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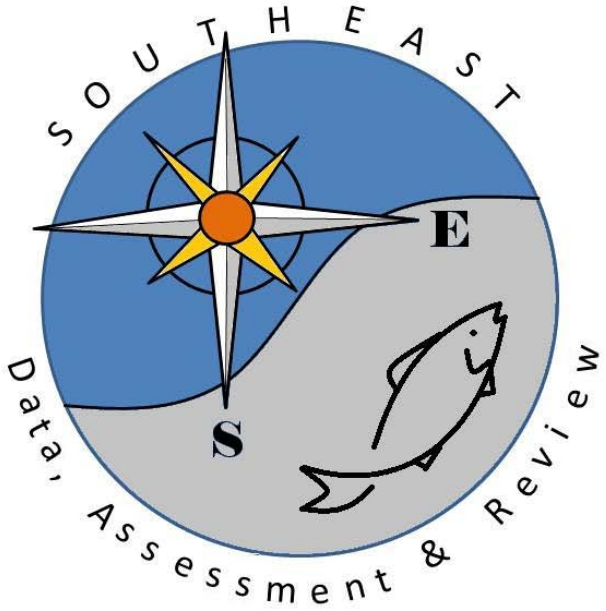

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INTRODUCTION

Recreational survey data for red snapper from the Marine Recreational Fisheries Statistics Survey (MRFSS), the Marine Recreational Information Program (MRIP), the NMFS Southeast Region Headboat Survey (SRHS), and the Texas Parks and Wildlife Department (TPWD) surveys in the Gulf of Mexico are presented, including summaries of catch estimates and sampling proportions. Issues addressed include the use of shore mode estimates, the calibration of MRFSS charterboat estimates back in time, 1981-1985 adjustments and substitutions, calibration of MRFSS estimates for 1981-2003 to MRIP estimates, estimating discards from the SRHS and TPWD, variance estimates from TPWD, and estimating recreational landings in weight from the surveys.

MRFSS and MRIP

The MRFSS began in 1981 and provides information on participation, effort, and species-specific catch. Data are collected to provide catch and effort estimates in two-month periods ("waves") for each recreational fishing mode (shore fishing, private/rental boat, charterboat, or headboat/charterboat combined) and area of fishing (inshore, state Territorial Seas, U.S. Exclusive Economic Zone) in each state, except TX. MRFSS was conducted in TX only through 1985 and did not include all modes in all years. Starting in 1986, MRFSS stopped covering Headboats in the Gulf of Mexico and South Atlantic. In recent years MRIP has re-incorporated headboats in some states, but these headboat estimates are not official. Official headboat estimates for the South Atlantic and Gulf of Mexico come from the Headboat Survey. Before 1986, charterboats and headboats were combined as one mode in the South Atlantic and the Gulf of Mexico. In the mid and North Atlantic, charterboats and headboats remained combined until 2003. Beginning in 2004, the charter and headboat modes in these regions were separated. No survey was conducted in wave 1 of 1981. Survey data for TX in 1981-1985, Wave 4, are no longer available. Catch estimates are made for strata used in the intercepts: fish landed whole and observed by the samplers ("Type A"), fish reported as killed by the fishers ("Type B1") and fish reported as released alive by the fishers ("Type B2").

For Hire Survey and calibration of old method estimates with the new method.
Two surveys within MRFSS provide the information described above: the "traditional" MRFSS and the For-Hire Survey (FHS), or "new charterboat method," discussed below. The traditional MRFSS design is based on an intercept survey of anglers and telephone survey of coastal households and has been used since the inception of the MRFSS. It applies to all fishing modes included in the survey. For 1981-1985 in TX to ME and for 1981-2003 in VA to ME, the traditional MRFSS covered charterboats and headboats as a combined mode.

In 1998, the FHS began providing estimates for charterboats in the Gulf of Mexico. The traditional MRFSS and FHS operate concurrently, but the FHS estimates have been phased in as the "official" charterboat estimates starting with LA through FL West Coast in 2000. (This was expanded to the FL East Coast in 2003 and to GA through ME starting in wave 2 of 2005.) There are also 'unofficial' FHS estimates from GA-ME in 2004. This new method was needed because of the low number of charterboat anglers contacted in the traditional telephone survey of coastal households.

In the FHS, directories of charterboats are developed for each state and are continuously updated. Each week, a sample of 10% of the listed charterboats are surveyed by telephone to ask about their fishing effort during the previous week, including the number of vessel trips, the number of anglers, areas fished and other information. Validation surveys by field samplers directly observe some charterboat effort on the docks to allow correction of over and under-reporting of trips in the telephone survey.

The MRFSS intercept survey of anglers at boat access sites is conducted as usual, encountering some charterboats. This allows calculation of a correction factor for charterboat trips on unlisted boats (not in the charterboat directory): (total intercepted cbt angler trips) / (intercepted cbt angler trips on listed boats).

Thus the estimate of total charterboat angler trips for an area of fishing is:

Estimated total charterboat angler trips =

(total charterboat angler trips in on listed boats) * (correction factor for trips on unlisted boats) where the total charterboat angler trips on listed boats is based on the 10% sample in the telephone survey and corrected for over/under reporting by the validation survey.

The FHS estimates of catch then follow in the same manner as for the traditional MRFSS, with the mean catch per trip coming from the MRFSS intercept survey. The pilot study of new charterboat methods in the Gulf of Mexico found that the annual effort at the state and Gulf level were not significantly different between the pilot study and the traditional MRFSS. However, the effort from the new charterboat methods differed from the traditional MRFSS in the distributions of effort by area and season.

Conversion factors have been estimated for the Gulf of Mexico to calibrate the traditional MRFSS charterboat/headboat estimates in 1981-1985 (SEDAR28-DW-12, Matter et.al., 2012) and the traditional MRFSS charterboat estimates in 1986-1997 (SEDAR7-AW-03, Diaz and Phares, 2004) with the FHS. The relationship between the old charterboat method estimates of angler trips and the FHS was used to estimate the conversion factors. Since these factors are based on effort, they can be applied to all species' landings. Table 1 shows the conversion factors and standard errors (in parentheses) for the Gulf of Mexico.

MRIP estimates and the calibration of MRFSS estimates

The Marine Recreational Information Program (MRIP) was developed to provide more accurate recreational catch estimates by accounting for potential biases such as possible differences in catch rates at high-activity and low-activity fishing sites, or the amount of fishing occurring at different parts of the day. Revised catch and effort estimates, based on this improved estimation method, were released on January 25, 2012. These estimates are available for the Atlantic and Gulf Coasts for 2004 through 2011. To learn more about the peer-reviewed re-estimation process, along with any implications for fisheries science and management, visit **www.countmyfish.noaa.gov**. (NOAA Fisheries, Office of Science and Technology). Table 2 shows the differences between the Gulf of Mexico red snapper MRIP estimates and the MRFSS estimates for the time period 2004-2011.

