# Modifications to Deep-water Grouper Management Measures

## Draft Amendment 58B
## to the Fishery Management Plan for
## Reef Fish Resources of the Gulf

## August 2025

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# ABBREVIATIONS USED IN THIS DOCUMENT

| Abbreviation | Definition |
|---|---|
| ABC | acceptable biological catch |
| ACL | annual catch limit |
| ACT | annual catch target |
| ALS | accumulated landings system |
| AM | accountability measures |
| APAIS | Access Point Angler Intercept Survey |
| BSIA | best scientific information available |
| BiOp | biological opinion |
| CFR | code of federal regulations |
| CFpA | net cash flow per angler |
| CHTS | Coastal Household Telephone Survey |
| CS | consumer surplus |
| Council | Gulf Council |
| Councils | Gulf and South Atlantic Fishery Management Councils |
| DPS | distinct population segments |
| DWG | deep-water grouper |
| E.O. | Executive Order |
| EA | Environmental Assessment |
| EEZ | exclusive economic zone |
| EFH | Essential Fish Habitat |
| EIS | economic impact statement |
| ESA | Endangered Species Act |
| FES | Fishing Effort Survey |
| FHS | for-hire survey |
| FL | fork length |
| FMP | Fishery Management Plan |
| FMSY | maximum sustainable yield |
| GDP | gross domestic product |
| GSAD | Gulf and South Atlantic Dealers |
| GT | grouper-tilefish |
| Gulf | Gulf of America (Formerly Gulf of Mexico) |
| HAPC | habitat areas of particular concern |
| IFQ | individual fishing quota |
| IRFA | initial regulatory flexibility analysis |
| LA Creel | Louisiana Department of Wildlife and Fisheries' recreational creel survey |
| LAPP | Limited Access Privilege Program |
| LQ | local quotient |
| MFMT | maximum fishing mortality threshold |
| MMPA | Marine Mammals Protection Act |

| | |
|---|---|
| MRFSS | Marine Recreational Fishery Statistics Survey |
| MRIP | Marine Recreational Information Program |
| MSST | minimum stock size threshold |
| MSY | maximum sustainable yield |
| Magnuson-Stevens Act | Magnuson-Stevens Fishery Conservation and Management Act |
| NEPA | National Environmental Policy Act |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanic and Atmospheric Administration |
| OFL | overfishing limit |
| OST | Office of Science and Technology |
| OY | optimum yield |
| Other SWG | Other Shallow-water Grouper complex |
| PS | producer surplus |
| RFA | Regulatory flexibility analysis |
| RFFA | reasonably foreseeable future actions |
| RIR | Regulatory Impact Review |
| RQ | regional quotient |
| RS | red snapper |
| Reef Fish FMP | Fishery Management Plan for the Reef Fish Resources in the Gulf |
| SDC | status determination criteria |
| SEDAR | Southeast Data, Assessment, and Review |
| SEFSC | Southeast Fisheries Science Center |
| SEIS | Supplemental Environmental Impact Statement |
| SERO | Southeast Regional Office |
| SMZ | special management zone |
| SPR | spawning potential ratio |
| SRHS | Southeast Regional Headboat Survey |
| SSB | spawning stock biomass |
| SSC | Scientific and Statistical Committee |
| SSRG | Social Scientists Research Group |
| SWG | shallow-water grouper |
| Secretary | Secretary of Commerce |
| TAC | total allowable catch |
| TNR | trip net revenue |
| TPWD | Texas Parks and Wildlife Department |
| USCG | United States Coast Guard |
| VMS | vessel monitoring system |
| WTP | willingness-to-pay |
| gw | gutted weight |
| mp | million pounds |
| ww | whole weight |

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# CHAPTER 1. INTRODUCTION

## 1.1 Background

Several species of groupers in the Gulf of America (formerly known as the Gulf of Mexico, and heretofore referred to in this document as "the Gulf" or "Gulf")[1] are currently managed within two distinct complexes: the Other Shallow-water Grouper (SWG) complex and the Deep-water Grouper (DWG) complex. Scamp (*Mycteroperca phenax*), yellowmouth grouper (*Mycteroperca interstitialis*), black grouper (*Mycteroperca bonaci*), and yellowfin grouper (*Mycteroperca venenosa*) are managed under the Other SWG complex. Yellowedge grouper (*Hyporthodus flavolimbatus*), snowy grouper (*Hyporthodus niveatus*), warsaw grouper (*Hyporthodus nigritus*), and speckled hind (*Epinephelus drummondhayi)* are managed under the DWG complex. These species were originally assigned to these complexes under the Generic Annual Catch Limits (ACL) and Accountability Measures (AM) Amendment to the Fishery Management Plans (FMP) of the Gulf of Mexico Region (ACL/AM Amendment; GMFMC 2011). Assignment of these species was, at the time, made with respect to where these species occurred in the Gulf environment, and whether it was common for these species to be caught on the same fishing trips. Until recently, none of these eight species had approved peer-reviewed stock assessments available to inform their stock status[2]. In 2022, a stock assessment of scamp and yellowmouth grouper was completed (SEDAR 68 2022), which assessed both species together as a complex, and passed a peer-review by the Gulf Council's (Council) Scientific and Statistical Committee (SSC). The SSC recommended updated status determination criteria (SDC) and catch advice for these two species. To act on these recommendations, the Council initiated work on Amendment 58 to the FMP for the Reef Fish Resources of the Gulf (Reef Fish FMP). Following, in 2024, a stock assessment of yellowedge grouper also passed a peer-review by the SSC (SEDAR 85 2023). Likewise, the SSC recommended updated SDC and catch advice for yellowedge grouper. Due to the way in which the SWG and DWG complexes are managed, modifications to the management of these species were originally examined concurrently in draft Amendment 58. In August 2024, to efficiently address necessary management modifications, the Council decided to split draft Amendment 58 into Amendment 58A, which focuses on the SWG species, and Amendment 58B (this document), which focuses on DWG species. As such, discussion of the Other SWG complex will be limited.

The DWG complex is managed under a total complex ACL. The commercial sector is apportioned 96.47% of the total complex ACL as specified in the Generic ACL/AM Amendment, and that apportionment and the associated catch limits are shown in Table 1.1.1. The commercial apportionment was implemented to allow the commercial sector to operate under the Grouper-Tilefish Individual Fishing Quota (IFQ) program (Amendment 29 to the Reef

[1] The Gulf of Mexico was renamed the Gulf of America pursuant to Executive Order 14172, and Secretary of the Interior Order No. 3423.

[2] Black grouper had last been assessed in 2010 (SEDAR 19), but an assessment attempted in 2017 (SEDAR 48) had to be terminated due to irreconcilable data issues. Thus, no assessment for informing the stock status of black grouper relative to its SDC exists.

Fish FMP; GMFMC 2008b). Landings (2000 – 2023) by species for DWG are shown in Table 1.1.2. The recreational landings data used to develop the current catch limits were derived from the Marine Recreational Fisheries Statistics Survey (MRFSS). Landings including MRFSS recreational data are shown in Table 1.1.3, which is provided only for illustrative and comparative purposes. Recreational data sources used in Table 1.1.2 include the Texas Parks and Wildlife Department (TPWD) recreational creel survey, the Louisiana Department of Wildlife and Fisheries creel survey (LA Creel), the Southeast Region Headboat Survey (SRHS), and the Marine Recreational Information Program (MRIP), MRIP's Fishing Effort Survey (FES), and MRIP's For-Hire Survey. MRIP-FES includes the Access Point Angler Intercept Survey (APAIS) and the FES, and covers Florida, Alabama, and Mississippi. MRIP's FHS gathers the effort information for the charter mode in Florida, Alabama, and Mississippi. MRFSS and MRIP-FES both generate estimates in pounds of fish, but those estimates are not directly comparable because they use different methods for estimating fishing effort. Therefore, the total landings shown in Table 1.1.2 cannot be directly compared to the complex ACL shown in Table 1.1.1. A depiction of the percentage of commercial landings attributable to each species within the DWG complex is shown in Figure 1.1.1.

**Table 1.1.1.** Catch limits and buffers by sector for DWG, as established in the Generic ACL/AM Amendment. Values are in millions of pounds (mp) gutted weight (gw). OFL = overfishing limit; ABC = acceptable biological catch.

| Complex | Year | OFL | ABC (Complex ACL) | Comm ACL | Comm Quota | Comm Buffer | Rec ACL |
|---|---|---|---|---|---|---|---|
| **DWG** | 2016+ | 1.113 | 1.105 | 1.066 | 1.024 | 4% | undefined |

**Table 1.1.2**. Landings for DWG species by sector from 2000 – 2023. Landings are in lb gw.

| | Commercial | | | | | | Recreational (MRIP-FES) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | | Snowy Grouper | Speckled Hind | Warsaw Grouper | Yellowedge Grouper | Total Comm Landings | Snowy Grouper | Speckled Hind | Warsaw Grouper | Yellowedge Grouper | Total Rec Landings | Total Landings |
| 2000 | Pre-IFQ Years, SEFSC Commercial ACL Files (February 2024) | 184,381 | 64,242 | 161,543 | 1,349,383 | 1,759,549 | Confidential | | | | 13,917 | 1,773,466 |
| 2001 | | 175,591 | 62,366 | 145,278 | 873,682 | 1,256,917 | 2,804 | 3,076 | 90,316 | 1,370 | 97,567 | 1,354,484 |
| 2002 | | 134,999 | 48,220 | 217,031 | 925,582 | 1,325,832 | 5,763 | 1,413 | 61,520 | 2,159 | 70,855 | 1,396,687 |
| 2003 | | 218,137 | 82,000 | 265,480 | 1,291,967 | 1,857,584 | 695 | 13,222 | 48,588 | 329 | 62,834 | 1,920,418 |
| 2004 | | 180,487 | 101,745 | 176,895 | 1,020,564 | 1,479,691 | 3,273 | 25,546 | 89,214 | 1,162 | 119,194 | 1,598,885 |
| 2005 | | 182,647 | 88,636 | 164,292 | 918,521 | 1,354,096 | 1,771 | 158 | 29,522 | 105,090 | 136,541 | 1,490,637 |
| 2006 | | 171,616 | 64,620 | 140,662 | 824,952 | 1,201,850 | 1,610 | 42,667 | 84,972 | 2,546 | 131,796 | 1,333,646 |
| 2007 | | 175,531 | 79,784 | 86,376 | 1,002,080 | 1,343,771 | 1,035 | 5,316 | 9,498 | 2,822 | 18,672 | 1,362,443 |
| 2008 | | 199,782 | 41,187 | 88,622 | 946,423 | 1,276,014 | 2,426 | 958 | 17,434 | 1,252 | 22,069 | 1,298,083 |
| 2009 | | 183,998 | 68,292 | 117,695 | 972,112 | 1,342,097 | 1,727 | 697 | 42,449 | 3,209 | 48,081 | 1,390,178 |
| 2010 | Gulf IFQ Program | 90,180 | 15,359 | 56,496 | 443,887 | 605,922 | 11,177 | 14,006 | 5,507 | 28,403 | 59,094 | 665,016 |
| 2011 | | 132,971 | 24,925 | 61,661 | 558,908 | 778,465 | 8,108 | 2,419 | 6,621 | 9,461 | 26,609 | 805,074 |
| 2012 | | 168,759 | 43,344 | 86,212 | 667,785 | 966,100 | 69,469 | 4,115 | 35,329 | 1,212 | 110,125 | 1,076,225 |
| 2013 | | 108,689 | 34,922 | 103,074 | 673,349 | 920,034 | 50,297 | 205 | 18,774 | 6,198 | 75,474 | 995,508 |
| 2014 | | 159,857 | 72,241 | 75,426 | 773,621 | 1,081,145 | 61,282 | 508 | 72,897 | 18,982 | 153,669 | 1,234,814 |
| 2015 | | 108,980 | 55,550 | 55,502 | 735,218 | 955,250 | 12,174 | 778 | 3,636 | 15,669 | 32,258 | 987,508 |
| 2016 | | 94,830 | 41,151 | 44,635 | 709,349 | 889,965 | 3,365 | 14,666 | 8,773 | 22,637 | 49,441 | 939,406 |
| 2017 | | 87,587 | 51,061 | 44,362 | 677,926 | 860,936 | 2,167 | 345 | 8,969 | 4,139 | 15,619 | 876,555 |
| 2018 | | 89,416 | 60,618 | 35,976 | 677,310 | 863,320 | 6,335 | 363 | 55,304 | 39,221 | 101,224 | 964,544 |
| 2019 | | 91,430 | 67,082 | 33,590 | 804,558 | 996,660 | 5,401 | 5,665 | 3,225 | 74,516 | 88,807 | 1,085,467 |
| 2020 | | 99,072 | 36,187 | 22,707 | 665,406 | 823,372 | 4,883 | 222 | 18,865 | 33,522 | 57,491 | 880,863 |
| 2021 | | 91,362 | 41,451 | 17,419 | 681,679 | 831,911 | 11,873 | 288 | 2,216 | 15,286 | 29,663 | 861,574 |
| 2022 | | 76,075 | 27,776 | 15,012 | 461,661 | 580,524 | 15,335 | 838 | 2,850 | 19,826 | 38,848 | 619,372 |
| 2023 | | 64,877 | 34,297 | 12,056 | 514,547 | 625,777 | 10,362 | 2,856 | 2,906 | 52,314 | 68,438 | 694,215 |

Sources: Commercial data from SEFSC Commercial ACL Data (March 2024); SERO Catch Share Database (February 2024). Recreational data from SEFSC Recreational MRIP-FES ACL File (MRIP_FES_rec81_24wv3_23Aug24), which includes data from LA Creel and Texas.

