General Recreational Survey Data for King Mackerel in the Gulf of America

Matthew A. Nuttall

SEDAR99-WP-08

27 March 2026

Please cite this document as:

Nuttall, Matthew A. 2026. General Recreational Survey Data for King Mackerel in the Gulf of America. SEDAR99-WP-08. SEDAR, North Charleston, SC. 45 pp.

SEDAR 99-DW-08

General Recreational Survey Data for King Mackerel in the Gulf of America

NOAA Fisheries
Southeast Fisheries Science Center
Sustainable Fisheries Division
Data Analysis and Assessment Support Branch

Matthew A. Nuttall

03-27-2026

General recreational catch estimates for King Mackerel are compiled from the following separate sampling programs:
1. Marine Recreational Information Program (MRIP) (SEDAR68-DW-13)
2. Texas Parks and Wildlife Department (TPWD) Creel survey (SEDAR70-WP-03)
3. Louisiana Creel survey program (LA Creel; 2014+)

Parameters for data prepared for SEDAR 99 recreational catch data:

- Species: King Mackerel
- Year Range: 1981 – 2024
  - Provided by FISHING year, defined as July 01 through June 30. As an example, the 1981 fishing year is set as 7/1/1981 to 6/30/1982. Unless otherwise stated, all summaries herein are based on FISHING year.

- Geographic Range: Gulf of America states from Texas to western Florida, including the Florida Keys.
    - The Florida Keys only included when attributed to the winter mixing zone, defined as Monroe County from November 01 through March 31, half of the estimates of which are attributed to the GULF stock. This is an improvement over the GenRec data provided in S38U, for which (half of) Monroe County catch across the entire year was attributed to the GULF stock, but which had relatively little effect on the overall time series.
- Fishing Modes: Charter, Headboat (1981-1985, excluding the Florida Keys), Private, Shore
- Weight Units: whole weight
- MRIP Calibration: 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). These calibrations allow for estimates in the entire time series to be compared to one another.
- TPWD Calibration: Applied ratio estimator developed from MRIP-FES study conducted in Texas in 2016 (SEDAR 74-RD-110) to calibrate TPWD catch and effort estimates for the private mode into MRIP-FES units (SEDAR 74-DW-10). This calibration was not available and so not applied in past assessments for Gulf king mackerel, and is responsible for most of the differences noted in the continuity comparison conducted for SEDAR 99 (Figure 3).
- LA Creel Calibration: Overlap in catch of Louisiana king mackerel between the MRIP and LA Creel surveys in the 2015 benchmarking year was considered inadequate to estimate a calibration factor for private estimates, which were not adjusted. Charter estimates between these two surveys are assumed equivalent and were also not adjusted (SEDAR 74-DW-04).
- 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 7-10). For SEDAR 99 King Mackerel, this includes any weights heavier than 103.95 pounds.

Summary of Data Imputations. Imputation Methods are discussed in the Appendix.

Estimate	Strata	Imputed	Rationale
Catch	1981 Wave1 (TX-FLW)	No	Strata dropped as part of the incomplete 1980 fishing year
Catch	1981 - 1983 (Texas)	Yes	Texas catch in 1983-1985 was not negligible
Discards	1981+ (Texas)	Yes	Discards in adjacent states were not negligible
Discards	2014 - 2015 (Louisiana)	Yes	Discards in adjacent states were not negligible
Effort	1981 Wave1 (TX-FLW)	No	Strata dropped as part of the incomplete 1980 fishing year
Effort	1981 - 1983 (Texas)	Yes	Effort is not species-specific, need to account for Texas effort in 1981-1983 before TPWD started

Catch and Sample Size Information for Particular Domains:

Annual estimates that appear relatively large/small compared to the adjacent years were further investigated by identifying and summarizing which strata were disproportionately contributing to the estimate. Estimates investigated are more likely to be high given the inherent zero-boundary constraint in catch data (>=0) that complicates identification of low estimates.

- 1986 landings estimate: 783,332 fish
  - Stratum: western Florida, private, wave 3, and ocean <= 10 miles
  - Intercept Records: a total of 63 angler trips that resulted in a landings estimate of 100,384 fish (12.8% of the total annual estimate)

Catch Observation	*Minimum*	*Median*	*Mean*	*Maximum*
Harvest seen by interviewer	0	0.974	1.34	6
Harvest not seen by interviewer	0	0	0.97	18
Released live fish	0	0	0.08	3

  - No single intercept contributed more than 50% to the total landings estimate for this stratum, with the largest contribution being from the one intercept that harvested 18 King Mackerel, responsible for 10.7% of the total landings estimate for this stratum and 1.4% of that for the year.

  - Stratum: Texas, private, wave 4, and ocean > 10 miles
  - Intercept Records: a total of 172 angler trips that resulted in a calibrated landings estimate of 98,940 fish (12.6% of the total annual estimate)

Catch Observation	*Minimum*	*Median*	*Mean*	*Maximum*
Harvest seen by interviewer	0	0	1.35	12

- 1989 discard estimate: 431,720 fish
  - Stratum: western Florida, shore, wave 4, and ocean <= 10 miles
  - Intercept Records: a total of 4 angler trips that resulted in a discard estimate of 316,042 fish (73.2% of the total annual estimate)
    - One angler trip released 50 live King Mackerel
    - One angler trip released 1 live King Mackerel
    - Two angler trips that released no live King Mackerel
  - The intercept that released 50 King Mackerel accounts for 97.8% of the total discard estimate for this stratum, and 71.6% of that for the year.

- 1991 landings estimate: 1,165,716 fish
  - Stratum: western Florida, shore, wave 4, and ocean <= 10 miles
  - Intercept Records: a total of 4 angler trips that resulted in a landings estimate of 116,964 fish (10.0% of the total annual estimate)
    - One angler trip harvested 4 King Mackerel (NOT seen by interviewer)
    - Three angler trips harvested 1 King Mackerel (NOT seen by interviewer)
  - The intercept that harvested 4 King Mackerel accounts for 61.3% of the total landings estimate for this stratum, but only 6.2% of that for the year.

  - Stratum: western Florida, shore, wave 5, and ocean <= 10 miles
  - Intercept Records: a total of 2 angler trips that resulted in a landings estimate of 105,915 fish (9.1% of the total annual estimate)
    - One angler trip harvested 5 King Mackerel, 4 seen by the interviewer and 1 NOT seen by the interviewer
    - One angler trip harvested 3 King Mackerel (seen by interviewer)
  - The intercept that harvested 5 King Mackerel accounts for 64.7% of the total landings estimate for this stratum, but only 5.9% of that for the year.

  - Stratum: Texas, private, wave 4, and ocean > 10 miles
  - Intercept Records: a total of 254 angler trips that resulted in a calibrated landings estimate of 101,610 fish (8.7% of the total annual estimate)

Catch Observation	*Minimum*	*Median*	*Mean*	*Maximum*
Harvest seen by interviewer	0	2	2.42	10

- 2001 discard estimate: 1,073,180 fish
  - Stratum: western Florida, shore, wave 6, and ocean <= 10 miles
  - Intercept Records: a total of 2 angler trips that resulted in a discard estimate of 427,803 fish (39.9% of the total annual estimate)
    - One angler trip released 82 live King Mackerel
    - One angler trip harvested 1 King Mackerel (seen by interviewer)
  - The intercept that released 82 King Mackerel accounts for 100% of the total discard estimate for this stratum, and 39.9% of that for the year.

  - Stratum: western Florida, shore, wave 3, and ocean <= 10 miles
  - Intercept Records: a total of 33 angler trips that resulted in a discard estimate of 107,606 fish (10.0% of the total annual estimate)

Catch Observation	*Minimum*	*Median*	*Mean*	*Maximum*
Harvest seen by interviewer	0	0	0.51	2
Harvest not seen by interviewer	0	0	0.82	8
Released live fish	0	0	0.45	2

  - No single intercept contributed more than 50% to the total discard estimate for this stratum, with the largest contribution being from the one intercept that released 8 King Mackerel, responsible for 36.2% of the total discard estimate for this stratum and 3.6% of that for the year.

- 2004 discard estimate: 795,669 fish
  - Stratum: western Florida, private, wave 2, and ocean <= 10 miles
  - Intercept Records: a total of 11 angler trips that resulted in a discard estimate of 182,855 fish (23.0% of the total annual estimate)
    - One angler trip harvested 2 King Mackerel (seen by interviewer) and released 25 live King Mackerel
    - Two angler trips released 5 live King Mackerel
    - One angler trip released 4 live King Mackerel
    - One angler trip released 3 live King Mackerel
    - One angler trip released 2 live King Mackerel
    - Three angler trips released 1 live King Mackerel, one of which harvested 6 King Mackerel (seen by interviewer)
    - One angler trip harvested 2 King Mackerel (seen by interviewer)
    - One angler trip harvested 1 King Mackerel (seen by interviewer)
  - No single intercept contributed more than 50% to the total discard estimate for this stratum, with the largest contribution being from the one intercept that released 25 King Mackerel, responsible for 32.7% of the total discard estimate for this stratum and 12.6% of that for the year.

  - Stratum: western Florida, shore, wave 4, and ocean <= 10 miles
  - Intercept Records: a total of 11 angler trips that resulted in a discard estimate of 115,157 fish (14.5% of the total annual estimate)
    - Two angler trips released 10 live King Mackerel
    - Two angler trips released 3 live King Mackerel
    - Two angler trips released 2 live King Mackerel
    - Two angler trips released 1 live King Mackerel
    - One angler trip harvested 2 King Mackerel (one fish seen by interviewer, one NOT seen)
    - Two angler trips harvested 1 King Mackerel (NOT seen by interviewer)
  - No single intercept contributed more than 50% to the total discard estimate for this stratum, with the largest contribution being from the two intercepts that each released 10 King Mackerel, each responsible for 30.9% of the total discard estimate for this stratum and, together, 8.9% of that for the year.

- 2014 landings estimate: 982,685 fish
  - Stratum: western Florida, shore, wave 4, and ocean <= 10 miles
  - Intercept Records: a total of 10 angler trips that resulted in a landings estimate of 104,057 fish (10.6% of the total annual estimate)
    - One angler trip harvested 2 King Mackerel (NOT seen by interviewer)
    - Five angler trips harvested 1 King Mackerel (seen by interviewer)
    - Three angler trips harvested 1 King Mackerel (NOT seen by interviewer)
    - One angler trip released 1 live King Mackerel
  - No single intercept contributed more than 50% to the total landings estimate for this stratum, with the largest contribution being from the one intercept that harvested 2 King Mackerel (NOT seen by interviewer), responsible for 22.4% of the total landings estimate for this stratum and 2.4% of that for the year.

- 2015 discard estimate: 487,795 fish
  - Stratum: western Florida, shore, wave 3, and ocean <= 10 miles
  - Intercept Records: a total of 13 angler trips that resulted in a discard estimate of 268,943 fish (55.1% of the total annual estimate)
    - One angler trip released 7 live King Mackerel and harvested 2 King Mackerel (NOT seen by interviewer)
    - One angler trip released 5 live King Mackerel and harvested 2 King Mackerel (NOT seen by interviewer)
    - Three angler trips released 3 live King Mackerel, one of which harvested 1 King Mackerel (seen by interviewer) and the other harvested 2 King Mackerel (NOT seen by interviewer)
    - Two angler trips released 2 live King Mackerel, one of which harvested 1 King Mackerel (seen by interviewer)

    - One angler trip released 1 King Mackerel
    - Two angler trips that harvested 2 King Mackerel, one seen by interviewer and one NOT seen by interviewer
    - Three angler trips that harvested 1 King Mackerel, two seen by interviewer and one NOT seen by interviewer
- No single intercept contributed more than 50% to the total discard estimate for this stratum, with the largest contribution being from the one intercept that released 7 King Mackerel, responsible for 41.3% of the total discard estimate for this stratum and 22.8% of that for the year.

Discussion

Generally speaking, the strata investigated above with relatively high estimates tend to be the result of relatively high catches being observed across multiple intercepts. Considering the associated sampling weights (i.e., *WP_CATCH*), there were few cases of a single intercept constituting the majority (>50%) of the strata-level catch estimate, with the most any single intercept contributing tending to be between 10-35% in the above exploration. This support for high catch across multiple intercepts suggests that these catch estimates either reflect real trends in the fishery or represent the true variability in MRIP catch estimates for Gulf King Mackerel.

Exceptions to this include discard estimates for FLW shore anglers in 1989 and in 2001, where a single angler trip accounted for 71.6% and 39.9% of the total annual estimates, respectively. These two intercepts also had suspiciously high reports of discarded King Mackerel, of 50 and 82 fish, respectively, which naturally cannot be verified by dockside samplers given they are reports of discarded fish.

Another exception to this includes the landings estimate for FLW shore anglers in 1991, two strata of which were informed by a single angler trip that accounted for >50% of the associated strata-level estimate, but only 6.2% and 5.9% of the total annual estimate. Although this harvest was not seen by the interviewer, the reported catch was of 4 and 5 fish respectively, which seem to fall within the distribution of plausible catch values for Gulf King Mackerel.

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.

Personal Communication from the National Marine Fisheries Service (NMFS), Office of Science and Technology, Fisheries Statistics Division. Recreational Fisheries Statistics Queries. US Department of Commerce. Retrieved Mar 17, 2026.

NMFS Office of Science and Technology. 2019. SEDAR 74-RD-110. Texas Fishing Effort Survey – Final Project Report. National Marine Fisheries Service (NMFS) Office of Science and Technology (OST) Fisheries Statistics Division. Silver Spring, MD.

NMFS Office of Science and Technology. 2022. SEDAR 74-DW-10. Methodology Description for a Calibration of Texas Private Boat Red Snapper Annual Landings Estimates. National Marine Fisheries Service (NMFS) Office of Science and Technology (OST) Fisheries Statistics Division. Silver Spring, MD.

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) Sustainable Fisheries 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

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

Zhang, X, J West, and J Adriance. 2022. SEDAR 74-DW-04. LA Creel/MRIP Red Snapper Private Mode Landings and Discards Calibration Procedure. Louisiana Department of Wildlife and Fisheries (LDWF) Office of Fisheries. Baton Rouge, LA.

Table 1. Annual landings (AB1) and discards (B2) of King Mackerel in numbers of fish by state and year from all data sources (MRIP, LACreel 2014+, TPWD).