Since new MRIP estimates are only available for a portion of the recreational time series that the MRFSS covers, calibration factors between the MRFSS estimates and the MRIP estimates were developed in order to maintain one consistent time series for the recreational estimates. The MRFSS to MRIP calibration process is detailed in SEDAR31-DW25. Table 3 shows the ratio estimators used in the calibration.

Calculating landings estimates in weight

The MRFSS and the MRIP surveys use different methodologies for estimating landings in weight. In order to maintain consistency over the entire time frame, the Southeast Fisheries Science Center (SEFSC) has developed a standardized approach for calculating average weight that can be applied to the MRIP (or MRIP adjusted) landings in number for all years. This method has been used in the past for filling in MRFSS weight estimates when they

were missing (there was an estimate of landings in number but not weight due to missing weight samples in that strata). The SEFSC method uses the MRFSS/MRIP sample data to obtain an average weight using the following hierarchy: species, region, year, state, mode, wave, and area (SEDAR22-DW16). The minimum number of weights used at each level of substitution is 30 fish, except for the final species level, where the minimum is 1 fish. In cases where the sample data includes a length but not a weight, the length-weight equation from SEDAR 7 was used to convert those lengths to weights (W=0.000662*(L(FL_inches)^2.9970)). Average weights are then multiplied by the landings estimates in number to obtain estimates of landings in weight. These estimates are provided in pounds whole weight. Table 4 shows the MRIP estimated landings in weight by year and 'lbsestSEC_source' for Gulf of Mexico red snapper.

The Office of Science and Technology, the Northeast Fisheries Science Center, and the Southeast Fisheries Science Center expect to work together in the near future to develop one standardized approach for the future. The objective is to develop one method for calculating landings estimates in weight for use in stock assessments, management, and in the MRIP survey.

Variances

Variances are provided by MRFSS/MRIP for their recreational catch estimates. Variances are adjusted to take into account the variance of the conversion factor when an adjustment to the estimate has been made (FHS and MRIP conversions). However, the variance estimates of the charter and headboat modes in 1981-1985 are missing. This is due to the MRIP calibration procedure, which requires the combined charter/headboat mode to be split in order to apply the MRIP adjustment to the charter mode back to 1981. In addition variance estimates are not available for weight estimates generated through the SEFSC method described above.

Issues and corresponding adjustments to the MRIP estimates

As previously discussed, the MRFSS began in 1981, wave 2. In the Gulf of Mexico, catch needs to be estimated for 1981, wave 1. The standard method used in other SEDARs (gag, red grouper, Spanish mackerel, cobia) is to fill this gap by determining the proportion of wave 1 to other waves in years 1982-1984 by fishing mode and area. These proportions are then used to estimate AB1 (in numbers and weight) and B2 catch estimates (and variances when available) in wave 1 in 1981 from the estimated catches in other waves of that year. Tables in this report reflect this methodology.

Texas data from the MRFSS is only available from 1981-1985 and is sporadic, not covering all modes and waves. The standard method used in other SEDARs (king mackerel, Spanish mackerel, cobia) is to eliminate Texas boat mode estimates from the MRFSS. Instead, TPWD data, which covers charter and private modes from 1983 (May 15) -2011, are used to fill in these modes between 1981-1983 (thru May 14). Texas shore mode estimates from the MRFSS were kept. Tables in this report reflect this methodology.

Shore mode estimates for Gulf of Mexico red snapper are shown in Table 5. In SEDAR 24 (SA red snapper) shore mode estimates were omitted from the assessment. It stated that since red snapper is an offshore species with a strong association with reefs and hard bottom it would not be caught from shore. Tables in this report include shore mode estimates.

HEADBOAT SURVEY (SRHS)

The Headboat Survey covers the Gulf of Mexico headboats starting in 1986. Total catch per trip is reported in logbooks provided to all headboats in TX through NC. Agents collect these logbook trip reports and sample some trips to gather size data. Although, reporting via the logbooks is mandatory, 100% compliance is rare. The SRHS creates substitutes for the missing reports based on data for similar vessels or time periods, thus providing estimates of total catch by month (or groups of months) and area. Each vessel is assigned to one of 28 Gulf of Mexico and South Atlantic areas, based on the port from which the vessel operates and the general fishing area. Area 28 (Mississippi) was added to the SRHS in 2010.

The Headboat Survey was inconsistent in LA in 2002-2006. There were no trip reports collected in LA in 2002. 2001 trip reports were used (by the HBS) as a substitute to generate estimates numbers caught (though there are some minor differences between the resulting estimates for the two years). In 2003, there were only a few trip

reports but they were still used to generate the estimates. From 2004 to 2006 there were no trip reports or fish sampled, and no substitutes were used, so there are no estimates or samples from 2004 to 2006 due to funding issues and Hurricane Katrina. However, the MRFSS For-Hire Survey included the LA headboats in their charter mode estimates for these years thereby eliminating this hole in the headboat mode estimates.

Variances
Variances are not provided by the SRHS and are assumed to be zero, in accordance with SEDAR 7.

Issues and corresponding adjustments to the SRHS estimates
Headboat mode estimates from 1981-1985 come from the MRFSS/MRIP survey for all states except Texas. The standard method used in other SEDARs (Spanish mackerel, cobia) is to use the Texas hoadboat mode estimates from SRHS from 1986-1988 to fill in the missing years. Tables in this report reflect this methodology.

The Southeast Region Headboat Survey logbook form was modified in 2004 to include a category to collect self-reported discards for each reported trip. This category is described on the form as the number of fish by species released alive and number released dead. Port agents instructed each captain on criteria for determining the condition of discarded fish. A fish is considered "released alive" if it is able to swim away on its own. If the fish floats off or is obviously dead or unable to swim, it is considered "released dead". This self-reported data are not currently validated within the Headboat Survey. The SRHS discard ratios need to be compared with the At-Sea Observer Data discard ratios in order to assess the validity of these discard estimates. Prior to 2004 (and perhaps for the entire time series if the SRHS discards estimates are not validated) the MRIP data can be used as a proxy to estimate discards. Discard ratios from MRIP (all modes, charterboat, or private) need to be compared with the SRHS and at-sea discard ratios for 2004-2011.