**Table 1.1.3.** Landings for the DWG complex by sector from 2013 – 2023, using MRFSS data for the recreational sector. Landings are in lb gw.

| Year | Total Comm Landings | Comm Quota (96% of Comm ACL) | Total Rec Landings (MRFSS) | Total Landings | DWG Complex ACL | % DWG ACL Landed |
|---|---|---|---|---|---|---|
| **2013** | 920,034 | 1,024,000 | 60,773 | 980,807 | 1,105,000 | 88.8% |
| **2014** | 1,081,145 | 1,024,000 | 81,938 | 1,163,083 | 1,105,000 | 105.3% |
| **2015** | 955,250 | 1,024,000 | 28,065 | 983,315 | 1,105,000 | 89.0% |
| **2016** | 889,965 | 1,024,000 | 28,589 | 918,554 | 1,105,000 | 83.1% |
| **2017** | 860,936 | 1,024,000 | 13,765 | 874,701 | 1,105,000 | 79.2% |
| **2018** | 863,320 | 1,024,000 | 67,123 | 930,443 | 1,105,000 | 84.2% |
| **2019** | 996,660 | 1,024,000 | 75,513 | 1,072,173 | 1,105,000 | 97.0% |
| **2020** | 823,372 | 1,024,000 | 32,977 | 856,349 | 1,105,000 | 77.5% |
| **2021** | 831,911 | 1,024,000 | 30,771 | 862,682 | 1,105,000 | 78.1% |
| **2022** | 580,524 | 1,024,000 | 44,869 | 625,393 | 1,105,000 | 56.6% |
| **2023** | 625,777 | 1,024,000 | 33,801 | 659,578 | 1,105,000 | 59.7% |

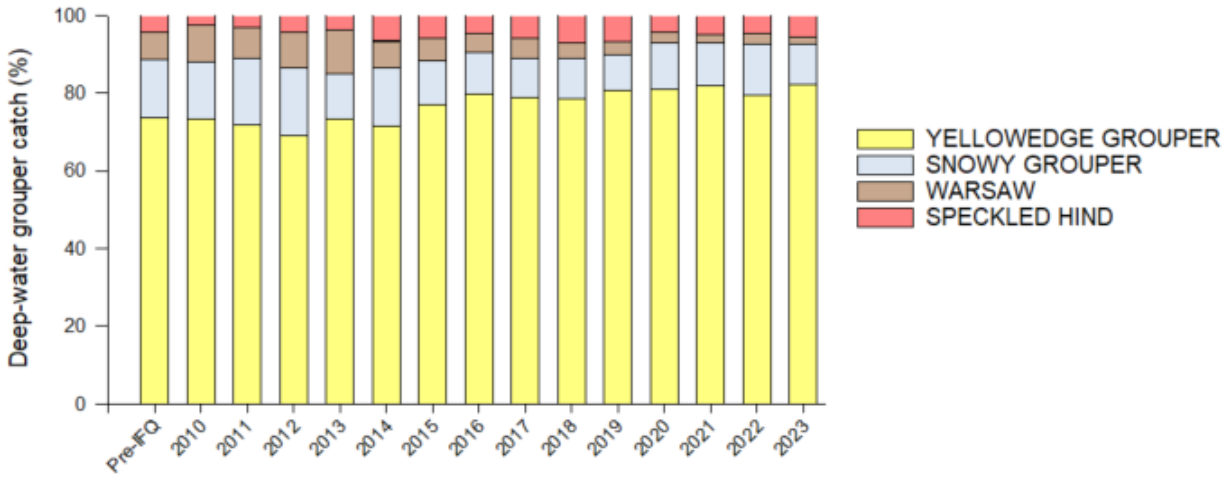


**Figure 1.1.1.** Percentages of commercial landings by species for the DWG complex from the 2023 Grouper-Tilefish IFQ Program Report3. Data for the years prior to the start of the IFQ program are summarized as "Pre-IFQ".

**Commercial Sector**

Commercial harvest of DWG has been managed under the Grouper-Tilefish IFQ program since 2010 (GMFMC 2008b). Any vessel commercially fishing for DWG must possess a federal commercial reef fish permit, have an active vessel monitoring system, have an IFQ account, and

[3] https://noaa-sero.s3.amazonaws.com/drop-files/cs/2023_GT_AnnualReport_FINAL.pdf

hold DWG allocation under the IFQ program. IFQ allocation is determined and distributed at the beginning of each calendar year by multiplying a shareholder's IFQ DWG shares, represented as a fraction of the total commercial quota, times the commercial quota for that year and complex. Allocation can be transferred to accounts that do not hold DWG shares. The current commercial quota for DWG is set 4% below the commercial ACL (GMFMC 2011; Table 1.1.1). The buffer between the commercial quota and the commercial ACL was put in place to account for uncertainty with discards upon implementation of the IFQ program, and it was noted therein that this buffer could be re-evaluated with time, and to allow for flexibility measures between the Other SWG and DWG complexes (see below). Since the implementation of the Generic ACL/AM Amendment, the commercial buffer has not been re-evaluated. The IFQ program acts as the AM for the commercial sector for DWG, and the commercial quota has never been exceeded under the IFQ program.

*Other SWG and DWG Flexibility Measures*

Amendment 29 to the Reef Fish FMP (GMFMC 2009) established flexibility measures between the Other SWG and DWG complexes to reduce discards and allow commercial fishermen to better use the allocation they have in a given fishing year. These measures were implemented without regard to a species' stock status. A graphical depiction of these flexibility measures is shown in Figure 1.1.2. Briefly:

- A shareholder may land scamp under their DWG allocation, so long as they have no Other SWG allocation remaining in their shareholder account or any associated vessel accounts.
- A shareholder may land warsaw grouper or speckled hind under their SWG allocation, so long as they have no DWG allocation remaining in their shareholder account or any associated vessel accounts.

These flexibility measures will be evaluated in Amendment 58A, which would modify the Other SWG complex structure and modify catch limits for species currently managed therein.

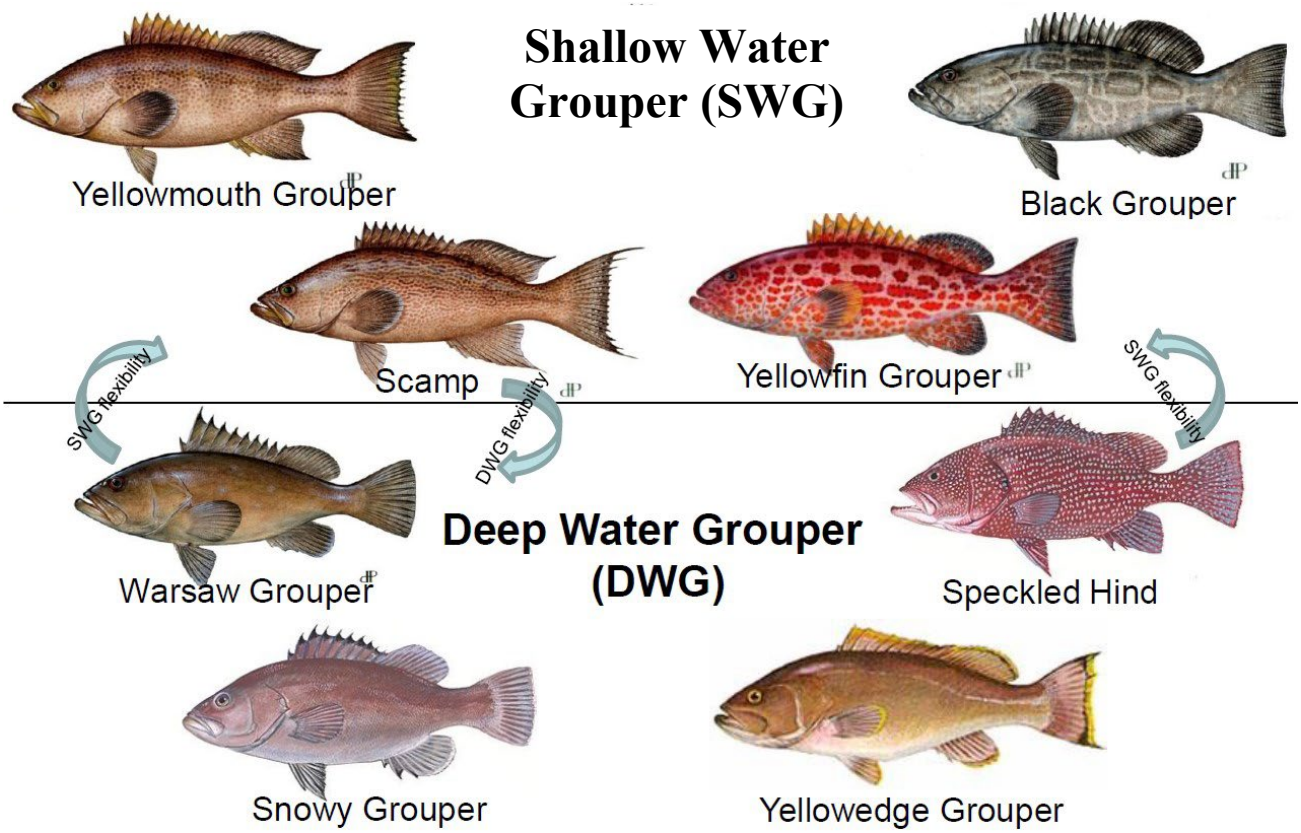


**Figure 1.1.2.** Depiction of the SWG and DWG flexibility measures as defined in Amendment 29 to the Reef Fish FMP.

**Recreational Sector**

Recreational landings comprise an increasing proportion of the total DWG landings in recent history, yet still comprise a minority fraction (see Table 1.1.2). Presently, there is no defined recreational ACL for DWG. The difference between the sector apportionment for the commercial ACL and the total complex ACL is available for the recreational sector to harvest. Thus, outside of the use of the IFQ program as the AM for the commercial sector, the only other AM for the DWG complex is a post-season AM for the recreational sector, which states that in the year following an overage, fishing will close for the recreational sector if the complex ACL is projected to be reached. No payback provision for an overage of the complex ACL currently exists. The complex ACL has not been exceeded since implementation of the IFQ program in 2010, and thus, the closure has not been invoked. However, because the AM is based on reaching the complex ACL (combined commercial and recreational), it would allow for overfishing each year since the recreational (undefined) catch limit could be exceeded prior to the commercial sector harvesting its IFQ quota. This scenario is more likely to occur given the reductions in catch limits being proposed in this document.

*Recreational Data*

Federal Data Collection Programs

The National Marine Fisheries Service (NMFS) created the MRFSS in 1979. In the Gulf, MRFSS collected recreational catch and effort data, including DWG species, beginning in 1981. MRFSS included both offsite telephone surveys and onsite interviews at marinas and other points where recreational anglers fish. In 2008, MRIP replaced MRFSS to meet increasing demand for more precise, accurate, and timely recreational catch estimates. Until 2013, recreational catch, effort, and participation were estimated through a suite of independent but complementary surveys: telephone surveys of households and for-hire vessel operators that collected information about recreational fishing activity and an angler intercept survey that collected information about the fish that were caught.

MRIP APAIS began incorporating a new survey design in 2013. This new design addressed concerns regarding the validity of the survey approach, specifically that trips recorded during a given time period are representative of trips for a full day, by extending the time period dockside samplers stayed at an assigned location (Foster et al. 2018). The more complete temporal coverage with the new survey design provides for consistent increases or decreases in APAIS angler catch rate statistics, which are used in stock assessments and management, for at least some species (NMFS 2019).

To assess fishing effort in the for-hire component, MRIP samplers contact charter vessel operators (a weekly sample of 10% of the fleet) by telephone to conduct the FHS for fishing effort. Charter vessel operators are required to report all trips taken during selected weeks (effort only) whenever they are selected to participate in this portion of the MRIP survey. The FHS has a stratified design, with for-hire vessels as sampling units, and is stratified by state, sub-state region (applicable to Florida only), vessel type (charter or headboat [as defined by the USCG]), and sample week within the two-month wave.

MRIP transitioned from the legacy Coastal Household Telephone Survey (CHTS) to a new mail survey (FES) in 2015, and in 2018, MRIP-FES replaced MRIP-CHTS for the private angler mode. Both survey methods collect data needed to estimate marine recreational fishing effort (number of fishing trips) by shore and private/rental boat anglers on the Atlantic and Gulf coasts. MRIP-CHTS used random-digit dialing of homes in coastal counties to contact anglers. The new mail-based FES uses angler license and registration information as one way to identify and contact anglers (supplemented with data from the U.S. Postal Service, which includes virtually all U.S. households). Because FES and CHTS are so different, NMFS conducted side-by-side testing of the two methods and found that, in general, total recreational fishing effort estimates generated from the FES are higher — and in some cases substantially higher — than the CHTS estimates (NMFS 2019). This is because the FES is designed to measure fishing activity more accurately than the CHTS, albeit while recognizing a greater degree of uncertainty in those landings estimates. This increase in estimated effort is not because there was a sudden rise in fishing effort, but rather because FES better targets actual fishery participants through the directed mail survey. Likewise, the increase in uncertainty about the effort estimates reflects uncertainty that was also present in CHTS but went unaccounted due to biases that were

identified as FES was developed. NMFS developed a calibration model to allow historic effort estimates using MRIP-CHTS to be compared to new estimates from MRIP-FES.

2023 MRIP-FES Pilot Study and 2024 Comprehensive Study

At the August 2023 Council meeting, the NMFS Office of Science and Technology (OST) discussed the release of a pilot study (NMFS 2023[4]), which evaluated potential respondents' bias (e.g., recall error) in the mail portion of the recreational FES survey used to estimate effort. The 2023 pilot study evaluated this bias for a portion of the year across several states, and preliminary results suggest the order of the questions in the survey led to overestimation of fishing effort by MRIP-FES. As a result of this, NMFS OST conducted a more comprehensive pilot study which began in 2024 and is expected to end data collection in 2025. NMFS OST plans to produce a public report with key findings and estimate comparisons in summer 2025 and determine if a new design will be implemented in 2026, pending study results and peer review. In mid-2026, NMFS OST is expecting to produce calibrated historical effort estimates to reflect the findings of the updated survey design for use in future stock assessments and fisheries management. Prior to when data calibration is finalized in spring 2026, any expectation about results would be speculative. After the updated survey data are finalized, it will then be available for evaluation by data users (e.g., the Southeast Fisheries Science Center, Southeast Regional Office, and the Council).

State of Louisiana LA Creel Program and Texas Parks and Wildlife creel survey

Since 2014, Louisiana generates weekly estimates of catch and effort through their LA Creel program. LA Creel uses a combination of data collected dockside (access point survey) and through weekly phone and email effort surveys to estimate recreational saltwater fish harvests. The LA Creel program consists of biologists conducting interviews at public fishing sites, with charter captains and groups of saltwater anglers about their fishing activities. LA Creel provides weekly recreational fishery information to aid in the management of Louisiana's fishery resources. It is composed of an on-site access-point survey and two weekly effort surveys stratified across five basins. The access point survey provides estimated catch rates per trip. One effort survey generates estimated private angler effort in the form of total angler trips and the other does the same for charter trips. Licensed private anglers are stratified across geographical regions and Louisiana's Recreational Offshore Landings Permit (ROLP) holders, while licensed charter captains are stratified between those with and without ROLP permits. Using licensed anglers provides a clearly defined angler frame with high quality contact information, while stratifying within this frame allows LA Creel to account for differences in fishing activity across the state. Access point survey assignments are randomly drawn based on fishing pressures weighted by the types of activities present and the total angler activity. LA Creel boasts production of weekly landings at the basin level on just a two-week delay, which can reduce recall bias and provide near real time landings estimates that can be used in monitoring recreational quotas and identifying impacts to recreational landings from short term events. LA Creel contacts for-hire captains via telephone at random, with a goal of reaching

[4] https://www.fisheries.noaa.gov/recreational-fishing-data/fishing-effort-survey-research-and-improvements

30% of captains who fish offshore (those who hold a ROLP) and 10% who fish inshore (who do not hold a ROLP). During red snapper season, LA Creel contacts 100% of captains who hold offshore permits.[5]

Alabama and Mississippi piloted versions of LA Creel in their own states alongside the MRIP APAIS and FES programs in 2024. Beginning in 2025, both Alabama and Mississippi were operating their own iterations of LA Creel (AL Creel and MS Creel, respectively) at full implementation.

