

Catch Limit Modifications for Gulf of Mexico Lane Snapper



Abbreviated Framework Action under the Fishery Management Plan for Reef Fish in the Gulf of Mexico

**Including Regulatory Impact Review and
Regulatory Flexibility Act Analysis**

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FRAMEWORK ACTION: CATCH LIMIT MODIFICATIONS FOR GULF OF MEXICO LANE SNAPPER

Catch Limit Modifications for Gulf of Mexico Lane Snapper: Framework Action to the Fishery Management Plan for Reef Fish Resources in the Gulf of Mexico including Regulatory Impact Review, Regulatory Flexibility Act Analysis.

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ABBREVIATIONS USED IN THIS DOCUMENT

ABC	acceptable biological catch
ACL	annual catch limit
BSIA	best scientific information available
CFpA	cash flow per angler
CS	consumer surplus
EEZ	exclusive economic zone
FES	Fishing Effort Survey
FMP	Fishery Management Plan
GDP	Gross Domestic Product
Gulf	Gulf of Mexico
IA	interim analysis
lb	pounds
MRIP	Marine Recreational Information Program
NMFS	National Marine Fisheries Service
OFL	overfishing limit
PS	producer surplus
RIR	Regulatory Impact Review
SEFSC	Southeast Fisheries Science Center
SOI	segments of interest
SRHS	Southeast Regional Headboat Survey
WTP	willingness-to-pay
ww	whole weight

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CHAPTER 1. INTRODUCTION

1.1 Background

Gulf of Mexico (Gulf) lane snapper is managed under the Fishery Management Plan (FMP) for Reef Fish Resources in the Gulf of Mexico (Reef Fish FMP), and catch limits are set for the stock, with no allocation between the commercial and recreational sectors. In 2022, the National Marine Fisheries Service (NMFS) implemented the Framework Action for Modification of the Gulf of Mexico Lane Snapper Catch Limits and Accountability Measures (2021a) which modified the lane snapper overfishing limit (OFL), acceptable biological catch (ABC), and annual catch limit (ACL). Additionally, the Framework Action modified accountability measures for lane snapper to require a prohibition on harvest for the remainder of the fishing year if landings met or are projected to meet the ACL. Prior to this change, if the ACL was exceeded in a given year, NMFS prohibited harvest in the subsequent year if landings met or were projected to meet the ACL.

This framework action evaluates modifications to the lane snapper OFL, ABC, and ACL, in response to the 2023 Southeast Data, Assessment, and Review (SEDAR) 49 interim analysis (IA) for Gulf lane snapper. The data for the 2023 lane snapper IA included landings and dead discards. The catch-per-unit-effort index for the headboat fleet was updated to include data through 2022.

Landings for the commercial and recreational sectors from 2003 through 2022 in both pounds (lb) whole weight (ww), and as a percentage of the total landings, are shown in Table 1.1.1. In terms of poundage, the commercial sector's landings have shown a slight decreasing trend since 2003; the recreational sector's landings have shown an increase beginning in 2016, with some fluctuations. The fishery experienced closures in 2019 (December 13), 2021 (closed October 18 and reopened December 23¹), and 2022 (November 15).

¹ In 2021, the fishery reopened on December 23 upon implementation of a higher ACL.

Table 1.1.1. Landings of lane snapper by sector from 2003-2022, by weight and as a percentage of total landings. Recreational landings are calibrated to, or derived from, the Marine Recreational Information Program’s (MRIP) Fishing Effort Survey (FES).

Year	Commercial		Recreational (FES)		Total
	<i>Landings (lb ww)</i>	%	<i>Landings (lb ww)</i>	%	<i>Landings (lb ww)</i>
2003	50,584	9.17	501,142	90.83	551,726
2004	50,772	7.72	607,006	92.28	657,778
2005	39,951	7.27	509,874	92.73	549,825
2006	49,340	8.77	513,265	91.23	562,605
2007	29,222	5.21	531,385	94.79	560,607
2008	25,475	6.70	354,496	93.30	379,971
2009	35,848	6.28	535,266	93.72	571,114
2010	17,262	8.81	178,642	91.19	195,904
2011	14,365	8.68	151,116	91.32	165,481
2012	28,928	6.40	423,252	93.60	452,180
2013	23,189	4.83	456,712	95.17	479,901
2014	30,237	6.07	467,957	93.93	498,194
2015	46,027	10.28	401,702	89.72	447,729
2016	34,723	5.36	612,615	94.64	647,338
2017	42,618	3.24	1,272,029	96.76	1,314,647
2018	26,435	3.23	791,568	96.77	818,004
2019	24,299	2.29	1,036,281	97.71	1,060,580
2020	24,246	2.76	852,730	97.24	876,976
2021	22,885	3.96	554,911	96.04	577,797
2022	16,447	1.46	1,113,580	98.54	1,130,027

Source: Commercial data sources – SEDAR 49 (2003-2013) and Southeast Fishery Science Center’s (SEFSC) ACL Monitoring Data (2014-2022), accessed September 2023; recreational data source – SEFSC FES ACL Monitoring Data, accessed October 2023.

1.2 Purpose and Need

The purpose is to modify the OFL, ABC, and ACL for Gulf lane snapper based on the 2023 SEDAR 49 interim analysis.

The need is to update existing lane snapper catch limits based on the best scientific information available and to achieve optimum yield while preventing overfishing, consistent with the requirements of the Magnuson-Stevens Fishery Conservation and Management Act.

1.3 Modification of the OFL, ABC, and ACL for Gulf Lane Snapper

1.3.1 Options

Option 1. No Action. Retain the OFL, ABC, and ACL for the lane snapper stock as implemented in 2021 by Framework Action: Modification to Lane Snapper Catch Limits and Accountability Measures. The OFL is equal to 1,053,834 lb ww, and the ABC is equal to 1,028,973 lb ww. The ACL is set equal to the ABC.

Option 2. Modify the OFL for Gulf lane snapper stock to be 1,116,331 lb ww, and the ABC to be 1,088,873 lb ww. The ACL is set equal to the ABC.

1.3.2 Discussion

Option 1 would maintain the current catch limits (OFL, ABC, and ACL) for Gulf lane snapper. **Option 2** would modify these catch limits based on the 2023 Gulf lane snapper interim catch analysis, using data through 2022. The **Option 2** would increase the stock ACL by 59,900 lb ww, which would be expected to result in a marginal increase in the fishing season duration if implemented compared to that expected from **Option 1**. **Option 2** is consistent with the catch advice recommended to the Council by the Gulf of Mexico Fishery Management Council's Scientific and Statistical Committee (SSC). The SSC determined that the results of the 2023 SEDAR 49 interim catch analysis are consistent with the best scientific information available (BSIA), and used the results of that analysis to inform the OFL and ABC recommendations in **Option 2**. However, because **Option 1** would retain catch limits that are more biologically conservative than those recommended by the SSC in **Option 2**, **Option 1** is a viable management alternative. Both options express catch limits that are directly comparable because the current and proposed catch limits are derived in part using recreational catch limits calibrated to MRIP-FES. The catch limits under **Option 1** were implemented in December, 2021 (86 FR 72854; December 23, 2021), and NMFS closed harvest of lane snapper for the remainder of the fishing year in November of 2022 (87 FR 68382; November 15, 2022). However, total 2022 landings still exceed the 2022 ACL as well as the ACL proposed in **Option 2**. Recreational landings for 2023 are currently only available through August, so it is unknown whether 2023 landings will meet or exceed the ACL. However, given that the 2022 ACL was exceeded, both the commercial and recreational sectors support the increase in the catch limits specified in **Option 2**.

The commercial and recreational reef fish fisheries in the Gulf of Mexico are multi-species, and thus, a change in the catch limits of one reef fish species is not expected to result in an appreciable difference in the amount of overall fishing effort. Thus, impacts to the physical environment from either **Option 1** or **Option 2** are expected to be negligible. The SSC determined the catch limits in **Option 2** to be consistent with BSIA, and increasing the catch limits from **Option 1** to **Option 2** is not expected to result in negative effects to the biological environment, provided the OFL is not exceeded. Generally, NMFS is responsible for monitoring landings and closing the fishing season for lane snapper when the stock ACL is met or projected to be met (GMFMC 2021a). Setting and monitoring the ACL and, when necessary, closing the fishing season are administrative processes which are not expected to be affected by the implementation of either **Option 1** or **Option 2**. **Option 2** is expected to have minor positive economic and social effects on fishermen who harvest this species when compared to **Option 1** due to the increased catch limits.

CHAPTER 2. REGULATORY IMPACT REVIEW

2.1 Introduction

The National Marine Fisheries Service (NMFS) requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest. The RIR does three things: 1) it provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action; 2) it provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problem; and 3) it ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way. The RIR also serves as the basis for determining whether the proposed regulations are a "significant regulatory action" under the criteria provided in Executive Order (E.O.) 12866.

2.2 Problems and Objectives

The problems and objectives addressed by this action are discussed in Section 1.2.

2.3 Description of the Fishery

Additional details on the economic environment of the recreational and commercial sectors of the reef fish fishery are provided in Final Amendment 48 to the Fishery Management Plan for Reef Fish Resources of the Gulf of Mexico and Amendment 5 to the Fishery Management Plan for the Red Drum Fishery of the Gulf of Mexico (GMFMC 2021a). Additional details on the economic environment of the recreational and commercial sectors of the lane snapper component of the Gulf reef fish fishery are provided in the Modification of the Gulf of Mexico Lane Snapper Catch Limits and Accountability Measures Framework Action (GMFMC 2021b).

Sections 2.3.1 and 2.3.2 contain additional information on the economic environment of the commercial sector and the for-hire and private recreational components of the recreational sector in the Gulf reef fish fishery, with a specific focus on the lane snapper portion of the fishery. This amendment contains management measures that would indirectly affect Gulf lane snapper dealers, and thus additional details on the economic environment of that component of the commercial sector are also provided.

2.3.1 Commercial Sector

Permits

Any fishing vessel that harvests and sells lane snapper from the Gulf exclusive economic zone (EEZ) must have a valid Gulf reef fish commercial permit. Commercial Gulf reef fish permits are a limited access permit. After a permit expires, it can be renewed or transferred up to one year after the date of expiration. As of August 26, 2021, there were 814 valid or renewable commercial Gulf reef fish permits. As shown in Table 2.3.1.1, the number of permits that were

valid at any point in a given year decreased steadily from 2016-2020. There were approximately 2% fewer valid permits in 2020 relative to 2016.

Table 2.3.1.1. Number of valid Gulf commercial permits for reef fish, 2016-2020.

Year	Number of Permits
2016	852
2017	850
2018	845
2019	842
2020	837

Source: NMFS SERO Sustainable Fisheries (SF) Access permits database (accessed 05/17/22).

Vessels

Not all holders of Gulf commercial permits for reef fish are active each year. The information in Tables 2.3.1.2 and 2.3.1.3 describe the landings and revenue for vessels which, during the 2018-2022 timeframe, possessed a valid or renewable commercial Gulf reef fish permit and were actively fishing. Tables 2.3.1.2 and 2.3.1.3 show the landings and revenue from all reef fish and other species. Additionally, landings and revenue from species harvested in the South Atlantic by these vessels is shown to provide a full accounting of the commercial fishing activity of commercial Gulf reef fish permitted vessels.

The number of permitted commercial Gulf reef fish vessels actively fishing each year has declined overall from 2018-2022, with an 18% decline in active vessels in 2022, relative to 2018. Total landings of reef fish species also declined during this time period, by 5% in 2022 relative to 2018. Landings of jointly caught species on reef fish trips (i.e., trips that harvested any reef fish species) increased by 5% in 2022 relative to 2018. Total landings of all species by permitted commercial Gulf reef fish vessels declined by 5% in 2022, relative to 2018. On average from 2018-2022, reef fish species accounted for 90% of total landings by permitted commercial Gulf reef fish vessels.

Table 2.3.1.2. Number of vessels and landings (lb whole weight [ww]), by year for permitted commercial Gulf reef fish vessels. Average (mean) and maximum (max) are of per vessel landings for each year.

Year	Number of Vessels	Statistic	Reef Fish Landings	Other species jointly caught w/ reef fish Landings	Other Gulf Landings	Other South Atlantic (SATL) Landings	Total Landings
2018	519	Max	402,188	18,819	56,607	72,114	403,969
		Mean	22,765	807	1,025	595	25,193
		Total	12,498,242	443,278	562,599	326,908	13,831,026
2019	516	Max	420,962	17,192	66,462	33,920	421,669
		Mean	24,803	780	1,240	773	27,595
		Total	12,798,571	402,224	639,643	398,620	14,239,058
2020	496	Max	625,764	16,046	42,152	68,257	626,341
		Mean	24,530	589	1,205	444	26,768
		Total	12,166,825	291,927	597,856	220,187	13,276,794
2021	466	Max	593,944	28,207	63,486	79,145	596,629
		Mean	27,726	693	1,367	963	30,749
		Total	12,920,310	323,100	636,864	448,872	14,329,145
2022	427	Max	632,298	181,343	132,631	96,069	633,335
		Mean	27,532	1,091	1,167	826	30,616
		Total	11,756,096	465,914	498,421	352,494	13,072,925

Source: Southeast Fisheries Science Center (SEFSC) Social Science Research Group (SSRG) Socioeconomic Panel (Aug 2023 version).

Overall dockside revenue of reef fish species landed by permitted commercial Gulf reef fish vessels declined slightly during this time period, by less than a percent in 2022 relative to 2018. Revenue from jointly caught species on Gulf reef fish trips decreased by 16% in 2022, relative to 2018. Revenue from other Gulf species not caught on reef fish trips declined by 28% in 2022, relative to 2018. Revenue from South Atlantic trips increased by 12% in 2022, relative to 2018. Total gross revenue by permitted commercial Gulf reef fish vessels declined by 5% overall during this time period. The maximum total revenue earned by a single vessel from all landings during this time period was approximately \$3.63 million. On average from 2018-2022, reef fish species accounted for 95% of the total revenue by permitted commercial Gulf reef fish vessels.

Table 2.3.1.3. Number of vessels and revenues (2022\$) by year for permitted commercial Gulf reef fish vessels.

Year	Number of Vessels	Statistic	Reef Fish Revenue	Other species revenue jointly caught w/ Reef Fish	Other Gulf Revenue	Other SATL Revenue	Total Gross Revenue
2018	519	Max	\$2,377,078	\$46,821	\$151,444	\$285,749	\$2,382,899
		Mean	\$115,156	\$1,640	\$2,809	\$2,448	\$122,054
		Total	\$63,220,721	\$900,571	\$1,542,109	\$1,344,059	\$67,007,461
2019	516	Max	\$2,540,735	\$35,799	\$111,589	\$137,655	\$2,542,864
		Mean	\$129,172	\$1,673	\$2,720	\$2,906	\$136,471
		Total	\$66,652,723	\$863,034	\$1,403,705	\$1,499,603	\$70,419,065
2020	496	Max	\$3,410,762	\$40,255	\$105,607	\$256,720	\$3,412,737
		Mean	\$123,040	\$1,266	\$2,722	\$1,695	\$128,722
		Total	\$61,027,622	\$627,692	\$1,350,117	\$840,570	\$63,846,001
2021	466	Max	\$3,275,932	\$77,283	\$178,032	\$272,440	\$3,282,199
		Mean	\$141,016	\$1,583	\$3,415	\$3,390	\$149,403
		Total	\$65,713,318	\$737,656	\$1,591,471	\$1,579,536	\$69,621,981
2022	427	Max	\$3,637,256	\$87,328	\$298,527	\$417,497	\$3,639,389
		Mean	\$147,744	\$1,765	\$2,619	\$3,531	\$155,660
		Total	\$63,086,897	\$753,627	\$1,118,335	\$1,507,926	\$66,466,786

Source: SEFSC-SSRG Socioeconomic Panel (Aug 2023 version).