TPWD

The TPWD Sport-boat Angling Survey was implemented in 1983 and samples fishing trips made by sport-boat anglers fishing in Texas marine waters. All sampling takes place at recreational boat access sites. The raw data includes information on catch, effort and length composition of the catch for sampled boat-trips. These data are used by TPWD to generate recreational catch and effort estimates. The survey is designed to estimate landings and effort by high-use (May 15-November 20) and low-use seasons (November 21-May 14). SEFSC personnel disaggregates the TPWD seasonal estimates into waves (2 month period) using the TPWD intercept data, in order to be compatible with MRFSS/MRIP. Only private boat and charterboat fishing are surveyed. Most of the sampled trips are private boats fishing in bay/pass because these represent most of the fishing effort, but all trips (private, charterboat, ocean, bay/pass) are sampled. Charterboat trips in ocean waters are the least encountered in the survey.

Producing landings estimates in weight
In the TPWD survey, landings estimates are produced only in number of fish. In addition, the TPWD sample data does not provide weights, only lengths of the intercepted fish. TPWD length-weight equations were applied to the lengths in order to obtain weights. In order to obtain estimated landings in weight, the SEFSC method (described above) is applied to the TPWD landings. Table 6 shows the estimated landings in weight from the TPWD survey by year and 'lbsestSEC_source' for red snapper

Variances
Recently TPWD has provided NMFS with standard errors associated with their seasonal estimates. Although the variances derived from these standard errors apply only to the seasonal TPWD seasonal and would not match up exactly to the TPWD wave estimates, this information provides a measure of the uncertainty of the TPWD estimates. TPWD seasonal variances are shown in Table 7 along with the seasonal catch estimates.

Issues and corresponding adjustments to the TPWD estimates
The TPWD survey begins with the high-use season in 1983 (May15, 1983). Charter and private mode estimates need to be filled in for this state and these modes back to 1981. The standard method used in other SEDARs (king mackerel, Spanish mackerel, cobia) is to use averages from TPWD 1983-1985 to fill in the missing estimates. Tables in this report reflect this methodology.

TPWD does not estimate discards. Discard ratios from Louisiana MRIP data by year and mode were applied to the TPWD landings in order to estimate discards.

Data from 2011 is only through the 2011 TPWD high-use season (November 20th). When the seasonal estimates from the last few years are compared to the wave estimates, they show that relatively few landings are coming from this last period of the year (Nov 21-Dec 31).

CATCH ESTIMATES and SAMPLING PROPORTIONS

Tables 8-10 show the MRIP catch estimates and CVs by mode and by state for red snapper in the Gulf of Mexico. In the tables, estimated A+B1 is the catch that was killed and B2 is the catch that was released alive. Tabulated estimates use the new charterboat method (FHS) or are calibrated to the new using the discussed calibration factors. MRIP or MRIP adjusted landings are used for all years (except for headboat mode 1981-1985). Table 11 shows the SRHS landings by year and state. Table 12 shows the TPWD landings and discard estimates by mode for red snapper in the state of Texas. Table 13 shows the number of trips with measured or weighed red snapper from the MRFSS/MRIP survey by year, mode and state. Table 14 shows the number of trips with weighed or measured red snapper from the SRHS by year and state. Table 15 shows the number of trips with measured red snapper from the TPWD survey by year and mode.

References:

General overview of the MRFSS has been adapted from the following:
Recreational Survey Data for Gag and Black Grouper in the Gulf of Mexico. Patty Phares, Vivian Matter, and Steve Turner. National Marine Fisheries Service, Southeast Fisheries Science Center, Sustainable Fisheries Division, January, 2006. Sustainable Fisheries Division Contribution No. SFD-2006-008. SEDAR10-DW-26.

Estimated Conversion Factors for Calibrating MRFSS Charterboat Landings and Effort Estimates for the Gulf of Mexico in 1981-1997 with the For Hire Survey Estimates with Application to Red Snapper Landings. Guillermo A. Diaz and Patty Phares. National Marine Fisheries Service, Southeast Fisheries Science Center, Sustainable Fisheries Division, August, 2004. Sustainable Fisheries Division Contribution No. SFD-2004-036. SEDAR7-AW-03

Estimated conversion factors for calibrating MRFSS charterboat landings and effort estimates from the Southeastern US (North Carolina to Florida-east coast) in 1981-2003 with For-Hire Survey estimates with application to King Mackerel landings. Tom Sminkey. National Marine Fisheries Service, Office of Science and Technology, February 2008. SEDAR16-DW-15.

Estimated Recreational Catch in Weight: Method for Filling in Missing Weight Estimates from the Recreational Surveys with Application to Yellowedge Grouper, Tilefish (golden), and Blueline Tilefish. Vivian M. Matter and Stephen C. Turner. National Marine Fisheries Service, Southeast Fisheries Science Center, Sustainable Fisheries Division, March, 2010. Sustainable Fisheries Division Contribution No. SFD-2010-003. SEDAR22-DW-16.

Table 1. Gulf of Mexico MRFSS charterboat conversion factors and standard errors (in parentheses).

Table 1a) Apply to 1981-1985 charterboat/headboat mode in the Gulf of Mexico.

	WAVE					
STATE	1	2	3	4	5	6
AFW	0.883 (0.03)	0.883 (0.03)	1.104 (0.05)	1.104 (0.05)	0.883 (0.03)	0.883 (0.03)
MS	1.155 (0.11)	1.155 (0.11)	2.245 (0.11)	2.245 (0.11)	1.155 (0.11)	1.155 (0.11)
LA	0.962 (0.09)	0.962 (0.09)	2.260 (0.13)	2.260 (0.13)	0.962 (0.09)	0.962 (0.09)

Table 1b) Apply to 1986 – 1997 charterboat mode in LA, MS, and AL

	WAVE					
Area	1	2	3	4	5	6
Inshore	1.26 (1.31)	1.54 (1.27)	3.82 (1.26)	4.67 (1.26)	3.28 (1.27)	1.48 (1.28)
< 3 miles	0.74 (1.37)	0.75 (1.26)	1.49 (1.25)	2.28 (1.24)	0.64 (1.28)	0.52 (1.40)
> 3 miles	0.44 (1.28)	0.63 (1.24)	2.23 (1.23)	1.87 (1.24)	1.26 (1.23)	0.53 (1.28)

Table 1c) Apply to 1986- 1997 charterboat mode in FLW

	WAVE					
Area	1	2	3	4	5	6
Inshore	3.17 (0.16)	5.31 (0.16)	5.71 (0.16)	5.33 (0.16)	3.49 (0.16)	3.70 (0.16)
< 10 miles	0.95 (0.16)	1.10 (0.16)	1.78 (0.16)	0.70 (0.16)	0.48 (0.16)	0.98 (0.16)
> 10 miles	0.38 (0.16)	0.58 (0.16)	0.77 (0.16)	0.73 (0.16)	0.59 (0.16)	0.55 (0.16)

Table 2. Red snapper MRIP vs MRFSS estimates of landings (number of fish) for the Gulf of Mexico 2004-2011. See accompanying graph below table.