	TX		LA		MS		AL		FLW		Total	
Year	AB1	B2	AB1	B2	AB1	B2	AB1	B2	AB1	B2	AB1	B2
1981	319,425	24,921	47,727	3,306	0	0	118,503	2,034	117,763	6,086	603,418	36,348
1982	301,536	32,627	120,675	46,647	6,135	0	131,855	0	204,024	250	764,225	79,524
1983	322,913	42	27,441	0	2,278	0	20,893	0	350,894	44	724,419	86
1984	383,781	8,352	40,313	0	5,934	3,732	139,446	0	249,633	15,050	819,107	27,134
1985	258,335	28,049	13,650	0	15,916	0	82,039	20,534	202,035	8,170	571,975	56,753
1986	172,729	8,291	16,918	0	2,460	0	74,783	5,510	516,443	73,535	783,332	87,336
1987	139,948	18,704	1,707	0	2,370	94	44,053	4,653	331,767	107,796	519,845	131,247
1988	112,336	67,479	11,509	0	4,329	0	17,558	0	272,364	78,456	418,095	145,935
1989	104,643	30,369	9,583	43,764	6,808	6,555	78,360	8,285	691,709	342,748	891,103	431,720
1990	110,408	11,978	0	0	1,949	74	110,554	31,437	724,106	229,601	947,017	273,091
1991	265,185	129,743	5,996	1,173	44,860	8,444	86,007	63,073	763,668	213,413	1,165,716	415,846
1992	179,506	127,779	17,709	3,228	19,259	2,483	82,644	4,181	411,586	97,206	710,703	234,877
1993	168,663	58,596	11,537	1,898	4,775	4,315	123,107	51,931	605,768	175,051	913,850	291,791
1994	172,363	114,341	23,199	10,211	3,225	0	147,177	55,703	632,149	322,689	978,112	502,943
1995	365,905	364,750	9,485	4,610	608	0	67,179	27,401	375,533	332,107	818,710	728,867
1996	332,014	245,543	14,862	12,413	16,822	0	66,723	81,615	586,028	201,094	1,016,450	540,665
1997	270,606	120,951	24,622	17,429	16,869	5,655	109,932	16,295	405,653	177,197	827,683	337,528
1998	221,992	77,912	4,185	5,798	731	147	104,446	59,661	493,908	142,276	825,262	285,794
1999	225,936	89,942	8,261	7,237	16,323	144	102,601	36,085	392,185	149,877	745,307	283,284
2000	203,419	120,212	5,551	20,279	6,451	8,029	189,881	57,005	505,786	297,413	911,089	502,939
2001	118,392	76,382	1,363	37,043	6,263	9,074	168,764	49,638	651,009	901,042	945,791	1,073,180
2002	190,902	106,388	15,898	23,032	16,435	3,763	89,978	40,188	407,724	188,753	720,937	362,123
2003	103,363	61,293	14,087	9,051	7,446	79	146,400	131,531	372,625	215,959	643,922	417,914

	TX		LA		MS		AL		FLW		Total	
Year	AB1	B2	AB1	B2	AB1	B2	AB1	B2	AB1	B2	AB1	B2
2004	141,332	109,069	797	422	14,236	0	128,318	92,477	519,307	593,701	803,991	795,669
2005	224,462	210,533	9,440	24,071	7	9,870	117,491	48,440	448,477	445,800	799,877	738,714
2006	185,711	151,340	7,485	3,398	4,862	322	97,514	56,038	582,729	378,879	878,301	589,977
2007	71,463	42,778	4,883	507	6,804	68	124,510	124,990	407,392	323,239	615,052	491,583
2008	103,408	62,102	1,383	2,063	881	0	45,842	26,903	627,594	293,886	779,107	384,953
2009	125,742	57,683	1,885	2,278	4,638	521	187,354	61,295	624,137	325,785	943,757	447,562
2010	46,967	24,124	0	0	241	0	174,014	42,819	376,455	187,208	597,678	254,151
2011	117,492	60,813	691	6,127	2,842	1,672	207,452	59,237	350,570	142,386	679,046	270,235
2012	88,818	51,349	1,187	0	37,195	1,256	214,983	78,965	471,568	224,951	813,750	356,521
2013	95,356	68,397	8,832	532	1,131	0	57,683	55,477	374,627	178,196	537,628	302,602
2014	105,883	91,068	4,136	3,231	1,164	31,525	232,374	100,198	639,128	223,195	982,685	449,217
2015	98,530	44,349	807	126	779	0	135,107	67,584	430,718	375,736	665,941	487,795
2016	91,488	54,656	2,446	207	1,643	9,985	102,725	228,169	499,357	127,937	697,659	420,954
2017	147,902	104,734	4,252	1,555	590	103	84,983	171,065	437,646	181,791	675,374	459,248
2018	182,403	48,312	3,461	794	19,858	1,877	167,747	29,560	284,934	37,916	658,403	118,459
2019	95,465	29,002	1,507	384	417	269	59,054	63,530	260,206	46,599	416,648	139,785
2020	56,637	19,430	1,547	770	12	0	92,601	39,926	238,838	97,677	389,635	157,804
2021	57,040	26,455	964	0	0	0	23,584	3,499	191,040	31,417	272,628	61,371
2022	24,294	13,791	81	5	518	7,724	20,049	21,411	114,621	46,417	159,563	89,349
2023	59,255	27,059	167	0	255	0	31,171	14,436	176,968	56,141	267,816	97,635
2024	15,042	7,253	37	0	656	0	69,170	14,765	107,771	55,691	192,677	77,710

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

	Shore		Hbt		Cbt		Priv		Total	
Year	AB1	B2	AB1	B2	AB1	B2	AB1	B2	AB1	B2
1981	98,239	2,034	5,545	0	40,617	0	459,017	34,313	603,418	36,348
1982	93,676	0	6,510	96	56,376	157	607,664	79,271	764,225	79,524
1983	22,850	0	25,095	0	81,073	86	595,401	0	724,419	86
1984	0	0	12,617	0	59,874	918	746,616	26,217	819,107	27,134
1985	0	6,484	18,502	0	46,925	32	506,548	50,238	571,975	56,753
1986	100,537	40,853			105,549	12,186	577,246	34,297	783,332	87,336
1987	54,340	0			39,124	71,571	426,381	59,677	519,845	131,247
1988	58,527	0			49,560	24,827	310,009	121,109	418,095	145,935
1989	128,957	316,042			83,189	5,926	678,957	109,752	891,103	431,720
1990	375,269	165,400			200,911	53,265	370,837	54,426	947,017	273,091
1991	373,161	29,488			186,136	19,444	606,419	366,915	1,165,716	415,846
1992	119,058	4,101			179,278	21,746	412,367	209,030	710,703	234,877
1993	138,737	27,691			138,062	6,797	637,051	257,304	913,850	291,791
1994	140,148	10,343			175,442	37,763	662,522	454,837	978,112	502,943
1995	32,710	9,241			163,442	20,997	622,558	698,629	818,710	728,867
1996	26,272	38,931			196,215	33,585	793,963	468,149	1,016,450	540,665
1997	14,988	21,753			129,823	9,842	682,871	305,933	827,683	337,528
1998	60,718	35,941			130,997	9,423	633,547	240,430	825,262	285,794
1999	44,085	20,587			128,766	13,297	572,456	249,401	745,307	283,284
2000	133,101	63,929			103,579	16,909	674,409	422,100	911,089	502,939
2001	238,730	607,333			97,110	16,109	609,950	449,738	945,791	1,073,180
2002	82,094	85,891			80,810	14,831	558,034	261,400	720,937	362,123
2003	96,490	92,614			68,328	15,953	479,105	309,346	643,922	417,914
2004	122,757	187,697			78,541	21,777	602,693	586,195	803,991	795,669
2005	68,221	250,961			69,804	10,635	661,852	477,119	799,877	738,714
2006	73,662	76,630			139,939	28,789	664,700	484,558	878,301	589,977
2007	65,230	103,953			113,795	26,092	436,027	361,538	615,052	491,583
2008	55,077	116,903			118,356	38,801	605,674	229,250	779,107	384,953
2009	265,051	59,931			142,466	15,392	536,239	372,238	943,757	447,562
2010	164,547	52,454			62,035	11,710	371,096	189,987	597,678	254,151
2011	163,402	34,767			81,772	15,454	433,872	220,015	679,046	270,235
2012	278,444	67,898			124,904	19,253	410,402	269,370	813,750	356,521
2013	142,314	91,401			81,127	10,597	314,186	200,605	537,628	302,602

	Shore		Hbt		Cbt		Priv		Total	
Year	AB1	B2	AB1	B2	AB1	B2	AB1	B2	AB1	B2
2014	275,899	38,938			167,070	33,789	539,716	376,490	982,685	449,217
2015	173,306	318,674			101,577	15,068	391,058	154,053	665,941	487,795
2016	113,909	162,704			133,727	26,291	450,023	231,959	697,659	420,954
2017	109,937	20,854			121,215	30,738	444,221	407,657	675,374	459,248
2018	166,928	2,312			88,403	16,516	403,072	99,630	658,403	118,459
2019	49,095	51,927			91,309	17,460	276,244	70,398	416,648	139,785
2020	55,452	33,683			90,981	9,756	243,203	114,364	389,635	157,804
2021	13,519	8,881			49,775	7,502	209,334	44,989	272,628	61,371
2022	45,877	19,204			27,428	11,512	86,259	58,633	159,563	89,349
2023	125,228	11,598			32,501	13,077	110,087	72,960	267,816	97,635
2024	45,674	25,775			26,107	5,085	120,896	46,850	192,677	77,710

Table 3. King Mackerel landings in numbers of fish (AB1) with associated coefficients of variation (CV; Dettloff et al. 2020) by mode and year from all data sources (MRIP, LACreel 2014+, TPWD). Sample size is provided both as the total number of primary sampling units (PSU) and angler trips (TRP) intercepted by dockside samplers and, in parentheses, the number of PSUs and TRPs that intercepted King Mackerel.

	Cbt				Hbt				Priv				Shore			
Year	AB1	CV	PSU	Trp	AB1	CV	PSU	Trp	AB1	CV	PSU	Trp	AB1	CV	PSU	Trp
1981	40,617	0.41	107 (16)	818 (27)	5,545	0.41	93 (16)	803 (27)	459,017	0.14	409 (26)	3,427 (35)	98,238	0.82	537 (5)	3,394 (7)
1982	56,376	0.55	160 (17)	1,340 (29)	6,510	0.53	103 (12)	1,272 (24)	607,664	0.27	543 (31)	4,716 (49)	93,676	0.71	520 (5)	3,720 (6)
1983	81,073	0.41	250 (44)	1,949 (85)	25,095	0.86	113 (29)	1,739 (52)	595,401	0.34	795 (83)	7,050 (227)	22,850	1.00	397 (1)	2,842 (1)
1984	59,874	0.41	195 (34)	1,571 (53)	12,616	0.59	93 (17)	1,353 (28)	746,616	0.22	807 (101)	6,101 (405)	0	0.00	412 (0)	3,132 (0)
1985	46,925	0.42	335 (43)	2,231 (60)	18,502	0.74	52 (11)	694 (17)	506,548	0.26	1,302 (100)	10,487 (369)	0	0.00	507 (0)	3,190 (0)
1986	105,549	0.24	490 (90)	2,978 (165)					577,246	0.16	2,007 (155)	15,563 (379)	100,537	0.59	443 (4)	2,214 (8)
1987	39,124	0.25	332 (56)	1,736 (90)					426,381	0.19	1,643 (145)	14,431 (331)	54,340	0.90	407 (3)	2,595 (7)
1988	49,560	0.25	472 (69)	2,593 (129)					310,009	0.15	1,851 (132)	15,041 (277)	58,527	0.59	614 (4)	3,809 (9)
1989	83,189	0.34	318 (51)	1,423 (68)					678,957	0.19	1,371 (116)	10,387 (267)	128,957	0.55	439 (10)	2,883 (16)
1990	200,911	0.31	352 (61)	1,787 (95)					370,837	0.23	1,257 (85)	9,413 (211)	375,269	0.63	459 (8)	2,936 (9)
1991	186,136	0.34	496 (68)	2,714 (135)					606,419	0.18	1,716 (160)	15,963 (406)	373,161	0.39	720 (12)	4,616 (22)
1992	179,278	0.30	484 (100)	3,094 (189)					412,367	0.13	1,860 (144)	18,676 (330)	119,058	0.40	906 (10)	7,023 (23)
1993	138,062	0.21	456 (81)	2,502 (171)					637,051	0.15	1,875 (136)	19,268 (356)	138,737	0.25	1,118 (21)	9,393 (43)
1994	175,442	0.23	449 (87)	2,361 (238)					662,522	0.16	1,716 (138)	19,397 (342)	140,148	0.29	930 (19)	9,253 (34)
1995	163,442	0.25	453 (62)	2,464 (119)					622,558	0.15	1,647 (133)	18,584 (538)	32,710	0.45	791 (7)	7,065 (10)
1996	196,215	0.30	538 (86)	2,717 (148)					793,963	0.16	2,047 (153)	21,334 (468)	26,272	0.73	822 (4)	6,396 (5)
1997	129,823	0.14	1,038 (248)	5,500 (487)					682,871	0.15	1,821 (143)	20,653 (468)	14,988	0.57	737 (4)	6,162 (7)
1998	130,997	0.13	1,290 (298)	10,297 (645)					633,547	0.16	2,525 (160)	29,256 (487)	60,718	0.56	1,065 (6)	9,768 (8)
1999	128,766	0.10	1,604 (398)	13,073 (777)					572,456	0.16	2,331 (137)	25,323 (397)	44,085	0.44	848 (8)	7,529 (9)

	Cbt				Hbt				Priv				Shore			
Year	AB1	CV	PSU	Trp	AB1	CV	PSU	Trp	AB1	CV	PSU	Trp	AB1	CV	PSU	Trp
2000	103,579	0.12	1,421 (412)	13,808 (912)					674,409	0.15	2,187 (148)	24,543 (457)	133,101	0.33	850 (17)	7,373 (27)
2001	97,110	0.09	1,229 (346)	11,609 (699)					609,950	0.14	2,217 (154)	26,398 (368)	238,731	0.27	827 (24)	7,877 (50)
2002	80,810	0.09	1,407 (362)	13,651 (733)					558,034	0.15	2,271 (158)	26,050 (353)	82,093	0.40	879 (10)	7,887 (19)
2003	68,328	0.10	1,375 (307)	13,327 (587)					479,105	0.14	2,232 (144)	24,580 (303)	96,490	0.39	813 (10)	7,322 (19)
2004	78,541	0.13	1,241 (288)	12,790 (583)					602,693	0.13	2,207 (151)	25,564 (324)	122,757	0.51	724 (13)	6,837 (22)
2005	69,804	0.13	1,014 (230)	9,217 (442)					661,852	0.16	2,061 (155)	23,119 (412)	68,221	0.58	682 (6)	6,135 (19)
2006	139,939	0.13	1,024 (283)	8,908 (575)					664,700	0.14	2,274 (173)	25,028 (424)	73,662	0.53	688 (7)	6,686 (19)
2007	113,795	0.16	1,145 (255)	9,652 (453)					436,027	0.13	2,411 (138)	25,827 (267)	65,231	0.52	819 (7)	6,770 (11)
2008	118,356	0.22	963 (206)	7,293 (370)					605,674	0.26	2,522 (155)	26,905 (338)	55,077	0.37	845 (14)	7,497 (19)
2009	142,466	0.17	991 (205)	7,834 (426)					536,239	0.16	2,420 (157)	25,470 (338)	265,050	0.28	761 (25)	6,767 (72)
2010	62,035	0.12	1,042 (210)	7,988 (358)					371,096	0.19	2,485 (98)	25,493 (173)	164,546	0.36	789 (16)	7,735 (36)
2011	81,772	0.14	1,226 (224)	9,937 (409)					433,872	0.13	2,680 (142)	27,062 (302)	163,402	0.34	834 (13)	7,681 (24)
2012	124,904	0.25	988 (190)	7,231 (366)					410,402	0.14	2,677 (143)	26,359 (282)	278,444	0.30	845 (28)	7,871 (52)
2013	81,127	0.21	1,055 (133)	6,335 (268)					314,186	0.17	2,869 (136)	26,482 (253)	142,314	0.74	517 (11)	5,285 (19)
2014	167,070	0.20	1,540 (193)	8,602 (403)					539,716	0.12	3,760 (220)	33,720 (416)	275,898	0.37	459 (20)	4,434 (41)
2015	101,577	0.17	1,586 (183)	8,276 (391)					391,058	0.13	3,910 (208)	32,801 (409)	173,307	0.67	621 (6)	4,655 (17)
2016	133,727	0.16	1,508 (165)	7,918 (378)					450,023	0.18	3,729 (197)	31,731 (342)	113,909	0.42	628 (10)	4,268 (16)
2017	121,215	0.28	1,576 (165)	8,495 (317)					444,221	0.15	3,586 (174)	29,701 (372)	109,937	0.54	571 (8)	4,509 (14)
2018	88,403	0.24	1,558 (137)	8,072 (250)					403,072	0.15	3,470 (170)	26,660 (406)	166,928	0.37	603 (12)	4,545 (23)
2019	91,309	0.26	1,564 (139)	8,344 (266)					276,244	0.20	3,639 (129)	30,054 (249)	49,095	0.49	665 (7)	4,932 (10)
2020	90,981	0.24	1,677 (132)	9,162 (240)					243,203	0.19	3,451 (119)	26,165 (217)	55,451	0.55	686 (6)	5,381 (7)
2021	49,775	0.19	1,713 (124)	9,977 (213)					209,334	0.24	3,477 (87)	23,833 (163)	13,519	0.86	733 (3)	5,588 (5)
2022	27,428	0.23	1,751 (98)	10,673 (140)					86,259	0.24	3,494 (73)	21,840 (104)	45,877	0.68	805 (3)	5,845 (3)

	Cbt				Hbt				Priv				Shore			
Year	AB1	CV	PSU	Trp	AB1	CV	PSU	Trp	AB1	CV	PSU	Trp	AB1	CV	PSU	Trp
2023	32,501	0.14	2,120 (132)	13,698 (270)					110,087	0.20	3,991 (94)	26,141 (143)	125,228	0.57	842 (8)	6,827 (16)
2024	26,107	0.19	1,542 (90)	12,030 (187)					120,896	0.37	2,772 (25)	18,453 (27)	45,674	0.46	795 (11)	7,977 (14)

Table 4. King Mackerel discards in numbers of fish (B2) with associated coefficients of variation (CV; Dettloff et al. 2020) by mode and year from all data sources (MRIP, LACreel 2014+, TPWD). Sample size is provided both as the total number of primary sampling units (PSU) and angler trips (TRP) intercepted by dockside samplers and, in parentheses, the number of PSUs and TRPs that intercepted King Mackerel.

