

General Recreational Survey Data for Red Snapper in the Gulf of Mexico

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06-09-2022

Update to the 01-19-2022 working paper

Adjusted the FHS calibration method to account for the zero effort estimate of for-hire vessels fishing in (western) Florida in 1981 wave-2.

General recreational catch estimates for Red Snapper are compiled from the following separate sampling programs:

1. Marine Recreational Information Program (MRIP) (SEDAR68-DW-13)
 2. Texas Parks and Wildlife Department (TPWD) (SEDAR70-WP-03)
 3. Louisiana Creel survey program (LA Creel; 2014+)
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Parameters for data prepared for SEDAR 74 recreational catch data:

- Species: Red Snapper
- Year Range: 1981 - 2019
- Geographic Range: Gulf of Mexico states from Texas to western Florida, including the Florida Keys. SEDAR 74 stock ID boundaries include western (Texas-Louisiana), central (Mississippi-Florida panhandle), and eastern (western Florida) Gulf of Mexico.
- Fishing Modes: Charter, Headboat (1981-1985), Private
- MRIP Survey Methodology: Fully calibrated estimates that take into account the change in the Fishing Effort Survey (FES), the redesigned Access Point Angler Intercept Survey (APAIS), and the For Hire Survey (FHS)
- MRIP Data Gaps from COVID: Missing 2020 intercepts were imputed from all APAIS data collected in 2018 and 2019 from the same strata as the 2020 data gap, with original sample weights reduced by a factor of two to account for using two years of data (Cody 2021).
- SEFSC Data QAQC: Size records above an allowable (max size) threshold are excluded from average weight estimation and the summary tables included in this working paper (Tables 8-15). For SEDAR 74 red snapper, this includes any weights heavier than 52.668 pounds.

Catch and Sample Size Information for Particular Domains:

Domains were selected based on strata-level catch estimates (year-state-mode-wave-area) that have a disproportionately large contribution to those total (annual) catch estimates that appear relatively large/small, as compared to adjacent years. Selected domains are more likely to be high catch estimates given the inherent zero-boundary constraint in all catch/effort data (≥ 0) that complicates identification of low catch estimates.

- 1981 landings estimate: 7,398,864 fish
 - Strata: LA, private, wave 5, and ocean greater than 3 miles
 - Intercept Records: a total of 11 angler trips that resulted in a landings estimate of 1,470,041 fish
 - One angler trip that harvested 6 Red Snapper (seen by interviewer)
 - One angler trip that harvested 18 Red Snapper (seen by interviewer)
 - Five angler trips that harvested 6 Red Snapper (NOT seen by interviewer)
 - Two angler trips that harvested 7 Red Snapper (NOT seen by interviewer)
 - Two angler trips that harvested 8 Red Snapper (NOT seen by interviewer)

- Strata: AL, for-hire, wave 2, and ocean greater than 3 miles
 - Intercept Records: a total of 3 angler trips that resulted in a landings estimate of 1,374,578 fish for charterboat and 859,711 fish for headboat
 - One angler trip that harvested 47 Red Snapper (24 fish seen by interviewer and 23 fish NOT seen by interviewer)
 - One angler trip that harvested 18 Red Snapper (seen by interviewer)
 - One angler trip that harvested 15 Red Snapper (seen by interviewer)
 - Investigated this domain after identifying a disagreement in trend between FHS-calibrated estimates and those in the original CHTS units (Figure 1), which revealed the FHS calibration model (SEDAR 64-RD-12) was inflating the Alabama effort estimate for this strata to account for a zero effort estimate in the associated Florida-west cell. As a substitute, the FHS-calibration ratios calculated for AL-wave2 in subsequent years (1982-1985) were averaged and applied to 1981 (CHTS) estimates to convert them into FHS units. The new FHS-estimates for this strata are:
 - Charterboat: Catch = 37,936 fish and Effort = 1,897 angler trips
 - Headboat: Catch = 24,546 fish and Effort = 1,186 angler trips
- 1983 landings estimate: 6,035,594 fish
 - Strata: LA, private, wave 1, and ocean greater than 3 miles
 - Intercept Records: a total of 2 angler trips that resulted in a landings estimate of 1,131,381 fish
 - One angler trip that harvested 51 Red Snapper (seen by interviewer)
 - One angler trip that harvested 8 Red Snapper (seen by interviewer)
- 2017 discard estimate: 9,337,574 fish
 - Strata: FLW, private, wave 3, and ocean less than or equal to 10 miles
 - Intercept Records: a total of 121 angler trips that resulted in a landings/discard estimate of 1,049,036 fish

<i>Catch Observation</i>	<i>Minimum</i>	<i>Median</i>	<i>Mean</i>	<i>Maximum</i>
<i>Harvest seen by interviewer</i>	0	0	1.17	10
<i>Harvest not seen by interviewer</i>	0	0	0.56	10
<i>Released live fish</i>	0	3	4.04	27

- Strata: FLW, private, wave 3, and ocean greater than 10 miles
- Intercept Records: a total of 143 angler trips that resulted in a landings/discard estimate of 1,629,272 fish

<i>Catch Observation</i>	<i>Minimum</i>	<i>Median</i>	<i>Mean</i>	<i>Maximum</i>
<i>Harvest seen by interviewer</i>	0	0	1.04	12
<i>Harvest not seen by interviewer</i>	0	0	0.54	2
<i>Released live fish</i>	0	2	4.07	25

Tables

Table 1. Annual landings (AB1) and discards (B2) of Red Snapper in numbers of fish by state and year (MRIP, LACreel 2014+, TPWD).

Table 2. Annual landings (AB1) and discards (B2) of Red Snapper in numbers of fish by mode and year (MRIP, LACreel 2014+, TPWD). Note that catch from the combined private-shore fishing mode in the LA Creel survey is added to the private mode.

Table 3. Red Snapper landings in numbers of fish (AB1) with associated coefficients of variation (CV; Dettloff et al. 2020) by mode and year (MRIP only). Table does not include any MRIP catch estimates imputed by the SEFSC for 1981 wave1 or adjustments to the Alabama for-hire estimates for 1981 wave-2. Sample size is provided both as the total number of primary sampling units (PSU) and angler trips (Trp) intercepted by MRIP samplers within a specified strata and, in parentheses, the number of PSUs and angler trips that intercepted Red Snapper.

Table 4. Red Snapper discards in numbers of fish (B2) with associated coefficients of variation (CV; Dettloff et al. 2020) by mode and year (MRIP only). Table does not include any MRIP catch estimates imputed by the SEFSC for 1981 wave1 or adjustments to the Alabama for-hire estimates for 1981 wave-2. Sample size is provided both as the total number of primary sampling units (PSU) and angler trips (Trp) intercepted by MRIP samplers within a specified strata and, in parentheses, the number of PSUs and angler trips that intercepted Red Snapper.

Table 5. Total Red Snapper landings (AB1) and discards (B2), in numbers of fish, with associated coefficients of variation (CV; Dettloff et al. 2020) by year (MRIP only). Table does not include any MRIP catch estimates imputed by the SEFSC for 1981 wave1 or adjustments to the Alabama for-hire estimates for 1981 wave-2. Sample size is provided both as the total number of primary sampling units (PSU) and angler trips (Trp) intercepted by MRIP samplers within a specified strata and, in parentheses, the number of PSUs and angler trips that intercepted Red Snapper.

Table 6. Estimated landings of Red Snapper in pounds whole weight by state and year (MRIP, LACreel 2014+, TPWD). Average weight estimates are calculated by strata using the following hierarchy: species, region, year, state, mode, wave, and area (Matter and Rios 2013). The minimum number of weights used at each level of substitution is fifteen fish, except for the final species level where the minimum is one fish (Dettloff and Matter 2019b).

Table 7. Red Snapper landings in pounds whole weight (LBS) with associated coefficients of variation (CV; Approach 1 described in Nuttall and Dettloff 2022) by mode and year (MRIP only). Table does not include any MRIP catch estimates imputed by the SEFSC for 1981 wave1 or adjustments to the Alabama for-hire estimates for 1981 wave-2.

Table 8. Summary of length measurements (millimeters fork length) from MRIP-intercepted Red Snapper by state and year. Summaries include the number of fish

measured by MRIP and, in parentheses, the number of angler trips from which those fish were measured (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish lengths. LA lengths are available from MRIP only until 2013.

Table 9. Summary of weight measurements (pounds whole weight) from MRIP-intercepted Red Snapper by state and year. Summaries include the number of fish weighed by MRIP and, in parentheses, the number of angler trips from which those fish were weighed (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish weights. LA weights are available from MRIP only until 2013.

Table 10. Summary of length measurements (millimeters fork length) from MRIP-intercepted Red Snapper by mode and year. Summaries include the number of fish measured by MRIP and, in parentheses, the number of angler trips from which those fish were measured (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish lengths.

Table 11. Summary of weight measurements (pounds whole weight) from MRIP-intercepted Red Snapper by mode and year. Summaries include the number of fish weighed by MRIP and, in parentheses, the number of angler trips from which those fish were weighed (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish weights.

Table 12. Summary of length (millimeters fork length) and weight measurements (pounds whole weight) from MRIP-intercepted Red Snapper by year. Summaries include the number of fish for which size information was collected by MRIP and, in parentheses, the number of angler trips from which those fish were sampled (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish lengths and weights.

Table 13. Summary of length measurements (millimeters total length) from TPWD-intercepted Red Snapper by mode and year. Summaries include the number of fish measured by TPWD and, in parentheses, the number of angler trips from which those fish were measured (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish lengths.

Table 14. Summary of length measurements (millimeters fork length) from Red Snapper intercepted by the LA BIO sampling program by mode and year. Summaries include the number of fish measured by LDWF and, in parentheses, the number of angler trips from which those fish were measured (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish lengths.

Table 15. Summary of weight measurements (pounds whole weight) from Red Snapper intercepted by the LA BIO sampling program by mode and year. Summaries include the number of fish weighed by LDWF and, in parentheses, the number of angler trips from which those fish were measured (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish lengths.

Table 16. Resolution of landings-in-weight estimates (pounds whole weight) for Gulf of Mexico Red Snapper by year and hierarchy level (MRIP, LACreel 2014+, TPWD), defined by species, region, year, state, mode, wave, and area. Average weight estimates are calculated at the finest strata meeting a minimum sample size threshold (Dettloff and Matter 2019b). Larger sample sizes therefore allow average weights to be calculated at finer stratifications, the finest being at the srysmwa level (Matter and Rios 2013). Annual summaries include the number of fish and angler trips from which weight information was collected (N) and the landings-in-weight estimates (AB1.lbs) by hierarchy level. As an example, (srysmw) summarizes those landings-in-weight estimates originating from cells where average weights are specific to a particular species, region, year, state, mode, and wave (i.e., weight observations collapsed across areas).

Table 17. Recreational Fishing Effort (in angler trips) for Gulf of Mexico anglers by state and year (MRIP, LACreel 2014+, TPWD).

Table 18. Recreational Fishing Effort (in angler trips) for Gulf of Mexico anglers by mode and year (MRIP, LACreel 2014+, TPWD). Note that effort from the combined private-shore fishing mode in the LA Creel survey has been added to the private mode.

Table 19. Annual landings (AB1) and discards (B2) of Red Snapper in numbers of fish by Stock-ID boundary and year (MRIP, LACreel 2014+, TPWD).

Table 20. Summary of fish weights (in pounds whole weight) from intercepted Red Snapper by Stock-ID boundary and year (MRIP, LACreel 2014+, TPWD). This table includes both raw measurements of fish weight and weights imputed from TPWD length measurements, using appropriate length-weight conversions. Summaries include the number of fish and, in parentheses, number of angler trips providing information on fish weight (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) of these weight records.

Table 21. Recreational Fishing Effort (in angler trips) for Gulf of Mexico anglers by Stock-ID boundary and year (MRIP, LACreel 2014+, TPWD).

Figures

Figure 1. Comparison of charterboat landings (AB1) and discard (B2) estimates (with standard error intervals shown) for Red Snapper from the Coastal Household Telephone Survey (CHTS) and For-Hire Survey (FHS) from the Gulf of Mexico between 1981 and 1999 (MRIP). The charterboat calibration approach is discussed in Dettloff and Matter (2019a). Figure does not include adjustments to the FHS-calibrated estimates of Alabama for-hire in 1981 wave-2.

Figure 2. MRIP Base (BASE), APAIS Calibrated (ACAL), and Fully Calibrated APAIS and FES (FCAL) catch estimates for Red Snapper in the Gulf of Mexico between 1981 and 2017. Landings (AB1) and discard (B2) estimates are in thousands of fish (NMFS). The Shore mode is also included as uncertainty estimates for catch across multiple modes are only available when all modes are selected. Figure does not include any MRIP catch estimates imputed by the SEFSC for 1981 wave1 or adjustments to the Alabama for-hire estimates for 1981 wave-2.

Figure 3. Comparison of total general recreational landings (AB1) and discard estimates (B2) for Gulf of Mexico red snapper between SEDAR 74 and SEDAR 52, the terminal years of which are 2019 and 2016 respectively. Differences in catch estimates, which are in thousands of fish, are largely a function of changes in the MRIP survey (i.e., FES in 2018).

Figure 4. Annual Red Snapper landings (AB1) and discards (B2), in thousands of fish, by state from 1981 to 2019 (MRIP, LACreel 2014+, TPWD).

Figure 4a. Percent of Red Snapper landings (AB1) and discards (B2), in numbers of fish, from each state by year (bar graph) and overall (pie chart) between 1981 and 2019 (MRIP, LACreel 2014+, TPWD).

Figure 5. Annual Red Snapper landings (AB1) and discards (B2), in thousands of fish, by mode from 1981 to 2019 (MRIP, LACreel 2014+, TPWD). Note that catch from the combined private-shore fishing mode in the LA Creel survey has been added to the private mode.

Figure 5a. Percent of Red Snapper landings (AB1) and discards (B2), in numbers of fish, from each mode by year (bar graph) and overall (pie chart) between 1981 and 2019 (MRIP, LACreel 2014+, TPWD). Note that catch from the combined private-shore fishing mode in the LA Creel survey has been added to the private mode.

Figure 6. Estimates of annual landings for Red Snapper in the Gulf of Mexico (MRIP, LACreel 2014+, TPWD): estimated landings in thousands of fish (top), estimated landings in thousands of pounds whole weight (middle), and average weight of landed fish (estimated lbs/estimated fish) (bottom). Average weight estimates are calculated by strata using the following hierarchy: species, region, year, state, mode, wave, and area (Matter and Rios 2013). The minimum number of weights used at each level of substitution is fifteen fish, except for the final species level where the minimum is one fish (Dettloff and Matter 2019b).

Figure 7. Annual landings estimates of Gulf of Mexico Red Snapper in thousands of pounds whole weight by hierarchy level (MRIP, LACreel 2014+, TPWD), defined by **species**, **region**, **year**, **state**, **mode**, **wave**, and **area**. Landings are grouped by the strata at which average weights were estimated, the finest stratification being at the srysmwa level (Matter and Rios 2013). As an example, (srysmw) summarizes those landings-in-weight estimates originating from cells where average weights are specific to a particular **species**, **region**, **year**, **state**, **mode**, and **wave** (i.e., weight observations collapsed across areas). Landings are provided (A) in absolute pounds and (B) as a percentage of total landings-in-weight, which is summarized by year (stacked bar plot) and across all years (pie chart).

Appendices

Appendix A. Additional Details of Survey Data and SEFSC Estimation

References

- Cody, R. 2021. MRIP 2020 Estimates: Overview of Methodology and Select Catch and Effort Estimates. Office of Science and Technology (OST) Marine Recreational Information Program (MRIP) Fisheries Statistics Division. Silver Spring, MD. Presentation given to the Mid-Atlantic Fishery Management Council at the June 8 2021 council meeting. Retrieved from: <https://www.mafmc.org/briefing/june-2021>
- Dettloff, K and VM Matter. 2019a. SEDAR 64-RD-12. Model-estimated conversion factors for calibrating Coastal Household Telephone Survey (CHTS) charterboat catch and effort estimates with For Hire Survey (FHS) estimates in the Atlantic and Gulf of Mexico with application to red grouper and greater amberjack. National Marine Fisheries Service (NMFS) Southeast Fisheries Science Center (SEFSC) Fisheries Statistics Division. Miami, FL.
- Dettloff, K and VM Matter. 2019b. SEDAR 67-WP-06. Sample Size Sensitivity Analysis for calculating MRIP Weight Estimates. National Marine Fisheries Service (NMFS) Southeast Fisheries Science Center (SEFSC) Fisheries Statistics Division. Miami, FL.
- Dettloff, K, VM Matter, and MA Nuttall. 2020. SEDAR 68-DW-10. SEFSC Computation of Variance Estimates for Custom Data Aggregations from the Marine Recreational Information Program. National Marine Fisheries Service (NMFS) Southeast Fisheries Science Center (SEFSC) Fisheries Statistics Division. Miami, FL.
- Matter, VM and A Rios. 2013. SEDAR 32-DW-02. MRFSS to MRIP Adjustment Ratios and Weight Estimation Procedures for South Atlantic and Gulf of Mexico Managed Species. National Marine Fisheries Service (NMFS) Southeast Fisheries Science Center (SEFSC) Fisheries Statistics Division. Miami, FL.
- Matter, VM and MA Nuttall. 2020. SEDAR 68-DW-13. Marine Recreational Information Program: Metadata for the Atlantic, Gulf of Mexico, and Caribbean Regions. National Marine Fisheries Service (NMFS) Southeast Fisheries Science Center (SEFSC) Fisheries Statistics Division. Miami, FL.
- Nuttall, MA and K Dettloff. 2022. SEDAR 74-DW-12. SEFSC Computation of Uncertainty for General Recreational Landings in Weight Estimates, with Application to SEDAR 74 Gulf of Mexico Red Snapper. National Marine Fisheries Service (NMFS) Southeast Fisheries Science Center (SEFSC) Fisheries Statistics Division. Miami, FL.
- Nuttall, MA and VM Matter. 2020. SEDAR 70-WP-03. Texas Parks and Wildlife Department's Marine Sport-Harvest Monitoring Program Metadata. National Marine Fisheries Service (NMFS) Southeast Fisheries Science Center (SEFSC) Fisheries Statistics Division. Miami, FL.
- Papacostas, KJ and J Foster. 2021. The Marine Recreational Information Program: Survey Design and Statistical Methods for Estimation of Recreational Fisheries Catch and Effort. Available at: <https://www.fisheries.noaa.gov/resource/document/survey-design-and-statistical-methods-estimation-recreational-fisheries-catch-and>
- Personal Communication from the National Marine Fisheries Service, Office of Science and Technology, Fisheries Statistics Division. December 1, 2021.

SEDAR. 2015. SEDAR-PW-07. SEDAR Procedural Workshop 7: Data Best Practices. SEDAR, North Charleston, SC. 151 pp. Available online at: <http://sedarweb.org/pw-07>

Table 1. Annual landings (AB1) and discards (B2) of Red Snapper in numbers of fish by state and year (MRIP, LACreel 2014+, TPWD).

