SOUTHERN FLOUNDER FMP AMENDMENT 3

SOUTHERN FLOUNDER FMP AMENDMENT 3 MEMO

SOUTHERN FLOUNDER FISHERY SECTOR ALLOCATIONS

ROY COOPER
Governor

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January 29, 2021

MEMORANDUM

TO: N.C. Marine Fisheries Commission

FROM: Michael S. Loeffler and Anne L. Markwith Southern Flounder FMP Co-Leads

SUBJECT: Southern Flounder FMP Allocation Issue Paper

Issue
At its November 2020 business meeting the N.C. Marine Fisheries Commission (MFC) asked the division to review several allocation scenarios for Amendment 3 to the NC Southern Flounder FMP. The division has provided the MFC with analysis that shows various commercial and recreational harvest allocation percentages as requested. The sector allocation selected by the MFC will provide the basis for implementing quota management in the southern flounder fishery.

Action Needed
At its February 2021 business meeting the commission is scheduled to vote to select their preferred sector allocations for Amendment 3 to the Southern Flounder FMP. If the commission chooses an allocation other than the historically based allocation, they may also need to consider ramifications to the gear sub-allocations.

Findings
- National Oceanic and Atmospheric Administration (NOAA) defines allocation as a direct and deliberate distribution of the opportunity to participate in a fishery among identifiable, discrete user groups or individuals. In fisheries managed by the South Atlantic and Gulf of Mexico fishery management councils, the share a sector gets is typically based on historical harvest amounts.
- Redistribution of harvest or allocations among sectors at this time is not based on a biological need, may alter rebuilding timelines, and impacts each user group.
- The division analyzed commercial and recreational data from 2017, the terminal year of the stock assessment. Table 1 shows the allocations as requested by the MFC as well as an option for an allocation based on the historical harvest. The historically based allocation of 73% commercial 27% recreational, which was used in Amendment 2, is based on historical harvest.
- Changes to sector allocation may have negative and positive impacts to different sub-sectors in the southern flounder fishery. Allocation shifts to the recreational sector would provide additional harvest, possibly allowing for longer seasonal access if the daily bag limit is lowered. If the daily bag limit is not lowered from four fish, gains from increased allocation may provide a buffer against potential overages from increased angler success.
- Reductions in the commercial allocation may have negative impacts on the commercial fishery as a lower allocation will result in a reduced harvest period. It is also prudent to consider gear sub-allocations within the sectors as allocation shifts may have consequences that impact one gear category more than another.

- Changes in allocation may alter the rebuilding schedule. Projections for rebuilding use a model that accounts for the rate of removal according to the size class that each sector harvests to estimate changes in spawning stock biomass. Allocation changes would impact the overall size range of fish removed from the population and could impact model projections.
- With the exception of the historical allocation, we expect these proposed scenarios to further reduce the overall value of the commercial southern flounder fishery at the gain of the recreational sector. The magnitude of these economic changes within each sector is unknown and unquantifiable.

Table 1. Allocation options for the North Carolina southern flounder fishery that maintain overall landings reduction of 72%, with 532,352 lb available for allocation. The % Allocation value describes the percentage of the TAL that would be made available to each sector. The % Reduction describes the percent reduction each sector would incur when compared with the 2017 harvest. The Historically based allocation is based on 2017 landings data.

	Total Allowable Landings (TAL) in Pounds					
		Commercial		Recreational		
	% Allocation (Comm./Rec.)	TAL	% Reduction	TAL	% Reduction	Change in TAL
Historical Harvest	73/27	390,493	72%	141,859	72%	0
MFC Requested Options	70/30	372,646	73%	159,706	68%	+/- 17,847
	65/35	346,029	75%	186,323	63%	+/- 44,464
	60/30/10*	358,459	74%	173,893	66%	+/- 32,034
	60/40	319,411	77%	212,941	58%	+/- 71,082
	50/50	266,176	81%	266,176	47%	+/- 124,317

* *This denotes a 10% allocation for gigs that was further divided out to each sector based on historically based allocation (73/27).*

For more information, please refer to the full document titled, "Southern Flounder Fishery Sector Allocations Issue Paper" that is included in the briefing materials.

SOUTHERN FLOUNDER FISHERY SECTOR ALLOCATIONS

February 04, 2021

I. ISSUE

Provide the N.C. Marine Fisheries Commission (MFC) with analysis that shows various commercial and recreational allocation percentages.