	Cbt				Hbt				Priv				Shore			
Year	B2	CV	PSU	Trp	B2	CV	PSU	Trp	B2	CV	PSU	Trp	B2	CV	PSU	Trp
1981	0	0.00	107 (0)	818 (0)	0	0.00	93 (0)	803 (0)	34,313	0.47	409 (3)	3,427 (3)	2,034	1.00	537 (1)	3,394 (1)
1982	157	0.98	160 (1)	1,340 (1)	96	1.00	103 (1)	1,272 (1)	79,271	0.68	543 (2)	4,716 (2)	0	0.00	520 (0)	3,720 (0)
1983	86	0.69	250 (1)	1,949 (1)	0	0.00	113 (0)	1,739 (0)	0	0.00	795 (0)	7,050 (0)	0	0.00	397 (0)	2,842 (0)
1984	918	0.92	195 (1)	1,571 (1)	0	0.00	93 (1)	1,353 (1)	26,217	0.65	807 (2)	6,101 (2)	0	0.00	412 (0)	3,132 (0)
1985	32	0.99	335 (0)	2,231 (0)	0	0.00	52 (0)	694 (0)	50,238	0.60	1,302 (2)	10,487 (2)	6,484	1.00	507 (1)	3,190 (1)
1986	12,186	0.75	490 (7)	2,978 (9)					34,297	0.36	2,007 (12)	15,563 (15)	40,854	0.74	443 (2)	2,214 (2)
1987	71,571	0.96	332 (6)	1,736 (10)					59,677	0.48	1,643 (12)	14,431 (20)	0	0.00	407 (0)	2,595 (0)

	Cbt				Hbt				Priv				Shore			
Year	B2	CV	PSU	Trp	B2	CV	PSU	Trp	B2	CV	PSU	Trp	B2	CV	PSU	Trp
1988	24,827	0.84	472 (10)	2,593 (17)					121,109	0.40	1,851 (9)	15,041 (10)	0	0.00	614 (0)	3,809 (0)
1989	5,926	0.83	318 (3)	1,423 (3)					109,752	0.44	1,371 (9)	10,387 (11)	316,042	0.98	439 (2)	2,883 (2)
1990	53,265	0.54	352 (24)	1,787 (48)					54,426	0.39	1,257 (8)	9,413 (14)	165,401	0.79	459 (3)	2,936 (3)
1991	19,444	0.49	496 (14)	2,714 (36)					366,915	0.24	1,716 (26)	15,963 (37)	29,488	0.66	720 (3)	4,616 (4)
1992	21,746	0.57	484 (19)	3,094 (36)					209,031	0.32	1,860 (16)	18,676 (23)	4,101	1.00	906 (1)	7,023 (1)
1993	6,797	0.52	456 (10)	2,502 (16)					257,304	0.26	1,875 (23)	19,268 (35)	27,690	0.68	1,118 (4)	9,393 (4)
1994	37,763	0.67	449 (14)	2,361 (35)					454,837	0.21	1,716 (29)	19,397 (59)	10,343	0.71	930 (2)	9,253 (2)
1995	20,997	0.61	453 (7)	2,464 (15)					698,630	0.34	1,647 (14)	18,584 (33)	9,241	0.71	791 (2)	7,065 (2)
1996	33,585	0.70	538 (15)	2,717 (33)					468,150	0.30	2,047 (26)	21,334 (40)	38,931	0.79	822 (2)	6,396 (3)
1997	9,842	0.23	1,038 (48)	5,500 (110)					305,933	0.31	1,821 (24)	20,653 (30)	21,753	1.00	737 (1)	6,162 (1)
1998	9,423	0.28	1,290 (48)	10,297 (89)					240,430	0.19	2,525 (38)	29,256 (59)	35,941	0.74	1,065 (4)	9,768 (5)
1999	13,297	0.28	1,604 (61)	13,073 (114)					249,401	0.20	2,331 (34)	25,323 (50)	20,586	0.60	848 (3)	7,529 (4)
2000	16,909	0.21	1,421 (122)	13,808 (228)					422,100	0.23	2,187 (41)	24,543 (74)	63,929	0.45	850 (6)	7,373 (12)
2001	16,109	0.29	1,229 (75)	11,609 (186)					449,738	0.19	2,217 (55)	26,398 (89)	607,333	0.71	827 (14)	7,877 (26)
2002	14,831	0.18	1,407 (93)	13,651 (247)					261,400	0.19	2,271 (39)	26,050 (63)	85,892	0.48	879 (8)	7,887 (11)
2003	15,953	0.20	1,375 (77)	13,327 (211)					309,346	0.24	2,232 (39)	24,580 (67)	92,615	0.44	813 (7)	7,322 (13)
2004	21,777	0.21	1,241 (78)	12,790 (226)					586,195	0.25	2,207 (40)	25,564 (77)	187,696	0.60	724 (8)	6,837 (24)
2005	10,635	0.22	1,014 (49)	9,217 (117)					477,119	0.21	2,061 (41)	23,119 (74)	250,961	0.64	682 (8)	6,135 (27)
2006	28,789	0.27	1,024 (80)	8,908 (206)					484,558	0.18	2,274 (53)	25,028 (88)	76,630	0.65	688 (5)	6,686 (10)
2007	26,092	0.38	1,145 (53)	9,652 (123)					361,538	0.23	2,411 (44)	25,827 (78)	103,952	0.60	819 (6)	6,770 (10)
2008	38,801	0.36	963 (53)	7,293 (142)					229,250	0.21	2,522 (40)	26,905 (67)	116,902	0.41	845 (13)	7,497 (22)
2009	15,392	0.30	991 (37)	7,834 (80)					372,238	0.23	2,420 (49)	25,470 (74)	59,931	0.38	761 (14)	6,767 (19)
2010	11,710	0.24	1,042 (47)	7,988 (92)					189,987	0.36	2,485 (21)	25,493 (31)	52,454	0.39	789 (12)	7,735 (15)

	Cbt				Hbt				Priv				Shore			
Year	B2	CV	PSU	Trp	B2	CV	PSU	Trp	B2	CV	PSU	Trp	B2	CV	PSU	Trp
2011	15,454	0.31	1,226 (48)	9,937 (142)					220,015	0.20	2,680 (34)	27,062 (47)	34,766	0.51	834 (8)	7,681 (11)
2012	19,253	0.43	988 (38)	7,231 (83)					269,370	0.36	2,677 (38)	26,359 (51)	67,897	0.44	845 (11)	7,871 (14)
2013	10,597	0.33	1,055 (28)	6,335 (86)					200,605	0.22	2,869 (38)	26,482 (50)	91,401	0.57	517 (7)	5,285 (10)
2014	33,789	0.33	1,540 (43)	8,602 (111)					376,490	0.19	3,760 (61)	33,720 (96)	38,939	0.64	459 (6)	4,434 (6)
2015	15,068	0.40	1,586 (29)	8,276 (52)					154,053	0.17	3,910 (52)	32,801 (69)	318,674	0.83	621 (7)	4,655 (14)
2016	26,291	0.28	1,508 (47)	7,918 (128)					231,959	0.20	3,729 (48)	31,731 (76)	162,705	0.50	628 (9)	4,268 (14)
2017	30,738	0.30	1,576 (41)	8,495 (109)					407,657	0.32	3,586 (43)	29,701 (64)	20,854	0.61	571 (4)	4,509 (5)
2018	16,516	0.34	1,558 (21)	8,072 (51)					99,630	0.23	3,470 (28)	26,660 (31)	2,312	1.00	603 (1)	4,545 (1)
2019	17,460	0.62	1,564 (32)	8,344 (87)					70,398	0.26	3,639 (25)	30,054 (27)	51,928	0.87	665 (5)	4,932 (7)
2020	9,756	0.24	1,677 (33)	9,162 (90)					114,364	0.39	3,451 (21)	26,165 (34)	33,683	0.82	686 (4)	5,381 (4)
2021	7,502	0.37	1,713 (22)	9,977 (45)					44,989	0.35	3,477 (11)	23,833 (15)	8,881	0.87	733 (2)	5,588 (2)
2022	11,512	0.42	1,751 (23)	10,673 (52)					58,633	0.29	3,494 (14)	21,840 (21)	19,204	1.00	805 (1)	5,845 (1)
2023	13,077	0.27	2,120 (45)	13,698 (110)					72,960	0.29	3,991 (14)	26,141 (23)	11,598	0.89	842 (2)	6,827 (2)
2024	5,085	0.33	1,542 (26)	12,030 (69)					46,850	0.35	2,772 (12)	18,453 (14)	25,775	0.67	795 (4)	7,977 (4)

Table 5. King Mackerel landings (AB1) and discards (B2), in numbers of fish, with associated coefficients of variation (CV; Dettloff et al. 2020) by year for all modes combined from all data sources (MRIP, LACreel 2014+, TPWD). Sample size is provided both as the total number of primary sampling units (PSU) and angler trips (TRP) intercepted by dockside samplers and, in parentheses, the number of PSUs and TRPs that intercepted King Mackerel.

	AB1				B2			
Year	Total	CV	PSU	Trp	Total	CV	PSU	Trp
1981	603,418	0.17	1,146 (63)	8,442 (96)	36,347	0.44	1,146 (4)	8,442 (4)
1982	764,226	0.24	1,326 (65)	11,048 (108)	79,524	0.68	1,326 (4)	11,048 (4)
1983	724,419	0.29	1,555 (157)	13,580 (365)	86	0.69	1,555 (1)	13,580 (1)
1984	819,106	0.20	1,507 (152)	12,157 (486)	27,135	0.63	1,507 (4)	12,157 (4)
1985	571,975	0.24	2,196 (154)	16,602 (446)	56,754	0.54	2,196 (3)	16,602 (3)
1986	783,332	0.14	2,940 (249)	20,755 (552)	87,336	0.39	2,940 (21)	20,755 (26)
1987	519,845	0.18	2,382 (204)	18,762 (428)	131,247	0.57	2,382 (18)	18,762 (30)
1988	418,096	0.14	2,937 (205)	21,443 (415)	145,935	0.36	2,937 (19)	21,443 (27)
1989	891,103	0.17	2,128 (177)	14,693 (351)	431,720	0.73	2,128 (14)	14,693 (16)
1990	947,017	0.27	2,068 (154)	14,136 (315)	273,092	0.50	2,068 (35)	14,136 (65)
1991	1,165,716	0.17	2,932 (240)	23,293 (563)	415,846	0.22	2,932 (43)	23,293 (77)
1992	710,703	0.13	3,250 (254)	28,793 (542)	234,877	0.29	3,250 (36)	28,793 (60)
1993	913,850	0.12	3,449 (238)	31,163 (570)	291,791	0.24	3,449 (37)	31,163 (55)
1994	978,112	0.12	3,095 (244)	31,011 (614)	502,943	0.20	3,095 (45)	31,011 (96)
1995	818,710	0.13	2,891 (202)	28,113 (667)	728,868	0.33	2,891 (23)	28,113 (50)
1996	1,016,450	0.14	3,407 (243)	30,447 (621)	540,665	0.27	3,407 (43)	30,447 (76)
1997	827,683	0.13	3,596 (395)	32,315 (962)	337,528	0.29	3,596 (73)	32,315 (141)
1998	825,262	0.13	4,880 (464)	49,321 (1,140)	285,794	0.18	4,880 (90)	49,321 (153)
1999	745,307	0.13	4,783 (543)	45,925 (1,183)	283,284	0.18	4,783 (98)	45,925 (168)
2000	911,089	0.12	4,458 (577)	45,724 (1,396)	502,938	0.20	4,458 (169)	45,724 (314)
2001	945,792	0.11	4,273 (524)	45,884 (1,117)	1,073,180	0.41	4,273 (144)	45,884 (301)
2002	720,937	0.12	4,557 (530)	47,588 (1,105)	362,124	0.18	4,557 (140)	47,588 (321)
2003	643,922	0.12	4,420 (461)	45,229 (909)	417,914	0.21	4,420 (123)	45,229 (291)
2004	803,991	0.13	4,172 (452)	45,191 (929)	795,668	0.23	4,172 (126)	45,191 (327)
2005	799,877	0.14	3,757 (391)	38,471 (873)	738,714	0.26	3,757 (98)	38,471 (218)
2006	878,301	0.12	3,986 (463)	40,622 (1,018)	589,977	0.17	3,986 (138)	40,622 (304)
2007	615,053	0.11	4,375 (400)	42,249 (731)	491,582	0.22	4,375 (103)	42,249 (211)
2008	779,107	0.21	4,330 (375)	41,695 (727)	384,952	0.18	4,330 (106)	41,695 (231)
2009	943,755	0.12	4,172 (387)	40,071 (836)	447,562	0.20	4,172 (100)	40,071 (173)
2010	597,677	0.16	4,316 (324)	41,216 (567)	254,151	0.28	4,316 (80)	41,216 (138)

	AB1				B2			
Year	Total	CV	PSU	Trp	Total	CV	PSU	Trp
2011	679,045	0.12	4,740 (379)	44,680 (735)	270,235	0.17	4,740 (90)	44,680 (200)
2012	813,750	0.13	4,510 (361)	41,461 (700)	356,520	0.29	4,510 (87)	41,461 (148)
2013	537,628	0.22	4,441 (280)	38,102 (540)	302,602	0.23	4,441 (73)	38,102 (146)
2014	982,684	0.13	5,759 (433)	46,756 (860)	449,219	0.17	5,759 (110)	46,756 (213)
2015	665,941	0.19	6,117 (397)	45,732 (817)	487,795	0.54	6,117 (88)	45,732 (135)
2016	697,659	0.14	5,865 (372)	43,917 (736)	420,955	0.22	5,865 (104)	43,917 (218)
2017	675,373	0.14	5,733 (347)	42,705 (703)	459,248	0.28	5,733 (88)	42,705 (178)
2018	658,403	0.14	5,631 (319)	39,277 (679)	118,459	0.20	5,631 (50)	39,277 (83)
2019	416,649	0.16	5,868 (275)	43,330 (525)	139,786	0.36	5,868 (62)	43,330 (121)
2020	389,635	0.15	5,814 (257)	40,708 (464)	157,804	0.34	5,814 (58)	40,708 (128)
2021	272,628	0.19	5,923 (214)	39,398 (381)	61,371	0.29	5,923 (35)	39,398 (62)
2022	159,563	0.24	6,050 (174)	38,358 (247)	89,349	0.29	6,050 (38)	38,358 (74)
2023	267,816	0.28	6,953 (234)	46,666 (429)	97,635	0.24	6,953 (61)	46,666 (135)
2024	192,677	0.26	5,109 (126)	38,460 (228)	77,710	0.31	5,109 (42)	38,460 (87)

Table 6. King Mackerel landings in pounds whole weight (LBS) with associated coefficients of variation (CV; Approach 2 described in Nuttall and Dettloff 2022) by year and mode from all data sources (MRIP, LACreel 2014+, TPWD). Sample size is provided both as the total number of primary sampling units (PSU) and angler trips (TRP) intercepted by dockside samplers and, in parentheses, the number of PSUs and TRPs that intercepted King Mackerel.