Texas Parks and Wildlife Department (TPWD) conducts their own creel survey to estimate private and charter landings in Texas. TPWD Sport-boat Angling Survey uses dockside interviews at recreational boat access sites to generate catch and effort estimates for finfish species caught by private boat and charter operators off the Texas coast. Texas reports recreational data in high (May 15 through November 20) and low (November 21 through May 14) activity periods. Creel surveys are conducted from 10 AM to 6 PM at specified boat-access sites along the Texas coast. Over 1,000 surveys are scheduled annually on randomly selected weekdays and weekends in proportion to the amount of fishing activity at each site. Charter vessel catch and effort data in Texas are monitored by the Texas Parks and Wildlife Department's Coastal Creel Survey. This is a field-intercept survey of boat-based fishing, including for-hire vessels. This survey estimates fishing effort and catch (harvest only) on a seasonal (high-use and low-use) basis.

Like all surveys, both the Louisiana and Texas state surveys have inherent uncertainty. Both LA Creel and the TPWD survey are only conducted in their state and therefore cannot generate Gulf-wide estimates. LA Creel is comparable in survey methodology to the MRIP design. The TPWD survey only produces landings estimates and reports every six-months. This time frame limits in-season monitoring for short fishing seasons (e.g., weeks or months). Both state effort surveys, like APAIS, are also limited to intercepting anglers at public access points and their willingness to answer dockside interview questions, and in the case of LA Creel, the effort (telephone survey) portion of the program.

**Recent Stock Assessments and Catch Projections**

SEDAR 85 (2023)

A stock assessment for yellowedge grouper (SEDAR 85) was completed in 2023 using data through 2021. This assessment used updated recreational landings information informed by MRIP-FES. However, because recreational landings make up such a small fraction of total yellowedge grouper removals (Table 1.1.3), they were combined with the commercial vertical line fleet for the assessment. These fleets were combined due to similarities in their estimated selectivity and retention functions (i.e., ages and lengths of fish caught by this gear type and kept). In reviewing SEDAR 85, the Council's SSC determined that the default maximum sustainable yield proxy value of $F_{30\%SPR}$ for DWG was not biologically appropriate for

[5] https://www.lafisheriesforward.org/wp-content/uploads/2024/02/LFF_FastFacts_LaCREEL_2024-01-ADA.pdf

protogynous hermaphrodites like yellowedge grouper. Thus, the SSC recommended changing the MSY proxy to a more conservative yield when fishing at $F_{40\%SPR}$. Based on this proxy, yellowedge grouper would not be overfished, but would be experiencing overfishing, as of 2021[6] (Table 1.1.4.). During its review of SEDAR 85, the SSC recommended revised catch limits for yellowedge grouper, which are expected to end overfishing and are shown in Table 1.1.5.

**Table 1.1.4.** Summary of benchmarks and reference points used in the SEDAR 85 assessment. Spawning stock biomass (SSB) is in metric tons (male and female combined SSB), whereas F is a harvest rate (total biomass killed all ages / total biomass age 1+). An SPR proxy of 40% is presented.

| Criteria | Definition | Value |
|---|---|---|
| $SSB_0$ | Virgin SSB | 13,197 |
| $F_{MSYProxy}$ | Equilibrium F to achieve 40% SPR | 0.044 |
| MFMT | $F_{MSYProxy}$ | 0.044 |
| $F_{Current}$ | Geometric mean of $F_{2019-2021}$ | 0.047 |
| $F_{Current}$/MFMT | Current overfishing status | **1.08** |
| $SSB_{MSYProxy}$ | Equilibrium SSB at $F_{40\%SPR}$ | 4,842 |
| MSST | 0.75 * $SSB_{40\%SPR}$ | 3,632 |
| $SSB_{Current}$ | SSB in 2021 | 6,017 |
| $SSB_{Current}/SSB_{MSYProxy}$ | Stock status based on $SSB_{40\%SPR}$ | 1.24 |
| $SSB_{Current}$/MSST | Stock status based on MSST | **1.66** |
| $SSB_{Current}/SSB_0$ | SSB in 2021 compared to virgin SSB | 0.46 |

**Table 1.1.5.** SSC recommended OFL and ABC values for yellowedge grouper, based on the results of SEDAR 85 (2023) and using a maximum sustainable yield (MSY) proxy of the yield when fishing at $F_{40\%SPR}$. Catch limits are in lb gw.

| Year | OFL | ABC |
|---|---|---|
| 2025 – 2029+ | 487,000 | 372,000 |

The SSC also recommended updated catch limits for snowy grouper, warsaw grouper, and speckled hind, using landings calibrated to MRIP-FES to inform recreational landings (Table 1.1.6). The SSC used Tier 3b of the Council's ABC Control Rule[7], which is reserved for unassessed and data-poor species, since none of these three species have a stock assessment available to use to inform management decisions.

[6] 2021 is the terminal year of the stock assessment.

[7] Tier 3b of the Council's ABC Control Rule is used when there is no stock assessment available (as is the case for three of the four DWG species), but landings data exist. Based on SSC judgement, recent landings may be unsustainable. The OFL is then set equal to the mean of the landings from a representative time series, typically the most recent 10 years. The ABC is then set representative of an acceptable level of risk relative to scientific uncertainty. The default choice is to set the ABC at 75% of the OFL, but the SSC can use another percentage with justification (GMFMC 2012).

**Table 1.1.6.** SSC recommended OFL and ABC values for snowy grouper, warsaw grouper, and speckled hind in lb gw.

| Year | OFL | ABC |
|---|---|---|
| 2025+ | 244,035 | 183,026 |

The SSC thought it appropriate, in the case of DWG, to continue managing all four species together as a complex (Table 1.1.7) by adding the OFL and ABC values for yellowedge grouper to the values for snowy grouper, warsaw grouper, and speckled hind. Since DWG species inhabit similar environments, the SSC acknowledged the difficulty for fishermen attempting to avoid catching yellowedge grouper when targeting other DWG species. Managing all four DWG species together under combined catch limits is expected to reduce overall discard mortality compared to managing each DWG species individually.

**Table 1.1.7.** SSC combined DWG OFL and ABC recommendations in lb gw.

| Year | OFL | ABC |
|---|---|---|
| 2025 – 2029+ | 731,035 | 555,026 |

**Expected Management Considerations**

The Council is considering revising the MSY proxy for yellowedge grouper given the SSC's recommendation to modify that proxy to the yield when fishing at $F_{40\%SPR}$. Due in large part to the magnitude of the reduction of the DWG ABC compared to the current landings for the DWG complex, it is possible that the number of DWG discards could increase. Thus, the establishment of the separate yellowedge grouper catch limits likely requires further evaluation of expected discards. The SSC recommended keeping the four DWG species in the same complex for management to reduce discards, especially because the DWG species are vulnerable to considerable discard mortality due to the deeper depths from which those species are harvested (greater than 100 meters or 330 feet). Because recent recreational sector landings have exceeded the portion of the DWG stock ACL available to the recreational sector for harvest (see Table 1.1.2), the Council is considering establishing a recreational ACL, and considering sector allocations. Further, the Council is considering changes to the current AMs to prevent overfishing.

## 1.2 Purpose and Need

The purpose of this amendment is to modify the status determination criteria, sector allocations, catch limits, and accountability measures of the DWG complex species in response to recent stock assessment results.

The need for these actions is to use the best scientific information available, based on the recent stock assessment, to implement measures to end current and prevent future overfishing of yellowedge grouper, and to achieve optimum yield for the species considered herein, consistent with the authority under the Magnuson-Stevens Fishery Conservation and Management Act.

## 1.3 History of Management

This section focuses specifically on management modifications affecting the DWG complex. A complete history of management for the Reef Fish FMP is available on the Council's website.[8]

**Amendment 1 to the Reef Fish FMP**, including an environmental assessment (EA), regulatory impact review (RIR), and regulatory flexibility analysis (RFA), implemented in 1990, set objectives to stabilize long-term population levels of all reef fish species by establishing a survival rate of biomass into the stock of spawning age fish to achieve at least 20% spawning stock biomass per recruit by January 1, 2000. It set a five-grouper recreational daily bag limit; allowed a 2-day possession limit for charter vessels and head boats on trips that extend beyond 24 hours, provided the vessel has two licensed operators aboard as required by the U.S. Coast Guard, and each passenger can provide a receipt to verify the length of the trip; set an 11.0 mp commercial quota for grouper, with the commercial quota divided into a 9.2 mp SWG (black grouper, gag, red grouper, Nassau grouper, yellowfin grouper, yellowmouth grouper, rock hind, red hind, speckled hind, and scamp) quota and a 1.8 mp DWG (misty grouper, snowy grouper, yellowedge grouper, and warsaw grouper, and scamp once the SWG quota was filled) quota; established a longline and buoy gear boundary at the 50-fathom depth contour west of Cape San Blas, Florida, and the 20-fathom depth contour east of Cape San Blas, inshore of which the directed harvest of reef fish with longline gear and buoy gear was prohibited, and the retention of reef fish captured incidentally in other longline operations (e.g., sharks) was limited to the recreational daily bag limit; limited trawl vessels to the recreational size and daily bag limits of reef fish; established fish trap permits (up to 100 fish traps per permit holder); and established a commercial reef fish vessel permit.

**Amendment 3 to the Reef Fish FMP**, including an EA, RIR, and RFA and implemented in July 1991, transferred speckled hind from the SWG quota category to the DWG quota category.

**Amendment 4 to the Reef Fish FMP**, including an EA, RIR, and IRFA, and implemented in May 1992, established a moratorium on the issuance of new reef fish permits for a maximum period of three years. The moratorium was created to moderate short term future increases in fishing effort and to attempt to stabilize fishing mortality while the Council considers a more comprehensive effort limitation program. It allows the transfer of permits between vessels owned by the permittee or between individuals when the permitted vessel is transferred. Amendment 4 also changed the time of the year that TAC is specified from April to August and included additional species in the reef fish management unit.

**Amendment 5 to the Reef Fish FMP**, including an EA, RIR, and RFA and implemented in February 1994, established restrictions on the use of fish traps in the Gulf exclusive economic zone (EEZ); implemented a three-year moratorium on the use of fish traps by creating a fish trap endorsement for fishermen with historical landings; created a special management zone (SMZ) with gear restrictions off the Alabama coast; created a framework procedure for establishing

[8] https://gulfcouncil.org/fishery-management/implemented-amendments/reef-fish/

future SMZ's; required that all finfish except for oceanic migratory species be landed with head and fins attached; and closed the region of Riley's Hump (near Dry Tortugas, Florida) to all fishing during May and June to protect mutton snapper spawning aggregations.

**Amendment 11 to the Reef Fish FMP**, including EA, RIR, and IRFA, was partially approved by NMFS and implemented in January 1996. The six approved provisions are: (1) limit sale of Gulf of Mexico (Gulf) reef fish by permitted vessels to permitted reef fish dealers; (2) require that permitted reef fish dealers purchase reef fish caught in Gulf federal waters only from permitted vessels; (3) allow transfer of reef fish permits and fish trap endorsements in the event of death or disability; (4) implement a new reef fish permit moratorium for no more than five years or until December 31, 2000, while the Council considers limited access for the reef fish fishery; (5) allow permit transfers to other persons with vessels by vessel owners (not operators) who qualified for their reef fish permit; and, (6) allow a one-time transfer of existing fish trap endorsements to permitted reef fish vessels whose owners have landed reef fish from fish traps in federal waters, as reported on logbooks received by the Science and Research Director of the National Oceanic and Atmospheric Administration (NOAA) Fisheries from November 20, 1992 through February 6, 1994. NOAA Fisheries disapproved a proposal to redefine optimum yield (OY) from 20 percent spawning potential ratio (SPR) (the same level as overfishing) to an SPR corresponding to a fishing mortality rate of $F_{0.1}$ until an alternative operational definition that optimizes ecological, economic, and social benefits to the nation could be developed. In April 1997, the Council resubmitted the OY definition with a new proposal to redefine OY as 30 percent SPR. The resubmission document was disapproved by NMFS.

A **Framework Action**, including an EA, RIR, and RFA implemented in June 2000 established two marine reserves (Steamboat Lumps and Madison-Swanson) that are closed year-round to fishing for all species under the Council's jurisdiction.

**Amendment 17 to the Reef Fish FMP**, including EA, RIR and IRFA, and implemented in August 2000, extended the commercial reef fish permit moratorium for another five years, from its previous expiration date of December 31, 2000, to December 31, 2005, unless replaced sooner by a comprehensive controlled access system. The purpose of the moratorium is to provide a stable environment in the fishery necessary for evaluation and development of a more comprehensive controlled access system for the entire commercial reef fish fishery.

**Secretarial Amendment 1 to the Reef Fish FMP**, including EIS, RIR, IRFA, and effective July 2004, reduced the DWG quota from 1.6 mp ww (equal to 1.35 mp landed weight) to 1.02 mp gw.

**Amendment 24 to the Reef Fish FMP**, including EA, RIR, and IRFA, and implemented in August 2005, establishes a permanent limited access system for the commercial fishery for Gulf of Mexico reef fish. Permits issued under the limited access system are renewable and transferable.

An **October 2005 Regulatory Amendment**, including EA, RIR, IRFA and implemented in January 2006, established an aggregate DWG and SWG commercial trip limit of 6,000 lb gw.

**Amendment 29 to the Reef Fish FMP,** including an EA, RIR, and RFA, implemented January 2010, established an IFQ system for the commercial harvest of grouper and tilefish.

**Amendment 30B to the Reef Fish FMP,** including a final Supplemental Environmental Impact Statement (SEIS), RIR and IRFA, implemented May 2009, repealed the commercial closed season of February 15 to March 15 on gag, black and red grouper, and replaced it with a January through April seasonal area closure to all fishing at the Edges 40-fathom contour, a 390-nautical square mile gag spawning region northwest of Steamboat Lumps. In addition, the Steamboat Lumps and Madison-Swanson fishing area restrictions were continued indefinitely. For the recreational sector, the amendment reduced the aggregate grouper bag limit from five fish to four. Finally, the amendment required that all vessels with federal commercial or charter reef fish permits comply with the more restrictive of state or federal reef fish regulations when fishing in state waters.

**Amendment 31 to the Reef Fish FMP,** including a final SEIS, RIR and IRFA, implemented May 2010, prohibited the use of bottom longline gear shoreward of a line approximating the 35-fathom contour from June through August; established a longline endorsement; and restricted the total number of hooks onboard each reef fish bottom longline vessel to 1,000, of which only 750 may be rigged for fishing.

**Amendment 44 to the Reef Fish FMP** standardized the MSST for certain reef fish species. The MSST is used to determine whether a stock is overfished; if the biomass of the stock falls below the threshold, then the stock is overfished. The MSST for several reef fish species was set equal to 50% of the biomass at MSY. This amendment was approved on December 21, 2017.

**Amendment 36A to the Reef Fish FMP**, including EIS, RIR and IRFA and implemented in January 2019, requires all reef fish permitted vessels landing federally managed reef-fish to land at approved locations and hail-in at least 3 hours, but no more than 24 hours before landing. The Amendment returns red snapper and grouper-tilefish shares from non-activated individual fishing quota (IFQ) accounts to the NMFS for redistribution and allows NMFS to withhold a portion of IFQ allocation at the start of the year equal to an anticipated quota reduction.

