



NATIONAL  
FISHERIES  
INSTITUTE

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Samuel D. Rauch, III  
Deputy Assistant Administrator  
for Regulatory Programs  
National Marine Fisheries Service  
National Oceanographic & Atmospheric  
Administration  
Department of Commerce  
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**Re: Fisheries of the Caribbean, Gulf of Mexico, and South Atlantic; Reef Fish Fishery of the Gulf of Mexico; Amendment 53, 87 Fed. Reg. 2737 (Jan. 19, 2022) (Docket No. NOAA-NMFS-2021-0098).**

Dear Mr. Rauch:

The National Marine Fisheries Service (“NMFS”) proposes to implement management measures described in “Amendment 53” to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico, as prepared by the Gulf of Mexico Fishery Management Council. The proposed rule and Amendment 53 would significantly shift the allocation of Gulf red grouper catch away from commercial harvesters to recreational fishermen, reducing commercial access to the fishery by nearly *one third*. If adopted, this proposal will undermine the competitiveness both of harvesters that depend on the red grouper fishery *and* of retailers and restaurants that in turn depend on those harvesters. In the process, the proposal will violate multiple National Standards, undercutting the successful Magnuson-Stevens Fishery Conservation and Management Act (“MSA”) framework. NMFS should send Amendment 53 back to the Gulf Council for wholesale reconsideration.

The National Fisheries Institute (“NFI”) submits these comments in opposition to Amendment 53 and the above-captioned proposed rule. The nation’s largest commercial seafood trade association, NFI represents the full seafood value chain, including vessel owners, harvesters, processors, wholesalers, distributors, retailers, and seafood restaurants. NFI member companies annually supply hundreds of millions of seafood meals to American families and customers around the world. NFI offers these comments on behalf of companies that depend on a consistent, reliable supply of items such as red grouper to meet increasing consumer demand for high-quality, sustainable, wild-capture seafood.

NFI urges NMFS to disapprove Amendment 53 as proposed and to remand the entire proposal to the Gulf Council for thorough reconsideration consistent with MSA, the agency’s National Standards, and the Gulf Council’s formal procedures for reallocation of fishery resources.

The fundamental problem is clear. Amendment 53 will “revise the sector allocations of the total [allowable catch limits] for Gulf red grouper from 76 percent for the commercial sector and 24 percent for the recreational sector to 59.3 percent for the commercial sector and 40.7 percent for the recreational sector.”<sup>1</sup> That shift, according to NMFS, would reduce the commercial ACL from 3.16 million pounds to 2.53 million pounds.<sup>2</sup> But that calculation significantly *understates* the contemplated shift away from commercial access. In fact – and as four Gulf Council members concluded months ago – ***Amendment 53 deprives the commercial sector of nearly one third of its allocation solely to benefit the recreational sector.***<sup>3</sup>

This proposal is unjustified and contradicts multiple National Standards. Consider Amendment 53 in light of five of them.

**National Standard 1 – Optimum Yield: Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.**

National Standard 1 is the foundational national standard under MSA and requires NMFS to achieve long term optimum yield and minimized bycatch, in support of users. Amendment 53 does the opposite, however, *decreasing* yields the stock supplies and potentially *maximizing* bycatch. And yet in doing so the proposal will leave consumers with fewer fish and less reliable supply.

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<sup>1</sup> 87 Fed. Reg. at 2739.

<sup>2</sup> *Id.*

<sup>3</sup> Under Amendment 53 Action 1, Alternative 2 – which retains the status quo allocations at 76:24 – the commercial sector ACL is 3.72 million pounds. Under Preferred Alternative 3, the commercial sector ACL is 2.53 million pounds, or a reduction of 1.19 million pounds compared to Alternative 2. Hence the 32 percent decrease for the commercial sector. (Minority Report in Opposition to the Gulf of Mexico Fishery Management Council’s Approval of Amendment 53 to the Gulf of Mexico Reef Fish, at 1, 5 (Aug. 9, 2021) (the “Council Minority Report”) ([https://gulfcouncil.org/wp-content/uploads/2021-08-09\\_A53\\_Minority-Report.pdf](https://gulfcouncil.org/wp-content/uploads/2021-08-09_A53_Minority-Report.pdf)).