II. ORIGINATION

At the November 2020 MFC business meeting; the MFC passed a motion to consider commercial and recreational allocations in the Southern Flounder Fishery Management Plan (FMP) Amendment 3 of 70/30, 65/35, 60/30 with 10% allotment for gigging, 60/40, and 50/50.

III. BACKGROUND

National Oceanic and Atmospheric Administration (NOAA) defines allocation as a direct and deliberate distribution of the opportunity to participate in a fishery among identifiable, discrete user groups or individuals (NOAA 2006). In fisheries managed by the South Atlantic and Gulf of Mexico fishery management councils, the share a sector gets is typically based on historical harvest amounts. Revisions to allocations do occur, most commonly to account for changes among sectors or stock status. Changes among sectors includes scenarios where one group consistently has excess allocation remaining, which can be re-allocated to another sector based on management preferences. Changes to stock status also impact reallocation; if the stock rebuilds and harvest levels can be increased quota would be increased to allow for more harvest. Authority to make changes to allocations lies with the commission or body charged with making management decisions. For the purpose of this paper the term "sector" will be used to differentiate between the commercial and recreational components of the southern flounder fisheries.

At its November 2020 business meeting the MFC asked the division to review several allocation scenarios for Amendment 3 to the NC Southern Flounder FMP. The sector allocation selected by the MFC will provide the basis for implementing quota management in the southern flounder fishery. Selection of allocations is informed by data provided by the division, in this case historical landings. The commission can also rely on economic, social, and behavioral aspects of each sector that may influence allocation decisions.

The historically based allocation of 73% commercial 27% recreational (Table 1) in Amendment 2 is based on historical harvest for each sector from 2017. As with the 73/27 historically based allocation, the commercial and recreational sectors include gear sub-allocations based on historical harvest. In the initial draft of Amendment 3 discussed with the FMP Advisory Committee (AC) the recommendation for the commercial sector is for separate mobile gear (all gears except pound nets) and pound net categories (approximately 50/50) and for the recreational sector to have separate hook-and-line and gig gears (89/11 allocation). Different allocation scenarios will significantly change available harvest in a sector, so the commission will need to consider ramifications to the gear sub-allocations and whether those fisheries remain realistically viable to prosecute. The amount of landings for a specific fishery may be too low to invest further in the expense of the gear, if sub-allocations are not changed.

Much like regional councils, the MFC and North Carolina Wildlife Resources Commission (WRC) have historically allocated quotas to fishing sectors based on historical harvest, and in some fisheries like the Albemarle Sound and Roanoke River Management Areas striped bass fishery the quota was ultimately revised so a 50/50 parity was achieved between the commercial and recreational sectors. In 1991, the initial striped bass quota was allocated 62.5/37.5 based on historical landings. After seven years of rebuilding at this initial allocation, the stock's spawning stock biomass (SSB) was declared recovered, allowing for an increase in quota. In 1998, the quota was increased by 94,340 pounds, of which 29% was allocated to the commercial sector and the remaining 71% was allocated to the recreational sector. This increase brought the quota allocation to a 50/50 parity.

IV. AUTHORITY

North Carolina General Statutes
G.S. 113-134 RULES
G.S. 113-182 REGULATIONS OF FISHING AND FISHERIES
G.S. 113-182.1 FISHERY MANAGEMENT PLANS
G.S. 143B-289.52 MARINE FISHERIES COMMISSION – POWERS AND DUTIES

V. DISCUSSION

Initial analyses of southern flounder quota allocations followed the convention of using historical landings from a previous year or years. To provide information for the MFC motion, commercial and recreational data were analyzed based on 2017 harvest data, the terminal year of the stock assessment. Table 1 shows the allocation options as requested by the MFC.

Shifting allocation between sectors is within the authority of the MFC (G.S. 113-134, 113-182, 113-182.1, and 143B-289.52). Changes to sector allocation may have negative and positive impacts to different sub-sectors in the southern flounder fishery. Allocation shifts to the recreational sector would provide additional harvest possibly allowing for longer seasonal access if the daily bag limit is lowered. If the bag limit is not lowered, gains from increased allocation may help to provide a buffer against potential overages from increased angler success (see *Sustainable Harvest issue paper*).

