

ESTIMATES OF RED SNAPPER DISCARDS BY
VESSELS WITH FEDERAL PERMITS IN THE GULF OF MEXICO

by

John Poffenberger and Kevin J. McCarthy

Southeast Fisheries Science Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
75 Virginia Beach Drive
Miami, Florida 33149

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I. Introduction

A Southeast Data, Assessment, and Review (SEDAR) has been established for red snapper that is managed under the Gulf of Mexico Management Council's Fishery Management Plan for the Reef Fish. 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. The random selection process is done without replacement, i.e., when a vessel is selected, 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 is stratified and a random sample is selected, without replacement, 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.

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

For purposes of this analysis, the data for the two years, that supplemental discard reporting was required, are combined into a single data set. Although the same vessels are not selected in consecutive years, the selection process is random and there should not be any significant differences in the fishing operations or patterns of the vessels that were sampled would justify separating the data by year. Thus, the data set for this analysis includes all trips that occurred between August 1, 2001 and July 31, 2003.

During this period, discard reporting forms were received for 3,296 trips. Of those trips, discards of any species were reported on 2,674 trips and no discards were reported on the remaining 624 trips. Discards of red snapper were reported on 1,141 trips or 42.7% of the trips where discards were reported.

By way of comparison, there were 33,999 trips reported by vessels that have been issued a Federal permit to fish for species in the reef fish, shark, and king/Spanish mackerel fisheries in the Gulf of Mexico. These vessels that reported these trips comprise the universe that is comparable to universe of vessels that was use to select the 0% sample for the discard reporting. Of those trips, red snapper landings were reported on 9,287 trips or about 27%.

The objective of this analysis is to estimate the numbers of red snapper discarded by vessels that fish commercially for species other than shrimp or other shellfish¹. To provide estimates of red snapper discards, the fishing activity by this universe of vessels is stratified in various ways and estimates of the red snapper discards are made for combinations of various

¹The universe of fishing activity for this analysis does not include the surface longline vessels that typically fish for swordfish, pelagic sharks, tunas and other highly migratory species.

strata. The stratifications can be categorized in two ways. First, characteristics of the actual fishing activity can be used. Gear type and fishing areas are the two that are considered. Second, the regulations imposed on the commercial fishery are used to stratify the data. The two constraints that are considered are the different classes of permit endorsements and the open/closed seasons for the commercial fishery.

The fishing activity for red snapper is stratified into following 4 gear categories - (1) bandit rigs, which includes power assisted handline gear, whether it is hydraulic or electric; (2) general handline gear, which is largely a manual type of gear; (3) bottom longline gear and (4) a general category that includes all other types of gear, i.e., traps, dive gear, etc. The numbers of trips for each of the gear categories for the 8/1/2001 - 7/31/2003 period are presented in Table 1. The numbers of trips where red snapper were reported as part of the catch are also presented in Table 1. In addition, the numbers of trips by gear category where discard information were reported are also presented in this table.

The Gulf of Mexico is divided into two area strata, east and west. The eastern area includes statistical grids 1 through 12 and grids 13 through 21 are defined as the western Gulf. The total number of trips reported to the logbook program, and the numbers of trips with discard information for the two area strata are shown in Table 2. The total reported pounds of red snapper and the numbers of red snapper discarded for the two strata are also shown in Table 2.

The two permit endorsements for red snapper are a Class I, which allows a vessel to possess and land up to 2,000 pounds of red snapper on a trip, and a Class II, which allows a vessel to possess up to 200 pounds of red snapper as incidental catch. The number of Class I permits is capped at 139 and at present, the only way a vessel can get a Class I endorsement is to purchase it from another vessel. The number of Class II endorsements, on the other hand, is not capped, and fluctuates because new endorsements can be issued to a vessel that has a Gulf reef fish permit. That is, a vessel can be issued a Class II endorsement simply by applying for one, and it does not have to be purchased from another vessel. However, there is a moratorium on the issuance of Gulf reef fish vessel permits and the only way a vessel can get this type of permit is to purchase it from a vessel owner that already has one. The numbers of trips and reported catches by vessels with either a Class I or Class II endorsement are shown in Table 3. The numbers of trips and discards of red snapper are also shown in this table.

