Headboat Data for Red Snapper in the US Gulf of Mexico

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Contents

1 Survey Description

The Southeast Region Headboat Survey (SRHS) estimates landings and effort for headboats in the southeast U.S. Atlantic and Gulf of Mexico. The Headboat Survey began in 1972 in North Carolina and South Carolina. In 1976 the survey expanded to northeast Florida (Nassau-Indian River counties) and Georgia, followed by southeast Florida (St. Lucie-Monroe counties) in 1978 (Chester et al. 1984; Grimes and Hollingsworth 1979; Huntsman 1976; Huntsman, Colby, and Dixon 1978). The SRHS began in the Gulf of Mexico in 1986 and extends from Naples, FL to South Padre Island, TX. The headboat survey generally includes 70-80 vessels participating in each region annually (Table 1). Headboat data are considered confidential and cannot be publicly distributed if less than three vessels contribute to the data product.

The SRHS implemented electronic logbook reporting in the South Atlantic and Gulf of Mexico as of Jan 1, 2013. Headboat operators now have the ability to report trip information via a website or mobile application. A review of the headboat data methodology and validity was conducted in 2015 for the Atlantic waters of the Southeastern U.S. (Fitzpatrick et al. 2017; SEDAR 2015). Panelists agreed the SRHS data products were the best available information for regional headboat data and should be used in stock assessments. The decision should translate to the Gulf of Mexico since the methodology and data collection are identical.

The paper headboat logbook forms varied by region and year due to space limitation on the forms during the early years of the survey. Predominant species listed on the paper forms varied by region. In general, the number of species increased in all regions over the early years. There were blank lines to write in species not listed on all forms. In the electronic logbook entry, starting in 2013, all species are available to users. Reporting of discards was added to the form in 2004. Due to confusion about the condition of the released fish, only total discards have been reported since 2013. Live and dead releases are typically combined for 2004 to 2012 as total discards to match later years.

The area definitions for SRHS were modified in 2013 primarily to remove the inshore - offshore component for the Carolinas and create state-specific areas for the Gulf of Mexico. A few other areas were collapsed in the Florida Keys and west Florida (Figures 1 and 2). For this assessment, state is used to define finer scale regions rather than actual states as advised by the assessment staff. The assignment of SRHS areas to states and regions are below:

- Areas 25,26,27 - TX
- Areas 24 - LA
- Areas 28 - MS (added in 2010)
- Areas 29 - AL (added in 2013)
- Areas 21,23 - FLNWAL (includes AL prior to 2013)
- Areas 24,25,26,27 - West Region
- Areas 23,28,29 - Central Region
- Areas 18,21,22 - East Region

The SRHS dockside sampling was suspended in March 2020 due to concerns about COVID. No biological samples were collected during this time. During the dockside sampling suspension, port agents continued to monitor reporting compliance to ensure captains continue to report trip level catch and effort data via the electronic logbooks. Reported catch and effort data were used to estimate 2020 headboat landings and effort with no disruption. Converting landings in number to landings in weight requires mean weights by species. The logic for determining mean weights expands across strata and backwards in time until a minimum of 10 fish are available. The 2020 landings estimates in weight were derived by applying mean weights from 2019 to 2020 landings in number. Port agents continued to maintain QA-QC checks and validations in the database for their area of responsibility. Port agents also provided outreach and support to captains regarding the new for-hire reporting requirements and changes to the electronic reporting application. Given that headboat dockside sampling necessarily involves interactions between the sampler and headboat anglers and staff, biological samples were not collected until NMFS/SEFSC approved measures to resume sampling in July 2021. However, some port agents are supported by state agencies and returned to dockside sampling earlier.

2 Methods

2.1 Landings

The SRHS incorporates two components for estimating catch and effort. 1) Information about total catch and effort are collected via a logbook form that is filled out by vessel personnel for individual trips. These logbooks are summarized by vessel to generate estimated landings by species, area, and time strata. The compliance in reporting this information has improved over the years of the survey. Port agents are able to

identify missing trip reports by contacting the captain or office associated with the fishing vessel, personal observations, reviewing the weekly compliance report, and other methods. If a missing trip is identified, the catch is estimated using a report from the same vessel when possible or a vessel of similar size over the same time and area. Reporting compliance has been near 100 percent since permits were tied to reporting requirements in 2008. The proportion of trips reported is the primary information used to develop a proxy for uncertainty estimates for landings and discards. 2) The size of the fish landed are collected by port samplers during dockside sampling, where fish are measured to the nearest mm and weighed to the nearest 0.01 kg. The mean weights by species, area, and month are used to convert reported landings in numbers of fish to landings in weight.

2.2 Discards

The Southeast Region Headboat Survey logbook form was modified in 2004 to include a category to collect self-reported discards for each reported trip. This category is described on the form as the number of fish by species released alive and number released dead. Port agents instructed each captain on criteria for determining the condition of discarded fish. A fish is considered "released alive" if it is able to swim away on its own. If the fish floats off or is obviously dead or unable to swim, it is considered "released dead". As of Jan 1, 2013 the SRHS began collecting logbook data electronically. Changes to the trip report were also made at this time, one of which removed the condition category for discards i.e., released alive vs. released dead. The new form now collects only the total number of fish released regardless of condition.

Some under reporting and misunderstanding of the data requested were identified in the initial years of the discard data collection (2004 - 2007). Observers with the headboat at-sea program collect catch and discard information from a subset of anglers. Annual catch rates from the observer data can be compared to catch rates reported on logbooks to evaluate the validity of logbook discard data for 2004 to 2007. Starting in January 2023, two fields were added to the logbook form, number of discards descended and number vented. These will be used to quantify the prevalence of use and effectiveness of fish descending devices and venting tools which are required to be onboard in both the South Atlantic and Gulf of Mexico.

2.3 Uncertainty

The first attempt to provide uncertainty estimates for headboat landings were developed for the SEDAR 68 scamp research track assessment (Nuttall et al. 2020). The approach was statistically valid but applied the uncertainty of reported SRHS landings (across areas, months, and vessels) as a proxy for uncertainty in SRHS landings estimates, which produced unrealistic coefficients of variation (CV) in some years. For SEDAR 68 scamp, years with only 60 percent of the vessels reporting had CV values of approximately 0.05. As an alternative, a proxy CV method was developed for the SEDAR 74 red snapper research track data workshop that relies on the proportion of trips reported (N) to total estimated trips (n) and adds a buffer of 0.05 to prevent the CV from reaching zero

$proxyCV = 1 - \frac{N}{n} + 0.05$ (SEDAR 2022).

This proxy CV method was again refined for the SEDAR 82 gray triggerfish research track data workshop to account for any spatial variability in species abundance and reporting compliance. In particular, using the SEDAR 74 approach, high CVs could be estimated for strata that have low compliance rates across most areas, even if compliance was high in the few areas comprising the majority of catch. To address this concern, compliance rates are now weighted (spatially) by the associated landings estimates:

$$proxyCV_i = 1 - \sum_{j=1}^{n}\left[\left(\frac{N_{i,j}}{n_{i,j}}\right)*\left(\frac{L_{i,j}}{L_i}\right)\right]+0.05$$

where n is the number of reported trips, N is the number of estimated trips, and L is the landings in number for year i and state/region j.

2.4 Effort

Catch and effort data were reported on logbook forms provided to all headboats in the survey until 2012 and electronically since 2013. The information is entered by the owner, captain, or designated crew member after each trip and the total number of all the species landed on a given trip, along with the total number of fish discarded for each species. Data on effort are provided as number of anglers on a given trip. Effort is standardized as angler days by multiplying the number of hours associated with the type of trip (e.g., 40 anglers on a half-day trip would yield $40 * 0.5 = 20$ angler days). Angler days are summed by month for individual vessels. Each month, port agents collect these logbook trip reports and check for accuracy and completeness. Although reporting via the logbooks is mandatory, compliance is not 100% and is variable by location. To account for non-reporting, a correction factor is developed based on sampler observations, angler numbers headboat booking offices, and all available information. This information is used to provide estimates of total catch (expanded or corrected for non-reporting) by month and area, along with estimates of effort. The effort estimates for Louisiana in 2004 and 2005 are zero. During this time period only one or two vessels were active and did not report their catch in 2002, 2004, 2005, or 2006. In 2002, 2004 and early 2005 funding and staffing issues prevented the collection of trip information by port agents necessary to estimate effort and catch. In August 2005, Hurricane Katrina impacted Louisiana fishing operations to the extent it was unlikely there was any fishing effort through the end of the year and some of 2006. Alabama was assigned a separate area code in 2013. In prior years, Alabama was combined with northwest Florida. Mississippi was added to the headboat survey in 2010. In earlier years, there was little to no headboat fishing in Mississippi. Angler Days is the best practice unit of effort for headboat data. Angler trips can be calculated to match units for general recreational effort from the Marine Recreational Information Program (MRIP) for the purpose of combining effort across sectors. There are some caveats with the method because it does not account for all effort expansions in the standard estimation method.

2.5 Biological Samples

Length data has been collected by SRHS dockside samplers since the initiation of the survey, the collection of which coincides with associated catch count. Weights are typically collected for the same fish measured during dockside sampling. Other biological samples and data (scales, otoliths, spines, stomachs, gonads, and sex determination) are collected routinely and processed for ageing, diet studies, and maturity studies. Lists of priority species are provided to port agents but no specific sampling quotas are directed.

3 Results and Discussion

3.1 Landings

Landings in number are given region (Table 2, Figure 3). Landings in pounds are shown by region (Table 3, Figure 4). The western Gulf of Mexico had relatively higher landings of red snapper over the course of the survey (Tables 3). The SEDAR 98 landings for red snapper were identical to the SEDAR 74 landings for overlapping years (Figure 5).

3.2 Discards

The assessment team requested discards to be split between open and closed seasons. The estimation process operates at the year, vessel, month strata. The estimated discards were used for all months that were either fully open or closed. For months that were partially open, the discards reported on the logbooks were split to open and closed based on the day of the trip. The difference between the estimated and reported discards were then assigned to open or closed based on the proportion of days open or closed. The compliance rates are good over this time period so the difference between reported and estimated discards was only about 250 fish over the entire time series. The majority of the discards were from Northwest Florida/Alabama and

Texas from 2008 to 2023 which follows the pattern of landings (Table 6, Figure 6). The discards summed across closed and open seasons are identical to the SEDAR 74 discards with the exception of 10 more fish in the central region in 2010 for SEDAR 98 (Figure 7). There is no SRHS information on the size of these fish with which to convert the discards in number to weight. Therefore discard estimates in weight were not provided for the headboat fleet.

