

## DISCARD ESTIMATES SOUTH ATLANTIC REGION

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### I. Introduction

A Southeast Data, Assessment, and Review (SEDAR) has been established for 8 deep-water species in the South Atlantic Fishery Management Council's Fishery Management Plan for the Snapper-Grouper Complex. The species in this SEDAR are snowy grouper, golden tilefish, speckled hind, Warsaw grouper, blueline tilefish, queen snapper, misty grouper and yellowedge grouper. As part of the data that are provided for the Data Workshop, discard data from the Southeast Fisheries (SEFSC) coastal fisheries logbook program are used to estimate the numbers of fish that were discarded during the period August 1, 2001 through July 31, 2003.

In August 2001, the Southeast Fisheries Science Center (SEFSC) initiated a program to collect information on the numbers of fish that are being discarded in the Gulf of Mexico reef fish and South Atlantic snapper-grouper fisheries. To collect this information, the SEFSC developed a form that supplements the existing vessel logbooks that are currently mandatory for these fisheries.

To help reduce the reporting burden on the fishermen, a 20% sample of the vessels with a Gulf of Mexico, South Atlantic snapper-grouper, king mackerel, Spanish mackerel or shark permit were selected to report and the same vessel is not selected in subsequent years. To assure that the sample is representative of the total universe of vessels with these Federal permits, the universe of permitted vessels was stratified and a random sample was selected from each strata. During the first year (8/1/2002 - 7/31/2003), three strata were used. One of the strata was geographical location where the vessel fished during 2000. There are two categories in this strata - the Gulf of Mexico (Florida Keys to the Texas-Mexican border) and the South Atlantic (which extends from the North Carolina - Virginia border to the Florida Keys). The second stratum was based on the type of gear. There are 5 categories in this stratum - handline, longline, trolling, trap and gill nets. The third stratum is based on the fishing activity of the vessels during calendar year 2000. There are two strata - vessels that made between 1 and 10 trips and vessels that made more than 10 trips. In all, there are 20 strata; however, there were too few boats that used gill nets in the Gulf of Mexico, so all of the boats that used gill nets in the Gulf were combined into a single strata. Consequently, random selections were made in 19 strata.

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Because of the inconsistency between the vessel's fishing activity during 2000 and the 8/1/2001 - 7/31/2002 reporting period, the fishing activity strata was dropped for the sample selection for the second year of the survey that began in 8/1/2002. As a result of this change, there are 10 strata for the second year of the survey instead of 19 as there were for the first year.

The selected fishermen were instructed to complete a supplemental discard form for every fishing trip that they made. If they did not have any discards for the trip, they were instructed to complete a discard form and write "no discards" on the form. It is very important that fishermen understand the need to report for every trip, even when they did not discard any fish. If they did not fish during a calendar month and submitted a no-fishing form, then they did not have to submit a discard form.

In addition to the numbers of discards, fishermen are asked to record their best estimate of the condition of the fish (animals) when they were released. The fishermen are given 6 options for the condition of released fish. These options are; all animals are dead, majority of the animals are dead, all animals are alive when released, majority of animals are alive, the fish are kept but not sold, and the condition of the animals is unknown. The fishermen are also asked to specify a reason why the fish (animals) were discarded. The choices are that the fish are discarded because of regulations or because the fish are unmarketable or unwanted.

## **II. Methods**

The data for trips where any of these 8 species were reported as discards were extracted from the SEFSC supplemental discard logbook database. The identification numbers from the vessels that made these trips were used to extract any additional trips that these vessels made, but discards for any of the SEDAR species were not reported. The resulting data set includes all of the fishing trips from the discard logbook data for vessels that reported discards of any of the 8 SEDAR species.

From this data set, the means and standard deviations of the numbers of discards for each species for each of the two survey years were calculated. The two years are treated separately because different vessels were selected to report for each year and the stratifications for the two years were slightly different, although the change in strata is not likely to affect the survey because the numbers of vessels that were selected is the same for the two years. The means and standard deviations are calculated with all of the trips for the vessels that reported each of the species, including the trips where zero discards were reported.