The commercial sector total allowable landings (TAL) would be lowered by the same amount of the recreational gains. As noted earlier it is also prudent to consider the gear sub-allocations within the sectors as allocation shifts may have consequences that impact one gear category more than another (Table 2). Reductions in the commercial allocation may have negative impacts on the commercial fishery as a lower allocation will result in a reduced harvest period. The *Description of the Fishery* section within draft Amendment 3 contains additional information that provides background details on landings, effort, and economic data for the commercial and recreational fisheries. For reference those tables have been added to this Issue Paper. Table 3 provides commercial southern flounder landings by year and gear and Table 4 provides the number of trips, average pounds per trip, and the number of participants by year and gear.

Table 5 shows the annual variation in harvest for the recreational hook-and-line fishery and what the following years TAL consequences might have been. In table 5, landings during the identified season were displayed on a yearly basis to provide examples of overages that could have occurred

compared to the TAL necessary for rebuilding based on historical landings. If more fish are available because of a good year class both sectors would likely see increases in harvest. For the recreational sector, where daily reporting is not available, the larger the bag limit the greater the risk of exceeding the TAL.

Tables 6 & 7 demonstrate the effects to the recreational sector between the historical landings (73/27) and a 60/40 allocation. For each table, annual landings data (2008 through 2017) were prorated to an Aug 16-Sept 30 season under different bag limits (1 fish, 2 fish, 3 fish, 4 fish). Estimated landed pounds were then compared to a 73/27 allocation (Table 6) and a 60/40 allocation (Table 7) to determine whether or not the TAL would be exceeded for each bag limit option based on the percent of the allocated harvested. Finally, the percent of the allocated harvested for each year was used to calculate the subsequent year allocation for each bag limit option. Any overages that occur in one year will be deducted in subsequent years, possibly resulting in no recreational fishery for a year or more. It should be noted that for the recreational sector, where daily reporting is not realistic, the larger bag limits increase the risk of exceeding the TAL. When compared to each other, Tables 6 and 7 also show that with more allocation provided to the recreational fishery and a lower bag limit, the lower the chance of the recreational fishery of exceeding their TAL.

Future increases in total quota would not occur until the southern flounder SSB is recovered and this cannot be determined until an updated stock assessment is completed. Additionally, changes in allocation may alter the rebuilding schedule. Projections for rebuilding use a model that accounts for the rate of removal according to the size class that each sector harvests to estimate changes in SSB. Allocation changes would impact the overall size range of fish removed from the population and could therefore have some impact on the model projections.

All of the proposed reallocation scenarios increase recreational quota while lowering the commercial quota, there is the expectation that similar economic effects will follow. Specifically, as the overall commercial allocation is reduced, the total value of the commercial southern flounder industry will decrease, while the value of the recreational southern flounder fishery may be mitigated to some extent due to increased angler expenditures to target this species (Figure 8, Figure 9, Figure 10). However, economic losses and gains are unpredictable.

Decreasing the commercial allocation may result in a proportional decrease in value. It is possible, per-pound southern flounder prices may rise with reduced supply, counter-acting the losses from reduced quota. However, if commercial quota reductions were large enough, the southern flounder fishery could see reduced participation, creating even larger economic losses. The magnitude of these economic changes within each sector is unknown and unquantifiable.

Allocation deliberations should take into consideration the limited southern flounder TAL. Reallocation between sectors at this time could have unintended social and economic consequences that are most noticeable at the finer level of specific fisheries within each sector. It may be more prudent to allocate future quota increases towards one sector over the other as SSB expands. This can be achieved in future amendments with methodic increases until the preferred allocation is achieved.

VI. PROPOSED MANAGEMENT OPTIONS

Below are possible overarching positive and negative impacts for all options which may inform the MFC's deliberations in its decision. The options are listed after the impacts.

+ Shifting allocation to the recreational sector may buffer against recreational overages.
+/- Allocation not based on biological need.
+/- Allocation other than historically based allocation is not based on historical landings.
+/- Increasing allocation to the recreational sector provides more fish to harvest but depending on amount may not increase the season dates, season lengths or bag limits.
+ Increasing allocation to the recreational sector mitigates some of the economic impact of the severe reductions to the recreational fishery.
- Decreasing allocation to the commercial fishery exacerbates the economic impact of the commercial fishery.
- Increasing allocation to the recreational fishery provides additional harvest to the sector with the least precise estimates.
- Changes in allocation may alter the rebuilding schedule (changing allocation changes the fish available to each sector and their associated selectivity, projections are based on sector specific selectivity's).
- Depending on how much allocation is shifted to the recreational sector there may be significant impacts to the commercial seasons.
- May be necessary to adjust allocations within a sector to maintain specific gear-based fisheries.
- Shifting allocation to the recreational sector may increase the chance of the commercial sector exceeding their allocation.