# CHAPTER 2. MANAGEMENT ALTERNATIVES

## 2.1 Action 1: Modification of Deep-Water Grouper (DWG) Maximum Sustainable Yield (MSY) Proxy, Overfishing Limit (OFL), Acceptable Biological Catch (ABC), and Complex Annual Catch Limit (ACL)

**Alternative 1:** No Action. Maintain the current MSY proxy, OFL, ABC, and DWG complex ACL. The MSY proxy for the DWG complex is the yield when fishing at 30% spawning potential ratio ($F_{30\%SPR}$), the OFL is 1.113 million pounds (mp) gutted weight (gw), the ABC and complex ACL are 1.105 mp gw.

**Preferred Alternative 2**: Revise the MSY proxy and catch limits for the DWG complex based on the Gulf Council's (Council) Scientific and Statistical Committee (SSC) recommendations. The OFL and ABC for yellowedge grouper would be set based on an MSY proxy of the yield when fishing at $F_{40\%SPR}$, and the yield when fishing at 75% of the $F_{MSY}$ proxy, respectively. The OFL and ABC for the three remaining species would be based on Tier 3b of the Council's ABC Control Rule. The DWG complex MSY proxy would be the yield when fishing at $F_{40\%SPR}$. The OFL and ABC for yellowedge grouper and the three remaining species would be combined, and all four species would be managed as a single complex with a complex OFL of 731,035 pounds (lb) gw, and an ABC of 555,026 lb gw. The complex ACL would be set equal to the ABC.

***Note:*** *Alternative 1 is not a viable alternative because the catch limits in Alternative 1 were set using recreational data from the Marine Recreational Fisheries Statistics Survey (MRFSS), which is no longer in operation. Further, these catch limits exceed those recently recommended by the Council's SSC (see Alternative 2). Subsequent catch limit recommendations rely on analyses using Marine Recreational Information Program (MRIP) Fishing Effort Survey (FES) data; these analyses are recognized as consistent with the best scientific information available.*

**Discussion:**

Gulf Yellowedge grouper were assessed in Southeast Data, Assessment, and Review (SEDAR) 85 (2023), which estimated that while the stock was not overfished as of 2021, it was experiencing overfishing. The Council's SSC evaluated SEDAR 85 and found the analyses to be consistent with the best scientific information available at its February 2024 meeting. The SSC recommended that the OFL and ABC for yellowedge grouper be 487,000 lb gw and 372,000 lb gw, respectively. The SSC then evaluated updated catch limits for the other three DWG complex species: snowy grouper, warsaw grouper, and speckled hind. These updated landings were informed by MRIP-FES for the recreational private vessel landings. The SSC recommended that the OFL and ABC for the remaining three DWG complex species for 2025 and subsequent years be 244,035 lb gw and 183,026 lb gw, respectively. Since DWG species inhabit similar environments, the SSC acknowledged the difficulty fishermen would have in avoiding yellowedge grouper when targeting other DWG species, and vice versa. Therefore, the

SSC also recommended maintaining yellowedge grouper as part of the DWG complex. The catch limits for the DWG complex are calculated by summing the SSC's recommended OFL and ABC for yellowedge grouper as informed by SEDAR 85 with the OFL and ABC for the rest of the DWG complex (calculated using Tier 3b of the ABC Control Rule).

**Alternative 1** would maintain the current MSY proxy at $F_{30\%SPR}$ and maintain the OFL and ABC for the DWG complex at 1.113 mp gw and 1.105 mp gw, respectively. The MSY proxy in **Alternative 1** was established in Amendment 48 to the Fishery Management Plan (FMP) for the Reef Fish Resources of the Gulf (Reef Fish FMP). At that time, there was no defined MSY proxy for any of the species in the DWG complex. The catch limits in **Alternative 1** were based on the results of SEDAR 22 for yellowedge grouper and Tier 3b of the ABC Control Rule for the other three species, which used recreational landings data from MRFSS. MRFSS has not been in use since 2013. Further, the catch limits in **Alternative 1** would exceed those currently recommended by the SSC and are no longer consistent with the best scientific information available. Thus, **Alternative 1** is not a viable alternative.

**Preferred Alternative 2** would revise the catch limits for the DWG complex based on the SEDAR 85 stock assessment for yellowedge grouper and Tier 3b of the Council's ABC Control Rule for the other three DWG species. **Preferred Alternative 2** incorporates the SSC's recommendations from its February 2024 meeting, which used MRIP-FES data for recreational private vessel landings. The DWG complex OFL would be 731,035 lb gw, and the ABC would be 555,026 lb gw. **Preferred Alternative 2** would also modify the MSY proxy for the DWG complex to be the yield when fishing at $F_{40\%SPR}$, based on the SSC's recommendations for yellowedge grouper and the similarities between the species in the DWG complex with respect to their life histories. The SSC recommended changing the yellowedge grouper MSY proxy because yellowedge grouper reaches sexual maturity at older ages relative to other Gulf groupers (half of females are sexually mature by age-9, compared to age-3 in red grouper) and is longer lived (maximum age is estimated at 85 years, SEDAR 85 2023). The other species in the complex are not as long-lived as yellowedge grouper but share other similar characteristics such as later maturity at age (Stevens et al. 2019). Amendment 48 to the Reef Fish FMP provides that for future assessments of reef fish stocks, the MSY proxy equals the yield produced by the $F_{Proxy}$ recommended by the SSC and subject to approval by the Council through a plan amendment. This amendment recognizes the SSC's recommendation for yellowedge grouper, and because yellowedge is managed as part of the DWG complex and the other species in the complex have similar life histories, adopts this new MSY proxy for the complex.

To reduce the likelihood of dead discards, and due to the difficulty in targeting any specific DWG species separate from the others, the four DWG complex species are managed as a single complex under **Preferred Alternative 2**. Despite combining the yellowedge grouper OFL and ABC with the three other DWG species, the recommended catch limits are expected to end and prevent future overfishing of yellowedge grouper. This is due in part to the historical composition of landings from the DWG complex, in that the other three species normally account for some minority fraction of landings for that complex (approximately 20% for 2019 – 2023; see Table 1.1.2).

Compared to **Alternative 1**, **Preferred Alternative 2** would reduce allowable catch of DWG by approximately 50%. This reduction is explained by three main factors. First, the use of the MSY proxy ($F_{40\%SPR}$) for yellowedge grouper results in a reduction in allowable yield compared to **Alternative 1**, as more of the spawning stock biomass is conserved. Second, when evaluating the projections for yellowedge grouper, the SSC used the average recruitment to the population from 1998 – 2012 to inform future recruitment from the yellowedge grouper stock. This timeline includes periods of lower recruitment (during the time period in which recruitment was estimable), and results in a lower yield projection to account for that. Third, the yield projections informing **Preferred Alternative 2** are designed to end overfishing, as is currently occurring under **Alternative 1**.

## 2.2 Action 2: Modification of Deep-Water Grouper Sector ACLs and Sector Allocations

**Note: This action assumes that Alternative 2 in Action 1 is selected as the Preferred Alternative. Therefore, Alternative 1 reflects the status quo method of specifying the catch limits but uses the ABC from Alternative 2 in Action 1 to specify the complex ACL. All of the alternatives would account for the change in the recreational data from MRFSS to MRIP-FES.**

**Alternative 1:** No Action. The Generic ACL/AM Amendment allocated 96.50% of the DWG complex ACL for the commercial sector based on landings during 2001-2004. The recreational sector's ACL is unspecified.

The DWG complex ACL is set equal to the DWG complex ABC. Based on the DWG complex ABC of 555,026 lb gw, the commercial ACL is 535,600 lb gw. The commercial quota is reduced from the commercial ACL by 4%[9] and is set at 514,176 lb gw[10]. These values are shown in the table below in lb gw. As described in the Generic ACL/AM Amendment, the recreational harvest is managed through the current recreational accountability measures (AMs).

| Year | OFL | ABC (Complex ACL) | Rec ACL | Comm ACL | Comm Quota |
|---|---|---|---|---|---|
| 2025-2029+ | 731,035 | 555,026 | Unspecified | 535,600 | 514,176 |

**Alternative 2:** The DWG complex ACL is set equal to the DWG complex ABC. Establish a recreational ACL and sector allocation based on the average recreational landings as used in the Generic ACL/AM Amendment (2001 – 2004). This results in a recreational ACL of 19,426 lb gw, or 3.50% of the complex ACL. The commercial sector is allocated 96.50% of the complex ACL, or 535,600 lb gw. The commercial quota is reduced from the commercial ACL by 4% and is set at 514,176 lb gw. The recreational and commercial ACLs sum to equal the DWG complex ACL.

| Year | OFL | ABC (Complex ACL) | Rec ACL | Comm ACL | Comm Quota |
|---|---|---|---|---|---|
| 2025-2029+ | 731,035 | 555,026 | 19,426 | 535,600 | 514,176 |

[9] The 4% reduction in the commercial quota from the commercial ACL was implemented with the Grouper-Tilefish Individual Fishing Quota (IFQ) program. The buffer accounts for flexibility measures which allow for a system of cross-use of allocation between the DWG and Other Shallow-water Grouper share categories, and for any other variability in landings associated with the institution of the program or new participation.

[10] The commercial ACL and commercial quota are presently codified in the federal regulations as 1.067 million pounds gutted weight (mp gw) and 1.024 mp gw, respectively; the recreational ACL is not codified.

**Preferred Alternative 3:** The DWG complex ACL is set equal to the DWG complex ABC. Establish a recreational ACL and sector allocation based on the average recreational landings from the most recent 5 years (2019 – 2023). This results in a recreational ACL of 56,668 lb gw, or approximately 10.21% of the complex ACL. The commercial sector is allocated approximately 89.79% of the complex ACL, or 498,358 lb gw. The commercial quota is reduced from the commercial ACL by 4% and is set at 478,424 lb gw. The recreational and commercial ACLs sum to equal the DWG complex ACL.

| Year | OFL | ABC (Complex ACL) | Rec ACL | Comm ACL | Comm Quota |
|---|---|---|---|---|---|
| 2025-2029+ | 731,035 | 555,026 | 56,668 | 498,358 | 478,424 |

**Alternative 4:** The DWG complex ACL is set equal to the DWG complex ABC. Establish a recreational ACL and sector allocation based on an equal reduction in the landings from the recreational and commercial sectors from the most recent 5 years (2019 – 2023; see Table 1.1.2), such that the resulting sector ACLs do not exceed the complex ACL proposed in Action 1. This results in a recreational ACL of 37,964 lb gw, or approximately 6.84% of the complex ACL. The commercial sector is allocated approximately 93.16% of the complex ACL, or 517,062 lb gw. The commercial quota is reduced from the commercial ACL by 4% and is set at 496,380 lb gw. The recreational and commercial ACLs sum to equal the DWG complex ACL.

| Year | OFL | ABC (Complex ACL) | Rec ACL | Comm ACL | Comm Quota |
|---|---|---|---|---|---|
| 2025-2029+ | 731,035 | 555,026 | 37,964 | 517,062 | 496,380 |

**Discussion:**

Currently, there is no specified DWG ACL for the recreational sector. However, the commercial ACL was specified as 96.5% of the DWG complex ACL (**Alternative 1**) so there would be a portion of the total ACL unallocated which would be sufficient to allow the historical recreational fishery to continue (GMFMC 2011). There are no in-season measures that limit recreational harvest, but there is a 4-grouper daily recreational bag limit. The post-season AM only limits recreational harvest (in the year following an overage of the DWG complex ACL) after the DWG complex ACL has been reached. In addition, the recreational AM could still allow for overfishing since recreational landings could exceed the 3.5% of the DWG complex ACL prior to closure of the recreational fishery, while still allowing harvest of the entire commercial quota. This could occur because the AM allows NMFS to close the recreational sector only if the sum of commercial and recreational landings reaches or is projected to reach the DWG complex ACL. The commercial sector operates under the Grouper-Tilefish IFQ program and is managed to the commercial quota and is allowed to fish year-round. Therefore, total commercial landings cannot be determined until the fishing year is over.

The current commercial allocation is based on that sector's average landings from 2001 – 2004. Further, the commercial quota is decreased from the commercial ACL by 4%. This buffer was

originally intended to account for uncertainty in commercial discards at the inception of the IFQ program, and to accommodate the flexibility measures that exist in the IFQ program between the Other Shallow-water Grouper and DWG share categories. In a recent stock assessment (SEDAR 85 2023), the commercial removals for yellowedge grouper were input as known with 1% error, indicating high precision, and negating the need to continue to account for uncertainty in commercial discards. Remaining, the flexibility measures allow a fisherman to land certain species from one share category under the other share category, so long as they no longer hold any allocation for the share category in which the species is included. These flexibility measures are being reconsidered in Reef Fish Amendment 58A. If, in that amendment, the flexibility measures are not continued, then the commercial quota for DWG will be set equal to the commercial ACL, with no buffer. These catch limits are provided for all alternatives in Action 2.

The recreational landings used to establish the allocation scenario in **Alternative 1** were based on recreational data from MRFSS. Because of the transition to MRIP-FES recreational data (which generally estimate greater historical recreational landings than MRFSS) and the increase in recreational landings estimated in the SEDAR 85 stock assessment, additional recreational removals are not accounted for in **Alternative 1** or **Alternative 2**. This means with the reduction in the catch limits recommended by the Council's SSC, there is an increased relative reduction to the recreational sector compared to the commercial sector because recreational landings estimates in **Preferred Alternative 3** and **Alternative 4** use MRIP-FES data, which estimate higher recreational landings compared to the MRFSS estimates used in **Alternative 1** and **Alternative 2**. Thus, the commercial sector is inherently benefitting from a sector allocation standpoint if the sector allocation does not explicitly account for the change from MRFSS to MRIP-FES, because after the implementation of this amendment, MRIP-FES landings estimates will be used to monitor recreational landings. Although **Alternative 2** would benefit the commercial sector by retaining the same allocation scenario as represented in **Alternative 1**, having a recreational ACL could allow for the establishment of a more effective recreational AM (see Action 3). Managing the recreational sector may be difficult given the high proportional standard error surrounding DWG recreational landings. Under **Alternative 2**, the recreational ACL would have been exceeded in each of the last 5 years (2019-2023).

**Preferred Alternative 3** would establish a recreational ACL and sector allocation based on the average recreational landings from the most recent five years (2019 – 2023; see Table 1.1.2.). This time period includes 2020, during which the COVID-19 pandemic resulted in various effects on fishing effort and landings. However, the DWG landings do not demonstrate any obvious effect from this during 2020. Overall commercial fishing effort, and landings per trip, are similar to surrounding years (e.g., 2018-2019, 2021-2022). The high variability in the recreational landings data make comparisons among years less meaningful. Thus, in the absence of a quantitative reason for excluding 2020, those data are included here. The recreational ACL would equal 56,668 lb gw, or approximately 10.21% of the DWG complex ACL. The commercial ACL would equal 498,358 lb gw, or approximately 89.79% of the DWG complex ACL. The commercial quota is reduced from the commercial ACL by 4% and is set at 478,424 lb gw. **Preferred Alternative 3** use more recent recreational landings compared to **Alternative 1** and **Alternative 2**, and landings estimates have ranged from 29,663 lb gw to 88,807 lb gw.

Under **Preferred Alternative 3**, the recreational ACL would have been exceeded in three of the last 5 years (2019, 2020, and 2023).