3.3 Confidentiality

Headboat landings and discards are confidential if fewer than three vessels contributed logbook records for any strata. The number of vessels reporting by state, region, and annually are given in tables 7 - 9. For red snapper, only the regional and annual catch can be released to the public. However, regional estimates are confidential for 1995 and 2002 due to a small number of vessels reporting in the East region.

3.4 Uncertainty

Unweighted proxy CV estimates by state, region and overall are provided in tables 10 - 12. Regional proxy CV values weighted by state landings in number and weight are given in tables 13 and 14. Annual weighted proxy CV values weighted by regional landings in number and weight are provided in tables 15 and 16. The weighted proxy CVs should provide the best estimate for uncertainty.

3.5 Effort

Estimated headboat angler days and angler trips decreased until about 2010 followed by an increase until 2015 after which it has been relatively constant (Tables 17 - 20, Figure 10). Reports from industry staff, captains or owners, and port agents indicated fuel prices, the economy and fishing regulations are the factors that most affected the amount of trips, number of passengers, and overall decrease in fishing effort through 2010. One of the caveats with the expansion of angler trips to account for non-reporting is evident for Louisiana in 2002 where the estimation process for angler days used a non-standard process to account for reporting deficiencies. The estimated angler trips for LA in 2002 is zero while the estimated angler days is approximately 6000 angler days. This does not dramatically impact regional or Gulfwide estimates but demonstrates an issue with the calculation created to combine with the less informative general recreational effort unit.

3.6 Biological Samples

Annual numbers of red snapper measured for natural total length in the headboat fleet by state and region are given in tables 21 - 22. The number of trips from which red snapper were measured are summarized in Tables 23 - 24. Mean total lengths (mm) and weight (g) and associated CVs for the headboat fishery are tabulated by state and region in Tables 25 - 32. Patterns in length and weight by year and region are shown in Figures 8 and 9.

3.7 Tables

Table 1: Number of vessels in the SRHS by year and region (Gulf - SW Florida to Texas, Atlantic - North Carolina to SE Florida.)

year	Atlantic	Gulf
1980	89	
1981	92	
1982	89	
1983	86	
1984	90	
1985	89	
1986	94	87
1987	94	79
1988	94	72
1989	95	95
1990	93	88
1991	94	80
1992	105	80
1993	95	81
1994	95	84
1995	89	82
1996	90	73
1997	92	70
1998	89	73
1999	86	69
2000	89	72
2001	84	72
2002	77	61
2003	68	65
2004	81	65
2005	76	74
2006	76	70
2007	78	69
2008	84	71
2009	82	76
2010	86	78
2011	77	73
2012	78	71
2013	76	68
2014	76	68
2015	73	68
2016	76	69
2017	66	71
2018	65	72
2019	65	72
2020	66	68
2021	62	70
2022	62	68
2023	61	68

Table 2: Red snapper landings by region in number (TX and LA are West; AL, MS, FLNWAL are Central, FLSW is East). Years with less than 3 vessels reporting for any region are listed as conf.

year	West	Central	East	Total
1986	316090	14903	1461	332454
1987	319348	9256	429	329033
1988	423024	12881	951	436856
1989	372473	10357	440	383270
1990	187006	15393	146	202545
1991	264686	15349	231	280266
1992	413056	33832	41	446929
1993	458772	36735	540	496047
1994	497738	28771	227	526736
1995	conf	conf	conf	377628
1996	349266	28314	74	377654
1997	347424	48398	41	395863
1998	244738	76455	304	321497
1999	98699	64725	2707	166131
2000	111410	56399	1241	169050
2001	116358	50343	946	167647
2002	conf	conf	conf	213596
2003	157905	70539	482	228926
2004	110329	62020	1462	173811
2005	99988	41612	5179	146779
2006	121177	46744	1138	169059
2007	110314	62842	761	173917
2008	57569	60630	1356	119555
2009	75998	78421	3169	157588
2010	51514	33932	2011	87457
2011	50656	66156	3031	119843
2012	54283	51710	2468	108461
2013	43743	41303	2682	87728
2014	35511	40547	2210	78268
2015	63033	42346	3116	108495
2016	61137	35553	2896	99586
2017	60068	50271	8339	118678
2018	62595	56764	8690	128049
2019	67126	41097	8645	116868
2020	70161	31632	7161	108954
2021	83724	28351	10460	122535
2022	84263	24034	11133	119430
2023	78862	33715	9391	121968

Table 3: Red snapper landings by region in pounds(TX and LA are West; AL, MS, and FLNWAL are Central, FLSW is East). Years with less than 3 vessels reporting for any region are listed as conf.

year	West	Central	East	Total
1986	372643	34204	3644	410491
1987	384748	25022	1274	411045
1988	581361	30605	2195	614161
1989	962620	22824	1004	986449
1990	342555	35331	429	378315
1991	448516	34585	576	483677
1992	872859	77060	152	950071
1993	1300057	82788	1557	1384402
1994	1441644	83204	615	1525463
1995	conf	conf	conf	1357635
1996	1324394	84173	225	1408792
1997	1183785	120501	137	1304423
1998	940659	183412	685	1124755
1999	503005	187746	8222	698973
2000	585453	173964	3877	763294
2001	405872	164165	3454	573491
2002	conf	conf	conf	824809
2003	569760	220615	1529	791904
2004	503163	185771	4348	693282
2005	379858	128016	18468	526341
2006	450708	122689	2845	576243
2007	313255	171338	2416	487009
2008	222711	180280	4965	407956
2009	491339	300227	14334	805901
2010	284081	136540	8909	429531
2011	309919	306287	14362	630568
2012	440874	265255	17955	724084
2013	240316	192471	12493	445280
2014	195438	176566	10289	382293
2015	356570	204629	19032	580231
2016	352210	162091	12278	526579
2017	344966	211776	27176	583919
2018	371114	244814	36716	652644
2019	417573	163298	48405	629277
2020	368121	179595	40658	588373
2021	605964	118425	68006	792394
2022	430181	88230	77704	596115
2023	402913	116883	68922	588718

Table 4: Red snapper open season discards by state in number of fish. Alabama (AL) was included with northwest Florida (FLNWAL) until 2013. The FLNWAL discards are from northwest Florida only starting in 2013.

year	TX_open	LA_open	MS_open	AL_open	FLNWAL_open	FLSW_open
2008	6692	5674	0	0	37173	676
2009	8020	4813	0	0	46567	1486
2010	8265	0	280	0	13640	618
2011	6602	4692	327	0	21435	1963
2012	6136	1732	256	0	17068	253
2013	2234	388	284	6368	19902	442
2014	1083	499	177	1754	3801	286
2015	3439	611	391	6398	12395	411
2016	2727	648	267	8478	29002	4336
2017	4648	843	586	10045	42360	4803
2018	4480	644	627	11654	31627	5885
2019	6844	491	430	11695	20484	5701
2020	5526	197	443	12353	16092	2593
2021	31849	485	739	11174	58888	3882
2022	17718	1026	886	13926	40880	5206
2023	10023	402	619	7369	16899	5747

Table 5: Red snapper closed season discards by state in number of fish. Alabama (AL) was included with northwest Florida (FLNWAL) until 2013. The FLNWAL discards are from northwest Florida only starting in 2013.

year	TX_closed	LA_closed	MS_closed	AL_closed	FLNWAL_closed	FLSW_closed
2008	24990	4178	0	0	56879	3243
2009	15526	2615	0	0	47634	4355
2010	9479	667	0	0	38892	912
2011	10427	1371	394	0	59948	4332
2012	7709	331	289	0	53963	1846
2013	6405	822	78	6605	46776	1133
2014	6428	557	203	15079	38813	1534
2015	5355	309	275	9473	24414	1078
2016	6130	277	23	9192	34854	7014
2017	4244	543	34	13530	48851	10465
2018	4376	2	22	8548	42751	8372
2019	3903	74	106	10825	33888	6979
2020	3916	0	3	6055	24530	3637
2021	4382	78	0	3045	48455	2918
2022	2306	227	1	3776	36549	2887
2023	2224	0	1	3130	26946	2549

Table 6: Red snapper discards by region and closed or open season in number of fish (TX and LA are West; AL, MS, and FLNWAL are Central, FLSW is East).

year	West_open	West_closed	Central_open	Central_closed	East_open	East_closed	Total
2008	12366	29168	37173	56879	676	3243	139505
2009	12833	18141	46567	47634	1486	4355	131016
2010	8265	10146	13920	38892	618	912	72753
2011	11294	11798	21762	60342	1963	4332	111491
2012	7868	8040	17324	54252	253	1846	89583
2013	2622	7227	26554	53459	442	1133	91437
2014	1582	6985	5732	54095	286	1534	70214
2015	4050	5664	19184	34162	411	1078	64549
2016	3375	6407	37747	44069	4336	7014	102948
2017	5491	4787	52991	62415	4803	10465	140952
2018	5124	4378	43908	51321	5885	8372	118988
2019	7335	3977	32609	44819	5701	6979	101420
2020	5723	3916	28888	30588	2593	3637	75345
2021	32334	4460	70801	51500	3882	2918	165895
2022	18744	2533	55692	40326	5206	2887	125388
2023	10425	2224	24887	30077	5747	2549	75909

Table 7: Red snapper number of vessels by state contributing to landings estimates. Strata with less than 3 vessels reporting are considered confidential.

year	TX	LA	MS	AL	FLNWAL	FLSW
1986	17	4			10	13
1987	17	4			15	5
1988	17	4			18	10
1989	18	5			17	12
1990	17	6			17	17
1991	16	6			19	12
1992	18	7			17	5
1993	19	7			18	7
1994	19	7			22	7
1995	18	8			23	1
1996	17	8			20	3
1997	18	6			22	4
1998	19	6			21	4
1999	16	5			19	9
2000	15	4			20	5
2001	16	2			19	3
2002	19				20	1
2003	20	1			19	5
2004	20				20	8
2005	21				21	10
2006	19				20	11
2007	19	5			20	7
2008	12	4			22	12
2009	16	4			24	18
2010	16	3	3		24	14
2011	17	4	3		24	13
2012	16	4	3		24	9
2013	16	3	4	8	17	8
2014	16	2	4	7	17	10
2015	15	2	5	9	17	9
2016	15	2	3	9	17	13
2017	16	2	3	10	18	12
2018	16	2	3	9	19	12
2019	15	2	3	10	16	14
2020	16	1	2	9	16	13
2021	17	2	2	9	16	13
2022	16	2	2	8	13	16
2023	16	1	2	8	15	14
2024	17	1	1	7	16	14

Table 8: Red snapper number of vessels by region contributing to landings estimates. Strata with less than 3 vessels reporting are considered confidential.