	Cbt		Hbt		Priv		Shore		Total	
Year	LBS	CV	LBS	CV	LBS	CV	LBS	CV	LBS	CV
1981	581,111	0.40	63,486	0.37	4,842,461	0.14	1,034,837	0.81	6,521,895	0.00
1982	523,893	0.54	124,356	0.53	7,061,338	0.27	940,512	0.69	8,650,098	0.00
1983	1,341,342	0.40	221,569	0.74	5,607,666	0.34	156,339	1.00	7,326,916	0.00
1984	1,272,650	0.41	150,694	0.59	7,476,840	0.21	0	0.00	8,900,184	0.00
1985	426,962	0.42	165,324	0.74	4,799,604	0.26	0	0.00	5,391,890	0.00
1986	890,604	0.24			5,330,777	0.16	997,749	0.54	7,219,130	0.00
1987	310,152	0.25			3,527,539	0.19	534,342	0.79	4,372,033	0.00
1988	603,313	0.24			3,238,048	0.15	623,308	0.59	4,464,669	0.00
1989	948,812	0.34			5,955,510	0.19	1,357,668	0.53	8,261,990	0.00
1990	1,833,939	0.31			3,496,440	0.23	3,652,539	0.62	8,982,918	0.00
1991	1,266,697	0.34			5,655,841	0.18	2,423,171	0.38	9,345,709	0.00
1992	1,886,373	0.30			4,078,998	0.13	978,209	0.40	6,943,580	0.00
1993	1,343,841	0.21			6,244,719	0.15	1,279,326	0.25	8,867,885	0.00
1994	1,639,180	0.23			7,048,055	0.16	1,265,906	0.29	9,953,141	0.00
1995	1,618,824	0.25			5,985,913	0.15	354,947	0.44	7,959,683	0.00
1996	1,946,627	0.30			9,731,575	0.16	352,352	0.72	12,030,555	0.00
1997	1,855,779	0.14			6,732,773	0.15	204,238	0.57	8,792,789	0.00
1998	1,358,597	0.13			6,561,090	0.16	437,428	0.55	8,357,116	0.00
1999	1,190,369	0.10			6,413,553	0.16	138,849	0.40	7,742,771	0.00
2000	916,215	0.12			7,443,328	0.15	793,033	0.33	9,152,576	0.00
2001	842,737	0.09			6,981,307	0.14	2,035,029	0.27	9,859,073	0.00
2002	686,438	0.09			5,771,621	0.15	1,002,778	0.40	7,460,837	0.00
2003	623,613	0.10			5,529,156	0.14	1,310,425	0.38	7,463,194	0.00
2004	626,717	0.13			5,181,589	0.13	621,280	0.48	6,429,586	0.00
2005	592,393	0.13			5,198,372	0.16	419,248	0.54	6,210,013	0.00
2006	1,021,552	0.13			5,834,102	0.14	625,128	0.53	7,480,782	0.00
2007	873,510	0.16			4,107,709	0.13	404,683	0.51	5,385,902	0.00
2008	789,102	0.22			4,624,179	0.26	403,263	0.36	5,816,544	0.00
2009	1,064,353	0.17			4,959,074	0.16	2,832,597	0.28	8,856,024	0.00
2010	509,841	0.12			3,918,958	0.19	1,288,081	0.36	5,716,880	0.00

	Cbt		Hbt		Priv		Shore		Total	
Year	LBS	CV	LBS	CV	LBS	CV	LBS	CV	LBS	CV
2011	658,600	0.14			4,121,876	0.13	1,230,782	0.34	6,011,258	0.00
2012	1,091,680	0.25			4,023,960	0.14	2,370,670	0.30	7,486,309	0.00
2013	647,579	0.21			3,144,024	0.17	1,031,035	0.73	4,822,638	0.00
2014	1,212,920	0.20			5,036,521	0.12	2,416,844	0.37	8,666,284	0.00
2015	913,392	0.17			3,598,680	0.13	1,191,117	0.67	5,703,190	0.00
2016	1,011,516	0.16			3,728,404	0.17	1,002,217	0.41	5,742,137	0.00
2017	997,018	0.28			4,356,402	0.15	1,134,283	0.54	6,487,703	0.00
2018	740,599	0.24			4,658,876	0.15	1,334,393	0.37	6,733,867	0.00
2019	730,307	0.26			3,028,988	0.20	398,030	0.46	4,157,324	0.00
2020	698,561	0.24			2,695,659	0.19	470,470	0.55	3,864,690	0.00
2021	470,493	0.19			2,208,770	0.24	114,128	0.85	2,793,391	0.00
2022	224,532	0.22			882,796	0.24	424,685	0.65	1,532,013	0.00
2023	292,940	0.14			1,055,547	0.20	690,405	0.56	2,038,893	0.00
2024	210,359	0.19			1,099,716	0.36	332,517	0.46	1,642,592	0.00

Table 7. Summary of weight measurements (pounds whole weight) from MRIP-intercepted King Mackerel 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. Summaries include observed and imputed weights.

	Cbt					Hbt					Priv					Shore				
Year	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max
1981	38 (20)	3.6	12.9	11.8	56.3	19 (5)	6.4	21.0	10.7	44.7	66 (34)	0.2	8.5	7.5	48.3	12 (7)	4.9	8.7	4.8	22.0
1982	88 (23)	0.0	8.1	12.0	40.3	1 (1)	5.7	5.7	0.0	5.7	52 (22)	0.6	12.6	7.7	38.1	10 (6)	0.7	8.3	5.7	16.5
1983	166 (40)	0.0	12.4	15.6	76.4	31 (9)	0.7	20.3	16.4	50.7	29 (13)	0.7	8.2	6.6	29.3	3 (1)	2.9	11.0	7.2	16.5
1984	87 (28)	1.1	21.2	14.0	84.7	0 (0)	0.0	0.0	0.0	0.0	61 (21)	3.7	10.5	7.0	29.3	0 (0)	0.0	0.0	0.0	0.0
1985	121 (38)	0.7	10.7	10.1	50.0	0 (0)	0.0	0.0	0.0	0.0	49 (26)	1.2	11.4	7.6	41.0	0 (0)	0.0	0.0	0.0	0.0
1986	453 (143)	0.7	10.6	10.1	91.0						354 (157)	1.2	7.7	4.7	40.6	10 (8)	2.2	8.8	10.8	38.9
1987	234 (67)	1.1	7.6	7.8	69.8						287 (154)	1.2	7.5	4.5	36.0	9 (7)	2.2	10.5	11.2	38.9
1988	40 (18)	2.6	14.4	9.6	39.7						15 (12)	3.7	12.3	8.7	31.1	0 (0)	0.0	0.0	0.0	0.0
1989	175 (56)	1.4	16.9	17.1	93.0						192 (100)	0.7	9.4	8.7	51.6	18 (16)	0.7	12.5	9.9	40.1
1990	304 (77)	0.4	10.7	9.2	55.1						122 (56)	2.1	10.7	7.1	37.0	18 (8)	3.5	11.4	9.1	42.1
1991	356 (107)	1.8	9.8	8.6	86.3						204 (100)	0.5	8.9	8.0	49.4	36 (22)	1.1	7.1	4.7	19.2
1992	469 (144)	2.2	11.2	7.8	57.2						211 (113)	0.0	10.4	7.7	39.0	32 (23)	2.4	8.7	4.3	23.1
1993	542 (150)	0.6	10.3	6.2	49.5						213 (115)	1.5	10.3	5.9	34.5	57 (43)	2.4	9.7	4.9	23.1
1994	622 (218)	1.1	9.7	7.7	75.2						237 (118)	0.7	11.0	9.6	67.0	47 (34)	3.1	8.8	5.2	18.1
1995	469 (101)	1.3	10.9	7.3	50.0						136 (79)	0.8	9.4	6.4	36.3	13 (10)	2.5	9.3	5.9	21.0
1996	464 (114)	2.2	11.2	7.4	39.9						217 (97)	0.7	14.4	8.6	38.9	7 (5)	0.9	3.0	4.5	13.2
1997	2,235 (424)	1.8	13.7	7.2	65.1						211 (110)	1.9	10.5	7.0	41.6	8 (7)	0.9	4.3	5.2	15.0
1998	2,113 (597)	0.7	10.8	6.2	51.3						272 (138)	0.3	11.1	6.5	36.6	24 (8)	0.2	2.6	3.9	14.6
1999	2,803 (709)	1.6	8.9	5.4	80.4						218 (105)	1.6	14.0	10.0	63.1	11 (9)	0.6	3.0	3.5	10.1
2000	3,455 (826)	0.9	8.8	5.5	54.4						284 (151)	1.7	12.5	7.8	76.3	33 (27)	0.3	5.6	5.4	17.0
2001	2,584 (642)	0.8	9.3	6.1	61.7						314 (175)	0.4	12.6	8.2	57.9	71 (50)	0.5	10.6	7.3	34.8

	Cbt					Hbt					Priv					Shore				
Year	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max
2002	2,145 (627)	0.6	8.5	5.4	62.7						229 (107)	2.4	11.4	7.5	39.5	21 (19)	6.4	12.6	5.3	21.5
2003	1,589 (526)	0.2	9.1	5.7	71.9						265 (133)	1.3	12.3	7.7	50.3	25 (19)	0.7	13.3	6.5	21.6
2004	1,746 (546)	1.8	8.0	4.6	41.6						221 (119)	0.7	8.7	5.3	33.2	39 (22)	0.4	4.2	6.2	24.0
2005	1,266 (384)	0.9	8.6	4.7	40.7						201 (101)	0.4	8.3	5.9	38.6	31 (19)	0.5	8.6	9.8	29.8
2006	1,886 (509)	0.1	7.3	3.6	36.1						268 (135)	1.1	8.1	4.8	31.9	36 (19)	0.5	5.9	4.6	15.4
2007	1,264 (387)	1.0	8.1	4.6	39.6						223 (124)	0.9	9.4	5.4	33.4	12 (11)	0.6	6.4	3.9	11.9
2008	1,178 (313)	1.0	7.0	4.0	32.5						186 (108)	1.3	7.7	5.4	34.9	27 (19)	0.4	4.0	6.9	24.7
2009	1,548 (388)	1.6	7.4	3.8	37.8						185 (112)	0.7	9.2	6.0	46.3	115 (72)	0.7	10.7	8.2	32.1
2010	1,039 (334)	0.5	8.5	5.5	56.0						157 (87)	1.2	10.6	6.8	38.5	56 (36)	0.7	7.3	6.3	19.4
2011	1,272 (372)	1.4	8.3	4.9	47.0						159 (103)	1.7	8.7	4.6	33.1	41 (24)	0.7	7.5	6.5	25.7
2012	1,037 (336)	0.4	8.9	5.8	48.8						227 (122)	2.2	10.0	5.7	28.9	73 (52)	0.7	8.9	5.6	25.6
2013	783 (237)	0.4	7.9	5.8	42.4						183 (108)	0.5	9.3	6.9	40.7	25 (19)	1.3	7.8	5.4	20.7
2014	1,255 (349)	0.6	7.2	3.9	33.9						384 (217)	0.6	9.0	5.1	32.8	49 (41)	0.8	9.5	6.4	23.0
2015	899 (322)	0.7	9.2	5.5	44.3						242 (164)	1.2	8.8	5.2	40.9	25 (17)	3.4	7.9	3.5	17.6
2016	1,164 (322)	1.8	7.5	3.7	29.8						308 (158)	0.8	7.8	7.0	48.5	21 (16)	3.8	13.2	7.9	29.8
2017	690 (241)	1.3	8.4	4.4	29.1						152 (99)	0.5	9.6	6.7	39.0	17 (14)	1.6	9.7	5.8	28.8
2018	494 (165)	1.6	8.3	4.3	35.0						113 (78)	2.9	10.6	6.4	36.2	29 (23)	1.3	10.0	5.8	25.5
2019	552 (182)	1.8	7.9	3.9	24.9						113 (68)	3.3	10.1	6.5	39.0	14 (10)	3.5	12.6	7.9	28.8
2020	635 (198)	2.1	7.5	4.7	46.0						127 (70)	1.5	10.5	6.8	32.2	8 (7)	2.5	5.6	3.1	11.9
2021	378 (157)	1.9	9.1	3.9	29.4						84 (45)	0.8	9.9	5.2	29.0	6 (5)	3.2	7.1	2.8	9.9
2022	192 (107)	2.1	8.1	5.8	42.1						48 (30)	2.4	10.2	8.8	54.2	3 (3)	4.0	6.7	4.5	11.9
2023	506 (226)	1.4	7.4	4.6	39.1						43 (31)	1.1	8.2	6.0	28.1	20 (16)	1.0	5.7	5.0	14.0
2024	356 (185)	1.5	8.8	5.8	41.2						35 (24)	1.6	9.2	6.7	28.4	17 (14)	1.0	5.4	2.9	9.9

Table 8. Summary of weight measurements (pounds whole weight) from MRIP-intercepted King Mackerel 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 weights.

	Weight				
Year	N	Min	Avg	SD	Max
1981	135 (66)	0.2	11.5	10.1	56.3
1982	151 (52)	0.0	9.6	10.5	40.3
1983	229 (63)	0.0	12.9	15.1	76.4
1984	148 (49)	1.1	16.8	12.7	84.7
1985	170 (64)	0.7	10.9	9.4	50.0
1986	817 (308)	0.7	9.3	8.3	91.0
1987	530 (228)	1.1	7.6	6.3	69.8
1988	55 (30)	2.6	13.8	9.3	39.7
1989	385 (172)	0.7	12.9	13.7	93.0
1990	444 (141)	0.4	10.7	8.7	55.1
1991	596 (229)	0.5	9.3	8.2	86.3
1992	712 (280)	0.0	10.8	7.6	57.2
1993	812 (308)	0.6	10.3	6.0	49.5
1994	906 (370)	0.7	10.0	8.1	75.2
1995	618 (190)	0.8	10.5	7.1	50.0
1996	688 (216)	0.7	12.1	8.0	39.9
1997	2,454 (541)	0.9	13.4	7.3	65.1
1998	2,409 (743)	0.2	10.7	6.3	51.3
1999	3,032 (823)	0.6	9.2	6.0	80.4
2000	3,772 (1,004)	0.3	9.0	5.8	76.3
2001	2,969 (867)	0.4	9.7	6.4	61.7
2002	2,395 (753)	0.6	8.8	5.7	62.7
2003	1,879 (678)	0.2	9.6	6.1	71.9
2004	2,006 (687)	0.4	8.0	4.8	41.6
2005	1,498 (504)	0.4	8.6	5.0	40.7
2006	2,190 (663)	0.1	7.3	3.8	36.1
2007	1,499 (522)	0.6	8.3	4.7	39.6
2008	1,391 (440)	0.4	7.0	4.3	34.9
2009	1,848 (572)	0.7	7.8	4.5	46.3
2010	1,252 (457)	0.5	8.7	5.7	56.0
2011	1,472 (499)	0.7	8.3	4.9	47.0

	Weight				
Year	N	Min	Avg	SD	Max
2012	1,337 (510)	0.4	9.1	5.8	48.8
2013	991 (364)	0.4	8.1	6.0	42.4
2014	1,688 (607)	0.6	7.7	4.4	33.9
2015	1,166 (503)	0.7	9.1	5.4	44.3
2016	1,493 (496)	0.8	7.6	4.7	48.5
2017	859 (354)	0.5	8.7	4.9	39.0
2018	636 (266)	1.3	8.8	4.9	36.2
2019	679 (260)	1.8	8.4	4.6	39.0
2020	770 (275)	1.5	8.0	5.2	46.0
2021	468 (207)	0.8	9.2	4.2	29.4
2022	243 (140)	2.1	8.5	6.5	54.2
2023	569 (273)	1.0	7.4	4.8	39.1
2024	408 (223)	1.0	8.7	5.9	41.2

Table 9. Summary of weight measurements (pounds whole weight) from King Mackerel 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 weighed (N), and the minimum (Min), arithmetic mean (Avg), standard deviation (SD), and maximum (Max) size of fish weights.

