

Red Snapper General Recreational Open and Closed Season Discard Development

Gulf of Mexico Fisheries Branch, Sustainable Fisheries Division

SEDAR74-DW-35

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Abstract

General recreational survey data consists of catch and effort information from the Marine Recreational Information Program (MRIP), the Louisiana Department of Wildlife and Fisheries recreational saltwater landings data collection program (LA Creel), and the Texas Parks and Wildlife Department (TPWD). In order to get an accurate representation of the population, General Recreational discards, in numbers, are used in the stock assessment model. Due to changes in regulations (quotas, season length, etc.), tracking discards separately for the recreational fishing components (private and the for-hire/charter), in both the open and closed season is necessary. Code to reproduce data summaries can be found on GitHub (Denson 2022). Partitioned results indicate that the number of discarded red snapper is higher for the private component of the General Recreational fishery compared to the for-hire component. When taking the three stock ID regions (east, central and west) into consideration, the Central Stock ID region accounts for the largest portion of discards annually, regardless of the fishery component.

Introduction

The Office of Science and Technology (OST) collects catch and effort data through their Marine Recreational Information Program (MRIP) (SEDAR68-DW-13). This along with the surveys from the Louisiana Department of Wildlife and Fisheries recreational saltwater landings data collection program (LA Creel) (SEDAR74-DW-04), and the Texas Parks and Wildlife Department (TPWD) (SEDAR70-WP-03) are combined to form the general recreational survey data for red snapper in the Gulf of Mexico (SEDAR74-DW-01). MRIP survey data begins in 1981 and covers multiple recreational fishing components (private, for-hire/charter, head boat 1981-1985). The information recorded by MRIP includes landings (AB1) and discards (B2) which are estimated by the Southeast Fisheries Science Center (SEFSC) using SEDAR best practices (SEDAR-PW-07). In order to account for the contribution of discards to the Gulf of Mexico red snapper population General Recreational discards, in numbers, are summarized annually by stock ID region, for each season (open or closed), and recreational fishing component.

General Recreational discards are initially calculated by mode, wave and season (open or closed), but if the season closes within a given wave the reported discards are not adjusted accordingly (i.e., they are

assigned to the season that corresponds to the beginning of the wave) (SEDAR74-DW-01). Therefore, discards occurring within a wave where the recreational fishing season was initially open but subsequently closed require additional partitioning to prorate discards adequately between open and closed seasons. The process involves calculating the length of the open season (based on exact season closure dates) for any wave during which a closure occurred and prorating the discards for that wave between open and closed seasons based on the proportion of the wave that the season was open or closed. Discards are then summed for each season in a given year to provide the total open and closed season discards for that year. These calculations are necessary from 1997 on, because prior to this the recreational season lasted year round.

In 2013, Gulf States began to set their own season lengths for their state waters. Since 2015, the recreational fishing components private and for-hire/charter) have been assigned separate quotas resulting in different season lengths in the federal waters (GMFMC 2014). In 2018 and 2019, the private angling, component fishing seasons were officially set by each Gulf State through State recreational Red Snapper management Exempted Fishing Permits (EFPs) in both state and federal waters, while the federal for-hire component season continued to be set by the National Marine Fisheries Service ([EFP_description](#)). In 2020, an amendment to the fisheries management plan was made to provide limited authority to the Gulf States to manage private recreational fishing of red snapper in federal waters in the Gulf of Mexico, adjacent to their state waters (GMFMC 2019a-f). As such, partitioning between open and closed seasons must be calculated independently for each recreational fishing component, and with the consideration of discards from state and/or federal waters.

Methods

Determining Private vs. For-hire and Federal vs. State Season Lengths

Starting in 2013, the season length for the private component was split into season lengths in federal waters (Table 1) versus season lengths in the state waters (Table 2). Season length information was provided by the Southeast Regional Office as part of the Gulf of Mexico Red Snapper management history summary. An R script was used to tabulate season length based on annual regulations (see `reg_table.R` script in GitHub repository). Given these season lengths, the proportion of days the season was open was calculated per wave, by each component. There are six waves in a year, starting in January. To get the proportion of open days in a wave, the number of open days in a wave was divided by the total number of days in a wave (i.e., total numbers of days in the wave months). Leap years are taken into consideration.

Discards by Component, Stock ID region, and Season

For-Hire Component

To determine the annual discards for each recreational fishing component, the General Recreational data (SEDAR74-DW-01) was first filtered for the For-hire fishing component and partitioned by federal season status (`fed_closed`). A discard summary was created for each federal season status level (3). The factor levels for each record determine if the catch took place during a wave when the federal season was *Open*, *Closed*, or *Both* (`fed_closed` = 0, 2, 1). The discard summary was created in terms of year, wave, and stock ID region (Gulf).