The open/closed seasons for the red snapper commercial fishery has varied since it was implemented in 1990. In the early 1990's, the fishery was open until the quota was (estimated to have been) reached. This methodology created a situation with intense fishing and resulted in severe market gluts and significantly depressed ex-vessel prices, as well as safety issues because fishing often took place during severe weather conditions. In 1998, the seasonal closures were changed to an open/closed scenario within each month. Specifically, the fishery was open for the first 10 days of the month and then closed for the remainder of the month. This open/closed scenario would continue until the overall quota was reached. The numbers of trips reported for the open and closed seasons during the 8/1/2001 - 7/31/2003 period are shown in Table 4. The numbers of trips with red snapper catches and discards are also shown in this table.

The average numbers of red snapper discards per trip are presented in the following section. These means and standard deviation about the means for various combinations of these 4 strata are used to estimate the total numbers of red snapper that were discarded.

III. Results

A generalized least squares model (GLM) was used to estimate the parameters, from those described above, that are statistically correlated with the numbers of red snapper discards reported to the SEFSC. Separate GLM models were used to determine the statistically significant parameters for each of the major types of gear - general handlines, bandit rigs and bottom longline. In addition to the parameters described above, a measure of fishing effort is calculated for each of the types of gears and used as a possible independent parameter in the GLM. For the handline and bandit rig categories, the numbers of hook hours is used as the effort measure. This measure is calculated by multiplying the number lines times the numbers of hooks per line times the estimated fishing time for each trip. There are four categories for this effort measure - (1) less than or equal to 100 hours, (2) 101 to 500 hours, (3) 501 to 1,000 hours, and (4) greater than 1,000 hours. For bottom longline, the effort measure is the total numbers of hooks. This measure is calculated by multiplying the numbers of sets times the hooks per set. The total numbers of hours are aggregated into five categories for the GLM. These categories are: (1) less than or equal to 5,000 hooks, (2) 5,001 to 10,000 hooks, (3) 10,001 to 20,000 hooks, (4) 20,001 to 30,000 hooks and (5) greater than 30,000 hooks.

For the trips where handline gear were reported, the type of permit endorsements and the hook hours are the parameters that are significant at the thresholds set for the GLM. For bandit rig gear, the type of permit endorsement, the hook hours and the open/closed seasons are the three parameters that are significantly correlated with red snapper discards. For trips where bottom longline gear was reported, the type of permit endorsement, the total numbers of hooks and the region (eastern and western Gulf of Mexico) are the parameters that are significant.

The means and standard deviations for the numbers of discards for the combinations of parameters that are significantly correlated with red snapper discards for the three GLM's are shown in Tables 5, 6 and 7 for handline, bandit rig and bottom longline gear, respectively. These summary statistics are used to estimate the numbers of discards for the 12 month period, 8/1/2002 through 7/31/2003. This period is used because the logbook form included bandit rig as one of the types of gear for the first time beginning January 1, 2002. The numbers of trips for each of the three gear categories reported in the Gulf of Mexico for this period are used to expand the average discards per trip from Tables 5 through 7. The estimated numbers of discards for the three models and the numbers of trips for the combinations of parameters are presented in Tables 8, 9 and 10 for handline, bandit rig and bottom longline gear, respectively.

From the means and numbers of trips during 8/1/2002 - 7/31/2003, an estimated 738,900 red snapper were discarded. Of those the majority (84%) were reported as being discarded by

vessels that used bandit rig gear. Vessels using general handline gear reported about 15% of the total estimated numbers of discards. The remaining 1% were reported by vessels equipped with bottom longline gear.

Beginning with the second year of the discard survey, fishermen were asked to estimate the average weight of the fish they discarded. From these estimates, the average weight of fish released by handline gear was 2.35 pounds, the average for bandit rig vessels was 2.9 pounds and the average weight for bottom longline vessels was 6.49 pounds. Using these weights, the weight for the red snapper discards is estimated at 2.1 million pounds (i.e., 108.6 thousand at 2.35 pounds, 623.8 thousand at 2.9 pounds and 6.5 thousand at 6.49 pounds).