The information in Tables 2.3.1.4 and 2.3.1.5 describe the landings and revenue for vessels that harvested Gulf lane snapper in each year from 2018 through 2022, and their revenue from other species. Vessel participation declined 28% from 2018-2022. Total landings of lane snapper also declined during this time period by 44%. Landings of other species caught on lane snapper trips declined by 5% in 2022 relative to 2018. Lane snapper accounted for less than one percent of total landings by commercial vessels harvesting Gulf lane snapper.

Table 2.3.1.4. Number of vessels and landings (lb ww), by year for Gulf lane snapper vessels.

Year	Number of Vessels	Statistic	Lane Snapper Landings	Other species landings jointly caught w/ Lane Snapper	Other Gulf Landings	Other SATL Landings	Total Landings
2018	305	Max	1,032	83,139	342,992	24,682	403,969
		Mean	75	11,532	19,364	225	31,196
		Total	22,803	3,517,215	5,906,048	68,565	9,514,632
2019	296	Max	1,369	226,920	356,575	19,648	421,669
		Mean	69	12,183	20,056	282	32,591
		Total	20,481	3,606,280	5,936,622	83,514	9,646,897
2020	297	Max	1,353	199,063	427,224	8,018	626,341
		Mean	68	13,347	19,315	107	32,838
		Total	20,272	3,964,117	5,736,577	31,909	9,752,874
2021	274	Max	612	340,263	430,679	20,779	596,629
		Mean	69	13,333	25,261	394	39,057
		Total	18,994	3,653,167	6,921,517	108,061	10,701,739
2022	220	Max	579	300,181	552,026	38,521	633,335
		Mean	58	13,970	26,978	481	41,487
		Total	12,775	3,073,382	5,935,114	105,852	9,127,122

Source: SEFSC-SSRG Socioeconomic Panel (Aug 2023 version).

Dockside revenue of lane snapper declined 44% 2018-2022. Revenue from species caught on Gulf lane snapper trips decreased 5% between 2018 and 2022. Revenue from other Gulf species not caught on lane snapper trips and revenue from South Atlantic trips increased during this time period, by 5% and 46%, respectively. The maximum total revenue for a vessel that harvested lane snapper during this time period was approximately \$3.63 million (2022\$). On average from 2018-2022, lane snapper accounted for less than a percent of the total revenue by commercial vessels harvesting Gulf lane snapper, suggesting there is little financial dependency specifically on Gulf lane snapper landings.

Table 2.3.1.5. Number of vessels and revenues (2022\$) by year for Gulf lane snapper vessels. Average (mean) and maximum (max) are of per vessel landings for the year.

Year	Number of Vessels	Statistic	Lane Snapper Revenue	Other species revenue jointly caught w/ Lane Snapper	Other Gulf Revenue	Other SATL Revenue	Total Gross Revenue
2018	305	Max	\$3,897	\$462,148	\$2,023,074	\$119,733	\$2,382,899
		Mean	\$263	\$57,783	\$95,871	\$988	\$154,905
		Total	\$80,163	\$17,623,739	\$29,240,654	\$301,434	\$47,245,990
2019	296	Max	\$4,926	\$1,373,189	\$2,164,680	\$75,152	\$2,542,864
		Mean	\$231	\$64,064	\$100,110	\$1,018	\$165,423
		Total	\$68,521	\$18,962,925	\$29,632,419	\$301,452	\$48,965,316
2020	297	Max	\$4,330	\$1,069,772	\$2,342,770	\$37,225	\$3,412,737
		Mean	\$220	\$68,327	\$92,659	\$442	\$161,648
		Total	\$65,218	\$20,293,207	\$27,519,688	\$131,299	\$48,009,411
2021	274	Max	\$1,915	\$1,914,522	\$2,413,758	\$89,149	\$3,282,199
		Mean	\$218	\$69,092	\$124,066	\$1,375	\$194,752
		Total	\$59,829	\$18,931,205	\$33,994,098	\$376,802	\$53,361,934
2022	220	Max	\$2,080	\$1,765,703	\$3,186,835	\$147,640	\$3,639,389
		Mean	\$203	\$75,717	\$140,055	\$2,004	\$217,980
		Total	\$44,761	\$16,657,750	\$30,812,119	\$440,860	\$47,955,490

Source: SEFSC-SSRG Socioeconomic Panel (Aug 2023 version).

Economic Value

Changes in commercial lane snapper landings may result in economic effects because of potential changes in ex-vessel prices due to less (or more) domestic lane snapper being available in markets. In turn, if the ex-vessel price is expected to change, gross revenue and thus consumer surplus (CS) would also be expected to change. The potential effects on ex-vessel price, gross revenue, and CS can be estimated utilizing the work by Asche (2020). According to the results of the inverse almost ideal demand system, Asche (2020) estimated a Marshallian own-price flexibility for “other snappers,” inclusive of lane snapper, of -0.340. The own-price flexibility is the percentage change in a product’s price relative to the percentage change of a product’s quantity sold, and thus estimates the responsiveness of a product’s price to the quantity being sold. The own-price flexibility estimate in Asche (2020) is not compensated for income. An income-compensated estimate would likely be lower, which would in turn yield smaller changes in the ex-vessel price and thus smaller changes in gross revenue and producer surplus (PS)². Thus, any estimates based on their analysis should be considered maximum expected changes in ex-vessel price, gross revenue, and CS in the commercial sector.

² Producer surplus is the difference between total annual revenue and variable costs.

Estimates of economic returns are not directly available for the lane snapper commercial sector in the Gulf. The most recent analysis, which calculated estimates of economic returns for Gulf commercial fishing vessels was performed by C. Liese, Southeast Fisheries Science Center, pers. comm. 2023. Liese, Southeast Fisheries Science Center, pers. comm. 2023 calculated economic returns for commercial Gulf reef fish vessels and other segments of interest (SOI). In most cases, these SOIs are at the species or species group and/or at the gear-level, such as red snapper or longline trips. C. Liese, Southeast Fisheries Science Center, pers. comm. 2023 produced estimates for a Gulf Reef Fish³ SOI, which can be used as a proxy for lane snapper estimates. These estimates are specific to economic performance in 2014-2018. The analysis also provides average estimates of economic returns across 2014-2018, which are the most useful for this purpose. Estimates in the analysis are based on a combination of Southeast Coastal Logbook data, a supplemental economic add-on survey to the logbooks, and an annual economic survey at the vessel level. The economic surveys collect data on gross revenue, variable costs, fixed costs, and some auxiliary economic variables (e.g., market value of the vessel). The analysis provides estimates of critical economic variables for the commercial sector in the Gulf reef fish fishery. In addition, estimates are provided at the trip level and the annual vessel level, of which the latter are most important for this purpose. Findings from the analysis are summarized below.

Table 2.3.1.6 illustrates the economic “margins” generated on Gulf reef fish trips, i.e., trip net cash flow and trip net revenue as a percentage of trip revenue. As shown in this table, 16% and 33.3% (or 49.3% in total) of the average revenues generated on Gulf reef fish trips were used to pay for fuel/supplies costs and crew labor costs, while the remaining 38% was net cash flow back to the owner(s). The margin associated with trip net revenue about 51%. Thus, trip cash flow and trip net revenue were both positive on average from 2014 through 2018, generally indicating that Gulf reef fish trips were profitable during this time.

From an economic returns perspective, the two most critical results at the trip level are the estimates of trip net cash flow and trip net revenue. Trip net cash flow is trip revenue minus the costs for fuel, bait, ice, groceries, miscellaneous, hired crew, and purchases of annual allocation from other allocation holders. Thus, this estimate represents the amount of cash generated by a typical Gulf reef fish trip over and above the cash cost of taking the trip (i.e., variable costs of the trip) and is a proxy for PS at the trip level. Trip net revenue is trip revenue minus the costs for fuel, bait, ice, groceries, miscellaneous, hired crew, and the opportunity cost of owner’s time as captain. By including opportunity cost of the owner’s time and excluding purchases of annual allocation, trip net revenue is a measure of the commercial fishing trip’s economic profit.

³ Per C. Liese, Southeast Fisheries Science Center, pers. comm. 2023, the Reef Fish SOI “consists of all logbook trips by permitted vessels where at least one pound of a reef fish species managed by the Gulf Reef Fish FMP was landed.”

Table 2.3.1.6. Economic characteristics of Gulf Reef Fish trips 2014-2018 (2022\$).

	2014	2015	2016	2017	2018	Average
Number of Observations	1,237	1,787	1,955	1,943	1,448	
Response Rate (%)	78%	85%	94%	95%	94%	
Trips						
Owner-Operated	73%	65%	68%	61%	70%	67.4%
Fuel Used per Day at Sea (gallons/day)	46	46	40	49	46	45
Total Revenue	100%	100%	100%	100%	100%	100%
Costs (% of Revenue)						
Fuel	6.8%	4.9%	4.3%	5.1%	5.8%	5.4%
Bait	3.1%	3.4%	3.6%	4.1%	3.9%	3.6%
Ice	1.4%	1.5%	1.7%	1.6%	1.6%	2%
Groceries	2.4%	2.4%	3.1%	3.2%	2.7%	2.8%
Miscellaneous	2.5%	2.4%	3.0%	2.5%	2.5%	2.6%
Hired Crew	28.2%	25.9%	27.0%	27.6%	23.8%	26.5%
IFQ Purchase	15%	27%	19%	19%	20%	20%
Owner-Captain Time	6.5%	6.2%	7.4%	6.4%	7.1%	6.7%
Trip Net Cash Flow	41%	33.0%	38.8%	36.8%	39.5%	38%
Trip Net Revenue	49%	53.2%	49.8%	49.5%	52%	51%
Labor - Hired & Owner	35%	32.1%	34.4%	33.9%	30.9%	33.3%
Fuel & Supplies	16%	14.7%	15.7%	16.6%	16.6%	16%
Input Prices						
Fuel Price (per gallon)	\$4.50	\$3.21	\$2.56	\$2.76	\$3.09	\$3.23
Hire Crew Wage (per crew-day)	\$421	\$354	\$314	\$351	\$281	\$344
Productivity Measures						
Landings/Fuel Use (lb/gallon)	13.3	12.6	11.4	10.7	10.5	12
Landings/Labor Use (lbs/crew-day)	221	204	169	196	176	193

Source: C. Liese, Southeast Fisheries Science Center, pers. comm. 2023.

Table 2.3.1.7 provides estimates of the important economic variables at the annual level for all vessels that had Gulf reef fish landings from 2014 through 2018. Similar to the trip level, the three most important estimates of economic returns from a financial perspective are net cash flow, net revenue from operations, and economic return on asset value. Of these measures, net revenue from operations most closely represents economic profits to the owner(s). Net cash flow is total annual revenue minus the costs for fuel, other supplies, hired crew, vessel repair and maintenance, insurance, overhead, loan payments, and purchases of annual allocation. Net revenue from operations is total annual revenue minus the costs for fuel, other supplies, hired crew, vessel repair and maintenance, insurance, overhead, and the opportunity cost of an owner's

time as captain, and the vessel's depreciation. Economic return on asset value is calculated by dividing the net revenue from operations by the vessel value.

Net cash flow and net revenue from operations at the annual vessel level were both positive from 2014-2018, generally indicating that commercial Gulf reef fish vessels were profitable during this time. Specifically, net cash flow and net revenue from operations averaged 26% and 32%, respectively.

In general, PS is the difference between total annual revenue and variable costs. PS is a measure of net economic benefits to producers. Overstreet and Liese (2018b) state the following about individual fishing quota (IFQ) allocation: "sale of IFQ allocation or shares is also not accounted for, as these transactions cannot be associated with a vessel." If revenue from the sale of allocation is not accounted for, then the cost of buying allocation should also not be considered in the calculation of PS. Although lane snapper are not part of an IFQ program, many vessels that participate in the commercial sector of the lane snapper component of the reef fish fishery also participate in the Gulf IFQ programs. Therefore, a more accurate estimate of PS in percentage terms would be 50.7% of gross revenue based on estimates of variable costs in Table 2.3.1.6.⁴

⁴ PS = 100% - (Labor% + Fuel&Supplies%)

Table 2.3.1.7. Economic characteristics of Gulf Reef Fish vessels from 2016-2018 (2022\$).

	2014	2015	2016	2017	2018	Average
Number of Observations	84	105	121	132	110	
Response Rate (%)	62%	75%	82%	78%	79%	
Vessels						
Owner-Operated	78%	69%	78%	65%	70%	72%
For-Hire Active	9%	17%	16%	22%	15%	16%
Vessel Value	\$154,104	\$129,669	\$107,541	\$134,239	\$123,785	\$129,867
Total Revenue	100%	100%	100%	100%	100%	100%
Costs (% of Revenue)						
Fuel	8.4%	6.1%	6.7%	6.8%	8.1%	7.2%
Other Supplies	9.6%	9.4%	10.8%	11.0%	11.8%	10.5%
Hired Crew	26.9%	25.3%	24.5%	25.3%	23.4%	25.1%
Vessel Repair & Maintenance	7.7%	6.9%	8.5%	11.2%	10.6%	9.0%
Insurance	1.1%	0.8%	1.0%	1.2%	1.1%	1.0%
Overhead	5.6%	5.5%	5.1%	6.5%	4.8%	5.5%
Loan Payment	1.0%	1.4%	1.3%	1.3%	1.4%	1.3%
IFQ Purchase	11.1%	24.1%	14.0%	10.6%	15.0%	15.0%
Owner-Captain Time	5.6%	5.4%	6.6%	5.5%	6.6%	5.9%
Net Cash Flow	29.0%	20.6%	28.1%	26.0%	23.8%	26.0%
Net Revenue for Operations	31.0%	37.6%	33.5%	28.4%	29.3%	32.0%
Depreciation	3.7%	3.1%	3.2%	4.0%	4.4%	3.7%
Fixed Costs	14.0%	13.2%	14.7%	18.9%	16.6%	15.0%
Labor - Hired & Owner	33.0%	30.7%	31.1%	30.9%	29.9%	31.0%
Fuel & Supplies	18.0%	15.4%	17.5%	17.9%	19.8%	18.0%
Economic Return (on asset value)	42.1%	60.2%	51.8%	35.8%	33.5%	44.7%

Source: C. Liese, Southeast Fisheries Science Center, pers. comm. 2023.

Dealers

The information in Table 2.3.1.8 illustrates the purchasing activities of dealers that bought Gulf lane snapper landings from vessels from 2018 through 2022. Additionally, the purchasing activities from species harvested in the South Atlantic by these dealers is shown to provide a full accounting of the purchasing of dealers that bought Gulf lane snapper landings. The total number of dealers purchasing lane snapper declined each year from 2018-2022 and averaged 83 dealers per year. In 2022, the total number of dealers purchasing lane snapper was approximately 54% fewer relative to 2018. Lane snapper purchases by dealers varied with a

decrease of 6% in 2022 relative to 2018. Average purchases of Gulf lane snapper were \$610,123 with a 45% increase of lane snapper purchases per dealer (2022\$) over that time.

Value of other species purchased decreased by 9% in 2022, relative to 2018. South Atlantic species average value declined by about 37% in 2022, relative to 2018. Total purchases for all species by dealers purchasing Gulf lane snapper averaged approximately \$116.4 million (2022\$) 2018-2022. Lane snapper made up approximately less than 1% of total purchases by lane snapper dealers, indicating that there is a very low financial dependency on lane snapper landings. Additionally, because of federal dealers' ability to switch to purchasing other species, changes to those values as a result of the management measures considered in this amendment are likely to be relatively small. Similarly, any additional PS and profit generated from lane snapper sales further up the distribution chain to wholesalers/distributors, grocers, and restaurants is likely minimal, given the vast number of seafood and other products they handle and their even greater ability to shift to purchasing other products.