Year	TX		LA		MS		AL		FLW		Total	
	AB1	B2	AB1	B2	AB1	B2	AB1	B2	AB1	B2	AB1	B2
1981	69,528	3,668	2,623,149	23,485	0	0	1,703,863	84,367	830,518	172,187	5,227,057	283,706
1982	69,528	516	1,464,280	18,223	43,449	5,693	333,800	173	509,592	20,521	2,420,649	45,126
1983	71,769	77	3,335,193	1,646	23,098	0	1,429,454	4,470	1,176,080	0	6,035,594	6,193
1984	36,125	4,004	813,175	0	1,274	0	458,299	0	228,569	94,398	1,537,442	98,402
1985	100,690	10,869	911,124	86,825	2,032	0	694,566	0	478,885	47,600	2,187,298	145,294
1986	132,810	3,753	410,996	2,353	364	0	339,833	15,095	671,615	34,574	1,555,618	55,775
1987	47,438	8,937	165,719	27,174	47,978	29,720	344,273	64,423	665,940	66,998	1,271,348	197,253
1988	53,576	34,768	244,148	152,146	15,794	2,443	323,422	2,956	440,028	104,327	1,076,967	296,639
1989	24,246	16,238	341,472	199,550	442,463	161,947	175,338	17,400	328,323	185,795	1,311,842	580,929
1990	24,932	26,609	152,653	196,564	145,948	337,501	230,390	468,455	157,984	68,476	711,907	1,097,606
1991	41,121	36,103	144,629	165,788	181,451	345,240	690,435	1,280,727	141,709	235,862	1,199,345	2,063,720
1992	34,634	25,024	374,654	293,135	402,749	606,824	1,106,323	721,945	271,925	385,512	2,190,285	2,032,439
1993	46,376	25,702	688,787	372,657	529,362	654,791	902,991	725,703	838,410	566,446	3,005,926	2,345,299
1994	87,188	96,877	415,630	459,325	116,008	165,850	806,957	794,273	452,525	292,583	1,878,308	1,808,909
1995	97,372	123,283	616,464	779,408	121,037	9,908	589,354	367,666	236,771	264,171	1,660,999	1,544,435
1996	85,739	41,598	258,417	160,373	111,082	259,741	484,302	766,326	371,442	511,067	1,310,981	1,739,105
1997	80,182	40,318	309,287	170,855	167,036	486,525	740,040	1,284,461	456,230	1,371,850	1,752,775	3,354,010
1998	66,111	47,925	511,348	368,700	98,665	224,121	508,543	742,451	835,751	891,904	2,020,418	2,275,100
1999	54,041	141,384	215,068	529,781	73,234	122,815	653,486	1,166,345	1,219,113	2,305,058	2,214,942	4,265,384
2000	52,714	53,190	184,195	196,203	18,463	105,314	450,908	1,524,209	774,246	1,505,548	1,480,526	3,384,465
2001	48,606	49,290	87,846	94,692	39,848	112,882	505,541	1,800,383	1,244,856	3,039,519	1,926,698	5,096,766
2002	52,897	78,920	64,752	75,010	89,070	382,963	910,163	2,442,990	1,437,107	4,161,911	2,553,988	7,141,795
2003	38,350	154,418	80,644	191,857	81,698	177,997	544,079	1,152,369	1,193,206	3,600,011	1,937,978	5,276,653
2004	40,770	297,934	90,889	320,986	32,240	174,835	564,210	1,182,620	1,576,053	3,854,517	2,304,161	5,830,893
2005	56,095	193,960	118,280	366,620	2,852	160,666	435,518	1,690,009	929,645	2,880,078	1,542,390	5,291,333
2006	62,716	190,608	209,223	580,771	16,822	146,623	261,046	1,458,563	1,125,449	3,444,119	1,675,256	5,820,683
2007	47,170	93,450	202,918	401,912	6,391	31,295	365,610	1,868,379	1,672,362	4,526,897	2,294,452	6,921,934
2008	37,320	136,032	100,394	363,969	32,254	390,745	272,770	1,146,844	867,394	3,361,619	1,310,132	5,399,209
2009	34,389	83,485	129,993	312,236	51,621	334,934	277,445	1,186,417	976,290	2,911,624	1,469,738	4,828,696
2010	30,069	117,514	12,189	12,371	916	119,900	241,141	1,266,569	866,993	3,399,611	1,151,308	4,915,965

Year	TX		LA		MS		AL		FLW		Total	
	AB1	B2	AB1	B2	AB1	B2	AB1	B2	AB1	B2	AB1	B2
2011	35,588	107,836	63,287	210,098	39,606	442	604,381	1,433,886	768,588	4,173,659	1,511,450	5,925,921
2012	34,193	48,361	153,064	216,051	109,457	10,007	402,654	548,906	816,223	3,686,490	1,515,591	4,509,814
2013	49,149	146,871	113,413	333,498	47,796	133,688	757,047	1,474,833	1,456,426	3,685,531	2,423,830	5,774,422
2014	39,972	61,447	128,131	214,947	13,230	127,499	363,951	2,018,352	560,227	2,059,155	1,105,511	4,481,400
2015	49,948	75,119	171,451	273,645	20,106	471,621	629,849	1,366,271	588,250	1,617,424	1,459,605	3,804,080
2016	29,169	13,557	144,691	67,969	91,279	333,041	646,380	2,834,432	796,664	3,482,373	1,708,183	6,731,372
2017	46,027	31,911	118,559	80,356	120,714	750,477	1,249,445	2,370,799	1,534,162	6,104,031	3,068,906	9,337,574
2018	54,422	37,751	101,081	72,231	100,908	245,652	824,374	1,720,000	1,179,665	4,187,889	2,260,450	6,263,523
2019	80,373	91,050	123,140	139,477	176,573	638,820	966,990	1,853,567	1,209,706	4,189,767	2,556,782	6,912,681

Table 2. Annual landings (AB1) and discards (B2) of Red Snapper in numbers of fish by mode and year (MRIP, LACreel 2014+, TPWD). Note that catch from the combined private-shore fishing mode in the LA Creel survey is added to the private mode.

Year	Cbt		Hbt		Priv		Total	
	AB1	B2	AB1	B2	AB1	B2	AB1	B2
1981	319,700	490	76,829	305	4,830,527	282,911	5,227,057	283,706
1982	688,130	21,431	273,441	6,222	1,459,078	17,473	2,420,649	45,126
1983	1,219,532	1,526	534,722	132	4,281,339	4,534	6,035,594	6,193
1984	621,380	7,386	183,963	4,615	732,099	86,402	1,537,442	98,402
1985	863,179	3,319	209,233	2,059	1,114,886	139,916	2,187,298	145,294
1986	646,154	27,019			909,464	28,756	1,555,618	55,775
1987	524,761	46,042			746,587	151,211	1,271,348	197,253
1988	379,197	66,119			697,771	230,520	1,076,967	296,639
1989	278,632	39,696			1,033,210	541,233	1,311,842	580,929
1990	171,965	144,761			539,942	952,845	711,907	1,097,606
1991	305,056	336,545			894,289	1,727,174	1,199,345	2,063,720
1992	478,176	430,550			1,712,109	1,601,889	2,190,285	2,032,439
1993	917,717	327,239			2,088,209	2,018,060	3,005,926	2,345,299
1994	430,757	381,205			1,447,551	1,427,704	1,878,308	1,808,909
1995	370,718	490,718			1,290,281	1,053,717	1,660,999	1,544,435
1996	480,603	577,291			830,378	1,161,814	1,310,981	1,739,105
1997	613,633	910,230			1,139,142	2,443,780	1,752,775	3,354,010
1998	985,664	728,052			1,034,753	1,547,049	2,020,418	2,275,100
1999	690,071	873,247			1,524,871	3,392,137	2,214,942	4,265,384
2000	397,250	514,990			1,083,276	2,869,476	1,480,526	3,384,465
2001	416,836	589,398			1,509,862	4,507,367	1,926,698	5,096,766
2002	611,118	592,844			1,942,871	6,548,951	2,553,988	7,141,795
2003	584,179	635,653			1,353,799	4,641,000	1,937,978	5,276,653
2004	614,028	792,854			1,690,133	5,038,040	2,304,161	5,830,893
2005	461,458	770,407			1,080,932	4,520,926	1,542,390	5,291,333
2006	494,425	1,023,214			1,180,830	4,797,469	1,675,256	5,820,683
2007	540,913	812,945			1,753,539	6,108,989	2,294,452	6,921,934
2008	294,139	570,791			1,015,993	4,828,417	1,310,132	5,399,209
2009	236,536	526,636			1,233,202	4,302,060	1,469,738	4,828,696
2010	80,901	253,537			1,070,407	4,662,427	1,151,308	4,915,965
2011	163,881	385,278			1,347,569	5,540,643	1,511,450	5,925,921
2012	180,792	278,963			1,334,800	4,230,852	1,515,591	4,509,814
2013	186,056	441,854			2,237,774	5,332,568	2,423,830	5,774,422
2014	50,442	297,602			1,055,070	4,183,798	1,105,511	4,481,400
2015	241,713	291,333			1,217,892	3,512,748	1,459,605	3,804,080
2016	259,801	472,145			1,448,382	6,259,227	1,708,183	6,731,372
2017	295,673	707,867			2,773,233	8,629,708	3,068,906	9,337,574
2018	278,364	488,002			1,982,086	5,775,522	2,260,450	6,263,523
2019	328,852	556,278			2,227,930	6,356,403	2,556,782	6,912,681

Table 3. Red Snapper landings in numbers of fish (AB1) with associated coefficients of variation (CV; Dettloff et al. 2020) by mode and year (MRIP only). Table does not include any MRIP catch estimates imputed by the SEFSC for 1981 wave1 or adjustments to the Alabama for-hire estimates for 1981 wave-2. Sample size is provided both as the total number of primary sampling units (PSU) and angler trips (Trp) intercepted by MRIP samplers within a specified strata and, in parentheses, the number of PSUs and angler trips that intercepted Red Snapper.

Year	Cbt				Hbt				Priv			
	AB1	CV	PSU	Trp	AB1	CV	PSU	Trp	AB1	CV	PSU	Trp
1981	1,642,314	0.70	85 (22)	706 (61)	909,276	0.79	76 (22)	691 (61)	3,888,578	0.44	243 (19)	1,973 (36)
1982	682,022	0.46	88 (25)	673 (115)	273,441	0.40	76 (25)	658 (115)	1,395,657	0.45	509 (41)	4,151 (66)
1983	1,208,869	0.23	149 (66)	1,626 (371)	534,722	0.28	123 (66)	1,626 (371)	4,220,233	0.32	222 (32)	1,822 (50)
1984	620,763	0.29	157 (52)	1,841 (174)	183,963	0.29	116 (52)	1,776 (174)	696,591	0.35	231 (21)	2,301 (29)
1985	856,137	0.44	110 (32)	1,380 (137)	209,233	0.32	89 (32)	1,354 (137)	1,021,238	0.38	304 (16)	2,792 (28)
1986	641,023	0.18	335 (114)	2,601 (331)					781,785	0.31	1,171 (42)	9,597 (62)
1987	514,903	0.22	298 (98)	2,421 (167)					709,007	0.23	1,168 (66)	8,951 (90)
1988	378,460	0.31	298 (77)	1,952 (143)					644,932	0.32	1,200 (34)	9,343 (49)
1989	277,524	0.26	236 (52)	1,510 (106)					1,010,072	0.46	783 (35)	6,304 (44)
1990	171,954	0.29	161 (39)	1,145 (77)					515,021	0.31	644 (30)	5,485 (51)
1991	304,382	0.17	245 (100)	1,778 (189)					853,842	0.23	733 (43)	6,203 (67)
1992	477,807	0.15	434 (199)	3,243 (332)					1,677,844	0.17	1,359 (105)	14,523 (161)
1993	910,743	0.31	248 (93)	1,825 (208)					2,048,807	0.18	1,051 (77)	10,676 (111)
1994	420,330	0.19	252 (89)	1,909 (193)					1,370,790	0.22	1,008 (58)	12,644 (100)
1995	363,081	0.24	241 (52)	1,739 (123)					1,200,546	0.29	867 (48)	10,945 (87)
1996	473,620	0.28	281 (71)	1,966 (140)					751,622	0.18	1,209 (63)	14,014 (89)
1997	606,859	0.14	526 (167)	3,193 (304)					1,065,734	0.18	1,134 (71)	14,027 (115)
1998	974,200	0.10	839 (238)	6,273 (435)					980,106	0.25	1,257 (59)	16,086 (82)
1999	680,961	0.10	1,183 (333)	10,759 (681)					1,479,940	0.21	1,754 (98)	20,494 (222)
2000	388,972	0.08	1,256 (296)	13,504 (783)					1,038,840	0.19	1,529 (72)	16,890 (152)
2001	403,657	0.09	991 (236)	11,553 (548)					1,474,435	0.21	1,399 (63)	18,399 (163)
2002	595,100	0.09	1,001 (237)	11,563 (591)					1,905,992	0.20	1,508 (67)	19,901 (179)
2003	578,111	0.08	1,081 (266)	12,309 (649)					1,321,517	0.19	1,629 (67)	19,054 (185)
2004	604,641	0.09	1,006 (275)	12,218 (825)					1,658,750	0.27	1,387 (83)	17,869 (176)
2005	451,598	0.10	808 (253)	10,092 (711)					1,034,697	0.22	1,233 (58)	16,060 (144)
2006	484,203	0.10	661 (230)	7,925 (570)					1,128,336	0.18	1,528 (92)	18,039 (150)
2007	529,303	0.10	760 (209)	8,161 (578)					1,717,979	0.20	1,516 (91)	18,385 (204)
2008	287,711	0.11	755 (163)	7,509 (361)					985,101	0.16	1,691 (68)	19,207 (170)
2009	230,837	0.15	651 (75)	6,307 (199)					1,204,512	0.19	1,673 (65)	19,690 (186)
2010	73,227	0.17	651 (67)	6,442 (203)					1,048,012	0.31	1,663 (31)	18,160 (97)

Year	Cbt				Hbt				Priv			
	AB1	CV	PSU	Trp	AB1	CV	PSU	Trp	AB1	CV	PSU	Trp
2011	157,768	0.19	798 (45)	8,104 (158)					1,318,094	0.19	1,765 (50)	18,615 (166)
2012	175,817	0.16	878 (66)	9,153 (216)					1,305,582	0.20	1,919 (48)	19,939 (177)
2013	180,951	0.33	462 (28)	3,834 (95)					2,193,730	0.30	1,674 (78)	16,838 (310)
2014	39,171	0.25	625 (34)	5,975 (96)					898,238	0.21	1,517 (60)	16,300 (263)
2015	212,984	0.22	681 (62)	5,702 (240)					1,025,222	0.23	1,591 (69)	16,061 (264)
2016	226,081	0.21	695 (76)	5,241 (266)					1,308,242	0.14	1,626 (130)	15,890 (418)
2017	258,798	0.24	590 (68)	4,889 (218)					2,645,522	0.19	1,293 (123)	13,432 (519)
2018	252,592	0.21	596 (73)	5,069 (270)					1,852,355	0.23	1,223 (74)	11,286 (313)
2019	300,071	0.26	572 (87)	4,486 (275)					2,053,198	0.19	1,244 (93)	11,421 (445)

Table 4. Red Snapper discards in numbers of fish (B2) with associated coefficients of variation (CV; Dettloff et al. 2020) by mode and year (MRIP only). Table does not include any MRIP catch estimates imputed by the SEFSC for 1981 wave1 or adjustments to the Alabama for-hire estimates for 1981 wave-2. Sample size is provided both as the total number of primary sampling units (PSU) and angler trips (Trp) intercepted by MRIP samplers within a specified strata and, in parentheses, the number of PSUs and angler trips that intercepted Red Snapper.

Year	Cbt				Hbt				Priv			
	B2	CV	PSU	Trp	B2	CV	PSU	Trp	B2	CV	PSU	Trp
1981	427	0.71	85 (2)	706 (2)	267	0.71	76 (2)	691 (2)	163,072	0.56	243 (8)	1,973 (13)
1982	21,135	0.72	88 (4)	673 (4)	6,222	0.80	76 (4)	658 (4)	17,252	0.56	509 (5)	4,151 (7)
1983	1,513	0.73	149 (3)	1,626 (3)	132	0.73	123 (3)	1,626 (3)	4,470	1.00	222 (1)	1,822 (1)
1984	7,378	0.71	157 (2)	1,841 (2)	4,615	0.71	116 (2)	1,776 (2)	82,405	0.79	231 (2)	2,301 (2)
1985	3,292	0.76	110 (2)	1,380 (3)	2,059	0.76	89 (2)	1,354 (3)	129,074	0.70	304 (5)	2,792 (7)
1986	26,806	0.34	335 (27)	2,601 (50)					25,216	0.56	1,171 (5)	9,597 (7)
1987	45,766	0.37	298 (18)	2,421 (58)					142,550	0.34	1,168 (20)	8,951 (26)
1988	66,060	0.84	298 (16)	1,952 (45)					195,812	0.38	1,200 (17)	9,343 (26)
1989	39,615	0.41	236 (12)	1,510 (24)					525,076	0.45	783 (12)	6,304 (22)
1990	144,736	0.37	161 (21)	1,145 (63)					926,260	0.50	644 (21)	5,485 (44)
1991	335,725	0.22	245 (73)	1,778 (374)					1,691,892	0.27	733 (45)	6,203 (95)

Year	Cbt				Hbt				Priv			
	B2	CV	PSU	Trp	B2	CV	PSU	Trp	B2	CV	PSU	Trp
1992	430,214	0.18	434 (158)	3,243 (734)					1,577,201	0.15	1,359 (106)	14,523 (235)
1993	321,507	0.37	248 (60)	1,825 (253)					1,998,091	0.20	1,051 (65)	10,676 (136)
1994	361,586	0.20	252 (64)	1,909 (357)					1,350,446	0.22	1,008 (50)	12,644 (129)
1995	481,486	0.37	241 (47)	1,739 (293)					939,666	0.34	867 (29)	10,945 (66)
1996	566,193	0.26	281 (64)	1,966 (392)					1,131,315	0.24	1,209 (58)	14,014 (133)
1997	904,125	0.24	526 (155)	3,193 (612)					2,409,567	0.24	1,134 (68)	14,027 (228)
1998	722,865	0.11	839 (260)	6,273 (1,352)					1,504,310	0.21	1,257 (72)	16,086 (212)
1999	871,182	0.09	1,183 (356)	10,759 (2,572)					3,252,818	0.19	1,754 (114)	20,494 (343)
2000	510,952	0.08	1,256 (346)	13,504 (2,621)					2,820,323	0.21	1,529 (96)	16,890 (277)
2001	579,075	0.10	991 (269)	11,553 (2,063)					4,468,401	0.19	1,399 (95)	18,399 (374)
2002	581,750	0.09	1,001 (303)	11,563 (2,740)					6,481,125	0.21	1,508 (99)	19,901 (444)
2003	629,264	0.09	1,081 (316)	12,309 (2,998)					4,492,970	0.19	1,629 (84)	19,054 (378)
2004	772,378	0.10	1,006 (335)	12,218 (3,528)					4,760,581	0.18	1,387 (107)	17,869 (414)
2005	744,227	0.11	808 (286)	10,092 (3,108)					4,353,146	0.17	1,233 (87)	16,060 (347)
2006	1,001,447	0.10	661 (288)	7,925 (2,936)					4,628,628	0.15	1,528 (133)	18,039 (441)
2007	790,257	0.10	760 (251)	8,161 (2,813)					6,038,227	0.15	1,516 (129)	18,385 (553)
2008	553,542	0.11	755 (205)	7,509 (1,813)					4,709,635	0.19	1,691 (101)	19,207 (463)
2009	520,213	0.12	651 (161)	6,307 (1,441)					4,224,998	0.15	1,673 (108)	19,690 (476)
2010	231,571	0.15	651 (163)	6,442 (1,298)					4,566,879	0.19	1,663 (87)	18,160 (336)
2011	380,957	0.12	798 (208)	8,104 (1,976)					5,437,128	0.30	1,765 (107)	18,615 (409)
2012	275,528	0.11	878 (226)	9,153 (1,822)					4,185,925	0.15	1,919 (116)	19,939 (530)
2013	434,754	0.20	462 (98)	3,834 (572)					5,192,797	0.28	1,674 (147)	16,838 (593)
2014	290,627	0.16	625 (119)	5,975 (824)					3,914,379	0.21	1,517 (158)	16,300 (647)
2015	273,552	0.15	681 (140)	5,702 (688)					3,181,764	0.19	1,591 (156)	16,061 (473)
2016	459,090	0.18	695 (158)	5,241 (802)					6,190,756	0.17	1,626 (224)	15,890 (753)
2017	697,946	0.23	590 (141)	4,889 (816)					8,527,361	0.17	1,293 (204)	13,432 (944)
2018	481,058	0.14	596 (145)	5,069 (863)					5,672,484	0.17	1,223 (163)	11,286 (644)
2019	522,318	0.24	572 (157)	4,486 (809)					6,159,836	0.16	1,244 (176)	11,421 (828)

Table 5. Total Red Snapper landings (AB1) and discards (B2), in numbers of fish, with associated coefficients of variation (CV; Dettloff et al. 2020) by year (MRIP only). Table does not include any MRIP catch estimates imputed by the SEFSC for 1981 wave1 or adjustments to the Alabama for-hire estimates for 1981 wave-2. Sample size is provided both as the total number of primary sampling units (PSU) and angler trips (Trp) intercepted by MRIP samplers within a specified strata and, in parentheses, the number of PSUs and angler trips that intercepted Red Snapper.