Amendment 53 severely reduces the supply of red grouper available to commercial harvesters and the restaurants and retailers dependent on those harvesters for popular, U.S.-caught reef fish. The proposal decreases the commercial sector's share of annual catch by nearly 1.2 million pounds – almost one third of the sector's current share. Applying estimates of six-ounce servings and a 50 percent fillet conversion rate, *this single proposal removes over 1.5 million servings from the marketplace every year.*

This step – an unprecedented reduction in commercial sector access to a vital U.S. fishery – will do significant harm to restaurants and retailers trying to meet consumer demand for popular, domestically harvested reef fish. Recent economic analysis demonstrates the importance of the red grouper fishery to U.S. seafood restaurants and retailers. For instance, 2020 red grouper landings generated over \$187 million in domestic food service and retail revenues. In 2021, this single item supported more than 900 direct jobs in Florida alone – no small feat for a single fish in the midst of a national pandemic. Overall, and including direct, indirect, and induced activity, Gulf red grouper contributed \$274 million to the domestic economy in the pandemic-battered year of 2021.<sup>4</sup> A substantial reduction in supply will trigger increased prices for red grouper and substitutes, will undermine the supply chain reliability that major purchasers *must* have to do business, and will encourage greater reliance on overseas sourcing.

In exchange for this harm, and as discussed below in greater detail, Amendment 53 *lessens* conservation protections for the red grouper stock, leaving the stock *more* vulnerable to overfishing. In particular, Amendment 53 will result in increased bycatch and discards in non-commercial fisheries, outcomes that – as documented by the Council Minority Report – Amendment 53 concedes will occur. This result not only wastes fish that could otherwise be supplied to consumers but also increases uncertainty about fishing mortality and whether the stock is subject to overfishing.<sup>5</sup> These results cannot be squared with National Standard 1.

**National Standard 2 – Scientific Information: Conservation and management measures shall be based upon the best scientific information available.**

Nor has the Gulf Council demonstrated that Amendment 53 rests upon the best available science. NFI understands that basis for this draconian reallocation of rights to the recreational sector is the use of a “newer” methodology to estimate the catch effort of the recreational sector, applied retroactively to the Amendment 53 outcomes. It is not clear that the MRIP-FES system materially improves the catch data programs managed by the Gulf states. At the very least, the agency should not embrace the MRIP-FES in isolation, without also utilizing conventional approaches to ensure methodological rigor. In short, switching to a new statistical survey system

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<sup>4</sup> Thomas J. Murphy & Associates, Inc., *Economic Impacts Associated with Harvest and Marketing of Red Grouper* (Dec. 2021) (prepared for stakeholders that harvest or rely on access to red grouper harvested by the commercial sector).

<sup>5</sup> NMFS categorizes for-hire fishing businesses, i.e., charter vessels, as part of the commercial sector. But charter fishing businesses do not land a commercial catch, of red grouper or any other species. They do not supply the restaurants and retailers whose customers prize local, wild-caught Gulf species, red grouper among them. They do not feed the country. To the contrary, they offer a variant of recreational fishing to sport fishermen. Including for-hire vessels in the commercial sector is another way in which the severity of the Amendment 53 reallocation is more damaging for restaurants and retailers than is apparent at first glance.

and using it retroactively as the basis for reallocation cannot be characterized as using the best available scientific information.

**National Standard 5 – Efficiency: Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.**

**National Standard 8 – Communities: Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirement of paragraph (2) [i.e., National Standard 2], in order to (a) provide for the sustained participation of such communities, and (b) to the extent practicable, minimize adverse economic impacts on such communities.**

One can understand that in extreme circumstances, NMFS may give heavy weight to conservation objectives at the expense of other considerations, including economically efficient utilization of the resource. But nothing like that has occurred here. Nowhere in the January 19 Federal Register Notice or in Amendment is there an argument that a collapse in biomass or other threat compels the agency to reduce commercial sector access to red grouper as proposed by Amendment 53.

In the absence of such a crisis, the agency must hew to the management approach that best supports efficient use of the resource by, *inter alia*, commercial users. As described above, red grouper is a popular food service and retail item, especially in Gulf states, across the Southeast, and in the coastal seafood restaurants whose menus are replete with wild-caught domestic fish entrees and fish sandwiches. These outlets must latch on to the recovering hospitality industry, regionally and nationally, if they are to survive in a fragile post-pandemic economy. Having ample and *reliable* supply is essential for restaurants, bars, food trucks, cruise lines, casinos, churches, big box retailers, and grocery chains to continue to source U.S.-harvested grouper. Without those customers, Gulf of Mexico fishermen will lose significant demand for their catch and could be forced to turn to other species – perhaps creating pressure on *those* stocks.<sup>6</sup>

Despite this, Amendment 53 fails to consider adverse impacts to local communities that are often home to both shoreside processing and the seafood restaurants and retailers that emphasize local catch of species such as grouper.

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<sup>6</sup> There is no appreciable export market for U.S. grouper.