Estimate Status	Year	Fishing Year	Common Name	MRFSS Unweighted Total Harvest (A+B1)	MRIP Weighted Total Harvest (A+B1)	Difference: MRIP - MRFSS	% Change from MRFSS	PSE for MRIP Weighted Total Harvest (A + B1)
FULL YEAR	2004	Calendar Year	RED SNAPPER	1,077,441	1,279,027	201,586	18.7%	12.4
FULL YEAR	2005	Calendar Year	RED SNAPPER	828,887	835,166	6,279	0.76%	8.8
FULL YEAR	2006	Calendar Year	RED SNAPPER	969,005	966,580	-2,425	-0.25%	8.4
FULL YEAR	2007	Calendar Year	RED SNAPPER	1,117,368	1,223,818	106,450	9.53%	7.9
FULL YEAR	2008	Calendar Year	RED SNAPPER	708,818	678,220	-30,598	-4.32%	8.5
FULL YEAR	2009	Calendar Year	RED SNAPPER	721,802	795,585	73,783	10.2%	12.0
FULL YEAR	2010	Calendar Year	RED SNAPPER	304,271	333,689	29,418	9.67%	15.6
FULL YEAR	2011	Calendar Year	RED SNAPPER	564,516	520,269	-44,248	-7.84%	12.0

Fishing Year=Calendar Year (Jan 1 - Dec 31) Common Name=RED SNAPPER

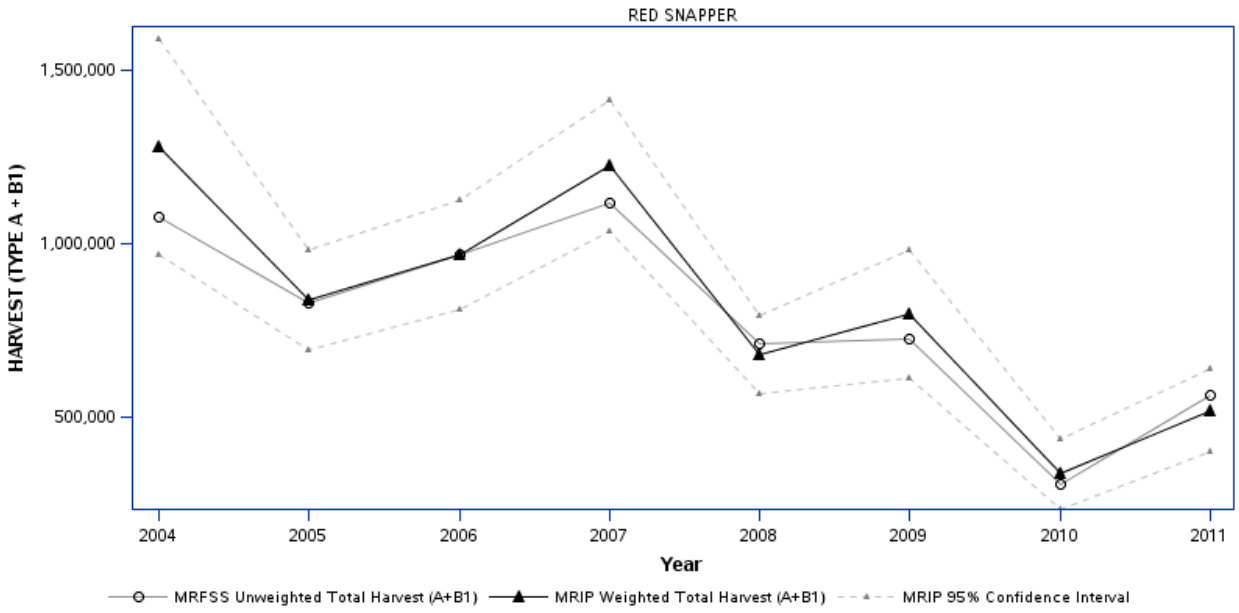

Table 3. Gulf of Mexico red snapper ratio estimators for numbers, variances, and variances of the numbers ratio estimator.

	Private		Shore		Charter	
	AB1	**B2**	**AB1**	**B2**	**AB1**	**B2**
Numbers Ratio Estimator	1.080	1.151	1.473	0.753	1.020	1.014
Variance Ratio Estimator	3.498	3.932	2.137	0.321	1.651	2.138
Variance of Numbers Ratio Estimator	0.003635	0.003080	0.051214*	0.051214	0.000197	0.000107

* The shore mode AB1 numbers ratio estimator was based on only one year. In order to avoid assuming that the variance of the ratio estimator is zero, the variance of the AB1 ratio estimator was borrowed from the variance of the B2 ratio estimator.

Table 4. Gulf of Mexico red snapper MRIP estimates of landings (whole weight in pounds) using the SEFSC weight estimation method by year and source.

lbsest_SEC	lbsest_SECsource*					
YEAR	sry	srys	srysm	srysmw	srysmwa	Grand Total
1981		398,818	3,182,814	419	5,622	3,587,674
1982	122,541	1,828,366	979,212	49,132	410,459	3,389,710
1983	17,571	930,839	2,705,161	180,001	767,076	4,600,648
1984	287,854	251,385	947,445	40,918	1,275,922	2,803,524
1985	344,910	305,393	1,244,998		427,909	2,323,209
1986	2,870	350,084	1,082,242	769,442	173,911	2,378,550
1987	44,541	71,846	376,811	307,575	515,080	1,315,853
1988		464,311	593,121	14,766	947,501	2,019,699
1989	284,393	540,018	239,453		613,810	1,677,674
1990	45,617	502,024	389,152		258,607	1,195,400
1991		184,418	602,747	14,295	1,165,371	1,966,831
1992		120,728	763,013	137,392	1,926,857	2,947,989
1993		138,318	2,461,978	504,177	1,554,007	4,658,480
1994		104,879	1,919,712	419,811	1,112,374	3,556,776
1995	128,646	37,756	1,880,081	373,309	691,476	3,111,268
1996		95,029	2,530,295		343,150	2,968,474
1997		636,943	1,924,184	191,630	1,526,011	4,278,766
1998		479,806	603,892	44,696	1,712,122	2,840,516
1999			581,303	210,128	2,563,329	3,354,760
2000		598,064	200,145	320,106	2,013,309	3,131,624
2001	217,017	72,245	198,957	890,983	2,337,229	3,716,430
2002		237,837	244,607	169,015	3,889,958	4,541,417
2003		203,799	970,675	295,357	2,786,457	4,256,287
2004	44,168	57,966	459,851	1,164,917	2,986,430	4,713,332
2005	3,421	195,850	1,186,806	39,812	1,799,285	3,225,174
2006	22,656		819,617	309,813	2,087,243	3,239,328
2007	5,865		440,520	729,605	2,935,539	4,111,530
2008	37,279	370,056	444,629	555,730	1,637,854	3,045,548
2009			833,146	1,039,351	1,898,824	3,771,321
2010	5,971		222,002	943,684	498,997	1,670,654
2011	39,574	256,236	10,762	1,099,850	2,073,883	3,480,305
Grand Total	1,654,893	9,433,014	31,039,329	10,815,916	44,935,600	97,878,752

* The hierarchy used for each estimate of weight is recorded in the variable 'lbsestSEC_source' and uses the first letter of each variable used from the hierarchy (**s**pecies, **r**egion, **y**ear, **s**tate, **m**ode, **w**ave, and **a**rea). For example an estimate with 'lbsestSEC_source'=srys, would have used an average weight from the combined samples in for the strata defined by that species, region, year, and state. All modes, waves, and areas in that stratum would have been included.