year	West	Central	East
1986	21	10	13
1987	21	15	5
1988	21	18	10
1989	23	17	12
1990	23	17	17
1991	22	19	12
1992	25	17	5
1993	26	18	7
1994	26	22	7
1995	26	23	1
1996	25	20	3
1997	24	22	4
1998	25	21	4
1999	21	19	9
2000	19	20	5
2001	18	19	3
2002	19	20	1
2003	21	19	5
2004	20	20	8
2005	21	21	10
2006	19	20	11
2007	24	20	7
2008	16	22	12
2009	20	24	18
2010	19	27	14
2011	21	27	13
2012	20	27	9
2013	19	29	8
2014	18	28	10
2015	17	31	9
2016	17	29	13
2017	18	31	12
2018	18	31	12
2019	17	29	14
2020	17	27	13
2021	19	27	13
2022	18	23	16
2023	17	25	14
2024	18	24	14

Table 9: Red snapper number of vessels annually contributing to landings estimates. Strata with less than 3 vessels reporting are considered confidential.

year	n_vessel
1986	44
1987	41
1988	49
1989	52
1990	57
1991	53
1992	47
1993	51
1994	55
1995	50
1996	48
1997	50
1998	50
1999	48
2000	44
2001	40
2002	40
2003	45
2004	48
2005	52
2006	50
2007	51
2008	50
2009	62
2010	60
2011	61
2012	56
2013	56
2014	56
2015	57
2016	59
2017	61
2018	61
2019	60
2020	57
2021	59
2022	57
2023	56
2024	56

Table 10: Unweighted proxy CV values by state. These values are based on logbook reporting compliance and are consistent across species.

year	TX	LA	MS	AL	FLNWAL	FLSW
1986	0.410	0.349	0.000	0.000	0.888	0.594
1987	0.322	0.700	0.000	0.000	0.710	0.759
1988	0.268	0.685	0.000	0.000	0.218	0.668
1989	0.239	0.174	0.000	0.000	0.241	0.573
1990	0.272	0.423	0.000	0.000	0.191	0.215
1991	0.352	0.135	0.000	0.000	0.265	0.081
1992	0.201	0.242	0.000	0.000	0.190	0.115
1993	0.170	0.469	0.000	0.000	0.153	0.095
1994	0.177	0.357	0.000	0.000	0.192	0.241
1995	0.162	0.282	0.000	0.000	0.144	0.491
1996	0.252	0.550	0.000	0.000	0.086	0.428
1997	0.248	0.223	0.000	0.000	0.135	0.334
1998	0.138	0.139	0.000	0.000	0.140	0.586
1999	0.152	0.476	0.000	0.000	0.175	0.552
2000	0.163	0.371	0.000	0.000	0.108	0.608
2001	0.133	0.576	0.000	0.000	0.128	0.610
2002	0.088	0.000	0.000	0.000	0.156	0.482
2003	0.317	0.955	0.000	0.000	0.250	0.413
2004	0.119	0.000	0.000	0.000	0.246	0.327
2005	0.067	1.050	0.000	0.000	0.249	0.257
2006	0.058	1.050	0.000	0.000	0.385	0.264
2007	0.570	0.586	0.000	0.000	0.427	0.250
2008	0.273	0.104	0.000	0.000	0.087	0.066
2009	0.096	0.055	0.000	0.000	0.055	0.055
2010	0.055	0.050	0.145	0.000	0.059	0.098
2011	0.051	0.050	0.050	0.000	0.051	0.065
2012	0.095	0.050	0.050	0.000	0.083	0.054
2013	0.050	0.050	0.050	0.050	0.050	0.050
2014	0.050	0.050	0.050	0.051	0.050	0.050
2015	0.051	0.059	0.058	0.050	0.052	0.050
2016	0.052	0.050	0.050	0.052	0.050	0.050
2017	0.074	0.060	0.050	0.051	0.050	0.054
2018	0.052	0.050	0.050	0.054	0.050	0.052
2019	0.059	0.050	0.050	0.054	0.053	0.051
2020	0.050	0.050	0.050	0.050	0.050	0.050
2021	0.050	0.050	0.050	0.050	0.050	0.050
2022	0.050	0.050	0.050	0.050	0.050	0.050
2023	0.050	0.050	0.050	0.050	0.050	0.050

Table 11: Unweighted proxy CV values by region. These values are based on logbook reporting compliance and are consistent across species.

year	West	Central	East
1986	0.399	0.888	0.594
1987	0.387	0.710	0.759
1988	0.344	0.218	0.668
1989	0.233	0.241	0.573
1990	0.300	0.191	0.215
1991	0.314	0.265	0.081
1992	0.209	0.190	0.115
1993	0.239	0.153	0.095
1994	0.215	0.192	0.241
1995	0.185	0.144	0.491
1996	0.320	0.086	0.428
1997	0.243	0.135	0.334
1998	0.138	0.140	0.586
1999	0.221	0.175	0.552
2000	0.193	0.108	0.608
2001	0.211	0.128	0.610
2002	0.088	0.156	0.482
2003	0.408	0.250	0.413
2004	0.119	0.246	0.327
2005	0.208	0.249	0.257
2006	0.206	0.385	0.264
2007	0.571	0.427	0.250
2008	0.244	0.087	0.066
2009	0.092	0.055	0.055
2010	0.055	0.063	0.098
2011	0.051	0.051	0.065
2012	0.092	0.081	0.054
2013	0.050	0.050	0.050
2014	0.050	0.050	0.050
2015	0.051	0.052	0.050
2016	0.052	0.051	0.050
2017	0.073	0.051	0.054
2018	0.052	0.051	0.052
2019	0.059	0.053	0.051
2020	0.050	0.050	0.050
2021	0.050	0.050	0.050
2022	0.050	0.050	0.050
2023	0.050	0.050	0.050

Table 12: Unweighted proxy CV values by year. These values are based on logbook reporting compliance and are consistent across species.

year	cv
1986	0.621
1987	0.656
1988	0.496
1989	0.435
1990	0.229
1991	0.181
1992	0.158
1993	0.150
1994	0.222
1995	0.317
1996	0.314
1997	0.250
1998	0.339
1999	0.365
2000	0.376
2001	0.376
2002	0.274
2003	0.363
2004	0.252
2005	0.240
2006	0.284
2007	0.398
2008	0.101
2009	0.063
2010	0.079
2011	0.057
2012	0.071
2013	0.050
2014	0.050
2015	0.051
2016	0.050
2017	0.056
2018	0.052
2019	0.053
2020	0.050
2021	0.050
2022	0.050
2023	0.050

Table 13: Regional proxy CV values weighted by state landings of red snapper in number.

year	West	Central	East
1986	0.407	0.888	0.594
1987	0.333	0.710	0.759
1988	0.296	0.218	0.668
1989	0.237	0.241	0.573
1990	0.283	0.191	0.215
1991	0.329	0.265	0.081
1992	0.205	0.190	0.115
1993	0.201	0.153	0.095
1994	0.194	0.192	0.241
1995	0.174	0.144	0.491
1996	0.286	0.086	0.428
1997	0.245	0.135	0.334
1998	0.138	0.140	0.586
1999	0.220	0.175	0.552
2000	0.190	0.108	0.608
2001	0.185	0.128	0.610
2002	0.079	0.156	0.482
2003	0.352	0.250	0.413
2004	0.119	0.246	0.327
2005	0.067	0.249	0.257
2006	0.058	0.385	0.264
2007	0.571	0.427	0.250
2008	0.253	0.087	0.066
2009	0.094	0.055	0.055
2010	0.055	0.061	0.098
2011	0.051	0.051	0.065
2012	0.093	0.083	0.054
2013	0.050	0.050	0.050
2014	0.050	0.050	0.050
2015	0.051	0.051	0.050
2016	0.052	0.051	0.050
2017	0.074	0.051	0.054
2018	0.052	0.051	0.052
2019	0.059	0.053	0.051
2020	0.050	0.050	0.050
2021	0.050	0.050	0.050
2022	0.050	0.050	0.050
2023	0.050	0.050	0.050

Table 14: Regional proxy CV values weighted by state landings of red snapper in weight.

year	West	Central	East
1986	0.405	0.888	0.594
1987	0.338	0.710	0.759
1988	0.301	0.218	0.668
1989	0.238	0.241	0.573
1990	0.283	0.191	0.215
1991	0.318	0.265	0.081
1992	0.206	0.190	0.115
1993	0.203	0.153	0.095
1994	0.200	0.192	0.241
1995	0.176	0.144	0.491
1996	0.286	0.086	0.428
1997	0.245	0.135	0.334
1998	0.138	0.140	0.586
1999	0.221	0.175	0.552
2000	0.182	0.108	0.608
2001	0.192	0.128	0.610
2002	0.081	0.156	0.482
2003	0.359	0.250	0.413
2004	0.119	0.246	0.327
2005	0.067	0.249	0.257
2006	0.058	0.385	0.264
2007	0.571	0.427	0.250
2008	0.234	0.087	0.066
2009	0.094	0.055	0.055
2010	0.055	0.061	0.098
2011	0.051	0.051	0.065
2012	0.093	0.082	0.054
2013	0.050	0.050	0.050
2014	0.050	0.050	0.050
2015	0.051	0.051	0.050
2016	0.052	0.051	0.050
2017	0.073	0.051	0.054
2018	0.052	0.052	0.052
2019	0.059	0.053	0.051
2020	0.050	0.050	0.050
2021	0.050	0.050	0.050
2022	0.050	0.050	0.050
2023	0.050	0.050	0.050

Table 15: Annual proxy CV values weighted by regional landings of red snapper in number.

year	CV
1986	0.421
1987	0.397
1988	0.341
1989	0.234
1990	0.292
1991	0.311
1992	0.207
1993	0.232
1994	0.214
1995	0.183
1996	0.302
1997	0.230
1998	0.139
1999	0.208
2000	0.168
2001	0.188
2002	0.112
2003	0.359
2004	0.166
2005	0.221
2006	0.256
2007	0.518
2008	0.163
2009	0.073
2010	0.059
2011	0.051
2012	0.086
2013	0.050
2014	0.050
2015	0.051
2016	0.051
2017	0.062
2018	0.052
2019	0.056
2020	0.050
2021	0.050
2022	0.050
2023	0.050

Table 16: Annual proxy CV values weighted by regional landings of red snapper in weight.