**National Standard 9 – Bycatch: Conservation and management measures shall, to the extent practicable, (a) minimize bycatch and (b) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.**

By increasing the allocation to the recreational sector, discards and resulting discard mortality will increase dramatically, in violation of this National Standard. The proposal does not use the term “bycatch” and avoids even acknowledging the simple fact that reallocating a substantial amount of red grouper to the recreational sector will lead to higher volumes of bycatch and associated mortality. But the Amendment 53 documentation makes crystal clear that annual recreational bycatch will increase by 640,000 lbs. This is a huge number in context and represents a clear violation of National Standard 9.

The agency need not take NFI at its word on this point. The Council Minority Report makes the argument powerfully, in part by quoting Amendment 53 itself:

Amendment 53 would diminish conservation efforts for red grouper at this critical time. Amendment 53 concedes that “allocating a greater percentage of the ACL to a sector that has more uncertainty in landings” (i.e., the recreational sector) “is more likely to result in overfishing/overfished status for Gulf red grouper.” In addition, Amendment 53 will result in 640,000 pounds more dead discards of red grouper by the recreational sector. NOAA Fisheries’ National Standard 9 guidelines explain that “bycatch can increase substantially the uncertainty concerning total fishing-related mortality, which makes it more difficult to...ensure that...overfishing levels are not exceeded.”

***Amendment 53 thus increases the level of uncertainty about both landings and discards and thus increases the overall risk of overfishing.*** An action that increases the risk of overfishing and substantially increases discards of dead fish, particularly in conjunction with one of the worst red tide fish kills in memory, is not “reasonably calculated to promote conservation” of the red grouper stock.<sup>7</sup>

In effect, Amendment 53 contends that increasing the volume of dead discards by 640,000 lbs. every year will improve conservation outcomes in the Gulf red grouper fishery. This breathtaking argument cannot be reconciled with National Standard 9.

In addition to conflicting with multiple National Standards, Amendment 53 appears to have been adopted in violation of the Gulf Council process for all reallocation proposals. The Gulf Council uses a formal Fisheries Allocation Review Policy to address competing uses for fisheries that may require a reallocation among sectors. This policy incorporates numerous “primary” and “secondary” triggers that necessitate allocation review and related procedural directives, including the Council’s public interest-based review triggers.<sup>8</sup> NFI is concerned that the Gulf Council did not follow the policy when adopting Amendment 53, and specifically that the Council never conducted the requisite full allocation review. Surely, all required procedural steps should be observed before the federal government blesses a plan to remove 1.5 million servings of grouper from the marketplace every year.

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<sup>7</sup> Council Minority Report, at 3 (emphasis supplied) (internal citations omitted).

<sup>8</sup> Fisheries Allocation Review Policy (<https://gulfcouncil.org/wp-content/uploads/Allocation-Review-Policy.pdf>).

A final point warrants emphasis. If adopted, Amendment 53 will establish a worrisome precedent against the science-driven, collaborative MSA framework. That framework has enabled NMFS and the fishery management councils to restore dozens of significant fisheries to maximum sustainable yield and then to keep them there in the face of conservation and other headwinds. But if one sector can successfully engineer a dramatic reallocation in the red grouper fishery as proposed here, that will tempt others to seek similar, one-sided outcomes in other, completely unrelated fisheries that (like this one) do not face sustainability disaster. Gulf Council management of the red snapper fishery in recent years has already prompted similar concerns from environmental advocates, commercial seafood producers, Gulf Council members, and other parties.<sup>9</sup> This will undermine the MSA framework and if repeated often enough will cause its collapse. NFI implores NMFS to carefully consider the collateral damage that adoption of Amendment 53 is almost certain to create in other federally managed fisheries.

For all of these reasons above, NFI urges NMFS to disapprove Amendment 53 and send it back to the Gulf Council. If the Gulf Council believes a reallocation of the Red Grouper fishery is necessary, then it should follow conduct a thorough review in accordance with its own Allocation Policy.

Respectfully submitted,



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John P. Connelly  
President

cc: The Hon. Janet Coit

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<sup>9</sup> A similar cross-section of stakeholders is likely to oppose Amendment 53 here.

# Economic Impacts Associated with Harvest and Marketing of Red Grouper

Prepared by

*Thomas J. Murray & Associates, Inc.*

December 2021

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## **Introduction**

Of all fishery species managed by Gulf of Mexico Fisheries Management Council (GMFMC) the red grouper<sup>1</sup> is one of the most contentious. There continues to be debate over division of quota among commercial and recreational fisheries.

Absent from this debate is an economic assessment for the commercial sector of the fishery. The objective of this project is to provide a current market and economic impact assessment specifically for the Gulf of Mexico red grouper fishery.