Table 5. MRIP shore mode estimates for Gulf of Mexico red snapper by year and state. Texas shore mode only available 1981-1985.

	AL		FLW		LA		TX		Grand Total	
YEAR	A+B1	B2	A+B1	B2	A+B1	B2	A+B1	B2	A+B1	B2
1983	0		0	0	10,855	0	5,830	0	16,685	0
1984	0		0	0	0	0	26,182	0	26,182	0
1985	0		9,160	0	0	0	0	0	9,160	0
1986	0		0	0	312	2,199			312	2,199
1987	0	2,951	2,931	2,772	0	0			2,931	5,723
1988	0		5,542	2,646	0	0			5,542	2,646
1989	0		49,969	10,981	0	0			49,969	10,981
1990	47,496	0	27,103	27,837	0	0			74,599	27,837
1991	736	379	13,202	38,584	0	1,327			13,938	40,290
1992	0		0	10,179	0	0			0	10,179
1993	516	0	5,752	1,963	0	0			6,268	1,963
1994	0		6,461	0	0	0			6,461	0
1995	0		0	2,436	0	0			0	2,436
1996	0		0	3,224	0	0			0	3,224
1998	0		0	1,510	0	0			0	1,510
1999	0	1,799	0	5,586	0	0			0	7,385
2000	0	807	0	4,710	0	0			0	5,517
2001	0		0	8,422	0	0			0	8,422
2002	0		1,478	2,646	0	0			1,478	2,646
2003	0		0	688	0	0			0	688
2005	0	2,777	0	1,515	0	0			0	4,293
2006	0	8,641	0	0	0	0			0	8,641
2007	0		0	13,310	0	0			0	13,310
2008	0		2,271	4,225	0	0			2,271	4,225
2009	0	2,570	0	0	0	0			0	2,570
2010	0	430	0	2,002	0	0			0	2,431
Grand Total	48,748	20,355	123,869	145,236	11,167	3,526	32,012	0	215,796	169,116

Table 6. Red snapper TPWD estimates of landings (whole weight in pounds) by year and source. 2011 data is through Nov 20th.

Sum of lbsest_SEC	lbsest_SECsource*				
YEAR	srys	srysm	srysmw	srysmwa	Grand Total
1983	12,083	3,153	2,200	62,986	80,422
1984	1,069	6,749	1,552	57,319	66,690
1985		9,325	6,105	282,830	298,260
1986	7,292	42,126	2,039	128,999	180,456
1987		32,428	11,439	41,760	85,627
1988	1,250	19,402		66,591	87,243
1989	1,625	3,468	7,604	26,109	38,807
1990	18	155	9,190	33,633	42,996
1991	1,244	6,633	6,154	59,580	73,611
1992		5,226	4,423	73,412	83,061
1993	19,031	3,516	4,597	97,521	124,665
1994		46,101	17,235	184,607	247,943
1995		29,109	41,139	248,333	318,581
1996		14,632	3,388	295,587	313,608
1997		12,730	17,392	259,984	290,105
1998		29,417	14,241	224,063	267,721
1999		25,153	19,451	148,273	192,878
2000		7,777	11,225	155,771	174,773
2001		23,498	5,000	129,019	157,517
2002		19,840	4,436	163,547	187,823
2003		7,326	2,026	124,300	133,651
2004		2,853	13,944	116,696	133,493
2005		37,931	1,960	162,437	202,327
2006		9,742	1,967	197,575	209,284
2007		17,271	7,300	145,002	169,573
2008		19,940	2,089	152,906	174,935
2009		7,813	6,313	183,554	197,680
2010		50,810	9,323	117,096	177,228
2011		15,785	27,228	152,109	195,121
Grand Total	43,612	509,908	260,961	4,091,599	4,906,079

* The hierarchy used for each estimate of weight is recorded in the variable 'lbsestSEC_source' and uses the first letter of each variable used from the hierarchy (**s**pecies, **r**egion, **y**ear, **s**tate, **m**ode, **w**ave, and **a**rea). For example an estimate with 'lbsestSEC_source'=srys, would have used an average weight from the combined samples in for the strata defined by that species, region, year, and state. All modes, waves, and areas in that stratum would have been included.

Table 7. Seasonal TPWD landings and CVs (Nov 21st-Nov20th) for red snapper in the state of Texas. These seasonal landings will not match the wave estimates depicted in Table 12. However, the CVs for these seasonal landings provide a measure of uncertainty for the TPWD estimates. 2011 data is through Nov 20th.

	Cbt		Priv		All modes	
syear	landings	CV_landings	landings	CV_landings	landings	CV_landings
1983	10,662	0.57	55,101	0.26	65,763	0.31
1984	617	1.00	35,465	0.36	36,082	0.37
1985	7,042	0.70	17,891	0.39	24,933	0.48
1986	5,131	1.00	188,777	0.83	193,908	0.83
1987	9,858	0.75	47,249	0.50	57,107	0.54
1988	737	0.79	57,926	0.56	58,663	0.57
1989	1,108	0.95	23,138	0.40	24,246	0.42
1990	11	1.00	24,172	0.41	24,183	0.41
1991	674	0.70	39,853	0.35	40,527	0.36
1992	369	1.00	35,609	0.23	35,978	0.24
1993	6,973	1.00	38,211	0.26	45,184	0.37
1994	10,426	0.55	76,193	0.28	86,619	0.31
1995	7,637	0.94	88,254	0.23	95,891	0.28
1996	6,983	0.59	71,148	0.22	78,131	0.26
1997	6,774	0.52	81,823	0.26	88,597	0.28
1998	11,466	0.70	57,087	0.30	68,553	0.36
1999	9,110	0.63	44,932	0.29	54,042	0.35
2000	8,278	0.54	44,436	0.30	52,714	0.34
2001	13,179	0.41	33,338	0.27	46,517	0.31
2002	16,018	0.38	37,322	0.23	53,340	0.28
2003	6,068	0.31	33,928	0.27	39,996	0.28
2004	9,387	0.46	30,949	0.28	40,336	0.32
2005	4,353	0.37	44,759	0.25	49,112	0.26
2006	15,730	0.62	53,757	0.29	69,487	0.37
2007	11,611	0.34	33,024	0.26	44,635	0.28
2008	6,429	0.65	34,073	0.36	40,502	0.41
2009	5,698	0.35	25,445	0.25	31,143	0.27
2010	7,674	0.61	25,638	0.33	33,312	0.39
2011	6,786	0.82	29,475	0.32	36,261	0.41
Grand Total	206,789	0.59	1,408,973	0.37	1,615,762	0.40

Table 8. Estimated MRIP A+B1 landings (number of fish killed) and coefficients of variations (CV) by mode for red snapper in the Gulf of Mexico. Charterboat estimates use the FHS method or are calibrated to the FHS method. MRIP estimates (or MRFSS estimates adjusted to MRIP estimates) are used.