**Alternative 4** would establish a recreational ACL and sector allocation based on an equal reduction in the landings from the recreational and commercial sectors from 2019 – 2023 (see Table 1.1.2), such that the resulting sector ACLs sum to the DWG complex ACL proposed in Action 1. This method uses a percentage reduction based on the proportional landings attributable to each sector during the reference period. To make this reduction, the average landings from 2019 – 2023 (828,298 lb gw) were compared to the proposed DWG complex ACL (555,026 lb gw), indicating that a reduction in landings of approximately 33% would be necessary to constrain landings to the proposed DWG complex ACL. This percent reduction was applied to the average recreational landings from 2019 – 2023, and results in a recreational ACL of 37,964 lb gw, or approximately 6.84% of the DWG complex ACL. The commercial sector, equally reduced, is allocated approximately 93.16% of the DWG complex ACL, or 517,062 lb gw. The commercial quota is reduced from the commercial ACL by 4% and is set at 496,380 lb gw. **Alternative 4** applies proportionally the same degree of reduction in recent landings to each fishing sector, based on those sectors' respective landings from 2019 - 2023. Under **Alternative 4**, the recreational ACL would have been exceeded in 4 of the last 5 years (2019, 2020, 2022, and 2023).

The alternatives in Action 2 differ in how they determine the sector allocation. **Alternative 2** uses the existing allocation to create a recreational ACL, thereby using the historical proportion of landings attributable to each fishing sector from the Generic ACL/AM Amendment. However, because recreational landings would now be monitored using MRIP-FES, not MRFSS, these catch limits represent a lower allowable harvest relative to the historical proportions. **Preferred Alternative 3** uses the average landings from the recreational sector from 2019 – 2023, and then deducts that value from the DWG complex ACL; the remainder is then allocated to the commercial sector. **Alternative 4** equally reduces the average landings (on a percentage basis) for both the commercial and recreational sectors from 2019 – 2023 such that the resulting sector ACLs do not exceed the DWG complex ACL proposed in Action 1.

Appendix B in this document characterizes the expected reduction in quota compared to recent landings for the commercial IFQ program, and estimates the recreational fishing season duration, using landings data from 2021 – 2023. Under all alternatives in Action 2, the commercial sector would be expected to land its quota based on its average landings from 2021 – 2023. For the recreational sector the number of fishing days needed to harvest the ACL is directly related to the size of the recreational ACL and to the month in which fishing occurs. Table 2.2.1, which mirrors Table B.4 from Appendix B, shows the predicted recreational closure dates based on when the ACL is projected to be met. The longest recreational fishing season duration corresponds with **Preferred Alternative 3**. However, due to the variability in the landings in the three-year period used, there still exists a possibility that the average landings from a three-year period could exceed the recreational ACL under **Preferred Alternative 3**. The next longest fishing season duration corresponds with **Alternative 4**, followed equally by **Alternative 1** and **Alternative 2**.

**Table 2.2.1.** Projected Gulf DWG closure dates expected for the recreational sector with each proposed ACL alternative.

| Alternatives | Proposed Recreational ACL (lb gw) | 3-year Average (2021-2023) | Upper 95% 3-year Average (2021-2023) |
|---|---|---|---|
| **Alternative 1: No Action** | **undefined** | **Jun 10** | **May 12** |
| **Alternative 2** | **19,426** | **Jun 10** | **May 12** |
| **Preferred Alternative 3** | **56,668** | **No Closure** | **Jul 1** |
| **Alternative 4** | **37,964** | **Sep 14** | **Jun 5** |

Source: SEFSC MRIP-FES Recreational ACL Dataset (December 2024). Note: the fishing year for DWG is January 1 – December 31.

Under **Alternative 2**, **Preferred Alternative 3**, and **Alternative 4**, the recreational and commercial ACLs sum to equal the DWG complex ACL, which is set equal to the DWG complex ABC. **Preferred Alternative 3** and **Alternative 4** would set the recreational sector's allocation of the total DWG complex ACL higher than **Alternative 2**. Under all alternatives and based on the estimated recreational landings from the most recent 5 years, it is possible that recreational landings would exceed the recreational ACL. However, the larger ACL in **Preferred Alternative 3** would make exceeding the ACL less likely than under other alternatives and may improve the ability of NMFS to monitor recreational harvest against the recreational ACL and apply any AMs as necessary compared to **Alternative 2** (there is no recreational ACL under **Alternative 1**) and **Alternative 4**, which have comparatively lower proposed recreational ACLs. This is because a larger ACL may result in landings being spread over a longer time period and allow for more landings data to accumulate and be used in the landings estimated before an ACL closure is implemented. Table 2.2.2 shows the sector allocations and corresponding ACLs in this action. Figure 2.2.1 demonstrates how the alternatives in Action 2 compared to recreational landings from 2014 – 2023. Over the last 10 years, recreational landings would have exceeded the recreational ACL nine times under **Alternative 2**, five times under **Preferred Alternative 3**, and seven times under **Alternative 4**. Similar data for the commercial sector are not presented, because recent commercial landings exceed the proposed commercial ACLs in all alternatives in Action 2 for the last 10 years. However, because the commercial sector is managed under an IFQ program, the commercial ACL is not expected to be exceeded no matter the alternative chosen in this action.

**Table 2.2.2.** Sector allocations and corresponding ACLs for alternatives presented in Action 2. All ACLs are in lb gw.

| Alternative | Complex ACL | Rec Sector Allocation | Rec ACL | Comm Sector Allocation | Comm ACL | Comm Quota |
|---|---|---|---|---|---|---|
| **1** | 555,026 | *none* | *undefined* | 96.50% | 535,600 | 514,176 |
| **2** | 555,026 | 3.50% | 19,426 | 96.50% | 535,600 | 514,176 |
| **Preferred-3** | 555,026 | 10.21% | 56,668 | 89.79% | 498,358 | 478,424 |
| **4** | 555,026 | 6.84% | 37,964 | 93.16% | 517,062 | 496,380 |

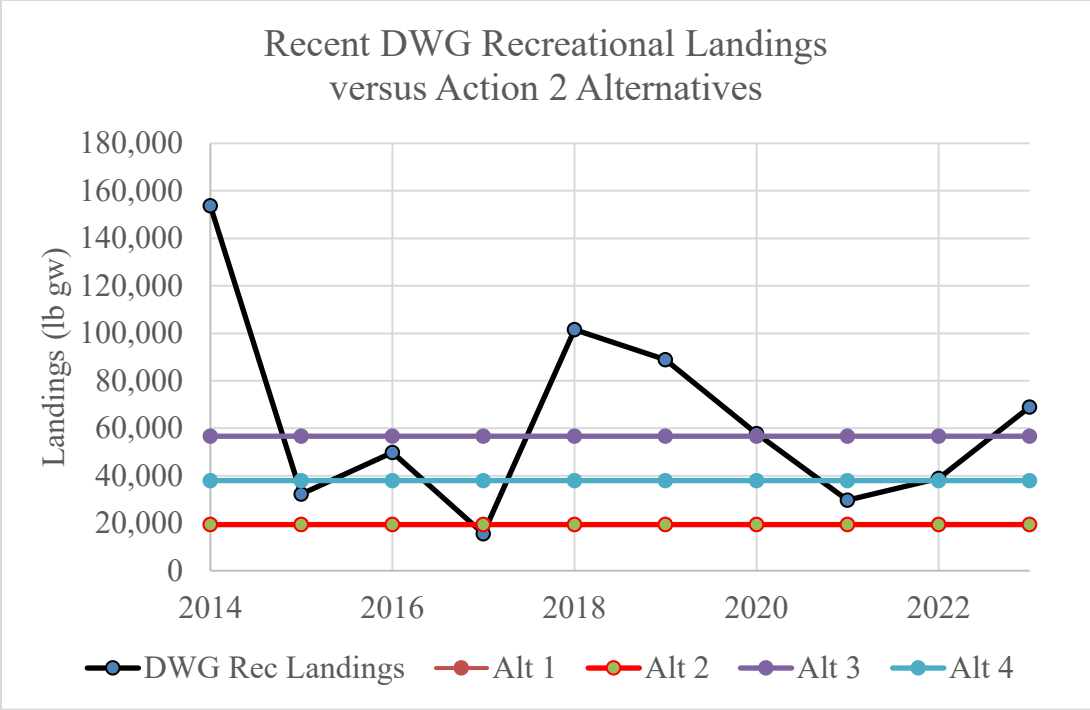


**Figure 2.2.1.** Comparison of recent landings of the DWG complex by the recreational sector in lb gw to the alternatives in Action 2. Recreational landings data derived from Table 1.1.2. The data for **Alternative 1** and **Alternative 2** overlap.

It is important to note that the representativeness and accuracy of the MRIP-FES recreational landings estimates is highly uncertain. This is due to two main reasons. First, the portion of the MRIP-FES survey which records catch, known as the Access Point Angler Intercept Survey (APAIS), is constrained to sampling at public locations and marinas which grant a surveyor access. Excluded from APAIS are all private docks and marinas, and other private access points. Given the distances necessary to travel to access the depths in which DWG species are typically harvested (again, greater than 100 meters or 330 feet, often requiring vessels to traverse long distances across Gulf waters to reach), larger vessels with greater fuel capacity and large and/or multiple engines are often used by private anglers to fish these species. This means that the recreational landings for private vessels are likely underestimated, and this potential bias should be considered in setting catch limits. Second, the proportional standard error about the annual recreational landings estimates for the species in the DWG complex regularly exceeds 50%, even when aggregated to the greatest possible degree (i.e., all recreational fleets combined, all areas in the Gulf combined, and all MRIP waves combined).[11] However, these data represent the only scientific information available related to recreational landings from Florida, Alabama, and Mississippi, and will be used as appropriate to monitor harvest as required under section 303(a)(15) of the Magnuson-Stevens Fishery Conservation and Management Act and the National Standard 1 Guidelines.

[11] https://www.fisheries.noaa.gov/data-tools/recreational-fisheries-statistics-queries

## 2.3 Action 3: Modification of Deep-Water Grouper Recreational Accountability Measures

**Alternative 1:** No Action. Maintain the recreational AMs for the DWG complex. If the total complex ACL is exceeded in a fishing year, then in the following fishing year, the Regional Administrator will close the recreational sector for the remainder of the fishing year if the sum of commercial and recreational landings reaches or is projected to reach the total complex ACL.

***Note: This AM directs NMFS to close the recreational sector only if the sum of commercial and recreational landings reaches or is projected to reach the total complex ACL. Because the IFQ system allows commercial landings year-round, it is unlikely that this AM will effectively constrain recreational landings to the remainder of the complex ACL unless NMFS assumes at the beginning of the fishing year that 100% of the commercial quota will be landed. However, this assumption is not clearly stated in the current AM.***

**Alternative 2**: Revise the post-season recreational AMs for the DWG complex. For the recreational sector, if the recreational ACL is exceeded in a fishing year, then in the following fishing year, the Regional Administrator would close the recreational sector for the DWG complex for the remainder of that fishing year when the recreational ACL is projected to be met.

**Alternative 3**: Revise the post-season recreational AMs for the DWG complex. For the recreational sector, if the recreational ACL is exceeded in a fishing year and the total complex ACL for DWG is exceeded, then in the following fishing year, the Regional Administrator would close the recreational sector for the DWG complex for the remainder of the fishing year when the recreational ACL is projected to be met.

**Preferred Alternative 4**: For the recreational sector, if the average recreational DWG landings exceed the average recreational ACL, and the average DWG complex landings exceed the average DWG complex ACL over a three-year moving period, the Regional Administrator would reduce the duration of the recreational season by the amount projected such that the recreational ACL is not exceeded during the following fishing year unless NMFS determines based upon the best scientific information available (BSIA) that no adjustment to the recreational fishing season is necessary.

**Discussion:**

The current AMs for the DWG complex were established in the Generic ACL/AM Amendment (GMFMC 2011). These AMs, based on 96.5% commercial allocation, are reflected in **Alternative 1**. While the commercial allocation constitutes a large proportion of the complex ACL, it was deemed to not be excessive given the historical use of the resource at the time (GMFMC 2012). DWG species are found at greater depths and further distances from shore than most reef fish species, requiring larger vessels with greater fuel capacity and large and/or multiple engines to fish these species. However, there is some recreational harvest for these species, so the methods employed in GMFMC (2011a) left a portion of the complex ACL unallocated, which was thought to be sufficient at the time to allow the historical recreational fishery to continue. Stock complexes like the DWG complex did not have AMs other than IFQs

applied to commercial harvest at the time of the implementation of the Generic ACL/AM Amendment. The DWG complex did not apportion catch between sectors and the ACL applies to the complex as a whole. None of the DWG complex stocks were overfished, in a rebuilding plan, or undergoing overfishing as of 2008; therefore, the likelihood the DWG ACL would be exceeded was minimal. The rationale for the recreational AM was to allow for the historical recreational component to continue unencumbered. For this reason, a post-season AM was thought to be appropriate for the DWG complex, and no overage adjustment (payback provision) was applied. However, **Alternative 1** is currently unlikely to constrain recreational landings because of the greatly reduced catch limits required under Action 1 and because the IFQ system allows commercial landings year-round. To increase the likelihood of constraining landings to the stock ACL, NMFS would have to assume at the beginning of the fishing year that the entire commercial quota would be landed and make projections on when to close the recreational season based on that assumption. However, since it is not clear that this was the intent of the AM when regulations were implemented, it is unclear whether NMFS could make that assumption.

**Alternative 2** is proposed because yellowedge grouper is undergoing overfishing as of 2021 SEDAR 85 (2023), and the Council must take steps to end overfishing. This is expected to be accomplished through the reduction of catch limits, as specified in Alternative 2 of Action 1. However, AMs are necessary to help ensure that those reduced catch limits are not exceeded. **Alternative 2** would modify the post-season AMs for the recreational sector such that if the recreational ACL, as established in Action 2, is exceeded in a fishing year, then in the following fishing year, the Regional Administrator would close the recreational sector for the DWG complex for the remainder of that fishing year (post-season AM) when the recreational ACL is projected to be met. The very low level of allowable harvest attributed to the recreational sector under Alternative 1 and Alternative 2 of Action 2 would both present concerns about the ability to accurately restrain recreational harvest to the recreational ACL under **Alternative 2** in Action 3. The high interannual variability of these landings (see Table 1.1.2) would be expected to make accurately forecasting recreational fishing season durations difficult, and overages (or underages) of the recreational ACL would be expected. Preferred Alternative 3 and Alternative 4 in Action 2 both increase the recreational ACL relative to Alternative 2 in Action 2 and would increase the likelihood of avoiding a closure of the recreational fishing season due to imprecise recreational landings data under **Alternative 2** in Action 3.

**Alternative 3** would revise the post-season recreational AMs for the DWG complex such that the Regional Administrator would close the recreational sector for the DWG complex when the recreational ACL is projected to be met only if both the recreational ACL and the total complex ACL had been exceeded in the previous fishing year. For the commercial sector, the Grouper-Tilefish IFQ program would continue to serve as the AM. **Alternative 3** is similar to **Alternative 2** in that it is applied post-season; however, the threshold for a closure in the following fishing year is higher under **Alternative 3**. Based on the landings history in Table 1.1.2, it would be unlikely that the commercial sector would not land its quota, regardless of the selected preferred alternative in Action 2.