Option 1. Historically based allocation (73 commercial/27 recreational)
Option 2. 70/30
Option 3. 65/35
Option 4. 60/30/10, includes a 10 percent allocation for the gig fishery
Option 5. 60/40
Option 6. 50/50

VII. LITERATURE CITED

NOAA 2006, NOAA Tech. Memo NMFS-F/SPO 69

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Table 1. Allocation options for the North Carolina Southern Flounder fishery that maintain overall landings reduction of 72% with 532,352 lb available for allocation.

	Total Allowable Landings (TAL) in Pounds					
		Commercial		Recreational		
	% Allocation (Comm./Rec.)	TAL	% Reduction	TAL	% Reduction	Change in TAL
Historical Harvest	73/27	390,493	72%	141,859	72%	0
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	65/35	346,029	75%	186,323	63%	+/- 44,464
	60/30/10*	358,459	74%	173,893	66%	+/- 32,034
	60/40	319,411	77%	212,941	58%	+/- 71,082
	50/50	266,176	81%	266,176	47%	+/- 124,317

1. This denotes a 10% allocation for gigs that was further divided out to each sector based on historically based allocation (73/27).

Table 2. Sub-allocations for the commercial and recreational sectors for NCMFC options based on the 2017 harvest.

	Commercial		Recreational	
NCMFC Option	**Mobile Gear**	**Pound Net**	**Hook-and-Line**	**Gig**
Historically Based Allocation	195,105	195,388	126,315	15,544
70/30	186,188	186,458	142,206	17,500
65/35	172,889	173,140	165,907	20,416
[1].60/30/10	180,228	178,231	159,706	14,187
60/40	159,590	159,821	189,608	23,333
50/50	132,992	133,184	237,010	29,166

1. This denotes a 10% allocation for gigs that was further divided out to each sector based on historically based allocation (73/27).

Table 3. Annual commercial southern flounder landings in pounds by gear type, 2008-2017. Numbers in parentheses are the percent of the total landings for each gear in a given year. Source: North Carolina Trip Ticket Program.

Year	Gill Net	Pound Net	Gigs	Other	Total
2008	1,770,204 (68%)	685,546 (26%)	82,846 (3%)	63,793 (2%)	2,602,390
2009	1,658,074 (69%)	591,534 (25%)	84,303 (4%)	62,329 (3%)	2,396,240
2010	958,271 (57%)	571,151 (34%)	128,081 (8%)	32,054 (2%)	1,689,557
2011	652,810 (52%)	464,546 (37%)	113,414 (9%)	16,680 (1%)	1,247,450
2012	879,373 (53%)	569,388 (35%)	149,387 (9%)	47,989 (3%)	1,646,137
2013	1,096,060 (50%)	924,887 (42%)	118,489 (5%)	46,955 (2%)	2,186,391
2014	659,394 (39%)	860,216 (51%)	135,273 (8%)	18,628 (1%)	1,673,511
2015	392,339 (33%)	667,847 (56%)	130,277 (11%)	12,422 (1%)	1,202,885
2016	361,570 (40%)	398,258 (44%)	126,983 (14%)	10,953 (1%)	897,765
2017	552,292 (40%)	697,814 (50%)	136,094 (10%)	8,416 (1%)	1,394,617
Average	898,039 (53%)	643,119 (38%)	120,515 (7%)	32,022 (2%)	1,693,694

*Percentages may not total 100% due to rounding.

Table 4. Annual trips, average landings per trip (APT), and number of participants (#PAR) by gear type in the southern flounder fishery, 2008-2017. Source: North Carolina Trip Ticket Program.