When there were both open and closed days in a wave (`fed_closed` = 1), the open season discards were calculated by multiplying the number of summarized discards by year, wave and stock ID region by the proportion of days open in that year and wave (no matter the stock ID region). To determine the number of discards observed during the closed portion of the wave, the resulting number of open season discards

by year, wave and stock ID region were summarized across waves and subtracted from the total number of discards in that year and region (across all waves). Resulting in annual discards by stock ID region and season (open/closed).

When the wave was completely open ($\text{fed_closed} = 0$), the discards in terms of year, and stock ID region were added to the open season discards calculated when fed_closed equaled one (see above) for the same year, and stock ID regions. Similarly, the closed season portion of discards from fed_closed equal to one, is added to discards when the wave is completely closed ($\text{fed_closed} = 2$). The discards are summarized as open and closed season discards for each stock id region, each year in numbers from 1986-2019 (see `2_Charter_ForHire_Discards.R` script in GitHub repository).

Private Component

For the recreational fishing private component, similar steps as those used for the for-hire component were followed until 2013.

From 2013 to 2016 the discard data is still summarized by wave, year, and stock ID region but it is filtered based on the jurisdiction the fishing took place in (state or federal waters). The proportion of days open from the mixed season waves ($\text{fed_closed} = 1$) changes based on the jurisdiction. Determining open and closed season discards for those taking place in federal waters follow the season length from Table 1, determining those from state waters follow the season length of each state in Table 2. The state adjusted open wave proportions were multiplied by the discard summary filtered for the state water jurisdiction. These values were then summed across all waves similar to the process for discards pre-2013. This was also done for the federal jurisdiction using the federal season lengths, proportion open, and discard summary (see `3_FedPrivate_2016_Discard.R` script in GitHub repository). In 2017-2019 the seasons were all managed by the fisheries management plans (i.e., the states) so the season length no matter the jurisdiction is based on Table 2 (see `4_StatePrivate_2013_2019_Discards.R`).

The final number of discards in the open and closed season for the private component are the summation of the state and federal discards annually by stock ID region and season.

Results

General recreational discards vary based on stock ID region, season, and fishery component (Table 3 -6). The private component continuously has the largest number of discards across seasons, (Table 4-6) with the central region having on average more discards during the closed season (~1.5 million) than the open season (~1.2 million). Having more discards in the closed season is unique to the central region private recreational component as the open season discards are higher than the closed season discards on average in the east and the west. In the central and the western region, open season discards appear to decrease starting in 2005 in the west and 2007 in the central region. The eastern region is continuously under 500 thousand discards during the open season but experiences a spike starting in 2013. Closed season discards increase rapidly overtime for the central region while the west and east remain relatively stable, with the east having a large spike in 2011. For closed season discards in the west, it is important to note that the Texas state waters have always been open year around so there are no Texas closed season discards from state waters.

The General Recreation for-hire component contributes considerably less discards than the private component (Table 3). The central region only averages 249,000 fish annually in the open season compared to the 1.2 million fish from the private component open season. The for-hire component central region has the highest average annual discards compared to the east and west in both open and closed season. While the central region experiences discards in the hundreds of thousands the other regions only

contribute thousands of discards annually. The median values for annual discards by region are lower than the average indicating that there are years with relatively high discards in all regions, pulling the average up. Similar to the private component in the open season, the for-hire component experiences a decrease in discards starting in 2007 for the central and western regions, while the east remains relatively flat. The closed season discards increase rapidly for the central region, while the east and west remain relatively constant, with a spike in the east in 2017.

In general, the temporal patterns across recreational components appear to coincide with the various shifts in management. The first major change besides initiating season closure in 1997 was the reduction in season lengths in 2007-2008 (194 days to 65 days). For the private component, changes from federal to the state level management in 2013 and regional changes in season length, also appear to have an impact on spikes in discards.

It is important to note that these are estimates of discards in numbers and not actual observed discards although there has been a procedural workshop to ensure the accuracy of these estimates (SEDAR-PW-07). In addition to the assumptions made to produce the discard estimates, there are assumptions that go into splitting the open and closed season discards within a wave. Fisher behavior may change within that wave if the season is closing and the quota has or has not been met, skewing open and closed season discards from that wave. Using the proportion of days open in a given wave attempts to rectify any bias this may cause but it is also an estimate. With this in mind, the approximation for the split of the proportion of days open for a wave is just an approximation and analyses could benefit from more temporally refined General Recreational data.