As noted above, fishermen are asked to provide their observation 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.), and (6) unable to determine. The fishermen reported that about 42% of the fish they released were or appeared to be dead (42%) and about the same percent (42%) appeared to be alive. For the remaining 16%, they were unable to determine the condition of the released fish or did not respond to this question. The relative percentage breakdowns for the 4 strata are presented in Table 11.

The percentage of the reported discards for the red snapper are shown in Table 12. 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. As would be expected, all of the red snapper were discarded in response to the regulations on the fishery.

Table 1. Numbers of trips reported to the logbook program and to the discard by type of gear in the Gulf of Mexico, 8/1/2001 - 7/31/2003.*

Gear type	Logbook data set		Discard data set	
	All Trips	Red snapper trips**	All Trips	Red snapper trips**
Bandit Rig	7,857	3,974	800	411
Handline	17,505	4,850	1,797	390
Bottom longline	4,164	376	320	44
Other	4,473	87	379	4
Total	33,999	9,287	3,296	849

* Source: Southeast Fisheries Science Center, Coastal Fisheries Logbook Program, Miami FL, 33149.

** Red snapper trips are defined as a trip when at least one pound of red snapper was reported.

Table 2. Numbers of trips and reported catch and discards of red snapper by assessment area in the Gulf of Mexico, 8/1/2001 - 7/31/2003**

Area*	Number of Trips		Red snapper catch/discards	
	Logbook	Discards	Logbook (lbs)	Discards (no.)
East	26,375	2,610	2,143,832	37,549
West	7,624	686	7,419,105	102,873
Total	33,999	3,296	9,562,938	140,422

* East is the area included in statistical grids 1 through 12. West is the area included in statistical grids 13 - 21.

** Source: Southeast Fisheries Science Center, Coastal Fisheries Logbook Program, Miami, FL 33149

Table 3. Numbers of trips and reported catches (pounds , whole weight) of red snapper in the Gulf of Mexico by gear and permit endorsement type for the entire logbook data and the discard data , 8/1/2001 - 7/31/2003.*

Gear type	Logbook data set				Discard data set			
	Class I Endorsements		Class II Endorsements		Class I Endorsements		Class II Endorsements	
	Trips	Pounds	Trips	Pounds	Trips	Pounds	Trips	Pounds
Bandit Rig	2,520	4,532,385	1,331	230,747	304	103,995	162	7,305
Handline	2,176	3,928,106	2,446	372,429	107	9,818	421	13,403
Bottom longline	176	284,502	181	15,436	38	882	16	634
Other	3	426	79	7,734	4	10	6	76
Total	4,875	8,745,419	4,037	626,345	453	114,705	605	21,418

* Source: Southeast Fisheries Science Center, Coastal Fisheries Logbook Program, Miami, FL 33149.

Table 4. Numbers of trips reported for the entire logbook data set and the discard data set for the open and closed seasons in the Gulf of Mexico red snapper fishery, 8/1/2001 - 7/31/2003.*

Seasons	All trips		Trips with red snapper	
	Logbook	Discards	Logbook	Discard
Open	14,775	1,319	8,469	660
Closed	19,224	1,977	818	481
Total	33,999	3,296	9,287	1,141

* Source: Southeast Fisheries Science Center, Coastal Fisheries Logbook Program, Miami, FL 33149.