## Methods & Analysis

Data collection and modeling completed, provide a basis for estimation of product market distribution, mark up, and associated economic impacts upon the Gulf of Mexico red grouper landings. For 2020 red grouper landings were reported to be 2,812,147 pounds with a value of \$12,095,655, at an average ex-vessel price of \$4.30 per pound.<sup>2</sup>

The market distribution model and economic assessments were developed were first based upon secondary data from NOAA Fisheries 2020 landings data and interviews during 2021 with the

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<sup>1</sup> The fishery for red grouper (*Epinephelus morio*) is primarily a Florida fishery as indicated by the landings data from both the federal and state cooperative fishery statistics program.

<sup>2</sup> Landings data for 2020 was the most recent available for this analysis and appears in Florida Fish And Wildlife Conservation Commission web portal [myfwc.org](http://myfwc.org) Commercial Landings Summary. As well as NOAA Fisheries Commercial Landings <https://www.fisheries.noaa.gov/national/sustainable-fisheries/commercial-fisheries-landings>. The average price for red grouper was estimated by industry to be \$5-\$6.50 for the most recent year. In view of this the trip average ticket price \$4.35 per pound reported by the agencies was unrealistically considered low. Based upon this and experience with such price differentials between the voluntary trip values and actual prices, a price of \$5.00 per pound was used as a basis for a \$14,046,500 landed value. Note that the GMFMC briefing document reports an average price of \$5.31 in 2019.



seafood industry involved in landing and marketing red grouper. The market sector markups contained herein are adapted from NOAA Fisheries “Summary of Value Added” tables presented in annual reports. Based upon those linkages the IMPLAN input-output model was utilized to convert the marketplace values to economic impact estimates<sup>3</sup>

This case study shows the market chain impacts derived from the number of transactions and markups the product encounters from the harvest to the consumer.

Estimates of changes to those markups and margins measures may be completed in the future based upon proposed management measures, or more current landings information when available from NOAA fisheries.

#### Discussion - Market Channel Distribution

Commercial fishery product landings begin the product development, processing, and distribution changes which create additional economic value and impacts beyond the initial landed value and economic impact. Here the scope and extent of economic impacts are evaluated at each level along the entire market chain of distribution from the fishermen in the harvest sector, through final sale to consumers generally by retail markets or restaurants.

*The distinct market sectors for which data are presented are:*

Harvesting sector – Fishermen

Primary wholesaling and processing sector – initial phase of distribution typically unloading vessels and/or purchasing directly from the harvesters.

Secondary wholesaling or distributing sector –all distribution, storage, packing or repacking that takes place between the wholesale market or processor and the final retail point of sale.

Foodservice – all activities resulting in the sale of prepared foods to the end consumer, such as restaurants.

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<sup>3</sup> For a description of IMPLAN and the input-output technique as adapted here see Appendix 1.

Retail markets – establishments selling seafood for at-home consumption. Includes supermarkets, independent grocers, and specialty seafood markets including “direct markets”.

As the products leave the boat and are sold initially, they are further marketed at some or all of the levels noted above. At each level the initial purchase price is increased to a product sale price which reflects the added utility provided by that function. Along each step of the market chain, the price of the fishery product is increased by virtue of that additional sector’s value-added function. The estimated product flow and associated markups for commercial red grouper is summarized in Table 1.

From the reported \$14,046,500 million initial landings value industry estimates suggest that most of the landed red grouper moved directly up the entire market chain via primary wholesalers. Based upon industry interviews and estimates, this analysis presents a final distribution of product of 15% reaching the consumer at retail, and 85% at foodservice or restaurants.

The markup values associated with those individual market sectors are estimated therein based upon data from NOAA.<sup>4</sup> Those markups are: 80% at primary wholesale, 63% at secondary wholesale, 33% at retail markets, and 182% at foodservice.

In this case study the \$14.0 million in initial landings flow upward through the market ultimately generating \$187.50 million in total final red grouper product consumer sales.

TABLE 1 summarizes this hierarchy of sales associated with the Gulf of Mexico commercial red grouper fishery.

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<sup>4</sup> National Marine Fisheries Service (2018) Fisheries of the United States, 2017. U.S. Department of Commerce, NOAA Current Fishery Statistics No. 2017 Available at: <https://www.fisheries.noaa.gov/feature-story/fisheries-united-states-2017>