	Cbt					Priv					Total				
Year	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max	N	Min	Avg	SD	Max
2013	2 (2)	11.7	14.8	4.4	17.9	1 (1)	6.1	6.1	0.0	6.1	3 (3)	6.1	11.9	5.9	17.9
2014	3 (3)	7.1	14.5	8.8	24.3	8 (3)	12.7	21.2	8.7	40.8	11 (6)	7.1	19.4	8.8	40.8
2015	0 (0)	0.0	0.0	0.0	0.0	1 (1)	15.2	15.2	0.0	15.2	1 (1)	15.2	15.2	0.0	15.2
2016	4 (2)	14.3	17.2	4.5	23.8	2 (2)	9.9	18.7	12.5	27.6	6 (4)	9.9	17.7	6.6	27.6
2017	0 (0)	0.0	0.0	0.0	0.0	2 (2)	20.1	20.3	0.3	20.5	2 (2)	20.1	20.3	0.3	20.5
2018	7 (4)	11.5	28.3	13.7	52.0	2 (1)	15.0	15.1	0.2	15.2	9 (5)	11.5	25.4	13.2	52.0
2019	1 (1)	7.7	7.7	0.0	7.7	0 (0)	0.0	0.0	0.0	0.0	1 (1)	7.7	7.7	0.0	7.7
2020	0 (0)	0.0	0.0	0.0	0.0	0 (0)	0.0	0.0	0.0	0.0	0 (0)	0.0	0.0	0.0	0.0
2021	0 (0)	0.0	0.0	0.0	0.0	0 (0)	0.0	0.0	0.0	0.0	0 (0)	0.0	0.0	0.0	0.0
2022	0 (0)	0.0	0.0	0.0	0.0	3 (2)	9.3	22.4	17.7	42.5	3 (2)	9.3	22.4	17.7	42.5
2023	0 (0)	0.0	0.0	0.0	0.0	0 (0)	0.0	0.0	0.0	0.0	0 (0)	0.0	0.0	0.0	0.0
2024	0 (0)	0.0	0.0	0.0	0.0	1 (1)	3.3	3.3	0.0	3.3	1 (1)	3.3	3.3	0.0	3.3

Table 10. Estimated average weights of landed King Mackerel in pounds whole weight (WGT) with associated coefficients of variation (CV; Approach 2 described in Nuttall and Dettloff 2022) by year and mode from all data sources (MRIP, LACreel 2014+, TPWD). Average weight estimates are calculated from annual estimates (by-mode) of landings-in-weight (whole, Table 7) divided by estimates of landings-in-number (Table 2). Sample size (N) is provided as the total number of angler trips and, in parentheses, number of fish from which weight information was collected (MRIP, LABIO 2014+, TPWD).

	Shore			Hbt			Cbt			Priv			Total		
Year	WGT	CV	N	WGT	CV	N	WGT	CV	N	WGT	CV	N	WGT	CV	N
1981	10.53	0.15	7 (12)	11.45	0.22	5 (19)	14.31	0.22	20 (38)	10.55	0.16	34 (66)	10.81	0.11	66 (135)
1982	10.04	0.27	6 (10)	19.10	0.00	1 (1)	9.29	0.25	23 (88)	11.62	0.14	22 (52)	11.32	0.13	52 (151)
1983	6.84	0.00	1 (3)	8.83	0.24	9 (31)	16.54	0.17	40 (166)	9.42	0.22	13 (29)	10.11	0.13	63 (229)
1984							21.26	0.11	28 (87)	10.01	0.11	21 (61)	10.87	0.09	49 (148)
1985							9.10	0.14	38 (121)	9.48	0.11	26 (49)	9.43	0.09	64 (170)
1986	9.92	0.43	8 (10)				8.44	0.07	143 (453)	9.23	0.05	157 (354)	9.22	0.05	308 (817)
1987	9.83	0.38	7 (9)				7.93	0.15	67 (234)	8.27	0.05	154 (287)	8.41	0.06	228 (530)
1988							12.17	0.19	18 (40)	10.45	0.21	12 (15)	10.68	0.14	30 (55)
1989	10.53	0.20	16 (18)				11.41	0.14	56 (175)	8.77	0.09	100 (192)	9.27	0.08	172 (385)
1990	9.73	0.18	8 (18)				9.13	0.09	77 (304)	9.43	0.09	56 (122)	9.49	0.06	141 (444)
1991	6.49	0.12	22 (36)				6.81	0.07	107 (356)	9.33	0.09	100 (204)	8.02	0.05	229 (596)
1992	8.22	0.08	23 (32)				10.52	0.05	144 (469)	9.89	0.06	113 (211)	9.77	0.04	280 (712)
1993	9.22	0.08	43 (57)				9.73	0.05	150 (542)	9.80	0.05	115 (213)	9.70	0.03	308 (812)
1994	9.03	0.09	34 (47)				9.34	0.05	218 (622)	10.64	0.07	118 (237)	10.18	0.04	370 (906)
1995	10.85	0.19	10 (13)				9.90	0.06	101 (469)	9.62	0.07	79 (136)	9.72	0.05	190 (618)
1996	13.41	0.62	5 (7)				9.92	0.06	114 (464)	12.26	0.05	97 (217)	11.84	0.04	216 (688)
1997	13.63	0.43	7 (8)				14.29	0.02	424 (2,235)	9.86	0.06	110 (211)	10.62	0.02	541 (2,454)
1998	7.20	0.34	8 (24)				10.37	0.02	597 (2,113)	10.36	0.05	138 (272)	10.13	0.02	743 (2,409)
1999	3.15	0.38	9 (11)				9.24	0.02	709 (2,803)	11.20	0.07	105 (218)	10.39	0.02	823 (3,032)
2000	5.96	0.16	27 (33)				8.85	0.02	826 (3,455)	11.04	0.04	151 (284)	10.05	0.02	1,004 (3,772)

	Shore			Hbt			Cbt			Priv			Total		
Year	WGT	CV	N	WGT	CV	N	WGT	CV	N	WGT	CV	N	WGT	CV	N
2001	8.52	0.10	50 (71)				8.68	0.02	642 (2,584)	11.45	0.05	175 (314)	10.42	0.02	867 (2,969)
2002	12.22	0.10	19 (21)				8.49	0.02	627 (2,145)	10.34	0.06	107 (229)	10.35	0.02	753 (2,395)
2003	13.58	0.11	19 (25)				9.13	0.03	526 (1,589)	11.54	0.05	133 (265)	11.59	0.02	678 (1,879)
2004	5.06	0.27	22 (39)				7.98	0.02	546 (1,746)	8.60	0.05	119 (221)	8.00	0.02	687 (2,006)
2005	6.15	0.22	19 (31)				8.49	0.03	384 (1,266)	7.85	0.06	101 (201)	7.76	0.03	504 (1,498)
2006	8.49	0.15	19 (36)				7.30	0.02	509 (1,886)	8.78	0.05	135 (268)	8.52	0.02	663 (2,190)
2007	6.20	0.19	11 (12)				7.68	0.02	387 (1,264)	9.42	0.05	124 (223)	8.76	0.02	522 (1,499)
2008	7.32	0.35	19 (27)				6.67	0.03	313 (1,178)	7.63	0.07	108 (186)	7.47	0.03	440 (1,391)
2009	10.69	0.09	72 (115)				7.47	0.02	388 (1,548)	9.25	0.06	112 (185)	9.38	0.02	572 (1,848)
2010	7.83	0.12	36 (56)				8.22	0.03	334 (1,039)	10.56	0.07	87 (157)	9.57	0.03	457 (1,252)
2011	7.53	0.13	24 (41)				8.05	0.03	372 (1,272)	9.50	0.05	103 (159)	8.85	0.02	499 (1,472)
2012	8.51	0.08	52 (73)				8.74	0.03	336 (1,037)	9.80	0.05	122 (227)	9.20	0.03	510 (1,337)
2013	7.24	0.15	19 (25)				7.98	0.05	239 (785)	10.01	0.07	109 (184)	8.97	0.04	367 (994)
2014	8.76	0.10	41 (49)				7.26	0.03	352 (1,258)	9.33	0.04	220 (392)	8.82	0.02	613 (1,699)
2015	6.87	0.11	17 (25)				8.99	0.03	322 (899)	9.20	0.05	165 (243)	8.56	0.02	504 (1,167)
2016	8.80	0.15	16 (21)				7.56	0.02	324 (1,168)	8.28	0.06	160 (310)	8.23	0.03	500 (1,499)
2017	10.32	0.16	14 (17)				8.23	0.03	241 (690)	9.81	0.07	101 (154)	9.61	0.03	356 (861)
2018	7.99	0.11	23 (29)				8.38	0.05	169 (501)	11.56	0.07	79 (115)	10.23	0.04	271 (645)
2019	8.11	0.18	10 (14)				8.00	0.03	183 (553)	10.96	0.08	68 (113)	9.98	0.04	261 (680)
2020	8.48	0.22	7 (8)				7.68	0.05	198 (635)	11.08	0.08	70 (127)	9.92	0.04	275 (770)
2021	8.44	0.14	5 (6)				9.45	0.03	157 (378)	10.55	0.08	45 (84)	10.25	0.03	207 (468)
2022	9.26	0.39	3 (3)				8.19	0.06	107 (192)	10.23	0.13	32 (51)	9.60	0.06	142 (246)
2023	5.51	0.20	16 (20)				9.01	0.04	226 (506)	9.59	0.13	31 (43)	7.61	0.04	273 (569)
2024	7.28	0.15	14 (17)				8.06	0.05	185 (356)	9.10	0.13	25 (36)	8.53	0.04	224 (409)

Table 11. Recreational Fishing Effort (in angler trips) for Gulf of America anglers by mode and year from all data sources (MRIP, LACreel 2014+, TPWD). These effort estimates depict all (general) recreational fishing activity in the Gulf of America and are not specific to King Mackerel. Effort from the combined private-shore fishing mode in the LA Creel survey has been added to the private mode.

Year	Cbt	Hbt	Priv	Shore	Total
1981	579,440	258,896	14,277,702	17,464,984	32,581,022
1982	610,982	238,741	16,865,840	20,892,828	38,608,391
1983	599,333	242,563	22,593,704	21,203,614	44,639,214
1984	653,590	273,160	24,964,859	23,013,399	48,905,008
1985	642,212	123,125	23,308,665	20,281,959	44,355,961
1986	668,850		23,475,390	17,140,745	41,284,985
1987	667,116		26,058,690	19,251,783	45,977,589
1988	595,798		25,782,298	24,867,068	51,245,164
1989	702,296		26,095,846	19,709,434	46,507,576
1990	704,925		27,336,738	25,804,563	53,846,226
1991	696,552		27,916,818	24,418,208	53,031,578
1992	769,605		30,426,133	24,260,989	55,456,727
1993	799,845		30,323,575	25,007,744	56,131,164
1994	858,096		31,678,881	23,173,784	55,710,761
1995	936,070		31,200,874	20,904,104	53,041,048
1996	878,170		32,010,580	21,003,522	53,892,272
1997	888,098		31,552,245	22,173,321	54,613,664
1998	903,347		34,657,566	24,370,765	59,931,678
1999	855,750		36,120,686	28,262,886	65,239,322
2000	920,986		36,699,526	30,576,786	68,197,298
2001	924,041		34,790,606	28,810,662	64,525,309
2002	839,165		35,741,094	28,399,569	64,979,828
2003	966,895		38,916,274	33,245,644	73,128,813
2004	915,602		40,392,980	29,888,589	71,197,171
2005	839,402		36,941,839	25,840,548	63,621,789
2006	985,004		35,402,618	28,584,465	64,972,087
2007	1,024,148		38,219,320	26,514,343	65,757,811
2008	902,887		39,153,625	26,815,512	66,872,024
2009	865,769		36,509,052	28,079,419	65,454,240
2010	765,384		39,766,490	29,537,881	70,069,755
2011	1,069,638		40,062,736	31,749,444	72,881,818
2012	1,064,829		40,676,492	34,934,744	76,676,065

Year	Cbt	Hbt	Priv	Shore	Total
2013	997,940		36,531,619	31,789,031	69,318,590
2014	1,200,386		31,097,527	24,934,208	57,232,121
2015	1,234,363		33,823,833	26,139,225	61,197,421
2016	1,275,243		33,201,176	32,617,687	67,094,106
2017	1,317,688		33,492,608	33,363,111	68,173,407
2018	1,510,941		29,264,836	25,631,375	56,407,152
2019	1,482,821		31,299,620	25,761,566	58,544,007
2020	1,566,751		33,447,332	34,733,526	69,747,609
2021	1,652,926		31,813,595	26,856,796	60,323,317
2022	1,626,286		31,888,596	32,837,439	66,352,321
2023	1,636,098		34,388,374	32,208,987	68,233,459
2024	1,362,454		30,162,792	30,821,801	62,347,047

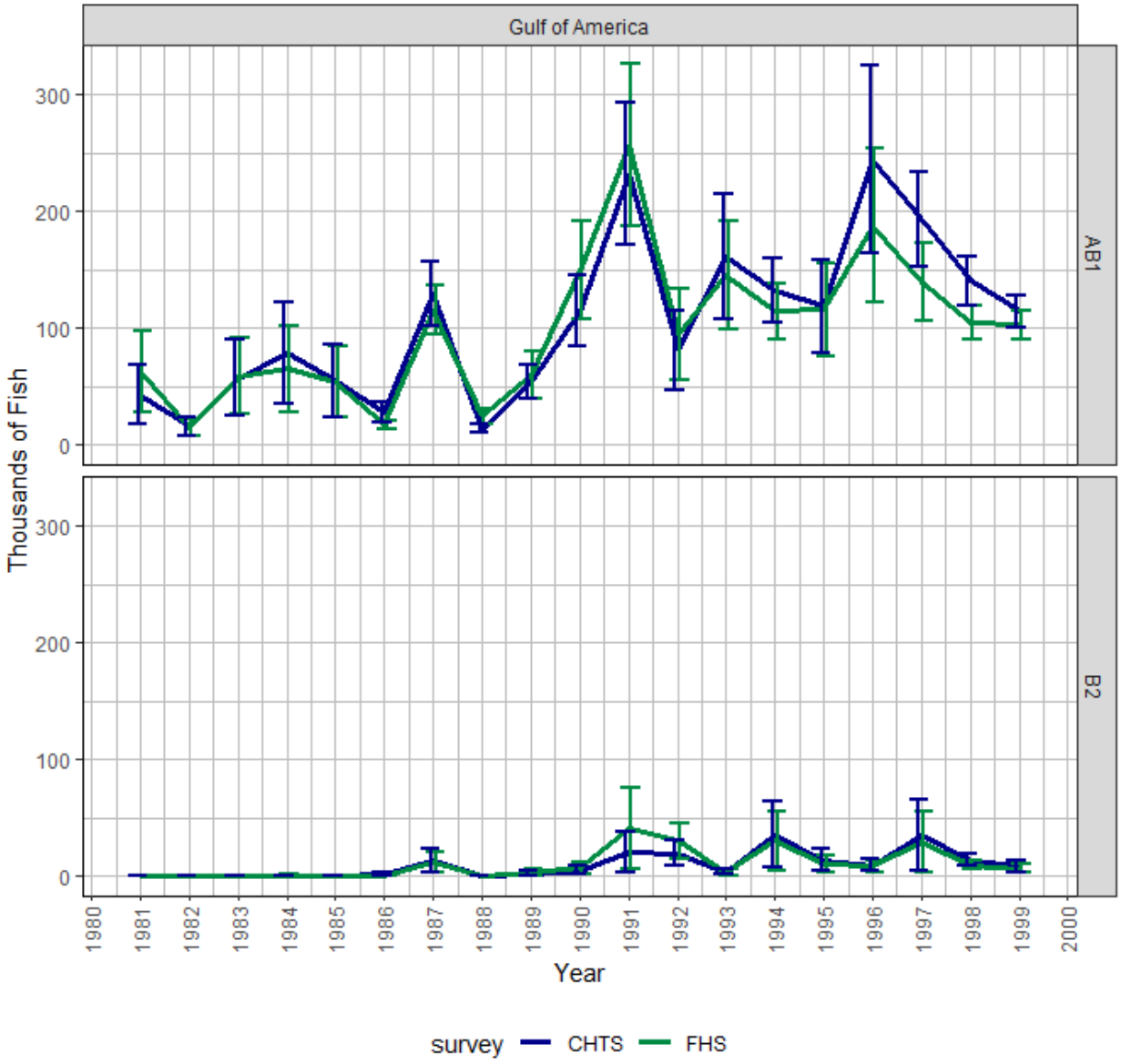

Figure 1. *Comparison of MRIP charterboat landings (AB1) and discard (B2) estimates (with standard error intervals shown) for King Mackerel from the Coastal Household Telephone Survey (CHTS) and For-Hire Survey (FHS) from the Gulf of America between 1981 and 1999 (MRIP). The Charterboat calibration approach is discussed in Dettloff and Matter (2019a). Time series constructed based on* ***calendar year****.*