Estimates on the mark-ups between the ex-vessel price and dealer sales price of lane snapper are unavailable. Keithly and Wang (2018) estimated the most recent mark-ups between the ex-vessel price and dealer sales price. However, those estimates only apply to grouper and tilefish. Further, these are insufficient to estimate PS or profit for lane snapper dealers, or changes to such as a result of regulatory changes, in part because costs other than the raw fish costs (which are equivalent to the ex-vessel value) are not considered. NMFS does not have estimates of those other costs for lane snapper dealers or seafood dealers more broadly, and thus does not have estimates of net cash flow or net revenue from operations for lane snapper dealers comparable to those in the commercial harvesting sector. Thus, while it is likely that the harvest of lane snapper generates some PS and profit for lane snapper dealers, NMFS does not possess the data to estimate PS and profit.

Table 2.3.1.8. Dealer statistics for dealers that purchased Gulf lane snapper landings by year, 2018-2022. All dollar estimates are in 2022\$.

Year	Number Dealers	Statistic	Lane Snapper Purchases	Other Gulf Species Purchases	Other SA Species Purchases	Total Purchases
2018	97	Maximum	\$8,237	\$9,717,477	\$4,988,738	\$9,717,776
		Mean	\$857	\$1,067,424	\$194,264	\$1,262,545
		Total	\$83,148	\$103,540,121	\$18,843,565	\$122,466,834
2019	92	Maximum	\$8,016	\$11,774,272	\$4,252,869	\$11,774,768
		Mean	\$794	\$1,090,063	\$122,726	\$1,213,583
		Total	\$73,043	\$100,285,788	\$11,290,828	\$111,649,659
2020	88	Maximum	\$9,269	\$10,541,741	\$4,711,230	\$10,542,526
		Mean	\$791	\$1,084,470	\$164,253	\$1,249,514
		Total	\$69,626	\$95,433,398	\$14,454,225	\$109,957,249
2021	75	Maximum	\$6,723	\$11,876,694	\$5,136,897	\$11,876,760
		Mean	\$857	\$1,528,789	\$183,871	\$1,713,517
		Total	\$64,252	\$114,659,188	\$13,790,348	\$128,513,788
2022	63	Maximum	\$6,658	\$11,293,996	\$7,976,816	\$14,022,692
		Mean	\$702	\$1,514,732	\$187,176	\$1,702,610
		Total	\$44,248	\$95,428,108	\$11,792,095	\$107,264,451

Source: SEFSC Fishing Communities Web Query Tool, Version 1. Accessed 11/13/2023.

Imports

Imports of foreign seafood products compete in the domestic seafood market and have dominated many segments of the domestic seafood market. Imports aid in determining the price for domestic seafood products and tend to set the price in the market segments in which they dominate. Seafood imports can have downstream effects on the local fish market. At the harvest level, imports can affect ex-vessel prices fishermen receive for landings. As substitutes to domestic production, imports tend to cushion the adverse economic effects on consumers resulting from a reduction in domestic landings. Imports that directly compete with domestic snapper grouper including lane snapper are described in this section.

Snappers

According to NMFS' foreign trade data, Gulf lane snapper and other snapper species are not exported from the U.S. to other countries. Imports of fresh and frozen snapper products, which directly compete with domestic harvest of snapper species are described in this section. . As shown in Table 2.3.1.9, imports of fresh snapper products were 30.5 million lb product weight (pw) in 2018. They peaked at 36.0 million lb pw in 2021. Total revenue from snapper imports increased to a five-year high of \$159.1 million in 2021. The average price per pound for fresh snapper products was \$4.00 from 2018-2022 and has been steadily increasing, reaching the

highest price per pound in 2021. Imports of fresh snapper products primarily originated in Mexico, Nicaragua, or Panama, entering the U.S. through the port of Miami.

Table 2.3.1.9. Annual pounds and value of fresh snapper imports and share of imports by country, 2018-2022. All monetary estimates are in 2022\$.

	2018	2019	2020	2021	2022
Pounds of fresh Snapper imports (product weight, million pounds)	30.5	32.8	32.4	36.0	32.2
Value of fresh Snapper imports (millions \$, 2022\$)	111.1	123.8	121.7	159.1	142.2
Average price per lb (2022\$)	\$3.64	\$3.78	\$3.76	\$4.42	\$4.42
Share of Imports by Country					
Mexico	32.5	34.9	40.4	32.8	31.2
Nicaragua	16.6	13.9	15.1	13.3	14.9
Panama	17.0	14.6	11.0	14.0	10.6
All others	33.9	36.6	33.5	39.9	43.4

Source: NOAA Foreign Trade Query Tool, accessed 12/01/23.

As shown in Table 2.3.1.10, imports of frozen snapper increased 49% from 2018 to 2021. Total revenue from frozen snapper imports increased from \$40.4 million (2022\$) in 2018 to a five-year high of \$71.3 million in 2021 (2022\$) followed by a 6% decrease in 2022. The average price per pound for frozen snapper products was \$3.58 from 2018-2022, and has been increasing. Frozen snapper product imports primarily originated in Brazil, Suriname, entering through the port of Miami.

Table 2.3.1.10. Annual pounds and value of frozen snapper imports and share of imports by country, 2018-2022.

	2018	2019	2020	2021	2022
Pounds of frozen Snapper imports (product weight, million pounds)	12.2	11.4	15.9	18.2	16.9
Value of frozen Snapper imports (millions \$, 2022\$)	40.4	39.4	51.9	71.3	66.7
Average price per lb (2022\$)	\$3.31	\$3.46	\$3.27	\$3.91	\$3.94
Share of Imports by Country					
Brazil	63.8	54.6	55.4	58.6	64.1
Suriname	6.9	13.5	10.3	10.5	5.5
Indonesia	11.3	6.8	5.4	3.9	8.0
All others	17.9	25.0	28.9	27.0	22.4

Source: NOAA Foreign Trade Query Tool, accessed 12/01/23.

Groupers

According to NMFS' foreign trade data,⁵ grouper are not exported. Imports of fresh and frozen grouper products, which also directly compete with domestic harvest of reef fish species are described in this section. As shown in Table 2.3.1.11, imports of fresh grouper products peaked in 2018. Total value of fresh grouper imports has been variable, and averaged \$57.3 million annually. The average price per pound for fresh grouper products was \$4.92 from 2018-2022 primarily origins of Mexico, Panama and Brazil.

⁵ <https://www.fisheries.noaa.gov/foss/>

Table 2.3.1.11. Annual pounds and value of fresh grouper imports and share of imports by country, 2018-2022.

	2018	2019	2020	2021	2022
Pounds of fresh Grouper imports (product weight, million pounds)	12.4	11.3	10.4	12.2	11.7
Value of fresh Grouper imports (millions \$, 2022\$)	61.5	56.9	43.6	61.6	63.1
Average price per lb (2022\$)	\$4.96	\$5.03	\$4.18	\$5.03	\$5.39
Share of Imports by Country					
Mexico	58.0	57.9	67.6	54.4	44.0
Brazil	15.9	16.9	12.3	18.1	23.9
Panama	9.0	8.1	8.0	10.9	13.4
All others	17.1	17.0	12.2	16.6	18.7

Source: NOAA Foreign Trade Query Tool, accessed 01/25/23.

As shown in Table 2.3.1.12, imports of frozen grouper products peaked at 4.6 million lb pw in 2018 declining to a low of 0.8 million lb. pw in 2020. Total revenue from frozen grouper decreased 2018 to 2020, but increased to \$2.8 million in 2022. The average price per pound for frozen grouper products was \$1.75 from 2018-2022, and increased 66% by 2022. Imports of frozen grouper products primarily originated in Brazil, Suriname, and Indonesia.

Table 2.3.1.12. Annual pounds and value of frozen grouper imports and share of imports by country, 2018-2022.

	2018	2019	2020	2021	2022
Pounds of frozen Grouper imports (product weight, million pounds)	4.6	3.5	0.8	2.2	1.3
Value of frozen Grouper imports (millions \$, 2022\$)	5.7	4.5	1.4	5.1	2.8
Average price per lb (2022\$)	\$1.25	\$1.30	\$1.77	\$2.34	\$2.07
Share of Imports by Country					
Brazil	78.9	79.2	33.7	23.5	26.2
Suriname	11.8	11.2	25.9	30.6	16.2
Indonesia	3.0	3.0	1.1	22.2	5.9
All others	6.3	6.5	39.3	23.7	51.7

Source: NOAA Foreign Trade Query Tool, accessed 01/25/23.

Economic Impacts

The commercial harvest and subsequent sales and consumption of fish generates business activity as fishermen expend funds to harvest the fish and consumers spend money on goods and services, such as lane snapper purchased at a local fish market and served during restaurant visits. These expenditures spur additional business activity in the region(s) where the harvest and purchases are made, such as jobs in local fish markets, grocers, restaurants, and fishing supply establishments. In the absence of the availability of a given species for purchase, consumers would spend their money on substitute goods and services. As a result, the analysis presented below represents a distributional analysis that only shows how economic impacts may be distributed through regional markets. It should not be interpreted to represent the impacts if these species are not available for harvest or purchase.

In addition to these types of impacts, economic impact models can be used to determine the sources of the impacts. Each impact can be broken down into direct, indirect, and induced economic impacts. “Direct” economic impacts are the results of the money initially spent in the study area (e.g., country, region, state, or community) by the fishery or industry being studied. This includes money spent to pay for labor, supplies, raw materials, and operating expenses. The direct economic impacts from the initial spending create additional activity in the local economy, i.e., “indirect” economic impacts. Indirect economic impacts are the results of business-to-business transactions indirectly caused by the direct impacts. For example, businesses initially benefiting from the direct impacts will subsequently increase spending at other local businesses. The indirect economic impact is a measure of this increase in business-to-business activity, excluding the initial round of spending which is included in the estimate of direct impacts. “Induced” economic impacts are the results of increased personal income caused by the direct and indirect economic impacts. For example, businesses experiencing increased revenue from the direct and indirect impacts will subsequently increase spending on labor by hiring more employees, increasing work hours, raising salaries/wage rates, etc. In turn, households will increase spending at local businesses. The induced impact is a measure of this increase in household-to-business activity.

Estimates of the U.S. average annual business activity associated with the commercial harvest of all Gulf reef fish species and Gulf lane snapper specifically were derived using the model developed for and applied in NMFS (2023)⁶ and are provided in Tables 2.3.1.13 and 2.3.1.14. Specifically, these impact estimates reflect the expected impacts from average annual gross revenues generated by landings of all Gulf reef fish species and Gulf lane snapper from 2018 through 2022. This business activity is characterized as jobs (full time equivalents), income impacts (wages, salaries, and self-employed income), value-added impacts (the difference between the value of goods and the cost of materials or supplies), and output impacts (gross business sales). Income impacts should not be added to output (sales) impacts because this would result in double counting

The results provided should be interpreted with caution. These results are based on average relationships developed through the analysis of many fishing operations that harvest many

⁶ A detailed description of the input/output model is provided in NMFS (2023).

different species. Separate models specific to individual species such as lane snapper are not available.

Between 2018 and 2022, landings of all Gulf reef fish species resulted in approximately \$63.4 million dollars (2022\$) in gross revenue on average. In turn, this revenue generated employment, income, value-added, and output impacts of 7,113 jobs, \$232.86 million, \$329.00 million, and \$634.08 million per year, respectively, on average.

Table 2.3.1.13. Average annual economic impacts in the commercial sector of the Gulf reef fish fishery. All monetary estimates are in thousands of 2022\$, and employment is measured in full-time equivalent jobs.

Harvesters	Direct	Indirect	Induced	Total
Employment impacts	1,240	193	255	1,688
Income impacts	\$34,522	\$6,409	\$15,499	\$56,430
Total value-added impacts	\$36,798	\$23,075	\$26,519	\$86,392
Output Impacts	\$63,940	\$52,021	\$51,481	\$167,442
Primary dealers/processors	Direct	Indirect	Induced	Total
Employment impacts	258	103	179	541
Income impacts	\$11,264	\$10,381	\$9,818	\$31,463
Total value-added impacts	\$12,007	\$13,245	\$18,485	\$43,737
Output impacts	\$36,254	\$27,307	\$36,132	\$99,694
Secondary wholesalers/ distributors	Direct	Indirect	Induced	Total
Employment impacts	120	26	116	263
Income impacts	\$6,710	\$1,996	\$7,057	\$15,764
Total value-added impacts	\$7,153	\$3,348	\$12,055	\$22,556
Output impacts	\$17,974	\$6,553	\$23,444	\$47,971
Grocers	Direct	Indirect	Induced	Total
Employment impacts	514	58	114	686
Income impacts	\$13,804	\$4,587	\$6,928	\$25,318
Total value-added impacts	\$14,714	\$7,391	\$11,729	\$33,834
Output impacts	\$23,592	\$12,004	\$23,028	\$58,623
Restaurants	Direct	Indirect	Induced	Total
Employment impacts	3,200	213	523	3,936
Income impacts	\$55,372	\$16,794	\$31,717	\$103,883
Total value-added impacts	\$59,024	\$30,019	\$53,440	\$142,482
Output impacts	\$107,926	\$46,975	\$105,453	\$260,354
Harvesters and seafood industry	Direct	Indirect	Induced	Total
Employment impacts	5,332	594	1,187	7,113
Income impacts	\$121,672	\$40,166	\$71,020	\$232,858
Total value-added impacts	\$129,696	\$77,077	\$122,228	\$329,001
Output impacts	\$249,686	\$144,860	\$239,538	\$634,084

Between 2018 and 2022, landings of Gulf lane snapper resulted in approximately \$318,492 (2022\$) in annual gross revenue on average. In turn, this revenue generated employment,

income, value-added, and output impacts of 35 jobs, \$1.16 million, \$1.64 million, and \$3.16 million per year, respectively, on average, as seen in Tables Table 2.3.1.13 and 2.3.1.14.

Table 2.3.1.14. Average annual economic impacts in the commercial sector of the Gulf lane snapper fishery. All monetary estimates are in thousands of 2022\$, and employment is measured in full-time equivalent jobs.

Harvesters	Direct	Indirect	Induced	Total
Employment impacts	6	1	1	8
Income impacts	\$172	\$32	\$77	\$281
Total value-added impacts	\$183	\$115	\$132	\$430
Output Impacts	\$318	\$259	\$256	\$834
Primary dealers/processors	Direct	Indirect	Induced	Total
Employment impacts	1	1	1	3
Income impacts	\$56	\$52	\$49	\$157
Total value-added impacts	\$60	\$66	\$92	\$218
Output impacts	\$181	\$136	\$180	\$497
Secondary wholesalers/distributors	Direct	Indirect	Induced	Total
Employment impacts	1	0	1	1
Income impacts	\$33	\$10	\$35	\$79
Total value-added impacts	\$36	\$17	\$60	\$112
Output impacts	\$90	\$33	\$117	\$239
Grocers	Direct	Indirect	Induced	Total
Employment impacts	3	0	1	3
Income impacts	\$69	\$23	\$35	\$126
Total value-added impacts	\$73	\$37	\$58	\$169
Output impacts	\$118	\$60	\$115	\$292
Restaurants	Direct	Indirect	Induced	Total
Employment impacts	16	1	3	20
Income impacts	\$276	\$84	\$158	\$517
Total value-added impacts	\$294	\$150	\$266	\$710
Output impacts	\$538	\$234	\$525	\$1,297
Harvesters and seafood industry	Direct	Indirect	Induced	Total
Employment impacts	27	3	6	35
Income impacts	\$606	\$200	\$354	\$1,160
Total value-added impacts	\$646	\$384	\$609	\$1,639
Output impacts	\$1,244	\$722	\$1,193	\$3,158

2.3.2 Recreational Sector

The recreational sector is comprised of the private and for-hire modes. The private mode includes anglers fishing from shore (all land-based structures) and private/rental boats. The for-hire mode is composed of charter boats and headboats (also called party boats). Charter boats

generally carry fewer passengers and charge a fee on an entire vessel basis, whereas headboats carry more passengers and payment is per person. The type of service, from a vessel- or passenger-size perspective, affects the flexibility to search different fishing locations during the course of a trip and target different species since larger concentrations of fish are required to satisfy larger groups of anglers.

