

Recreational Survey Data for Gag and Black Grouper in the Gulf of Mexico

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INTRODUCTION

Data for gag from recreational fisheries surveys in the Gulf of Mexico are presented, including summaries of catch estimates and sampling fractions. [Length distributions will be presented in a separate document.] Corresponding data for black grouper are also presented because of possible misidentification of some gag as black grouper in the 1980s. Issues addressed include missing estimates, the lack of estimates for fish released in the Headboat Survey, placement of the Keys landings into the Gulf of Atlantic, and misidentification of gag as black grouper.

OVERVIEW OF THE SURVEYS

Estimates of recreational catch for marine fish species in the Gulf of Mexico and Atlantic states beginning in 1981 are obtained by a combination of results from three surveys:

- the Marine Recreational Fishery Statistics Survey (MRFSS) conducted by the NOAA Fisheries (NMFS).
- the Texas Marine Sport-Harvest Monitoring Program by the Texas Parks and Wildlife Department (TPWD).
- the Headboat Survey (HBS) conducted by NMFS, Southeast Fisheries Science Center, Beaufort, NC.

These three surveys together provide estimates of catch in numbers (and sometimes weight), estimates of effort, length and weight samples, and catch-effort observations for shore-based and boat fishing. The combined coverage is continuous beginning in 1981 with only minor gaps (see next section).

The MRFSS and the TPWD survey are both sampling-based, while the Headboat Survey strives to be a census of headboats using logbooks. The strata, data gathered and quantities estimated also differ. Strata for estimates of catch from the three surveys can be made comparable by summing (e.g., summing Headboat Survey estimates into bi-monthly "waves" to match MRFSS and TPWD). Other differences, such as the lack of estimate of released fish in the Headboat Survey and different measures of effort, must also be addressed.

MRFSS

The MRFSS 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 through only 1985 and did not include all modes in all years. Starting in 1986, MRFSS has not covered Headboats in the Gulf of Mexico and South Atlantic. Before 1986, charterboats and headboats were combined as one mode. No survey was conducted in wave 1 of 1981. Survey data for TX in 1981-1985, Wave 4, are no longer available. (Note: the MRFSS is in the process of re-incorporating headboats in some states, but headboat estimates are not yet being provided.) 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").

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 all years 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 some states. 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.) This new method was needed because of the low number of charterboat anglers contacted in the traditional telephone survey of coastal households.

For Hire Survey and calibration of old method estimates with the new method.

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:

$$\text{Estimated total charterboat angler trips} = (\text{total charterboat angler trips in on listed boats}) * (\text{correction factor for trips on unlisted boats})$$

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 were estimated by Diaz and Phares to calibrate the traditional MRFSS charterboat estimates for 1981-1997 with the FHS in the Gulf of Mexico (Diaz and Phares, 2004). In addition to the official FHS estimates for 2000-2003, estimates were also made for 1998-1999 using the FHS methodology. Thus the relationship between the old charterboat method estimates of trips and the FHS for 1998-2003 was used to estimate the conversion factors. The following are the conversion factors and standard errors (in parentheses):

Apply to 1986 – 1997, AL, LA, MS

	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)

Apply to 1986- 1997 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)

Apply to 1981-1985 combined Charterboat+Headboat mode in LA, MS, AL, FLW:

Wave					
1	2	3	4	5	6
1.45 (1.10)	1.31 (1.10)	1.63 (1.10)	1.34 (1.10)	2.67 (1.10)	1.58 (1.10)

Reference:

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.

Headboat Survey (HBS)

The Headboat Survey covers the Gulf of Mexico headboats starting in 1986. (At the same time, the MRFSS combined charter+headboat mode estimates changed to charterboat only for the Gulf.)

Total catch per trip by 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, compliance is low in some areas for recent years, especially S Florida. The HBS 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 27 GMOX and S.Atl. areas, based on the port from which the vessel operates and the general fishing area.

The survey was inconsistent in LA in 2002-2004. 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. In 2004 there were no trip reports or fish sampled, and no substitutes were used, so there are no estimates or samples for 2004.

TX Parks and Wildlife Survey

Very few gag or black grouper are caught in Texas. Table 10 shows the landings estimated in the TPWD Survey. 1983-1985 are incomplete and do not include headboats. Shore mode is not included in the survey.

CATCH ESTIMATES and SAMPLING PROPORTIONS

MRFSS

Tables 1-6 show the MRFSS catch estimates and CVs by mode and by state, sampling proportions by mode. Sampling proportions use the number observed (tspclaim = type A catch sampled) and number measured for length (tsp_lex) contained on the catch estimates records. There may be minor differences between these and the same quantities calculated directly from the intercept files. Sampled catch (observed or measured) may occur in cells where there is no catch estimate. This occasionally happens when the intercept survey encounters fishers in a state-wave-mode cell but there is no corresponding estimate of trips, usually in the traditional MRFSS in a charterboat cell with low effort. Sampled fish with no corresponding estimate were kept in calculating the proportions but this does not greatly affect the proportions.

In the tables, estimated A+B1 is the catch that was killed and B2 is the catch that was released alive. In the intercepts, Type A is the catch that was seen and identified by the interviewer, thus is the "observed catch" in the sampling proportions. Type A estimates are the expansion of the observed catch.

Tabulated estimates use the new charterboat method (FHS) for 1998-2004. Except as noted, the charterboat estimates for 1986-1997 and charter+headboat estimates for 1981-1985 are calibrated to the new method using the conversion factors estimated in Diaz and Phares. CVs for the calibrated charterboat and charter+headboat in 1981-1997 do not include the variance associated with the calibration factor.

Table 1. Estimated MRFSS A+B1 and B2 catch and coefficients of variations (CV) by mode for the Gulf of Mexico gag and black grouper. Charter and cbt/hbt estimates use the new method or are calibrated to the new method.

Table 2. Estimated MRFSS A+B1 and B2 catch by state for Gulf of Mexico gag and black grouper. Charter and cbt/hbt estimates use the new method or are calibrated to the new method.

Table 3. Comparison of MRFSS old charterboat method estimates to recalibrated charterboat estimates (using conversion factors from Diaz and Phares) for the Gulf of Mexico.

Table 4. Percent of MRFSS **Type A catch estimate which was measured** for Gulf of Mexico gag and black grouper. Charter and cbt/hbt estimates use the new method or are calibrated to the new method.

Table 5. Percent of MRFSS **observed Type A catch which was measured** for Gulf of Mexico gag and black grouper.

Table 6. Percent of MRFSS **Type A catch estimate which was observed** for Gulf of Mexico gag and black grouper. Charter and cbt/hbt estimates use the new method or are calibrated to the new method.

Headboat Survey

Tables 7 - 9 show the Headboat Survey catch estimates by year area and sampling proportions by year and area. Sampling proportions use the number observed from the trip reports and number of fish measured by the samplers. Occasional trip reports have observed catch that does not correspond to an estimate (by area and month) or observed catch with weight but no number reported. Occasional length samples do not match any estimate or trip report. These are retained in calculations of total catch and sampling proportions but they do not greatly affect the results.

Table 7. Headboat Survey **estimated catch** by area for Gulf of Mexico gag and black grouper. (Estimated catch includes only kept fish.)