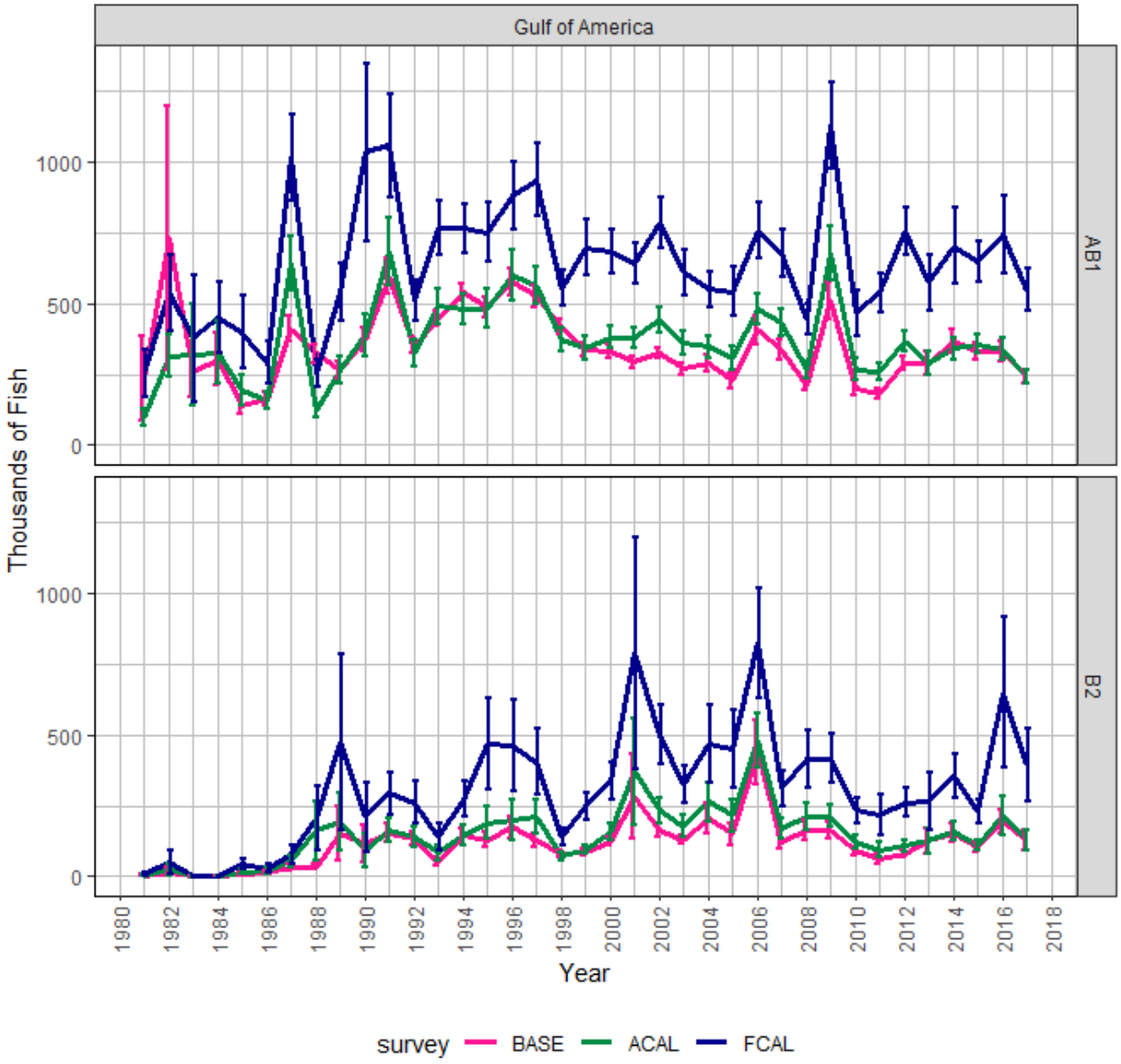

Figure 2. *MRIP Base (BASE), APAIS Calibrated (ACAL), and Fully Calibrated APAIS and FES (FCAL) estimates for King Mackerel in the Gulf of America between 1981 and 2017 (NMFS pers comm). Time series constructed based on* ***calendar year****.*

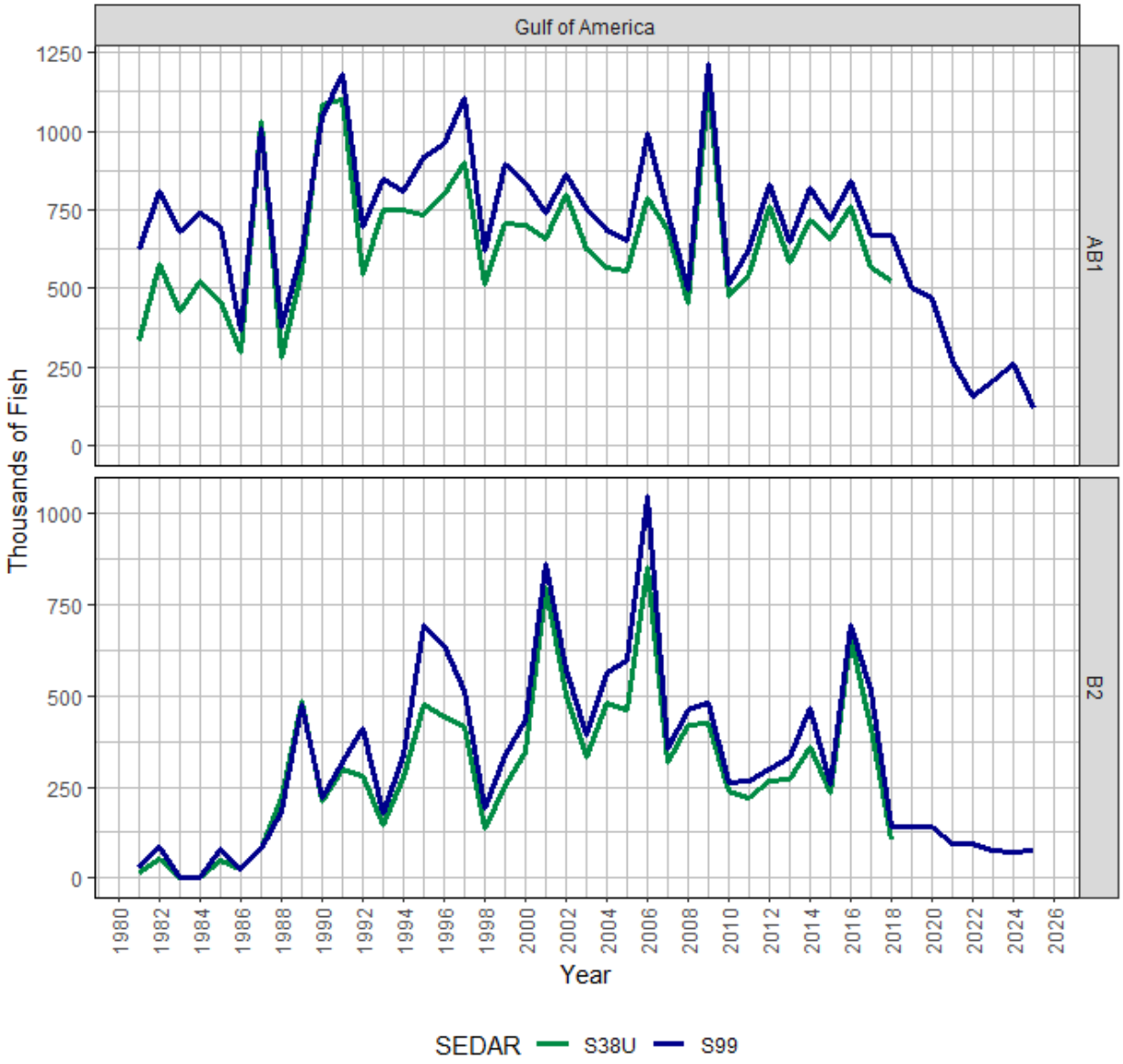

Figure 3. *Comparison of total general recreational landings (AB1) and discard estimates (B2) for Gulf of America King Mackerel between SEDAR 99 and SEDAR 38U, the terminal years of which are 2025 and 2018 respectively. Time series constructed based on* ***calendar year****, the differences in which are largely attributed to the application of a MRIP:TPWD calibration factor to Texas private estimates in SEDAR 99, with less attributed to the correction of an error in "mixing zone" catch in SEDAR 38U.*

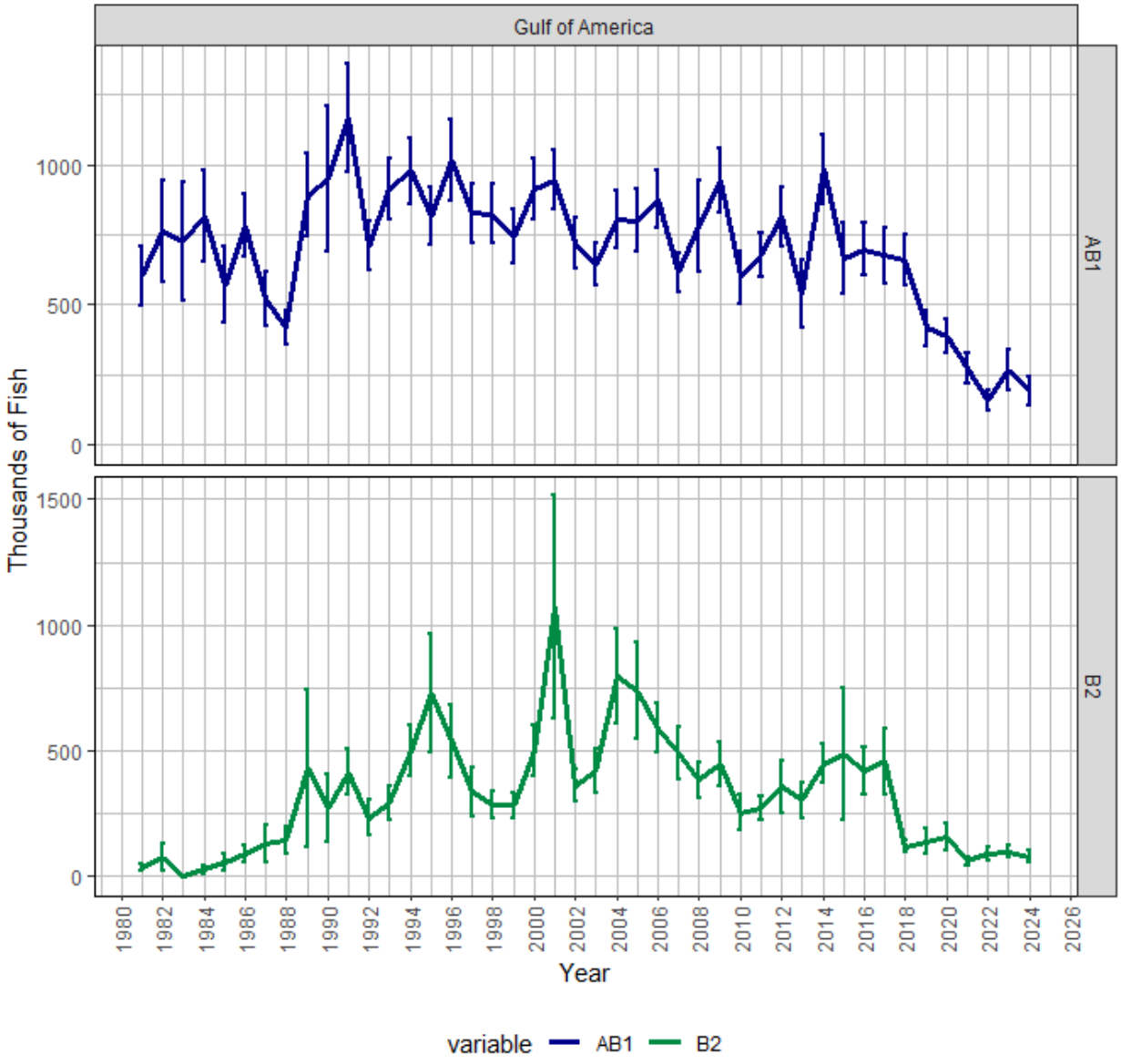

Figure 4. *Annual landings (AB1) and discard (B2) estimates with standard error intervals, in thousands of fish, for Gulf of America King Mackerel between 1981 to 2024.*

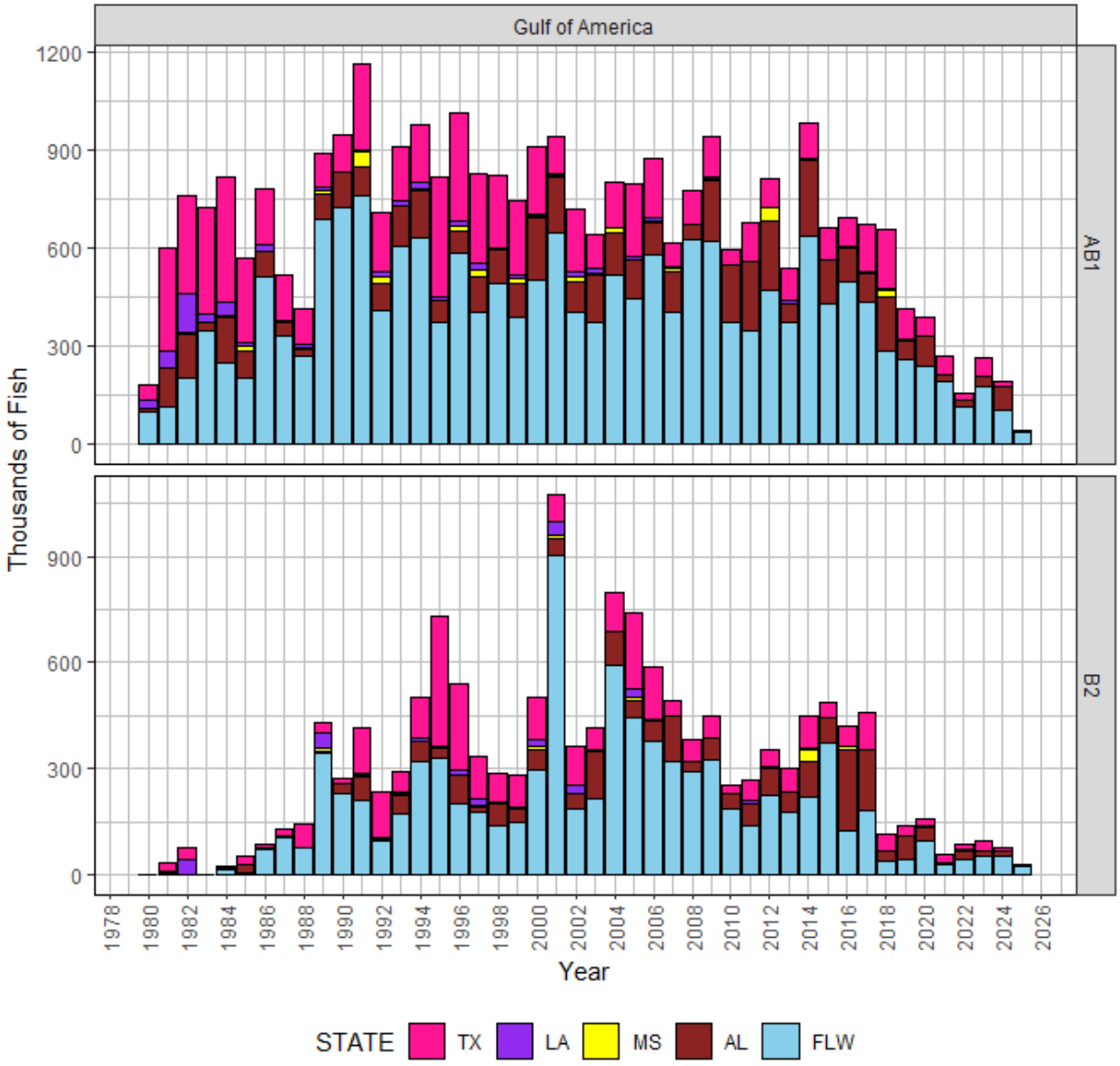

Figure 5a. *Annual King Mackerel landings (AB1) and discards (B2), in thousands of fish, by state from 1981 to 2025 from all data sources (MRIP, LACreel 2014+, TPWD).*