Landings

This section contains landings data from the Southeast Fisheries Science Center (SEFSC) Marine Recreational Information Program (MRIP) ACL monitoring data set, and landings estimates provided by the Louisiana Department of Wildlife and Fisheries, and the Texas Parks and Wildlife Department.

Recreational Gulf lane snapper landings have been highly variable from 2018-2022 (Table 2.3.2.1). Total recreational landings of Gulf lane snapper averaged approximately 870,000 lb ww. Landings declined by 35% from 2020 to 2021. Private vessels on average from 2018-2022 accounted for 70% of Gulf lane snapper landings, charter vessels 20%, and headboats and shore mode making up the remaining 5% and 4% respectively. The majority of landings on average occurred in Florida (98%) (Table 2.3.2.2). Waves 3 and 4, which includes the months May through August, accounted for the majority of landings on average from 2018-2022 (Table 2.3.2.3).

Table 2.3.2.1. Recreational landings (lb whole weight [ww]) and percent distribution of Gulf lane snapper across all states by mode for 2018-2022.

	Landings (pounds ww)					Percent Distribution			
	Charter vessel	Headboat	Private	Shore	Total	Charter vessel	Headboat	Private	Shore
2018	110,305	37,859	643,419	0	791,583	14%	5%	81%	0
2019	82,754	26,003	754,814	169,302	1,032,873	8%	3%	73%	16%
2020	228,720	21,209	602,855	0	852,784	27%	2%	71%	0%
2021	183,728	69,946	294,509	6,689	554,872	33%	13%	53%	1%
2022	215,724	46,883	814,607	36,391	1,113,605	19%	4%	73%	3%
AVG	164,246	40,380	622,041	42,477	869,144	20%	5%	70%	4%

Source: MRIP FES ACL dataset (Oct23 version).

Table 2.3.2.2. Recreational landings (lb ww) and percent distribution of Gulf lane snapper by state* for 2018-2022.

	Landings (pounds ww)					Percent Distribution			
	AL	FL	LA/MS	TX	Total	AL	FL	LA/MS	TX
2018	6,539	779,252	3,312	2,480	791,583	1%	98%	0%	0%
2019	7,510	1,018,692	3,982	2,688	1,032,873	1%	99%	0%	0%
2020	10,077	839,102	638	2,968	852,784	1%	98%	0%	0%
2021	4,582	541,721	4,898	3,671	554,872	1%	98%	1%	1%
2022	15,775	1,092,582	3,082	2,167	1,113,605	1%	98%	0%	0%
AVG	8,897	854,270	3,182	2,795	869,144	1%	98%	0%	0%

Source: MRIP FES ACL dataset (Oct 2023 version).

*Louisiana and Mississippi’s landings are reported together for confidentiality purposes.

Table 2.3.2.3. Recreational landings (lb ww) and percent distribution of Gulf lane snapper by MRIP wave for 2018-2022.

	Landings (pounds ww)					
	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
2018	100,904	156,175	235,795	197,684	12,553	88,472
2019	154,808	98,172	245,714	351,995	122,762	59,421
2020	175,831	109,487	174,317	146,028	157,464	89,658
2021	113,778	55,616	164,814	157,721	34,308	28,634
2022	151,300	199,855	270,528	403,902	54,815	33,205
AVG	139,324	123,861	218,234	251,466	76,381	59,878
	Percent Distribution					
	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
2018	13%	20%	30%	25%	2%	11%
2019	15%	10%	24%	34%	12%	6%
2020	21%	13%	20%	17%	18%	11%
2021	21%	10%	30%	28%	6%	5%
2022	14%	18%	24%	36%	5%	3%
AVG	16%	14%	26%	28%	9%	7%

Source: MRIP FES ACL dataset (Oct 2023 version).

Angler Effort

Recreational effort derived from the MRIP database can be characterized in terms of the number of angler trips as follows:

- Target effort - The number of individual angler trips, regardless of duration, where the intercepted angler indicated that the species or a species in the species group was targeted as either the first or the second primary target for the trip. The species did not have to be caught.

- Catch effort - The number of individual angler trips, regardless of duration and target intent, where the individual species or a species in the species group was caught. The fish did not have to be kept.
- Total recreational trips - The total estimated number of recreational trips in the Gulf, regardless of target intent or catch success.

Other measures of effort are possible, such as directed trips (the number of individual angler trips that either targeted or caught a particular species). Estimates of lane snapper target or catch effort for additional years, and other measures of directed effort, are available.⁷

Tables 2.3.2.4 – 2.3.2.5 describe the recreational target and catch trips for lane snapper in the Gulf from 2018-2022. There are no recorded target trips in Texas or Mississippi for lane snapper in the Gulf. Private vessels represent more than 93% of target effort in the recreational sector. The majority of target effort occurs by private vessels in Florida, followed by Florida’s charter vessel target effort. Target effort for Gulf lane snapper from the shore mode was only recorded in Florida in 2022. Target effort for Gulf lane snapper increased by over 200% in 2022, relative to 2018.

Private vessels are also responsible for the majority of catch effort for Gulf lane snapper (58%). However, unlike target effort, the shore mode was responsible for an average of 26% of overall catch effort during this time period. Catch effort by charter vessels represents about 15% of the total catch effort. Private vessels in Florida account for the majority of catch effort for Gulf lane snapper (56%). Florida’s shore mode on average accounted for 26% of the recreational catch effort, and Florida’s charter mode 14%. As expected, the trends in catch effort mimic the trends in landings, with the peaks occurring in 2022 and 2019.

⁷ <https://www.fisheries.noaa.gov/data-tools/recreational-fisheries-statistics-queries>

Table 2.3.2.4. Lane snapper recreational target trips, by mode and state,* 2018-2022.

Mode	Year	Alabama	Florida	Louisiana	Total
Charter	2018	0	0	0	0
	2019	0	0	263	263
	2020	0	0	31	31
	2021	0	7,735	0	7,735
	2022	135	8,301	291	8,727
	Average	27	3,207	117	3,351
Private	2018	0	39,628	70	39,698
	2019	0	85,767	143	85,910
	2020	0	28,676	632	29,308
	2021	0	21,999	363	22,362
	2022	8,213	99,025	38	107,276
	Average	1,643	55,019	249	56,911
Shore	2018	0	0	0	0
	2019	0	0	0	0
	2020	0	0	0	0
	2021	0	0	0	0
	2022	0	5,051	0	5,051
	Average	0	1,010	0	1,010
All	2018	0	39,628	70	39,698
	2019	0	85,767	406	86,173
	2020	0	28,676	663	29,339
	2021	0	29,734	363	30,097
	2022	8,348	112,377	329	121,054
	Average	1,670	59,236	366	61,272

Sources: MRIP Survey Data available at <https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads>. Louisiana recreational effort estimates came from the Louisiana Department of Wildlife and Fisheries Recreational Creel Survey.

*No reported target trips for Texas or Mississippi

Table 2.3.2.5. Lane snapper recreational catch trips, by mode and state, 2018-2022.

Mode	Year	Mississippi	Alabama	Florida	Louisiana	Total
Charter	2018	0	0	0	0	0
	2019	0	0	0	263	263
	2020	0	0	0	31	31
	2021	0	0	7,735	0	7,735
	2022	0	135	8,301	291	8,727
	Average	0	27	3,207	117	3,351
Private	2018	314	0	39,628	70	40,012
	2019	0	0	85,767	143	85,910
	2020	0	0	28,676	632	29,308
	2021	4,029	0	21,999	363	26,391
	2022	1,465	8,213	99,025	38	108,741
	Average	1,162	1,643	55,019	249	58,072
Shore	2018	0	0	0	0	0
	2019	0	0	0	0	0
	2020	0	0	0	0	0
	2021	0	0	0	0	0
	2022	0	0	5,051	0	5,051
	Average	0	0	1,010	0	1,010
All	2018	314	0	39,628	70	40,012
	2019	0	0	85,767	406	86,173
	2020	0	0	28,676	663	29,339
	2021	4,029	0	29,734	363	34,126
	2022	1,465	8,348	112,377	329	122,519
	Average	1,162	1,670	59,236	366	62,434

Sources: MRIP Survey Data available at <https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads>. Effort estimates for Texas are from the Texas Parks and Wildlife Department’s Marine Sport-Harvest Monitoring Program and assumed equivalent to MRIP-FES estimates. Louisiana recreational effort estimates came from the Louisiana Department of Wildlife and Fisheries Recreational Creel Survey.

Similar analysis of recreational effort is not possible for the headboat mode in the Gulf because headboat data are not collected at the angler level. Estimates of effort by the headboat mode are provided in terms of angler days, or the number of standardized 12-hour fishing days that account for the different half-, three-quarter-, and full-day fishing trips by headboats. The stationary “fishing for demersal (bottom-dwelling) species” nature of headboat fishing, as

opposed to trolling, suggests that most, if not all, headboat trips and, hence, angler days, are demersal or reef fish trips by intent.

Headboat angler days have been variable across the Gulf States from 2018 through 2020, but decreased by about 7% in 2022, relative to 2018 (Table 2.3.2.6). On average (2018 through 2022), Florida accounted for the majority of headboat angler days reported, followed by Texas and Alabama; Mississippi and Louisiana combined accounted for only a small percentage (Table 2.3.2.6).

Table 2.3.2.6. Gulf headboat angler days and percent distribution by state (2018 through 2022).

	Angler Days					Percent Distribution			
	FL	AL	MS-LA*	TX	Total	FL	AL	MS-LA	TX
2018	171,996	19,851	3,235	52,160	247,242	69.57%	8.03%	1.31%	21.10%
2019	167,167	18,607	2,632	52,456	240,862	69.40%	7.73%	1.09%	21.78%
2020	126,794	13,091	1,728	51,498	193,111	65.66%	6.78%	0.89%	26.67%
2021	181,632	13,844	3,197	71,344	270,017	67.27%	5.13%	1.18%	26.42%
2022	149,368	14,588	3,675	62,705	230,336	64.85%	6.33%	1.60%	27.22%
Average	159,391	15,996	2,893	58,033	236,314	67.35%	6.80%	1.22%	24.64%

Source: NMFS SRHS (2023).

*headboat data from Mississippi and Louisiana are combined for confidentiality purposes.

Permits

There are no specific federal permitting requirements for private recreational anglers to fish for or harvest lane snapper. The same is true of private recreational vessel owners. Instead, private anglers are required to possess either a state recreational fishing permit that authorizes saltwater fishing in general, or to be registered in the federal National Saltwater Angler Registry system, subject to appropriate exemptions. As a result, it is not possible to identify with available data how many individual private anglers or private recreational vessels would be expected to be affected by the actions in this amendment.

Charter vessel/headboat vessels in the Gulf are required to have a limited access charter vessel/headboat for reef fish permit (Gulf Reef for-hire permit) to fish for or possess reef fish species. As of August 26, 2021, there were 1,273 valid or renewable charter vessel/headboat reef fish permits. The total number of valid or renewable Gulf Reef for-hire permits has been relatively stable with less than 1% change in valid or renewable Gulf Reef for-hire permits from year to year (Table 2.3.2.7).

Although the permit application collects information on the primary method of operation, the permit itself does not identify the permitted vessel as either a headboat or a charter vessel and vessels may operate in both capacities. However, if a vessel meets the selection criteria used by the Southeast Regional Headboat Survey (SRHS) and is selected to report by the Science Research Director of the SEFSC, it is determined to operate primarily as a headboat and is required to submit harvest and effort information to the SRHS.

Table 2.3.2.7. Number of valid or renewable Gulf Reef for-hire permits, 2016-2020.

Year	Number of Permits
2016	1,282
2017	1,280
2018	1,279
2019	1,277
2020	1,289

Source: NMFS SERO Sustainable Fisheries (SF) Access permits database (accessed 05/17/22).

Economic Value

Economic value can be measured in the form of CS per additional lane snapper kept on a trip for anglers (the amount of money that an angler would be willing to pay for a fish in excess of the cost to harvest the fish). There is no direct available estimate of CS for lane snapper, but other estimates can serve as close proxies. Carter, Lovell and Liese (2020) used a 2014 mail survey of recreational anglers fishing in the Gulf of Mexico (GOM) to produce values of the CS for increasing the aggregate snapper bag limit from 5 fish to 10 fish for private boat anglers which was \$19 (2022\$). Carter and Liese (2022) used the same 2014 mail survey of recreational anglers to produce values of the CS for increasing the aggregate snapper bag limit from 5 fish to 10 fish for charter boat anglers which was \$25 (2022\$). Carter and Liese (2022) divide the option price for the 5 to 10 fish snapper bag limit increment by a factor of 0.52 to derive the expected value of a one unit snapper harvest increment of \$60.01. This factor is based on the distribution of snapper catch per angler for charter trips. If we assume the distribution of catch per angler is similar on private boat trips, then we can also apply this factor to the option price estimate for snapper on private boats to get the expected value of a one fish change in snapper harvest of \$36.26.

Economic value for the for-hire component of the recreational sector can be measured in many ways. According to Savolainen et al. (2012), the average charter vessel operating in the Gulf is estimated to receive approximately \$101,421 (2022\$) in gross revenue and \$28,122 (2022\$) in net income (gross revenue minus variable and fixed costs) annually. The average headboat is estimated to receive approximately \$306,491 (2022\$) in gross revenue and \$89,161 (2022\$) in net income annually. More recent estimates of average annual gross revenue for Gulf headboats are provided in Abbott and Willard (2017) and D. Carter, Southeast Fisheries Science Center, pers. comm. 2018. Abbott and Willard (2017) suggest that Savolainen, et al.'s estimate of average annual gross revenue for headboats may be an underestimate, as data in the former suggest that average gross revenue in 2009 for the vessels in their sample was about \$541,653 (2022\$). Further, their data suggest average annual gross revenue per vessel had increased to about \$654,218 (2022\$) by 2014. However, Abbott and Willard's estimates are based on a sample of 17 headboats that chose to participate in the headboat Collaborative Program in 2014, while Savolainen, et al.'s are based on a random sample of 20 headboats. The headboats that

participated in the Collaborative may be economic highliners, in which case Abbott and Willard’s estimates would overestimate average annual gross revenue for Gulf headboats. D. Carter, Southeast Fisheries Science Center, pers. comm. 2018 recently estimated that average annual gross revenue for Gulf headboats were approximately \$482,421 (2022\$) in 2017. This estimate is likely the best current estimate of annual gross revenue for Gulf headboats, as it is based on a relatively large sample of 63 boats, or more than 90% of the active fleet, and is more recent.

However, gross revenues overstate the annual economic value and profits generated by for-hire vessels. Economic value for for-hire vessels can be measured by PS per passenger trip (the amount of money that a vessel owner earns in excess of the cost of providing the trip). Estimates of revenue, costs, and trip net revenue trips taken by headboats and charter vessels in 2017 are available from Souza and Liese (2019). They also provide estimates of trip net cash flow per angler trip, which approximate PS per angler trip. After accounting for transactions fees, supply costs, and labor costs, net revenue per trip was 42% of revenue for Gulf charter vessels and 54% of revenue for Southeast headboats,⁸ or \$880 and \$2,044 (2022 dollars), respectively (Table 2.3.2.8). Trip net revenue (TNR), which is the return used to pay all labor wages, returns to capital. When TNR is divided by the number of anglers on a trip, it represents cash flow per angler (CFpA). The estimated CFpA value for an average Gulf charter angler trip is \$160 (2022\$) and the estimated CFpA value for an average Gulf headboat angler trip is \$72 (2022\$) (Souza and Liese 2019). Estimates of CFpA for all individual Reef Fish species target trips, in particular, are not available.