	Cbt		Hbt		Priv		Shore		All Modes	
YEAR	A+B1	CV	A+B1	CV	A+B1	CV	A+B1	CV	A+B1	CV
1981	181,629		56,666		1,994,411	0.43	0	0.00	2,232,706	0.38*
1982	930,447		206,705		783,673	0.63	0	0.00	1,920,824	0.26*
1983	902,203		336,924		1,678,736	0.40	16,685	0.62	2,934,548	0.23*
1984	508,350		78,694		250,678	0.51	26,182	1.06	863,904	0.15*
1985	535,068		123,473		348,848	0.36	9,160	1.25	1,016,548	0.13*
1986	560,729	0.25			267,230	0.29	312	0.88	828,271	0.19
1987	413,525	0.37			241,793	0.29	2,931	1.25	658,249	0.26
1988	385,811	0.32			371,786	0.26	5,542	0.89	763,139	0.21
1989	257,691	0.47			399,811	0.47	49,969	0.90	707,471	0.32
1990	189,598	0.44			219,015	0.35	74,599	0.44	483,212	0.24
1991	452,113	0.37			294,974	0.32	13,938	0.73	761,025	0.25
1992	398,535	0.29			716,277	0.17	0	0.00	1,114,812	0.15
1993	844,892	0.25			760,073	0.18	6,268	0.81	1,611,233	0.16
1994	461,487	0.25			535,825	0.17	6,461	1.05	1,003,773	0.15
1995	486,852	0.31			419,356	0.25	0	0.00	906,208	0.20
1996	423,494	0.32			303,490	0.25	0	0.00	726,984	0.21
1997	675,949	0.26			454,175	0.24	0	0.00	1,130,124	0.18
1998	606,042	0.07			263,085	0.25	0	0.00	869,127	0.09
1999	360,803	0.06			453,055	0.19	0	0.00	813,858	0.11
2000	435,575	0.07			367,283	0.23	0	0.00	802,858	0.11
2001	404,167	0.07			487,922	0.21	0	0.00	892,088	0.12
2002	606,857	0.06			550,629	0.18	1,478	1.25	1,158,964	0.09
2003	514,728	0.07			527,093	0.22	0	0.00	1,041,822	0.12
2004	586,492	0.06			692,536	0.22	0	0.00	1,279,027	0.12
2005	441,323	0.07			393,843	0.17	0	0.00	835,166	0.09
2006	480,471	0.07			486,108	0.15	0	0.00	966,580	0.08
2007	524,337	0.06			699,481	0.13	0	0.00	1,223,818	0.08
2008	290,517	0.06			385,432	0.14	2,271	0.99	678,220	0.09
2009	231,618	0.09			563,967	0.17	0	0.00	795,585	0.12
2010	71,264	0.11			262,426	0.20	0	0.00	333,689	0.16
2011	148,888	0.11			371,381	0.16	0	0.00	520,269	0.12
Grand Total	14,311,456	0.04	802,462	0.00	16,544,389	0.08	215,796	0.30	31,874,103	0.04

*CVs for all modes in 1981-1985 only reflect the private and shore mode CVs, since charter and headboat mode CVs are unavailable.

Table 9. Estimated MRIP B2 catch (number released alive) and coefficients of variations (CV) by mode for red snapper in the Gulf of Mexico. Charterboat estimates use the FHS method or are calibrated to the FHS method. MRIP estimates (or MRFSS estimates adjusted to MRIP estimates) are used.

	Cbt		Hbt		Priv		Shore		All Modes	
YEAR	B2	CV	B2	CV	B2	CV	B2	CV	B2	CV
1981	301		186		61,099	0.76	0	0.00	61,586	0.75*
1982	15,026		3,743		12,234	1.08	0	0.00	31,003	0.42*
1983	3,301		285		479	1.98	0	0.00	4,064	0.23*
1984	697		430		24,033	1.59	0	0.00	25,159	1.52*
1985	923		569		59,713	1.07	0	0.00	61,204	1.04*
1986	27,383	0.48			17,252	1.00	2,199	0.66	46,834	0.47
1987	28,024	0.71			42,485	0.58	5,723	0.43	76,232	0.42
1988	20,075	0.72			191,177	0.65	2,646	0.66	213,898	0.58
1989	50,869	0.73			232,145	0.57	10,981	0.51	293,995	0.47
1990	181,781	0.79			415,868	0.58	27,837	0.42	625,487	0.45
1991	415,360	0.47			610,865	0.37	40,290	0.37	1,066,515	0.28
1992	299,177	0.36			763,144	0.21	10,179	0.50	1,072,500	0.18
1993	407,189	0.41			753,110	0.26	1,963	0.38	1,162,262	0.22
1994	422,680	0.38			568,854	0.28	0	0.00	991,534	0.23
1995	416,186	0.47			386,068	0.39	2,436	0.66	804,690	0.31
1996	580,963	0.41			397,764	0.27	3,224	0.40	981,951	0.27
1997	872,044	0.42			1,027,066	0.23	0	0.00	1,899,110	0.23
1998	567,378	0.09			471,169	0.20	1,510	0.55	1,040,056	0.10
1999	577,137	0.07			920,424	0.19	7,385	0.42	1,504,946	0.12
2000	544,544	0.08			1,016,280	0.21	5,517	0.49	1,566,341	0.14
2001	573,601	0.09			1,415,345	0.18	8,422	0.35	1,997,369	0.13
2002	588,010	0.08			1,735,300	0.18	2,646	0.44	2,325,956	0.13
2003	558,131	0.07			1,600,233	0.17	688	0.66	2,159,052	0.13
2004	768,865	0.06			1,918,281	0.15	0	0.00	2,687,146	0.11
2005	741,077	0.08			1,448,331	0.16	4,293	0.76	2,193,701	0.11
2006	999,475	0.07			1,823,225	0.13	8,641	0.98	2,831,341	0.09
2007	787,409	0.06			2,457,097	0.12	13,310	1.00	3,257,816	0.09
2008	543,210	0.08			1,564,021	0.14	4,225	0.75	2,111,455	0.11
2009	524,812	0.09			1,618,482	0.14	2,570	1.01	2,145,863	0.11
2010	226,309	0.15			1,207,106	0.18	2,431	0.78	1,435,847	0.16
2011	365,214	0.09			1,156,030	0.17	0	0.00	1,521,243	0.13
Grand Total	12,107,150	0.05	5,212	0.00	25,914,678	0.04	169,116	0.16	38,196,156	0.03

*CVs for all modes in 1981-1985 only reflect the private and shore mode CVs, since charter and headboat mode CVs are unavailable.