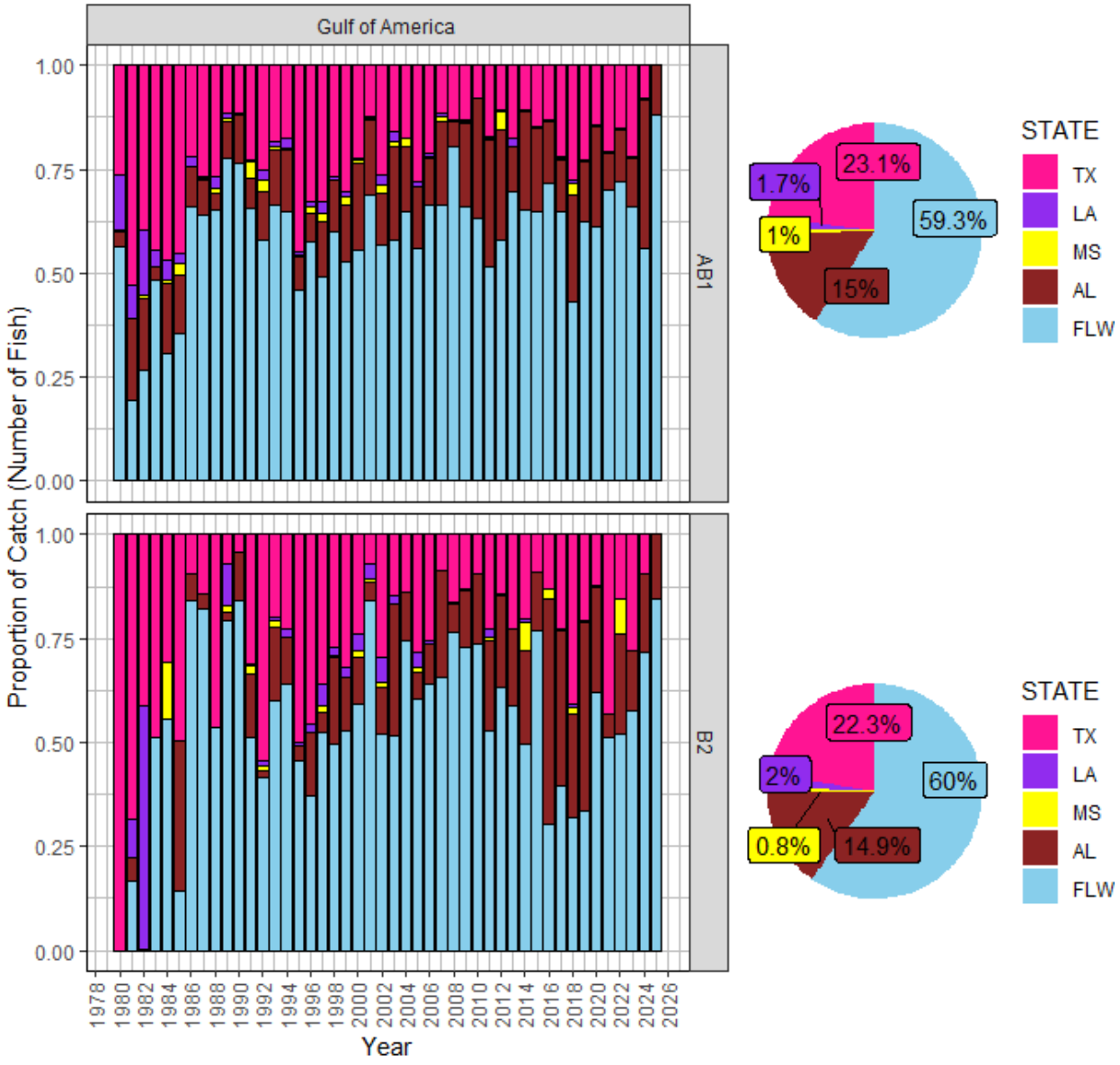

Figure 5b. *Proportion of King Mackerel landings (AB1) and discards (B2), in numbers of fish, from each state by year (bar graph) and overall (pie chart) between 1981 and 2025 from all data sources (MRIP, LACreel 2014+, TPWD).*

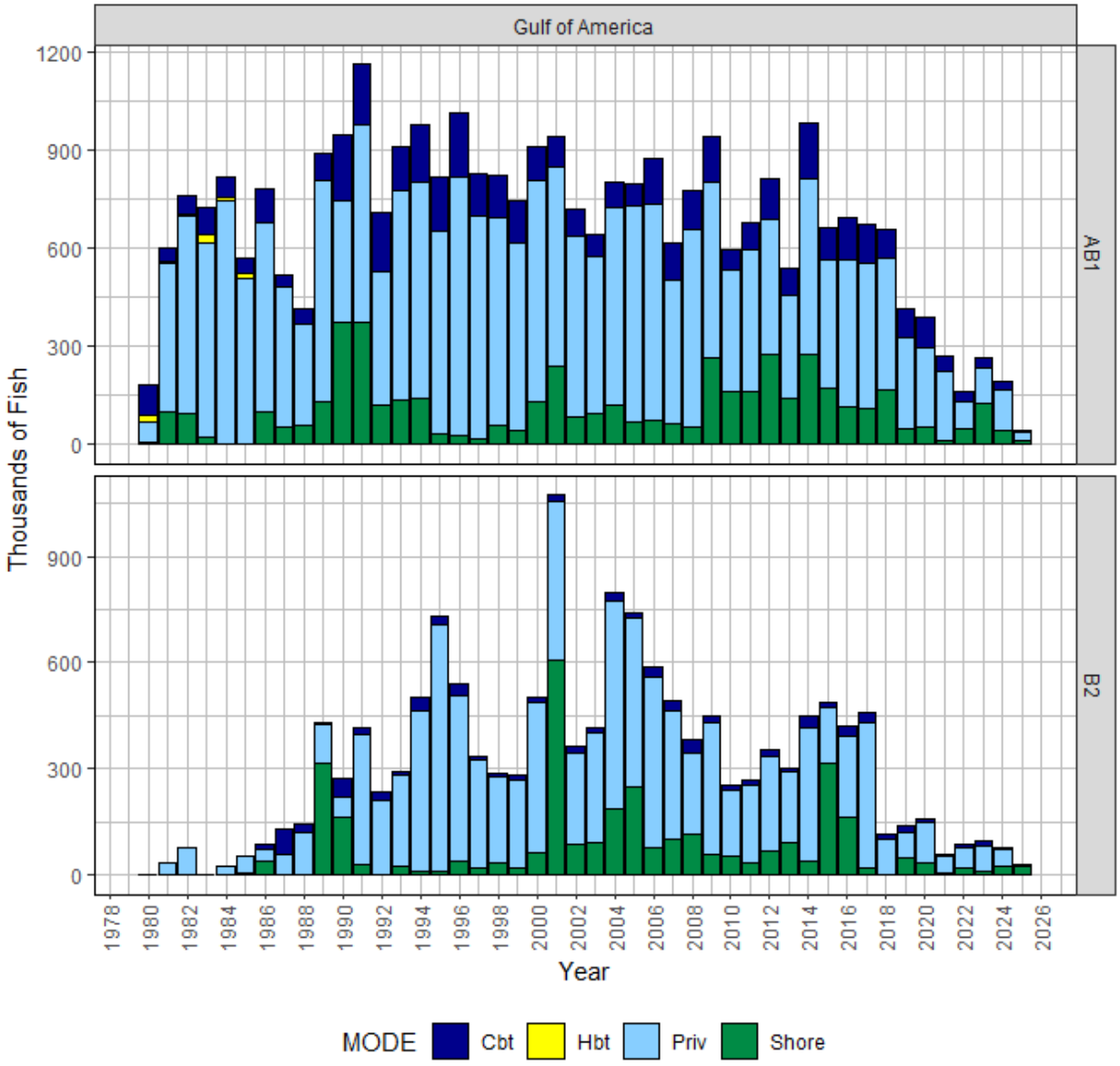

Figure 6a. *Annual King Mackerel landings (AB1) and discards (B2), in thousands of fish, by mode from 1981 to 2025 from all data sources (MRIP, LACreel 2014+, TPWD). Note that catch from the combined Private-Shore fishing mode in the LA Creel survey has been added to the Private mode.*

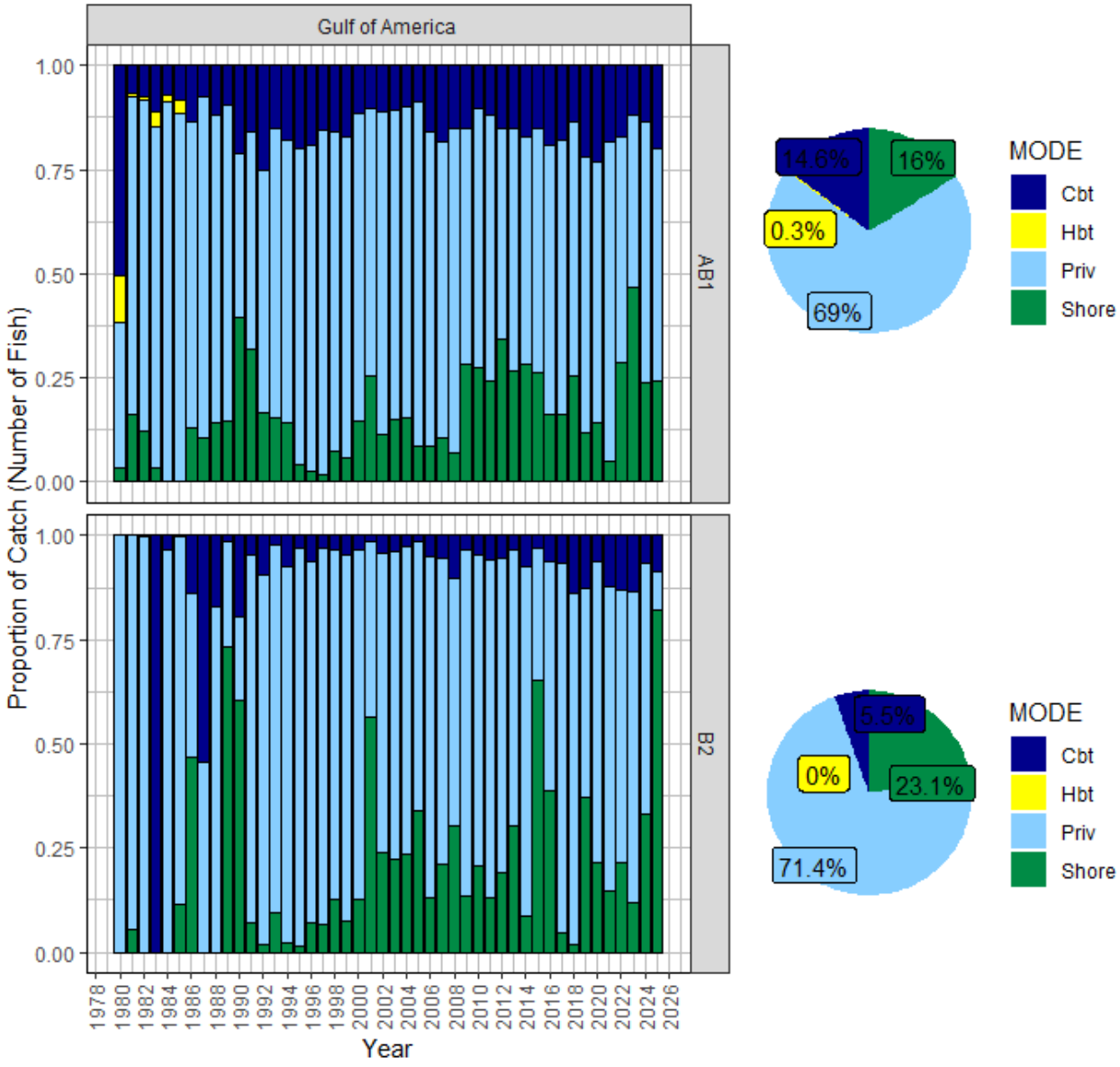

Figure 6b. *Proportion of King Mackerel landings (AB1) and discards (B2), in numbers of fish, from each mode by year (bar graph) and overall (pie chart) between 1981 and 2025 from all data sources (MRIP, LACreel 2014+, TPWD). Note that catch from the combined Private-Shore fishing mode in the LA Creel survey has been added to the Private mode.*