To estimate the total numbers of discards for each of the 8 species, a profile of the types of fishing trips where the SEDAR species were discarded was compiled. The profiles consist of three aspects of the vessel's fishing characteristics for the trips where discards for the SEDAR species were reported. The three characteristics are the type of gear, the fishing areas and the major species caught on the trips. The trip profiles are used to extract all of the fishing trips where discards of the SEDAR species are likely. The average discard per trip is multiplied by the

numbers of trips to estimate the total number of discards. The standard deviations about these means are used to present a range in the number of possible discards.

The following sections presents the numbers of discards for these species, the mean and standard deviation for these discards and a discussion of the fishing profiles used to determine the numbers of trips where discards of these species are likely. The estimated numbers of discards for each of the 8 species are also presented in this section.

### **III. Results**

The numbers of discards for each of the 8 SEDAR species are as follows:

Snowy grouper . . . A total of 52 snowy grouper discards were reported on 12 trips. Handline and bandit gear were reported on all but three of these trips. There were two trap trips. There was also one trip with trolling gear, although this could have been a recording error.

Golden tilefish . . . There were only 3 trips where tilefish were reportedly discarded during the two years. On one trap trip, there were 125 discards and on two handline trips, there was one tilefish discarded on each trip.

Speckled hind . . . There were 115 trips where speckled hinds were discarded. All of these, except one, were either handline or bandit gear. The one exception was a trip with trolling gear, which may be a reporting error.

Warsaw grouper . . . Warsaw grouper were reportedly discarded on 30 trips during the two years. All of the trips were either handline or bandit gear.

Queen snapper . . . Queen snapper were reportedly discarded on only one trip during the two years.

Misty grouper . . . Misty grouper were reportedly discarded on only one trip during the two years.

There were no discards reported for either blueline tilefish or yellowedge grouper.

The means and standard deviations for the numbers of discards reported for snowy grouper, speckled hind and Warsaw grouper are presented in Table 1. Two sets of summary statistics are presented. The means and standard deviations are calculated for only the trips

Table 1. Mean and standard deviations for the numbers of discards for deep-water SEDAR species by reporting periods, 8/1/2001 - 7/31/2002.

	Trips reported during 8/1/2001 - 7/31/2002							
	Trips where discards were reported					All trips*		
	Mean	Std. Dev.	Max	Min	Trips	Mean	Std. Dev	Trips
Snowy grouper	3.0	2.7	10	1	8	0.5	1.6	49
Speckled hind	19.1	42.1	200	1	43	3.6	19.7	228
Warsaw grouper	23.0	24.0	60	1	7	5.8	15.6	28
	Trips reported during 8/1/2002 - 7/31/2003							
	Trips where discards were reported					All trips*		
	Mean	Std. Dev.	Max	Min	Trips	Mean	Std. Dev	Trips
Snowy grouper	12.5	2.5	15	10	2	1.1	3.6	23
Speckled hind	16.6	19.0	113	1	72	8.1	15.6	148
Warsaw grouper	2.1	1.4	5	1	7	0.4	1.0	118

\* All trips means that all of the trips that the vessels that reported the respective species made during each of the two survey years. It includes the trips where no discards were reported for the respective species.

Source: Southeast Fisheries Science Center, Coastal Fisheries Logbook Program, 75 Virginia Beach Drive, Miami, FL.

where discards were reported. The second set of statistics are calculated for all of the trips that the vessels made, even if discards for the respective species were not reported. For example, discards of speckled hind were reported for 43 trips during the first survey year, but the vessels that reported these 43 trips also reported an additional 185 trips where discards of speckled hind were not reported. Thus, for the first set of summary statistics, the number of trips (n) is 43 and for the second set of summary statistics, the number of trips is 228.

As described in the Methods section, a profile of the fishing characteristics for the SEDAR species is developed to determine the numbers of trips where the respective species is likely to have been discarded. Because of the few numbers of discards, profiles are not developed for golden tilefish, blueline tilefish, queen snapper, misty grouper and yellowedge grouper. The profiles for snowy grouper, speckled hind and Warsaw grouper, along with the estimated total discards, follows.