**Preferred Alternative 4** would revise the post-season AM for the recreational sector such that if the average recreational DWG landings exceed the average recreational ACL, and the average

DWG complex ACL is exceeded over a three-year moving period, the Regional Administrator would reduce the duration of the recreational season by the amount necessary to ensure that the recreational ACL is not exceeded during the following fishing year unless NMFS determines based upon BSIA that no adjustment to the recreational fishing season is necessary. In practice, consideration of BSIA is standard by the Regional Administrator when projecting fishing season durations. However, in this instance, the Council thought it worthy to include such language in **Preferred Alternative 4** to make clear, the latitude available to NMFS under National Standard 2 to consider the available data and make the appropriate decision. **Preferred Alternative 4** examines the relationship between the recreational landings and recreational ACL and complex ACL annually but considers the application of the AM based on this relationship over a three-year period. The use of the average landings over that three-year period allows for some variation in the landings data between years without triggering the AM annually. Even still, the recreational landings are monitored annually against the recreational ACL to facilitate the application of the AM in years when it applies. Recreational landings would be evaluated relative to the recreational ACL as follows. For the year of implementation ($I_0$), only landings from $I_0$ would be compared to the recreational ACL and DWG complex ACL; in the year following implementation ($I_1$), the average of $I_0$ and $I_1$ landings would be compared to the average recreational ACL and DWG complex ACL for those two years; and in the second year following implementation and subsequent fishing years, the 3-year running average landings would be compared to the average recreational ACL and DWG complex ACL for the same three years. Using the average recreational ACL and DWG complex ACL for this alternative is necessary to account for instances when catch limits might change in the future, but the AM does not.

The probability of the recreational ACL being exceeded is discussed in Action 2 and in Table 2.2.1, which mirrors Table B.4 from Appendix B. Table 3.3.1 demonstrates, based on the last 10 years (2014 – 2023), when the AM would have been applied under **Preferred Alternative 4**. Table 3.3.1 corroborates the recreational fishing season duration analysis (Appendix B) relative to the proposed recreational ACLs in Action 2 and assumes that the commercial quota will be landed in each fishing year based on the data in Table 1.1.2. Even under the highest proposed recreational ACL (Preferred Alternative 3 in Action 2), there exists the possibility that the average recreational landings over a three-year period could exceed the recreational ACL.

**Table 3.3.1.** Demonstration of the annual application of the AM proposed in Preferred Alternative 4 of Action 3 for the recreational sector, based on that sector's DWG landings from 2014 – 2023. Landings and ACLs are based in part on MRIP-FES and are in lb gw.

| Year | Total Rec Landings | Rec ACL: Action 2 Alt 2 | Comm Quota: Action 2 Alt 2 | Complex ACL: Action 2 Alt 2 | Action 3 Alt 4 AM applied? | Rec ACL: Action 2 Pref Alt 3 | Comm Quota: Action 2 Pref Alt 3 | Complex ACL: Action 2 Pref Alt 3 | Action 3 Alt 4 AM applied? | Rec ACL: Action 2 Alt 4 | Comm Quota: Action 2 Alt 4 | Complex ACL: Action 2 Alt 4 | Action 3 Alt 4 AM applied? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 | 153,669 | 19,426 | 514,176 | 555,026 | | 56,668 | 478,424 | 555,026 | | 37,964 | 496,380 | 555,026 | |
| 2015 | 32,258 | 19,426 | 514,176 | 555,026 | | 56,668 | 478,424 | 555,026 | | 37,964 | 496,380 | 555,026 | |
| 2016 | 49,441 | 19,426 | 514,176 | 555,026 | | 56,668 | 478,424 | 555,026 | | 37,964 | 496,380 | 555,026 | |
| 2017 | 15,619 | 19,426 | 514,176 | 555,026 | Yes | 56,668 | 478,424 | 555,026 | Yes | 37,964 | 496,380 | 555,026 | Yes |
| 2018 | 101,224 | 19,426 | 514,176 | 555,026 | No | 56,668 | 478,424 | 555,026 | No | 37,964 | 496,380 | 555,026 | No |
| 2019 | 88,807 | 19,426 | 514,176 | 555,026 | Yes | 56,668 | 478,424 | 555,026 | No | 37,964 | 496,380 | 555,026 | No |
| 2020 | 57,491 | 19,426 | 514,176 | 555,026 | Yes | 56,668 | 478,424 | 555,026 | No | 37,964 | 496,380 | 555,026 | Yes |
| 2021 | 29,663 | 19,426 | 514,176 | 555,026 | Yes | 56,668 | 478,424 | 555,026 | Yes | 37,964 | 496,380 | 555,026 | Yes |
| 2022 | 38,848 | 19,426 | 514,176 | 555,026 | Yes | 56,668 | 478,424 | 555,026 | No | 37,964 | 496,380 | 555,026 | Yes |
| 2023 | 68,438 | 19,426 | 514,176 | 555,026 | Yes | 56,668 | 478,424 | 555,026 | No | 37,964 | 496,380 | 555,026 | No |

All alternatives in Action 3 are post-season AMs. However, **Preferred Alternative 4** is less likely to be triggered than **Alternative 2**, which requires only one overage of the recreational ACL to take effect. **Preferred Alternative 4** is also less likely to be triggered than **Alternative 3** which, despite also requiring both the recreational ACL and DWG complex ACL to be exceeded to be triggered, only requires an overage in the previous year. Based on the landings in Table 1.1.2, the proposed catch limits specified in Alternative 2 of Action 1, and on Alternatives 1-4 in Action 2, it is possible that the fishing season for the recreational sector under **Alternative 2** or **Alternative 3** in Action 3 would not continue for the full year as it has in previous years. The same is expected for **Preferred Alternative 4**, depending on the relationship between the recreational DWG landings and the recreational and DWG complex ACLs in the applicable three-year period.

Without proper consideration of ACLs and AMs for the recreational sector, overages of the recreational ACL may occur. It is common in these circumstances for overages of the complex ACL to occur due to the imprecision of the data available for fishing season projections (and particularly for recreational fishing seasons), and when the closure of the fishing season is scheduled. These fishing season projections are only as reliable as the data upon which they are based. These MRIP-FES data are presently only representative of Mississippi, Alabama, and Florida; Texas and Louisiana have separate recreational data collection programs for estimating recreational landings. The precision of the Texas and Louisiana programs with respect to DWG species has not yet been reviewed by the Council's SSC.

# CHAPTER 3. AFFECTED ENVIRONMENT

## 3.1 Description of the Physical Environment

**General Description of the Physical Environment**

The physical environment for Gulf of America (Gulf) reef fish is detailed in the Environmental Impact Statement (EIS) for the Generic Essential Fish Habitat (EFH) Amendment (GMFMC 2004a), Generic EFH Amendment 3 (GMFMC 2005), and the Generic Annual Catch Limit/Accountability Measure (ACL/AM) Amendment (GMFMC 2011a), which are hereby incorporated by reference and summarized below.

The Gulf has a total area of approximately 600,000 square miles (1.5 million $km^2$), including state waters (Gore 1992). It is a semi-enclosed, oceanic basin connected to the Atlantic Ocean by the Straits of Florida and to the Caribbean Sea by the Yucatan Channel (Figure 3.1.1).

Oceanographic conditions are affected by the Loop Current, discharge of freshwater into the northern Gulf, and a semi-permanent, anti-cyclonic gyre in the western Gulf. The Gulf includes both temperate and tropical waters (McEachran and Fechhelm 2005). Gulf water temperatures range from 54º F to 84º F (12º C to 29º C) depending on time of year and depth of water. Mean annual sea surface temperatures ranged from 73º F through 83º F (23-28º C), including bays and bayous (Figure 3.1.1), between 1982 and 2009, according to satellite-derived measurements (NODC 2011).[12] In general, mean sea surface temperature increases from north to south with large seasonal variations in shallow waters.

[12] http://accession.nodc.noaa.gov/0072888

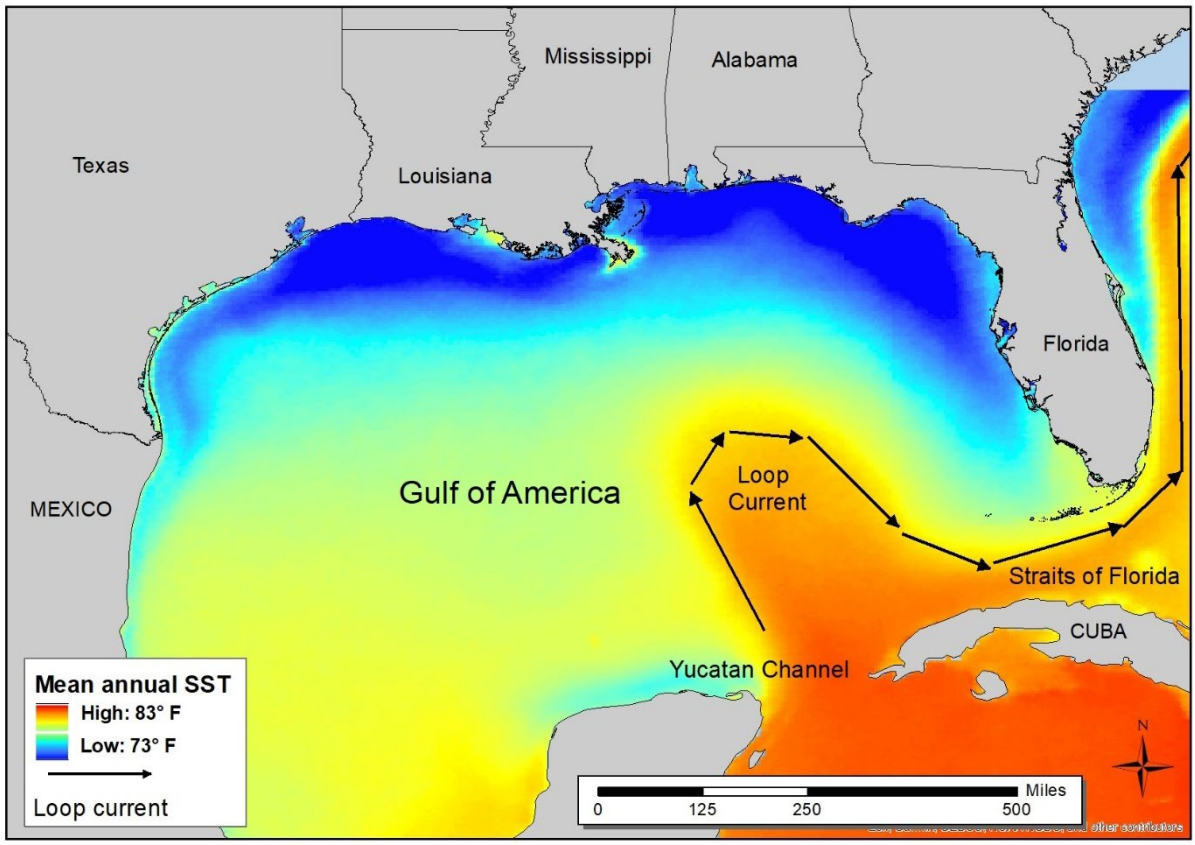


**Figure 3.1.1.** Mean annual sea surface temperature derived from the Advanced Very High-Resolution Radiometer Pathfinder Version 5 sea surface temperature data set.[13]

**General Description of the Reef Fish Physical Environment**

In general, reef fish are widely distributed in the Gulf, occupying both pelagic and benthic habitats during their life cycle. They generally have a planktonic larval stage that lives in the water column and feeds on zooplankton and phytoplankton (GMFMC 2004a). Juvenile and adult reef fish are typically demersal and usually associated with bottom topographies on the continental shelf (less than 100 m) which have high relief, i.e., coral reefs, artificial reefs, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings. However, several species are found over sand and soft-bottom substrates. For example, some juvenile snapper (e.g., mutton, gray, red, dog, lane, and yellowtail snappers) and grouper (e.g., goliath, red, gag, and yellowfin groupers) are associated with inshore seagrass beds, mangrove estuaries, lagoons, and larger bay systems.

[13] http://pathfinder.nodc.noaa.gov

**Habitat Areas of Particular Concern (HAPC) and Environmental Sites of Special Interest**

Detailed information pertaining to HAPCs is provided in Generic Amendment 3 (GMFMC 2005) and Amendment 9 to the Fishery Management Plan for the Coral and Coral Reefs of the Gulf of Mexico, U.S. Waters (GMFMC 2018). Detailed information pertaining to the Gulf area closures and marine reserves is provided in Amendment 32 to the Fishery Management Plan for the Reef Fish Resources in the Gulf of Mexico (Reef Fish FMP; GMFMC 2011b). There are environmental sites of special interest that are discussed in the Generic EFH Amendment (GMFMC 2004a) that are relevant to Reef Fish management. These documents are hereby incorporated by reference.

**Northern Gulf Hypoxic Zone**

A large hypoxic zone forms every summer in the northern Gulf. It is the result of allochthonous materials and runoff from agricultural lands resulting in increasing nutrient inputs to multiple rivers. These tributaries feed into the Mississippi River, which disperses to the Gulf, and creates a temperature and salinity dependent layering of waters. The nutrient rich fresh waters from the Mississippi create seasonal, large algal blooms at the surface that eventually die, sink to the bottom, and decompose. This creates the oxygen-poor, hypoxic, bottom water layer unless front or storm events occur, which allows for mixing of the layers (Rabalais and Turner 2019). Mapping of the hypoxic zone began in 1985. For 2021, the extent of the hypoxic area was 6,334 square miles, almost triple what it was in 2020 (2,116 square miles), but still less than the extent of the 2017 hypoxic area (8,776 square miles). The changes in hypoxic area can be attributed to changing amounts of river discharge and its associated nutrient load and storm events. The major factor for the reduced size in 2020 was the active storm season with Hurricane Hanna passing right over the zone, allowing for mixing of the waters. The 2021 hypoxia area was higher than the 5-year hypoxic area average (5,408 square miles) and much larger than the 1,930 square mile goal set by the Interagency Mississippi River and Gulf of America Hypoxia Task Force to be reached by 2035.[14] The hypoxic conditions in the northern Gulf directly impact less mobile benthic macroinvertebrates (e.g., polychaetes) by influencing density, species richness, and community composition (Baustian and Rabalais 2009; Breitburg et al. 2018). However, more mobile macroinvertebrates and demersal fishes are able to detect lower dissolved oxygen levels and move away from hypoxic conditions. Therefore, these organisms are indirectly affected by limited prey availability and constrained available habitat (Baustian and Rabalais 2009; Craig 2012).

## 3.2 Description of the Biological/Ecological Environment

The biological environment of the Gulf, including for DWG species, is described in detail in the Generic EFH Amendment (GMFMC 2004a) and the Generic ACL/AM Amendment (GMFMC 2011a), which are hereby incorporated by reference and summarized below.