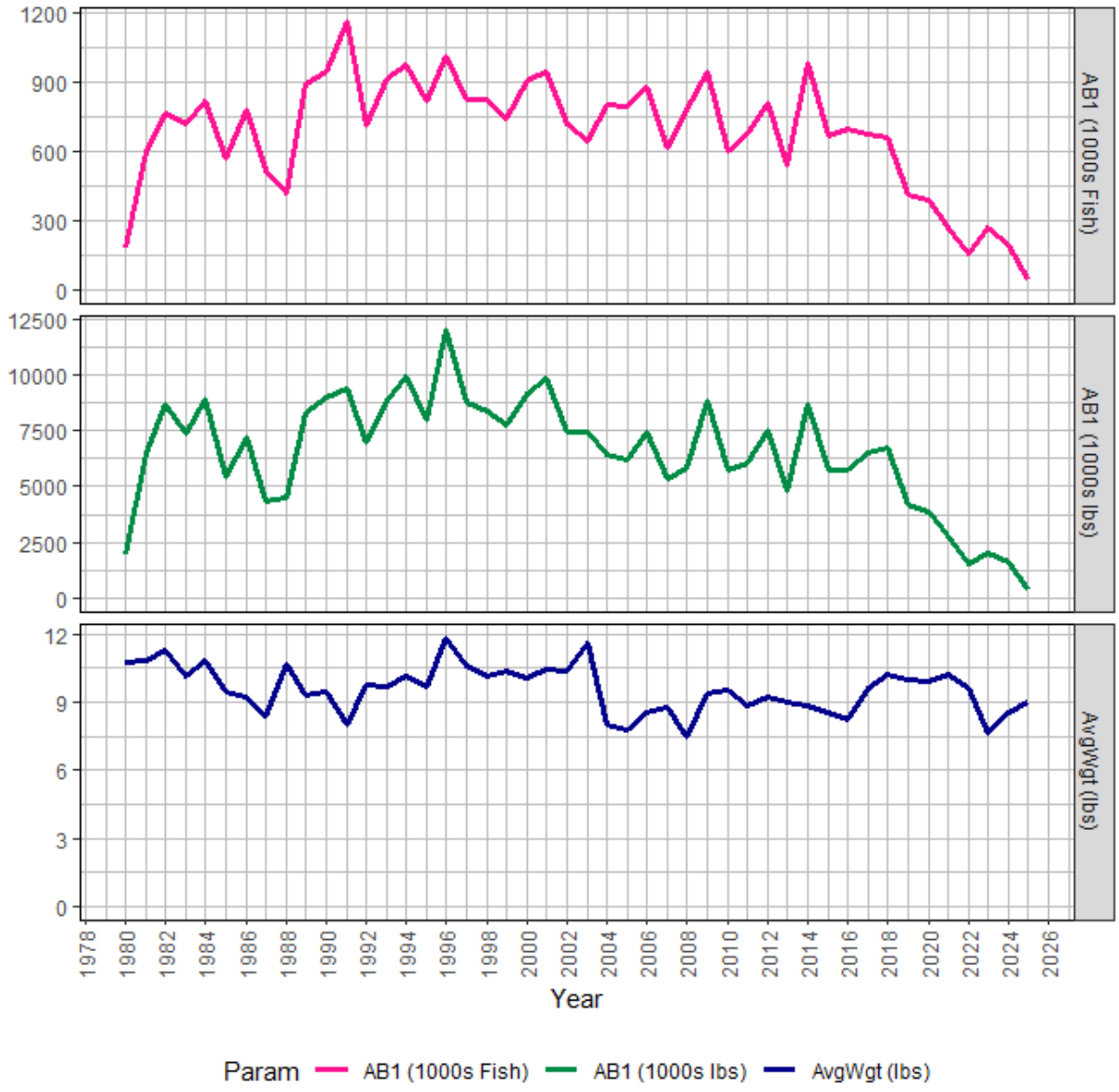

Figure 7. *Estimates of annual landings for King Mackerel in the Gulf of America from all data sources (MRIP, LACreel 2014+, TPWD): estimated landings in thousands of fish (top), estimated landings in thousands of pounds whole weight (middle), and average weight of landed fish (estimated lbs/estimated fish) (bottom). See Appendix for average weight calculation methods.*

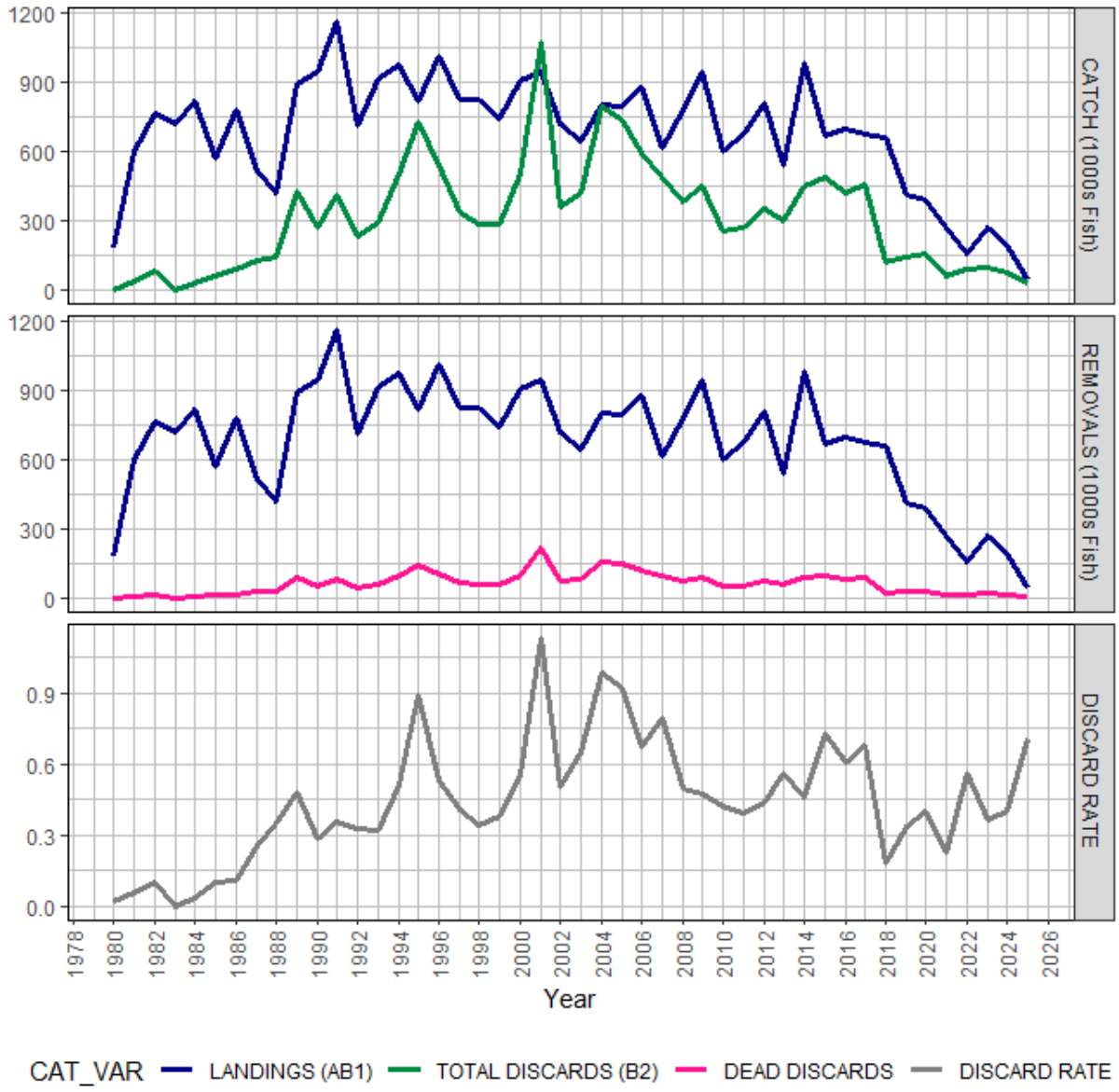

Figure 8. *Time series of general recreational landings (AB1) and discards (B2), in thousands of fish (top panel), and the associated discard rate (B2:AB1) (bottom panel) for Gulf of America King Mackerel from all data sources (MRIP, LACreel 2014+, TPWD). Dead discards (middle panel) were calculated by applying an assumed discard mortality rate of 20% from SEDAR 38 and 38U.*

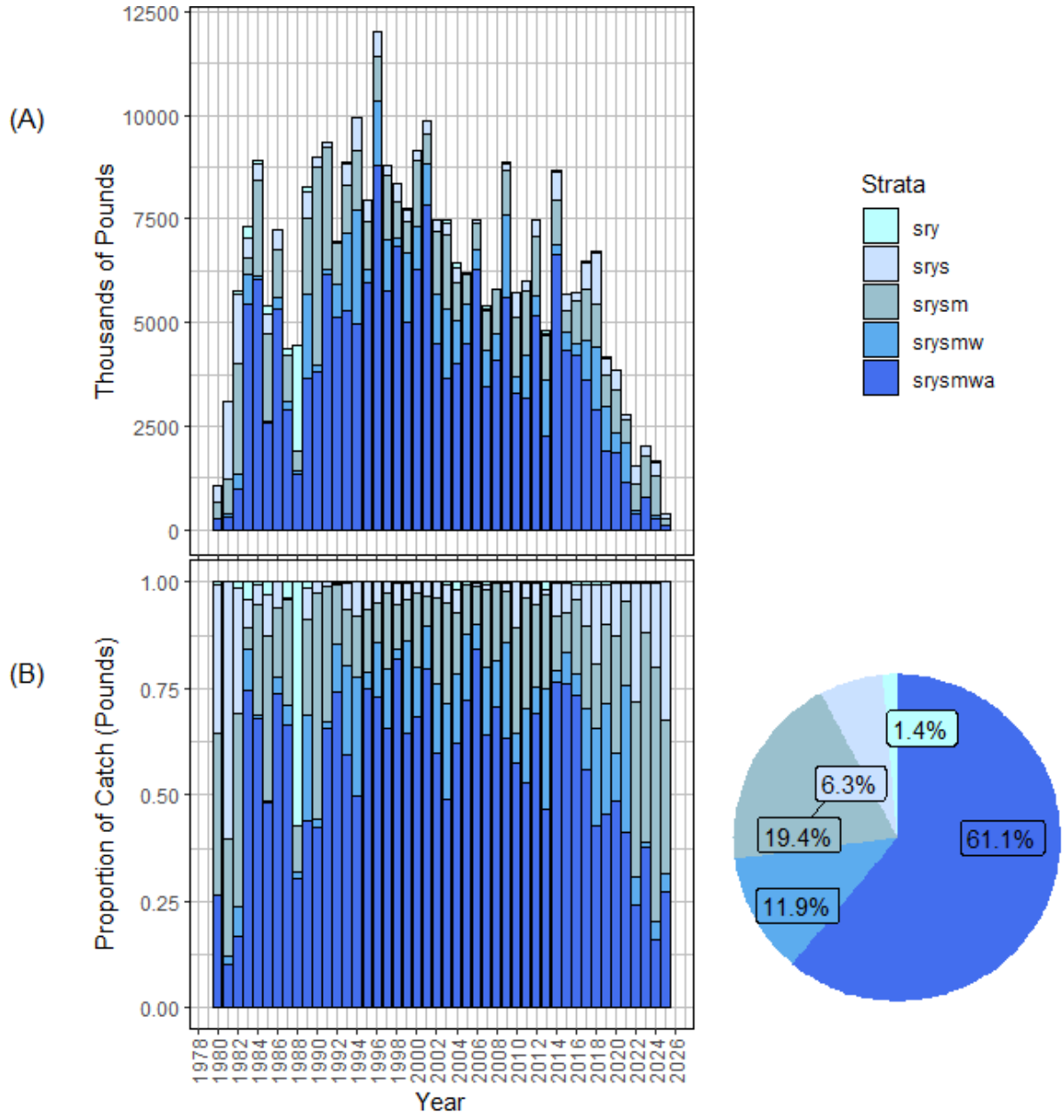

Figure 9. *Annual landings estimates of Gulf of America King Mackerel in thousands of pounds whole weight from all data sources (MRIP, LACreel 2014+, TPWD) by hierarchy level, defined by **s**pecies, **r**egion, **y**ear, **s**tate, **m**ode, **w**ave, and **a**rea. Landings are grouped by the strata at which average weights were estimated. As an example, (srysmw) summarizes those landings-in-weight estimates originating from cells where average weights are specific to a particular **s**pecies, **r**egion, **y**ear, **s**tate, **m**ode, and **w**ave (i.e., weight observations collapsed across areas). 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. Landings are provided (A) in absolute pounds and (B) as a percentage of total landings-in-weight, which is summarized by year (stacked bar graph) and across all years (pie chart).*

(A)

Wave	Cbt RAW	Cbt IMP	Priv RAW	Priv IMP	Shore IMP	Shore RAW
1	21		2			
2	2	97	1	21	5	
3	34	20	17	9	1	2
4	70		33			3
5	27		19			1
6	20		6			2

(B)

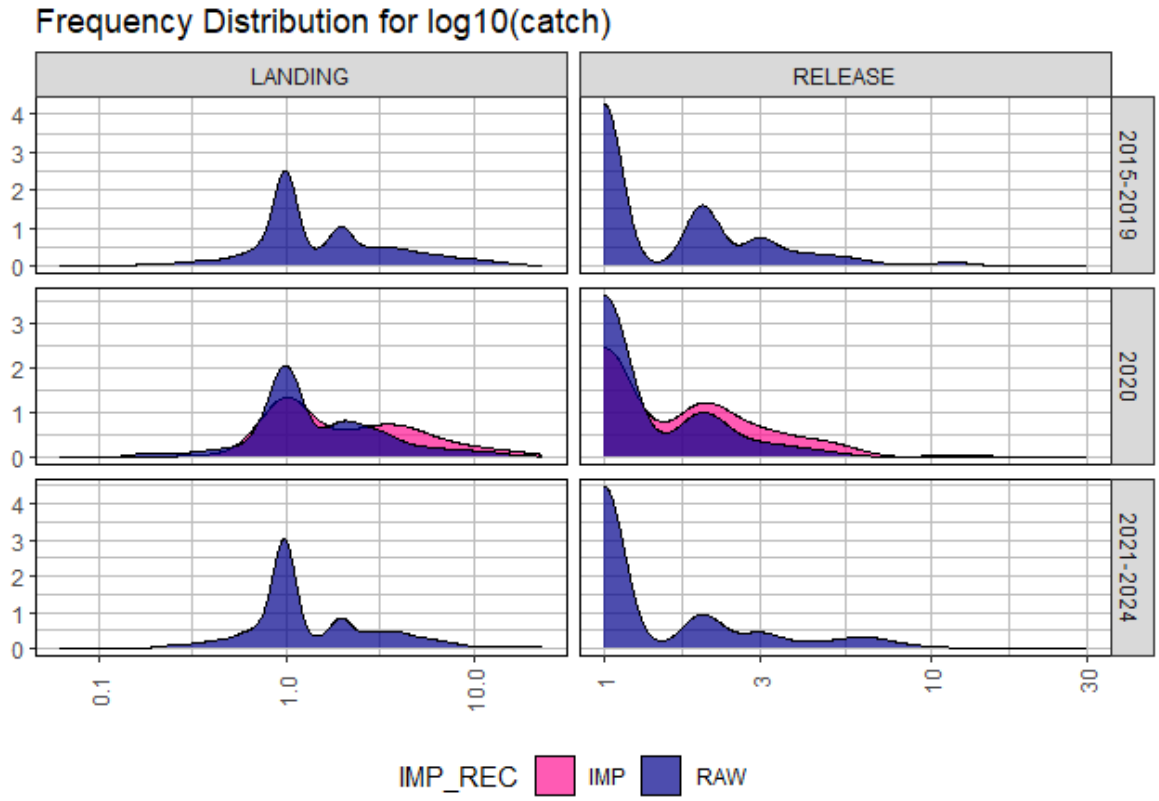

Figure 10. *COVID data gaps in the MRIP APAIS and associated imputations for (positive) fishing trips that intercepted Gulf of America King Mackerel. No 2020 data were imputed for the FES or FHS. (A) Number of positive intercepts in 2020 from the APAIS (RAW) vs. those imputed from intercepts in adjacent years (IMP). (B) Distribution of APAIS catch observations in years with no imputed catch data (in 2015-2019 and 2021-2024), in raw 2020 APAIS data, and in 2020 imputations. Refer to Cody (2021) for more information on COVID data gaps in MRIP.*

Appendix A

Additional Details of Survey Data and SEFSC Estimation

- MRIP Calibrations: 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 America 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 the For-Hire mode 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.
- SEFSC Weight Estimation: Average (fish) weight estimates are calculated in whole weight 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 7-10). For SEDAR 99 King Mackerel, this includes any weights heavier than 103.95 pounds.
- SEFSC Estimates derived using SEDAR best practices (SEDAR-PW-07):
    - The MRFSS survey began in wave2 of 1981. The preferred method was applied to fill-in this (1981 wave1) MRIP data gap, by which the proportion of the wave1 estimate to that from other waves (2-6) in years 1982-1984 (by fishing mode and area) was multiplied by the total estimate from waves 2-6 in 1981. This approach was used to impute both the catch and effort estimates for this strata.
    - Estimates from the TPWD survey are available starting in May (wave3) 1983. The average estimate (by mode and wave) from waves 1-2 in 1984-1985 and from waves 3-6 in years 1983-1985 were used to fill-in these (1981-1983) data gaps in Texas recreational estimates. This approach was used to impute both the catch and effort estimates for these strata.
    - 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 Gulf-wide 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, Monroe).

  - Between 1981 and 1985 in the Gulf of America, 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 King Mackerel since 2016. As a proxy for LA discards between 2014-2015, LA Creel landings estimates for 2014-2015 were multiplied by a mean ratio of Gulf-wide discards:landings (by mode).