To help evaluate the potential discards, two profiles of fishing characteristics are prepared. One of the profiles is developed using the fishing characteristics for vessels that actually reported discards of the SEDAR species. The other profile is developed using the fishing characteristics of vessels that reported catching and landing the SEDAR species, but were not selected to report to the supplemental discard program.

### Fishing profile for snowy grouper

A profile for the fishing characteristics for the trips where snowy grouper were discarded is difficult to develop because of the limited number of trips where this species was reportedly discarded. Using the vessel identification numbers for the 7 vessels that reported snowy grouper discards, the type of gear, areas fished and species composition. Handline, bandit rigs and trolling are the types of gear for the profile. The majority of the fishing trips for the profile occurred in the following stat grids - 2481, 2482, 3278 and 3575. Lastly, the reported catches for these trips indicate that the top species are yellowfin tuna, snowy grouper, king mackerel, and blueline tilefish. Using these characteristics, there are 2,184 trips during the first survey period and 1,876 trips during the second survey period that fit this profile.

The profile of fishing characteristics for vessels that caught and landed snowy groupers is similar to the profile of the vessels that reported discarding them. For the gear aspect of the profile, handline and bandit rigs accounted for the majority of the catch (about 60%), but about 30% of the reported catch were by vessels equipped with bottom longline gear. The fishing area where the majority of the catches and discards were reported were the same, albeit in different order. The top species used the profiles for the two scenarios show some differences. Vermilion snapper is the species with the largest reported catch for the profile of vessels catching/landings snowy grouper and golden tilefish is the 3<sup>rd</sup> ranking species. These two species are not among the top species reported by the vessels that reported discarding snowy grouper. In contrast, yellowfin tuna and king mackerel are among the top species reported by the vessels that reported snowy grouper discards. This difference is undoubtedly because trolling gear is included in the discard profile.

A critical issue is whether the 10 trips where discards of snowy grouper were reported in the first year of the survey and the 2 trips where discards of snowy grouper were reported during the second year are representative of fishing trip where snowy grouper are likely to be discarded. If trolling gear is excluded from the profile of vessels that reported discards, then the two profiles are essentially the same. Snowy grouper were reportedly caught on 10 out of the 2,925 trips during the two year survey period, and the profile for the vessels the reported catches and landings of snowy grouper is probably a better profile with which to expand the mean discards per trip.

### Fishing profile for speckled hind

The profile for the 115 trips where speckled hind were discarded consists of the following gear, area and species combinations. All of the trips were made with handline or bandit rig gear. They were reported in stat grids - 2980, 3080, 3179, 3180, 3278, 3377, and 3378. The top species in these trips are gag grouper, greater amberjack, gray triggerfish and vermilion snapper. From this profile, there were 1,781 trips reported during the first discard survey period and 1,561 trips during the second period.

The profile for vessels that reported catches of speckled hind is complicated by the fishing regulations. According to 50 CFR 622.32(c), the possession of speckled hind or Warsaw grouper in or from the South Atlantic EEZ is limited to one of each species per vessel per trip. Furthermore, in 50 CFR 622.41 Species specific limitations, section (d)(6), South Atlantic snapper-grouper, Longline species limitation, states that a longline equipped vessel that fishes in the EEZ may only possess the following South Atlantic snapper-grouper species: snowy grouper, Warsaw grouper, yellowedge grouper, misty grouper, golden tilefish, blueline tilefish, and sand tilefish. Thus, according to the regulations, longline equipped vessels cannot possess speckled hind.

There were 137 trips during the 2 discard periods where speckled hind were caught and landed. Total landings, reported in pounds (whole weight), of speckled hind for these trips are 5,270 pounds. The characteristics of these trips are slightly different from the trips where speckled hind were discarded. Because of the fishing regulations regarding longline gear, all of the trips in both profiles were made with handline or bandit gear. There are three notable differences in fishing area. The majority of the trips where speckled hind were caught and landed were reported in 2481 and 3476 and 3477, but none of the trips where discards were reported were in these areas. Two areas where both landings and discards were reported are 3278 and 3377. The top species caught on trips where speckled hind were caught/landed are vermilion snapper, red grouper, scamp, gag grouper, greater amberjack, almaco jack and gray triggerfish. The top species for the trips in the speckled hind discard profile are included in this list.