Table 8. Percent of Headboat Survey **estimated catch which was measured** by area for Gulf of Mexico gag and black grouper.

Table 9. Percent of Headboat Survey **estimated catch which was observed** by area for Gulf of Mexico gag and black grouper.

Headboat Survey Gulf and Keys area codes for reference in reviewing the tables:

12=Fl. Keys, Atlantic-based vessels

17=Dry Tortugas (Atlantic/Keys-based vessels)

18=Dry Tortugas (Gulf vessels)

20=SW FL (1/2 and 3/4-day trips) - [may be out of use?]. (Naples to Crystal River)

21=SW FL - full day trips (Naples to Crystal River)

22=Fl. Middle Grounds trips

23=NW FL and AL (Carrabelle to Pensacola, including Panama City and Destin)

24=LA

25=NE TX (Sabine Pass-Freeport)

26=Port Aransas, TX

27=Port Isabel, TX

In this report, Headboat Survey areas 12 and 17, which are considered "Atlantic" by the Headboat Survey, are included in the Gulf to make the Headboat areas included comparable to the MRFSS. The MRFSS includes the Keys in FLW. However, separating the Keys into a separate "state" can be considered. The post-stratified estimates which treat the Keys separately is shown in Table 13.

ADJUSTMENTS TO ESTIMATES

Estimation of the number of fish released in the Headboat Survey.

In 2004 the Headboat Survey logbook trip reports started collecting information on fish released alive and returned dead but estimates of the total fish released were not generated. However, the sample data (trip reports) for 2004 can be used to suggest the use of the ratio of charterboat estimates for $B2 / (A+B1)$ from the MRFSS to estimate the releases in the Headboat Survey.

Examination of the 2004 headboat release data by vessel indicate that some vessels may not have been reporting released fish (or at least not on some trips). For this exercise, only trips with some release data for any species were selected, and of those, trips with gag or black grouper (kept or released) were selected. Of these, the quality of data may have varied. For instance, the reports for certain vessels often contained identical entries for the number of fish released as the number of fish kept, a prominent difference from other vessels.

Tables 11 A and 11 B show the ratios for fish released alive to fish kept calculated using Headboat Survey 2004 trip reports and MRFSS catch estimates for 2004. For the Headboat Survey, the ratios are calculated as $r_{hbt} = \text{live}/(\text{num}+\text{dead})$, where live = fish released alive, num = fish kept, and dead = fish released dead. For the MRFSS, ratios are $r_{mrf} = B2 / (A+B1)$. In practice, the ratio r_{mrf} would be applied to the headboat catch estimate which corresponds to "num" only, since there is no estimate of fish released dead in the Headboat Survey. The MRFSS includes fish released dead in the B1 catch, and while the fish released dead can not be separated from other kinds of B1 catch in the estimates, this quantity is small in the sample data relative to the total B1 samples.

This adjustment using MRFSS estimates might also be calculated using the post-stratified MRFSS which estimate the Keys separately from FLW (Table 13).

Adjustments for probable misidentification of gag as black grouper

There has long been concern that in the 1980s gag were recorded as black grouper in the MRFSS in parts of FLW. Prior assessments have converted some black grouper to gag through 1989. There was a sudden shift from black grouper to gag in the data in 1990. MRFSS upgraded interviewer training, interviewer supervision, and contractor QA/QC work with many new requirements that were implemented in the 1990 MRFSS contracts. The shift in species ID may have been due to consistent errors in the species IDs made by contractor staff in the 1980's. (Dave Van Voorhees, MRFSS, pers. comm.) It is not certain whether there has been any similar problem in Headboat Survey, though none has previously been discussed.

The presumed relative occurrence of gag and black grouper changes with latitude on the west coast of Florida, with few black grouper occurring in the southwest. Table 12. A and 12. B show the occurrence of gag in the total gag + black grouper catch observed in the MRFSS and Headboat Survey by geographic strata. No suggested adjustments are presented here but should be discussed.

Table 12. Percent of observed gag in (observed gag + observed black grouper) for the Gulf of Mexico in the MRFSS and Headboat Survey, by year and county (MRFSS, AL-FLW only) or area (Headboat Survey, all Gulf).

Table 1. Estimated MRFSS A+B1 and B2 catch and coefficients of variations (CV) by mode for Gulf of Mexico. Charter and cbt/hbt estimates use the new method or are calibrated to the new method. A+B1 = catch that was killed; B2 = released alive.

A. Gag

	shore		charter		private		Cbt/hbt		All modes	
	A+B1	CV	A+B1	CV	A+B1	CV	A+B1	CV	A+B1	CV
1981	5,145	42%			62,250	33%	52,790	27%	120,185	21%
1982	4,257	80%			214,120	19%	87,441	35%	305,818	17%
1983					168,851	21%	166,212	20%	335,063	14%
1984	169,266	90%			170,082	51%	71,906	27%	411,255	43%
1985	0				90,809	33%	315,626	28%	406,435	23%
1986	26,155	100%	39,472	19%	49,396	28%			115,022	27%
1987	3,980	100%	32,424	26%	117,356	13%			153,760	12%
1988			21,649	22%	141,914	18%			163,563	16%
1989	15,246	54%	34,601	21%	70,516	19%			120,363	14%
1990			32,326	25%	128,248	27%			160,574	22%
1991	18,755	37%	13,810	26%	230,651	16%			263,215	14%
1992	7,712	49%	43,797	21%	185,448	10%			236,957	9%
1993	10,520	31%	102,509	19%	222,595	9%			335,624	9%
1994	1,636	71%	50,021	15%	208,261	9%			259,918	8%
1995	16,114	37%	109,628	24%	284,073	11%			409,815	10%
1996	3,124	58%	102,611	19%	242,272	12%			348,007	10%
1997	2,315	71%	105,621	16%	279,310	11%			387,246	9%
1998	32,608	85%	136,094	6%	315,039	9%			483,741	9%
1999	7,633	34%	129,510	8%	382,144	8%			519,287	6%
2000	9,578	59%	159,502	8%	530,544	9%			699,624	7%
2001	0		105,805	13%	359,989	10%			465,794	8%
2002	2,000	71%	91,965	7%	416,282	9%			510,247	8%
2003	605	100%	88,544	6%	394,438	9%			483,587	7%
2004	4,061	51%	125,269	5%	500,526	8%			629,856	7%
	B2	CV	B2	CV	B2	CV	B2	CV	B2	CV
1981	45,965	81%			25,593	81%	31,541	32%	103,098	43%
1982	0				93,863	31%	11,506	57%	105,369	29%
1983					476,617	35%	21,329	35%	497,947	33%
1984	13,208	92%			27,252	60%	13,278	56%	53,739	40%
1985	6,533	73%			10,526	60%	50,509	28%	67,569	24%
1986	0		17,369	25%	20,726	48%			38,095	28%
1987	0		9,574	43%	107,503	30%			117,078	28%
1988			5,481	46%	84,898	27%			90,379	25%
1989	54,867	52%	12,911	34%	211,161	21%			278,938	19%
1990			85,537	31%	277,859	29%			363,396	23%
1991	91,775	61%	1,838	51%	781,548	14%			875,160	14%
1992	99,839	39%	46,411	22%	581,357	10%			727,606	10%
1993	211,888	23%	92,334	21%	984,468	8%			1,288,690	7%
1994	90,010	18%	152,985	28%	1,588,795	6%			1,831,790	6%
1995	131,483	17%	192,925	13%	1,539,459	7%			1,863,867	6%
1996	80,270	32%	191,374	20%	948,021	6%			1,219,664	6%
1997	63,964	21%	186,373	27%	1,490,474	7%			1,740,811	7%
1998	74,421	21%	298,547	8%	1,698,616	7%			2,071,585	6%
1999	54,839	17%	214,848	8%	1,216,171	6%			1,485,858	5%
2000	62,253	29%	136,840	12%	1,240,288	6%			1,439,381	5%
2001	98,240	20%	142,988	14%	1,679,649	6%			1,920,878	5%
2002	242,404	17%	210,561	9%	2,033,709	6%			2,486,673	5%
2003	160,732	13%	275,452	7%	2,958,881	5%			3,395,064	4%
2004	139,962	15%	298,007	7%	3,125,300	4%			3,563,269	4%

