishing practices and fishing behavior as a result of the actions implemented through this amendment.

Social effects of actions proposed in Regulatory Amendment 22 are addressed in **Chapter 4** of this document. **Section 3.3.4** includes information on environmental justice.

1.7 Changes in Research, Administration, and Enforcement Costs and Management Effectiveness

Research and monitoring is ongoing to understand the effectiveness of proposed management measures and their effect on bycatch. In 1990, the SEFSC initiated a logbook program for vessels with federal permits in the snapper grouper fishery from the Gulf of Mexico and South Atlantic. Approximately 20% of commercial fishermen are asked to fill out discard information in logbooks; however, a greater percentage of fishermen could be selected with emphasis on individuals that dominate landings. The SEFSC is developing electronic logbooks, which could be used to enable fishery managers to obtain information on species composition, size distribution, geographic range, disposition, and depth of fishes that are released. Further, The Joint Commercial Logbook Reporting Amendment is being developed by the South Atlantic Council and the Gulf of Mexico Council, which would require electronic reporting of landings information by federally-permitted commercial vessels to increase the timeliness and accuracy of landings and discard data.

Recreational discards are obtained from MRIP and logbooks from the NMFS headboat program. Additional data collection activities for the recreational sector are being considered by the South Atlantic Council that could allow for a better monitoring of snapper grouper bycatch in the future. Some observer information has been provided by Marine Fisheries Initiative and

Cooperative Research Programs (CRP), but more is desired for the snapper grouper fishery. In December 2012, the Southeast Region Headboat Survey underwent a transition from paper logbooks to electronic logbooks, which is expected to improve the quality of data in that sector. As of January 1, 2013, the paper logbook form has been replaced by a new electronic logbook. The form is available through a password protected Web site on the internet, which can be accessed by personal computer, computer tablet, or “smart phone”. The South Atlantic Council approved an amendment at their March 2013 meeting, which if implemented, would require weekly electronic reporting.

Cooperative research projects between science and industry are being used to a limited extent to collect bycatch information on the snapper grouper fishery in the South Atlantic. For example, Harris and Stephen (2005) characterized the entire (retained and discarded) catch of reef fishes from a selected commercial fisherman in the South Atlantic including total catch composition and disposition of fishes that were released. The Gulf and South Atlantic Fisheries Foundation, Inc. conducted a fishery observer program within the snapper grouper vertical hook-and-line (bandit rig) fishery of the South Atlantic United States. Through contractors they randomly placed observers on cooperating vessels to collect a variety of data quantifying the participation, gear, effort, catch, and discards within the fishery.

In the spring 2010, Archipelago Marine Research Ltd. worked with North Carolina Sea Grant and several South Atlantic Unlimited Snapper Grouper Permit holders to test the effectiveness of electronic video monitoring to measure catch and bycatch. A total of 93 trips were monitored with video monitoring, 34 by self-reported fishing logbooks, and 5 by observers. Comparisons between electronic video monitoring data and observer data showed that video monitoring was a reliable source of catch and bycatch data.

Research funds for observer programs, as well as gear testing and testing of electronic devices are also available each year in the form of grants from the Marine Fisheries Initiative, Saltonstall-Kennedy program, and the CRP. Efforts are made to emphasize the need for observer and logbook data in requests for proposals issued by granting agencies. A condition of funding for these projects is that data are made available to the Councils and NMFS upon completion of a study.

Additional administrative and enforcement efforts would help to implement and enforce fishery regulations. NMFS established the South East Fishery-Independent Survey in 2010 to strengthen fishery-independent sampling efforts in southeast U.S. waters, addressing both immediate and long-term fishery-independent data needs, with an overarching goal of improving fishery-independent data utility for stock assessments. Meeting these data needs is critical to improving scientific advice to the management process, ensuring overfishing does not occur, and successfully rebuilding overfished stocks on schedule.

1.8 Changes in the Economic, Social, or Cultural Value of Fishing Activities and Non-Consumptive Uses of Fishery Resources

The preferred management measures and any changes in economic, social, or cultural values are discussed in **Chapter 4** of Regulatory Amendment 22. Further analysis can be found in **Appendices G** (Regulatory Impact Review) and **H** (Regulatory Flexibility Act Analysis).

1.9 Changes in the Distribution of Benefits and Costs

The distribution of benefits and costs expected from the action in Regulatory Amendment 22 are expected to be negligible and discussed in **Chapter 3**. Economic and social effects of the actions proposed in Regulatory Amendment 22 are addressed in **Chapter 4**.

1.10 Social Effects

The social effects of all the measures are described in **Chapter 4** of Regulatory Amendment 22.

1.11 Conclusion

This section evaluates the practicability of taking additional action to minimize bycatch and bycatch mortality using the ten factors provided at 50 CFR 600.350(d)(3)(i). In summary, measures proposed in Regulatory Amendment 22 are intended to revise the ACLs and OYs for gag and wreckfish, and to modify the recreational bag limit for gag within the aggregate bag limit. As summarized in **Section 1.1** of this BPA, most actions in Regulatory Amendment 22 are not expected to result in significant changes in bycatch of gag, wreckfish, or co-occurring species. Furthermore, Regulatory Amendment 22 is not expected to affect major changes in bycatch of other fish species.

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