[14] http://gulfhypoxia.net

**Deep-water Grouper Biology**

The Gulf DWG species are assumed to each be single stock units. All four species are protogynous hermaphrodites (SEDAR 85 2023), meaning that they begin life as female and can transition to male at older ages. When this transition occurs differs by species and is considered uncertain. Generally, eggs and larvae of DWG species are thought to be pelagic. Juvenile yellowedge grouper, snowy grouper, warsaw grouper, and speckled hind juveniles seek out reef structure (GMFMC 2011). As adults, DWG species seek hardbottom habitat. Speckled hind will also seek out reefs, as will snowy grouper which, along with warsaw grouper, can be found on the shelf edge. Yellowedge grouper can reach a maximum age of 85 years, with 50% of females reaching sexual maturity by age-9 (SEDAR 85 2023). Given the depths at which DWG species are harvested (deeper than 100 meters or 330 feet), they are expected to be consistently vulnerable to barotrauma, and discard mortality is assumed to be near 100%.

**Status of the Stock for DWG Species**

See Chapter 1.1: Background, for more information. In summary, according to SEDAR 85 (2023), yellowedge grouper is not overfished but would be subject to overfishing as of 2021. Stock assessments have not been completed for snowy grouper, warsaw grouper, or speckled hind stocks in the Gulf.

**Bycatch**

Details of bycatch in the DWG portion of the reef fish fishery can be found in Appendix C to this document and is hereby incorporated by reference.

The DWG complex is part of the reef fish fishery, and DWG species may be captured incidentally while fishing for other species, especially other groupers and snappers which are known to be captured while targeting DWG. Several reef species are undergoing overfishing including gag, greater amberjack, cubera snapper, and lane snapper, while both gag and greater amberjack are also overfished. The overfished status of the DWG complex as a whole, meaning all four species combined, is unknown (National Marine Fisheries Service [NMFS] 4th quarter 2024 Update Summary of Stock Status for non-Federal Strategic Sourcing Initiative [FSSI] stocks).[15] However, the yellowedge grouper stock, which is a component of the DWG complex, was estimated to be undergoing overfishing in 2021 (SEDAR 85 2023). Minimum size limits are estimated to be the greatest source of regulatory discards for the majority of reef fish species, but there are no commercial or recreational size limits applicable to any DWG species. This amendment would reduce the DWG complex catch limits and implement accountability measures that are expected to shorten the recreational DWG fishing season duration (to date, the recreational season has never closed). This is expected to result in increased discards due to out of season catch, which may be a large source of regulatory DWG discards in the future. The recreational daily bag limit (1 speckled hind per person; 1 warsaw grouper per person; 4

[15] https://www.fisheries.noaa.gov/national/population-assessments/fishery-stock-status-updates

yellowedge per person; 4 snowy grouper per person; as part of a 4-total grouper recreational daily bag limit) can also contribute to bycatch, albeit less substantially than other sources of regulatory discards like a closed season. Because DWG habitat and fishing grounds overlap with other commonly targeted reef fish species like those in the mid-water snapper complex, catch (and potentially discards) of DWG complex species while targeting other species, and vice versa, may occur frequently. Interactions with other species such as sea turtles and sea birds are known to occur in general in the reef fish fishery but are minimal (see next section).

The analysis in Appendix C considers measures that are expected to affect DWG discard mortality due to reducing allowable catch and changing accountability measures for the recreational sector, resulting in a shortened recreational season. However, there is some biological benefit to the DWG complex that outweighs any increases in discards because these measures allow more fish to remain in the water due to the reduced catch limit and an expected reduction in the open fishing season duration. Ultimately, overall mortality of the DWG complex would be expected to be substantially lower under this rule due to the expected reduction in the duration of the recreational fishing season resulting from the reduced catch limits and new accountability measures.

**Protected Species and Protected Species Bycatch**

The National Marine Fisheries Services manages marine protected species in the Southeast region under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). A brief summary of these two laws and more information is available on NMFS Office of Protected Resources website.[16] ESA-listed species or Distinct Population Segments (DPS) of marine mammals, sea turtles, fish, and corals occur in the exclusive economic zone (EEZ) of the Gulf. There are numerous stocks of marine mammals managed within the Southeast region. All marine mammals in U.S. waters are protected under the MMPA.

The five whale species that may be present in the Gulf (blue, sperm, sei, fin, and Rice's[17]) are listed as endangered under the ESA. Rice's whales are the only resident baleen whales in the Gulf. Manatees, listed as threatened under the ESA, also occur in the Gulf and are the only marine mammal species in this area managed by the U.S. Fish and Wildlife Service.

Sea turtles, fish, and corals that are listed as threatened or endangered under the ESA occur in the Gulf. These include the following: five species of sea turtles (Kemp's ridley, loggerhead (Northwest Atlantic Ocean DPS), green, leatherback, and hawksbill); five species of fish (Gulf sturgeon, smalltooth sawfish, Nassau grouper, oceanic whitetip shark, and giant manta ray); and six species of coral (elkhorn, staghorn, lobed star, mountainous star, boulder star, and rough cactus). Critical habitat designated under the ESA for smalltooth sawfish, Gulf sturgeon, and the

[16] https://www.fisheries.noaa.gov/about/office-protected-resources

[17] The Rice's whale (*Balaenoptera ricei*) was previously classified as the Gulf Bryde's whale but was later identified as morphologically and genetically distinct from other whales under the Bryde's whale complex, warranting classification as a new species of baleen whale living in the Gulf.

Northwest Atlantic Ocean DPS of loggerhead sea turtles occur in the Gulf, though only loggerhead critical habitat occurs in federal waters. Critical habitat has been proposed in the Gulf for the North Atlantic DPS of green sea turtles.

The most recent biological opinion (BiOp) for the fishery management plan (FMP) was completed on September 30, 2011. The BiOp determined the operation of the Gulf reef fish fishery managed under the Reef Fish FMP is not likely to adversely affect ESA-listed marine mammals or coral and was not likely to jeopardize the continued existence of sea turtles (loggerhead, Kemp's ridley, green, hawksbill, and leatherback) or smalltooth sawfish. Since issuing the opinion, in memoranda dated September 16, 2014, and October 7, 2014, NMFS concluded that the activities associated with the Reef Fish FMP are not likely to adversely affect critical habitat for the Northwest Atlantic Ocean loggerhead sea turtle DPS and four species of corals (lobed star, mountainous star, boulder star, and rough cactus).

On April 6, 2016, NMFS and the U.S. Fish and Wildlife Service published a final rule (81 FR 20057) removing the range-wide and breeding population ESA-listings of the green sea turtle and listing eight DPSs as threatened and three DPSs as endangered. The North Atlantic DPS of green sea turtle occurs in the Gulf and is listed as threatened. In addition, on June 29, 2016, NMFS published a final rule (81 FR 42268) listing Nassau grouper as threatened under the ESA. NMFS has reinitiated consultation on the FMP to address these listings. In a memorandum dated September 29, 2016, NMFS determined that fishing under the Reef Fish FMP during the re-initiation period is not likely to jeopardize the continued existence of the North Atlantic DPS of green sea turtles or Nassau grouper.[18]

On January 22, 2018, NMFS published a final rule (83 FR 2916) listing the giant manta ray as threatened under the ESA. On January 30, 2018, NMFS published a final rule (83 FR 4153) listing the oceanic whitetip shark as threatened under the ESA. In a memorandum dated March 6, 2018, NMFS revised the request for re-initiation of consultation on the Reef Fish FMP to address the listings of the giant manta and oceanic whitetip. In that memorandum, NMFS also determined that fishing under the Reef Fish FMP during the extended re-initiation period will not jeopardize the continued existence of the giant manta ray, oceanic whitetip shark, Nassau grouper, or the North Atlantic and South Atlantic DPSs of green sea turtles.

NMFS published a final rule on April 15, 2019, listing the Gulf Bryde's whale (now Rice's whale, see footnote 14 above) as endangered. In a memorandum dated June 20, 2019, NMFS revised the re-initiation request to include the Gulf Bryde's whale (Rice's whale) and determined

[18] The memo also addressed the South Atlantic DPS of green sea turtle because at that time, NMFS thought that individuals from that DPS would be found in the Gulf based on a study that found that approximately 5% of the turtles sampled off the Atlantic coast of Florida came from the South Atlantic DPS. However, with additional research, NMFS has determined that South Atlantic juveniles are not likely to be occurring in U.S. mainland coastal waters in anything more than negligible numbers.

that fishing under the Reef Fish FMP during the re-initiation period will not jeopardize the continued existence of any of the newly listed species discussed above.[19]

There is no information to indicate marine mammals and birds rely on DWG species for food, and they are not generally caught by fishermen harvesting DWG species. The primary gear in the Gulf Reef Fish fishery used to harvest DWG species is hook-and-line and bottom longlines. These gear types are classified in the proposed 2025 Marine Mammal Protection Act List of Fisheries as a Category III fishery (89 FR 77789; September 24, 2024), meaning the annual mortality and serious injury of a marine mammal resulting from the fishery is less than or equal to 1% of the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. Additionally, there is no evidence that the Gulf DWG portion of the reef fish fishery as a whole is adversely affecting seabirds. Dolphins are the only species documented as interacting with the reef fish fishery. Bottlenose dolphin prey upon bait, catch, and/or discarded fish from the reef fish fishery.

## 3.3 Description of the Economic Environment

### 3.3.1 Commercial Sector

**Permits**

Any fishing vessel that harvests and sells any of the reef fish species managed under the Reef Fish FMP from the Gulf EEZ must have a valid Gulf reef fish permit. As of July 8, 2021, there were 825 limited access valid or renewable reef fish permits (SERO Permits Database, May 2022). Note more recent permit information is currently unavailable. In order to harvest DWG, a vessel permit must also be linked to an individual fishing quota (IFQ) account and possess sufficient allocation for this species. IFQ accounts can be opened, and valid permits can be linked to IFQ accounts at any time during the year. Eligible vessels can receive DWG allocation from other IFQ participants. On average from 2019 through 2023, there were 451 IFQ accounts that held DWG allocation and 70% of those held DWG shares (NMFS 2024b).

Although many fishing businesses only own one permitted vessel, some hold or own multiple permits and vessels. Detailed discussions on the business composition of IFQ participants are provided in the description of the economic environment sections of Amendment 53 (GMFMC 2021b) and Amendment 56 (GMFMC 2023) and are incorporated herein by reference.

Commercial harvest of reef fish in the Exclusive Economic Zone (EEZ) may only be sold to dealers with a federal dealer permit. As of December 21, 2021, there were 341 entities with a federal Gulf and South Atlantic Dealers (GSAD) permit (J. Dudley, NMFS SERO, pers. comm.

[19] The official change to the name has no effect on NMFS's conclusion that the activities associated with the Reef Fish FMP will not jeopardize the continued existence of the species during the revised reinitiation period.

2022). In order to purchase IFQ species, including DWG, dealers are also required to have a Gulf IFQ dealer endorsement. As of July 22, 2022, there were 166 eligible IFQ dealers; however, the total number of dealers can vary over the course of the year and from year to year.

**Vessels, Landings, and Dockside Revenue**

The information in Table 3.3.1.1 describes the landings and revenue for vessels that harvested DWG each year from 2019 through 2023, including their revenue from other IFQ species, Gulf non-IFQ fisheries, and South Atlantic fisheries. The number of vessels that harvested Other DWG varied from year to year with a notable increase in vessel participation from 2022 to 2023 (Table 3.3.1.1). On average, DWG comprised approximately 10% of vessels' total annual ex-vessel revenue, and IFQ species, in general, comprised 91% of revenue. DWG landings and ex-vessel revenue trended downwards during 2019 through 2023, with overall decreases of 37% and 36% respectively. Although not shown in the table, the maximum annual gross revenue earned by a single vessel from 2019 through 2023 was approximately $4.56 million (2024 dollars) in 2023.

**Table 3.3.1.1.** Landings and revenue statistics for vessels harvesting DWG species (2024 dollars).*

| Year | # of Vessels | DWG landings in pounds (lb) gutted weight (gw) | DWG ex-vessel revenue | Other IFQ species ex-vessel revenue | Gulf Non-IFQ species ex-vessel revenue | South Atlantic all species ex-vessel revenue | Average ex-vessel revenue per vessel |
|---|---|---|---|---|---|---|---|
| 2019 | 147 | 951,729 | $6,429,093 | $36,723,017 | $4,722,740 | $325,993 | $327,897 |
| 2020 | 147 | 803,754 | $4,922,333 | $38,427,301 | $3,318,671 | $101,618 | $318,163 |
| 2021 | 134 | 800,427 | $5,111,374 | $40,626,717 | $3,686,721 | $156,549 | $370,010 |
| 2022 | 138 | 559,908 | $3,841,927 | $42,304,207 | $3,813,889 | $389,466 | $364,851 |
| 2023 | 160 | 601,633 | $4,146,089 | $46,949,771 | $4,838,528 | $310,296 | $351,529 |
| Average | 145 | 743,490 | $4,890,163 | $41,006,203 | $4,076,110 | $256,784 | $346,490 |

Source: NMFS SERO IFQ database (accessed 5/1/2024) and Southeast Fisheries Science Center (SEFSC) Socioeconomic Panel (January 2025 version).
*Includes scamp landed using DWG quota under the DWG/SWG flexibility measures established in Amendment 29 to the Reef Fish FMP (GMFMC 2009).

**IFQ Share Transfer, IFQ Allocation Transfer, and Ex-vessel Prices**

Price information is important for evaluating the performance of a catch share program. Theoretically, allocation prices should reflect the expected annual profit from harvesting one unit of quota, whereas share prices should reflect the net present value of the expected profit from harvesting one unit of quota in the long run. Dockside or ex-vessel price is the price the vessel

receives at the first sale of harvest. Average share transfer[20] prices fluctuated from 2019 through 2023; whereas allocation transfer prices and ex-vessels prices remained relatively flat (Table 3.3.1.2). The average ex-vessel price increased by 2% overall during this period; the average allocation transfer price declined by 14%; and the average share price increased by 10%.

**Table 3.3.1.2.** Average DWG share transfer, allocation transfer, and ex-vessel prices per pound-gutted weight in 2024 dollars.

| Year | Share Transfer | Allocation Transfer | Ex-Vessel |
|---|---|---|---|
| 2019 | $11.01 | $1.26 | $6.76 |
| 2020 | $16.59 | $1.25 | $6.25 |
| 2021 | $12.67 | $1.18 | $6.47 |
| 2022 | $12.66 | $1.24 | $6.90 |
| 2023 | $12.15 | $1.08 | $6.90 |
| Average | $13.01 | $1.20 | $6.66 |

Source: NMFS (2024b).

Estimates of economic returns for vessels that harvested DWG during 2019-2023 are provided by Liese (2023).[21] Liese (2023) generated annual vessel-level estimates of costs (as a percentage of revenue) and net revenue from operations for vessels that harvested "Deep Water Groupers" in the Gulf. Estimates of producer surplus (PS) can be calculated from the cost information contained in Liese (2023) in conjunction with estimates of annual revenue from the SERO IFQ database and the SEFSC Social Science Research Group (SSRG) Socioeconomic Panel. PS is total annual revenue minus variable costs, including the costs for fuel, other supplies, and hired crew, as well as the opportunity cost of an owner's time as captain. Net revenue from operations, which most closely represents economic profits to the owner(s), is total annual revenue minus variable and fixed costs, including the costs for fuel, other supplies, hired crew, vessel repair and maintenance, insurance, and overhead, as well as the opportunity cost of an owner's time as captain and the vessel's depreciation. According to Liese (2023), PS for commercial vessels that harvested Gulf DWG was approximately 53.7% of their annual gross revenue, on average, from 2014 through 2018. Net revenue from operations was 39.9% of their annual gross revenue, on average, during this period. Applying these percentages to the results provided in Table 3.3.1.1 would result in an estimated per vessel average annual PS of $186,065 (2024 dollars) and an average annual net revenue from operations of $138,250 per year. Liese (2023) also provides annual trip-level estimates of costs (as a percentage of trip revenue) and trip net revenue for vessels that harvested snappers and groupers in the South Atlantic. According to Liese (2023), labor, including both hired and owner's time, consumed 31.2% of trip revenue and fuel and supplies consumed 17%, leaving a trip net revenue margin of 51.8%, on average, from 2014 through 2018.