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Tables

Table 1. Recreational season lengths with season open and close dates from the NOAA Southeast Regional Office for both modes (Private and For-hire). In 2018, the Private mode managed structure changes based on the Exempted Fishing Permits (EFP) and in 2020, the quotas were amended by Reef Fish Amendment 50 changing the season lengths.

Year	Mode	# Days	Open date	Close date
Pre-1990	Both	365	1-Jan	31-Dec
1990	Both	"	"	"
1991	Both	"	"	"
1992	Both	"	"	"
1993	Both	"	"	"
1994	Both	"	"	"
1995	Both	"	"	"
1996	Both	"	"	"
1997	Both	330	"	27-Nov
1998	Both	272	"	30-Sep
1999	Both	240	"	29-Aug
2000	Both	194	21-Apr	1-Nov
2001	Both	"	"	1-Nov
2002	Both	"	"	1-Nov
2003	Both	"	"	1-Nov
2004	Both	"	"	1-Nov
2005	Both	"	"	1-Nov
2006	Both	"	"	1-Nov
2007	Both	"	"	1-Nov
2008	Both	65	1-Jun	5-Aug
2009	Both	75	"	15-Aug
2010	Both	53	"	24-Jul
2011	Both	48	"	19-Jul
2012	Both	46	"	17-Jul
2013	Both	42	1-Jun; 1-Oct	29-June; 15-Oct
2014	Both	9	"	9-Jun
2015	Private	10	"	11-Jun
	For-hire	44	"	15-Jul
2016	Private	11	"	12-Jun
	For-hire	46	"	17-Jul
2017	Private	3	"	3-Jun
	For-hire	49	"	19-Jul

2018	Private	EFP	EFP	EFP
	For-hire	51	1-Jun	22-Jul
2019	Private	EFP	EFP	EFP
	For-hire	48	1-Jun	19-Jul
2020	Private	RF50	RF50	EFP
	For-hire	63	1-Jun	2-Aug

Table 2. Gulf state season open days by wave annually. Each wave consists of two months, for instance wave one consists of open days in January and February of a given year.

State	Year	1	2	3	4	5	6	Annual Total
Florida	2013	0	0	30	14	21	0	65
Florida	2014	0	0	38	14	0	0	52
Florida	2015	0	0	39	12	22	1	74
Florida	2016	0	0	40	10	28	7	85
Florida	2017	0	0	33	28	4	0	65
Florida	2018	0	0	20	20	0	0	40
Florida	2019	0	0	20	12	6	2	40
Florida	2020	0	0	20	25	5	6	56
Alabama	2013	0	0	30	12	0	0	42
Alabama	2014	0	0	9	12	0	0	21
Alabama	2015	0	0	10	31	0	0	41
Alabama	2016	0	0	35	31	0	0	66
Alabama	2017	0	0	28	27	4	0	59
Alabama	2018	0	0	14	14	0	0	28
Alabama	2019	0	0	14	18	2	0	34
Alabama	2020	0	0	24	1	8	11	44
Mississippi	2013	0	0	30	12	0	0	42
Mississippi	2014	0	0	9	0	13	2	24
Mississippi	2015	0	0	10	47	61	0	118
Mississippi	2016	0	0	35	62	5	0	102
Mississippi	2017	0	0	28	28	4	0	60
Mississippi	2018	0	0	37	33	5	0	75
Mississippi	2019	0	0	37	36	5	0	78
Mississippi	2020	0	0	40	5	1	0	46
Louisiana	2013	0	17	41	0	14	0	72
Louisiana	2014	3	38	61	62	61	61	286
Louisiana	2015	0	42	61	62	8	41	214
Louisiana	2016	53	61	61	62	5	0	242
Louisiana	2017	28	61	46	0	11	19	165
Louisiana	2018	0	0	37	23	0	0	60
Louisiana	2019	0	0	17	28	18	46	109
Louisiana	2020	0	0	19	18	4	0	41
Texas	2013	59	61	61	62	61	61	365
Texas	2014	59	61	61	62	61	61	365
Texas	2015	59	61	61	62	61	61	365
Texas	2016	60	61	61	62	61	61	366
Texas	2017	59	61	61	62	61	61	365
Texas	2018	59	61	61	62	61	61	365

Texas	2019	59	61	61	62	61	61	365
Texas	2020	60	61	61	62	61	61	366

Table 3. General recreational Charter/For-Hire component discards in numbers of fish (thousands) per season (open/closed) and stock ID region (central, east, and west).