Year	AB1				B2			
	Total	CV	PSU	Trp	Total	CV	PSU	Trp
1981	6,440,167	0.34	328 (41)	2,679 (97)	163,766	0.55	328 (10)	2,679 (15)
1982	2,351,121	0.32	597 (66)	4,824 (181)	44,609	0.48	597 (9)	4,824 (11)
1983	5,963,825	0.23	371 (98)	3,448 (421)	6,116	0.75	371 (4)	3,448 (4)
1984	1,501,317	0.18	388 (73)	4,142 (203)	94,398	0.69	388 (4)	4,142 (4)
1985	2,086,608	0.27	414 (48)	4,172 (165)	134,425	0.67	414 (7)	4,172 (10)
1986	1,422,808	0.18	1,506 (156)	12,198 (393)	52,022	0.32	1,506 (32)	12,198 (57)
1987	1,223,910	0.15	1,466 (164)	11,372 (257)	188,316	0.27	1,466 (38)	11,372 (84)
1988	1,023,391	0.23	1,498 (111)	11,295 (192)	261,872	0.35	1,498 (33)	11,295 (71)
1989	1,287,596	0.37	1,019 (87)	7,814 (150)	564,692	0.42	1,019 (24)	7,814 (46)
1990	686,975	0.24	805 (69)	6,630 (128)	1,070,997	0.44	805 (42)	6,630 (107)
1991	1,158,224	0.16	978 (143)	7,981 (256)	2,027,616	0.22	978 (118)	7,981 (469)
1992	2,155,651	0.12	1,793 (304)	17,766 (493)	2,007,415	0.12	1,793 (264)	17,766 (969)
1993	2,959,550	0.15	1,299 (170)	12,501 (319)	2,319,597	0.17	1,299 (125)	12,501 (389)
1994	1,791,120	0.16	1,260 (147)	14,553 (293)	1,712,032	0.18	1,260 (114)	14,553 (486)
1995	1,563,627	0.22	1,108 (100)	12,684 (210)	1,421,152	0.25	1,108 (76)	12,684 (359)
1996	1,225,242	0.15	1,490 (134)	15,980 (229)	1,697,508	0.17	1,490 (122)	15,980 (525)
1997	1,672,593	0.12	1,660 (238)	17,220 (419)	3,313,692	0.18	1,660 (223)	17,220 (840)
1998	1,954,307	0.13	2,096 (297)	22,359 (517)	2,227,176	0.14	2,096 (332)	22,359 (1,564)
1999	2,160,901	0.14	2,937 (431)	31,253 (903)	4,124,000	0.15	2,937 (470)	31,253 (2,915)
2000	1,427,812	0.13	2,785 (368)	30,387 (935)	3,331,275	0.18	2,785 (442)	30,387 (2,898)
2001	1,878,092	0.17	2,390 (299)	29,952 (711)	5,047,476	0.16	2,390 (364)	29,952 (2,437)
2002	2,501,091	0.15	2,509 (304)	31,464 (770)	7,062,875	0.19	2,509 (402)	31,464 (3,184)
2003	1,899,628	0.13	2,710 (333)	31,363 (834)	5,122,234	0.17	2,710 (400)	31,363 (3,376)
2004	2,263,391	0.19	2,393 (358)	30,087 (1,001)	5,532,959	0.16	2,393 (442)	30,087 (3,942)
2005	1,486,295	0.15	2,041 (311)	26,152 (855)	5,097,373	0.13	2,041 (373)	26,152 (3,455)
2006	1,612,540	0.12	2,189 (322)	25,964 (720)	5,630,076	0.12	2,189 (421)	25,964 (3,377)
2007	2,247,282	0.15	2,276 (300)	26,546 (782)	6,828,484	0.13	2,276 (380)	26,546 (3,366)
2008	1,272,812	0.12	2,446 (231)	26,716 (531)	5,263,177	0.17	2,446 (306)	26,716 (2,276)
2009	1,435,349	0.15	2,324 (140)	25,997 (385)	4,745,211	0.13	2,324 (269)	25,997 (1,917)
2010	1,121,239	0.28	2,314 (98)	24,602 (300)	4,798,450	0.18	2,314 (250)	24,602 (1,634)
2011	1,475,862	0.16	2,563 (95)	26,719 (324)	5,818,085	0.27	2,563 (315)	26,719 (2,385)
2012	1,481,398	0.16	2,797 (114)	29,092 (393)	4,461,454	0.14	2,797 (342)	29,092 (2,352)
2013	2,374,681	0.26	2,136 (106)	20,672 (405)	5,627,551	0.25	2,136 (245)	20,672 (1,165)
2014	937,408	0.19	2,142 (94)	22,275 (359)	4,205,006	0.20	2,142 (277)	22,275 (1,471)
2015	1,238,206	0.18	2,272 (131)	21,763 (504)	3,455,315	0.17	2,272 (296)	21,763 (1,161)
2016	1,534,323	0.11	2,321 (206)	21,131 (684)	6,649,846	0.15	2,321 (382)	21,131 (1,555)
2017	2,904,320	0.16	1,883 (191)	18,321 (737)	9,225,307	0.15	1,883 (345)	18,321 (1,760)
2018	2,104,947	0.19	1,819 (147)	16,355 (583)	6,153,541	0.15	1,819 (308)	16,355 (1,507)

Year	AB1				B2			
	Total	CV	PSU	Trp	Total	CV	PSU	Trp
2019	2,353,269	0.16	1,816 (180)	15,907 (720)	6,682,154	0.15	1,816 (333)	15,907 (1,637)

Table 6. *Estimated landings of Red Snapper in pounds whole weight by state and year (MRIP, LACreel 2014+, TPWD). Average weight estimates are calculated by strata using the following hierarchy: species, region, year, state, mode, wave, and area (Matter and Rios 2013). The minimum number of weights used at each level of substitution is fifteen fish, except for the final species level where the minimum is one fish (Dettloff and Matter 2019b).*

Year	TX	LA	MS	AL	FLW	Total
1981	97,114	6,682,124	0	3,032,241	1,451,501	11,262,980
1982	97,114	3,294,189	105,689	393,964	1,055,517	4,946,473
1983	91,286	5,609,216	42,558	2,196,571	2,336,836	10,276,466
1984	73,885	2,663,725	3,944	696,826	496,499	3,934,880
1985	126,172	4,209,475	3,820	1,559,620	1,394,796	7,293,883
1986	185,602	1,017,409	965	1,181,505	2,451,068	4,836,549
1987	86,738	265,431	108,687	791,879	2,031,704	3,284,439
1988	85,920	509,032	20,148	843,749	1,446,460	2,905,308
1989	37,262	1,238,145	1,522,277	401,331	868,920	4,067,934
1990	40,850	235,252	294,283	573,449	865,949	2,009,784
1991	79,608	561,832	419,443	2,183,392	426,072	3,670,348
1992	81,567	1,200,683	1,153,168	3,424,794	701,946	6,562,158
1993	141,907	2,940,913	2,817,455	3,049,881	2,601,500	11,551,656
1994	250,452	2,085,223	456,473	2,979,359	2,409,654	8,181,161
1995	318,937	3,364,216	302,111	2,446,893	824,647	7,256,805
1996	314,941	1,464,818	378,842	2,076,409	1,344,550	5,579,561
1997	287,761	1,562,246	781,442	3,837,954	1,903,362	8,372,765
1998	268,558	4,503,974	455,944	2,283,653	3,173,289	10,685,418
1999	199,606	1,515,261	473,565	5,156,261	4,071,201	11,415,895
2000	174,535	1,655,392	112,267	2,855,505	2,651,051	7,448,751
2001	152,580	526,529	223,279	4,048,218	5,737,012	10,687,617
2002	190,502	392,447	628,471	5,629,588	5,416,176	12,257,184
2003	129,482	425,224	492,190	3,900,959	4,142,574	9,090,429
2004	129,022	382,301	198,329	2,729,683	5,084,261	8,523,595
2005	203,963	523,981	9,781	2,181,582	3,442,867	6,362,174
2006	207,075	679,669	56,909	1,126,207	3,571,808	5,641,668
2007	172,783	758,218	20,856	1,420,730	5,171,197	7,543,784
2008	178,728	478,442	131,760	1,295,688	3,682,012	5,766,631
2009	196,790	819,255	238,393	1,685,597	3,846,483	6,786,518
2010	181,112	67,373	5,062	1,543,611	4,199,759	5,996,917
2011	196,233	546,217	191,195	4,707,094	4,108,874	9,749,613
2012	180,832	1,066,597	1,398,887	3,690,479	5,135,985	11,472,780
2013	257,106	832,290	627,300	6,824,582	8,171,912	16,713,192
2014	208,885	1,130,286	97,412	2,981,595	3,329,504	7,747,683
2015	257,130	1,402,701	99,929	4,868,143	3,137,086	9,764,988
2016	162,971	1,250,234	665,080	4,904,515	4,129,949	11,112,750
2017	282,894	944,474	846,768	9,431,372	7,520,718	19,026,225
2018	342,497	923,225	605,865	6,359,084	5,618,750	13,849,422
2019	473,154	1,011,578	1,052,214	5,948,160	6,255,220	14,740,326

Table 7. Red Snapper landings in pounds whole weight (LBS) with associated coefficients of variation (CV; Approach 1 described in Nuttall and Dettloff 2022) by mode and year (MRIP only). Table does not include any MRIP catch estimates imputed by the SEFSC for 1981 wave1 or adjustments to the Alabama for-hire estimates for 1981 wave-2.

Year	Cbt		Hbt		Priv		Total	
	LBS	CV	LBS	CV	LBS	CV	LBS	CV
1981	3,233,825	0.36	2,177,130	0.41	8,560,852	0.45	13,971,807	0.31
1982	1,171,467	0.42	337,133	0.31	3,340,760	0.47	4,849,359	0.35
1983	2,192,914	0.16	1,076,622	0.25	6,915,645	0.31	10,185,181	0.22
1984	2,186,141	0.16	448,787	0.30	1,226,067	0.34	3,860,995	0.15
1985	4,307,873	0.51	448,496	0.29	2,411,342	0.39	7,167,711	0.34
1986	2,244,621	0.17			2,406,326	0.35	4,650,948	0.20
1987	1,513,731	0.21			1,683,970	0.20	3,197,701	0.15
1988	1,159,253	0.29			1,660,135	0.32	2,819,388	0.22
1989	758,298	0.22			3,272,375	0.48	4,030,673	0.39
1990	841,844	0.42			1,127,090	0.27	1,968,934	0.24
1991	998,043	0.16			2,592,697	0.20	3,590,740	0.15
1992	1,514,053	0.12			4,966,538	0.15	6,480,591	0.12
1993	3,107,254	0.28			8,302,495	0.17	11,409,749	0.15
1994	1,739,851	0.16			6,190,859	0.24	7,930,709	0.19
1995	1,293,865	0.24			5,644,003	0.33	6,937,868	0.27
1996	2,160,608	0.25			3,104,012	0.16	5,264,620	0.14
1997	3,077,539	0.12			5,007,466	0.18	8,085,004	0.12
1998	4,130,626	0.08			6,286,235	0.39	10,416,860	0.24
1999	3,173,963	0.09			8,042,325	0.16	11,216,288	0.12
2000	1,836,879	0.06			5,437,337	0.17	7,274,216	0.13
2001	1,878,290	0.07			8,656,747	0.22	10,535,037	0.18
2002	2,799,931	0.06			9,266,752	0.19	12,066,682	0.15
2003	2,816,828	0.06			6,144,119	0.17	8,960,947	0.12
2004	2,137,060	0.06			6,257,514	0.24	8,394,573	0.18
2005	1,648,121	0.08			4,510,090	0.18	6,158,211	0.14
2006	1,608,221	0.07			3,826,373	0.16	5,434,593	0.12
2007	1,702,967	0.07			5,668,034	0.16	7,371,001	0.12
2008	1,159,543	0.08			4,428,359	0.16	5,587,902	0.13
2009	1,283,871	0.11			5,305,857	0.16	6,589,728	0.13
2010	402,356	0.11			5,413,449	0.30	5,815,805	0.28
2011	998,017	0.13			8,555,363	0.18	9,553,380	0.16
2012	1,265,231	0.13			10,026,717	0.19	11,291,948	0.17
2013	1,298,143	0.19			15,157,942	0.17	16,456,085	0.16
2014	254,177	0.23			6,154,335	0.19	6,408,512	0.18
2015	1,379,557	0.18			6,725,601	0.21	8,105,158	0.17
2016	1,712,017	0.17			7,987,528	0.13	9,699,545	0.11
2017	1,589,921	0.18			16,208,936	0.15	17,798,857	0.14
2018	1,584,356	0.17			10,999,343	0.19	12,583,699	0.17
2019	1,775,554	0.19			11,480,040	0.15	13,255,594	0.13

Table 8. Summary of length measurements (millimeters fork length) from MRIP-intercepted Red Snapper by state and year. Summaries include the number of fish measured by MRIP and, in parentheses, the number of angler trips from which those fish were measured (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish lengths. LA lengths are available from MRIP only until 2013.

Year	LA					MS					AL					FLW				
	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max
1981	208 (35)	200	386	135	730	0 (0)	0	0	0	0	208 (22)	184	347	61	520	145 (40)	210	335	94	760
1982	329 (52)	100	322	99	720	26 (5)	197	355	118	654	359 (72)	150	363	100	480	178 (52)	23	354	105	810
1983	1,287 (177)	170	314	73	1,070	5 (1)	370	444	138	690	675 (127)	150	355	88	558	332 (116)	204	364	106	890
1984	595 (100)	215	418	133	1,010	1 (1)	610	610	0	610	265 (59)	190	348	78	595	99 (41)	190	356	84	565
1985	183 (32)	233	345	105	750	1 (1)	220	220	0	220	390 (91)	190	368	69	715	74 (41)	190	400	113	675
1986	731 (93)	160	330	89	800	21 (6)	225	329	69	499	233 (37)	225	373	98	781	778 (257)	311	442	89	783
1987	355 (31)	204	332	76	728	25 (4)	220	350	111	610	547 (68)	225	363	86	830	626 (154)	200	397	105	730
1988	139 (19)	260	372	102	762	82 (15)	181	301	50	435	482 (67)	229	361	68	699	304 (91)	220	418	83	675
1989	115 (26)	242	396	108	752	49 (10)	264	359	89	691	415 (74)	276	386	84	826	131 (40)	228	399	99	676
1990	149 (31)	246	342	52	592	78 (14)	300	354	47	555	293 (53)	250	373	81	740	87 (30)	235	399	119	660
1991	485 (54)	280	391	113	850	115 (16)	300	379	62	672	1,130 (138)	270	380	65	761	146 (48)	281	375	62	687
1992	683 (91)	251	388	99	818	778 (100)	290	403	77	775	2,302 (242)	200	377	66	772	373 (60)	263	367	60	737
1993	325 (53)	295	402	103	780	281 (41)	305	432	94	715	828 (122)	244	387	73	770	533 (103)	260	386	54	644
1994	358 (60)	304	446	108	823	164 (33)	340	464	98	805	806 (125)	226	421	85	845	306 (75)	290	415	83	735
1995	336 (50)	331	438	102	770	53 (13)	343	420	75	699	602 (122)	275	423	81	748	106 (25)	318	406	66	725
1996	261 (37)	320	454	88	741	119 (19)	341	423	78	734	574 (121)	208	462	96	916	193 (52)	331	437	91	741
1997	251 (50)	301	481	88	790	162 (35)	350	476	105	813	1,118 (156)	200	434	83	760	1,242 (178)	273	389	62	815
1998	339 (40)	340	474	99	757	105 (20)	335	468	101	773	1,855 (156)	268	417	67	788	2,587 (301)	265	407	56	773
1999	229 (41)	355	526	111	883	246 (43)	310	518	96	897	4,456 (311)	271	446	74	950	5,088 (508)	183	423	61	873
2000	226 (44)	375	525	117	883	95 (15)	347	475	83	800	3,440 (235)	295	444	72	830	6,528 (640)	240	417	55	882
2001	71 (23)	358	505	107	779	110 (11)	346	453	121	912	3,436 (228)	295	464	85	857	4,578 (449)	253	424	62	897
2002	330 (44)	358	504	110	790	226 (23)	334	470	103	802	3,623 (212)	300	448	73	884	5,730 (491)	300	423	58	911
2003	445 (47)	341	485	110	804	125 (33)	351	500	157	993	2,854 (195)	306	459	84	886	5,587 (559)	295	422	55	864
2004	468 (45)	349	437	91	770	34 (5)	366	527	102	869	2,230 (173)	309	451	83	918	6,118 (778)	301	429	59	840
2005	411 (67)	340	458	114	794	1 (1)	393	393	0	393	1,831 (152)	312	445	76	854	5,220 (635)	308	426	62	817
2006	818 (79)	343	437	84	844	25 (4)	372	431	53	562	1,282 (102)	288	439	78	841	4,507 (535)	240	418	57	810
2007	746 (72)	340	438	61	772	8 (2)	371	481	82	609	1,239 (121)	257	443	76	852	5,237 (587)	304	420	48	815
2008	190 (38)	377	494	76	762	12 (4)	365	446	66	609	506 (76)	357	461	73	778	2,778 (413)	316	453	64	800
2009	224 (46)	394	539	69	722	40 (8)	376	470	99	743	583 (91)	370	517	80	855	1,297 (240)	335	483	86	790
2010	6 (2)	516	555	48	647	13 (2)	392	528	83	628	308 (38)	380	555	88	842	1,597 (258)	303	493	83	850
2011	76 (16)	463	607	60	693	16 (6)	392	488	92	679	523 (84)	289	576	90	862	1,394 (218)	360	511	81	818

Year	LA					MS					AL					FLW				
	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max
2012	205 (40)	407	596	86	830	17 (2)	479	675	83	751	568 (102)	380	605	100	855	1,576 (249)	222	524	89	819
2013	245 (48)	386	561	95	958	81 (13)	364	633	149	889	773 (160)	290	602	110	828	765 (184)	364	508	97	841
2014						44 (6)	397	563	97	755	648 (116)	358	576	118	821	952 (237)	362	508	99	796
2015						89 (34)	364	562	133	849	1,045 (231)	227	571	119	866	1,183 (239)	313	501	94	868
2016						276 (86)	373	564	103	825	1,168 (263)	362	571	117	905	1,495 (335)	278	517	104	926
2017						371 (82)	391	541	94	941	1,350 (325)	298	556	119	830	1,294 (330)	214	482	94	832
2018						376 (77)	288	512	101	815	1,372 (285)	296	562	111	880	1,080 (221)	363	497	86	834
2019						484 (86)	360	520	113	895	1,993 (409)	335	535	112	888	1,079 (225)	322	508	86	857

Table 9. Summary of weight measurements (pounds whole weight) from MRIP-intercepted Red Snapper by state and year. Summaries include the number of fish weighed by MRIP and, in parentheses, the number of angler trips from which those fish were weighed (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish weights. LA weights are available from MRIP only until 2013.