year	CV
1986	0.441
1987	0.408
1988	0.339
1989	0.234
1990	0.290
1991	0.310
1992	0.207
1993	0.233
1994	0.214
1995	0.183
1996	0.306
1997	0.233
1998	0.139
1999	0.213
2000	0.176
2001	0.189
2002	0.106
2003	0.364
2004	0.154
2005	0.219
2006	0.245
2007	0.519
2008	0.173
2009	0.077
2010	0.058
2011	0.051
2012	0.087
2013	0.050
2014	0.050
2015	0.051
2016	0.051
2017	0.064
2018	0.052
2019	0.057
2020	0.050
2021	0.050
2022	0.050
2023	0.050

Table 17: Estimates of total effort in angler - days by year.

year	Angler_Day
1986	302536
1987	286774
1988	274035
1989	274581
1990	278948
1991	240654
1992	270931
1993	300058
1994	317991
1995	283372
1996	257753
1997	240657
1998	270835
1999	242378
2000	222678
2001	218826
2002	215004
2003	225279
2004	223420
2005	190090
2006	199843
2007	203166
2008	174309
2009	196443
2010	158887
2011	207966
2012	217431
2013	233886
2014	245853
2015	253105
2016	257016
2017	251421
2018	247242
2019	240862
2020	193111
2021	270017
2022	230336
2023	223771

Table 18: Estimates of total effort in angler - trips by year.

year	Angler_Trip
1986	345088
1987	349341
1988	344490
1989	349015
1990	375074
1991	321318
1992	344598
1993	362554
1994	389525
1995	359229
1996	333866
1997	297630
1998	325040
1999	219641
2000	297305
2001	272856
2002	261999
2003	276334
2004	275920
2005	240606
2006	249919
2007	333538
2008	215139
2009	264469
2010	208932
2011	281035
2012	301350
2013	293420
2014	312877
2015	320320
2016	326806
2017	321231
2018	316196
2019	303743
2020	237569
2021	352783
2022	317628
2023	275540

Table 19: Estimates of total effort in angler - days by region.

year	West	Central	East
1986	62459	101336	138741
1987	69725	76111	140938
1988	78087	67648	128300
1989	66256	57233	151092
1990	65042	60758	153148
1991	66342	62392	111920
1992	86129	66180	118622
1993	92160	73703	134195
1994	113429	69110	135452
1995	100962	67798	114612
1996	102840	64336	90577
1997	91215	65599	83843
1998	85504	66664	118667
1999	66261	60959	115158
2000	63347	57106	102225
2001	61583	55748	101495
2002	73173	55554	86277
2003	81068	62555	81656
2004	64990	63494	94936
2005	59857	52797	77436
2006	75794	66346	57703
2007	66286	67997	68883
2008	44133	62118	68058
2009	54005	65623	76815
2010	47371	41092	70424
2011	49170	79074	79722
2012	53615	79611	84205
2013	57328	81806	94752
2014	52865	90147	102841
2015	56799	88396	107910
2016	55368	92547	109101
2017	53131	90605	107685
2018	53698	93524	100020
2019	53714	85484	101664
2020	52168	69445	71498
2021	72877	87423	109717
2022	64563	77065	88708
2023	59885	75440	88446

Table 20: Estimates of total effort in angler - trips by region.

year	West	Central	East
1986	70752	113266	161070
1987	81749	81574	186017
1988	83764	89839	170887
1989	75876	83495	189644
1990	76780	86057	212237
1991	81337	91359	148622
1992	96090	93415	155093
1993	100043	103730	158781
1994	118160	95943	175422
1995	105772	99130	154326
1996	107764	88637	137464
1997	94157	92456	111017
1998	90553	94472	140016
1999	48435	60200	111006
2000	72056	81876	143374
2001	64516	77104	131235
2002	69614	78282	114102
2003	82703	88820	104811
2004	65024	89440	121456
2005	62093	70467	108046
2006	77265	93998	78657
2007	144368	97819	91350
2008	29253	86463	99423
2009	58088	95887	110494
2010	49273	55895	103763
2011	51748	110713	118573
2012	61315	114601	125435
2013	60035	111534	121851
2014	56145	123512	133220
2015	60540	120003	139778
2016	58190	124667	143949
2017	56164	123448	141619
2018	55687	129001	131509
2019	54741	119006	129996
2020	52947	94833	89789
2021	86183	124552	142048
2022	79823	111636	126169
2023	64718	106401	104421

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Table 21: Red snapper number of fish lengths sampled by state.

year	TX	LA	MS	AL	FLNWAL	FLSW
1986	6015	237			141	23
1987	5565	413			191	1
1988	4040	551			194	1
1989	5037	1278			280	6
1990	3547	715			330	3
1991	2476	944			496	1
1992	5875	2001			682	1
1993	5397	1657			385	
1994	5787	854			806	510
1995	7022	1303			441	
1996	4182	1060			496	
1997	2184	1812			1139	
1998	4358	2198			2156	
1999	1339	1945			839	45
2000	473	2721			1130	5
2001	1018	1512			648	5
2002	1439	935			1250	
2003	986	1015			1086	3
2004	801				542	1
2005	813	193			301	2
2006	643	108			464	17
2007	518	233			1264	15
2008	258	140			1219	2
2009	609	254			911	36
2010	795				687	21
2011	699	279			722	15
2012	61	395	60		515	32
2013	2073	226	37	543	475	19
2014	4640	133	28	1603	470	49
2015	3860	152	449	1201	488	125
2016	3557	236	307	282	85	31
2017	2799	88	231	386	137	78
2018	3843	93	169	319	162	94
2019	3697	91	99	461	853	96
2020	138					
2021	857	59	71	70	112	95
2022	1430	88	114	245	184	369
2023	2324	210	174	113	166	347

Table 22: Red snapper number of fish lengths sampled by region.

year	West	Central	East
1986	6252	141	23
1987	5978	191	1
1988	4591	194	1
1989	6315	280	6
1990	4262	330	3
1991	3420	496	1
1992	7876	682	1
1993	7054	385	
1994	6641	806	510
1995	8325	441	
1996	5242	496	
1997	3996	1139	
1998	6556	2156	
1999	3284	839	45
2000	3194	1130	5
2001	2530	648	5
2002	2374	1250	
2003	2001	1086	3
2004	801	542	1
2005	1006	301	2
2006	751	464	17
2007	751	1264	15
2008	398	1219	2
2009	863	911	36
2010	795	687	21
2011	978	722	15
2012	456	575	32
2013	2299	1055	19
2014	4773	2101	49
2015	4012	2138	125
2016	3793	674	31
2017	2887	754	78
2018	3936	650	94
2019	3788	1413	96
2020	138		
2021	916	253	95
2022	1518	543	369
2023	2534	453	347

Table 23: Red snapper number of trips sampled by state.

year	TX	LA	MS	AL	FLNWAL	FLSW
1986	386	27			64	10
1987	351	42			99	1
1988	242	57			93	1
1989	204	85			122	4
1990	208	39			114	2
1991	157	55			143	1
1992	212	111			181	1
1993	201	127			126	
1994	232	92			132	29
1995	242	115			111	
1996	158	83			115	
1997	80	151			164	
1998	212	131			248	
1999	107	114			126	6
2000	40	110			136	1
2001	98	90			88	2
2002	138	61			126	
2003	112	62			125	2
2004	79				78	1
2005	63	27			46	1
2006	44	19			78	7
2007	35	30			113	3
2008	19	18			78	2
2009	34	29			60	3
2010	40				36	6
2011	42	11			33	3
2012	3	32	8		29	6
2013	97	20	4	20	31	4
2014	134	8	2	55	37	4
2015	182	11	19	61	41	8
2016	138	11	16	14	7	6
2017	126	4	12	19	15	11
2018	193	8	11	19	15	15
2019	196	8	6	24	74	12
2020	13					
2021	40	4	4	9	21	8
2022	72	6	10	29	24	20
2023	102	6	9	10	29	23

Table 24: Red snapper number of trips sampled by region.

year	West	Central	East
1986	413	64	10
1987	393	99	1
1988	299	93	1
1989	289	122	4
1990	247	114	2
1991	212	143	1
1992	323	181	1
1993	328	126	
1994	324	132	29
1995	357	111	
1996	241	115	
1997	231	164	
1998	343	248	
1999	221	126	6
2000	150	136	1
2001	188	88	2
2002	199	126	
2003	174	125	2
2004	79	78	1
2005	90	46	1
2006	63	78	7
2007	65	113	3
2008	37	78	2
2009	63	60	3
2010	40	36	6
2011	53	33	3
2012	35	37	6
2013	117	55	4
2014	142	94	4
2015	193	121	8
2016	149	37	6
2017	130	46	11
2018	201	45	15
2019	204	104	12
2020	13		
2021	44	34	8
2022	78	63	20
2023	108	48	23

Table 25: Red snapper mean total length in mm by state.

year	TX	LA	MS	AL	FLNWAL	FLSW
1986	321	357			382	448
1987	329	358			396	473
1988	362	319			394	446
1989	346	326			385	577
1990	371	356			392	781
1991	371	394			400	450
1992	404	411			398	537
1993	416	420			400	
1994	414	463			423	432
1995	449	470			442	
1996	457	461			439	
1997	464	488			417	
1998	462	476			421	
1999	491	518			446	464
2000	514	462			452	464
2001	469	475			461	621
2002	504	472			449	
2003	492	456			457	481
2004	460				457	451
2005	466	442			453	430
2006	461	480			433	437
2007	468	470			440	458
2008	493	542			452	675
2009	544	580			484	516
2010	549				498	577
2011	569	640			523	587
2012	609	629	577		525	617
2013	565	593	532	550	521	521
2014	590	585	509	565	525	606
2015	582	617	520	563	523	575
2016	569	606	568	521	520	486
2017	574	597	515	509	501	466
2018	581	629	529	503	498	501
2019	578	572	536	500	491	557
2020	549					
2021	573	498	561	524	468	567
2022	551	513	550	463	489	591
2023	540	507	568	470	489	582

Table 26: Red snapper total length CV in mm by state.