<b>Table 1. Gulf of Mexico Red Grouper Commercial Harvest and Market Value Added. 2021</b>				
<b>Landings:</b>	<b>Domestic landings to primary wholesale and processing</b>			
	Allocation of landings	100%		
	Value of allocated landings	\$14,046,500		
<b>Primary wholesale and processing</b>	Value of segment inputs	\$14,046,500		
	Markup for primary wholesale and processing	0.80		
	Value of markup	\$11,237,200		
	Value of segment outputs	\$25,283,700		
<b>Secondary wholesale and distribution</b>	Total entering sector	\$25,283,700		
	Markup for secondary wholesale and processing	0.63		
	Distribution markup	\$15,928,731		
	Value of segment outputs	\$41,212,431		
<b>Retail sector</b>	Total inputs to retail/restaurant sectors	\$41,212,431		
	Retail sectors	<b>Restaurant</b>	<b>Retail Food Market</b>	
	Allocation among sectors <sup>5</sup>	0.85	0.15	Total
	Total entering sector	\$35,030,566	\$6,181,865	\$41,212,431
	Markup in final sector	1.82	0.33	
	Markup for retail & restaurant	\$63,755,631	\$2,040,015	\$65,795,646
	<b>Total retail</b>	<b>\$98,786,197</b>	<b>\$8,221,880</b>	<b>\$107,008,077</b>
	<b>Total Markup retail &amp; restaurant</b>	<b>\$107,008,077</b>		

<sup>5</sup> Based upon industry estimates gathered by Murray during the Fall of 2021.

## Economic Impacts

Economic impact analysis begins with introducing a change in the output of goods and services using the multiplier model to analyze the effects on a region's economic base. Most regional input-output studies attempt to characterize either, the economic impacts of specified changes in final demand for a given set of products, services, and industries, or, the economic significance of specific industries in a regional and national economy. The research described herein accomplishes the latter task. It assesses the economic significance of commercial red grouper fishing and marketing activity initiated in the State of Florida and throughout the U.S. economy. The standard input-output model estimates the direct, indirect, and induced economic implications of this basic economic activity. The secondary effects (the indirect and induced impacts), along with the basic economic activity estimates, provide a cumulative estimate of the "multiplier" effects from the basic activity (direct impact).<sup>6</sup>

At each market level described above, the value-added activity in itself not only has a discrete markup value, but it also generates discrete additional direct and indirect economic impacts associated with that function. For example, the direct activity, boxing, icing and transporting a grouper, requires the purchase of inputs such as corrugated or plastic boxes which constitute new and discrete indirect economic impact. In that way each market sector's value-added function amount generates its own economic impact. In this analysis the sector margins only are used in the impact assessment in order to avoid inflated (double counted) impacts.

TABLE 2 reflects these cumulative direct economic impacts associated with the \$187.5 million in gross sales (\$107.0 markup) from harvest to consumer explained above. Output (sales), value-added, employment and income are other commonly used measures of economic impact. They are adapted here to assess the economic impacts of the commercial fishery and marketing of red grouper.<sup>7</sup>

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<sup>6</sup> A Glossary of economic impact definitions is contained in Appendix 2. Herein "output" for wholesale and retail industries represents their markup margin only; it does not represent gross revenues (sales).

<sup>7</sup> Impact calculations, based on IMPLAN 2019 multipliers for the State of Florida. All impacts are adjusted to 2021 dollar values. Implan modelling completed for Thomas J. Murray & Associates, Inc. by Alan W. Hodges, PhD, Economic Consultant Gainesville, Florida.

In the standard input-output model, measures of aggregate economic activity are used as a basis for estimating the total economic impact of the subject activity. For example, measures of direct employment or total sales in an industry are obtained, and these are then used as a basis for evaluating the total impact. In this report, estimates of the primary commercial fishery sales were obtained and used as the base measure of the “direct impact” of the industry reflected below.

<b>Table 2. Economic Impacts of Gulf Red Grouper Value Chain in the State of Florida, 2021</b>					
<b>Activity</b>	<b>Impact Type</b>	<b>Employment (Jobs)</b>	<b>Labor Income (M\$)</b>	<b>Value Added (M\$)</b>	<b>Output (M\$)</b>
<b>Commercial Fishing</b>	Direct Effect	218	\$2.42	\$13.77	\$14.05
	Indirect Effect	1	\$0.08	\$0.13	\$0.29
	Induced Effect	16	\$0.76	\$1.42	\$2.50
	<b>Total Effect</b>	<b>235</b>	<b>\$3.25</b>	<b>\$15.32</b>	<b>\$16.83</b>
<b>Seafood Processing</b>	Direct Effect	28	\$1.27	\$1.63	\$11.24
	Indirect Effect	37	\$1.55	\$3.02	\$5.03
	Induced Effect	18	\$0.86	\$1.60	\$2.83
	<b>Total Effect</b>	<b>82</b>	<b>\$3.67</b>	<b>\$6.25</b>	<b>\$19.10</b>
<b>Wholesaling</b>	Direct Effect	79	\$6.08	\$8.35	\$15.93
	Indirect Effect	60	\$3.36	\$5.02	\$9.43
	Induced Effect	60	\$2.87	\$5.38	\$9.49
	<b>Total Effect</b>	<b>199</b>	<b>\$12.32</b>	<b>\$18.75</b>	<b>\$34.86</b>
<b>Restaurants and Retail stores</b>	Direct Effect	936	\$26.06	\$38.59	\$65.80
	Indirect Effect	164	\$9.06	\$14.86	\$29.68
	Induced Effect	224	\$10.69	\$20.00	\$35.31
	<b>Total Effect</b>	<b>1,324</b>	<b>\$45.81</b>	<b>\$73.46</b>	<b>\$130.79</b>
<b>Total All Activities</b>	Direct Effect	1,260	\$35.82	\$62.34	\$107.01
	Indirect Effect	262	\$14.05	\$23.04	\$44.44
	Induced Effect	318	\$15.18	\$28.40	\$50.13
	<b>Total Effect</b>	<b>1,840</b>	<b>\$65.05</b>	<b>\$113.78</b>	<b>\$201.58</b>