Year	LA					MS					AL					FLW				
	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max
1981	208 (35)	0.4	3.1	3.0	15.4	0 (0)	0.0	0.0	0.0	0.0	208 (22)	0.2	2.9	4.0	22.0	145 (40)	0.2	1.9	2.0	11.0
1982	329 (52)	0.2	1.6	2.1	15.7	26 (5)	0.2	2.4	2.5	9.8	359 (72)	0.2	2.1	1.2	4.4	178 (52)	0.2	2.2	2.1	11.5
1983	1,287 (177)	0.2	2.0	2.7	51.6	5 (1)	2.0	4.1	4.5	12.1	675 (127)	0.2	1.8	1.4	5.7	332 (116)	0.2	2.2	3.3	27.4
1984	595 (100)	0.2	4.7	6.2	50.0	1 (1)	6.6	6.6	0.0	6.6	265 (59)	0.2	1.9	1.7	9.5	99 (41)	0.2	2.1	1.4	8.0
1985	183 (32)	0.7	3.0	3.7	19.7	1 (1)	0.4	0.4	0.0	0.4	390 (91)	0.2	2.2	1.8	16.6	74 (41)	0.2	3.1	2.2	9.8
1986	731 (93)	0.2	2.0	2.7	27.9	3 (3)	0.6	1.0	0.5	1.6	222 (36)	0.4	2.6	2.9	20.1	778 (257)	1.1	3.8	3.0	22.2
1987	355 (31)	0.4	2.3	2.9	22.9	25 (4)	0.4	2.3	2.6	9.6	536 (67)	0.2	2.3	2.4	26.1	626 (154)	0.4	3.4	3.0	19.2
1988	5 (1)	1.1	1.9	1.4	4.4	21 (5)	0.3	1.3	0.7	2.8	38 (7)	0.7	2.6	2.6	10.8	154 (44)	0.7	3.3	1.9	7.7
1989	115 (26)	0.7	3.5	3.2	17.3	39 (9)	0.9	3.4	4.5	22.7	412 (73)	0.9	2.6	2.8	22.5	131 (40)	0.5	3.8	4.2	21.0
1990	149 (31)	0.7	2.5	1.7	12.9	78 (14)	1.1	2.0	1.1	7.6	293 (53)	0.7	2.9	2.7	21.7	87 (30)	1.0	4.8	5.2	25.5
1991	485 (54)	1.1	4.0	5.0	35.2	100 (15)	1.0	2.6	1.5	10.4	1,123 (137)	0.8	3.2	2.4	30.6	146 (48)	0.9	2.7	1.8	15.0
1992	563 (77)	0.7	3.7	4.1	29.9	467 (65)	1.1	3.1	2.3	22.3	1,914 (207)	0.4	3.5	2.7	38.0	373 (60)	0.9	2.7	1.9	21.9

Year	LA					MS					AL					FLW				
	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max
1993	325 (53)	0.9	3.9	3.4	18.6	281 (41)	0.9	4.3	3.0	15.5	815 (120)	0.6	3.6	2.7	27.0	533 (103)	0.9	3.5	1.9	17.3
1994	358 (60)	1.1	5.0	4.7	29.0	164 (33)	0.9	4.8	3.9	22.4	806 (125)	0.6	3.7	2.9	27.7	306 (75)	0.7	3.7	2.8	16.9
1995	336 (50)	1.4	4.8	4.0	21.2	53 (13)	1.5	3.4	2.4	14.3	602 (122)	1.0	3.7	2.9	21.8	106 (25)	1.5	3.2	1.8	15.2
1996	261 (37)	1.3	5.5	4.5	29.0	119 (19)	1.4	4.0	3.8	24.7	574 (121)	0.3	4.9	3.9	31.2	193 (52)	1.4	4.0	2.9	15.7
1997	251 (50)	1.8	5.9	3.9	23.8	162 (35)	1.7	5.4	4.7	23.7	1,118 (156)	1.4	5.9	4.1	43.9	1,242 (178)	0.9	4.8	3.6	40.5
1998	339 (40)	1.6	5.7	4.0	20.3	105 (20)	1.5	5.4	3.9	18.1	1,855 (156)	0.3	4.4	2.7	32.0	2,587 (301)	0.8	3.7	2.4	28.7
1999	229 (41)	1.9	7.3	5.7	34.3	209 (33)	1.3	6.3	4.2	27.9	4,456 (311)	2.0	8.2	5.1	52.5	5,088 (508)	0.2	3.5	2.0	34.4
2000	226 (44)	2.2	7.8	5.7	24.2	95 (15)	1.7	6.0	3.9	22.9	3,440 (235)	1.3	6.9	4.1	50.3	6,528 (640)	0.6	3.4	1.8	29.7
2001	71 (23)	1.9	6.8	4.9	22.3	110 (11)	2.6	5.8	4.9	26.5	3,436 (228)	1.6	6.7	4.4	36.1	4,578 (449)	0.7	3.4	1.9	29.4
2002	330 (44)	1.9	6.1	4.0	18.3	226 (23)	1.6	5.3	4.3	23.0	3,623 (212)	1.6	6.6	4.0	40.6	5,730 (491)	1.0	3.3	1.9	30.0
2003	445 (47)	1.5	6.4	5.0	29.2	125 (33)	1.7	6.1	7.0	39.9	2,854 (195)	1.8	7.4	4.8	41.1	5,587 (559)	1.1	3.3	1.7	25.9
2004	468 (45)	1.8	3.9	3.1	21.5	34 (5)	2.2	6.2	4.1	22.0	2,230 (173)	1.3	4.1	3.0	30.4	6,118 (778)	1.1	3.3	1.7	19.4
2005	411 (67)	1.5	4.7	4.3	20.9	1 (1)	2.2	2.2	0.0	2.2	1,831 (152)	1.3	3.9	2.5	23.8	5,220 (635)	1.3	3.2	1.8	22.1
2006	818 (79)	1.7	3.8	3.2	28.1	25 (4)	2.0	3.4	1.5	6.9	1,282 (102)	1.1	3.7	2.6	25.9	4,507 (535)	0.6	3.0	1.6	20.2
2007	746 (72)	1.7	3.7	2.0	18.2	8 (2)	1.9	4.6	2.2	7.5	1,239 (121)	0.7	3.8	2.7	25.9	5,237 (587)	1.1	3.0	1.3	20.8
2008	190 (38)	2.2	5.2	2.9	19.3	12 (4)	2.0	3.4	1.4	7.5	506 (76)	1.6	4.2	2.4	16.5	2,778 (413)	1.5	3.8	1.9	21.1
2009	224 (46)	2.6	6.6	2.6	16.0	40 (8)	2.2	4.6	3.7	18.4	583 (91)	1.9	6.0	2.9	24.3	1,297 (240)	1.9	4.9	2.8	19.8
2010	6 (2)	6.0	7.4	2.5	12.3	13 (2)	2.3	6.2	2.6	8.7	308 (38)	2.2	7.2	3.3	27.0	1,597 (258)	1.1	5.1	2.8	20.9
2011	76 (16)	4.0	9.4	2.7	14.3	16 (6)	2.3	4.8	2.7	11.2	523 (84)	1.1	7.9	3.7	27.3	1,394 (218)	1.9	5.5	2.8	23.3
2012	205 (40)	2.3	8.7	3.9	21.6	17 (2)	4.1	12.8	4.2	17.3	568 (102)	2.0	9.3	4.4	25.4	1,576 (249)	0.6	6.0	3.1	21.5
2013	245 (48)	2.4	7.3	3.7	29.3	72 (12)	2.0	11.4	6.5	24.4	773 (160)	1.2	9.2	4.4	22.0	765 (184)	1.6	5.7	3.4	23.1
2014						32 (5)	2.6	7.6	4.1	15.9	648 (116)	1.9	8.5	4.9	22.0	952 (237)	1.6	5.7	3.6	18.2
2015						59 (24)	2.0	5.4	3.6	19.9	1,045 (231)	0.4	8.1	4.6	23.6	1,183 (239)	1.5	5.5	3.5	25.8
2016						276 (86)	2.0	7.0	4.1	20.4	1,168 (263)	1.8	8.1	4.8	31.9	1,495 (335)	0.9	6.1	3.9	26.1
2017						298 (67)	2.5	6.7	4.2	23.4	1,350 (325)	1.0	7.9	4.9	25.4	1,294 (330)	0.4	4.8	3.4	24.9
2018						376 (77)	1.9	5.6	3.5	19.6	1,372 (285)	1.1	8.1	4.7	25.4	1,080 (221)	1.8	5.1	3.2	22.1
2019						484 (86)	1.7	6.1	4.4	25.4	1,993 (409)	1.5	6.7	4.5	25.4	1,079 (225)	1.2	5.4	3.1	24.3

Table 10. Summary of length measurements (millimeters fork length) from MRIP-intercepted Red Snapper by mode and year. Summaries include the number of fish measured by MRIP and, in parentheses, the number of angler trips from which those fish were measured (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish lengths.

Year	Cbt					Hbt					Priv				
	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max
1981	220 (34)	200	368	111	730	90 (27)	200	402	127	680	251 (36)	184	334	81	760
1982	164 (35)	150	338	85	654	425 (80)	23	352	100	670	303 (66)	100	342	115	810
1983	1,017 (143)	210	329	89	1,070	1,030 (228)	150	342	82	890	252 (50)	170	313	85	749
1984	697 (120)	220	409	123	1,010	147 (52)	227	376	78	595	116 (29)	190	313	109	790
1985	326 (66)	210	380	92	750	222 (71)	210	352	66	635	100 (28)	190	344	103	715
1986	1,549 (331)	207	385	103	800						214 (62)	160	385	112	787
1987	1,235 (167)	200	367	96	830						318 (90)	204	379	94	775
1988	787 (143)	220	370	77	699						220 (49)	181	393	103	762
1989	558 (106)	228	387	88	826						152 (44)	228	391	105	752
1990	418 (77)	235	369	77	740						189 (51)	246	362	87	660
1991	1,534 (189)	270	383	81	850						342 (67)	287	381	77	761
1992	3,118 (332)	244	382	76	818						1,018 (161)	200	387	71	760
1993	1,409 (208)	244	391	76	780						558 (111)	261	409	85	715
1994	1,113 (193)	226	427	91	823						521 (100)	257	435	96	845
1995	749 (123)	275	422	82	770						348 (87)	305	434	96	748
1996	771 (140)	283	458	90	837						376 (89)	208	438	96	916
1997	2,286 (304)	200	412	77	815						487 (115)	320	461	97	813
1998	4,549 (435)	265	413	63	788						337 (82)	335	466	104	750
1999	8,899 (681)	183	433	67	897						1,120 (222)	227	476	99	950
2000	9,642 (782)	240	427	64	883						647 (152)	295	461	89	800
2001	7,512 (548)	253	438	73	897						683 (163)	299	481	102	912
2002	8,963 (591)	300	433	67	911						946 (179)	334	467	90	884
2003	8,345 (649)	295	435	71	993						666 (185)	321	472	103	891
2004	8,164 (825)	301	434	67	918						686 (176)	342	458	83	885
2005	7,006 (711)	308	431	68	840						457 (144)	312	465	93	854
2006	6,110 (570)	240	423	65	844						522 (150)	288	439	71	730
2007	6,499 (578)	257	425	55	852						731 (204)	304	436	64	806
2008	2,904 (361)	316	453	65	800						582 (170)	354	475	71	742
2009	1,528 (199)	335	505	87	790						616 (186)	368	481	80	855
2010	1,575 (203)	303	504	89	850						349 (97)	369	503	76	723
2011	1,396 (158)	360	529	89	818						613 (166)	289	538	89	862
2012	1,715 (216)	358	548	100	830						651 (177)	222	559	97	855
2013	731 (95)	364	553	107	958						1,133 (310)	290	563	119	889
2014	570 (96)	363	540	113	821						1,074 (263)	358	534	111	805
2015	1,409 (240)	363	541	109	868						908 (264)	227	526	118	866
2016	1,589 (266)	355	557	114	926						1,350 (418)	278	526	108	811
2017	1,324 (218)	214	522	114	830						1,691 (519)	285	523	110	941
2018	1,725 (270)	296	533	109	880						1,103 (313)	288	526	100	845
2019	1,684 (275)	322	532	109	880						1,872 (445)	346	519	102	895

Table 11. Summary of weight measurements (pounds whole weight) from MRIP-intercepted Red Snapper by mode and year. Summaries include the number of fish weighed by MRIP and, in parentheses, the number of angler trips from which those fish were weighed (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish weights.

Year	Cbt					Hbt					Priv				
	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max
1981	220 (34)	0.2	3.4	4.4	22.0	90 (27)	0.2	3.2	2.6	11.0	251 (36)	0.2	2.0	1.8	10.1
1982	164 (35)	0.2	1.8	1.8	10.8	425 (80)	0.2	1.8	1.4	12.3	303 (66)	0.2	2.2	2.4	15.7
1983	1,017 (143)	0.2	2.0	2.8	51.6	1,030 (228)	0.2	2.0	2.2	27.4	252 (50)	0.2	1.6	2.3	24.5
1984	697 (120)	0.2	4.2	5.7	50.0	147 (52)	0.4	2.4	1.9	9.5	116 (29)	0.2	1.7	3.0	22.1
1985	326 (66)	0.4	3.0	3.1	19.7	222 (71)	0.4	1.9	1.4	9.8	100 (28)	0.2	2.1	2.1	16.6
1986	1,520 (327)	0.4	2.9	3.0	27.9						214 (62)	0.2	2.6	2.5	17.2
1987	1,224 (166)	0.2	2.8	2.9	26.1						318 (90)	0.4	2.4	2.3	21.2
1988	177 (42)	0.5	2.9	2.1	10.8						41 (15)	0.3	3.0	1.8	7.1
1989	545 (104)	0.5	3.0	3.4	22.7						152 (44)	0.5	3.1	3.1	17.3
1990	418 (77)	0.9	3.2	3.2	25.5						189 (51)	0.7	2.3	2.2	12.9
1991	1,512 (187)	0.8	3.5	3.2	35.2						342 (67)	0.9	2.8	3.3	30.6
1992	2,437 (264)	0.4	3.5	3.2	38.0						880 (145)	0.7	2.9	1.9	18.1
1993	1,396 (206)	0.6	3.7	2.7	27.0						558 (111)	0.7	3.8	2.7	16.6
1994	1,113 (193)	0.6	4.1	3.5	29.0						521 (100)	0.7	4.2	3.6	27.7
1995	749 (123)	1.1	3.8	3.0	21.2						348 (87)	1.0	4.5	3.8	21.8
1996	771 (140)	1.0	5.1	3.7	27.7						376 (89)	0.3	4.2	4.4	31.2
1997	2,286 (304)	0.9	5.5	4.0	43.9						487 (115)	1.1	4.9	3.7	20.6
1998	4,549 (435)	0.3	4.1	2.7	32.0						337 (82)	1.5	4.9	3.7	17.0
1999	8,862 (671)	0.2	5.6	4.3	52.5						1,120 (222)	0.5	6.7	5.4	51.7
2000	9,642 (782)	0.6	4.6	3.3	50.3						647 (152)	1.3	5.9	4.4	32.3
2001	7,512 (548)	0.7	4.7	3.4	36.1						683 (163)	1.0	6.8	5.5	31.2
2002	8,963 (591)	1.0	4.6	3.3	40.6						946 (179)	1.6	5.5	4.1	38.7
2003	8,345 (649)	1.1	4.7	3.7	41.1						666 (185)	1.8	5.7	4.7	37.2
2004	8,164 (825)	1.1	3.5	2.2	30.4						686 (176)	1.5	4.3	2.9	26.0
2005	7,006 (711)	1.3	3.3	2.2	22.1						457 (144)	1.3	4.5	3.2	23.8
2006	6,110 (570)	0.6	3.2	2.1	28.1						522 (150)	1.1	3.6	2.2	15.7
2007	6,499 (578)	0.7	3.2	1.7	25.9						731 (204)	1.1	3.5	2.1	22.5
2008	2,904 (361)	1.5	3.9	2.0	21.1						582 (170)	1.7	4.5	2.3	15.2
2009	1,528 (199)	1.9	5.6	3.0	19.8						616 (186)	1.9	4.9	2.7	24.3
2010	1,575 (203)	1.1	5.4	3.0	27.0						349 (97)	2.0	5.3	2.6	14.6
2011	1,396 (158)	1.9	6.1	3.2	23.3						613 (166)	1.1	6.5	3.4	27.3
2012	1,715 (216)	1.8	7.0	3.8	21.6						651 (177)	0.6	7.2	3.8	25.4
2013	722 (94)	1.9	7.2	4.0	29.3						1,133 (310)	1.2	7.8	4.6	24.4
2014	558 (95)	1.6	6.9	4.3	20.5						1,074 (263)	1.8	6.9	4.4	22.0
2015	1,379 (230)	1.8	6.8	4.2	25.8						908 (264)	0.4	6.5	4.4	23.6
2016	1,589 (266)	1.6	7.5	4.6	31.9						1,350 (418)	0.9	6.3	4.1	22.3
2017	1,251 (203)	0.4	6.5	4.5	24.9						1,691 (519)	1.0	6.3	4.5	25.4
2018	1,725 (270)	1.1	6.8	4.4	25.4						1,103 (313)	1.9	6.4	4.1	24.5
2019	1,684 (275)	1.2	6.5	4.4	25.4						1,872 (445)	1.5	6.0	3.9	24.8

Table 12. Summary of length (millimeters fork length) and weight measurements (pounds whole weight) from MRIP-intercepted Red Snapper by year. Summaries include the number of fish for which size information was collected by MRIP and, in parentheses, the number of angler trips from which those fish were sampled (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish lengths and weights.