Year	Trips[1] / APT / #PAR[2]	Gill Net Trips/ APT/ #PAR	Pound Net Trips / APT / #PAR	Gig Trips / APT / #PAR	Other Trips / APT / #PAR
2008	28,966 / 90 / 1,235	23,493/ 75 / 924	1,508 / 455 / 83	1,459 / 57 / 140	2,510 / 25 / 413
2009	29,395 / 82 / 1,299	23,691 / 70 / 992	1,746 / 339 / 85	1,450 / 58 / 143	2,510 / 25 / 426
2010	20,408 / 83 / 1,182	15,134 / 63 / 837	1,610 / 355 / 84	2,283 / 56 / 226	1,384 / 23 / 329
2011	15,810 / 79 / 1,039	11,403 / 57 / 759	1,370 / 339 / 63	2,076 / 55 / 212	963 / 17 / 250
2012	20,926 / 79 / 1,202	14,713 / 60 / 855	1,754 / 325 / 84	3,000 / 50 / 288	1,462 / 33 / 291
2013	23,579 / 93/ 1,286	16,968 / 65 / 933	2,111 / 438 / 82	2,408 / 49 / 270	2,094 / 22 / 343
2014	18,121 / 92 / 1,222	11,778 / 56 / 799	1,806 / 476 / 88	2,655 / 51 / 316	1,887 / 10 / 373
2015	13,880 / 87 / 1,029	8,465 / 46 / 674	1,803 / 370 / 81	2,616 / 50 / 307	1,002 / 12 / 249
2016	13,336 / 67 / 945	8,422 / 43 / 591	1,423 / 280 / 77	2,657 / 48 / 323	838 / 13 / 227
2017	17,963 / 78 / 1,048	12,363 / 45 / 713	1,908 / 366 / 88	2,752 / 49 / 310	943 / 9 / 237
Average	20,238 / 84 / 1,149	14,643 / 61 / 808	1,704 / 377/ 82	2,336 / 52 / 254	1,559 / 21 / 314

1 The number of trips, average landings per trip, and number of participants is from all trips that recorded southern flounder across all gear types including pound nets, gill nets, gigs, and other.
2 The annual number of participants cannot be summed by gear as many individuals fish multiple gears per trip.

Table 5. Recreational hook-and-line landings of southern flounder Aug 16 – Sept 30 at the 4-fish bag limit for current season and years compared to the status quo allocation (73/27 - does not include discards). Highlighted cells indicate overages in TAL the previous year resulting in closures the following year.

Year	Pounds Landed	% Overage	Subsequent Year Allocation
2008	106,493	-15.7%	126,315
2009	204,422	61.8%	48,209
2010	260,665	*106.4%	0
2011	348,203	*175.7%	0
2012	213,170	68.8%	39,461
2013	396,543	^213.9%	0
2014	133,016	5.3%	119,615
2015	142,540	12.8%	110,091
2016	172,348	36.4%	80,283
2017	108,420	-14.2%	126,315

* Denotes a scenario where the recreational hook-and-line fishery would not have quota in subsequent year resulting in a 1-year closure due to overages.

^ Denotes a scenario where the recreational hook-and-line fishery would not have a quota in 2 subsequent years resulting in a 2- year closure due to overages.

Table 6. Example of predicted harvest of southern flounder for a recreational hook-and-line season and compared to a 73/27 allocation and then applied to subsequent years to show future harvest during an Aug 16 – Sept 30 season. Highlighted cells indicate bag limits that exceed the TAL for the indicated year.

		Harvest of Southern Flounder (pounds)				Percent of Allocation Harvested based on 73/27 allocation				Subsequent Year Allocation (pounds)			
Season	**Year**	**4 Fish Bag**	**3 Fish Bag**	**2 Fish Bag**	**1 Fish Bag**	**4 Fish Bag**	**3 Fish Bag**	**2 Fish Bag**	**1 Fish Bag**	**4 Fish Bag**	**3 Fish Bag**	**2 Fish Bag**	**1 Fish Bag**
Aug 16 - Sept 30	2008	106,492	106,492	106,492	91,066	84%	84%	84%	72%	126,315	126,315	126,315	126,315
Aug 16 - Sept 30	2009	204,486	187,897	160,774	126,395	162%	149%	127%	100%	48,144	64,733	91,856	126,235
Aug 16 - Sept 30	2010	260,612	246,868	218,187	166,911	206%	195%	173%	132%	-	5,762	34,443	85,719
Aug 16 - Sept 30	2011	349,421	326,406	310,900	247,169	277%	258%	246%	196%	-	-	-	5,461
Aug 16 - Sept 30	2012	213,292	198,612	184,701	145,504	169%	157%	146%	115%	39,338	54,018	67,929	107,126
Aug 16 - Sept 30	2013	396,801	313,050	278,762	210,948	314%	248%	221%	167%	-	-	-	41,682
Aug 16 - Sept 30	2014	132,458	132,458	127,395	114,937	105%	105%	101%	91%	120,172	120,172	125,235	126,315
Aug 16 - Sept 30	2015	142,881	137,615	129,351	90,711	113%	109%	102%	72%	109,749	115,015	123,279	126,315
Aug 16 - Sept 30	2016	168,236	168,236	165,769	156,700	133%	133%	131%	124%	84,394	84,394	86,861	95,930
Aug 16 - Sept 30	2017	114,667	114,667	110,461	97,184	91%	91%	87%	77%	126,315	126,315	126,315	126,315