As shown in TABLE 3, the direct impacts of the fishery and marketplace were \$107.01 million in output (sales), 1,840 associated jobs, which required \$65.05 million in labor income. Further, \$113.78 in wages and salaries, interest, rent, profits, and indirect taxes paid by businesses, (“total value added”) was associated with this overall level of direct activity.

<b>Table 3. DIRECT Economic Impacts of the Commercial Red grouper Fishery Market (M\$)</b>	
Impact Type	Florida
Output (M\$)	\$107.01
Employment (FTES)	1,260
Labor Income (M\$)	\$35.82
Total Value-Added (M\$)	\$62.34

This measure of the market flow and associated direct impacts, allows estimation of the indirect impacts. IMPLAN uses information on the interactions between these direct industry sectors and other economic sectors which are, to varying extent, dependent upon grouper harvesting and marketing related industries.

For example, suppliers of materials into the retail and foodservice transportation, storage, marketing, and distribution are also dependent upon the initial harvest and sale of grouper. These added sales or impacts are referred to as the “indirect impacts.” Such “indirectly” dependent sectors include many other types of manufacturing and trade, for which industrial classifications range from “Boat Building and Repairing” to “Paper Board Container Manufacturing - Corrugated Boxes” to “Seafood Product Preparation and Packaging”.

TABLE 4 shows the cumulative indirect economic impacts across all harvest and marketing functions from boat to consumer.

<b>Table 4. INDIRECT Economic Impacts of the Commercial Red Grouper Fishery Market on the State of Florida (2021) (M\$)</b>	
Impact Type	Florida
Output (M\$)	\$44.44
Employment (FTES)	262
Labor Income (M\$)	\$14.05
Total Value-Added (M\$)	\$23.04

Ultimately, the direct sales activity, and the resulting indirect activity, generate increases in the general level of employment and income in households within the study area. The extra income generated in this way leads to a third “wave” of economic impact through greater household expenditures on goods and services. Much of this additional re-spending will also occur within the broader region, further expanding economic activity. These effects are referred to as the “induced impacts” of the industry and are summarized in TABLE 5.

<b>Table 5. INDUCED Economic Impacts of the Commercial Red Grouper Fishery Market on the State of Florida (2021) (M\$)</b>	
Impact Type	Florida
Output (M\$)	\$50.13
Employment (FTES)	318
Labor Income (M\$)	\$15.18
Total Value-Added (M\$)	\$28.40

## **Conclusion – Total Economic Impact of Red Grouper Harvest and Marketing**

To summarize, because of the interrelationships among the many sectors involved from fishery harvest to marketing, new sales of goods and services required by those sectors generate additional waves of economic impact. Expenditures by non-local marketers and consumers are in fact “exports” from local economic bases and these transactions initiate the multiple rounds of economic impacts among businesses and households detailed above and summarized in Table 6.

<b>Table 6. TOTAL Economic Impacts of the Commercial Red grouper Fishery Market on the State of Florida (2021) (M\$)</b>	
Impact Type	Florida Region
Output (M\$)	\$201.58
Employment (FTES)	1,840
Labor Income (M\$)	\$65.05
Total Value-Added (M\$)	\$113.78

As shown in TABLE 6 the cumulative impacts of the fishery and marketplace on the State of Florida were \$201.58 million in output (sales), 1,840 associated jobs, which required \$65.05 million in labor income. Further, \$113.78 million in wages and salaries, interest, rent, profits, and indirect taxes paid by businesses, (“total value added”) was associated with the grouper commercial harvest and markets in 2021.

By virtue of the fact that the hierarchy of transactions entail the payment of various taxes at each level, another impact of the red grouper marketplace can be measured in local, state and federal taxes generated. Table 7 below summarizes the taxes generated as a result of the provision of Gulf of Mexico Red Grouper on the State of Florida and the Nation.