Year	Length					Weight				
	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max
1981	561 (97)	184	359	104	760	561 (97)	0.2	2.7	3.2	22.0
1982	892 (181)	23	346	103	810	892 (181)	0.2	2.0	1.8	15.7
1983	2,299 (421)	150	333	86	1,070	2,299 (421)	0.2	1.9	2.5	51.6
1984	960 (201)	190	393	120	1,010	960 (201)	0.2	3.6	5.1	50.0
1985	648 (165)	190	365	87	750	648 (165)	0.2	2.5	2.6	19.7
1986	1,763 (393)	160	385	104	800	1,734 (389)	0.2	2.9	3.0	27.9
1987	1,553 (257)	200	370	96	830	1,542 (256)	0.2	2.7	2.8	26.1
1988	1,007 (192)	181	375	84	762	218 (57)	0.3	2.9	2.1	10.8
1989	710 (150)	228	388	92	826	697 (148)	0.5	3.0	3.3	22.7
1990	607 (128)	235	367	80	740	607 (128)	0.7	2.9	3.0	25.5
1991	1,876 (256)	270	383	80	850	1,854 (254)	0.8	3.3	3.2	35.2
1992	4,136 (493)	200	383	75	818	3,317 (409)	0.4	3.4	2.9	38.0
1993	1,967 (319)	244	396	79	780	1,954 (317)	0.6	3.7	2.7	27.0
1994	1,634 (293)	226	429	93	845	1,634 (293)	0.6	4.1	3.5	29.0
1995	1,097 (210)	275	426	87	770	1,097 (210)	1.0	4.0	3.2	21.8
1996	1,147 (229)	208	452	93	916	1,147 (229)	0.3	4.8	3.9	31.2
1997	2,773 (419)	200	421	83	815	2,773 (419)	0.9	5.4	4.0	43.9
1998	4,886 (517)	265	417	68	788	4,886 (517)	0.3	4.1	2.8	32.0
1999	10,019 (903)	183	438	73	950	9,982 (893)	0.2	5.7	4.5	52.5
2000	10,289 (934)	240	429	66	883	10,289 (934)	0.6	4.7	3.3	50.3
2001	8,195 (711)	253	442	77	912	8,195 (711)	0.7	4.8	3.6	36.1
2002	9,909 (770)	300	436	70	911	9,909 (770)	1.0	4.7	3.4	40.6
2003	9,011 (834)	295	438	74	993	9,011 (834)	1.1	4.8	3.8	41.1
2004	8,850 (1,001)	301	436	69	918	8,850 (1,001)	1.1	3.5	2.2	30.4
2005	7,463 (855)	308	433	70	854	7,463 (855)	1.3	3.4	2.3	23.8
2006	6,632 (720)	240	424	66	844	6,632 (720)	0.6	3.2	2.1	28.1
2007	7,230 (782)	257	426	56	852	7,230 (782)	0.7	3.2	1.7	25.9
2008	3,486 (531)	316	456	67	800	3,486 (531)	1.5	4.0	2.1	21.1
2009	2,144 (385)	335	498	86	855	2,144 (385)	1.9	5.4	2.9	24.3
2010	1,924 (300)	303	504	87	850	1,924 (300)	1.1	5.4	3.0	27.0
2011	2,009 (324)	289	531	89	862	2,009 (324)	1.1	6.2	3.3	27.3
2012	2,366 (393)	222	551	99	855	2,366 (393)	0.6	7.1	3.8	25.4
2013	1,864 (405)	290	559	114	958	1,855 (404)	1.2	7.6	4.4	29.3
2014	1,644 (359)	358	536	112	821	1,632 (358)	1.6	6.9	4.4	22.0
2015	2,317 (504)	227	535	113	868	2,287 (494)	0.4	6.7	4.2	25.8
2016	2,939 (684)	278	543	112	926	2,939 (684)	0.9	7.0	4.4	31.9
2017	3,015 (737)	214	522	112	941	2,942 (722)	0.4	6.4	4.5	25.4
2018	2,828 (583)	288	530	105	880	2,828 (583)	1.1	6.6	4.3	25.4
2019	3,556 (720)	322	525	106	895	3,556 (720)	1.2	6.2	4.1	25.4

Table 13. Summary of length measurements (millimeters total length) from TPWD-intercepted Red Snapper by mode and year. Summaries include the number of fish measured by TPWD and, in parentheses, the number of angler trips from which those fish were measured (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish lengths.

Year	Cbt					Priv					Total				
	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max
1983	19 (4)	245	321	76	530	334 (74)	190	323	71	680	353 (78)	190	322	71	680
1984	6 (1)	350	406	72	538	385 (90)	118	340	121	850	391 (91)	118	341	121	850
1985	94 (4)	211	366	93	695	601 (100)	170	323	77	704	695 (104)	170	329	81	704
1986	6 (1)	333	419	82	567	338 (73)	176	332	94	830	344 (74)	176	334	94	830
1987	35 (7)	230	407	112	670	430 (94)	179	324	101	770	465 (101)	179	331	104	770
1988	25 (5)	258	413	171	883	423 (98)	143	342	96	909	448 (103)	143	346	103	909
1989	9 (2)	309	510	143	700	265 (68)	183	335	80	641	274 (70)	183	341	88	700
1990	7 (2)	204	342	65	409	326 (90)	187	358	85	675	333 (92)	187	358	85	675
1991	15 (4)	311	381	83	612	444 (102)	202	377	84	740	459 (106)	202	377	84	740
1992	60 (10)	329	411	80	712	598 (141)	281	405	79	854	658 (151)	281	405	79	854
1993	28 (5)	319	489	124	708	740 (163)	223	418	99	869	768 (168)	223	421	100	869
1994	48 (8)	295	476	144	763	1,033 (224)	173	423	96	775	1,081 (232)	173	425	99	775
1995	47 (10)	348	465	116	758	1,811 (391)	112	444	91	890	1,858 (401)	112	445	92	890
1996	85 (15)	368	485	91	755	1,377 (319)	208	466	87	861	1,462 (334)	208	467	87	861
1997	79 (17)	361	484	102	889	1,323 (297)	300	466	86	830	1,402 (314)	300	467	87	889
1998	111 (22)	341	480	84	753	1,141 (260)	208	479	110	918	1,252 (282)	208	479	108	918
1999	89 (19)	357	488	123	865	642 (165)	246	455	99	927	731 (184)	246	459	102	927
2000	101 (18)	380	458	79	793	952 (219)	217	453	86	918	1,053 (237)	217	453	86	918
2001	120 (24)	365	446	59	755	824 (189)	223	453	83	825	944 (213)	223	452	80	825
2002	144 (24)	380	466	69	805	887 (205)	253	472	84	845	1,031 (229)	253	471	82	845
2003	145 (27)	328	466	76	713	863 (201)	221	454	87	845	1,008 (228)	221	456	86	845
2004	133 (25)	370	465	73	850	828 (198)	206	445	81	839	961 (223)	206	448	80	850
2005	141 (28)	371	475	88	766	1,046 (232)	232	459	96	909	1,187 (260)	232	461	95	909
2006	195 (38)	363	430	54	804	1,258 (309)	275	459	86	863	1,453 (347)	275	456	83	863
2007	257 (45)	342	483	63	741	876 (205)	262	475	75	830	1,133 (250)	262	477	73	830
2008	157 (31)	349	535	92	773	705 (163)	197	499	95	973	862 (194)	197	506	96	973
2009	155 (27)	384	547	101	852	864 (181)	176	538	101	890	1,019 (208)	176	539	101	890
2010	86 (15)	230	554	103	757	553 (114)	282	552	94	856	639 (129)	230	552	95	856
2011	69 (15)	260	548	119	780	798 (166)	223	533	107	835	867 (181)	223	535	108	835
2012	128 (24)	271	599	122	920	614 (139)	270	530	113	850	742 (163)	270	542	117	920
2013	140 (26)	356	563	115	832	902 (190)	242	529	109	872	1,042 (216)	242	533	110	872
2014	155 (26)	373	540	93	778	635 (129)	250	533	114	897	790 (155)	250	534	110	897
2015	299 (53)	373	548	101	849	1,144 (233)	215	525	92	877	1,443 (286)	215	530	95	877
2016	228 (42)	368	551	106	825	736 (164)	239	534	118	885	964 (206)	239	538	115	885
2017	306 (55)	355	603	111	873	1,346 (280)	270	548	106	876	1,652 (335)	270	558	109	876
2018	263 (50)	381	598	133	899	1,595 (323)	193	548	108	885	1,858 (373)	193	555	113	899
2019	219 (38)	379	586	120	857	1,882 (380)	231	547	102	886	2,101 (418)	231	551	104	886

Table 14. Summary of length measurements (millimeters fork length) from Red Snapper intercepted by the LA BIO sampling program by mode and year. Summaries include the number of fish measured by LDWF and, in parentheses, the number of angler trips from which those fish were measured (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish lengths.

Year	Cbt					Priv					Total				
	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max
2014	336 (35)	385	613	82	871	986 (103)	334	566	93	869	1,322 (138)	334	578	93	871
2015	566 (59)	365	592	79	805	683 (86)	353	573	93	815	1,249 (145)	353	582	87	815
2016	532 (47)	394	595	79	792	556 (57)	341	573	90	812	1,088 (104)	341	584	85	812
2017	763 (76)	351	579	87	892	486 (60)	370	579	87	814	1,249 (136)	351	579	87	892
2018	865 (126)	339	618	92	897	560 (81)	340	572	95	842	1,425 (207)	339	600	96	897
2019	527 (66)	384	589	95	853	346 (57)	341	551	105	790	873 (123)	341	574	101	853

Table 15. Summary of weight measurements (pounds whole weight) from Red Snapper intercepted by the LA BIO sampling program by mode and year. Summaries include the number of fish weighed by LDWF and, in parentheses, the number of angler trips from which those fish were measured (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish lengths.

Year	Cbt					Priv					Total				
	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max
2014	252 (28)	2.6	10.0	3.7	22.6	643 (70)	2.1	8.3	4.0	28.1	895 (98)	2.1	8.8	4.0	28.1
2015	497 (54)	1.8	9.1	3.4	20.1	559 (72)	2.0	8.2	3.8	20.4	1,056 (126)	1.8	8.7	3.7	20.4
2016	369 (34)	2.5	9.3	3.2	21.2	485 (50)	2.0	7.8	3.8	24.3	854 (84)	2.0	8.5	3.6	24.3
2017	705 (72)	2.0	7.8	3.4	28.2	325 (50)	2.1	8.2	3.4	21.8	1,030 (122)	2.0	7.9	3.4	28.2
2018	812 (122)	1.6	9.6	3.9	25.6	440 (71)	2.2	7.9	3.9	22.0	1,252 (193)	1.6	9.0	4.0	25.6
2019	448 (60)	2.2	8.8	4.2	25.9	309 (54)	1.6	7.1	4.1	19.8	757 (114)	1.6	8.1	4.2	25.9

Table 16. Resolution of landings-in-weight estimates (pounds whole weight) for Gulf of Mexico Red Snapper by year and hierarchy level (MRIP, LACreel 2014+, TPWD), defined by species, region, year, state, mode, wave, and area. Average weight estimates are calculated at the finest strata meeting a minimum sample size threshold (Dettloff and Matter 2019b). Larger sample sizes therefore allow average weights to be calculated at finer stratifications, the finest being at the srysmwa level (Matter and Rios 2013). Annual summaries include the number of fish and angler trips from which weight information was collected (N) and the landings-in-weight estimates (AB1.lbs) by hierarchy level. As an example, (srysmw) summarizes those landings-in-weight estimates originating from cells where average weights are specific to a particular species, region, year, state, mode, and wave (i.e., weight observations collapsed across areas).

Year	N	AB1.lbs				
		sry	srys	srysm	srysmw	srysmwa
1981	561 (97)	0	0	1,113,795	549,291	8,031,751
1982	892 (181)	0	546,608	936,018	339,196	3,027,538
1983	2,652 (499)	42,558	1,294,876	1,482,601	535,102	6,911,449
1984	1,351 (292)	3,944	62,485	1,193,183	83,003	2,592,265
1985	1,343 (269)	3,820	0	2,599,576	119,063	4,571,425
1986	2,078 (463)	965	7,441	1,359,713	262,328	3,206,102
1987	2,007 (357)	0	108,687	628,880	149,018	2,397,854
1988	666 (160)	509,032	565,158	564,278	83,971	1,182,869
1989	971 (218)	0	1,520,577	801,076	181,916	1,564,366
1990	940 (220)	0	18	541,815	520,413	947,538
1991	2,313 (360)	0	120,046	499,537	64,014	2,986,751
1992	3,975 (560)	0	0	683,077	692,613	5,186,467
1993	2,722 (485)	0	0	326,472	828,513	10,396,671
1994	2,715 (525)	0	0	2,158,708	265,986	5,756,467
1995	2,955 (611)	0	0	1,276,148	24,031	5,956,626
1996	2,609 (563)	0	0	842,731	250,950	4,485,879
1997	4,175 (733)	0	0	805,951	534,155	7,032,659
1998	6,138 (799)	0	0	923,473	3,429,671	6,332,273
1999	10,713 (1,077)	0	0	458,715	946,567	10,010,613
2000	11,342 (1,171)	0	95,140	182,046	816,726	6,354,839
2001	9,139 (924)	0	191,059	560,229	445,857	9,490,472
2002	10,940 (999)	0	0	792,447	711,758	10,752,978
2003	10,019 (1,062)	0	0	541,932	137,177	8,411,320
2004	9,811 (1,224)	0	180,440	129,802	86,050	8,127,303
2005	8,650 (1,115)	9,781	0	3,162	721,845	5,627,387
2006	8,085 (1,067)	0	55,101	62,382	200,775	5,323,411
2007	8,363 (1,032)	20,856	0	10,723	501,883	7,010,322
2008	4,348 (725)	131,760	0	65,384	300,245	5,269,242
2009	3,163 (593)	0	0	28,153	100,710	6,657,655
2010	2,563 (429)	72,435	0	1,780	35,895	5,886,807
2011	2,876 (505)	0	191,195	77,711	174,365	9,306,343
2012	3,108 (556)	0	1,398,887	88,146	162,526	9,823,220
2013	2,897 (620)	0	876	274,436	596,558	15,841,321
2014	3,317 (1,408)	0	1,082,655	128,958	112,708	6,423,362
2015	4,786 (1,836)	0	1,230,720	33,337	230,189	8,270,742
2016	4,757 (1,744)	0	998,386	179,862	218,573	9,715,930
2017	5,624 (2,087)	0	722,033	685,363	559,460	17,059,368

Year	N	AB1.lbs				
		sry	srys	srysm	srysmw	srysmwa
2018	5,938 (2,208)	0	773,737	155,834	203,182	12,716,669
2019	6,414 (1,895)	0	858,277	48,559	173,439	13,660,051

Table 17. *Recreational Fishing Effort (in angler trips) for Gulf of Mexico anglers by state and year (MRIP, LACreel 2014+, TPWD).*

Year	TX	LA	MS	AL	FLW	Total
1981		2,885,044	628,653	588,114	8,582,199	12,684,010
1982		3,534,377	730,214	555,508	10,028,678	14,848,777
1983	555,681	3,736,954	808,628	606,726	11,286,217	16,994,206
1984	643,796	3,483,682	735,160	604,616	13,377,537	18,844,791
1985	710,725	3,520,757	767,682	634,054	11,696,745	17,329,963
1986	704,809	3,368,108	720,668	656,533	11,015,370	16,465,488
1987	889,371	3,269,586	721,063	653,407	12,015,311	17,548,738
1988	857,643	3,187,868	696,849	645,931	13,418,607	18,806,898
1989	791,653	3,390,644	736,722	730,111	13,995,841	19,644,971
1990	760,711	3,622,354	784,910	714,855	14,318,744	20,201,574
1991	775,674	3,706,470	896,466	860,194	15,284,874	21,523,678
1992	865,301	3,920,391	890,818	914,374	14,638,415	21,229,299
1993	897,527	4,043,377	967,238	974,714	15,629,370	22,512,226
1994	997,059	3,988,582	990,253	1,013,123	15,411,259	22,400,276
1995	982,649	4,061,447	986,586	1,056,462	16,201,724	23,288,868
1996	979,300	4,259,790	1,041,652	1,123,082	15,964,213	23,368,037
1997	894,328	4,446,907	1,104,872	1,232,439	17,040,670	24,719,216
1998	924,659	4,529,530	1,126,139	1,210,971	17,476,950	25,268,249
1999	1,098,251	4,967,340	1,211,087	1,346,698	18,693,527	27,316,903
2000	1,119,611	5,418,948	1,280,132	1,410,357	17,743,152	26,972,200
2001	943,350	5,573,822	1,268,914	1,530,890	19,805,590	29,122,566
2002	935,055	5,196,030	1,256,962	1,542,848	18,987,724	27,918,619
2003	968,522	5,267,732	1,346,056	1,703,554	19,827,187	29,113,051
2004	988,042	4,969,316	1,338,192	1,836,510	23,905,705	33,037,765
2005	898,897	4,449,391	1,158,014	1,900,417	22,335,162	30,741,881
2006	1,005,097	4,557,397	1,398,518	1,883,001	20,567,249	29,411,262
2007	887,696	4,899,419	1,471,619	2,075,677	20,919,522	30,253,933
2008	873,237	5,388,373	1,588,234	2,316,742	22,923,098	33,089,684
2009	925,446	5,898,978	1,639,894	2,338,504	20,403,331	31,206,153
2010	870,541	6,174,336	1,569,529	2,349,701	21,078,418	32,042,525
2011	989,955	6,040,909	1,611,693	2,364,899	21,248,197	32,255,653
2012	1,000,270	5,838,749	1,654,760	2,173,049	24,020,926	34,687,754
2013	997,827	5,598,489	1,610,624	2,244,858	22,237,132	32,688,930
2014	963,087	2,226,868	1,503,011	2,124,707	19,552,233	26,369,906
2015	920,172	2,425,434	1,609,574	2,176,532	17,544,361	24,676,073
2016	1,071,428	2,241,734	1,757,923	2,113,993	18,687,613	25,872,691
2017	1,002,941	2,308,352	1,622,101	2,633,932	18,797,345	26,364,671
2018	1,120,640	2,275,932	1,546,008	1,928,020	18,151,209	25,021,809
2019	1,144,710	2,108,454	1,401,909	1,877,771	16,277,632	22,810,476

Table 18. *Recreational Fishing Effort (in angler trips) for Gulf of Mexico anglers by mode and year (MRIP, LACreel 2014+, TPWD). Note that effort from the combined private-shore fishing mode in the LA Creel survey has been added to the private mode.*

Year	Cbt	Hbt	Priv	Total
1981	354,271	142,790	12,186,947	12,684,008
1982	628,429	260,912	13,959,437	14,848,778
1983	637,248	256,493	16,100,466	16,994,207
1984	601,741	242,211	18,000,839	18,844,791
1985	650,994	277,516	16,401,453	17,329,963
1986	635,401		15,830,087	16,465,488
1987	694,259		16,854,478	17,548,737
1988	561,286		18,245,612	18,806,898
1989	715,802		18,929,169	19,644,971
1990	670,487		19,531,087	20,201,574
1991	737,662		20,786,015	21,523,677
1992	683,733		20,545,567	21,229,300
1993	784,728		21,727,500	22,512,228
1994	826,869		21,573,409	22,400,278
1995	941,440		22,347,428	23,288,868
1996	882,976		22,485,061	23,368,037
1997	868,221		23,850,996	24,719,217
1998	910,489		24,357,759	25,268,248
1999	876,478		26,440,425	27,316,903
2000	874,539		26,097,662	26,972,201
2001	919,223		28,203,344	29,122,567
2002	925,995		26,992,624	27,918,619
2003	860,599		28,252,451	29,113,050
2004	956,168		32,081,597	33,037,765
2005	818,973		29,922,907	30,741,880
2006	958,119		28,453,143	29,411,262
2007	1,014,728		29,239,206	30,253,934
2008	963,971		32,125,714	33,089,685
2009	929,263		30,276,890	31,206,153
2010	733,320		31,309,204	32,042,524
2011	902,984		31,352,669	32,255,653
2012	1,111,425		33,576,329	34,687,754
2013	1,055,300		31,633,629	32,688,929
2014	1,067,151		25,302,755	26,369,906
2015	1,211,008		23,465,065	24,676,073
2016	1,269,811		24,602,878	25,872,689
2017	1,248,715		25,115,957	26,364,672
2018	1,427,375		23,594,435	25,021,810
2019	1,675,699		21,134,778	22,810,477

Table 19. Annual landings (AB1) and discards (B2) of Red Snapper in numbers of fish by Stock-ID boundary and year (MRIP, LACreel 2014+, TPWD).