Table 5. Means and standard deviations for the numbers of red snapper discarded per trip by vessels with handline gear for the four categories of effort (hook hours) and permit type.*

Class I Permit Endorsements						
Hook Hours	Mean	Std. Dev	Min	Max	Trips	
<= 100	14.000	14.606	0	34	6	
101 - 500	34.800	44.126	0	150	20	
501 - 1,000	68.576	86.966	0	276	33	
> 1,000	80.655	115.704	0	450	84	
Class II Permit Endorsements						
Hook Hours	Mean	Std. Dev	Min	Max	Trips	
<= 100	9.800	16.933	0	125	509	
101 - 500	26.156	58.363	0	550	199	
501 - 1,000	15.760	19.985	0	73	25	
> 1,000	70.400	118.155	0	475	40	
No Red Snapper Permit Endorsements						
Hook Hours	Mean	Std. Dev	Min	Max	Trips	
<= 100	1.493	14.051	0	219	754	
101 - 500	4.243	19.879	0	150	70	
501 - 1,000	108.900	298.049	0	1000	10	
> 1,000	19.532	47.547	0	180	47	

*Source: Southeast Fisheries Science Center, Coastal Fisheries Logbook Program, Miami, FL 33149.

Table 6. Means and standard deviations for the numbers of red snapper discarded per trip by vessels with bandit rig gear for the four categories of effort (hook hours), open or closed seasons and permit type.*

Class I Permit Endorsements						
Hook Hours	Season	Mean	Std. Dev	Min	Max	Trips
<= 100	Open	333.333	402.768	0	900	3
101 - 500	Open	321.792	260.448	0	975	53
501 - 1,000	Open	410.905	428.790	0	2,000	74
> 1,000	Open	260.967	483.434	0	5,000	182
<= 100	Closed	0.000	0.000	0	0	1
101 - 500	Closed	20.714	33.393	0	100	7
501 - 1,000	Closed	72.625	61.810	0	200	8
> 1,000	Closed	140.596	218.655	0	1,300	52
Class II Permit Endorsements						
Hook Hours	Season	Mean	Std. Dev	Min	Max	Trips
<= 100	Open	12.907	15.743	0	62	43
101 - 500	Open	21.623	44.436	0	300	61
501 - 1,000	Open	10.375	14.991	0	45	8
> 1,000	Open	5.000	6.124	0	15	4
<= 100	Closed	12.327	21.562	0	70	55
101 - 500	Closed	20.664	35.056	0	205	116
501 - 1,000	Closed	18.037	34.443	0	140	27
> 1,000	Closed	88.300	228.235	0	1,000	20
No Red Snapper Permit Endorsements						
Hook Hours	Season	Mean	Std. Dev	Min	Max	Trips
<= 100	Open	3.375	8.929	0	27	8
101 - 500	Open	8.000	16.655	0	60	16
501 - 1,000	Open	0.000	0.000	0	0	0
> 1,000	Open	5.000	0.000	5	5	1
<= 100	Closed	5.619	10.697	0	35	21
101 - 500	Closed	6.556	17.077	0	100	36
501 - 1,000	Closed	152.000	152.000	0	304	2
> 1,000	Closed	1.000	1.000	0	2	2

*Source: Southeast Fisheries Science Center, Coastal Fisheries Logbook Program, Miami, FL 33149.

Table 7. Means and standard deviations for the numbers of red snapper discarded per trip by vessels with bottom longline gear for the five categories of effort (total numbers of hooks), region (eastern and western Gulf) and permit type.*