Year	Open			Closed		
	Central	East	West	Central	East	West
1981	0.488	0.000	0.002	0.000	0.000	0.000
1982	7.736	0.396	13.299	0.000	0.000	0.000
1983	0.000	0.000	1.526	0.000	0.000	0.000
1984	3.784	3.594	0.007	0.000	0.000	0.000
1985	2.285	1.007	0.027	0.000	0.000	0.000
1986	7.325	17.128	2.566	0.000	0.000	0.000
1987	42.598	1.642	1.802	0.000	0.000	0.000
1988	64.906	0.000	1.213	0.000	0.000	0.000
1989	35.092	0.000	4.604	0.000	0.000	0.000
1990	80.687	0.000	64.074	0.000	0.000	0.000
1991	196.019	0.000	140.526	0.000	0.000	0.000
1992	317.612	1.018	111.920	0.000	0.000	0.000
1993	260.033	0.000	67.206	0.000	0.000	0.000
1994	273.364	0.057	107.784	0.000	0.000	0.000
1995	401.693	0.000	89.025	0.000	0.000	0.000
1996	486.469	0.000	90.822	0.000	0.000	0.000
1997	833.406	0.231	61.019	14.866	0.311	0.396
1998	588.805	2.892	47.398	88.149	0.184	0.625
1999	715.193	1.918	12.322	143.259	0.000	0.555
2000	369.340	0.170	8.454	135.403	0.089	1.533
2001	472.442	0.076	15.101	99.096	2.682	0.000
2002	465.100	0.000	36.578	90.025	0.000	1.141
2003	498.264	0.300	55.881	75.088	2.578	3.541
2004	531.107	0.000	177.149	82.524	0.693	1.380
2005	484.190	0.522	166.530	87.763	1.044	30.359
2006	651.505	7.987	188.840	151.697	9.691	13.496
2007	581.523	0.230	121.512	103.570	2.001	4.107
2008	166.667	2.384	39.651	319.822	13.723	28.545
2009	213.608	4.877	13.875	262.248	12.779	19.249
2010	55.901	1.806	20.182	170.751	2.243	2.654
2011	99.759	0.000	4.564	276.186	1.948	2.821
2012	65.409	0.624	7.697	193.049	0.720	11.463
2013	77.989	4.882	11.481	324.961	6.315	16.226
2014	12.228	1.129	3.612	269.320	7.950	3.364
2015	63.244	5.520	8.449	195.166	9.621	9.332
2016	116.904	5.400	6.601	299.905	36.881	6.453

2017	184.248	14.473	4.597	353.694	145.530	5.324
2018	128.464	15.931	2.991	293.567	43.095	3.953
2019	158.788	9.610	15.856	338.369	15.550	18.104

Table 4. General recreational private component discards in federal waters in numbers of fish (thousands) per season (open/closed) and stock ID region (central, east, and west).

Year	Open			Closed		
	Central	East	West	Central	East	West
1981	179.403	76.357	63.443	0.000	0.000	0.000
1982	13.169	0.000	6.491	0.000	0.000	0.000
1983	4.470	0.000	0.695	0.000	0.000	0.000
1984	0.000	82.405	43.561	0.000	0.000	0.000
1985	0.925	41.324	204.990	0.000	0.000	0.000
1986	13.528	11.688	38.582	0.000	0.000	0.000
1987	113.799	3.103	120.038	0.000	0.000	0.000
1988	9.133	35.687	529.273	0.000	0.000	0.000
1989	323.028	7.022	371.122	0.000	0.000	0.000
1990	772.205	21.540	422.258	0.000	0.000	0.000
1991	1587.532	78.277	410.625	0.000	0.000	0.000
1992	1315.577	80.073	450.630	0.000	0.000	0.000
1993	1657.182	29.726	528.829	0.000	0.000	0.000
1994	940.422	38.864	1213.187	0.000	0.000	0.000
1995	226.084	13.967	1942.650	0.000	0.000	0.000
1996	1014.854	35.811	413.058	0.000	0.000	0.000
1997	2024.065	25.990	482.627	243.967	0.000	5.803
1998	831.318	12.660	739.975	281.524	52.945	51.693
1999	2312.350	26.440	2006.895	371.640	23.419	30.496
2000	1316.588	66.169	547.257	1245.758	1.556	178.707
2001	1673.859	5.729	458.869	2698.898	0.000	55.735
2002	3289.216	6.874	723.429	3136.651	0.000	64.182
2003	2425.089	2.069	1413.722	1924.069	2.920	338.460
2004	3415.206	25.301	2967.127	1089.849	67.293	219.802
2005	2388.489	92.921	1880.349	1639.565	36.258	144.177
2006	2892.932	30.938	2060.152	1280.177	24.378	180.231
2007	4146.943	43.270	916.910	1549.033	0.000	153.302
2008	929.750	4.081	1193.048	3426.382	36.400	414.570
2009	1497.497	51.471	795.670	2339.131	51.364	329.754
2010	1024.479	24.247	721.046	3401.432	105.221	331.823
2011	881.733	8.014	900.650	2847.783	1492.565	434.584
2012	684.466	3.687	459.849	3286.846	10.601	230.126
2013	770.844	3.026	297.268	1514.132	5.490	545.272
2014	120.990	6.504	13.251	1816.167	42.881	87.797
2015	226.239	1.265	31.544	1675.008	22.736	206.912
2016	329.841	8.600	6.070	3280.131	672.268	30.168