<b>Table 7. Total Tax Impacts to Florida and the U.S. (2021) (M\$)</b>		
	Florida	U.S.
State & Local Taxes (M\$)	\$10.23	\$14.85
Federal Taxes (M\$)	\$15.85	\$19.88

During 2021 impacts of the coronavirus closures reportedly shifted somewhat the final distribution of seafood products nationally at the retail level; away from foodservice toward retail. A significant shift between those ultimate outlets entail material changes in the final



markup of the product as reflected in TABLE 1. This analysis demonstrates that such reallocations would create significant changes on ultimate product values and associated economic impacts. As such, this model will prove useful in assessing a changing seafood marketplace as well as alterations in harvest conditions in the future.

Finally, presented in Table 8 below is a summary of the economic impacts of the red grouper landings and marketplace on the Nation as a whole. To summarize, at the national level the economic impacts are: 112% of employment, 142% of labor income, 131% of value added and 136% of total economic output compared to the State Florida economic impact levels.

<b>Table 8. Economic impacts of Florida Gulf Red Grouper Value Chain in the United States, 2021</b>					
<b>Activity</b>	<b>Impact Type</b>	<b>Employment (Jobs)</b>	<b>Labor Income (M\$)</b>	<b>Value Added (M\$)</b>	<b>Output (M\$)</b>
<b>Commercial Fishing</b>	Direct Effect	192	\$6.06	\$10.75	\$14.05
	Indirect Effect	19	\$1.49	\$2.69	\$5.72
	Induced Effect	62	\$3.61	\$6.38	\$11.39
	<b>Total Effect</b>	<b>273</b>	<b>\$11.15</b>	<b>\$19.82</b>	<b>\$31.16</b>
<b>Seafood Processing</b>	Direct Effect	26	\$1.68	\$2.17	\$11.24
	Indirect Effect	43	\$2.52	\$4.00	\$7.63
	Induced Effect	35	\$2.00	\$3.55	\$6.34
	<b>Total Effect</b>	<b>103</b>	<b>\$6.20</b>	<b>\$9.73</b>	<b>\$25.21</b>
<b>Wholesale Distribution</b>	Direct Effect	80	\$6.08	\$8.24	\$15.93
	Indirect Effect	66	\$4.65	\$7.01	\$12.83
	Induced Effect	88	\$5.11	\$9.07	\$16.20
	<b>Total Effect</b>	<b>234</b>	<b>\$15.84</b>	<b>\$24.32</b>	<b>\$44.95</b>
<b>Retail Stores</b>	Direct Effect	26	\$0.95	\$1.28	\$2.04
	Indirect Effect	7	\$0.42	\$0.69	\$1.36
	Induced Effect	11	\$0.65	\$1.15	\$2.06
	<b>Total Effect</b>	<b>44</b>	<b>\$2.01</b>	<b>\$3.12</b>	<b>\$5.46</b>
<b>Restaurants</b>	Direct Effect	900	\$25.44	\$37.60	\$63.76
	Indirect Effect	192	\$13.38	\$21.85	\$44.49
	Induced Effect	319	\$18.50	\$32.84	\$58.62
	<b>Total Effect</b>	<b>1,411</b>	<b>\$57.33</b>	<b>\$92.28</b>	<b>\$166.87</b>
<b>Total All Activities</b>	Direct Effect	1,225	\$40.21	\$60.04	\$107.01
	Indirect Effect	325	\$22.45	\$36.24	\$72.03
	Induced Effect	516	\$29.87	\$53.00	\$94.61
	<b>Total Effect</b>	<b>2,065</b>	<b>\$92.53</b>	<b>\$149.28</b>	<b>\$273.65</b>
Values in 2021 dollars. Employment represents fulltime and part-time jobs. Source: <i>Implan</i> model for the United States, 2019, standard specification (Implan Group, LLC)					

## **Appendix 1.**

### Economic Input-Output Model Application – IMPLAN

Many economic impact studies use information from a regional inter-industry impact (input-output) model such as Impact Planning for Analysis (IMPLAN).<sup>8</sup> IMPLAN is a nationally recognized economic model used for community/regional economic impact analysis across the country. The model uses input-output analysis in tandem with regional social accounting matrices and multipliers. IMPLAN divides the total national economy into 440 sectors corresponding to North American Industry Classification System (NAICS) codes related to agriculture, extraction, manufacturing, transportation, wholesale trade, retail trade, services and government. Data on these 440 industry sectors is based on national input/output or industry transaction tables (Minnesota IMPLAN Group, 2017). The IMPLAN model used herein was regionalized for this study to reflect the Mid-Atlantic region states. In addition to the modeling software, individual state data must be purchased from IMPLAN to use in the model. Running the basic IMPLAN model with individual state data yields the necessary employment, income and output multipliers to apply to the expenditure data.