Table 2.3.2.8. Trip economics for offshore trips by Gulf charter vessels and Southeast headboats in 2017 (2022\$).

	Gulf Charter Vessels	Southeast Headboats
Revenue	100%	100%
Transaction Fees (% of revenue)	3%	6%
Supply Costs (% of revenue)	27%	19%
Labor Costs (% of revenue)	27%	22%
Net Revenue per trip including Labor costs (% of revenue)	42%	54%
Net Revenue per Trip	\$880	\$2,044
Average # of Anglers per Trip	5.5	28.2
Trip Net Cash Flow per Angler Trip	\$160	\$72

Source: Souza and Liese (2019).

Business Activity

The desire for recreational fishing generates economic activity as consumers spend their income on various goods and services needed for recreational fishing. This spurs economic activity in

⁸ Southeast headboats include headboats operating either the Gulf or South Atlantic. Souza and Liese (2019) state “the sample size available for head boats is limited (n=30) and, hence, the results are presented at an overall SE aggregation.”

the region where recreational fishing occurs. It is noted that, in the absence of the opportunity to fish, the income would presumably be spent on other goods and services and these expenditures would similarly generate economic activity in the region where the expenditure occurs. As such, the analysis below represents a distributional analysis only.

Estimates of the business activity (economic impacts) associated with recreational angling for Gulf lane snapper were calculated using average trip-level impact coefficients derived from the 2020 Fisheries Economics of the U.S. report (NMFS 2023) and underlying data provided by the National Oceanic and Atmospheric Administration Office of Science and Technology.

Economic impact estimates in 2017 dollars were adjusted to 2022 dollars using the annual, not seasonally adjusted, gross domestic product (GDP) implicit price deflator provided by the U.S. Bureau of Economic Analysis.

Business activity (economic impacts) for the recreational sector is characterized in the form of jobs (full- and part-time), income impacts (wages, salaries, and self-employed income), output impacts (gross business sales), and value-added impacts (contribution to the GDP in a state or region). Estimates of the average annual economic impacts (2018–2022) resulting from Gulf lane snapper charter, private vessel, and shore target trips are provided in Table 3.3.2.9. To calculate the multipliers from Table 2.3.2.9, simply divide the desired impact measure (sales impact, value-added impact, income impact or employment) associated with a given state by the number of target trips for that state.

The estimates provided in Table 2.3.2.9 only apply at the state-level. Addition of the state-level estimates to produce a regional (or national) total may underestimate the actual amount of total business activity, because state-level impact multipliers do not account for interstate and interregional trading. It is also important to note that these economic impacts estimates are based on trip expenditures only and do not account for durable expenditures. Durable expenditures cannot be reasonably apportioned to individual species. As such, the estimates provided in Table 2.3.2.9 may be considered a lower bound on the economic activity associated with those trips that targeted lane snapper.

Estimates of the business activity associated with headboat effort are not available. Headboat vessels are not covered in MRIP in the Southeast, so, in addition to the absence of estimates of target effort, estimation of the appropriate business activity coefficients for headboat effort has not been conducted.

Table 2.3.2.9. Estimated average annual economic impacts (2018-2022) from Gulf charter, private vessel, and shore lane snapper target trips, by state,* using state-level multipliers. All monetary estimates are in 2022 dollars in thousands.

	FL	AL	LA
Charter Mode			
Target Trips	3,207	27	117
Value Added Impacts	\$1,256	\$13	\$62
Sales Impacts	\$2,109	\$23	\$117
Income Impacts	\$734	\$7	\$37
Employment (Jobs)	17	0	1
Private/Rental Mode			
Target Trips	55,019	1,643	249
Value Added Impacts	\$2,220	\$83	\$42
Sales Impacts	\$3,441	\$129	\$71
Income Impacts	\$1,165	\$32	\$22
Employment (Jobs)	28	1	0
Shore			
Target Trips	1,010	0	0
Value Added Impacts	\$41	\$0	\$0
Sales Impacts	\$65	\$0	\$0
Income Impacts	\$22	\$0	\$0
Employment (Jobs)	1	0	0
All Modes			
Target Trips	59,236	1,670	366
Value Added Impacts	\$3,518	\$96	\$104
Sales Impacts	\$5,615	\$152	\$188
Income Impacts	\$1,921	\$40	\$59
Employment (Jobs)	46	1	2

*No recorded target effort for lane snapper in Texas or Mississippi

The estimates provided in Table 2.3.2.9 use state-level multipliers and thus only apply at the state-level. For example, estimates of business activity in Florida represent business activity in Florida only and not to other states (for e.g., a good purchased in Florida may have been manufactured in a neighboring state) or the nation as a whole. The same holds true for each of

the other states. Income impacts should not be added to output (sales) impacts because this would result in double counting. The results provided should be interpreted with caution and demonstrate the limitations of these types of assessments. These results are based on average relationships developed through the analysis of many fishing operations that harvest many different species.

Addition of the state-level estimates to produce a regional (or national) total may underestimate the actual amount of total business activity because state-level impact multipliers do not account for interstate and interregional trading. National-level multipliers must be used to account for interstate and interregional trading. Between 2018 and 2022, and using national-level multipliers, Gulf lane snapper target effort generated employment, income, value-added, and output (sales) impacts of 20 jobs, \$1.1 million, \$2.0 million, and \$3.5 million per year, respectively, on average.

2.4 Impacts of Management Measures

This abbreviated framework action examines increasing the overfishing limit (OFL) of 1,053,834 pounds (lb) whole weight (ww), the acceptable biological catch (ABC) of 1,028,973 lb ww, and the annual catch limit (ACL) of 1,028,973 lb ww (**Option 1** in Section 1.3) to an OFL of 1,116,331 lb ww, an ABC of 1,088,873 lb ww, and an ACL of 1,088,873 lb ww (**Option 2** in Section 1.3), all of which are derived in part using Marine Recreational Information Program (MRIP) Fishing Effort Survey (FES) data. The OFL would increase by 62,497 lb ww, while the ABC and the ACL would increase by 59,900 lb ww. As lane snapper has a stock ACL, without sector ACLs, this analysis must examine how the proposed increase in the stock ACL may affect the two sectors, proportionally, based on the two sectors' average historical usage of the stock ACL. Based on the commercial and recreational sector-specific landings from 2018-2022, the recreational sector has accounted for 97.26% of landings, while the commercial sector has accounted for 2.74% of landings. Therefore, as sector ACLs for lane snapper do not currently exist, if that relative sector usage persists with the increase of 59,900 lb ww to the lane snapper ACL, the recreational sector would utilize an additional 58,259 lb ww, while the commercial sector would utilize an additional 1,641 lb ww.

Recreational Sector

Estimated increases in economic value to recreational fishermen are approximated by multiplying the expected change in the number of fish harvested by a consumer surplus (CS) estimate. The most recent proxy for a CS estimate for lane snapper is the estimated value of the CS for a 1 fish change in snapper harvest, derived from increasing the aggregate snapper bag limit from 5 fish to 10 fish for private boat anglers. A value of \$60.01 for the for-hire component and a value of \$36.26 for the private angler component (Carter, Liese, and Lovell 2022; values updated to 2022\$) reflect recreational willingness-to-pay (WTP) for 1 additional snapper harvest. This might underestimate the WTP of lane snapper for Gulf recreational fishermen as a whole, since WTP decreases as additional fish are retained and the majority of Gulf recreational fishermen are retaining one lane snapper or fewer per trip, between 2018 and

2022.⁹ The expected change in the number of fish harvested is calculated by dividing the change in the recreational sector’s expected use of the stock ACL by 0.8464 lb ww, which is the average weight of a recreationally landed lane snapper in the Gulf from the 2018 to 2022 fishing years.¹⁰ The for-hire component accounted for 25% of the recreational sector’s Gulf lane snapper landings from 2018-2022, while the private angler component accounted for 75%, as seen in Table 2.3.2.1. Therefore, of the expected increase in recreational sector landings expressed as number of fish (68,831), the for-hire component may expect an increase in landings of 17,208 fish, while the private angler component may expect an increase in landings of 51,623 fish, as seen in Table 2.4.1. Multiplying the increase in number of fish expected to be landed by each component by each component’s respective estimated value of the CS provides the expected increase in CS for each component; adding these values together provides the expected change in the recreational sector’s CS, as seen in Table 2.4.2.

Table 2.4.1. Expected change in the recreational sector’s landings, based on the difference between the sector expected usage of the ACL under **Options 1** and **2**. Landings are expressed as number of fish.

Difference	Fishing Year	Expected Change in For-Hire Landings, Expressed as Number of Fish	Expected Change in Private Angler Landings, Expressed as Number of Fish	Expected Change in Rec Sector Landings, Expressed as Number of Fish
Option 2 – Option 1	2024+	17,208	51,623	68,831

Table 2.4.2. Expected change in the recreational sector’s CS, based on the difference between the sector expected usage of the ACL under **Options 1** and **2**. CS values are in 2022 dollars.

Difference	Fishing Year	Expected Change in For-Hire Component CS	Expected Change in Private Angler Component CS	Expected Change in Rec Sector CS
Option 2 – Option 1	2024+	\$1,032,640	\$1,871,865	\$2,904,505

The producer surplus (PS) of the for-hire component of the recreational sector, being comprised of charter vessels and headboats, would be impacted by a change in the number of targeted trips. In the long run, factors of production, such as labor and capital, can be used elsewhere in the economy, and so only short-term changes to PS are expected. In the Gulf, headboat trips take a diverse set of anglers on a single vessel, generally advertising a diverse range of species to be caught. Therefore, an assumption that no headboat trips would be gained due to a change in ACL would be reasonable. However, charter vessel trips that are targeting lane snapper may be added by anglers and are the focus of the recreational sector PS analysis. Based on the predicted closure dates under the 3-year average (2018-2020) and 5-year average (2018-2022) shown in Table 3 in Appendix A, the season is not expected to close early under either the proposed or

⁹ See Appendix A, particularly Figure 3, for additional information.

¹⁰ See Appendix A, including Table 1, for additional information.

current ACLs. Furthermore, with respect to the recreational sector’s expected usage of 58,259 lb ww of the proposed ACL increase, based on Table 2.3.2.1 which shows the percent distribution by mode of recreational landings, charter vessels and headboats may be expected to capture 25% of the recreational sector’s landings (20% from charter vessels and 5% from headboats). This equates to 14,565 lb ww of the proposed ACL increase, or 17,208 fish. In relation to the average landings from 2018-2022 for the charter vessels and headboats shown in Table 2.3.2.1, this equates to 7.12% of the historical landings. In addition, when accounting specifically for charter vessel landings from 2018-2022 where lane snapper may be landed either during target trips or catch trips, Table 2.3.2.4 displays that the average target trips accounted for only 3,351 lb ww, whereas Table 2.3.2.5 displays that the average catch trips accounted for 134,864 lb ww. Therefore, the proposed ACL would not be expected to lengthen the season and provide additional charter trips nor have a significant effect on the number of target trips or associated landings of lane snapper, which would increase the PS for the recreational sector. As the number of target trips for lane snapper is not expected to change, the estimated average annual economic impacts in Table 2.3.2.9 are not expected to change as a result of the proposed increase in the stock ACL.

Commercial Sector

In order to calculate expected changes in commercial CS, own-price flexibility¹¹ for the Gulf lane snapper commercial sector would be required to derive the expected average price change. As discussed in Section 2.3.1, Asche (2020) estimated a Marshallian own-price flexibility for “other snappers,” inclusive of lane snapper, of -0.340. When own-price flexibility is unavailable, price is assumed constant with changes in the commercial ACL, and if the expected average price change is zero, then multiplying that by the expected harvest by the commercial sector under the proposed ACL to arrive at the expected change in commercial CS for lane snapper would result in a value of zero. However, for lane snapper, the expected change in commercial CS can be derived and is displayed in Table 2.4.3.

Table 2.4.3. Expected change in the commercial sector’s consumer surplus under **Option 2**. Values are in 2022\$.

Option	Expected Change in Landings by Commercial Sector (lb ww)	Expected Average Price Change (\$/lb)	Expected Change in CS (2022\$)
Option 2	1,641	-\$0.07	\$1,978

To determine the respective expected changes in ex-vessel revenue as a result of the proposed changes to the ACL and its effects on commercial landings, the average ex-vessel price per lb ww of \$3.35 for Gulf lane snapper from 2018-2022 (2022\$) is multiplied by the change in the expected commercial sector’s landings based on usage of the increase in ACL. These expected changes in revenue are displayed in Table 2.4.4. The commercial sector’s landings have

¹¹ The own-price flexibility is the percentage change in a product’s price relative to the percentage change of a product’s quantity sold. This shows the responsiveness of a product’s price to the quantity being sold.

declined annually from 2018-2022. Therefore, some of the expected change in commercial sector landings and commercial revenue may be realized by the recreational sector, as sector ACLs do not currently exist for lane snapper.

Table 2.4.4. Expected change in the commercial sector revenue, as the difference between **Options 2** and **1**. Values are in 2022\$.

Difference	Fishing Year	Expected Change in Comm Revenue
Option 2 – Option 1	2024+	\$5,498

The commercial PS for vessels that harvested lane snapper in the Gulf is estimated as 50.7% of the ex-vessel value (Section 2.3.1). The expected change in commercial PS is shown in Table 2.4.5.

Table 2.4.5. Expected change in the commercial sector PS, as the difference between **Options 2** and **1**. Values are in 2022\$.

Difference	Fishing Year	Expected Change in Comm PS
Option 2 – Option 1	2024+	\$2,788

The total expected change in net economic benefits for the commercial sector from **Option 2**, relative to **Option 1** is displayed in Table 2.4.6. The total expected change in net economic benefits for both the commercial and recreational sectors are displayed in Table 2.4.7.

Table 2.4.6. Total expected change in net economic benefits for the commercial sector relative to **Option 1**. Values are in 2022\$.

Option	Total Expected Change in Net Economic Benefits (2022\$)
Option 2	\$4,766

In addition to the cost-benefit analysis, **Option 2** is expected to increase gross revenues in the commercial sector, which would be expected to increase economic impacts in the onshore sector (e.g., dealers and processors) and related industries (e.g., grocers and restaurants). Based on the model used to estimate the average annual economic impacts of the commercial sector for lane snapper, as illustrated in Table 2.3.1.14, the expected increase in annual gross revenue in the commercial sector is expected to increase employment, income, total value added, and output to harvesters and the seafood industry by 1 job, \$20 thousand, \$28 thousand, and \$55 thousand in 2022\$, respectively.

Net Economic Benefits

Table 2.4.7. Combined total expected change in net economic benefits for the both the recreational and commercial sectors relative to **Option 1**. Values are in 2022\$.

Option	Total Expected Change in Net Economic Benefits (2022\$)
Option 2	\$2,909,271

Net economic benefits from the recreational and commercial sectors combined from **Option 2**, relative to **Option 1**, would be expected to increase by \$2,909,271 in 2024. Over a three-year timeframe of 2024-2026, the expected change in the discounted net present value of economic benefits to both sectors would be \$8,557,798 using a 2% discount rate.¹² As an average annual net present value, this expected change would be \$2,852,599 with a 2% discount rate. This analysis uses a three-year timeframe based on the SEDAR timeline for when the OFL and ABC values for lane snapper will be analyzed again.