year	TX	LA	MS	AL	FLNWAL	FLSW
1986	0.26	0.26			0.24	0.30
1987	0.23	0.22			0.33	
1988	0.29	0.21			0.23	
1989	0.22	0.24			0.26	0.17
1990	0.19	0.14			0.18	0.12
1991	0.16	0.20			0.19	
1992	0.18	0.22			0.17	
1993	0.21	0.23			0.18	
1994	0.19	0.24			0.19	0.24
1995	0.19	0.26			0.20	
1996	0.18	0.20			0.18	
1997	0.18	0.20			0.15	
1998	0.22	0.21			0.12	
1999	0.24	0.18			0.14	0.10
2000	0.21	0.16			0.15	0.22
2001	0.17	0.20			0.15	0.20
2002	0.19	0.19			0.12	
2003	0.19	0.19			0.14	0.06
2004	0.18				0.12	
2005	0.18	0.15			0.14	0.02
2006	0.20	0.23			0.10	0.08
2007	0.14	0.12			0.09	0.06
2008	0.14	0.13			0.11	0.05
2009	0.20	0.10			0.15	0.14
2010	0.16				0.15	0.17
2011	0.17	0.10			0.17	0.12
2012	0.25	0.12	0.25		0.19	0.15
2013	0.14	0.12	0.24	0.19	0.19	0.19
2014	0.13	0.17	0.25	0.21	0.19	0.21
2015	0.12	0.14	0.18	0.21	0.17	0.20
2016	0.13	0.13	0.19	0.21	0.17	0.22
2017	0.14	0.16	0.16	0.18	0.22	0.16
2018	0.14	0.25	0.20	0.19	0.16	0.14
2019	0.14	0.15	0.19	0.15	0.18	0.14
2020	0.15					
2021	0.18	0.18	0.20	0.26	0.16	0.19
2022	0.15	0.19	0.21	0.19	0.18	0.21
2023	0.13	0.20	0.19	0.17	0.14	0.22

Table 27: Red snapper mean weight (g) by state.

year	TX	LA	MS	AL	FLNWAL	FLSW
1986	585	850			1026	1814
1987	600	798			1347	1500
1988	876	667			1090	850
1989	728	789			1015	2858
1990	853	841			963	7327
1991	782	1078			1021	1620
1992	910	1218			980	2380
1993	1157	1343			1022	
1994	1204	1777			1359	1326
1995	1522	1964			1442	
1996	1479	1708			1352	
1997	1677	1971			1101	
1998	1706	1889			1105	
1999	2065	2230			1308	1437
2000	2173	1621			1377	1638
2001	1587	1826			1493	4110
2002	1902	1765			1318	
2003	1908	1600			1419	1590
2004	1558				1411	1260
2005	1623	1372			1403	1020
2006	1640	1963			1169	1068
2007	1431	1581			1206	1377
2008	1758	2394			1337	4045
2009	2825	2852			1715	1914
2010	2461				1789	2852
2011	2741	3885			2098	2700
2012	3678	3798	5447		2265	3487
2013	2510	3151	2462	2371	1928	2303
2014	2655	3123	2309	2472	1977	3569
2015	2689	3489	2281	2615	1919	2741
2016	2621	3441	2980	2065	1900	1945
2017	2668	3343	2219	1994	1824	1522
2018	2900	3118	2344	2073	1879	1918
2019	2773	2863	2448	1836	1774	2600
2020	2392					
2021	3128	1882	2801	2388	1498	2778
2022	2362	1859	2303	1536	1659	3226
2023	2228	2767	2203	1436	1612	3090

Table 28: Red snapper weight CV in g by state.

year	TX	LA	MS	AL	FLNWAL	FLSW
1986	1.27	1.20			1.05	1.00
1987	1.14	0.86			1.69	
1988	1.43	1.00			0.99	
1989	1.18	1.17			0.94	0.53
1990	1.04	0.57			0.72	0.35
1991	0.88	0.81			0.73	
1992	0.79	0.93			0.67	
1993	0.96	0.97			0.72	
1994	0.94	0.83			0.83	0.88
1995	0.89	0.96			0.90	
1996	0.80	0.83			0.72	
1997	0.72	0.73			0.67	
1998	0.92	0.82			0.53	
1999	0.93	0.65			0.52	0.38
2000	0.71	0.68			0.61	0.15
2001	0.60	0.74			0.65	0.29
2002	0.67	0.71			0.54	
2003	0.74	0.86			0.58	0.16
2004	0.80				0.52	
2005	0.75	0.67			0.60	0.06
2006	0.99	0.91			0.44	0.30
2007	0.58	0.52			0.37	0.25
2008	0.49	0.58			0.38	0.14
2009	0.59	0.35			0.53	0.40
2010	0.48				0.51	0.61
2011	0.49	0.31			0.56	0.29
2012	0.67	0.35	0.91		0.65	0.49
2013	0.43	0.37	0.77	0.59	0.66	0.66
2014	0.40	0.53	0.88	0.65	0.70	0.58
2015	0.39	0.42	0.68	0.65	0.63	0.72
2016	0.39	0.41	0.64	0.80	0.66	0.77
2017	0.39	0.48	0.58	0.60	0.84	0.72
2018	0.44	0.55	0.67	0.74	0.58	0.46
2019	0.43	0.48	0.65	0.53	0.73	0.46
2020	0.46					
2021	0.54	0.58	0.62	0.95	0.76	0.61
2022	0.48	0.77	0.74	0.91	0.69	0.62
2023	0.47	0.66	0.63	0.81	0.50	0.67

Table 29: Red snapper mean total length in mm by region.

year	West	Central	East
1986	322	382	448
1987	331	396	473
1988	357	394	446
1989	342	385	577
1990	368	392	781
1991	377	400	450
1992	406	398	537
1993	417	400	
1994	420	423	432
1995	452	442	
1996	458	439	
1997	475	417	
1998	467	421	
1999	507	446	464
2000	470	452	464
2001	472	461	621
2002	492	449	
2003	473	457	481
2004	460	457	451
2005	461	453	430
2006	464	433	437
2007	469	440	458
2008	510	452	675
2009	554	484	516
2010	549	498	577
2011	589	523	587
2012	626	530	617
2013	568	536	521
2014	590	556	606
2015	583	545	575
2016	571	542	486
2017	574	509	466
2018	582	509	501
2019	578	497	557
2020	549		
2021	568	510	567
2022	549	490	591
2023	537	515	582

Table 30: Red snapper total length CV in mm by region.

year	West	Central	East
1986	0.26	0.24	0.30
1987	0.23	0.33	
1988	0.29	0.23	
1989	0.23	0.26	0.17
1990	0.18	0.18	0.12
1991	0.18	0.19	
1992	0.19	0.17	
1993	0.22	0.18	
1994	0.20	0.19	0.24
1995	0.20	0.20	
1996	0.19	0.18	
1997	0.19	0.15	
1998	0.22	0.12	
1999	0.20	0.14	0.10
2000	0.18	0.15	0.22
2001	0.19	0.15	0.20
2002	0.19	0.12	
2003	0.20	0.14	0.06
2004	0.18	0.12	
2005	0.17	0.14	0.02
2006	0.20	0.10	0.08
2007	0.13	0.09	0.06
2008	0.15	0.11	0.05
2009	0.18	0.15	0.14
2010	0.16	0.15	0.17
2011	0.16	0.17	0.12
2012	0.14	0.20	0.15
2013	0.14	0.19	0.19
2014	0.13	0.21	0.21
2015	0.12	0.20	0.20
2016	0.13	0.20	0.22
2017	0.14	0.18	0.16
2018	0.14	0.19	0.14
2019	0.14	0.17	0.14
2020	0.15		
2021	0.19	0.22	0.19
2022	0.16	0.20	0.21
2023	0.13	0.19	0.22

Table 31: Red snapper mean weight (g) by region.

year	West	Central	East
1986	597	1026	1814
1987	613	1347	1500
1988	851	1090	850
1989	743	1015	2858
1990	850	963	7327
1991	889	1021	1620
1992	1039	980	2380
1993	1213	1022	
1994	1324	1359	1326
1995	1632	1442	
1996	1544	1352	
1997	1852	1101	
1998	1785	1105	
1999	2173	1308	1437
2000	1693	1377	1638
2001	1738	1493	4110
2002	1845	1318	
2003	1741	1419	1590
2004	1558	1411	1260
2005	1566	1403	1020
2006	1689	1169	1068
2007	1470	1206	1377
2008	1992	1337	4045
2009	2834	1715	1914
2010	2461	1789	2852
2011	3079	2098	2700
2012	3782	2547	3487
2013	2578	2178	2303
2014	2667	2359	3569
2015	2720	2389	2741
2016	2669	2459	1945
2017	2693	2031	1522
2018	2905	2095	1918
2019	2775	1842	2600
2020	2392		
2021	3048	2119	2778
2022	2332	1739	3226
2023	2235	1773	3090

Table 32: Red snapper weight CV in g by region.

year	West	Central	East
1986	1.27	1.05	1.00
1987	1.12	1.69	
1988	1.41	0.99	
1989	1.18	0.94	0.53
1990	0.96	0.72	0.35
1991	0.87	0.73	
1992	0.89	0.67	
1993	0.97	0.72	
1994	0.93	0.83	0.88
1995	0.93	0.90	
1996	0.81	0.72	
1997	0.73	0.67	
1998	0.88	0.53	
1999	0.75	0.52	0.38
2000	0.70	0.61	0.15
2001	0.70	0.65	0.29
2002	0.69	0.54	
2003	0.80	0.58	0.16
2004	0.80	0.52	
2005	0.74	0.60	0.06
2006	0.98	0.44	0.30
2007	0.57	0.37	0.25
2008	0.57	0.38	0.14
2009	0.52	0.53	0.40
2010	0.48	0.51	0.61
2011	0.46	0.56	0.29
2012	0.41	0.87	0.49
2013	0.43	0.64	0.66
2014	0.40	0.67	0.58
2015	0.40	0.67	0.72
2016	0.40	0.73	0.77
2017	0.40	0.64	0.72
2018	0.44	0.69	0.46
2019	0.43	0.67	0.46
2020	0.46		
2021	0.55	0.84	0.61
2022	0.50	0.81	0.62
2023	0.47	0.66	0.67