Class I Permit Endorsements						
Total Hooks	Region	Mean	St. Dev.	Min	Max	Trips
1 - 5,000	Eastern Gulf	0.000	0.000	0	0	0
5,001 - 10,000	Eastern Gulf	0.000	0.000	0	0	1
10,001 - 20,000	Eastern Gulf	22.000	0.000	22	22	1
20,001 - 30,000	Eastern Gulf	24.375	20.334	0	62	8
> 30,000	Eastern Gulf	28.625	16.263	0	53	16
1 - 5,000	Western Gulf	8.533	6.249	0	20	15
5,001 - 10,000	Western Gulf	2.500	2.500	0	5	2
10,001 - 20,000	Western Gulf	6.000	8.485	0	18	3
20,001 - 30,000	Western Gulf	0.000	0.000	0	0	0
> 30,000	Western Gulf	18.667	9.428	12	32	3
Class II Permit Endorsements						
Total Hooks	Region	Mean	St. Dev.	Min	Max	Trips
1 - 5,000	Eastern Gulf	1.531	5.732	0	30	49
5,001 - 10,000	Eastern Gulf	0.655	3.467	0	19	29
10,001 - 20,000	Eastern Gulf	9.518	41.375	0	300	56
20,001 - 30,000	Eastern Gulf	0.143	0.742	0	4	28
> 30,000	Eastern Gulf	0.100	0.539	0	3	30
1 - 5,000	Western Gulf	0.000	0.000	0	0	1
5,001 - 10,000	Western Gulf	0.000	0.000	0	0	0
10,001 - 20,000	Western Gulf	0.000	0.000	0	0	0
20,001 - 30,000	Western Gulf	0.000	0.000	0	0	0
> 30,000	Western Gulf	0.000	0.000	0	0	0
No Red Snapper Permit Endorsements						
Total Hooks	Region	Mean	St. Dev.	Min	Max	Trips
1 - 5,000	Eastern Gulf	1.524	4.856	0	20	21
5,001 - 10,000	Eastern Gulf	0.000	0.000	0	0	2
10,001 - 20,000	Eastern Gulf	0.417	1.382	0	5	12
20,001 - 30,000	Eastern Gulf	0.706	2.824	0	12	17
> 30,000	Eastern Gulf	0.000	0.000	0	0	17
1 - 5,000	Western Gulf	0.000	0.000	0	0	4
5,001 - 10,000	Western Gulf	0.000	0.000	0	0	5
10,001 - 20,000	Western Gulf	0.000	0.000	0	0	0
20,001 - 30,000	Western Gulf	0.000	0.000	0	0	0
> 30,000	Western Gulf	0.000	0.000	0	0	0

*Source: Southeast Fisheries Science Center, Coastal Fisheries Logbook Program, Miami, FL 33149.

Table 8. Estimates of the numbers of red snapper discards for vessels with handline gear based on hook hours and types of permits.

Class I Endorsements					
Hook Hours	Mean	Std. Dev.	Trips	Mean disc.	S.D. disc.
<= 100	14.000	14.606	110	1,540	3,147
101 - 500	34.800	44.126	193	6,716	15,233
501 - 1,000	68.576	86.966	129	8,846	20,065
> 1,000	80.655	115.704	438	35,327	86,005
			870	52,430	124,450
Class II Endorsements					
Hook Hours	Mean	Std. Dev.	Trips	Mean disc.	S.D. disc.
<= 100	9.800	16.933	2,158	21,148	57,690
101 - 500	26.156	58.363	489	12,790	41,330
501 - 1,000	15.760	19.985	83	1,308	2,967
> 1,000	70.400	118.155	98	6,899	18,478
			2,828	42,146	120,465
No Red Snapper Permit Endorsements					
Hook Hours	Mean	Std. Dev.	Trips	Mean disc.	S.D. disc.
<= 100	1.493	14.051	3,104	4,634	48,249
101 - 500	4.243	19.879	413	1,752	9,962
501 - 1,000	108.900	298.049	52	5,663	21,161
> 1,000	19.532	47.547	103	2,012	6,909
			3,672	14,061	86,281
			7,370	108,637	331,196

Table 9. Estimates of the numbers of red snapper discards for vessels with bandit rig gear based on hook hours and types of permits.