Table 1. Estimated MRFSS A+B1 and B2 catch and coefficients of variations (CV) by mode for Gulf of Mexico. Charter and cbt/hbt estimates use the new method or are calibrated to the new method. A+B1 = catch that was killed; B2 = released alive.

B. Black grouper

	shore		charter		private		ch/head		All modes	
	A+B1	CV	A+B1	CV	A+B1	CV	A+B1	CV	A+B1	CV
1981	9,222	52%			141,850	18%	22,087	37%	173,160	16%
1982	9,417	71%			189,509	22%	16,430	29%	215,356	19%
1983	77,280	60%			608,703	23%	6,288	43%	692,271	22%
1984	28,731	55%			162,693	24%	26,229	25%	217,652	19%
1985	9,477	43%			314,560	32%	207,793	24%	531,831	21%
1986	24,889	40%	124,168	14%	399,146	16%			548,203	12%
1987	0		55,854	29%	239,870	15%			295,725	14%
1988	19,566	48%	53,306	28%	365,675	12%			438,548	11%
1989	0		1,101	44%	266,006	19%			267,107	19%
1990			2,771	43%	27,995	53%			30,767	49%
1991	0		2,199	40%	26,392	35%			28,591	33%
1992	3,023	51%	6,104	33%	19,921	26%			29,049	20%
1993	1,803	60%	5,067	37%	19,936	25%			26,806	20%
1994	5,286	51%	7,942	29%	7,930	31%			21,158	20%
1995	1,162	100%	6,531	43%	11,729	40%			19,423	29%
1996	3,430	75%	2,462	41%	14,909	36%			20,801	29%
1997	2,738	100%	8,120	30%	22,189	31%			33,046	24%
1998	0		8,373	13%	8,727	39%			17,100	21%
1999	0		1,664	12%	3,292	47%			4,956	31%
2000	0		2,649	14%	2,142	58%			4,791	27%
2001	1,203	100%	2,476	16%	0				3,679	34%
2002	0		2,551	14%	5,276	62%			7,827	42%
2003			4,412	12%	7,295	42%			11,707	27%
2004	0		5,199	12%	5,351	43%			10,551	23%
	B2	CV	B2	CV	B2	CV	B2	CV	B2	CV
1981	84,545	44%			74,446	31%	4,623	57%	163,614	27%
1982	1,804	100%			13,250	53%	992	100%	16,046	45%
1983	8,787	100%			14,925	83%	0		23,712	64%
1984	32,211	60%			99,232	49%	2,870	56%	134,313	39%
1985	4,831	56%			235,745	48%	4,483	43%	245,059	46%
1986	19,450	68%	36,038	24%	301,994	18%			357,482	16%
1987	30,316	100%	8,697	51%	154,538	23%			193,551	24%
1988	5,690	72%	10,005	42%	170,351	23%			186,046	22%
1989	5,605	100%	5,813	100%	202,853	20%			214,271	19%
1990			508	100%	24,227	37%			24,735	36%
1991	12,011	80%	1,812	100%	56,230	51%			70,053	43%
1992	0		3,682	57%	80,474	51%			84,156	49%
1993	15,952	39%	2,260	64%	28,495	44%			46,708	30%
1994	5,529	38%	2,675	65%	51,275	34%			59,479	29%
1995	7,416	34%	3,541	46%	20,983	34%			31,940	24%
1996	5,595	53%	2,271	45%	79,136	26%			87,003	24%
1997	11,870	44%	9,690	50%	48,296	20%			69,856	17%
1998	4,060	57%	5,982	20%	22,906	32%			32,948	24%
1999	792	100%	6,813	23%	23,649	20%			31,255	16%
2000	1,064	100%	2,959	18%	28,937	35%			32,960	31%
2001	1,617	100%	3,655	21%	15,738	51%			21,011	39%
2002	2,988	74%	8,025	30%	16,390	26%			27,403	19%
2003			11,246	14%	22,239	25%			33,485	17%
2004	881	100%	10,362	19%	32,806	19%			44,050	15%

Table 2.. Estimated MRFSS A+B1 and B2 catch by state for Gulf of Mexico. Charter and cbt/hbt estimates use the new method or are calibrated to the new method. A+B1 = catch that was killed; B2 = released alive. MRFSS estimates for TX include only 1981-1985 and are incomplete.

Gag	TX		LA		MS		AL		FLW		All states	
	A+B1	B2	A+B1	B2								
1981							5,759	0	114,425	103,098	120,185	103,098
1982									305,818	105,369	305,818	105,369
1983									335,063	497,947	335,063	497,947
1984	151,556	12,124	87	0					259,612	41,614	411,255	53,739
1985			6,501	0					399,934	67,569	406,435	67,569
1986			842	0	1,961	0	2,906	2,657	109,312	35,437	115,022	38,095
1987			75	0	2,443	0	299	0	150,943	117,078	153,760	117,078
1988							6	0	163,557	90,379	163,563	90,379
1989			4,400	0	302	235	614	0	115,047	278,703	120,363	278,938
1990					117	0	1,211	0	159,247	363,396	160,574	363,396
1991			1,983	0			1,990	471	259,243	874,690	263,215	875,160
1992			2,063	768	611	24	1,339	211	232,945	726,602	236,957	727,606
1993			2,400	2,653	2,159	165	3,039	3,700	328,026	1,282,172	335,624	1,288,690
1994			2,577	1,401	1,447	3,707	5,842	7,187	250,053	1,819,495	259,918	1,831,790
1995			831	186	20	4,851	7,975	9,679	400,989	1,849,151	409,815	1,863,867
1996			10,603	2,572	5,914	2,535	21,134	16,861	310,356	1,197,696	348,007	1,219,664
1997			1,022	2,018	299	1,263	11,749	8,151	374,176	1,729,377	387,246	1,740,811
1998			2,832	607	3,813	311	7,488	36,336	469,608	2,034,331	483,741	2,071,585
1999			17,104	6,647	489	5,602	22,942	77,965	478,753	1,395,645	519,287	1,485,858
2000			3,166	0	2,342	1,566	23,253	21,567	670,863	1,416,249	699,624	1,439,381
2001			4,197	3,054	19	1,887	8,436	11,334	453,142	1,904,602	465,794	1,920,878
2002			1,964	5,636	6,921	8,118	11,003	23,505	490,359	2,449,414	510,247	2,486,673
2003			1,776	5,251	296	81	11,124	31,005	470,392	3,358,728	483,587	3,395,064
2004			14,014	7,342	0	965	6,051	25,286	609,791	3,529,675	629,856	3,563,269
Bl. Grp.			A+B1	B2	A+B1	B2	A+B1	B2	A+B1	B2	A+B1	B2
1981							1,496	0	171,664	163,614	173,160	163,614
1982			3,648	0	4,598	1,797			207,110	14,249	215,356	16,046
1983			2,996	0			2,436	0	686,840	23,712	692,271	23,712
1984			90	0			6	0	217,556	134,313	217,652	134,313
1985							34,781	0	497,049	245,059	531,831	245,059
1986			2,166	2,921			8,756	20	537,281	354,542	548,203	357,482
1987			4,059	0			543	0	291,123	193,551	295,725	193,551
1988			6,044	0	321	0			432,182	186,046	438,548	186,046
1989					604	0			266,503	214,271	267,107	214,271
1990									30,767	24,735	30,767	24,735
1991									28,591	70,053	28,591	70,053
1992									29,049	84,156	29,049	84,156
1993									26,806	46,708	26,806	46,708
1994									21,158	59,479	21,158	59,479
1995									19,423	31,940	19,423	31,940
1996									20,801	87,003	20,801	87,003
1997									33,046	69,856	33,046	69,856
1998			1,220	0					15,881	32,948	17,100	32,948
1999									4,956	31,255	4,956	31,255
2000									4,791	32,960	4,791	32,960
2001			271	0					3,409	21,011	3,679	21,011
2002			24	0					7,803	27,403	7,827	27,403
2003									11,707	33,485	11,707	33,485
2004									10,551	44,050	10,551	44,050