3.8 Figures

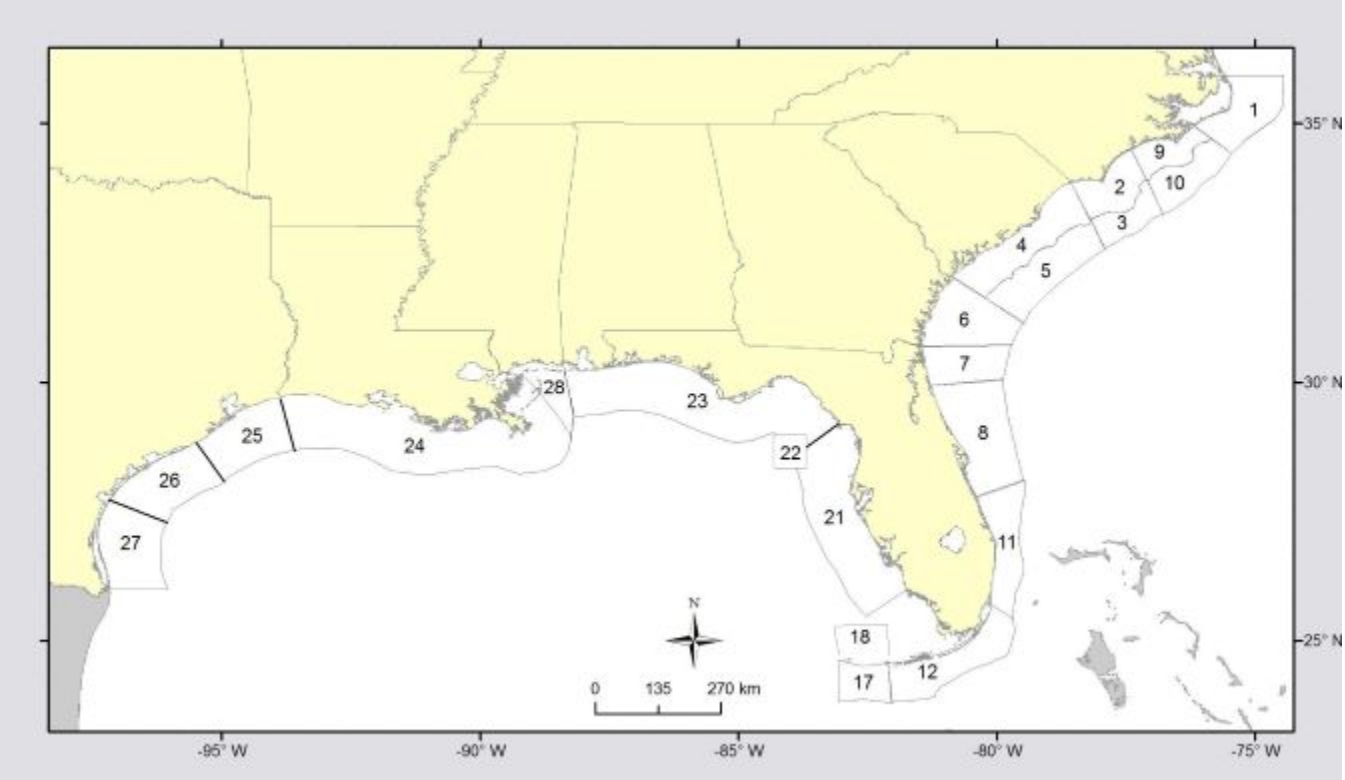

Figure 1: Headboat sampling areas prior to 2013.

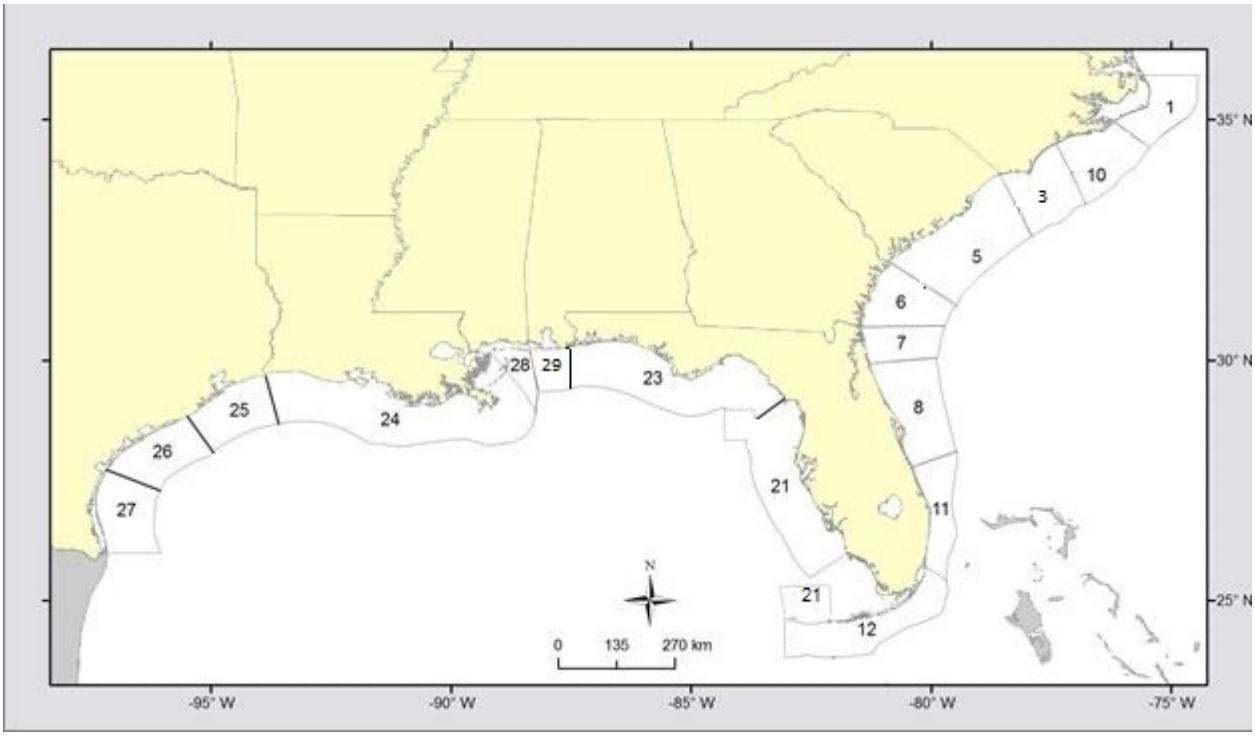

Figure 2: Headboat sampling areas 2013 - present.

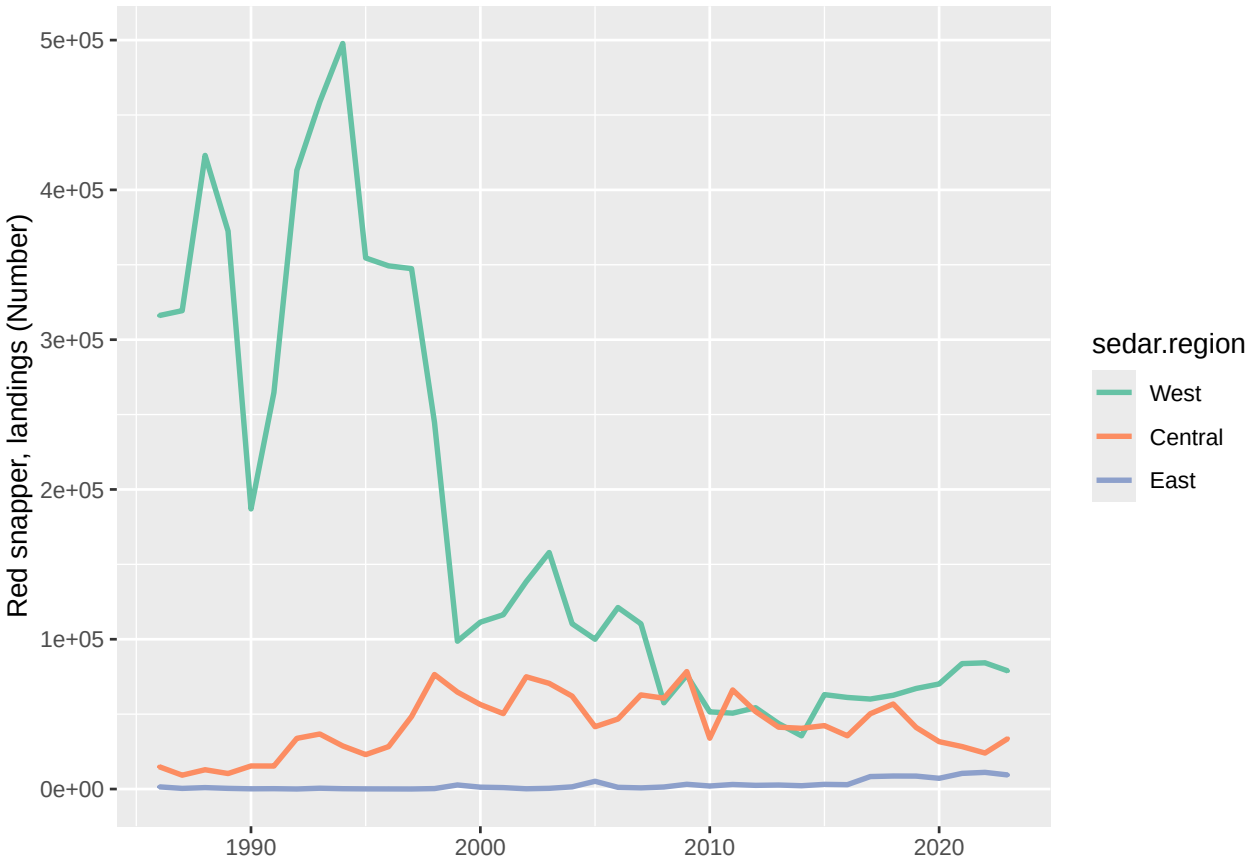

Figure 3: Red snapper landings in number.

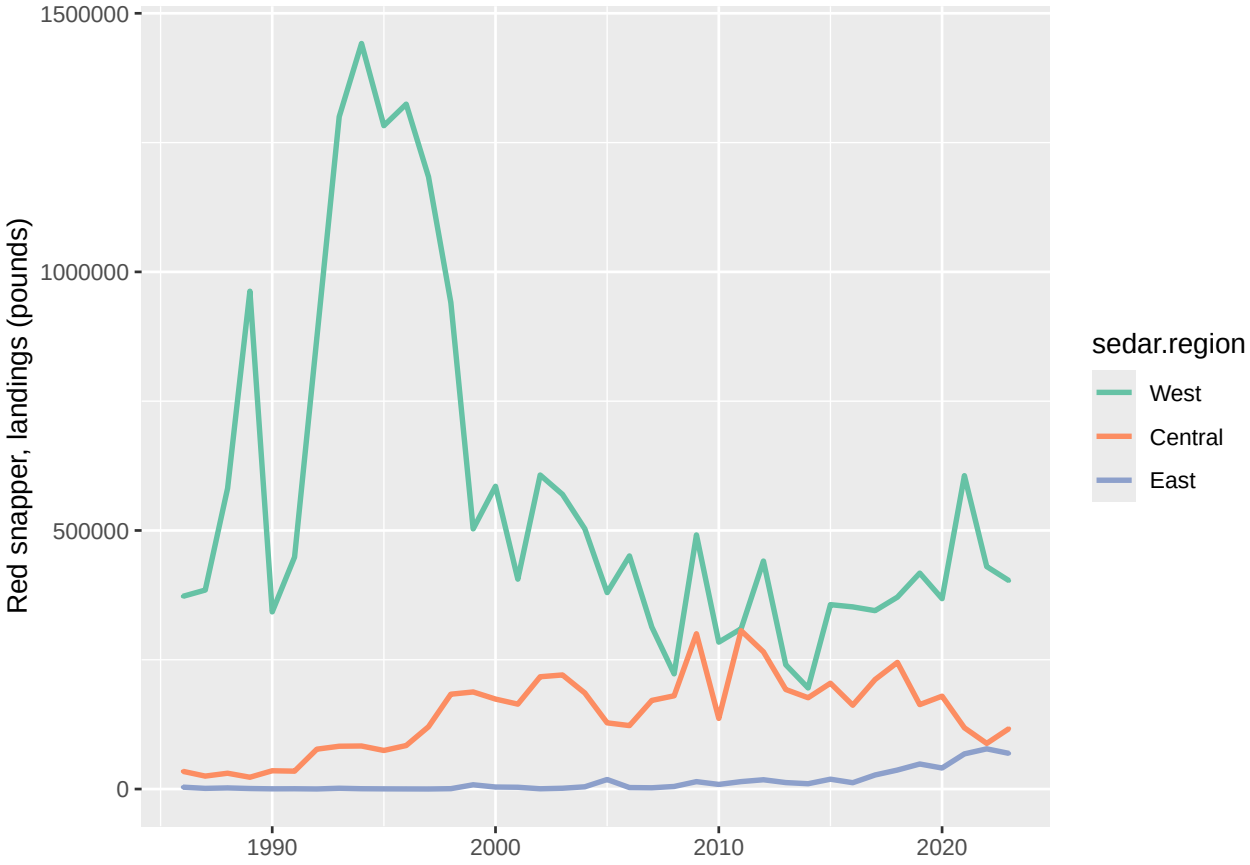

Figure 4: Red snapper landings in pounds.