Year	Central		East		West		Total	
	AB1	B2	AB1	B2	AB1	B2	AB1	B2
1981	1,930,977	180,197	603,403	76,357	2,692,677	27,153	5,227,057	283,706
1982	868,286	25,744	18,555	643	1,533,808	18,739	2,420,649	45,126
1983	1,987,210	4,470	641,422	0	3,406,962	1,723	6,035,594	6,193
1984	616,020	6,151	72,122	88,247	849,300	4,004	1,537,442	98,402
1985	1,000,375	4,639	175,109	42,961	1,011,814	97,694	2,187,298	145,294
1986	768,963	20,853	242,849	28,816	543,806	6,106	1,555,618	55,775
1987	948,636	156,397	109,554	4,745	213,157	36,111	1,271,348	197,253
1988	724,205	74,039	55,039	35,687	297,724	186,913	1,076,967	296,639
1989	792,265	358,120	153,860	7,022	365,718	215,788	1,311,842	580,929
1990	492,251	852,892	42,071	21,540	177,585	223,174	711,907	1,097,606
1991	996,304	1,783,552	17,291	78,277	185,750	201,891	1,199,345	2,063,720
1992	1,774,791	1,633,189	6,206	81,091	409,288	318,159	2,190,285	2,032,439
1993	2,270,763	1,917,215	0	29,726	735,163	398,359	3,005,926	2,345,299
1994	1,375,433	1,213,786	57	38,921	502,818	556,202	1,878,308	1,808,909
1995	943,864	627,777	3,298	13,967	713,836	902,691	1,660,999	1,544,435
1996	929,829	1,501,324	36,996	35,811	344,156	201,971	1,310,981	1,739,105
1997	1,361,577	3,116,304	1,729	26,533	389,469	211,173	1,752,775	3,354,010
1998	1,434,922	1,789,795	8,037	68,680	577,459	416,625	2,020,418	2,275,100
1999	1,933,483	3,542,442	12,350	51,776	269,109	671,165	2,214,942	4,265,384
2000	1,240,899	3,067,089	2,718	67,983	236,909	249,393	1,480,526	3,384,465
2001	1,788,729	4,944,296	1,516	8,488	136,452	143,982	1,926,698	5,096,766
2002	2,428,108	6,980,991	8,232	6,874	117,649	153,930	2,553,988	7,141,795
2003	1,814,558	4,922,510	4,426	7,867	118,994	346,275	1,937,978	5,276,653
2004	2,165,023	5,118,686	7,479	93,287	131,659	618,921	2,304,161	5,830,893
2005	1,285,258	4,600,007	82,757	130,746	174,375	560,580	1,542,390	5,291,333
2006	1,373,828	4,976,311	29,489	72,994	271,939	771,378	1,675,256	5,820,683
2007	2,002,188	6,381,069	42,176	45,502	250,088	495,363	2,294,452	6,921,934
2008	1,163,510	4,842,621	8,908	56,587	137,714	500,001	1,310,132	5,399,209
2009	1,284,529	4,312,484	20,827	120,491	164,382	395,722	1,469,738	4,828,696
2010	1,101,461	4,652,563	7,589	133,517	42,258	129,885	1,151,308	4,915,965
2011	1,396,185	4,105,461	16,390	1,502,526	98,875	317,934	1,511,450	5,925,921
2012	1,310,692	4,229,770	17,642	15,633	187,257	264,412	1,515,591	4,509,814
2013	2,257,208	5,274,340	4,061	19,712	162,562	480,370	2,423,830	5,774,422
2014	928,343	4,146,542	9,066	58,464	168,103	276,394	1,105,511	4,481,400
2015	1,228,286	3,416,173	9,920	39,143	221,399	348,765	1,459,605	3,804,080
2016	1,498,981	5,899,404	35,342	750,442	173,860	81,526	1,708,183	6,731,372
2017	2,807,480	8,804,577	96,840	420,731	164,586	112,267	3,068,906	9,337,574
2018	1,980,297	5,447,475	124,650	706,066	155,503	109,982	2,260,450	6,263,523
2019	2,229,018	6,261,842	124,251	420,312	203,513	230,527	2,556,782	6,912,681

Table 20. Summary of fish weights (in pounds whole weight) from intercepted Red Snapper by Stock-ID boundary and year (MRIP, LACreel 2014+, TPWD). This table includes both raw measurements of fish weight and weights imputed from TPWD length measurements, using appropriate length-weight conversions. Summaries include the number of fish and, in parentheses, number of angler trips providing information on fish weight (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) of these weight records.

Year	Central					East					West				
	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max
1981	299 (49)	0.2	2.7	3.5	22.0	54 (13)	0.2	1.7	1.9	11.0	208 (35)	0.4	3.1	3.0	15.4
1982	557 (126)	0.2	2.1	1.6	10.8	6 (3)	0.9	3.4	4.0	11.5	329 (52)	0.2	1.6	2.1	15.7
1983	906 (178)	0.2	1.7	1.5	12.9	106 (66)	0.7	3.9	5.0	27.4	1,640 (255)	0.2	1.8	2.5	51.6
1984	304 (73)	0.2	1.9	1.7	9.5	61 (28)	0.2	2.3	1.6	8.0	986 (191)	0.0	3.5	5.3	50.0
1985	426 (111)	0.2	2.3	1.8	16.6	39 (22)	0.2	2.7	2.5	9.8	878 (136)	0.1	1.6	2.3	19.7
1986	904 (253)	0.4	3.4	3.0	22.2	99 (43)	1.5	4.5	3.3	19.4	1,075 (167)	0.1	1.8	2.5	27.9
1987	1,155 (213)	0.2	2.8	2.7	26.1	32 (12)	0.7	4.6	4.4	19.2	820 (132)	0.2	1.8	2.4	22.9
1988	194 (46)	0.3	2.9	2.1	10.8	19 (10)	2.5	3.9	1.5	7.1	453 (104)	0.1	1.7	2.5	25.5
1989	558 (117)	0.5	3.0	3.4	22.7	24 (5)	0.9	1.9	0.9	4.0	389 (96)	0.2	2.1	2.3	17.3
1990	453 (93)	0.7	3.0	3.2	25.5	5 (4)	1.6	7.1	3.5	11.4	482 (123)	0.2	1.9	1.6	12.9
1991	1,364 (196)	0.8	3.1	2.3	30.6	5 (4)	2.0	4.7	3.1	8.3	944 (160)	0.2	3.0	3.9	35.2
1992	2,743 (325)	0.4	3.3	2.6	38.0	11 (7)	1.5	4.7	5.5	17.7	1,221 (228)	0.6	3.0	3.2	29.9
1993	1,629 (264)	0.6	3.7	2.5	27.0	0 (0)	0.0	0.0	0.0	0.0	1,093 (221)	0.3	3.1	2.8	22.1
1994	1,275 (232)	0.6	3.9	3.1	27.7	1 (1)	4.0	4.0	0.0	4.0	1,439 (292)	0.1	3.3	3.4	29.0
1995	760 (159)	1.0	3.6	2.7	21.8	1 (1)	15.2	15.2	0.0	15.2	2,194 (451)	0.0	3.4	2.9	23.8
1996	873 (185)	0.3	4.6	3.7	31.2	13 (7)	1.9	5.1	4.1	15.0	1,723 (371)	0.2	3.8	3.1	29.0
1997	2,501 (363)	1.1	5.3	4.0	43.9	21 (6)	0.9	4.9	5.4	26.7	1,653 (364)	0.8	3.9	3.0	23.8
1998	4,515 (466)	0.3	4.0	2.6	32.0	32 (11)	0.8	2.4	1.1	4.9	1,591 (322)	0.2	4.4	3.7	26.3
1999	9,717 (839)	0.2	5.7	4.4	52.5	36 (13)	1.3	4.4	3.9	25.9	960 (225)	0.4	4.4	4.3	34.3
2000	10,058 (886)	0.6	4.6	3.2	50.3	5 (4)	2.2	4.5	2.8	8.9	1,279 (281)	0.3	4.0	3.7	26.3
2001	8,102 (680)	0.7	4.8	3.6	36.1	22 (8)	1.9	6.2	4.2	14.9	1,015 (236)	0.3	3.4	2.9	22.3
2002	9,560 (719)	1.0	4.6	3.4	40.6	19 (7)	2.0	4.2	3.1	13.6	1,361 (273)	0.5	4.2	3.1	20.2
2003	8,507 (775)	1.1	4.7	3.7	41.1	59 (12)	1.5	3.4	1.2	8.2	1,453 (275)	0.3	4.2	3.8	29.2
2004	8,361 (947)	1.1	3.5	2.2	30.4	21 (9)	2.4	4.5	1.7	9.0	1,429 (268)	0.2	3.3	2.5	21.5
2005	6,975 (765)	1.3	3.3	2.1	23.8	77 (23)	1.8	3.7	1.8	10.8	1,598 (327)	0.3	3.8	3.3	25.5
2006	5,776 (631)	0.6	3.1	1.9	25.9	38 (10)	1.8	3.6	2.3	13.9	2,271 (426)	0.6	3.5	2.8	28.1
2007	6,453 (700)	0.7	3.1	1.7	25.9	31 (10)	2.2	3.6	1.4	8.5	1,879 (322)	0.5	3.6	2.0	19.1
2008	3,262 (482)	1.5	3.9	2.0	21.1	34 (11)	1.7	5.1	2.8	16.6	1,052 (232)	0.2	4.6	2.8	31.5
2009	1,904 (330)	1.9	5.2	2.9	24.3	16 (9)	2.8	5.3	2.4	8.4	1,243 (254)	0.1	5.7	3.2	23.8
2010	1,884 (290)	1.1	5.4	3.0	27.0	34 (8)	2.3	6.7	2.7	13.3	645 (131)	0.3	5.9	3.2	21.1
2011	1,918 (303)	1.1	6.1	3.3	27.3	15 (5)	4.1	6.1	2.3	12.5	943 (197)	0.3	5.8	3.5	19.5
2012	2,135 (348)	0.6	7.0	3.8	25.4	26 (5)	1.9	6.3	3.4	13.2	947 (203)	0.6	6.4	4.2	26.5
2013	1,579 (350)	1.2	7.6	4.5	24.4	31 (6)	2.4	7.3	3.3	13.4	1,287 (264)	0.4	5.8	3.8	29.3
2014	1,585 (345)	1.6	6.9	4.4	22.0	47 (13)	2.2	6.8	3.1	13.1	1,685 (253)	0.4	7.2	4.2	28.1
2015	2,242 (487)	0.4	6.7	4.3	25.8	45 (7)	3.2	6.3	3.0	17.0	2,499 (412)	0.3	6.6	3.7	22.8
2016	2,873 (660)	0.9	7.0	4.4	31.9	66 (24)	1.3	4.7	3.3	15.0	1,818 (290)	0.4	7.0	3.9	24.3
2017	2,766 (679)	0.4	6.5	4.5	25.4	176 (43)	0.7	4.1	2.7	22.0	2,682 (457)	0.6	6.9	3.7	28.2
2018	2,664 (555)	1.1	6.7	4.3	25.4	164 (28)	1.8	5.5	3.2	19.4	3,110 (566)	0.2	7.3	4.2	25.6
2019	3,363 (678)	1.2	6.3	4.2	25.4	193 (42)	1.6	5.5	2.8	15.0	2,858 (532)	0.3	6.5	3.9	25.9

Table 21. *Recreational Fishing Effort (in angler trips) for Gulf of Mexico anglers by Stock-ID boundary and year (MRIP, LACreel 2014+, TPWD).*

Year	Central	East	West	Total
1981	2,855,494	6,943,471	2,885,044	12,684,009
1982	3,232,917	8,081,484	3,534,377	14,848,778
1983	2,650,852	10,050,719	4,292,636	16,994,207
1984	3,932,183	10,785,130	4,127,478	18,844,791
1985	5,879,782	7,218,699	4,231,482	17,329,963
1986	5,114,117	7,278,454	4,072,918	16,465,489
1987	4,904,350	8,485,430	4,158,957	17,548,737
1988	4,645,585	10,115,801	4,045,511	18,806,897
1989	4,641,121	10,821,554	4,182,297	19,644,972
1990	2,940,501	12,878,008	4,383,065	20,201,574
1991	3,241,214	13,800,320	4,482,144	21,523,678
1992	2,965,892	13,477,715	4,785,693	21,229,300
1993	4,182,883	13,388,440	4,940,904	22,512,227
1994	4,467,169	12,947,467	4,985,641	22,400,277
1995	3,853,084	14,391,688	5,044,096	23,288,868
1996	4,462,034	13,666,913	5,239,089	23,368,036
1997	4,178,220	15,199,762	5,341,234	24,719,216
1998	4,347,583	15,466,476	5,454,188	25,268,247
1999	5,919,479	15,331,833	6,065,591	27,316,903
2000	6,248,874	14,184,768	6,538,559	26,972,201
2001	7,348,287	15,257,107	6,517,173	29,122,567
2002	6,789,230	14,998,304	6,131,085	27,918,619
2003	7,612,637	15,264,160	6,236,254	29,113,051
2004	8,935,467	18,144,940	5,957,358	33,037,765
2005	8,284,312	17,109,280	5,348,287	30,741,879
2006	9,351,407	14,497,361	5,562,495	29,411,263
2007	9,971,520	14,495,298	5,787,115	30,253,933
2008	9,532,196	17,295,879	6,261,610	33,089,685
2009	8,944,532	15,437,197	6,824,424	31,206,153
2010	8,841,629	16,156,019	7,044,876	32,042,524
2011	9,744,896	15,479,892	7,030,864	32,255,652
2012	11,010,789	16,837,946	6,839,019	34,687,754
2013	9,304,760	16,787,853	6,596,316	32,688,929
2014	7,820,725	15,359,225	3,189,955	26,369,905
2015	8,248,315	13,082,151	3,345,606	24,676,072
2016	9,098,211	13,461,317	3,313,162	25,872,690
2017	10,474,529	12,578,850	3,311,293	26,364,672
2018	9,461,343	12,163,895	3,396,572	25,021,810
2019	8,572,773	10,984,540	3,253,164	22,810,477

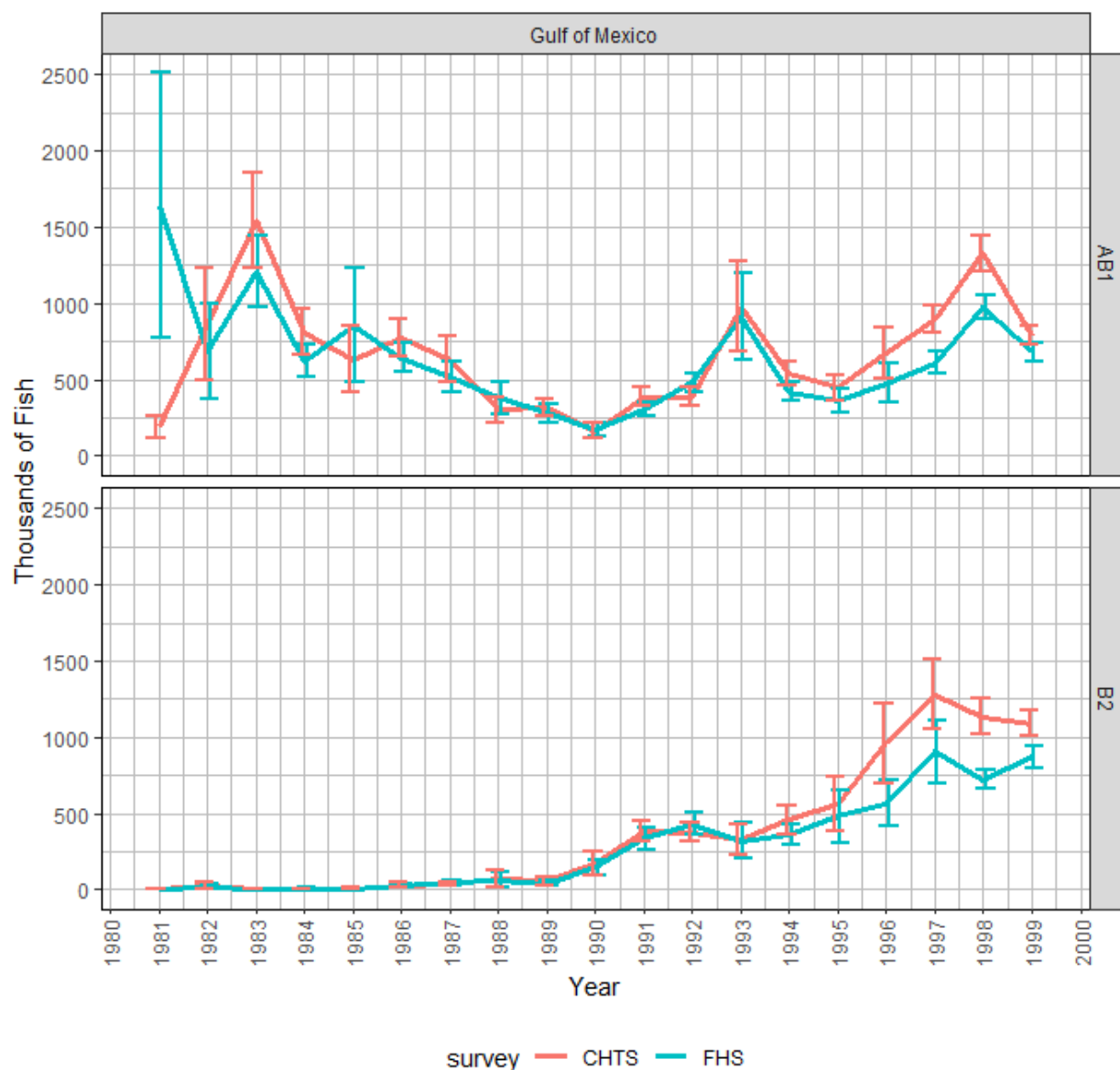


Figure 1. Comparison of charterboat landings (AB1) and discard (B2) estimates (with standard error intervals shown) for Red Snapper from the Coastal Household Telephone Survey (CHTS) and For-Hire Survey (FHS) from the Gulf of Mexico between 1981 and 1999 (MRIP). The charterboat calibration approach is discussed in Dettloff and Matter (2019a). Figure does not include adjustments to the FHS-calibrated estimates of Alabama for-hire in 1981 wave-2.