Table 3. Comparison of MRFSS old charterboat method estimates to recalibrated charterboat estimates (using conversion factors from Diaz and Phares) for the Guld fo Mexico.

YEAR	black grouper		gag		black grouper		gag	
	ab1_new	b2_newb2	ab1_old	b2_old	ab1_new	b2_newb2	ab1_old	b2_old
1981	22,087	4,623	10,282	2,585	52,790	31,541	25,698	16,898
1982	16,430	992	11,442	740	87,441	11,506	59,540	8,783
1983	6,288	0	4,253	0	166,212	21,329	97,823	14,420
1984	26,229	2,870	16,162	2,061	71,906	13,278	39,802	5,079
1985	207,793	4,483	124,674	3,267	315,626	50,509	144,749	27,715
1986	124,168	36,038	176,843	59,810	39,472	17,369	67,369	33,980
1987	55,854	8,697	95,781	11,717	32,424	9,574	52,097	16,585
1988	53,306	10,005	73,040	14,011	21,649	5,481	37,361	8,073
1989	1,101	5,813	1,548	1,571	34,601	12,911	57,171	23,495
1990	2,771	508	2,978	519	32,326	85,537	42,864	136,272
1991	2,199	1,812	2,461	1,907	13,810	1,838	14,559	1,736
1992	6,104	3,682	7,021	4,358	43,797	46,411	66,682	72,873
1993	5,067	2,260	4,268	2,601	102,509	92,334	122,783	99,695
1994	7,942	2,675	7,179	2,458	50,021	152,985	70,386	136,288
1995	6,531	3,541	9,545	5,510	109,628	192,925	98,501	354,507
1996	2,462	2,271	4,288	3,516	102,611	191,374	106,129	170,148
1997	8,120	9,690	12,282	10,693	105,621	186,373	133,828	174,150

Table 4. Percent of MRFSS Type A catch estimate which was measured for Gulf of Mexico gag and black grouper. Charter and cbt/hbt estimates use the new method or are calibrated to the new method.

<u>Gag</u>	<u>Shore</u>	<u>A est.</u>	<u>Cbt</u>	<u>A est.</u>	<u>Priv</u>	<u>A est.</u>	<u>Cbt/Hbt</u>	<u>A est.</u>	<u>All modes</u>	<u>No. Meas.</u>	<u>A est.</u>
	<u>Pct.</u>		<u>Pct.</u>		<u>Pct.</u>		<u>Pct.</u>		<u>Pct.</u>		
1981	0.14%	2,903			0.06%	30,314	0.17%	16,182	0.10%	51	49,400
1982	0.07%	4,257			0.05%	120,611	0.13%	19,266	0.07%	94	144,133
1983					0.03%	158,067	0.10%	82,187	0.05%	121	240,254
1984	0.01%	158,573			0.03%	73,785	0.08%	59,772	0.03%	80	292,129
1985		0			0.03%	71,727	0.04%	314,518	0.03%	135	386,245
1986		0	0.55%	28,142	0.06%	24,988			0.32%	171	53,130
1987	0.03%	3,980	0.52%	24,661	0.07%	113,197			0.14%	205	141,838
1988			0.40%	21,547	0.06%	100,809			0.12%	144	122,355
1989	0.02%	15,246	0.22%	34,601	0.03%	50,354			0.09%	94	100,201
1990			0.22%	31,354	0.03%	102,853			0.08%	102	134,206
1991	0.02%	18,755	0.26%	10,450	0.05%	172,156			0.06%	112	201,361
1992	0.04%	7,712	0.45%	36,421	0.07%	172,383			0.14%	293	216,516
1993	0.06%	10,520	0.12%	91,270	0.08%	174,847			0.10%	264	276,637
1994	0.12%	1,636	0.20%	37,570	0.08%	167,362			0.10%	216	206,568
1995	0.05%	6,077	0.12%	94,003	0.06%	222,863			0.07%	236	322,942
1996	0.10%	2,049	0.16%	65,815	0.07%	170,063			0.09%	220	237,927
1997	0.09%	2,315	0.38%	104,153	0.09%	199,993			0.19%	582	306,460
1998	0.02%	32,157	0.74%	135,838	0.11%	274,438			0.30%	1322	442,433
1999	0.07%	6,100	1.34%	129,334	0.15%	343,900			0.47%	2261	479,334
2000	0.06%	9,578	0.98%	157,990	0.09%	478,539			0.30%	1957	646,107
2001		0	0.94%	105,649	0.09%	337,396			0.29%	1290	443,046
2002	0.05%	2,000	1.19%	91,045	0.08%	360,695			0.31%	1388	453,740
2003		0	1.56%	86,093	0.08%	344,573			0.38%	1627	430,666
2004	0.09%	3,179	1.85%	120,799	0.09%	408,680			0.49%	2584	532,658
<u>Bl.grp.</u>											
	<u>Pct.</u>	<u>A est.</u>	<u>Pct.</u>	<u>A est.</u>	<u>Pct.</u>	<u>A est.</u>	<u>Pct.</u>	<u>A est.</u>	<u>Pct.</u>	<u>No. Meas.</u>	<u>A est.</u>
1981	0.07%	9,222			0.05%	116,529	0.13%	20,571	0.06%	85	146,323
1982	0.04%	9,417			0.05%	122,976	0.07%	16,430	0.05%	75	148,824
1983	0.01%	77,280			0.01%	603,018	0.17%	5,718	0.01%	63	686,016
1984	0.02%	19,926			0.02%	115,532	0.28%	13,039	0.04%	62	148,496
1985	0.24%	5,040			0.01%	207,900	0.13%	22,112	0.03%	71	235,052
1986	0.01%	19,026	0.29%	29,968	0.04%	110,760			0.09%	137	159,754
1987		0	0.17%	39,398	0.05%	171,523			0.07%	157	210,921
1988	0.03%	9,104	0.11%	27,934	0.05%	182,113			0.06%	122	219,150
1989		0	0.18%	1,101	0.03%	53,753			0.04%	20	54,854
1990			0.00%	2,771	0.01%	26,674			0.01%	3	29,445
1991		0	0.27%	2,199	0.02%	26,392			0.03%	10	28,591
1992	0.07%	3,023	0.15%	5,208	0.09%	14,105			0.10%	23	22,336
1993	0.06%	1,803	0.13%	4,778	0.11%	18,372			0.11%	27	24,953
1994	0.07%	2,924	0.21%	7,573	0.11%	4,646			0.15%	23	15,143
1995	0.09%	1,162	0.21%	3,305	0.05%	11,729			0.09%	14	16,197
1996	0.09%	2,286	0.32%	2,462	0.08%	14,107			0.11%	21	18,855
1997		0	0.46%	7,469	0.05%	15,352			0.18%	41	22,821
1998		0	1.00%	7,919	0.06%	8,727			0.50%	84	16,647
1999		0	3.73%	1,395	0.18%	3,292			1.24%	58	4,687
2000		0	2.48%	2,338	0.00%	2,142			1.29%	58	4,480
2001	0.08%	1,203	2.60%	2,464	#DIV/0!	0			1.77%	65	3,667
2002		0	1.82%	2,477	0.09%	4,697			0.68%	49	7,174
2003			1.56%	4,224	0.03%	7,295			0.59%	68	11,519
2004		0	0.84%	5,116	0.04%	5,351			0.43%	45	10,467