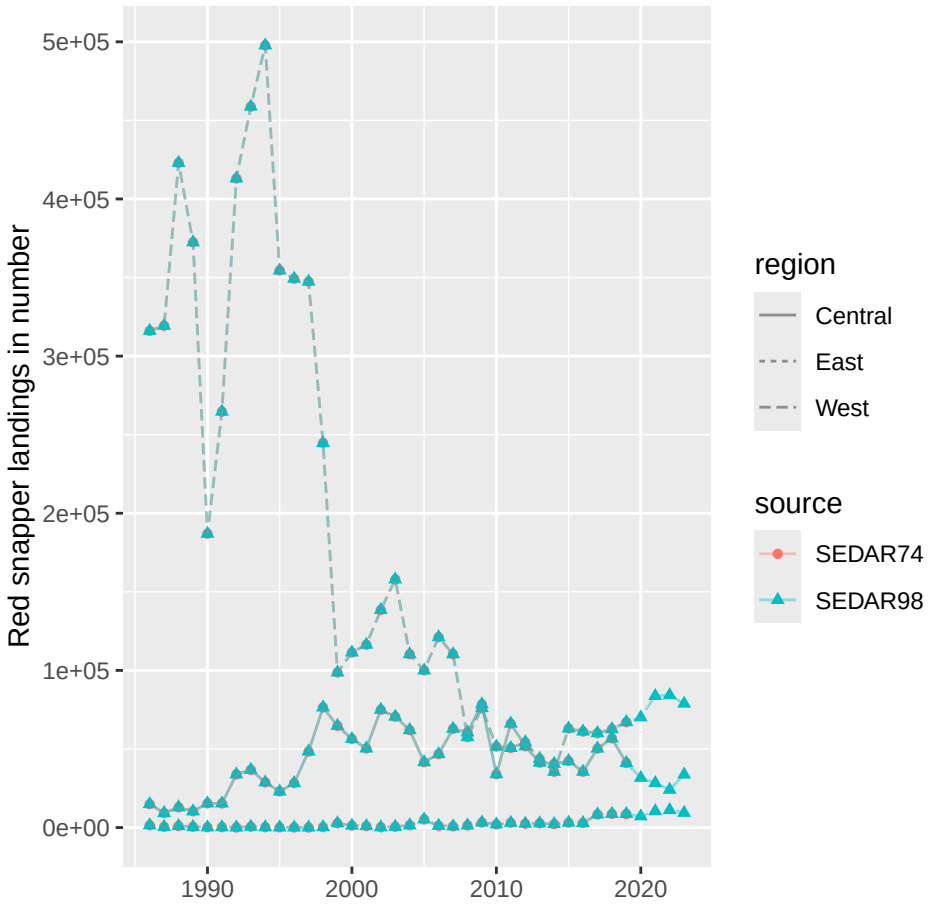

Figure 5: Comparison to SEDAR 74 red snapper landings.

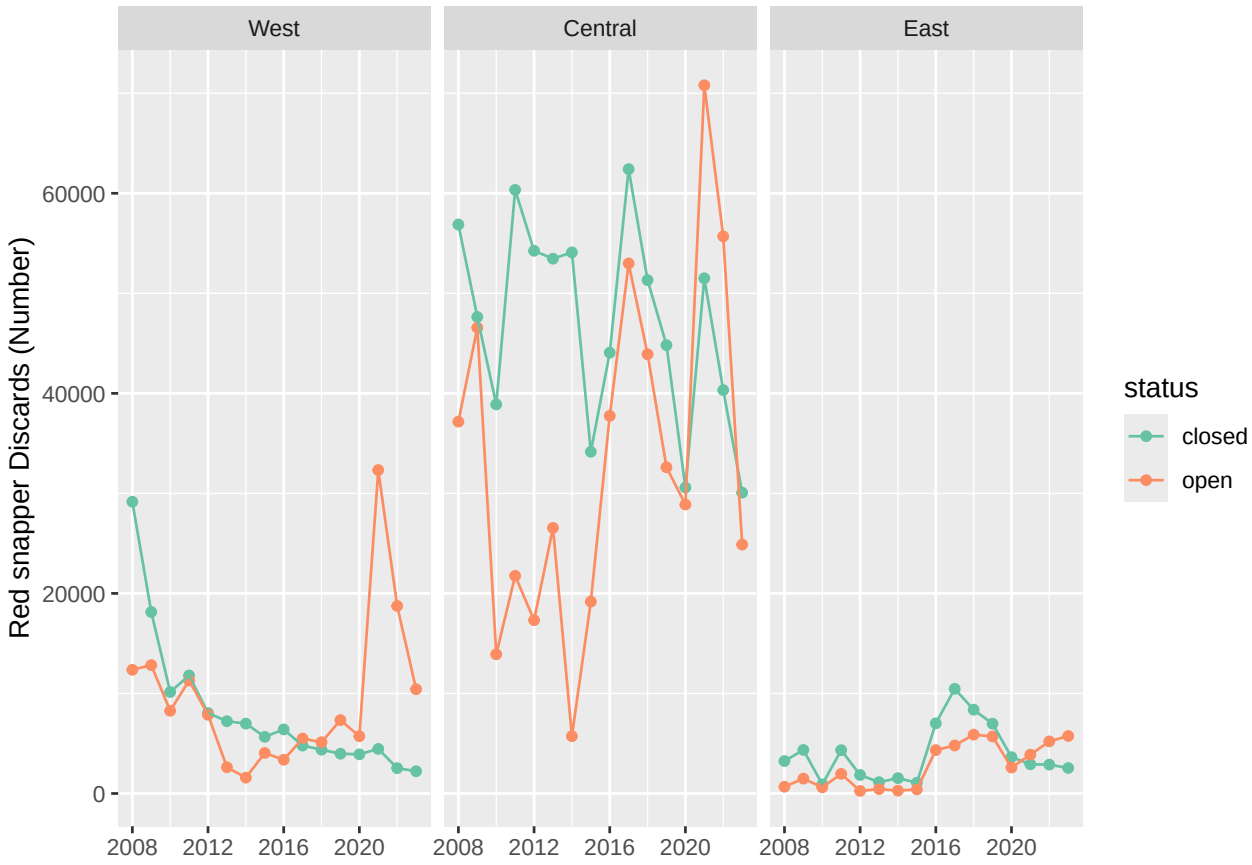

Figure 6: Red snapper discards in number

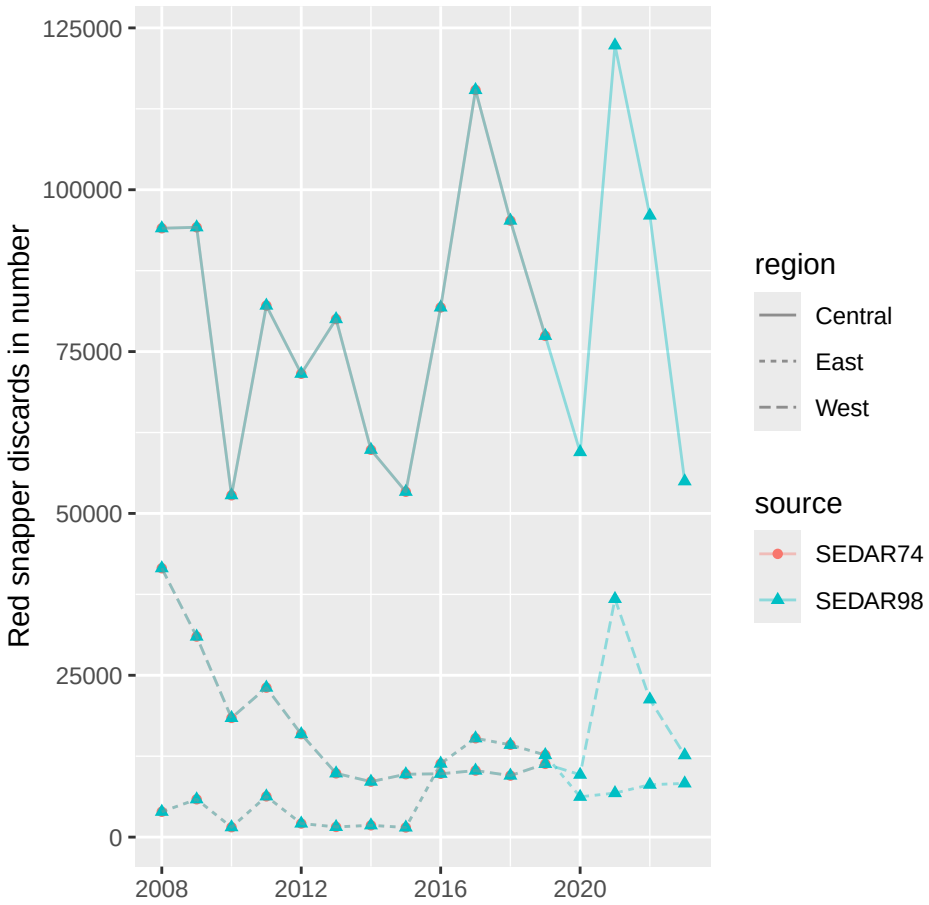

Figure 7: Comparison to SEDAR 74 red snapper discards.