2.5 Public and Private Costs of Regulations

The preparation, implementation, enforcement, and monitoring of this or any federal action involves the expenditure of public and private resources which can be expressed as costs associated with the regulations. Costs to the private sector are discussed in Section 2.4. Estimated public costs associated with this action include:

Council costs of document preparation, meetings, public hearings, and information dissemination.....	\$5,779
NMFS administrative costs of document preparation, meetings and review	\$17,508
TOTAL	\$23,287

The estimate provided above does not include any law enforcement costs. Any enforcement duties associated with this action would be expected to be covered under routine enforcement costs rather than an expenditure of new funds. The Gulf of Mexico Fishery Management Council and NMFS administrative costs directly attributable to this amendment and the rulemaking process will be incurred prior to the effective date of the final rule implementing this amendment.

¹² The 2% discount rate is recommended in Circular No. A-4. <https://www.whitehouse.gov/wp-content/uploads/2023/11/CircularA-4.pdf>

2.6 Determination of Significant Regulatory Action

Pursuant to E.O. 12866, a regulation is considered a “significant regulatory action” if it is likely to result in: 1) an annual effect of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities; 2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; 3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights or obligations of recipients thereof; or 4) raise novel legal or policy issues arising out of legal mandates, the President’s priorities, or the principles set forth in this E.O. Based on the information in Section 2.4-2.5, the costs and benefits resulting from this regulatory action are expected to be \$2,932,558 and therefore are not expected to meet or exceed the \$100 million threshold. Thus, this action has been determined to not be economically significant for the purposes of E.O. 12866.

CHAPTER 3. REGULATORY FLEXIBILITY ACT ANALYSIS

3.1 Introduction

The purpose of the Regulatory Flexibility Act (RFA) is to establish a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes to fit regulatory and informational requirements to the scale of businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure such proposals are given serious consideration. The RFA does not contain any decision criteria; instead the purpose of the RFA is to inform the agency, as well as the public, of the expected economic effects of various alternatives contained in the regulatory action and to ensure the agency considers alternatives that minimize the expected economic effects on small entities while meeting the goals and objectives of the applicable statutes (e.g., the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act)).

With certain exceptions, the RFA requires agencies to conduct an initial regulatory flexibility analysis (IRFA) for each proposed rule. The IRFA is designed to assess the effects various regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those effects. An IRFA is primarily conducted to determine whether the proposed regulatory action would have a significant economic effect on a substantial number of small entities. In addition to analyses conducted for the Regulatory Impact Review (RIR), the IRFA provides: 1) a description of the reasons why action by the agency is being considered; 2) a succinct statement of the objectives of, and legal basis for, the proposed regulatory action; 3) a description and, where feasible, an estimate of the number of small entities to which the proposed regulatory action will apply; 4) a description of the projected reporting, record-keeping, and other compliance requirements of the proposed regulatory action, including an estimate of the classes of small entities which will be subject to the requirements of the report or record; 5) an identification, to the extent practicable, of all relevant federal rules, which may duplicate, overlap, or conflict with the proposed rule; and 6) a description of any significant alternatives to the proposed regulatory action which accomplish the stated objectives of applicable statutes and would minimize any significant economic effects of the proposed regulatory action on small entities.

In addition to the information provided in this section, additional information on the expected economic effects of the proposed action is included in the RIR.

3.2 Statement of the need for, objective of, and legal basis for the proposed action

A discussion of the reasons why action by the agency is being considered is provided in Section 1.2. The purpose is to modify the overfishing limit (OFL), acceptable biological catch

(ABC), and annual catch limit (ACL) for Gulf lane snapper based on the 2023 SEDAR 49 interim analysis. The objectives are to update existing lane snapper catch limits based on the best scientific information available and to achieve optimum yield while preventing overfishing, consistent with the requirements of the Magnuson-Stevens Fishery Conservation and Management Act. The Magnuson-Stevens Act serves as the legal basis for the proposed regulatory action. All monetary estimates in the following analysis are in 2022 dollars.

3.3 Description and estimate of the number of small entities to which the proposed action would apply

This proposed regulatory action would revise the OFL, ABC, and ACL for Gulf lane snapper from 1,053,834 lb whole weight (ww), 1,028,973 lb ww, and 1,028,973 lb ww, respectively, to 1,116,331 lb ww, 1,088,873 lb ww, and 1,088,873 lb ww, respectively. Because all the current and proposed catch limits were both derived, in part, using MRIP-FES data they are directly comparable.

A valid commercial Gulf reef fish vessel permit is required in order for commercial fishing vessels to legally harvest lane snapper in the Gulf. At the end of 2020, 837 vessels possessed valid commercial Gulf reef fish vessel permit. However, not all vessels with a commercial Gulf reef fish permit actually harvest lane snapper in the Gulf. From 2018 through 2022, the average number of vessels that commercially harvested Gulf lane snapper was 278. Ownership data regarding vessels that harvest Gulf lane snapper is incomplete. Therefore, it is not currently feasible to accurately determine affiliations between these particular vessels. Because of the incomplete ownership data, for purposes of this analysis, it is assumed each of these vessels is independently owned by a single business, which is expected to result in an overestimate of the actual number of businesses directly regulated by this proposed action. Thus, it is assumed this proposed regulatory action would regulate 278 commercial fishing businesses.

Although the proposed changes to the recreational ACL and ACT would apply to recreational anglers, the RFA does not consider recreational anglers to be entities. Small entities include small businesses, small organizations, and small governmental jurisdictions (5 U.S.C. 601(6) and 601(3)-(5)). Recreational anglers are not businesses, organizations, or governmental jurisdictions and so they are outside the scope of this analysis (5 U.S.C. 603).

A valid charter-headboat (for-hire) Gulf reef fish vessel permit is required in order for for-hire vessels to legally harvest lane snapper in the Gulf. NMFS does not possess complete ownership data regarding vessels that hold charter-headboat (for-hire) Gulf reef fish vessel permits, and thus potentially harvest lane snapper. Therefore, it is not currently feasible to accurately determine affiliations between these vessels and the businesses that own them. As a result, for purposes of this analysis, it is assumed each for-hire vessel is independently owned by a single business, which is expected to result in an overestimate of the actual number of for-hire fishing businesses regulated by this proposed regulatory action.

This proposed regulatory action would only be expected to alter the fishing behavior of for-hire vessels that target lane snapper in the Gulf (i.e., the behavior of for-hire vessels that incidentally

harvest lane snapper in the Gulf is not expected to change). Therefore, only for-hire vessels that target lane snapper in the Gulf are expected to be directly affected by this proposed regulatory action. NMFS does not possess data indicating how many for-hire vessels actually harvest or target Gulf lane snapper in a given year. However, in 2020, there were 1,289 vessels with valid charter-headboat Gulf reef fish vessel permits. Further, Gulf lane snapper is primarily targeted in waters off the west coast of Florida. Of the 1,289 vessels with valid charter-headboat Gulf reef fish vessel permits, 803 were homeported in Florida. Of these permitted vessels, 62 are primarily used for commercial fishing rather than for-hire fishing purposes and thus are not considered for-hire fishing businesses. In addition, 46 of these permitted vessels are considered headboats, which are considered for-hire fishing businesses. However, headboats take a relatively large, diverse set of anglers to harvest a diverse range of species on a trip, and therefore do not typically target a particular species. Therefore, it is assumed that no headboat trips would be canceled, and thus no headboats would be directly affected as a result of this proposed regulatory action. However, charter vessels often target lane snapper. Of the 803 vessels with valid charter-headboat Gulf reef fish vessel permits that are homeported in Florida, 695 vessels are charter vessels. Souza and Liese (2019) reported that 76% of charter vessels with valid charter-headboat permits in the Gulf were active in 2017 (i.e., 24% were not fishing). A charter vessel would only be directly affected by this proposed regulatory action if it is fishing. Given this information, our best estimate of the number of charter vessels that are likely to target Gulf lane snapper in a given year is 528. Thus, this proposed regulatory action is estimated to regulate 528 for-hire fishing businesses.

On December 29, 2015, NMFS issued a final rule establishing a small business size standard of \$11 million in annual gross receipts (revenue) for all businesses primarily engaged in the commercial fishing industry (NAICS code 11411) for RFA compliance purposes only (80 FR 81194, December 29, 2015). In addition to this gross revenue standard, a business primarily involved in commercial fishing is classified as a small business if it is independently owned and operated, and is not dominant in its field of operations (including its affiliates). From 2018 through 2022, the maximum annual gross revenue earned by a single commercial reef fish vessel during this time was about \$3.64 million, while the average annual gross revenue for a vessel commercially harvesting Gulf lane snapper was \$178,941. Based on this information, all commercial fishing businesses directly regulated by this proposed regulatory action are determined to be small entities for the purpose of this analysis.

For other industries, the Small Business Administration (SBA) has established size standards for all major industry sectors in the U.S., including for-hire businesses (NAICS code 487210). A business primarily involved in for-hire fishing is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has annual receipts (revenue) not in excess of \$12.5 million for all its affiliated operations worldwide. NMFS does not have data to estimate the maximum gross revenue for charter vessels. However, the maximum annual gross revenue for a single headboat in the Gulf was about \$1.45 million in 2017 (D. Carter, pers. comm.), and according to Savolainen, et al. (2012), on average, annual gross revenue for headboats in the Gulf is about three times greater than annual gross revenue for charter vessels. Based on this information, all for-hire fishing businesses directly regulated by this proposed regulatory action are determined to be small businesses for the purpose of this analysis.

3.4 Description of the projected reporting, record-keeping and other compliance requirements of the proposed action

This proposed regulatory action would not establish any new reporting or record-keeping requirements.

3.5 Identification of all relevant federal rules, which may duplicate, overlap or conflict with the proposed action

No federal rules have been identified that duplicate, overlap or conflict with the proposed rule.

3.6 Significance of economic impacts on a substantial number of small entities

Substantial number criterion

If implemented, this proposed regulatory action is expected to directly affect 278 of the 837 vessels with commercial Gulf reef fish permits, or approximately 33% of those commercial fishing businesses. Further, this proposed regulatory action is expected to directly affect 528 of the 1,227 for-hire fishing businesses with valid charter/headboat permits in the Gulf reef fish fishery, or approximately 43% of those for-hire fishing businesses. All regulated commercial and for-hire fishing businesses have been determined, for the purpose of this analysis, to be small entities. Based on this information, the proposed regulatory action is expected to affect a substantial number of small businesses.

Significant economic effects

The outcome of “significant economic impact” can be ascertained by examining two factors: disproportionality and profitability.

Disproportionality: Do the regulations place a substantial number of small entities at a significant competitive disadvantage to large entities?

All entities directly regulated by this regulatory action have been determined to be small entities. Thus, the issue of disproportionality does not arise in the present case.

Profitability: Do the regulations significantly reduce profits for a substantial number of small entities?

For vessels that commercially harvest lane snapper in the Gulf, currently available data indicates that economic profits are approximately 38 % of annual average gross revenue. Given that their average annual gross revenue is \$178,941, annual average economic profit per vessel is estimated to be approximately \$67,997. The proposed action to change the total OFL, ACT, and

ACL for Gulf lane snapper would increase the total amount of lane snapper available for harvest by the commercial sector. Specifically, the ACL would increase from 1,028,973 lb ww to 1,088,873 lb ww. If current relative sector usage persists, the increase of 59,900 lb ww to the lane snapper ACL would allow the commercial sector to utilize an additional 1,641 lb ww. This increase in commercial landings is expected to have a minimal increase the average ex-vessel price due to a relatively high number of substitute products (e.g., imports, other reef fish species landed in the Gulf and South Atlantic, etc.). Thus, assuming the average ex-vessel price of \$3.35/lb gw from 2018-2022, annual gross revenue is expected to increase by \$5,498 and economic profit is expected to increase by \$2,788. On a per vessel basis, annual gross revenue and economic profit are expected to increase by \$18 and \$10, respectively.

According to Savolainen, et al. (2012), which contains the most recent estimates of economic returns, including economic profits, in the for-hire sector, average annual economic profits are approximately \$27,000 per charter vessel. The proposed action to change the total OFL, ACT, and ACL for Gulf lane snapper would increase the total amount of lane snapper available for harvest by the recreational sector. If current relative sector usage persists, the increase of 62,497 lb ww to the lane snapper ACL would allow the recreational sector to utilize an additional 58,259 lb ww.

The change to the recreational ACL may cause a change in the number of targeted trips. In the long run, factors of production, such as labor and capital, can be used elsewhere in the economy, and so only short-term changes to economic profits are expected. In the Gulf, headboat trips take a diverse set of anglers on a single vessel, generally advertising a diverse range of species to be caught. Therefore, an assumption that no headboat trips would be gained due to a change in ACL would be reasonable. However, charter vessel trips that are targeting lane snapper may be added and are the focus of the recreational sector PS analysis. Based on the predicted closure dates under the 3-year average (2018-2020) and 5-year average (2018-2022) shown in Table 3 in Appendix A, the season is not expected to close early under either the proposed or current ACLs. Therefore, the proposed ACL would not be expected to lengthen the season and provide additional charter trips, and therefore no changes to PS are expected as a result of this proposed regulatory action.

3.7 Description of the significant alternatives to the proposed action and discussion of how the alternatives attempt to minimize economic impacts on small entities

This proposed regulatory action, if implemented, is not expected to reduce the profits of any small entities regulated by this action. As a result, the issue of significant alternatives is not relevant.

CHAPTER 4. LIST OF PREPARERS

PREPARERS

Name	Expertise	Responsibility	Agency
Matt Freeman	Economist	Co-Team Lead – Amendment development, Regulatory Impact Review	GMFMC
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Adam Stemle	Economist	Regulatory Impact Review, Regulatory Flexibility Act Analysis	SERO
Dominique Lazarre	Fishery Biologist	Data analyses	SERO

REVIEWERS

Name	Expertise	Responsibility	Agency
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Scott Sandorf	Technical writer and editor	Regulatory writer	SERO
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GMFMC = Gulf of Mexico Fishery Management Council; NOAA GC = National Oceanic and Atmospheric Administration General Counsel; SEFSC = Southeast Fisheries Science Center; SERO = Southeast Regional Office of the National Marine Fisheries Service

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APPENDIX A. CATCH LIMIT ANALYSIS FOR GULF OF MEXICO LANE SNAPPER

Catch Limit Analysis for Gulf of Mexico Lane Snapper
LAPP/DM Branch
NOAA Fisheries Service
Southeast Regional Office
April 2023

Gulf of Mexico lane snapper (*Lutjanus synagris*) are managed in federal waters under the Reef Fish Fishery Management Plan. In March of 2021, a Framework Action was undertaken to modify the OFL, ABC, and ACL based on the updated yield projections for Gulf of Mexico lane snapper produced in SEDAR 49. The actions outlined in the 2021 Framework allowed for recreational catch statistics to be updated to reflect changes to the Marine Recreational Information Program's Fishing Effort Survey (MRIP-FES) as opposed to the Marine Recreational Fisheries Statistics Survey (MRFSS). In September 2023, an interim analysis of Gulf lane snapper was reviewed at a meeting of the Gulf of Mexico Scientific and Statistical Committee (SSC). The SSC recommended updating the OFL, ABC, and ACL for lane snapper based on the yield projections from the interim analysis. This report will provide data summaries that describe the Gulf of Mexico lane snapper fishery and a catch limit analysis that incorporates the proposed changes to the catch limit.