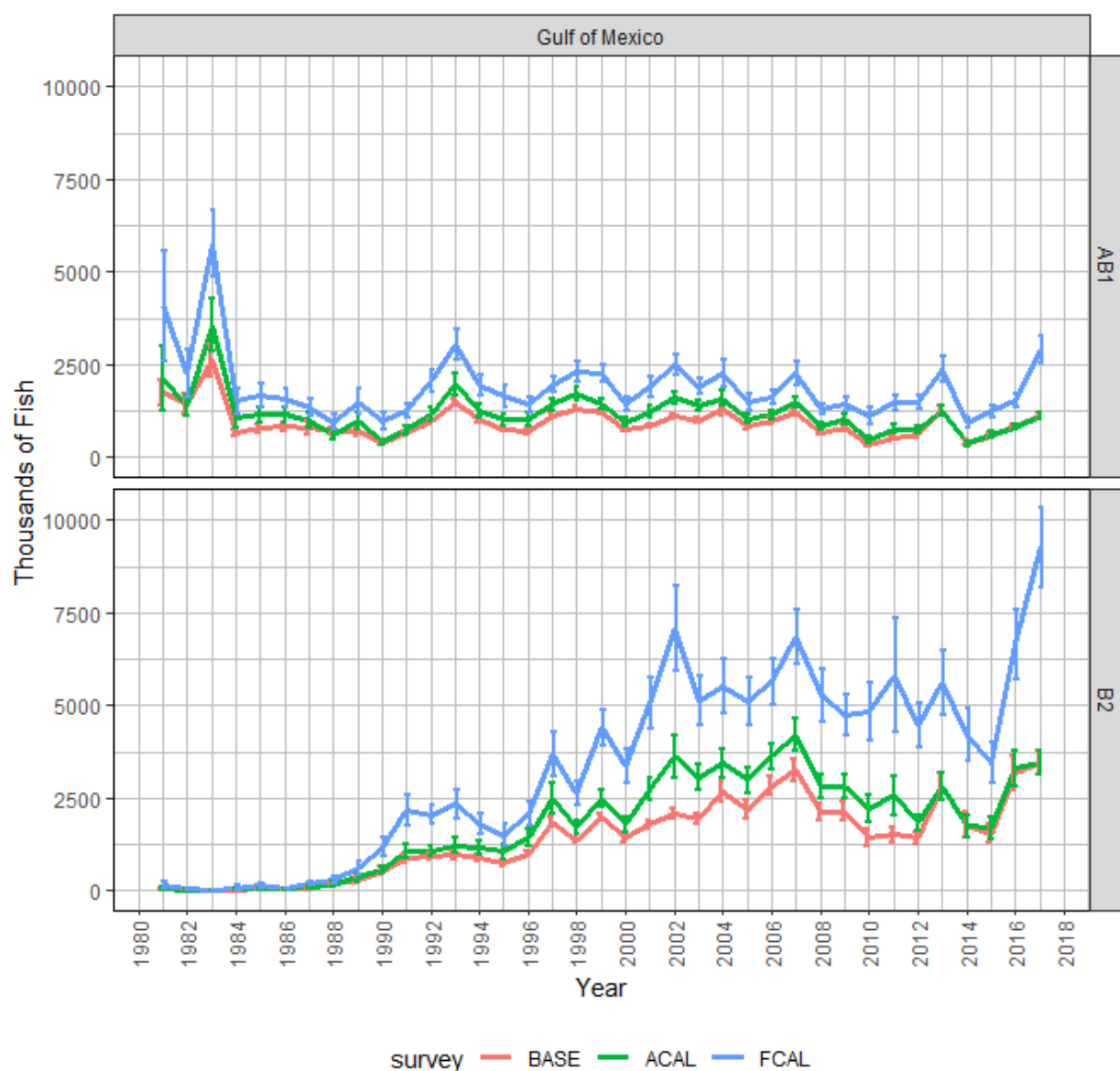


Figure 2. MRIP Base (BASE), APAIS Calibrated (ACAL), and Fully Calibrated APAIS and FES (FCAL) catch estimates for Red Snapper in the Gulf of Mexico between 1981 and 2017. Landings (AB1) and discard (B2) estimates are in thousands of fish (NMFS). The Shore mode is also included as uncertainty estimates for catch across multiple modes are only available when all modes are selected. Figure does not include any MRIP catch estimates imputed by the SEFSC for 1981 wave1 or adjustments to the Alabama for-hire estimates for 1981 wave-2.

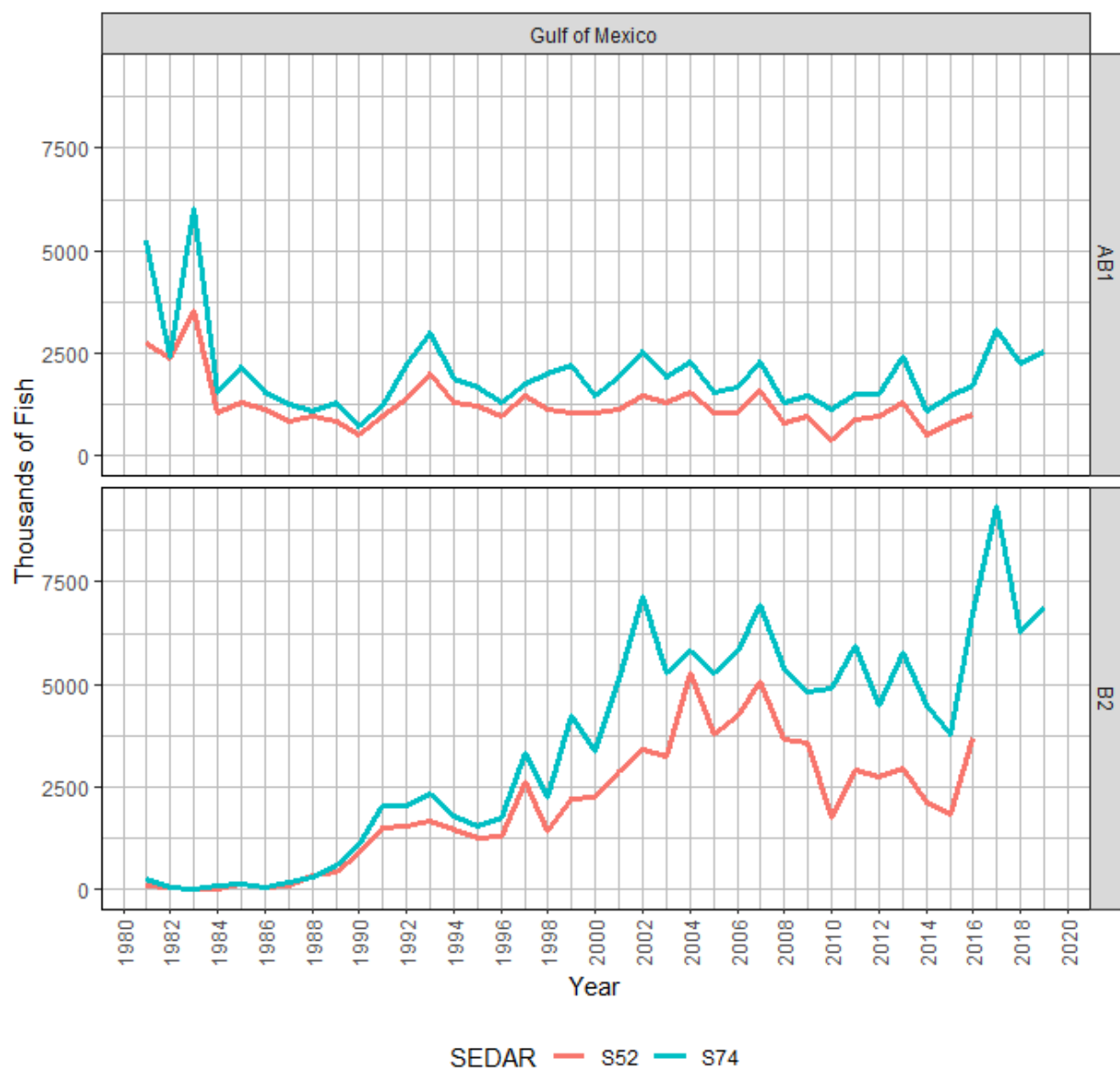


Figure 3. Comparison of total general recreational landings (AB1) and discard estimates (B2) for Gulf of Mexico red snapper between SEDAR 74 and SEDAR 52, the terminal years of which are 2019 and 2016 respectively. Differences in catch estimates, which are in thousands of fish, are largely a function of changes in the MRIP survey (i.e., FES in 2018).

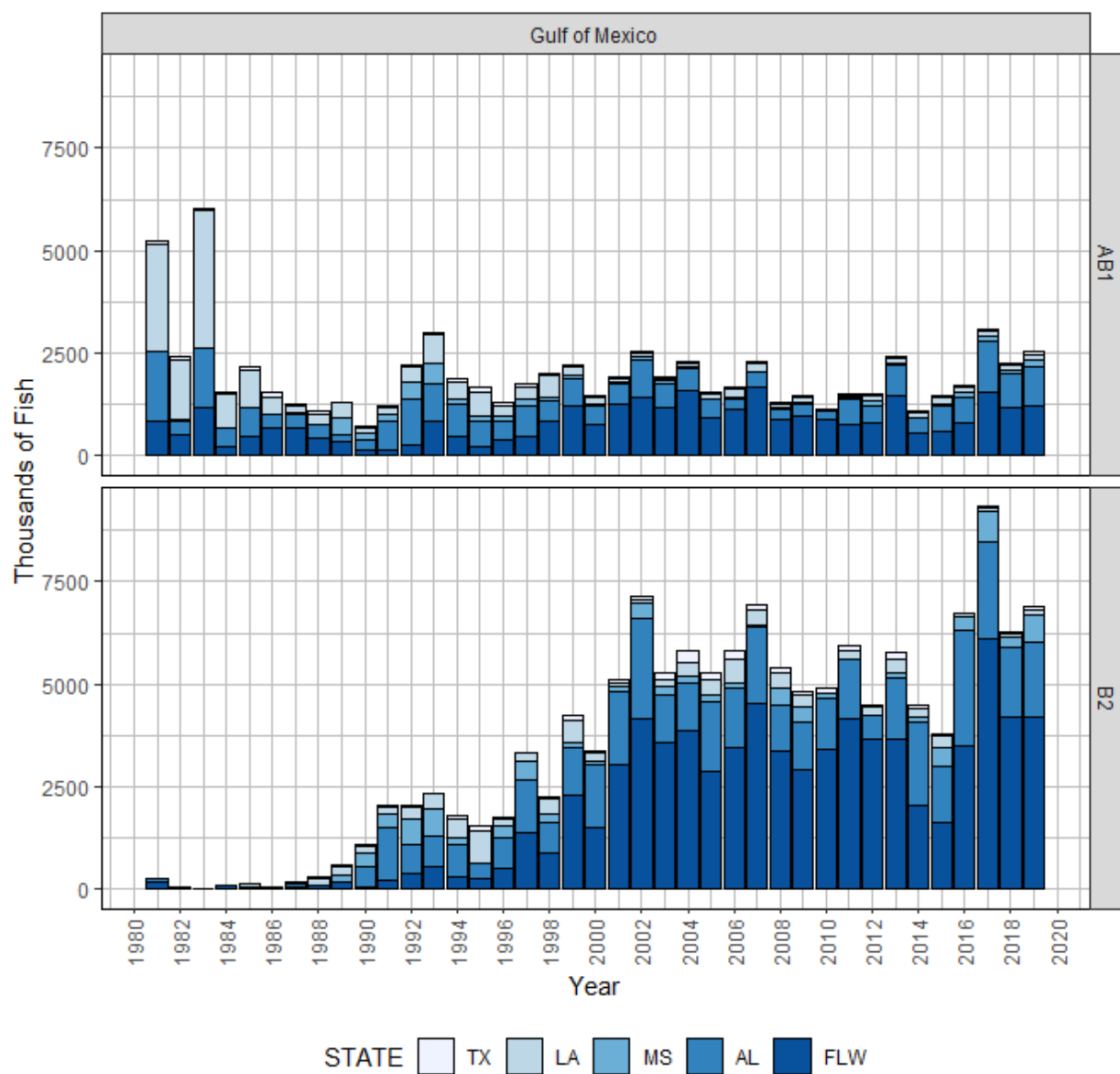


Figure 4. Annual Red Snapper landings (AB1) and discards (B2), in thousands of fish, by state from 1981 to 2019 (MRIP, LACreel 2014+, TPWD).

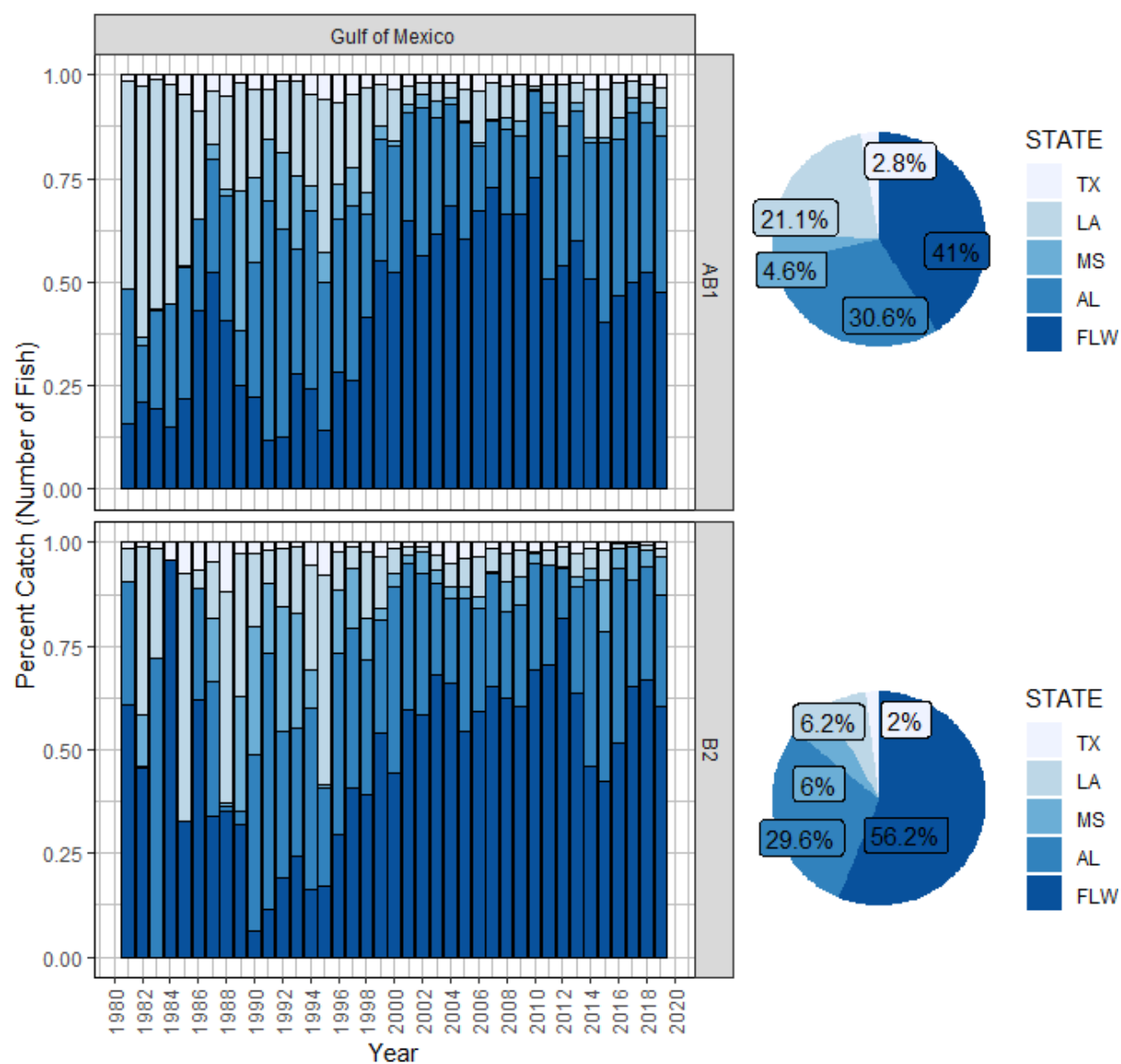


Figure 4a. Percent of Red Snapper landings (AB1) and discards (B2), in numbers of fish, from each state by year (bar graph) and overall (pie chart) between 1981 and 2019 (MRIP, LACreel 2014+, TPWD).