Class I Endorsements						
Hook Hours	Season	Mean	Std. Dev.	Trips	Mean disc.	S.D. disc.
<= 100	Open	333.333	402.768	52	17,333	38,277
101 - 500	Open	321.792	260.448	316	101,686	183,988
501 - 1,000	Open	410.905	428.790	400	164,362	335,878
> 1,000	Open	260.967	483.434	855	223,127	636,463
<= 100	Closed	0.000	0.000	21	0	0
101 - 500	Closed	20.714	33.393	44	911	2,381
501 - 1,000	Closed	72.625	61.810	25	1,816	3,361
> 1,000	Closed	140.596	218.655	352	49,490	126,456
Total				2,065	558,725	1,326,804
Class II Endorsements						
Hook Hours	Season	Mean	Std. Dev.	Trips	Mean disc.	S.D. disc.
<= 100	Open	12.907	15.743	456	5,886	13,064
101 - 500	Open	21.623	44.436	408	8,822	26,952
501 - 1,000	Open	10.375	14.991	68	706	1,725
> 1,000	Open	5.000	6.124	111	555	1,235
<= 100	Closed	12.327	21.562	421	5,190	14,267
101 - 500	Closed	20.664	35.056	479	9,898	26,690
501 - 1,000	Closed	18.037	34.443	109	1,966	5,720
> 1,000	Closed	88.300	228.235	224	19,779	70,904
Total				2,276	52,801	160,557
No Endorsements						
Hook Hours	Season	Mean	Std. Dev.	Trips	Mean disc.	S.D. disc.
<= 100	Open	3.375	8.929	108	365	1,329
101 - 500	Open	8.000	16.655	119	952	2,934
501 - 1,000	Open	0.000	0.000	43	0	0
> 1,000	Open	5.000	0.000	74	370	370
<= 100	Closed	5.619	10.697	293	1,646	4,781
101 - 500	Closed	6.556	17.077	259	1,698	6,121
501 - 1,000	Closed	152.000	152.000	47	7,144	14,288
> 1,000	Closed	1.000	1.000	98	98	196
Total				1,041	12,273	30,018
				5,382	623,799	1,517,380

Table 10. Estimates of the numbers of red snapper discards for vessels with bottom longline gear based on total numbers of hooks, region (eastern and western Gulf) and types of permits.

Class I Endorsements						
Total Hooks	Region	Mean	St. Dev.	Trips	Mean Est.	S.D. Est
1 - 5,000	Eastern Gulf	0.000	0.000	24	0	0
5,001 - 10,000	Eastern Gulf	0.000	0.000	20	0	0
10,001 - 20,000	Eastern Gulf	22.000	0.000	22	484	484
20,001 - 30,000	Eastern Gulf	24.375	20.334	28	683	1,252
> 30,000	Eastern Gulf	28.625	16.263	34	973	1,526
1 - 5,000	Western Gulf	8.533	6.249	9	77	133
5,001 - 10,000	Western Gulf	2.500	2.500	26	65	130
10,001 - 20,000	Western Gulf	6.000	8.485	42	252	608
20,001 - 30,000	Western Gulf	0.000	0.000	13	0	0
> 30,000	Western Gulf	18.667	9.428	36	672	1,011
Total					3,206	5,145
Class II Endorsements						
Total Hooks	Region	Mean	St. Dev.	Trips	Mean Est.	S.D. Est
1 - 5,000	Eastern Gulf	1.531	5.732	339	519	2,462
5,001 - 10,000	Eastern Gulf	0.655	3.467	90	59	371
10,001 - 20,000	Eastern Gulf	9.518	41.375	215	2,046	10,942
20,001 - 30,000	Eastern Gulf	0.143	0.742	125	18	111
> 30,000	Eastern Gulf	0.100	0.539	195	20	125
1 - 5,000	Western Gulf	0.000	0.000	2	0	0
5,001 - 10,000	Western Gulf	0.000	0.000	12	0	0
10,001 - 20,000	Western Gulf	0.000	0.000	3	0	0
20,001 - 30,000	Western Gulf	0.000	0.000	3	0	0
> 30,000	Western Gulf	0.000	0.000	0	0	0
Total					2,662	14,010
No Red Snapper Endorsements						
Total Hooks	Region	Mean	St. Dev.	Trips	Mean Est.	S.D. Est
1 - 5,000	Eastern Gulf	1.524	4.856	313	477	1,997
5,001 - 10,000	Eastern Gulf	0.000	0.000	93	0	0
10,001 - 20,000	Eastern Gulf	0.417	1.382	128	53	230
20,001 - 30,000	Eastern Gulf	0.706	2.824	104	73	367
> 30,000	Eastern Gulf	0.000	0.000	168	0	0
1 - 5,000	Western Gulf	0.000	0.000	86	0	0
5,001 - 10,000	Western Gulf	0.000	0.000	11	0	0
10,001 - 20,000	Western Gulf	0.000	0.000	16	0	0
20,001 - 30,000	Western Gulf	0.000	0.000	3	0	0
> 30,000	Western Gulf	0.000	0.000	6	0	0
Total					604	2,594
					6,471	21,750