Landings History

A history of the landings in the Gulf lane snapper fishery was generated for the commercial and recreational sectors. Commercial data for lane snapper were compiled from a combination of landings provided in SEDAR 49 (2003-2013) and the Southeast Fishery Science Center (SEFSC) Commercial ACL monitoring file (Years: 2014-2022; September 2023). Recreational landings data were compiled by combining data from various federal and state recreational surveys including: the Marine Recreational Information Program (MRIP), Southeast Regional Headboat Survey (SRHS), Louisiana Department of Wildlife and Fisheries Creel Survey (LA Creel), and Texas Parks and Wildlife's recreational survey (TPWD). MRIP, LA Creel and TPWD surveys provide catch estimates from the private boat, shore and charter fleets of the recreational sector. The SRHS survey provides landings estimates from headboat vessels operating in federal waters. Landings data from both sectors were aggregated annually for the last 20 years. The majority of lane snapper landings, more than 90%, come from the recreational sector (**Figure 1**). Commercial landings have a slight declining trend after 2015, but the magnitude of recreational landings increased after 2016.

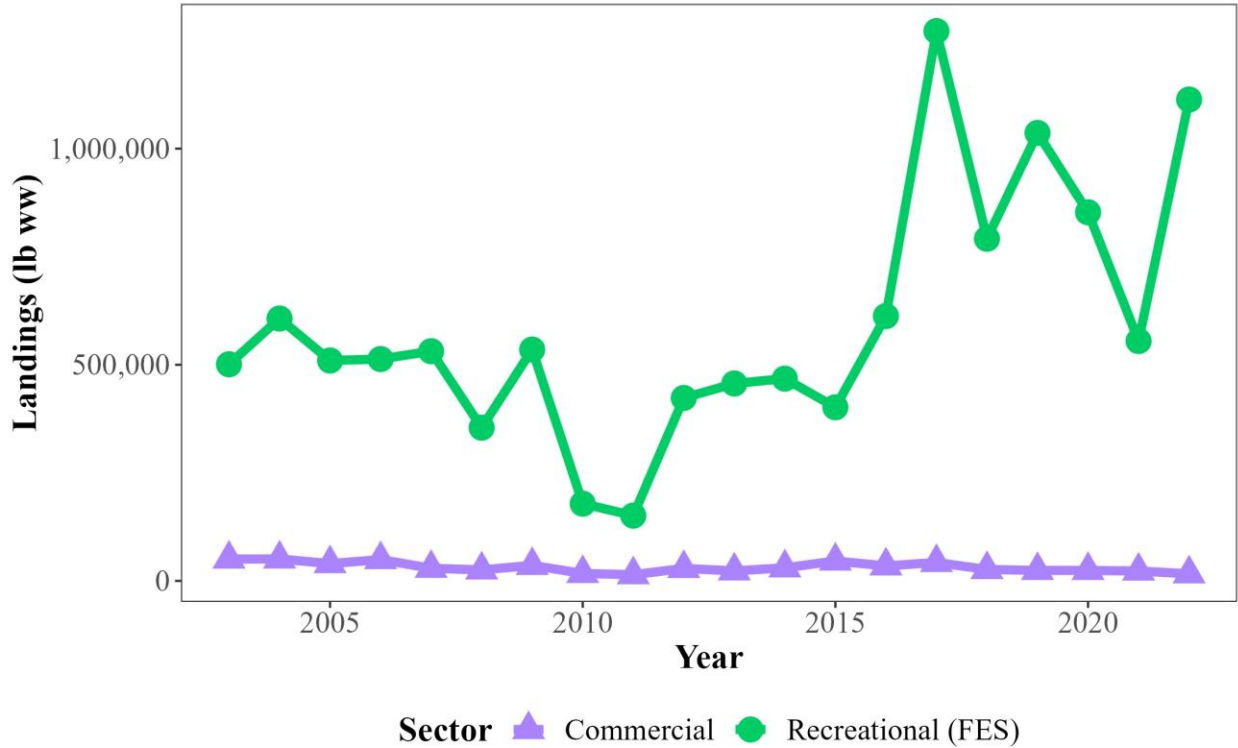


Figure 1. Annual Gulf lane snapper landings for the commercial and recreational fishing sector between 2003 and 2022 (Data Sources: Commercial – SEDAR 49 (2003-2013) & SEFSC Commercial ACL Monitoring data – September 2023; SEFSC FES ACL Monitoring data – October 2023).

Average Weight of Lane Snapper

The average weight of recreationally harvested Gulf lane snapper was requested for use in further analyses aimed at determining the recreational sector’s consumer surplus harvesting lane snapper. Weight data from 2018-2022 were used to generate an average weight representative of an individual fish caught by the recreational sector. The SEFSC FES ACL Monitoring data provides average weight estimates for each species by year, but only represents data from fish caught by private boat, shore mode and charter anglers. Separately, the mean weight of lane snapper caught by the headboat fleet was calculated for each year using data from fish intercepted by the SRHS. The average weight of lane snapper caught in the headboat fleet was found to be smaller than those caught in the remainder of the recreational sector, 0.6941 lb ww and 0.8561 lb ww, respectively. While headboats only accounted for 5.32% of recreational lane snapper landings in the Gulf of Mexico, a weighted average was then calculated to produce a representative final average weight. The average weight of each component of the recreational sector (non-headboat vs headboat) was weighted proportionally by the percentage of their landings (**Table 1**).

Table 1. Average weight of an individual Gulf lane snapper within each component of the recreational sector, and an overall weighted average for lane snapper that represents the entire recreational sector.

Year	Recreational Sector (excluding headboat)		Headboat Fleet		Weighted Average (lb ww)
	lb ww	%	lb ww	%	
2018	0.8459	95.22%	0.6449	4.78%	0.8363
2019	0.8642	97.49%	0.8410	2.51%	0.8637
2020	0.8875	97.51%	0.6922	2.49%	0.8826
2021	0.8412	87.40%	0.6386	12.60%	0.8157
2022	0.8415	95.79%	0.6539	4.21%	0.8336
5 Year Average	<i>0.8561</i>	<i>94.68%</i>	<i>0.6941</i>	<i>5.32%</i>	<i>0.8464</i>

Trip Analysis for Lane Snapper

A trip analysis was completed to show the distribution of catch, either in pounds or number of fish, for the commercial and recreational sectors, respectively. Commercial logbook data from 2018 to 2022 was used to investigate the trip level harvest of Gulf lane snapper. The total trip landings were assigned to 10 pound bins, and the proportion of trips landing lane snapper within each bin was calculated (**Figure 2**). The majority of commercial trips, 61%, landed 10 pounds of lane snapper or less. Only 1.13% of logbook trips landed more than 100 pounds of lane snapper per trip. Dockside intercept data collected between 2018 and 2022 from the MRIP Access Point Angler Intercept Survey (MRIP-APAIS), LA Creel, TPWD, and SRHS were used to describe the number of lane snapper harvested during recreational trips in the Gulf of Mexico. MRIP-APAIS data is provided at the angler trip level, whereas the other 3 surveys provide data at the vessel level. Catch per angler was calculated for the surveys with data at the vessel level by dividing the total lane snapper harvest by the number of anglers associated with each trip. The number of angler trips for each record was then set equal to the number of anglers associated with each trip record. The number of recreationally harvested lane snapper per person was grouped into 1 fish bins, and the proportion of angler trips landing fish within that bin was calculated (**Figure 3**). No lane snapper were intercepted during the 5 year time period from the TPWD Survey, but for all other surveys only one lane snapper was harvested per angler.

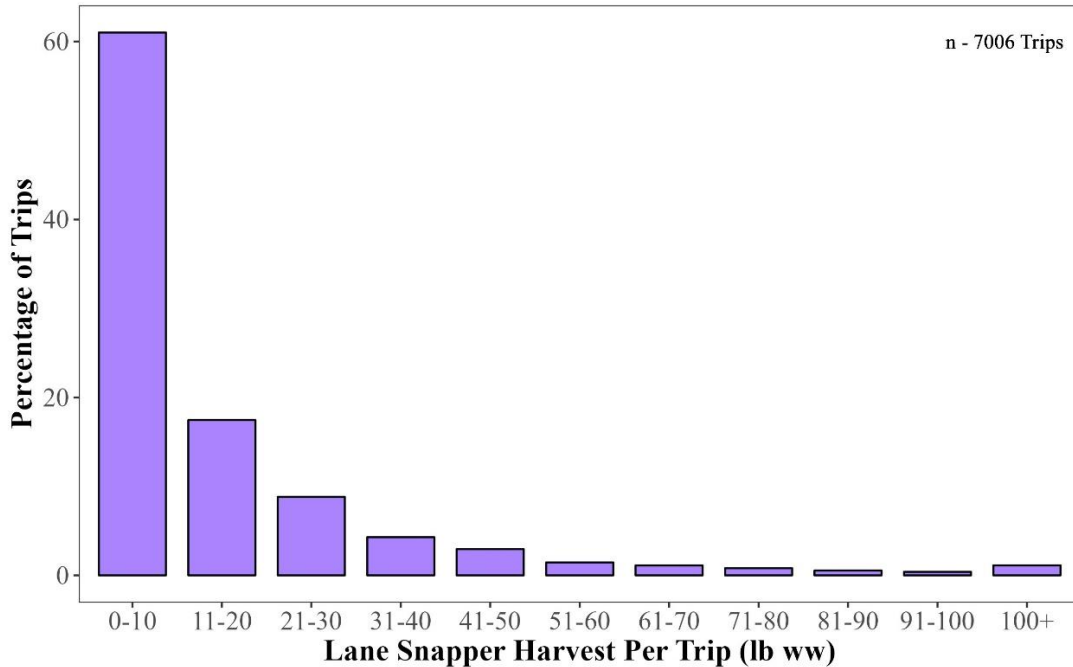


Figure 2. Distribution of Gulf lane snapper harvested per trip reported to the commercial logbook between 2018 and 2022, in lb ww (Data Source: Commercial Logbook – December 2023).

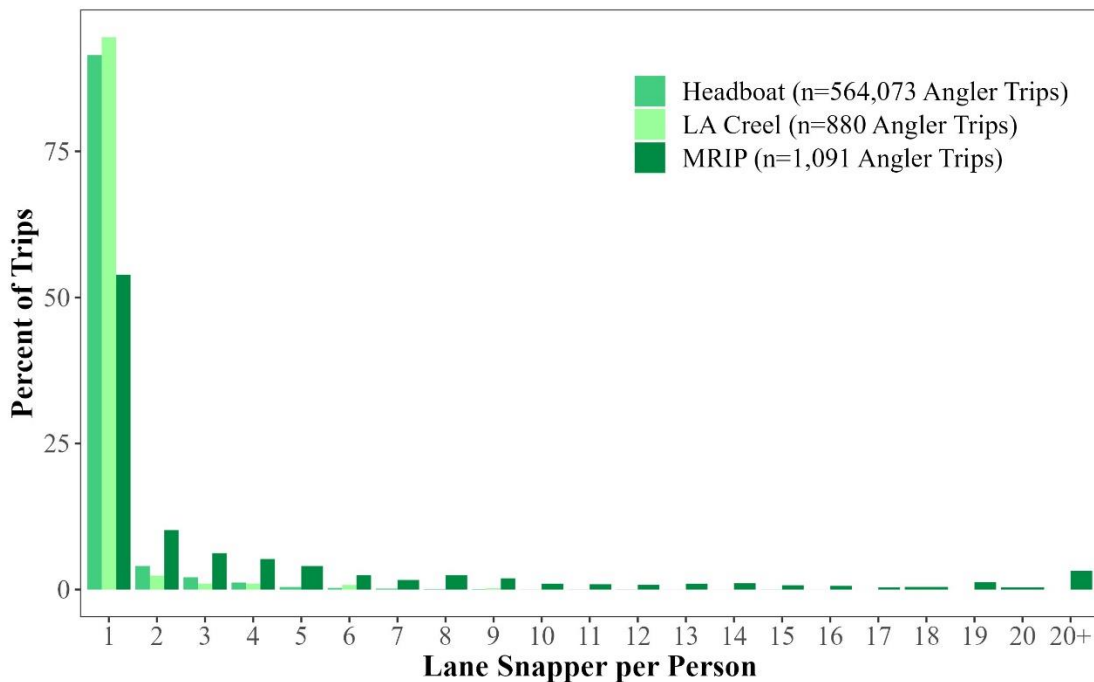


Figure 3. Distribution of lane snapper harvest per person (number of fish) from dockside interviews of recreational anglers between 2018 and 2022 (Data Sources: MRIP APAIS, LA Creel, TPWD, and SRHS).

Catch Limit Analysis

The proposed changes to the OFL, ABC, and ACL for Gulf lane snapper will increase the catch limit for the fishery by 60,000 lb ww. A catch limit analysis was completed to investigate whether stock landings are projected to meet the proposed catch limits. The last five years of available landings data, 2018 to 2022, were plotted to investigate which years were most representative of the commercial and recreational landing behavior (Commercial ACL Monitoring File – September 2023, Recreational FES ACL Monitoring File – October 2023). The monthly and wave-level data aggregations showed evidence of changing landing behavior as a result of seasonal closures over the last 5 years (**Figures 4 & 5**). Closures to the fishery occurred in December of 2019, October of 2021, and November of 2022. Minimal landings were reported in November and December of 2021 and 2022, likely in response to the closures, while the closure in 2019 may not have greatly impacted the landings because the closure occurred in the middle of December. Projected landings are generally calculated as the mean of the three most recent years of data, but the recent closures may lead to use of landings values that are lower than would be expected if the fishery remained open for the entire year. Instead, three alternative methods were devised to generate projected landings (**Table 2**).

Table 2. List of alternative methods used to generate projected landings and the years associated with the data being used. The * indicates a short closure in 2019 (18 days).

Alternative	Years
5 year Average	2018-2022
3 year Average of Non-Closure Years	2018, 2019*, 2020
Maximum Landings by Month / Wave	2018-2022

The 5 year average alternative incorporated the most recent years of data and the variation associated with both closure and non-closure years during that period. The 3 year average alternative only used data from years with no or minimal closures, 2018-2020. Data from 2019 was retained in this alternative, despite the short seasonal closure, because the season was only shortened by 18 days. The last alternative used the highest landings for each month or wave over the last 5 years to represent the most substantial observed landings in recent years. The projected landings for each scenario, within each fishing sector are plotted in **Figures 6 and 7**.

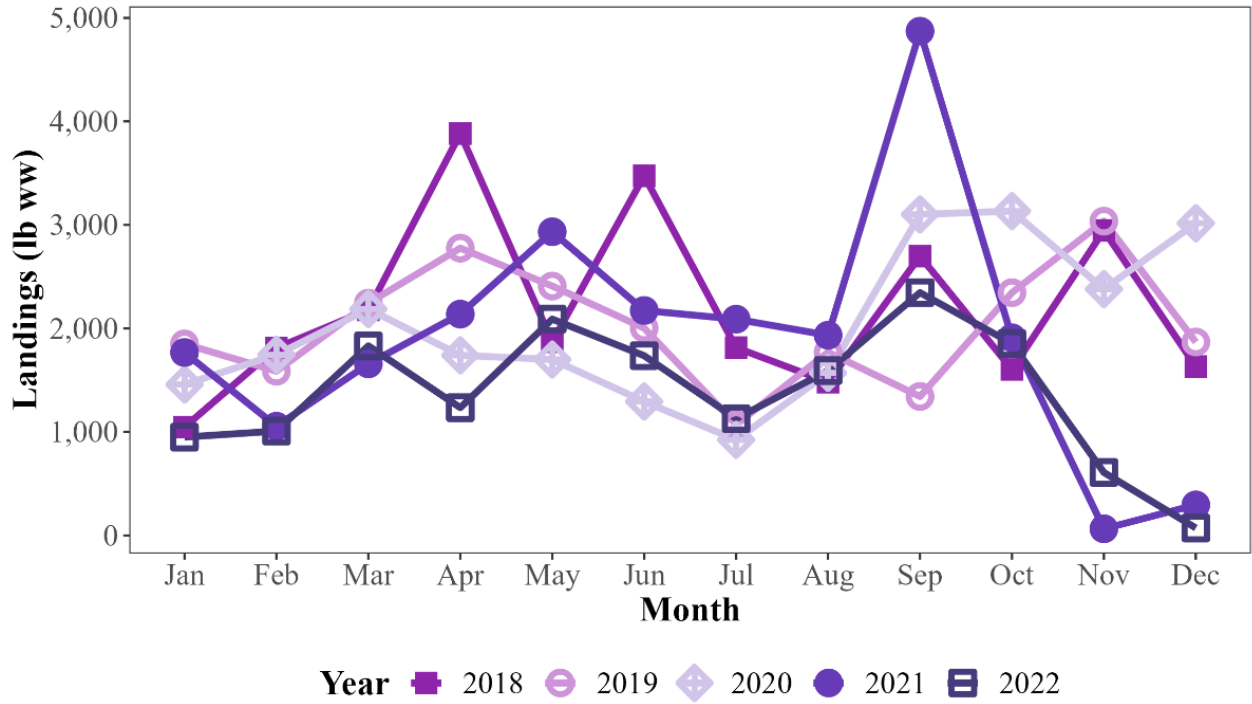


Figure 4. Observed monthly commercial landings from 2018-2022. Source: SEFSC Commercial ACL data (September 2023).