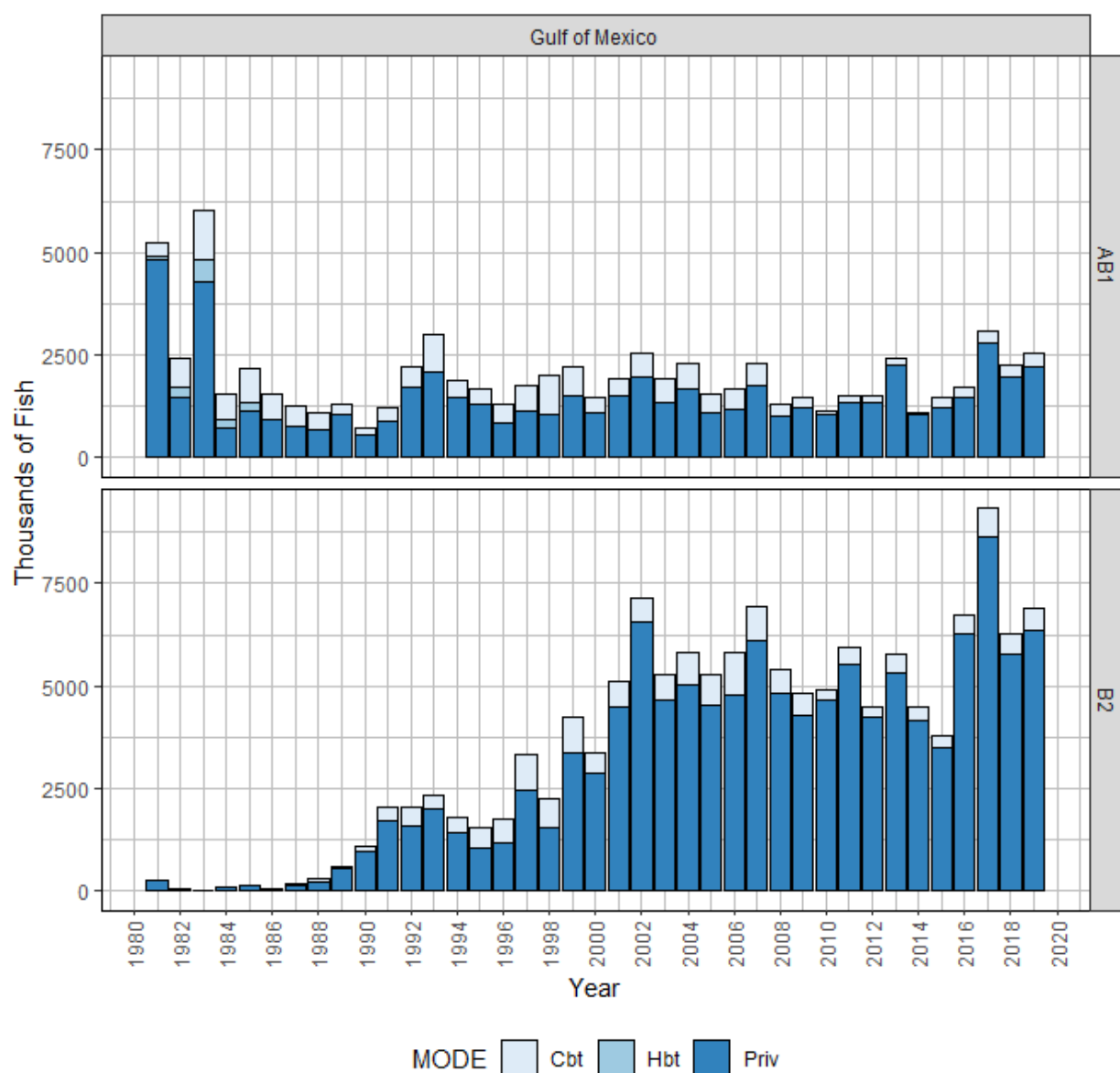


Figure 5. Annual Red Snapper landings (AB1) and discards (B2), in thousands of fish, by mode from 1981 to 2019 (MRIP, LACreel 2014+, TPWD). Note that catch from the combined private-shore fishing mode in the LA Creel survey has been added to the private mode.

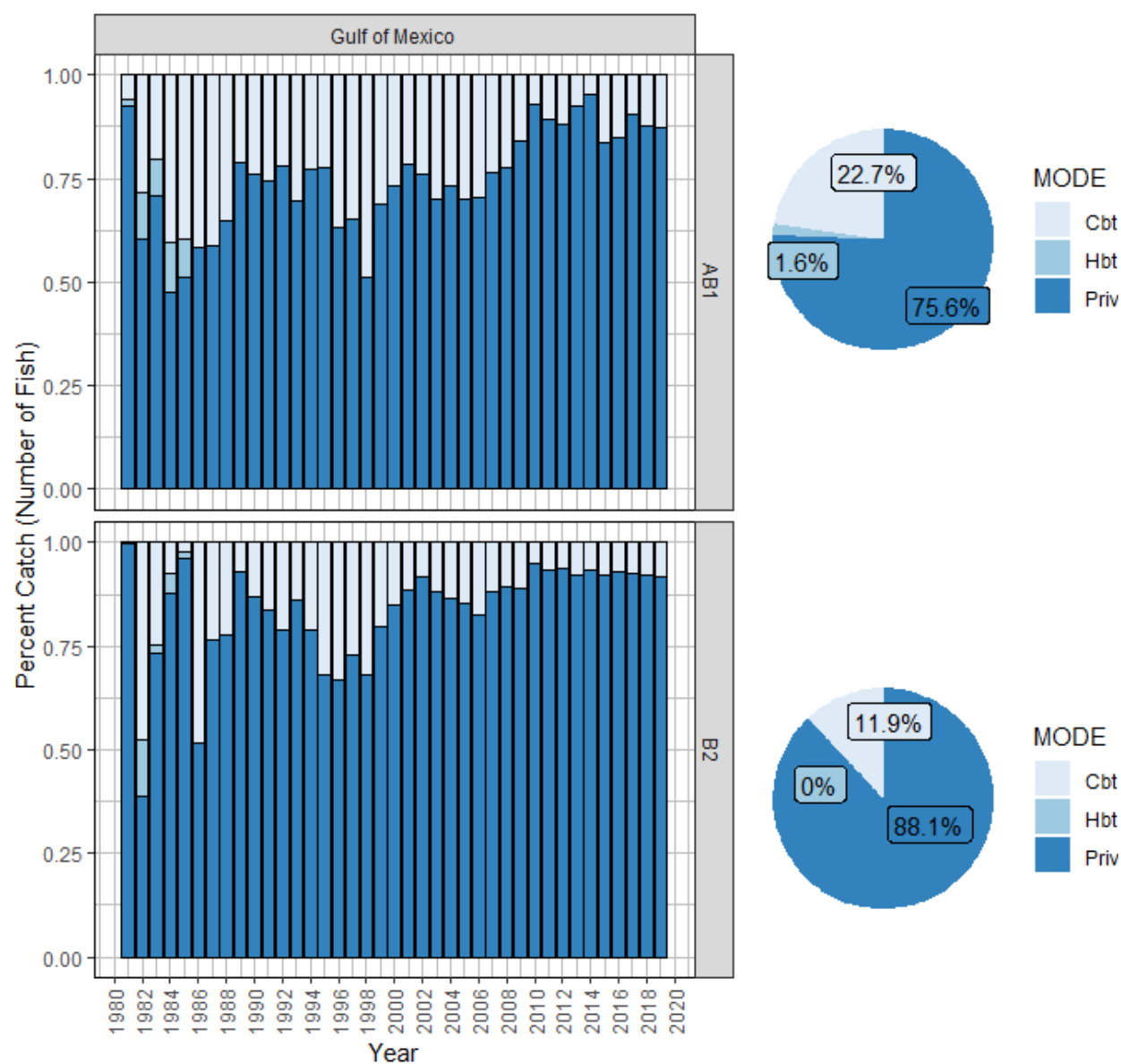


Figure 5a. Percent of Red Snapper landings (AB1) and discards (B2), in numbers of fish, from each mode by year (bar graph) and overall (pie chart) between 1981 and 2019 (MRIP, LACreel 2014+, TPWD). Note that catch from the combined private-shore fishing mode in the LA Creel survey has been added to the private mode.

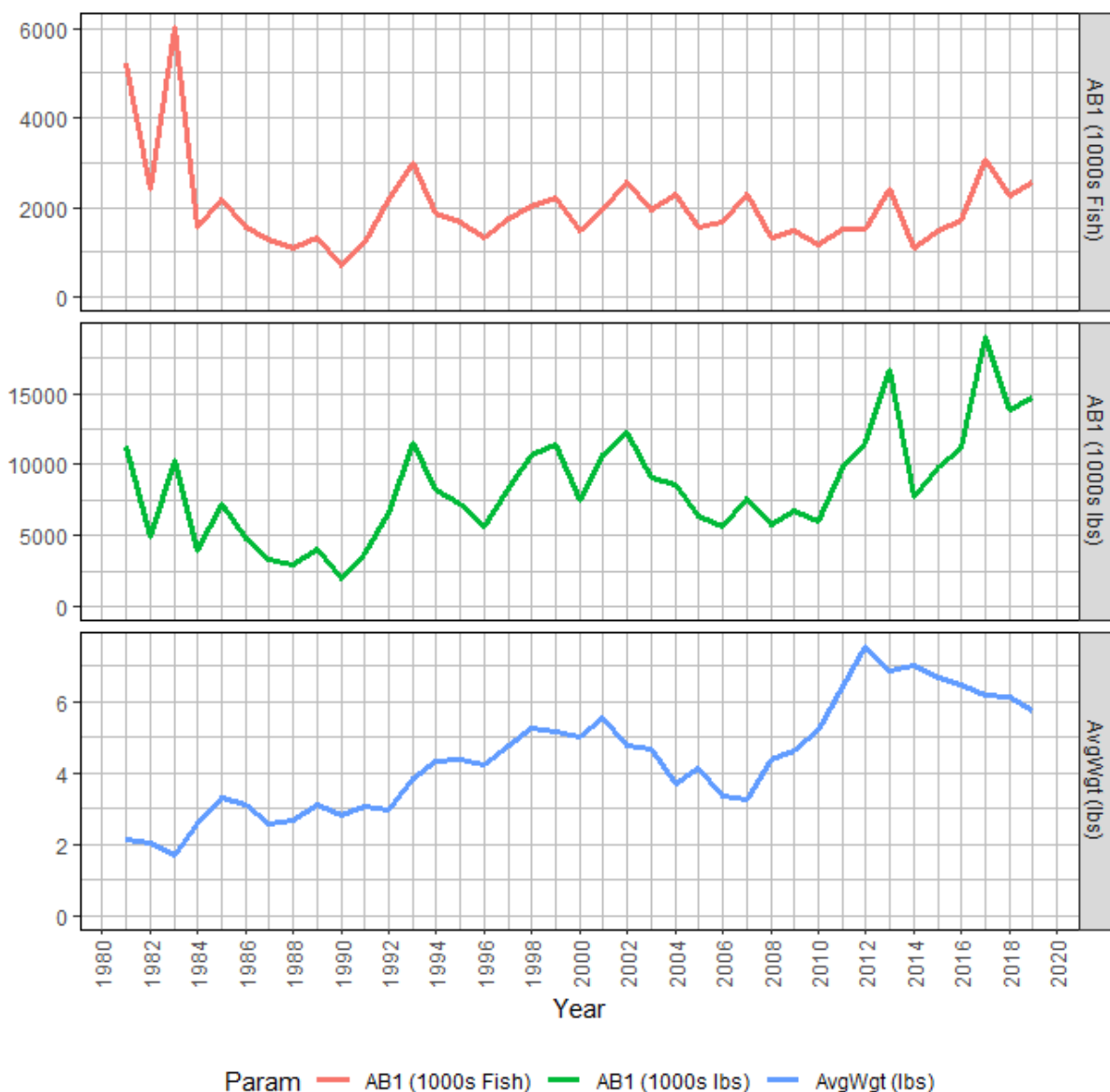


Figure 6. Estimates of annual landings for Red Snapper in the Gulf of Mexico (MRIP, LACreel 2014+, TPWD): estimated landings in thousands of fish (top), estimated landings in thousands of pounds whole weight (middle), and average weight of landed fish (estimated lbs/estimated fish) (bottom). Average weight estimates are calculated by strata using the following hierarchy: species, region, year, state, mode, wave, and area (Matter and Rios 2013). The minimum number of weights used at each level of substitution is fifteen fish, except for the final species level where the minimum is one fish (Dettloff and Matter 2019b).

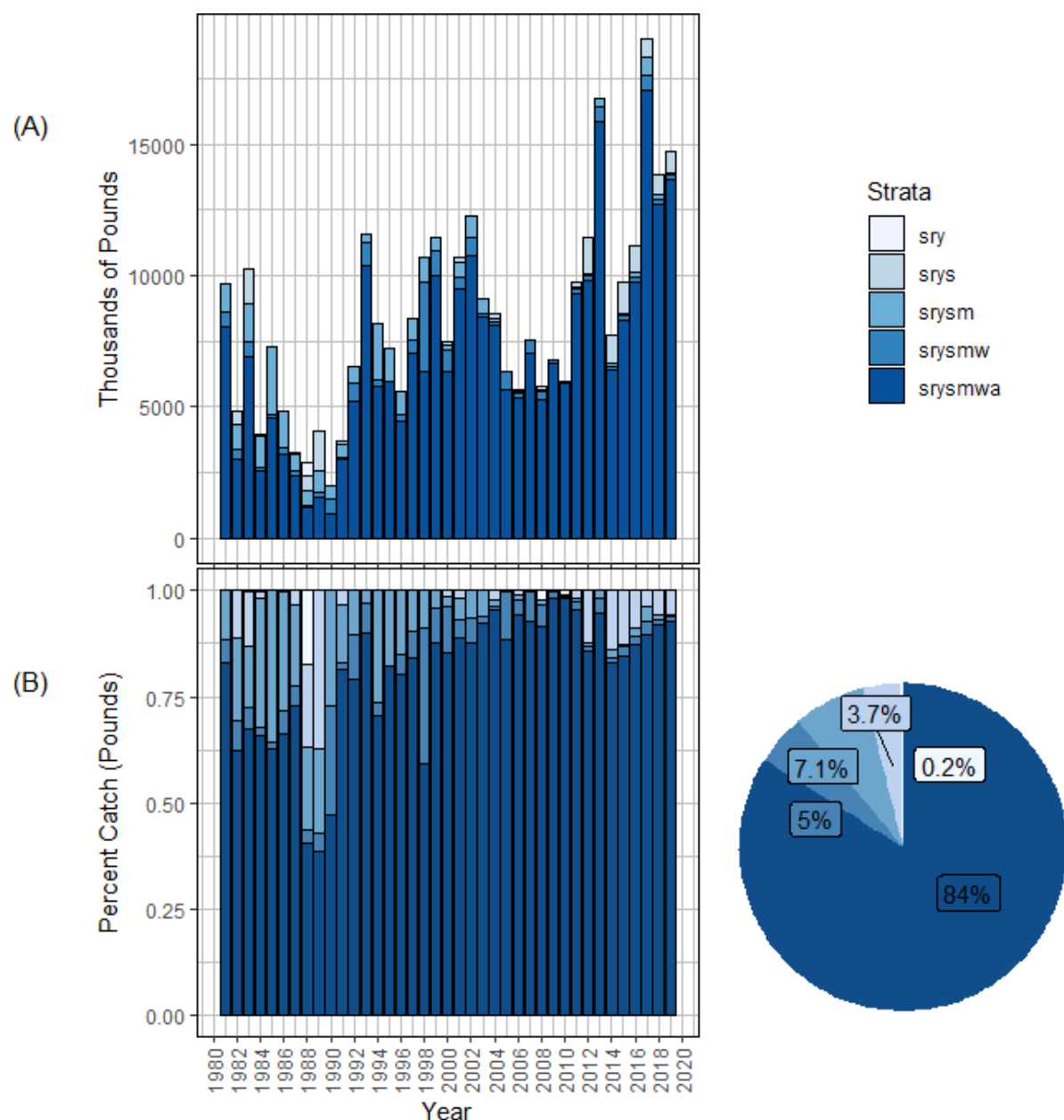


Figure 7. Annual landings estimates of Gulf of Mexico Red Snapper in thousands of pounds whole weight by hierarchy level (MRIP, LACreel 2014+, TPWD), defined by *species*, *region*, *year*, *state*, *mode*, *wave*, and *area*. Landings are grouped by the strata at which average weights were estimated, the finest stratification being at the *srysmwa* level (Matter and Rios 2013). As an example, (*srysmw*) summarizes those landings-in-weight estimates originating from cells where average weights are specific to a particular *species*, *region*, *year*, *state*, *mode*, and *wave* (i.e., weight observations collapsed across areas). Landings are provided (A) in absolute pounds and (B) as a percentage of total landings-in-weight, which is summarized by year (stacked bar plot) and across all years (pie chart).

Appendix A

Additional Details of Survey Data and SEFSC Estimation

- **MRIP Survey Methodology:** Fully calibrated estimates that take into account the change in the Fishing Effort Survey (FES; 2018), the redesigned Access Point Angler Intercept Survey (APAIS; 2013), and the For Hire Survey (FHS; 2000 for all Gulf of Mexico states).
 - Papacostas and Foster (2021) provide descriptions of the approaches used by the Office of Science and Technology to calibrate MRIP (1) effort estimates derived from the legacy Coastal Household Telephone Survey (CHTS) into FES units for the private and shore modes and (2) catch rate estimates between the original and redesigned APAIS for all modes.
 - SEFSC calibrations of catch and effort estimates between CHTS and FHS units are calculated for for-hire by year, region, state, wave, and area fished according to Dettloff and Matter (2019a). Figure 1 summarizes the resultant scaling of CHTS catch estimates under the FHS calibration ratios.
- **MRIP Data Gap from COVID:** Missing 2020 intercepts were imputed from all APAIS data collected in 2018 and 2019 from the same strata as the 2020 data gap, with original sample weights reduced by a factor of two to account for using two years of data (Cody 2021).
- **SEFSC Weight Estimation:** Average (fish) weight estimates are calculated by strata using the following hierarchy: species, region, year, state, mode, wave, and area (Matter and Rios 2013). The minimum number of weights used at each level of substitution is fifteen fish, except for the final species level where the minimum is one fish (Dettloff and Matter 2019b). Size records above an allowable (max size) threshold are excluded from weight estimation and the summary tables included in this working paper (Tables 8-15). For SEDAR 74 red snapper, this includes any weights heavier than 52.668 pounds.
- **SEFSC Estimates derived using SEDAR best practices (SEDAR-PW-07):**
 - The MRFSS survey began in wave2 of 1981. To fill-in this (1981 wave1) MRIP data gap, the proportion of wave1 catch to that from other waves (2-6) in years 1982-1984 (by fishing mode and area) was multiplied by the total catch from waves 2-6 in 1981.
 - Landings estimates from the TPWD survey are available starting in May (wave3) 1983. The average catch (by mode and wave) from waves 1-2 in 1984-1985 and average catch from waves 3-6 in years 1983-1985 were used to fill-in these (1981-1983) data gaps in Texas recreational landings.
 - The TPWD survey does not estimate discards. As a proxy for recreational discards from Texas private and charterboat anglers, discard:landings ratios (B2:AB1) are calculated (by year and mode) from Louisiana catch estimates and multiplied by TPWD landings estimates.

- To ensure sampling can support MRIP estimates at finer stratifications than for which the survey was designed, (sub-state) domain estimates are only generated for established geographic domains. For Florida, this includes the sub-state domains of Florida in the FHS (1 = Florida panhandle, Escambia to Dixie; 2 = western Florida, Levy to Collier; 3 = Florida Keys).
- Between 1981 and 1985 in the Gulf of Mexico, MRIP charter and headboat modes were combined into a single (for-hire) mode for estimation purposes. Since the NMFS Southeast Region Headboat Survey (SRHS) began in 1986 in the Gulf, the MRIP combined for-hire mode must be split to provide estimates of headboat landings in these early years. Estimates for the MRIP for-hire mode (1981-1985) were split using a ratio of SRHS headboat angler trip estimates to MRIP charterboat angler trip estimates for 1986-1990, calculated by state (or state equivalent to match SRHS areas to MRIP states).
- The LA Creel survey replaced MRIP sampling of Louisiana anglers in Jan 2014, but has only collected discard information for red snapper since 2016. As a proxy for LA discards between 2014-2015, LA Creel landings estimates for 2014-2015 were multiplied by the mean ratio of Louisiana discards:landings (by mode) between 2011-2013 (MRIP) and 2016-2018 (LA Creel).