Table 10. Estimated MRIP A+B1 (number of fish killed) and B2 catch (number released alive) by state for red snapper in the Gulf of Mexico. Charterboat estimates use the FHS method or are calibrated to the FHS method. MRIP estimates (or MRFSS estimates adjusted to MRIP estimates) are used.

	TX		LA		MS		AL		FLW		All States	
YEAR	A+B1	B2	A+B1	B2	A+B1	B2	A+B1	B2	A+B1	B2	A+B1	B2
1981	0	0	1,384,112	10,037	0	0	499,934	21,594	348,660	29,954	2,232,706	61,586
1982	0	0	1,052,602	14,344	70,818	2,278	489,687	949	307,717	13,432	1,920,824	31,003
1983	5,830	0	1,845,527	3,585	11,847	0	858,206	479	213,138	0	2,934,548	4,064
1984	26,182	0	651,177	0	517	0	125,261	0	60,768	25,159	863,904	25,159
1985	0	0	517,021	45,856	2,335	0	273,048	0	224,143	15,349	1,016,548	61,204
1986			269,805	7,236	1,579	0	137,703	6,827	419,184	32,772	828,271	46,834
1987			117,316	7,844	21,706	9,294	163,948	25,691	355,279	33,404	658,249	76,232
1988			248,104	147,211	17,919	2,175	215,863	266	281,254	64,246	763,139	213,898
1989			194,983	114,579	143,001	56,323	183,532	9,472	185,955	113,621	707,471	293,995
1990			103,483	172,929	23,238	86,866	265,985	318,331	90,506	47,360	483,212	625,487
1991			214,000	257,900	71,995	111,748	300,610	497,540	174,420	199,326	761,025	1,066,515
1992			283,851	214,942	228,166	351,448	478,592	309,611	124,202	196,500	1,114,812	1,072,500
1993			369,889	259,803	177,158	254,330	652,217	511,154	411,969	136,975	1,611,233	1,162,262
1994			224,480	282,222	101,228	115,913	469,057	475,107	209,008	118,292	1,003,773	991,534
1995			288,724	408,644	39,400	20,645	402,390	316,168	175,693	59,233	906,208	804,690
1996			156,415	100,060	55,970	107,770	331,330	473,986	183,269	300,134	726,984	981,951
1997			168,344	103,049	106,472	391,066	557,032	918,158	298,277	486,836	1,130,124	1,899,110
1998			114,799	105,271	38,219	102,998	354,116	456,788	361,994	374,999	869,127	1,040,056
1999			91,976	228,956	25,157	34,295	355,249	592,702	341,476	648,994	813,858	1,504,946
2000			104,877	127,605	9,705	45,324	279,479	760,836	408,796	632,577	802,858	1,566,341
2001			58,959	54,550	21,857	69,421	367,125	1,014,005	444,147	859,393	892,088	1,997,369
2002			49,195	43,270	45,273	189,628	498,133	1,098,331	566,362	994,727	1,158,964	2,325,956
2003			74,244	184,735	41,695	101,017	399,493	742,512	526,389	1,130,787	1,041,822	2,159,052
2004			88,405	274,135	12,577	61,091	304,651	589,557	873,394	1,762,362	1,279,027	2,687,146
2005			110,503	339,593	1,003	50,043	232,430	493,695	491,229	1,310,370	835,166	2,193,701
2006			172,934	429,127	6,912	52,166	180,856	639,078	605,878	1,710,971	966,580	2,831,341
2007			159,638	284,832	1,774	8,718	216,569	851,434	845,836	2,112,832	1,223,818	3,257,816
2008			84,311	262,197	8,970	103,409	107,306	339,678	477,633	1,406,172	678,220	2,111,455
2009			97,250	195,482	14,939	55,007	138,062	393,991	545,333	1,501,383	795,585	2,145,863
2010			6,676	6,779	1,040	25,163	41,612	287,630	284,361	1,116,275	333,689	1,435,847
2011			31,349	108,302	6,574	442	216,856	488,138	265,489	924,361	520,269	1,521,243
Grand Total	32,012	0	9,334,949	4,795,076	1,309,047	2,408,577	10,096,336	12,633,708	11,101,759	18,358,796	31,874,103	38,196,156

Table 11. Gulf of Mexico red snapper landings (number of fish) from the SRHS by year and state. MS added to program in 2010. Gap of TX headboat landings in 1981-1985 is filled in.

YEAR	TX	LA	MS	AL	FLW	All states
1981	335,366					335,366
1982	335,366					335,366
1983	335,366					335,366
1984	335,366					335,366
1985	335,366					335,366
1986	301,843	14,247		14,903	1,461	332,454
1987	309,638	9,710		9,256	429	329,033
1988	394,618	28,406		12,881	951	436,856
1989	360,165	12,308		10,357	440	383,270
1990	173,149	13,857		15,393	146	202,545
1991	236,126	28,560		15,349	231	280,266
1992	371,716	41,340		33,832	41	446,929
1993	411,039	47,733		36,735	540	496,047
1994	450,416	47,322		28,771	227	526,736
1995	319,642	34,908		22,980	98	377,628
1996	309,488	39,778		28,314	74	377,654
1997	313,020	34,404		48,398	41	395,863
1998	219,644	25,094		76,455	304	321,497
1999	77,729	20,970		64,725	2,707	166,131
2000	97,357	14,053		56,399	1,241	169,050
2001	102,774	13,584		50,343	946	167,647
2002	124,793	13,682		74,945	176	213,596
2003	149,426	8,479		70,539	482	228,926
2004	110,329			62,020	1,462	173,811
2005	99,988			41,612	5,179	146,779
2006	121,177			46,744	1,138	169,059
2007	105,362	4,952		62,842	761	173,917
2008	50,562	7,007		60,630	1,356	119,555
2009	71,550	4,448		78,421	3,169	157,588
2010	51,169	345	494	33,438	2,011	87,457
2011	47,972	2,684	769	65,387	3,031	119,843
Grand Total	7,057,522	467,871	1,263	1,121,669	28,642	8,676,967

Table 12. Estimated TPWD landings (number of fish killed) and discards (number of fish released alive) by year and mode for red snapper in the state of Texas. Gap in TX charter and private mode landings in 1981-1983 is filled in. 2011 data is through Nov 20th.