Table 5. General recreational private component discards in state waters in numbers of fish (thousands) per season (open/closed) and stock ID region (central, east, and west).

Year	Open			Closed		
	Central	East	West	Central	East	West
2013	870.272	991.406	0.000	1716.142	2.298	0.000
2014	332.383	524.337	0.000	1595.453	0.000	0.000
2015	351.058	514.676	0.000	905.458	0.000	0.000
2016	633.780	82.619	15.041	1238.843	0.000	12.252
2017	2727.022	320.400	61.761	5539.613	0.000	198.966
2018	1052.638	380.821	123.727	3972.806	0.000	523.313
2019	1186.893	844.184	61.010	4577.792	0.000	334.141

Table 6. Total State and Federal Private component discards in numbers of fish (thousands) by season (open/closed) and stock ID region.

Year	Open			Closed		
	East	Central	West	East	Central	West
1981	76.357	179.403	63.443	0.000	0.000	0.000
1982	0.000	13.169	6.491	0.000	0.000	0.000
1983	0.000	4.470	0.695	0.000	0.000	0.000
1984	82.405	0.000	43.561	0.000	0.000	0.000
1985	41.324	0.925	204.990	0.000	0.000	0.000
1986	11.688	13.528	38.582	0.000	0.000	0.000
1987	3.103	113.799	120.038	0.000	0.000	0.000
1988	35.687	9.133	529.273	0.000	0.000	0.000
1989	7.022	323.028	371.122	0.000	0.000	0.000
1990	21.540	772.205	422.258	0.000	0.000	0.000
1991	78.277	1587.532	410.625	0.000	0.000	0.000
1992	80.073	1315.577	450.630	0.000	0.000	0.000
1993	29.726	1657.182	528.829	0.000	0.000	0.000
1994	38.864	940.422	1213.187	0.000	0.000	0.000
1995	13.967	226.084	1942.650	0.000	0.000	0.000
1996	35.811	1014.854	413.058	0.000	0.000	0.000
1997	25.990	2024.065	482.627	0.000	243.967	5.803
1998	12.660	831.318	739.975	52.945	281.524	51.693
1999	26.440	2312.350	2006.895	23.419	371.640	30.496
2000	66.169	1316.588	547.257	1.556	1245.758	178.707
2001	5.729	1673.859	458.869	0.000	2698.898	55.735
2002	6.874	3289.216	723.429	0.000	3136.651	64.182
2003	2.069	2425.089	1413.722	2.920	1924.069	338.460
2004	25.301	3415.206	2967.127	67.293	1089.849	219.802
2005	92.921	2388.489	1880.349	36.258	1639.565	144.177
2006	30.938	2892.932	2060.152	24.378	1280.177	180.231
2007	43.270	4146.943	916.910	0.000	1549.033	153.302
2008	4.081	929.750	1193.048	36.400	3426.382	414.570
2009	51.471	1497.497	795.670	51.364	2339.131	329.754
2010	24.247	1024.479	721.046	105.221	3401.432	331.823
2011	8.014	881.733	900.650	1492.565	2847.783	434.584
2012	3.687	684.466	459.849	10.601	3286.846	230.126
2013	994.432	1641.116	297.268	7.788	3230.274	545.272
2014	530.841	453.374	13.251	42.881	3411.620	87.797
2015	515.941	577.297	31.544	22.736	2580.466	206.912
2016	91.219	963.622	21.111	672.268	4518.973	42.420

2017	320.400	2727.022	61.761	0.000	5539.613	198.966
2018	380.821	1052.638	123.727	0.000	3972.806	523.313
2019	844.184	1186.893	61.010	0.000	4577.792	334.141