Table 5. Percent of MRFSS observed Type A catch which was measured for Gulf of Mexico gag and black grouper.

Gag	Shore Pct.	A obs.	Cbt Pct.	A obs.	Priv Pct.	A obs.	Cbt/Hbt Pct.	A obs.	All modes Pct.	No. meas.	A obs.
1981	75%	5			95%	20	78%	36	83%	51	61
1982	83%	4			60%	110	100%	25	68%	94	139
1983					73%	55	93%	87	85%	121	142
1984	12%	102			86%	22	60%	82	39%	80	206
1985		0			100%	19	33%	349	37%	135	368
1986		0	67%	232	100%	16			69%	171	248
1987	100%	1	82%	157	62%	121			73%	205	279
1988			55%	157	68%	85			60%	144	242
1989	86%	3	52%	146	47%	32			52%	94	181
1990			81%	85	46%	71			65%	102	156
1991	100%	4	84%	32	79%	102			81%	112	138
1992	50%	6	77%	212	54%	235			65%	293	453
1993	55%	11	51%	220	68%	213			59%	264	444
1994	100%	2	68%	112	61%	227			63%	216	341
1995	50%	6	78%	139	47%	262			58%	236	407
1996	100%	2	67%	154	41%	278			51%	220	434
1997	100%	2	63%	624	69%	271			65%	582	897
1998	9%	66	63%	1,604	61%	499			61%	1322	2,169
1999	44%	9	74%	2,335	64%	819			71%	2261	3,163
2000	100%	6	73%	2,109	59%	687			70%	1957	2,802
2001		0	69%	1,433	56%	536			66%	1290	1,969
2002	50%	2	67%	1,610	51%	591			63%	1388	2,203
2003		0	58%	2,298	57%	504			58%	1627	2,802
2004	100%	3	54%	4,103	53%	656			54%	2584	4,762
Bl. grp	Shore Pct.	A obs.	Cbt Pct.	A obs.	Priv Pct.	A obs.	Cbt/Hbt Pct.	A obs.	All modes Pct.	No. meas.	A obs.
1981	60%	10			95%	56	79%	33	86%	85	99
1982	81%	5			51%	116	92%	13	56%	75	134
1983	113%	9			50%	86	34%	29	51%	63	124
1984	87%	3			79%	29	64%	56	70%	62	88
1985	50%	24			46%	67	53%	53	49%	71	144
1986	50%	4	58%	152	56%	84			57%	137	240
1987		0	80%	83	51%	178			60%	157	261
1988	75%	4	34%	89	63%	142			52%	122	235
1989		0	33%	6	49%	37			47%	20	43
1990			0%	4	15%	20			13%	3	24
1991		0	100%	6	44%	9			67%	10	15
1992		2	57%	14	87%	15			74%	23	31
1993	50%	2	100%	6	91%	22			90%	27	30
1994	100%	2	100%	16	83%	6			96%	23	24
1995	100%	1	100%	7	46%	13			67%	14	21
1996	100%	2	100%	8	52%	21			68%	21	31
1997		0	77%	44	33%	21			63%	41	65
1998		0	84%	94	38%	13			79%	84	107
1999		0	73%	71	75%	8			73%	58	79
2000		0	73%	79	0%	3			71%	58	82
2001	100%	1	58%	110		0			59%	65	111
2002		0	54%	83	57%	7			54%	49	90
2003		0	53%	125	18%	11			50%	68	136
2004		0	43%	100	25%	8			42%	45	108

Table 6. Percent of MRFSS Type A catch estimate which was observed for Gulf of Mexico gag and black grouper. Charter and cbt/hbt estimates use the new method or are calibrated to the new method.