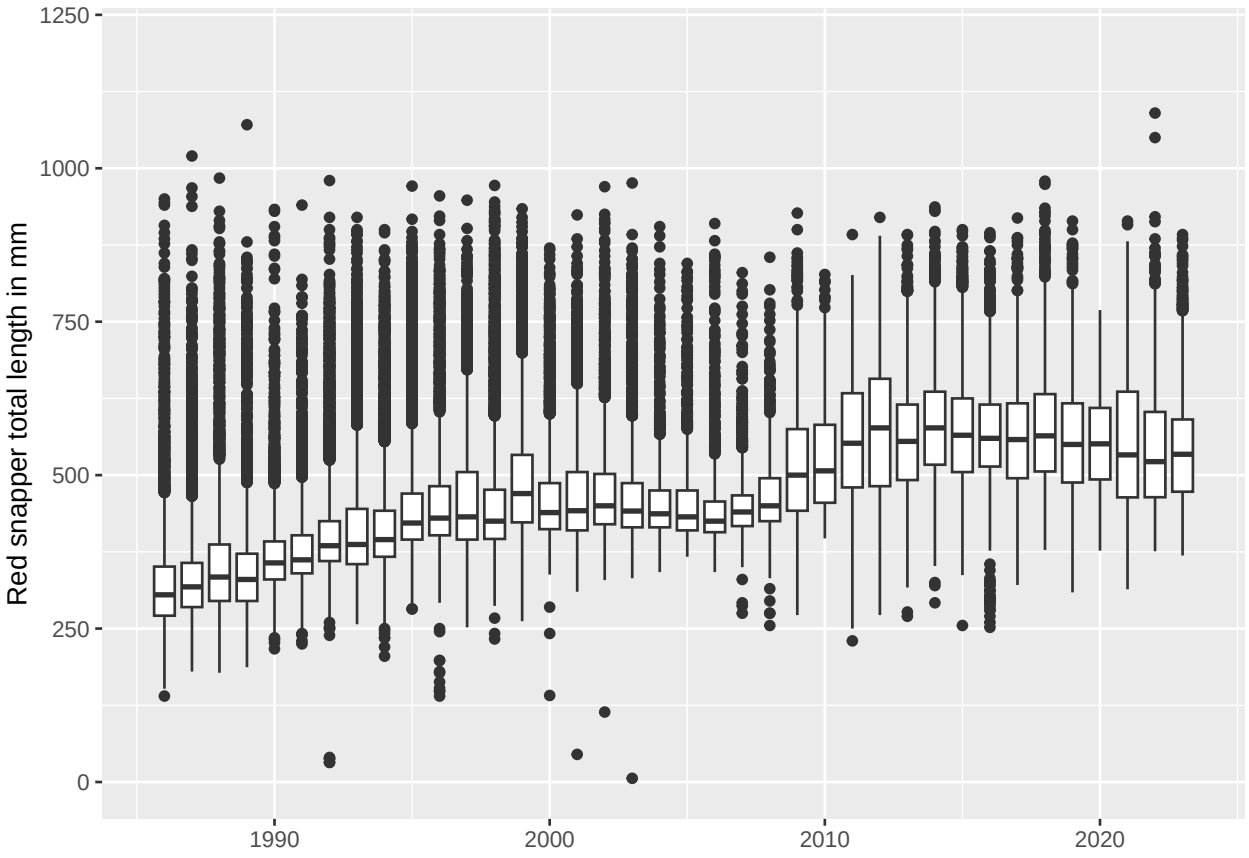

Figure 8: Red snapper total length.

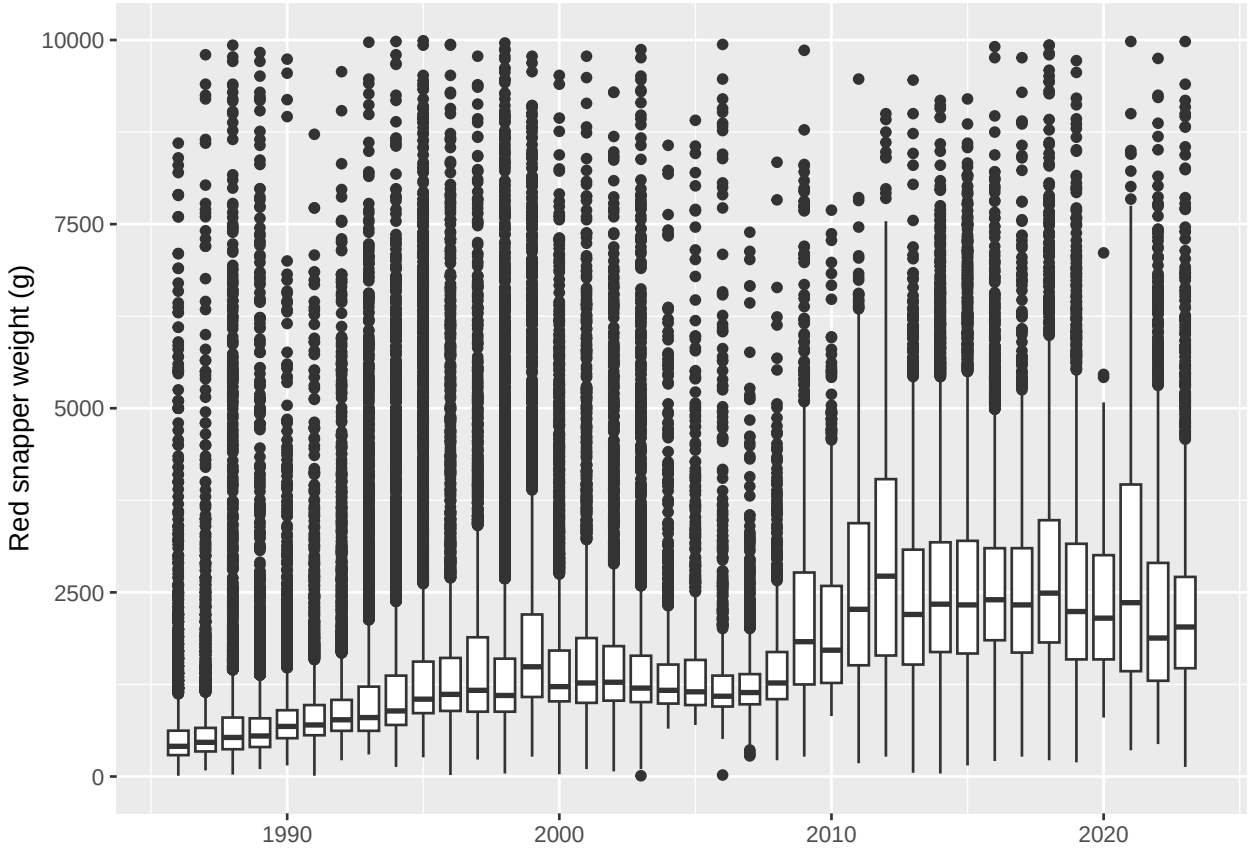

Figure 9: Red snapper weight (g).

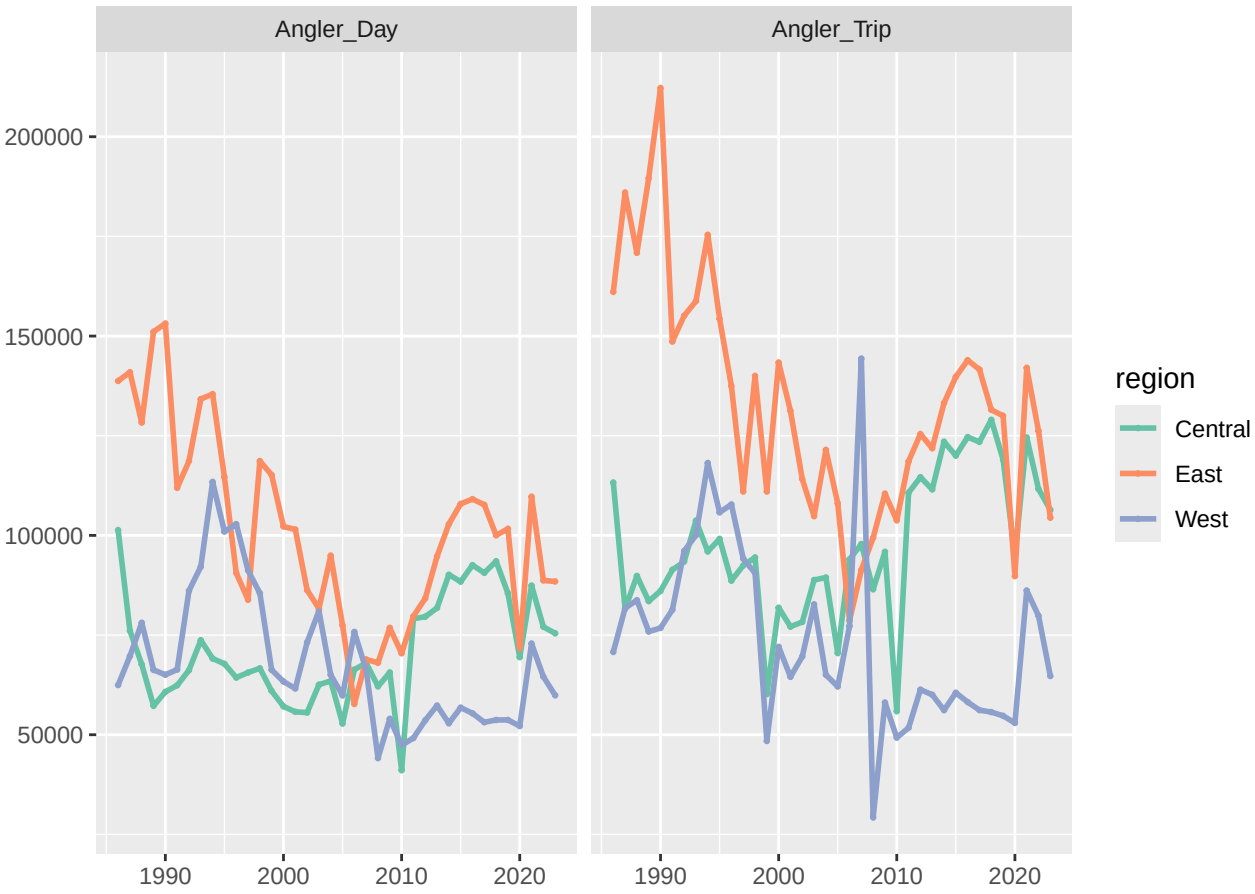

Figure 10: SRHS total estimated angler days and angler trips.

3.9 References

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