Table 11. The condition of red snapper discarded by vessels in the Gulf of Mexico, 8/1/2001 - 7/31/2004.*

Strata	All discards appeared dead		Majority discards appeared dead		All discards appeared alive		Majority discards appeared alive		Catch kept by not sold		Unable to determine		Total
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number
Eastern Gulf	1,608	4.3	7,229	19.3	8,643	23.0	18,138	48.3	39	0.1	1,892	5.0	37,549
Western Gulf	11,893	11.6	39,346	38.2	2,538	2.5	29,222	28.4	12	0.0	19,862	19.3	102,873
Total	13,501	9.6	46,575	33.2	11,181	8.0	47,360	33.7	51	0.0	21,754	15.5	140,422
Bandit Rig	11,906	10.6	38,623	34.4	4,884	4.4	36,785	32.8	30	0.0	19,892	17.7	112,120
Handline	1,446	5.4	7,689	28.9	6,059	22.7	9,580	35.9	15	0.1	1,862	7.0	26,651
Bottom longline	145	9.3	263	16.8	165	10.5	992	63.4					1,565
Other	4	4.7	73	84.9	73	84.9	3	3.5	6	7.0			86
Total	13,501	9.6	46,575	33.2	11,181	8.0	47,360	33.7	51	0.0	21,754	15.5	140,422
Class I	12,410	10.8	42,342	36.9	2,793	2.4	37,272	32.5	26	0.0	19,862	17.3	114,705
Class II	1,091	5.1	3,904	18.2	6,473	30.2	8,256	38.5	9	0.0	1,685	7.9	21,418
No endorsement			329	7.7	1,915	44.5	1,832	42.6	16	0.4	207	4.8	4,299
Total	13,501	9.6	46,575	33.2	11,181	8.0	47,360	33.7	51	0.0	21,754	15.5	140,422
Closed seasons	2,166	8.2	4,742	17.9	5,803	22.0	10,824	41.0	37	0.1	2,859	10.8	26,431
Open seasons	11,335	9.9	41,833	36.7	5,378	4.7	36,536	32.1	14	0.0	18,895	16.6	113,991
Total	13,501	9.6	46,575	33.2	11,181	8.0	47,360	33.7	51	0.0	21,754	15.5	140,422

Source: Southeast Fisheries Science Center, Coastal Fisheries Logbook Program, Miami, FL 33149.

Table 12. The reasons given for the discards red snapper by vessels in the Gulf of Mexico, 8/1/2001 - 7/31/2004.*

Strata	Due to fishery regulations		Fish are not marketable		Unreported		Total
	Number	Percent	Number	Percent	Number	Percent	Number
Eastern Gulf	36,231	96.5	138	0.4	1,180	3.1	37,549
Western Gulf	102,720	99.9	148	0.1	5	0.0	102,873
Total	138,951	99.0	286	0.2	1,185	0.8	140,422
Bandit Rig	112,014	99.9	106	0.1			112,120
Handline	25,474	95.6	92	0.3	1,085	4.1	26,651
Bottom longline	1,377	88.0	88	5.6	100	6.4	1,565
Other	86	100.0					86
Total	138,951	99.0	286	0.2	1,185	0.8	140,422
Class I	114,395	99.7	188	0.2	122	0.1	114,705
Class II	21,265	99.3	98	0.5	55	0.3	21,418
No endorsement	3,291	76.6			1,008	23.4	4,299
Total	138,951	99.0	286	0.2	1,185	0.8	140,422
Closed seasons	25,232	95.5	87	0.3	1,112	4.2	26,431
Open seasons	113,719	99.8	199	0.2	73	0.1	113,991
Total	138,951	99.0	286	0.2	1,185	0.8	140,422

*Source: Southeast Fisheries Science Center, Coastal Fisheries Logbook Program, Miami, FL 33149.