Gag	Shore	A.est.	Charter	A est.	Private	A est.	Cbt+Hbt	A est.	All modes	A obs.	A est.
	Pct.		Pct.		Pct.		Pct.		Pct.		
1981	0.18%	2,903			0.07%	30,314	0.22%	16,182	0.12%	61	49,400
1982	0.09%	4,257			0.09%	120,611	0.13%	19,266	0.10%	139	144,133
1983					0.03%	158,067	0.11%	82,187	0.06%	142	240,254
1984	0.06%	158,573			0.03%	73,785	0.14%	59,772	0.07%	206	292,129
1985		0			0.03%	71,727	0.11%	314,518	0.10%	368	386,245
1986		0	0.82%	28,142	0.06%	24,988			0.47%	248	53,130
1987	0.03%	3,980	0.64%	24,661	0.11%	113,197			0.20%	279	141,838
1988			0.73%	21,547	0.08%	100,809			0.20%	242	122,355
1989	0.02%	15,246	0.42%	34,601	0.06%	50,354			0.18%	181	100,201
1990			0.27%	31,354	0.07%	102,853			0.12%	156	134,206
1991	0.02%	18,755	0.31%	10,450	0.06%	172,156			0.07%	138	201,361
1992	0.08%	7,712	0.58%	36,421	0.14%	172,383			0.21%	453	216,516
1993	0.10%	10,520	0.24%	91,270	0.12%	174,847			0.16%	444	276,637
1994	0.12%	1,636	0.30%	37,570	0.14%	167,362			0.17%	341	206,568
1995	0.10%	6,077	0.15%	94,003	0.12%	222,863			0.13%	407	322,942
1996	0.10%	2,049	0.23%	65,815	0.16%	170,063			0.18%	434	237,927
1997	0.09%	2,315	0.60%	104,153	0.14%	199,993			0.29%	897	306,460
1998	0.21%	32,157	1.18%	135,838	0.18%	274,438			0.49%	2,169	442,433
1999	0.15%	6,100	1.81%	129,334	0.24%	343,900			0.66%	3,163	479,334
2000	0.06%	9,578	1.33%	157,990	0.14%	478,539			0.43%	2,802	646,107
2001		0	1.36%	105,649	0.16%	337,396			0.44%	1,969	443,046
2002	0.10%	2,000	1.77%	91,045	0.16%	360,695			0.49%	2,203	453,740
2003		0	2.67%	86,093	0.15%	344,573			0.65%	2,802	430,666
2004	0.09%	3,179	3.40%	120,799	0.16%	408,680			0.89%	4,762	532,658
Bl.Grp											
	Pct.	A.est.	Pct.	A est.	Pct.	A est.	Pct.	A est.	Pct.	A obs.	A est.
1981	0.11%	9,222			0.05%	116,529	0.16%	20,571	0.07%	99	146,323
1982	0.05%	9,417			0.09%	122,976	0.08%	16,430	0.09%	134	148,824
1983	0.01%	77,280			0.01%	603,018	0.51%	5,718	0.02%	124	686,016
1984	0.02%	19,926			0.03%	115,532	0.43%	13,039	0.06%	88	148,496
1985	0.48%	5,040			0.03%	207,900	0.24%	22,112	0.06%	144	235,052
1986	0.02%	19,026	0.51%	29,968	0.08%	110,760			0.15%	240	159,754
1987		0	0.21%	39,398	0.10%	171,523			0.12%	261	210,921
1988	0.04%	9,104	0.32%	27,934	0.08%	182,113			0.11%	235	219,150
1989		0	0.54%	1,101	0.07%	53,753			0.08%	43	54,854
1990			0.14%	2,771	0.07%	26,674			0.08%	24	29,445
1991		0	0.27%	2,199	0.03%	26,392			0.05%	15	28,591
1992	0.07%	3,023	0.27%	5,208	0.11%	14,105			0.14%	31	22,336
1993	0.11%	1,803	0.13%	4,778	0.12%	18,372			0.12%	30	24,953
1994	0.07%	2,924	0.21%	7,573	0.13%	4,646			0.16%	24	15,143
1995	0.09%	1,162	0.21%	3,305	0.11%	11,729			0.13%	21	16,197
1996	0.09%	2,286	0.32%	2,462	0.15%	14,107			0.16%	31	18,855
1997		0	0.59%	7,469	0.14%	15,352			0.28%	65	22,821
1998		0	1.19%	7,919	0.15%	8,727			0.64%	107	16,647
1999		0	5.09%	1,395	0.24%	3,292			1.69%	79	4,687
2000		0	3.38%	2,338	0.14%	2,142			1.83%	82	4,480
2001	0.08%	1,203	4.46%	2,464		0			3.03%	111	3,667
2002		0	3.35%	2,477	0.15%	4,697			1.25%	90	7,174
2003			2.96%	4,224	0.15%	7,295			1.18%	136	11,519
2004		0	1.95%	5,116	0.15%	5,351			1.03%	108	10,467

Table 7. Headboat Survey **estimated catch** by area for Gulf of Mexico gag and black grouper. (Estimated catch includes only kept fish.)

Gag												
Area:	TX West 27	TX Mid 26	TX East 25	LA 24	AL/ FLW Panh 23	FLW Mid gr 22	FLW SW 21	FLW Tortu 18	FLW Tortu 17	FLW Keys 12	Total Gulf Catch	
1986	43	56	412	375	13206	12684	15684	35	37	144	42676	
1987	48	114	386	261	6355	577	24415	0	130	361	32647	
1988	78	34	126	335	1869	3524	20370		147	260	26743	
1989	49	26	99	66	1305	5802	27466	332	10	249	35404	
1990	26	80	26	43	817	1683	16181	241	34	287	19418	
1991	26	95	30	10	739	1243	9260	50		99	11552	
1992	93	41	15	19	829	725	12058	9	22	144	13955	
1993	74	113	142	260	2106	4615	11999	26	124	244	19703	
1994	68	36	63	103	2066	3990	14229	6	61	234	20856	
1995	53	41	88	167	2351	1680	13430	6	22	364	18202	
1996	35	22	98	196	5342	0	10369		23	307	16392	
1997	33	35	74	81	5129	1403	8868		11	281	15915	
1998	38	371	691	604	5218	3593	25801		70	479	36865	
1999	27	51	157	484	4272	2599	24527		121	161	32399	
2000	73	43	50	75	3199	3286	24098		48	135	31007	
2001	53	50	44	50	2619	2166	9499	13	16	129	14639	
2002	142	38	35	101	1819	1730	7750		20	116	11751	
2003	242	43	42	147	3369	974	11564		15	405	16801	
2004	106	14	20		4607	1824	18099		7	3124	27801	
Black grouper												
1986	7		32	44	4622	0	3357	2	706	519	9289	
1987	10	29	8	5	4345		1281		1237	545	7460	
1988	7	12	6		24	0	717		1790	345	2901	
1989	7	3	10	3	104	33	1201	36	282	269	1948	
1990		27	1		72	6	1316	107	145	168	1842	
1991	2	2	3	4	52	128	1063	54	200	116	1624	
1992		6	4	9	16	8	1664	7	154	529	2397	
1993			6	6	80	13	866	7	351	639	1968	
1994		1	5	1	13	181	1109		239	758	2307	
1995		1	3	4	5	5	3501		147	708	4374	
1996		8	1		99		1855		81	623	2667	
1997		6	1	8	5	80	3116		85	382	3683	
1998		3	6	1	42		5393		157	417	6019	
1999		2	3	489	103	376	246		153	393	1765	
2000	4	9	2	161	25	157	120		235	239	952	
2001	5	5	23	80	52	967	437		72	315	1956	
2002	1	15	3	80	16	249	221		160	304	1049	
2003	2	9	6		16	446	181		65	534	1259	
2004	3	10	11		16	253	220		86	967	1566	

Table 8. Percent of Headboat Survey **estimated catch which was measured** by area for Gulf of Mexico gag and black grouper.