Table 7. Example of predicted harvest of southern flounder for a recreational hook-and-line season and compared a 60/40 allocation and then applied to subsequent years to show future harvest during an Aug 16 – Sept 30 season. Highlighted cells indicate bag limits that exceed the TAL for the indicated year.

		Harvest of Southern Flounder (pounds)				Percent of Allocation Harvested based on 60/40 allocation				Subsequent Year Allocation (pounds)			
Season	**Year**	**4 Fish Bag**	**3 Fish Bag**	**2 Fish Bag**	**1 Fish Bag**	**4 Fish Bag**	**3 Fish Bag**	**2 Fish Bag**	**1 Fish Bag**	**4 Fish Bag**	**3 Fish Bag**	**2 Fish Bag**	**1 Fish Bag**
Aug 16 - Sept 30	2008	106,492	106,492	106,492	91,066	56%	56%	56%	48%	189,608	189,608	189,608	189,608
Aug 16 - Sept 30	2009	204,486	187,897	160,774	126,395	108%	99%	85%	67%	174,730	189,608	189,608	189,608
Aug 16 - Sept 30	2010	260,612	246,868	218,187	166,911	137%	130%	115%	88%	118,604	132,348	161,029	189,608
Aug 16 - Sept 30	2011	349,421	326,406	310,900	247,169	184%	172%	164%	130%	29,795	52,810	68,316	132,047
Aug 16 - Sept 30	2012	213,292	198,612	184,701	145,504	112%	105%	97%	77%	165,924	180,604	189,608	189,608
Aug 16 - Sept 30	2013	396,801	313,050	278,762	210,948	209%	165%	147%	111%		66,166	100,454	168,268
Aug 16 - Sept 30	2014	132,458	132,458	127,395	114,937	70%	70%	67%	61%	189,608	189,608	189,608	189,608
Aug 16 - Sept 30	2015	142,881	137,615	129,351	90,711	75%	73%	68%	48%	189,608	189,608	189,608	189,608
Aug 16 - Sept 30	2016	168,236	168,236	165,769	156,700	89%	89%	87%	83%	189,608	189,608	189,608	189,608
Aug 16 - Sept 30	2017	114,667	114,667	110,461	97,184	60%	60%	58%	51%	189,608	189,608	189,608	189,608

Table 8. Economic impacts associated with commercial southern flounder fishing in North Carolina from 2008-2017. Data below represent the actual effort data from southern flounder harvest, along with the estimated economic impacts to the state of North Carolina using IMPLAN statistical software. Data from the 2016 NOAA Fisheries Economics of the U.S. report, along with internal division survey data, are also used to generate estimates. Note: impact estimates across categories are not additive.

Year	Pounds Landed	Ex-vessel Value	Participants	Estimated Sales Impact	Estimated Income Impacts	Estimated Employment Impact	Estimated Value Added Impact
2008	2,602,390	$ 5,650,295	1,235	$ 25,473,137	$ 10,483,954	1,544	$ 19,654,727
2009	2,396,240	$ 4,609,932	1,299	$ 20,547,716	$ 8,550,927	1,545	$ 16,161,407
2010	1,689,557	$ 3,695,889	1,182	$ 15,743,327	$ 6,531,811	1,380	$ 12,223,365
2011	1,247,450	$ 2,753,128	1,039	$ 11,771,643	$ 4,884,958	1,186	$ 9,140,235
2012	1,646,137	$ 4,451,482	1,202	$ 18,795,084	$ 7,827,308	1,440	$ 14,613,360
2013	2,186,391	$ 5,673,190	1,286	$ 23,172,478	$ 9,654,261	1,591	$ 17,977,144
2014	1,673,511	$ 4,839,672	1,222	$ 19,547,618	$ 8,134,986	1,482	$ 15,109,459
2015	1,202,885	$ 3,823,567	1,029	$ 15,852,258	$ 6,621,987	1,235	$ 12,379,619
2016	897,765	$ 3,610,533	945	$ 10,724,064	$ 6,301,409	1,129	$ 11,716,727
2017	1,394,617	$ 5,655,751	1,048	$ 20,489,984	$ 9,494,322	1,335	$ 17,676,161
Average	1,693,694	$ 4,476,342	1,149	$ 18,211,731	$ 7,848,592	1,387	$ 14,665,220