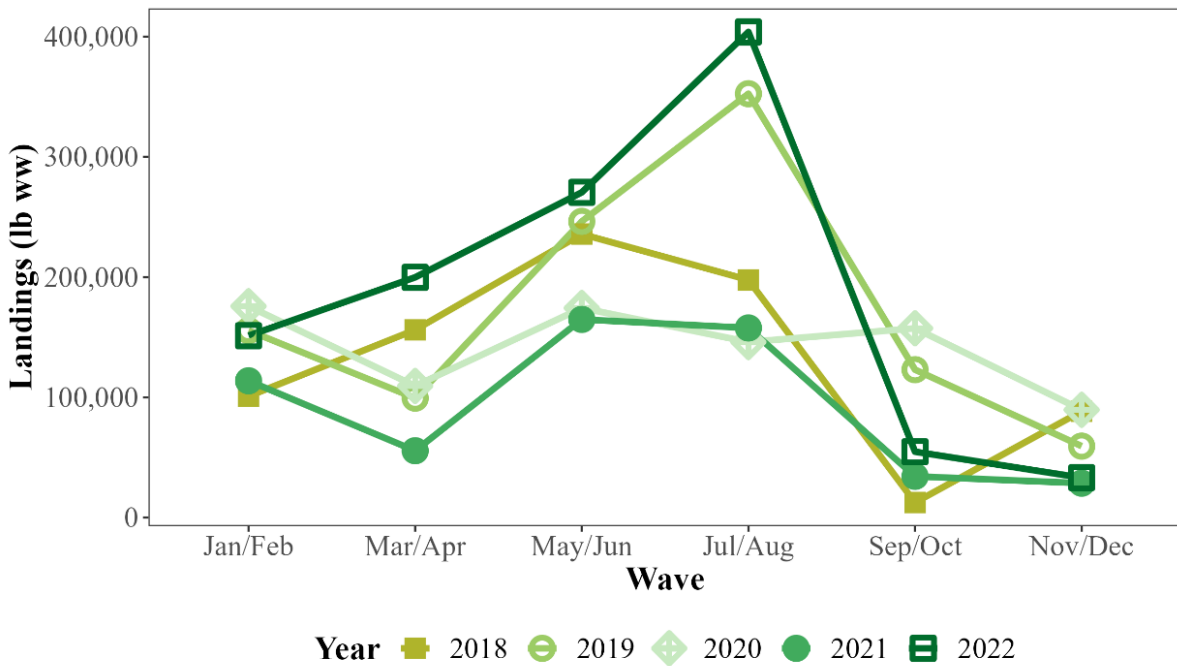


Figure 5. Observed recreational landings from 2018-2022, by wave. Source: SEFSC FES ACL Monitoring data (October 2023).

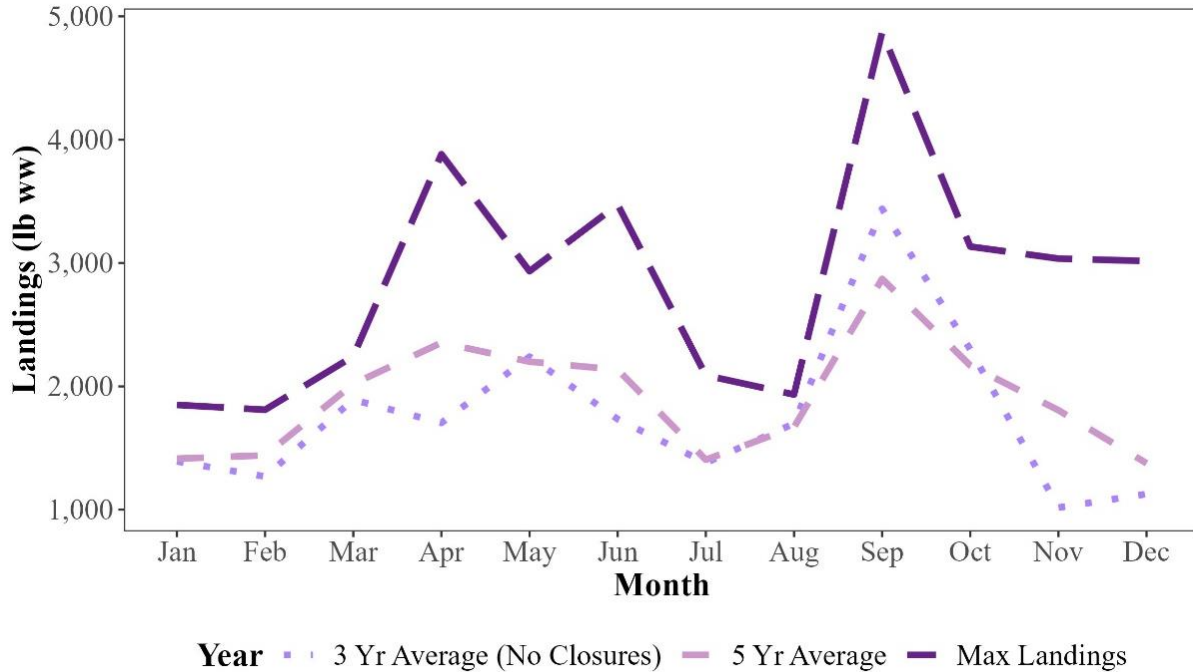


Figure 6. Projected monthly commercial landings based on the 3 projection methods: 3 year average (no closures), 5 year average, and max landings. Source: SEFSC Commercial ACL data (September 2023).

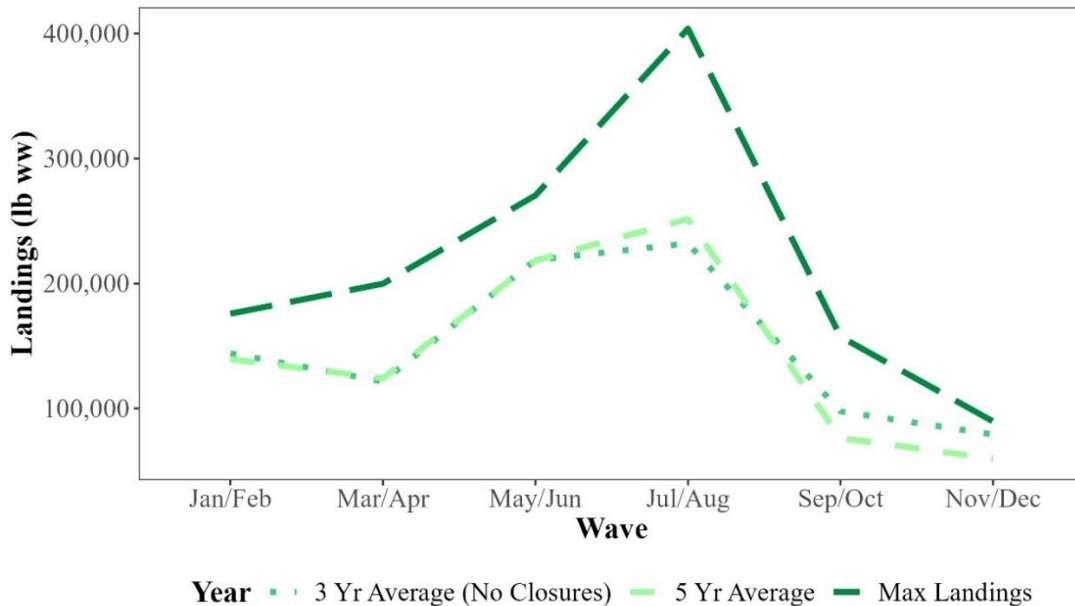


Figure 7. Projected wave-level landings based on the 3 projection methods: 3 year average (no closures), 5 year average, and max landings. Source: SEFSC FES ACL Monitoring data (October 2023).

The projected landings for each sector were used to generate daily landings estimates, by dividing the monthly or wave-level landings value by the number of days in the month or wave. The commercial and recreational daily landings were summed to create a total daily landings estimate for the lane snapper stock for each projection method. These daily landings estimates were then summed cumulatively and compared against the updated catch limit to project potential closure dates. The updated ABC is only projected to be met in a scenario when using the maximum landings for each month or wave (**Table 3 & Figure 8**). These projections reflect the variable nature of lane snapper landings in the Gulf of Mexico over the last 5 years, with stock landings approaching or exceeding the proposed ABC in 2 of the last 5 years (**Figure 9**).

Table 3. The predicted closure dates for the three projection scenarios: 3 year average (no closures), 5 year average (2018-2022) and max landings for an updated ABC of 1,088,862 lb ww.

Alternative	ABC Met	Season Length
5 year Average	-	366
3 year Average of Non-Closure Years	-	366
Maximum Landings by Month / Wave	6-Sep	249

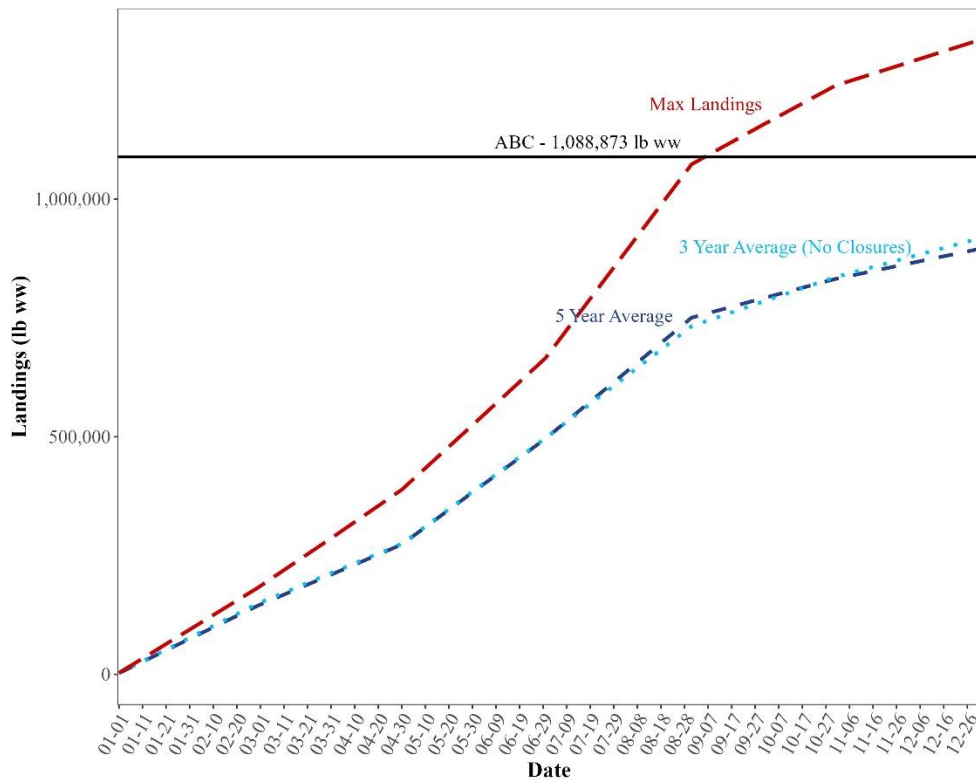


Figure 8. Cumulative Gulf lane snapper landings for each projection method used: 3 year average (no closures – light blue dotted line), 5 year average (dark blue dashed line), and max landings (red long dash line).

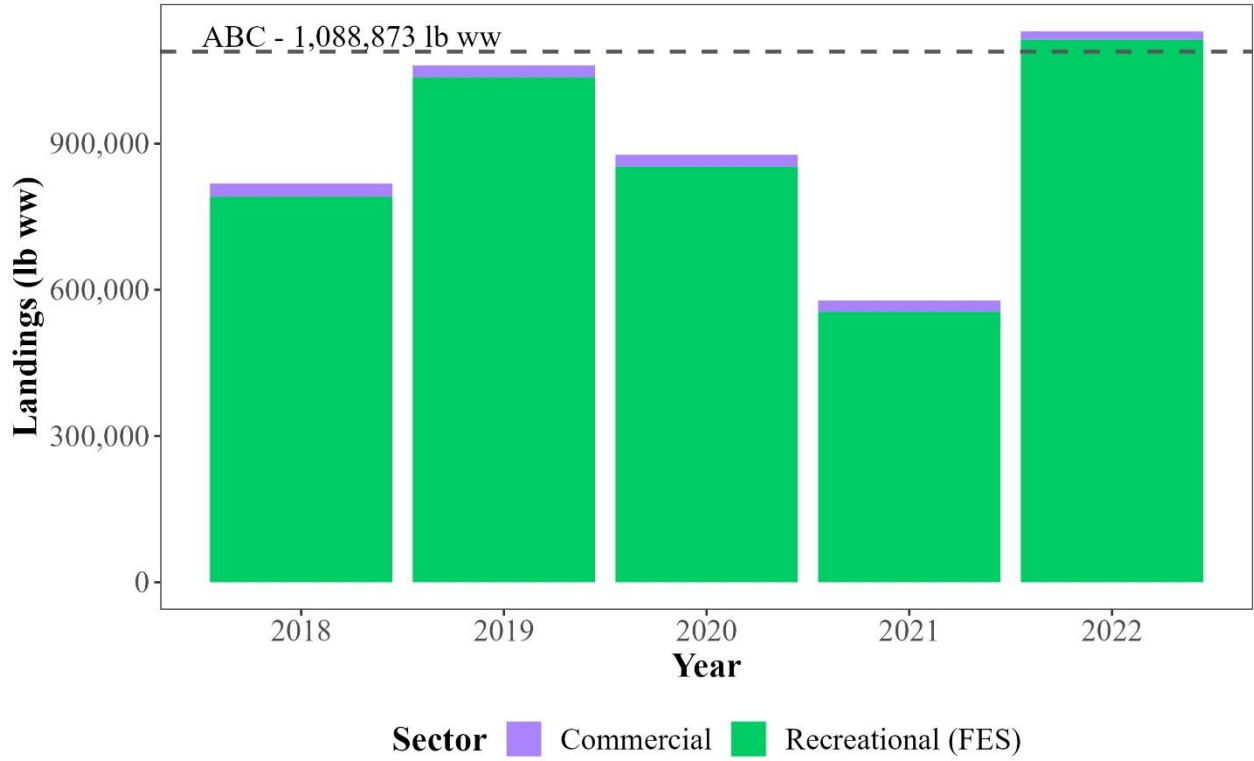


Figure 9. Observed stock landings of Gulf lane snapper for the commercial and recreational sectors from 2018 to 2022. The proposed ABC is represented with a horizontal dashed line.