Gag	TX West	TX Mid	TX East	LA	AL/ FLW Panh	FLW Mid gr	FLW SW	FLW Tortu	FLW Tortu	FLW Keys	Total Gulf Pct	Total Gulf Lengths	Total Gulf Cat.Est.
Area:	27	26	25	24	23	22	21	18	17	12			
1986	53%	7%	1%	3%	1%	1%	3%	6%	43%	10%	2%	694	42,676
1987	54%	7%	1%	4%	2%	3%	2%		7%	4%	2%	675	32,647
1988	15%	12%	1%	8%	4%	0%	1%		10%	5%	2%	406	26,743
1989	14%	15%	2%	21%	8%	1%	1%	0%	40%	7%	1%	474	35,404
1990	88%	3%	4%	14%	5%	6%	1%	4%	15%	8%	2%	420	19,418
1991	27%	1%	0%	40%	6%	0%	1%	4%		3%	1%	159	11,552
1992	8%	0%	7%	47%	7%	0%	1%	0%	5%	3%	1%	152	13,955
1993	19%	2%	4%	10%	3%	0%	0%	0%	2%	2%	1%	136	19,703
1994	7%	17%	25%	9%	4%	0%	1%	0%	3%	3%	1%	228	20,856
1995	13%	2%	1%	19%	2%	0%	1%	0%	0%	4%	1%	205	18,202
1996	17%	0%	0%	15%	3%		1%		0%	4%	2%	280	16,392
1997	15%	0%	0%	30%	2%	1%	2%		0%	4%	2%	322	15,915
1998	13%	6%	6%	17%	3%	0%	1%		3%	4%	1%	543	36,865
1999	4%	2%	1%	27%	2%	0%	1%		1%	1%	2%	492	32,399
2000	5%	5%	0%	67%	3%	0%	1%		0%	1%	1%	340	31,007
2001	4%	4%	0%	50%	1%	1%	2%	0%	13%	2%	2%	267	14,639
2002	7%	0%	0%	7%	3%	0%	3%		5%	3%	3%	304	11,751
2003	0%	2%	0%	9%	2%	1%	2%		7%	1%	2%	390	16,801
2004	5%	0%	0%		1%	0%	1%		0%	1%	1%	249	27,801
Black grouper													
1986	0%		0%		0%		0%	0%	4%	3%	1%	47	9,289
1987	0%	0%	0%		0%		0%		1%	2%	0%	24	7,460
1988	0%	8%	0%		0%		0%		1%	1%	0%	12	2,901
1989	0%	0%	0%		0%	0%	1%	0%	4%	2%	1%	24	1,948
1990		0%	0%		0%	0%	1%	2%	3%	5%	1%	23	1,842
1991	0%	0%	0%		0%	0%	0%	0%	4%	2%	1%	10	1,624
1992		0%	0%		0%	0%	0%	0%	1%	1%	0%	8	2,397
1993		!	0%		0%	0%	0%	0%	1%	1%	1%	12	1,968
1994		0%	0%		0%	0%	0%		1%	2%	1%	15	2,307
1995		0%	0%		0%	0%	0%		2%	1%	0%	13	4,374
1996		0%	0%		0%		0%		1%	2%	1%	16	2,667
1997		0%	100%		0%	0%	0%		7%	4%	1%	21	3,683
1998		0%	0%		0%		0%		1%	3%	0%	15	6,019
1999		0%	0%		1%	0%	0%		2%	1%	1%	9	1,765
2000	0%	0%	0%		0%	0%	0%		0%	2%	1%	6	952
2001	0%	0%	0%		2%	0%	0%		4%	0%	0%	5	1,956
2002	0%	0%	0%		0%	0%	0%		0%	0%	0%	1	1,049
2003	0%	0%	0%		0%	0%	0%		3%	1%	0%	5	1,259
2004	0%	0%	0%		0%	0%	0%		1%	0%	0%	3	1,566

Table 9. Percent of Headboat Survey **estimated catch which was observed** by area for Gulf of Mexico gag and black grouper.

Gag													
Area:	TX West 27	TX Mid 26	TX East 25	LA 24	AL/ FLW Panh 23	FLW Mid gr 22	FLW SW 21	FLW Tortu 18	FLW Tortu 17	FLW Keys 12	Total Gulf Pct	Total Gulf Obsv	Total Gulf Cat.Est.
1986	72%	57%	69%	52%	7%	15%	54%	251%	97%	60%	28%	11,998	42,676
1987	83%	56%	97%	32%	23%	2%	44%		67%	39%	40%	12,918	32,647
1988	59%	85%	91%	36%	87%	22%	42%		25%	40%	42%	11,348	26,743
1989	80%	69%	100%	73%	81%	2%	32%	12%	20%	49%	29%	10,292	35,404
1990	85%	63%	100%	47%	91%	78%	82%	72%	6%	38%	81%	15,646	19,418
1991	92%	84%	93%	80%	86%	93%	95%	100%		24%	94%	10,812	11,552
1992	76%	98%	93%	89%	92%	62%	95%	100%	100%	65%	93%	12,949	13,955
1993	70%	94%	89%	61%	98%	69%	90%	73%	80%	78%	85%	16,812	19,703
1994	94%	83%	81%	71%	90%	67%	77%	33%	98%	69%	77%	16,022	20,856
1995	83%	98%	95%	90%	94%	3%	42%	0%	55%	79%	46%	8,463	18,202
1996	431%	82%	83%	26%	96%		58%		52%	74%	72%	11,722	16,392
1997	97%	26%	65%	74%	96%	100%	69%		91%	77%	80%	12,778	15,915
1998	95%	99%	95%	91%	91%	64%	26%		51%	64%	43%	15,856	36,865
1999	100%	94%	92%	47%	91%	78%	44%		9%	47%	53%	17,257	32,399
2000	11%	100%	100%	73%	87%	77%	43%		67%	74%	52%	16,070	31,007
2001	81%	94%	100%	114%	95%	73%	33%	38%	56%	54%	51%	7,514	14,639
2002	98%	95%	100%	0%	81%	100%	61%		40%	47%	69%	8,163	11,751
2003	63%	84%	90%	12%	80%	100%	50%		73%	42%	59%	9,845	16,801
2004	98%	93%	70%		67%	96%	58%		71%	38%	60%	16,599	27,801
Black Grouper													
1986	29%		94%	66%	13%		42%	100%	93%	37%	31%	2,912	9,289
1987	90%	83%	88%	80%	21%		67%		76%	66%	41%	3,091	7,460
1988	100%	75%	67%		100%		50%		24%	50%	34%	997	2,901
1989	71%	67%	100%	67%	99%	100%	49%	100%	69%	68%	59%	1,154	1,948
1990		63%	100%		100%	100%	83%	79%	6%	52%	74%	1,371	1,842
1991	100%	100%	67%	100%	96%	100%	97%	100%	55%	51%	89%	1,443	1,624
1992		83%	100%	89%	100%	25%	99%	100%	90%	58%	89%	2,129	2,397
1993			100%	50%	95%	100%	99%	100%	76%	70%	85%	1,679	1,968
1994		100%	80%	100%	77%	98%	69%		95%	71%	75%	1,724	2,307
1995		100%	100%	100%	80%	0%	70%		54%	87%	72%	3,169	4,374
1996		200%	100%		94%		69%		74%	78%	73%	1,937	2,667
1997		67%	100%	25%	100%	100%	74%		73%	86%	75%	2,776	3,683
1998		100%	100%	100%	100%		22%		50%	76%	27%	1,647	6,019
1999		100%	33%	45%	98%	65%	30%		9%	87%	56%	997	1,765
2000	25%	100%	100%	60%	96%	47%	72%		17%	87%	57%	542	952
2001	100%	100%	100%	41%	98%	100%	29%		72%	86%	78%	1,532	1,956
2002	100%	100%	100%	0%	100%	100%	45%		44%	58%	60%	628	1,049
2003	100%	67%	100%		100%	27%	50%		72%	48%	43%	546	1,259
2004	100%	50%	100%		119%	100%	40%		67%	42%	54%	842	1,566

Table 10. TPWD Survey catch estimates of gag and black grouper. Catch of fish released alive in not estimated by the survey.

	gag Cbt	Priv	Total gag	Black grouper Charter
1983		58	58	
1984		19	19	
1985		31	31	
1986				196
1987	313		313	
1990		148	148	54
1991	50	19	69	
1993		22	22	
1994		154	154	
1996	90	116	206	11
1998	134	520	654	
1999	431	53	484	
2000	24	281	305	70
2001	92	263	355	
2002		411	411	
2003		141	141	
2004		192	192	

Table 11. Ratios of Released fish to Kept fish in the Headboat Survey and MRFSS charterboat.