In order to estimate economic activity, each category of expenditure by the commercial fishing and marketing sectors was first matched to one or more of the IMPLAN sectors. In most instances, this matching is straightforward.

Expenditures must be allocated by the proportion of the expenditure attributed to the value added by the retail, wholesale, transportation and producing sectors before applying the IMPLAN multipliers. Each of those sectors will have their own set of impacts on the region's economy. Allocation of the expenses is done through national averages of the margins for these expenditure categories as supplied in the IMPLAN data. If the expenditures are for services such

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<sup>8</sup> Source: *Implan* model for State of Florida, 2019, standard specification (Implan Group, LLC).

Employment represents fulltime and part-time jobs.

Source: *Implan* model for the United States, 2019, standard specification (Implan Group, LLC). Values in 2021 dollars

as at a commercial fishing dock, it is not necessary to calculate margins, as the full expenditure is applied to the commercial fishing sector and matched to an IMPLAN multiplier.

After expenditures are broken down using margins into the various IMPLAN sectors, they are then multiplied by a regional purchase coefficient (RPC) before applying the economic activity multipliers. A regional purchase coefficient indicates the extent to which the demand for a good or service can be met by a local industry. RPC's, expressed as percentages, are provided by IMPLAN for all sectors in the region.

The final components of the economic impact analysis are the economic activity multipliers. The multipliers estimate the amount of employment, income or output that a given level of expenditure generates, after it has been adjusted by the RPC. Employment multipliers provide impacts in terms of jobs (full-time, part-time and seasonal). IMPLAN includes several income multipliers. For this project, total income is used, which includes personal income plus proprietor (self-employment) income and other property income (e.g., rent). For output impacts, IMPLAN utilizes a Type I and modified Type II multiplier. The Type I output multiplier provides the relationship between the local expenditure and the direct and indirect output or sales in the state and region. The Type II multiplier includes the additional induced (household) effects created by the direct and indirect expenditures. The Type II multiplier is used in this analysis.

## Appendix 2.

### Glossary of Input-Output Terms

**Direct effects/impacts:** Direct impacts represent the revenues, value-added, income, or jobs that result directly from an economic activity within the study area or a regional economy.

**Employment or Jobs:** Represents the total numbers of wage and salaried employees as well as self-employed jobs. This includes full-time, part-time and seasonal workers measured in annual **average jobs**.

**Indirect business taxes:** Include sales, excise, and property taxes as well as fees and licenses paid by businesses during normal operations. It does not include taxes on profits or income.

**Indirect effects/impacts:** Indirect effects occur when businesses use revenues originating from outside the region, or study area, to purchase inputs (goods and services) from local suppliers. This secondary, or indirect business, generates additional revenues, income, jobs and taxes for the area economy.

**Induced effects/impacts:** Induced effects or impacts occur when new dollars, originating from outside the study area, are introduced into the local economy. Induced economic impacts occur as the households of business owners and employees spend their earnings from these enterprises to purchase consumer goods and services from other businesses within the region. This induced effect generates additional revenues, income, jobs and taxes for the area economy.

**Input-Output analysis:** The use of input-output models to estimate how revenues or employment for one or more particular industries, businesses or activities in a regional economy impact other businesses and institutions in that region, and the regional as a whole.

**Input-Output models:** A mathematical representation of economic activity within a defined region using inter-industry transaction tables or matrices where the outputs of various industries are used as inputs by those same industries and other industries as well.

**Labor income:** All forms of employment compensation, including employee wages and salaries, and proprietor income or profits.

**Local revenues/expenditures:** Local revenues or spending represent simple transfers between individuals or businesses within a regional economy. These transactions do not generate economic spin-off or multiplier (indirect and induced) effects.

**Markup:** Represents the differences between retail, wholesale, distributor and producer's prices.

**Non-local revenues/expenditures:** When outside or new revenues flow into a local economy either from the sale of locally produced goods and services to points outside the study area, or from expenditures by non-local visitors to the study area, additional economic repercussions occur through indirect and induced (multiplier) effects.

**Other Property Type Income:** Income in the form of rents, royalties, interest, dividends, and corporate profits.

**Output:** Output is the value of production by industry in a calendar year. Output for wholesale and retail Industries represents their markup margin only; it does not represent revenues (sales).

**Total Impacts:** The sum of direct, indirect and induced effects or economic impacts.

**Value-added:** Includes wages and salaries, interest, rent, profits, and indirect taxes paid by businesses. In the IMPLAN results tables, Value-added equals the sum of Labor Income, Other Property Type Income, and Indirect Business Taxes.

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