#### Fishing profile for Warsaw grouper

The profile for the 30 trips where Warsaw grouper were reported discards consists of the following gear, area and species combinations. The majority of the trips (about 80%) were made with handline or bandit and the other major gear was bottom longline gear (about 18%). The discards of Warsaw were reported in 3 stat grids (2980, 3278 and 3377); however, the vessels that reported these discards made trips that were fairly evenly reported in 8 different stat grids (i.e., 2880, 2980, 3080, 3179, 3180, 3278, 3377 and 3378). The top species reported for the trips made by the vessels reporting Warsaw discards are vermilion snapper, scamp, gag grouper, gray triggerfish, snowy grouper and greater amberjack. These characteristics are combined to extract the records from the logbook data. There are 1,624 trips during the first discard survey period, 8/1/2001 - 7/31/2002 and 1,453 trips during the second survey period, 8/1/2002 - 7/31/2003, that met these characteristics.

Similar to speckled hind, there are only a few trips, 9, where Warsaw grouper were caught and landed. Handline and trolling gear were the types of gear used on these trips. None of the fishing occurred in any of the area where the discards were reported. Vermilion snapper was the only species that was the same between the discard profile and the profile for trips where Warsaw groupers were caught and landed.

Based on the profiles for these three species, the numbers of discards are estimated from the mean and standard deviations in Table 1. These estimates are presented in Table 2.

Table 2. Estimates of the numbers of discards for 3 SEDAR species for the two discard survey periods, 8/1/2001 - 7/31/2003.

	Estimates for the 1st survey year				
	Mean	One std. deviation	# trips from profile	Estimated # of discards	
				Mean	Std. dev.
Snowy grouper	0.5	2.1	2,184	1,092	2,293
Speckled hind	3.6	23.3	1,784	6,422	149,642
Warsaw grouper	5.8	21.4	1,624	9,419	201,571
	Estimates for the 2nd survey year				
	Mean	One std. deviation	# trips from profile	Estimated # of discards	
				Mean	Std. dev.
Snowy grouper	1.1	4.7	1,876	2,064	9,699
Speckled hind	8.1	23.7	1,561	12,644	299,665
Warsaw grouper	0.4	1.4	1,453	581	814

Source: Southeast Fisheries Science Center, Coastal Fisheries Logbook Program, 75 Virginia Beach Drive, Miami, FL.

As noted above, fishermen are asked to provide their estimate of the condition of the fish when they are released. The discard reporting form allows the fishermen to pick one of the following six options: (1) all discards were dead, (2) the majority of the discards were dead, (3) all discards were alive, (4) the majority of the discards were alive, (5) the catch were kept, but not sold (i.e., eaten or used as bait, etc.), (6) unable to determine. The percentage of the reported discards for each of these categories for snowy grouper, speckled hind and Warsaw grouper are presented in Table 3.

As part of the discard reporting, fishermen are also asked to identify the reason that the animals were discarded. They are given two choices; (1) regulations or (2) market conditions. The percentages for the reasons for the discards are presented in Table 4 for snowy grouper, speckled hind and Warsaw grouper.

Table 3. The percentage of the reported discards for three of the SEDAR species by condition when they were released.

	All discard appeared dead	All discard appeared dead	All discards appeared alive	Majority of discards alive	Catch kept but no sold	Unable to determine	Unreported
Snowy grouper	8.1		41.9	29.0	21.0		
Speckled hind	3.1	31.9	17.7	45.2	0.9	0.7	0.5
Warsaw grouper	67.0	2.8	5.2	0.5	23.6	0.9	

Source: Southeast Fisheries Science Center, Coastal Fisheries Logbook Program, 75 Virginia Beach Drive, Miami, FL.

Table 4. The percentage of the reported discards of the SEDAR species by reason for discard.

	Regulations	Not marketable	Unreported
Snowy grouper	72.6	12.9	14.5
Speckled hind	99.1	0.3	0.6
Warsaw grouper	99.1	0.9	

Source: Southeast Science Science Center, Coastal Fisheries Logbook Program, 75 Virginia Beach Drive, Miami, FL.