	Cbt		Priv		All modes	
YEAR	landings	discards	landings	discards	landings	discards
1981	6,107	0	65,120	514	71,227	514
1982	6,107	103	65,120	516	71,227	619
1983	10,662	86	61,123	0	71,785	86
1984	617	0	35,474	0	36,091	0
1985	7,042	0	98,764	47,238	105,806	47,238
1986	5,131	236	122,608	0	127,739	236
1987	9,858	83	37,538	7,537	47,396	7,619
1988	737	6	52,840	34,323	53,577	34,329
1989	1,108	249	23,201	15,179	24,309	15,429
1990	11	24	25,482	26,629	25,493	26,652
1991	674	786	39,826	85,678	40,500	86,464
1992	369	294	34,267	24,459	34,636	24,753
1993	6,974	5,473	39,149	25,158	46,123	30,631
1994	10,427	17,660	76,992	78,013	87,419	95,673
1995	7,637	8,967	89,760	140,942	97,397	149,909
1996	6,984	7,637	78,486	32,106	85,470	39,742
1997	6,774	3,982	73,769	46,199	80,543	50,180
1998	11,466	5,759	54,559	54,876	66,025	60,634
1999	9,111	2,823	44,932	128,642	54,043	131,464
2000	8,278	3,292	44,436	61,269	52,714	64,560
2001	13,179	8,680	35,428	34,153	48,607	42,833
2002	16,017	10,257	36,880	51,999	52,897	62,256
2003	6,068	6,908	32,281	126,465	38,349	133,373
2004	9,387	22,338	31,383	207,552	40,770	229,890
2005	9,860	28,206	45,824	157,568	55,684	185,774
2006	10,223	22,389	53,061	147,037	63,284	169,427
2007	11,611	22,555	35,186	60,062	46,797	82,617
2008	6,430	14,170	30,012	104,259	36,442	118,428
2009	5,699	7,201	28,688	65,893	34,387	73,095
2010	7,674	0	22,523	19,754	30,197	19,754
2011	6,786	4,937	29,345	115,600	36,131	120,537
Grand Total	219,008	205,099	1,544,057	1,899,617	1,763,065	2,104,716

Table 13. Number of angler trips with measured or weighed red snapper in the Gulf of Mexico in the MRFSS/MRIP by year, mode, and state.

	Cbt					Hbt					Priv						Shore					
YEAR	LA	MS	AL	FLW	All	TX	LA	AL	FLW	All	TX	LA	MS	AL	FLW	All	TX	LA	AL	FLW	All	GTot
1981	3		8	5	16		1	3	12	16		4		8	12	24						56
1982	3	1	7	11	22		16	33	13	62		33	3	3	19	58						142
1983	68		15	10	93		55	9	63	127		27	1	2	1	31	1	2			3	254
1984	29		3	7	39		4	2	16	22		10	1	3	2	16	2				2	79
1985	4		8	2	14	16	17	2	13	48	6	5	1	2	3	17						79
1986	39	5	15	17	76							15	1	3	7	26						102
1987	24	1	30	50	105							5	2	12	49	68						173
1988	3	8	34	25	70							15	5	1	11	32				1	1	103
1989	5	7	32	10	54							15		3	7	25				1	1	80
1990	19	1	26	6	52							5	2	14	4	25			2	3	5	82
1991	30	8	81	15	134							2	6	32	2	42				2	2	178
1992	42	29	137	34	242							19	32	56	8	115						357
1993	21	12	45	51	129							18	11	33	11	73						202
1994	23	9	55	28	115							21	7	36	2	66				1	1	182
1995	15	1	28	15	59							17	3	32	3	55						114
1996	14	7	28	18	67							11	5	23	6	45						112
1997	18	4	68	132	222							12	21	22	5	60						282
1998	15	2	95	232	344							6	13	20	6	45						389
1999	4	14	182	395	595							20	14	113	32	179						774
2000	11	9	145	489	654							3	3	79	21	106						760
2001	2	7	133	339	481							2	3	80	33	118						599
2002	25	13	125	286	449								7	75	23	105				1	1	555
2003	27	7	103	327	464							1	8	67	35	111						575
2004	32	1	94	409	536							4		67	34	105						641
2005	19		77	412	508							2	1	55	25	83						591
2006	44	1	68	289	402							9	2	24	40	75						477
2007	38		73	336	447							7	1	27	58	93						540
2008	8	1	34	220	263							5	3	22	42	72						335
2009	10		34	79	123							11	7	33	16	67						190
2010		1	17	115	133							3		16	36	55						188
2011	5	1	27	72	105							4	1	33	31	69						174
Grand Total	600	150	1,827	4,436	7,013	16	93	49	117	275	6	311	164	996	584	2,061	3	2	2	9	16	9,365

Table 14. Number of trips with measured or weighed red snapper by year and area. Due to SRHS area definitions, West Florida and Alabama data are combined.

YEAR	TX	LA	AL/FLW	All states
1986	386	27	74	487
1987	351	42	100	493
1988	254	58	94	406
1989	248	90	127	465
1990	208	39	116	363
1991	157	55	144	356
1992	212	111	184	507
1993	201	127	126	454
1994	232	92	162	486
1995	242	115	111	468
1996	158	83	115	356
1997	80	151	165	396
1998	212	131	248	591
1999	107	114	132	353
2000	40	110	137	287
2001	98	90	90	278
2002	138	62	126	326
2003	112	62	127	301
2004	79		79	158
2005	63	27	47	137
2006	44	19	85	148
2007	35	30	116	181
2008	19	18	80	117
2009	34	29	63	126
2010	40		42	82
2011	41	11	36	88
Grand Total	3,791	1,693	2,926	8,410

Table 15. Number of trips with measured red snapper in Texas in the TPWD survey by year and mode. 2011 data is through Nov 20th.

YEAR	Cbt	Priv	All modes
1983	4	80	84
1984	1	93	94
1985	3	104	107
1986	1	79	80
1987	7	98	105
1988	5	104	109
1989	2	79	81
1990	2	99	101
1991	4	115	119
1992	11	153	164
1993	5	181	186
1994	8	242	250
1995	10	412	422
1996	16	344	360
1997	17	320	337
1998	22	274	296
1999	20	181	201
2000	18	235	253
2001	25	200	225
2002	24	214	238
2003	27	218	245
2004	25	211	236
2005	29	238	267
2006	40	332	372
2007	45	218	263
2008	31	169	200
2009	27	190	217
2010	15	125	140
2011	15	182	197
Grand Total	459	5,490	5,949