Table 9. Ex-vessel value of the commercial southern flounder fishery by year and gear.

	Gear				
Year	**Gigs**	**Gill Net**	**Other**	**Pound Net**	**Total**
2008	$ 173,360.40	$ 3,798,463.23	$ 132,612.99	$ 1,545,858.19	$ 5,650,294.81
2009	$ 159,031.29	$ 3,160,714.37	$ 116,727.33	$ 1,173,458.93	$ 4,609,931.91
2010	$ 267,481.76	$ 2,067,067.19	$ 66,800.66	$ 1,294,539.05	$ 3,695,888.65
2011	$ 256,846.25	$ 1,397,565.13	$ 34,239.01	$ 1,064,477.33	$ 2,753,127.72
2012	$ 388,313.40	$ 2,343,199.01	$ 126,800.50	$ 1,593,169.23	$ 4,451,482.14
2013	$ 320,379.72	$ 2,742,686.75	$ 114,816.10	$ 2,495,307.19	$ 5,673,189.76
2014	$ 414,205.88	$ 1,884,626.34	$ 53,262.79	$ 2,487,576.97	$ 4,839,671.98
2015	$ 417,188.88	$ 1,235,835.53	$ 38,535.39	$ 2,132,006.71	$ 3,823,566.52
2016	$ 506,533.39	$ 1,442,921.16	$ 42,422.91	$ 1,618,655.33	$ 3,610,532.80
2017	$ 547,308.32	$ 2,220,594.81	$ 32,975.26	$ 2,854,872.71	$ 5,655,751.10
Total	**$ 3,450,649.29**	**$ 22,293,673.52**	**$ 759,192.93**	**$ 18,259,921.64**	**$ 44,763,437.39**

Table 10. Economic impacts associated with recreational southern flounder fishing in North Carolina from 2008-2017. Impacts are generated using IMPLAN statistical software and division recreational survey data. Trips are defined as a fishing trip for which any flounder is the primary or secondary target, or southern flounder was caught during that trip. All job impacts represent both part- and full-time jobs. Note: Impact estimates across categories are not additive.

Year	Estimated Total Flounder Trips	Trip Expenditures	Estimated Sales Impact	Estimated Income Impact	Estimated Employment Impact	Estimated Value-Added Impact
2008	2,701,930	$ 403,612,123	$ 376,417,686	$ 135,957,566	3,292	$ 205,722,681
2009	1,482,500	$ 215,695,683	$ 200,699,372	$ 72,448,738	1,770	$ 109,870,023
2010	1,877,504	$ 280,546,465	$ 262,481,379	$ 95,039,325	2,312	$ 143,569,612
2011	1,796,204	$ 283,056,149	$ 250,861,698	$ 90,609,485	2,212	$ 137,255,698
2012	1,744,458	$ 277,772,559	$ 244,156,371	$ 88,393,860	2,159	$ 133,589,470
2013	1,707,904	$ 273,226,860	$ 238,202,597	$ 86,449,024	2,105	$ 130,332,132
2014	1,639,593	$ 269,763,604	$ 229,373,566	$ 83,466,334	2,027	$ 125,444,042
2015	1,708,499	$ 279,669,886	$ 228,724,518	$ 83,228,735	2,037	$ 125,250,995
2016	1,714,200	$ 279,905,674	$ 232,116,853	$ 84,789,195	2,079	$ 127,093,283
2017	1,250,216	$ 210,976,279	$ 171,358,430	$ 62,652,077	1,532	$ 93,793,106
Average	1,762,301	$ 77,422,528	$ 243,439,247	$ 88,303,434	2,153	$ 133,192,104