A. Headboat trip report data for 2004, gag reported as released dead, released alive and kept, by area and wave in the Gulf of Mexico. Only trips reporting released fish of some species were used. The ratios live / (kept+dead) for all waves combined in shown. Areas 12-17 are Keys , 21-22 are FLW, 23 is FL Panhandle+AL, 25-27 are TX. There was no Headboat Survey in LA in 2004.

area	Wv 1			Wv 2			Wv 3			Wv 4			Wv 5			Wv 6			Total kept	Total dead	Total Live	Ratio
	kept	dead	live																			
12	192	0	239	263	0	271	231	1	244	199	0	197	94	0	99	186	0	200	1165	1	1250	1.07
17	0	0	18	1	0	0	0	0	1				2	0	0				3	0	19	6.33
21	1281	28	4390	2638	6	9192	1196	5	3715	806	3	1690	463	9	1261	489	0	1082	6873	51	21330	3.08
22							80	0	50	23	0	15	210	0	85				313	0	150	0.48
23	5	0	0	96	0	60	23	0	29	6	0	21	2	0	0				132	0	110	0.83
25							1	0	0				1	0	0				2	0	0	0
26													2	0	0				2	0	0	0
27							9	0	1	11	0	6	0	0	1				20	0	8	0.40
	1478	28	4647	2998	6	9523	1540	6	4040	1045	3	1929	774	9	1446	675	0	1282	8510	52	22867	2.67

B. MRFSS b2/ab1 ratios calculated for 2004 estimates, Gulf of Mexico, based on charterboat mode.

	Wv1		Wv2		Wv3		Wv4		Wv5		Wv6		Annual ab1	b2	r
	b2	r													
LA					0	0.00	134	0.66	118		22	1.13	475	274	0.58
MS									23				0	23	
AL	34	8.02	214	0.58	917	0.99	765	1.34	575	0.71	75	0.55	2818	2579	0.92
FLW	61721	4.70	57265	3.37	64922	2.02	25163	2.28	47397	1.48	38663	2.35	121977	295131	2.42
	61755	4.70	57479	3.31	65839	1.97	26062	2.20	48112	1.46	38760	2.33	125269	298007	2.38

Table 12. Percent of observed gag in (observed gag + observed black grouper) for the Gulf of Mexico in the MRFSS and Headboat Survey , by year and county (MRFSS, AL-FLW only) or area (Headboat Survey, all Gulf).

A. MRFSS (AL, counties combined, and FLW by county)

Cnty:	AL	FLW Esc-Wak	Tay	Dix	Lev	Cit	Her	Pas	Pin	Hil	Man	Sar	Cha	Lee	Col	Mon	Total
1981	75	35				0			80		24	50		6	0	38	38
1982		9	15		0	90		100	85		100	100		10		33	52
1983	0	42		0		100		86	71		45	100	0	100		29	57
1984		0				40		33	72		33	9			44	15	55
1985	0	0						7	98		100	0		0	0	0	72
1986	49	2						100	82		0	0	0	0	0	0	51
1987	67	35	0					88	84		69	100			0	32	52
1988	100	29	0					75	75		67	40	100	38		82	50
1989	100	94							74		100	100	27	100	100	50	80
1990	100	97		100		100		100	97			100	0			10	87
1991	100	100	100		100	100		100	100	100	100	75	100	100		7	89
1992	100	100		100	100	100	100	100	100	100	100	100	100	43	100	4	93
1993	100	100		100		100	100	100	100	100	100	100	100			0	94
1994	100	100	100	100	100	100	100	100	100	100	100	100	86	100	100	4	93
1995	100	100	81		100	100	100	100	99	100	100	100	100	100		15	95
1996	100	100	100	100	100	100	100	100	100	100	100	100		100	100	18	93
1997	100	99	100	100	100	100	100	100	100	100	100	74	67	100	100	20	93
1998	100	99	67	100	100	100	100	100	100	100	100	99	100	100	100	24	95
1999	100	100	100	100	97	100	100	100	99	100	98	98	100	100	100	16	98
2000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	9	97
2001	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	19	95
2002	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	14	96
2003	100	100	100	100	100	100	100	100	100	100	100	96	100	100	100	20	95
2004	100	100	100	100	100	100	100	100	100	100	100	100	100	100	96	17	98

B. Headboat Survey

Area:	TX West 27	TX Mid 26	TX East 25	LA 24	AL/ FLW Panh 23	FLW Mid gr 22	FLW SW 21	FLW Tortu 18	FLW Tortu 17	FLW Keys 12	Total Gulf Pct
1986	94	100	90	87	62	100	86	98	5	31	80
1987	82	73	98	95	62	100	93		9	28	81
1988	87	76	97	100	99	100	96		8	37	92
1989	89	90	91	96	91	79	94	53	1	40	90
1990	100	75	96	100	91	100	92	67	18	55	92
1991	92	98	93	67	93	90	90	48	0	29	88
1992	100	89	78	68	98	100	87	56	14	24	86
1993	100	100	95	98	96	100	93	73	27	30	91
1994	100	97	93	99	99	94	93	100	21	23	90
1995	100	98	97	97	100	100	69		13	32	73
1996	100	53	99	100	98		83		17	32	86
1997	100	69	98	97	100	95	73		14	40	82
1998	100	99	99	100	99	100	85		31	49	91
1999	100	96	99	51	97	89	99		44	18	95
2000	89	83	96	36	99	97	99		44	32	97
2001	90	90	66	63	98	62	96		15	21	83
2002	99	71	92		99	87	98		10	24	93
2003	99	86	86	100	99	89	98		19	40	95
2004	97	72	56		99	87	99		8	75	95

Table 13. MRFSS annual estimated catch of gag West Florida by Florida regions (Monroe County = Keys).
 (Post-stratification by Tom Sminkey, MRFSS)

	Panhandle AB1	STD	West Peninsula AB1	STD	Monroe County AB1	STD	
1991	28,391	30.8	227,690	5.9	381	74.7	
1992	42,456	28.2	211,872	9.3	1269	63.8	
1993	77,703	12.4	268,215	9.3	1064	100	
1994	79,512	13.2	190,279	10	1338	74.6	
1995	57,351	20.9	327,859	8.2	4,353	58.9	
1996	160,078	11.6	143,064	10.6	9,255	35.3	
1997	115,693	13.2	276,927	8	6,010	28.2	
1998	156,060	6.5	347,371	10	6,646	23.3	
1999	136,205	6.6	363,639	5.7	1,242	24.7	
2000	221,465	8.8	443,360	7	361	44.3	
2001	168,619	8.6	280,525	8.3	733	35.6	
2002	196,251	9	289,851	7.3	1,617	49.9	
2003	152,182	7.6	314,773	7.6	3,256	25.4	
2004	270,668	7.2	337,837	6.6	2,067	21.3	