[20] Share transfer price refers to the price paid to purchase a share percentage that equates to one pound of DWG allocation at the time the transfer occurs (NMFS 2024a).
[21] This report is available at: https://repository.library.noaa.gov/view/noaa/56480.

**Dealers**

The information in Table 3.3.1.3 illustrates the purchasing activities of dealers that bought DWG landed from vessels during 2019 through 2023. Like vessels, dealer participation in the DWG IFQ program is fluid, and not all dealers purchased DWG in each year during this time. On average, from 2019 through 2023, IFQ purchases comprised 53% of all purchases made by these dealers, with DWG species, in particular, accounting for 5% of total purchases. The average annual value of total purchases by these dealers trended upwards during the period (Table 3.3.1.3). Although not shown in the table, the maximum annual value of all purchases made by a single dealer from 2019 through 2023 was approximately $16 million (2024 dollars) in 2022.

**Table 3.3.1.3.** Purchase statistics for dealers that bought DWG (2024 dollars).

| Year | Number of Dealers | DWG Purchases | Other IFQ Purchases | Gulf Non-IFQ Purchases | South Atlantic Purchases | Average total purchases per dealer |
|---|---|---|---|---|---|---|
| 2019 | 64 | $6,924,772 | $52,191,864 | $39,803,936 | $18,490,169 | $1,834,543 |
| 2020 | 53 | $5,020,551 | $49,624,916 | $28,733,564 | $15,375,093 | $1,863,285 |
| 2021 | 49 | $5,312,767 | $55,504,332 | $36,002,437 | $14,714,454 | $2,276,204 |
| 2022 | 50 | $3,935,962 | $57,421,956 | $35,846,142 | $23,139,766 | $2,406,877 |
| 2023 | 43 | $4,327,616 | $57,711,522 | $33,369,179 | $19,207,847 | $2,665,492 |
| Average | 52 | $5,104,333 | $54,490,918 | $34,751,052 | $18,185,466 | $2,209,280 |

Source: SEFSC Fishing Communities Web Query Tool (Version Feb 11, 2025, Years: 2014-2023).

Keithly and Wang (2018) estimated the mark-ups between the ex-vessel price and the dealer sales price for red snapper, dolphin, red grouper, and an "Other Groupers" category, which includes black grouper, gag grouper, yellowedge grouper, and warsaw grouper. However, those estimates are insufficient to estimate PS or profit for DWG dealers, or changes to such as a result of regulatory changes, because costs other than the raw fish costs (which are equivalent to the ex-vessel value) are not considered. NMFS does not possess estimates of operating costs for DWG dealers or seafood dealers more broadly, therefore, is not able to estimate profit, net cash flow, net revenue from operations, or PS for dealers as estimated for commercial vessels. However, it is likely that the harvest of DWG generates some PS and profit for DWG dealers. Further, because of federal dealers' ability to switch to purchasing other species, changes to those values because of the management measures considered in this amendment are likely to be relatively small. Subsequently, any additional PS and profit generated from DWG 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.

**Imports**

Imports of foreign seafood products compete within the domestic seafood market, and in the U.S., imports dominate many segments of that market. Imports also tend to be price setters (products that are able to set prices in a market, due to the influence of having a majority of market share). 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 reef fish, including DWG, are described in this section.

**Groupers**

According to NMFS' foreign trade data,[22] groupers are not exported. Imports of fresh and frozen grouper products, which also directly compete with domestic harvest of snapper and grouper species are described in this section. As shown in Table 3.3.1.4, imports of fresh grouper products peaked in 2023. Total value of fresh grouper imports has been increasing in recent years and averaged $67.0 million annually. The average price per pound (lb) product weight (pw) for fresh grouper products was $5.91 from 2019-2023, and these products primarily originated from Mexico, Brazil, and Panama.

**Table 3.3.1.4.** Annual pounds and value of fresh grouper imports and share of imports by country, 2019-2023.

| | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| **Pounds of fresh Grouper imports (product weight, million pounds)** | 11.3 | 10.4 | 12.2 | 11.7 | 12.6 |
| **Value of fresh Grouper imports (millions $, 2024$)** | 71.1 | 53.7 | 72.5 | 69.4 | 68.2 |
| **Average price per lb (2024$)** | $6.50 | $5.34 | $6.14 | $6.14 | $5.42 |
| ***Share of Imports by Country*** | | | | | |
| **Mexico** | 57.9 | 67.6 | 54.4 | 44 | 45 |
| **Brazil** | 16.9 | 12.3 | 18.1 | 23.9 | 19.8 |
| **Panama** | 8.1 | 8 | 10.9 | 13.4 | 12.7 |
| **All others** | 17 | 12.2 | 16.6 | 18.7 | 22.4 |

Source: NOAA Foreign Trade Query Tool, accessed 10/20/24.

As shown in Table 3.3.1.5, imports of frozen grouper products peaked at 3.5 million lb pw in 2019 declining to a low of 0.8 million lb pw in 2020. Total revenue from frozen grouper decreased from 2019 to 2020 but increased to $6.0 million in 2021. The average price per lb pw for frozen grouper products was $2.28 from 2019-2023. Imports of frozen grouper products primarily originated in Brazil, Suriname, and Indonesia in 2019-2022.

[22] https://www.fisheries.noaa.gov/foss/

**Table 3.3.1.5**. Annual pounds and value of frozen grouper imports and share of imports by country, 2019-2023.

| | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| **Pounds of frozen Grouper imports (product weight, million pounds)** | 3.5 | 0.8 | 2.2 | 1.3 | 1.2 |
| **Value of frozen Grouper imports (millions $, 2024$)** | 5.7 | 1.8 | 6.0 | 3.1 | 2.7 |
| **Average price per lb (2024$)** | $1.69 | $2.27 | $2.85 | $2.36 | $2.22 |
| ***Share of Imports by Country*** | | | | | |
| **Brazil** | 79.2 | 33.7 | 23.5 | 26.2 | 14 |
| **Suriname** | 11.2 | 25.9 | 30.6 | 16.2 | 0 |
| **Indonesia** | 3 | 1.1 | 22.2 | 5.9 | 0 |
| **All others** | 6.5 | 39.3 | 23.7 | 51.7 | 86 |

Source: NOAA Foreign Trade Query Tool, accessed 10/20/24.

**Snappers**

According to NMFS' foreign trade data, DWG and other reef fish 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 3.3.1.6, imports of fresh snapper products were 32.8 million lb pw in 2019. They peaked at 36.0 million lb pw in 2021. Total revenue from snapper imports increased to a five-year high of $187.5 million in 2021 (2024$). The average price per pound for fresh snapper products was $4.92 from 2019-2023 and prices varied over this period. Imports of fresh snapper products primarily originated in Mexico, Nicaragua, or Panama, entering the U.S. through the port of Miami.

**Table 3.3.1.6**. Annual pounds and value of fresh snapper imports and share of imports by country, 2019-2023. All monetary estimates are in 2024$.

| | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| **Pounds of fresh Snapper imports (product weight, million pounds)** | 32.8 | 32.4 | 36 | 32.2 | 32.1 |
| **Value of fresh Snapper imports (millions $, 2024$)** | 154.5 | 150.0 | 187.5 | 156.4 | 142.6 |
| **Average price per lb (2024$)** | $4.89 | $4.80 | $5.40 | $5.04 | $4.44 |
| ***Share of Imports by Country*** | | | | | |
| **Mexico** | 34.9 | 40.4 | 32.8 | 31.2 | 32.3 |
| **Nicaragua** | 13.9 | 15.1 | 13.3 | 14.9 | 14.4 |
| **Panama** | 14.6 | 11 | 14 | 10.6 | 10.3 |
| **All others** | 36.6 | 33.5 | 39.9 | 43.4 | 42.8 |

Source: NOAA Foreign Trade Query Tool, accessed 10/20/24.

As shown in Table 3.3.1.7, total revenue from imports of frozen snapper increased from $49.1 million (2024$) in 2019 to a five-year high of $84.0 million in 2021 (2024$) followed by a 49% decrease through 2023. The average price per pound for frozen snapper products was $4.31, with a notable decrease in 2023. Frozen snapper product imports primarily originated in Brazil or Suriname and entered through the port of Miami.

**Table 3.3.1.7** Annual pounds and value of frozen snapper imports and share of imports by country, 2019-2023.

| | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|
| **Pounds of frozen Snapper imports (product weight, million pounds)** | 11.4 | 15.9 | 18.2 | 16.9 | 11.7 |
| **Value of frozen Snapper imports (millions $, 2024$)** | 49.1 | 64.0 | 84.0 | 73.4 | 42.5 |
| **Average price per lb (2024$)** | $4.47 | $4.17 | $4.78 | $4.49 | $3.64 |
| ***Share of Imports by Country*** | | | | | |
| **Brazil** | 54.6 | 55.4 | 58.6 | 64.1 | 60.6 |
| **Suriname** | 13.5 | 10.3 | 10.5 | 5.5 | 12.3 |
| **Indonesia** | 6.8 | 5.4 | 3.9 | 8.0 | 7.0 |
| **All others** | 25 | 28.9 | 27 | 22.4 | 20.1 |

Source: NOAA Foreign Trade Query Tool, accessed 10/20/24.

**Business Activity**

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 grouper 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.

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 were derived using the model developed for and applied in NMFS (2024a)[23] and are provided in Table 3.3.1.8. Specifically, these impact estimates reflect the expected impacts from average annual gross revenues generated by landings of DWG IFQ species from 2019 through 2023. This business activity is characterized as jobs (full- and part-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 here should be interpreted with caution. The results are based on average relationships developed through the analysis of many fishing operations that harvest many different species.

**Table 3.3.1.8.** Average annual business activity (2019 through 2023) associated with the commercial harvest of DWG species in the Gulf. All monetary estimates are in thousands of dollars for 2024.

[23] A detailed description of the input/output model is provided in NMFS (2011).

| Harvesters | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Employment impacts | 90 | 14 | 18 | 122 |
| Income impacts | $2,640 | $490 | $1,185 | $4,315 |
| Total value-added impacts | $2,814 | $1,765 | $2,028 | $6,607 |
| Output Impacts | $4,890 | $3,978 | $3,937 | $12,805 |
| Primary dealers/processors | Direct | Indirect | Induced | Total |
| Employment impacts | 19 | 7 | 13 | 39 |
| Income impacts | $861 | $794 | $751 | $2,406 |
| Total value-added impacts | $918 | $1,013 | $1,414 | $3,345 |
| Output impacts | $2,773 | $2,088 | $2,763 | $7,624 |
| Secondary wholesalers/ distributors | Direct | Indirect | Induced | Total |
| Employment impacts | 9 | 2 | 8 | 19 |
| Income impacts | $513 | $153 | $540 | $1,206 |
| Total value-added impacts | $547 | $256 | $922 | $1,725 |
| Output impacts | $1,375 | $501 | $1,793 | $3,669 |
| Grocers | Direct | Indirect | Induced | Total |
| Employment impacts | 37 | 4 | 8 | 50 |
| Income impacts | $1,056 | $351 | $530 | $1,936 |
| Total value-added impacts | $1,125 | $565 | $897 | $2,587 |
| Output impacts | $1,804 | $918 | $1,761 | $4,483 |
| Restaurants | Direct | Indirect | Induced | Total |
| Employment impacts | 232 | 15 | 38 | 285 |
| Income impacts | $4,235 | $1,284 | $2,426 | $7,944 |
| Total value-added impacts | $4,514 | $2,296 | $4,087 | $10,896 |
| Output impacts | $8,254 | $3,592 | $8,064 | $19,911 |
| Harvesters and seafood industry | Direct | Indirect | Induced | Total |
| Employment impacts | 386 | 43 | 86 | 515 |
| Income impacts | $9,305 | $3,072 | $5,431 | $17,808 |
| Total value-added impacts | $9,918 | $5,894 | $9,347 | $25,160 |
| Output impacts | $19,095 | $11,078 | $18,319 | $48,491 |

Source: Calculated by NMFS SERO using the model developed for and applied in NMFS (2024a).

### 3.3.2 Recreational Sector

The recreational sector is composed 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 vessels and headboats (also called party boats). Charter vessels 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 because larger concentrations of fish are required to satisfy larger groups of anglers.

**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 target or catch effort for individual species and additional years, as well as other measures of directed effort, are available via NMFS' MRIP query tool.[24]

Tables 3.3.2.1 and 3.3.2.2 describe the recreational target and catch trips for DWG complex species (yellowedge grouper, snowy grouper, warsaw grouper, and speckled hind) in the Gulf from 2019 through 2023. There were no recorded target trips in Texas for these species and Louisiana data are currently unavailable. The overall number of target and catch trips recorded for DWG species were very low at 2,435 and 18,065, respectively, on average. Private vessels comprised the majority of DWG target and catch trips and these trips occurred almost entirely in federal waters off of Alabama and Florida (Table 3.3.2.1 and Table 3.3.2.2). Because DWG

[24] https://www.fisheries.noaa.gov/data-tools/recreational-fisheries-statistics-queries

complex species are rare event species in MRIP, the estimates presented in this section are imprecise[25] and should be viewed accordingly.

**Table 3.3.2.1.** DWG complex recreational target trips, by mode and state, 2019-2023.

| | Alabama | Florida | Mississippi | Total |
|---|---|---|---|---|
| | **Charter Mode** | | | |
| 2019 | 0 | 0 | 0 | 0 |
| 2020 | 0 | 0 | 0 | 0 |
| 2021 | 0 | 0 | 0 | 0 |
| 2022 | 94 | 204 | 0 | 299 |
| 2023 | 0 | 0 | 0 | 0 |
| Average | 19 | 41 | 0 | 60 |
| | **Private/Rental Mode** | | | |
| 2019 | 0 | 1,259 | 0 | 1,259 |
| 2020 | 0 | 683 | 0 | 683 |
| 2021 | 0 | 3,079 | 0 | 3,079 |
| 2022 | 0 | 1,739 | 0 | 1,739 |
| 2023 | 5,117 | 0 | 0 | 5,117 |
| Average | 1,023 | 1,352 | 0 | 2,375 |
| | **All Modes** | | | |
| 2019 | 0 | 1,259 | 0 | 1,259 |
| 2020 | 0 | 683 | 0 | 683 |
| 2021 | 0 | 3,079 | 0 | 3,079 |
| 2022 | 94 | 1,943 | 0 | 2,038 |
| 2023 | 5,117 | 0 | 0 | 5,117 |
| Average | 1,042 | 1,393 | 0 | 2,435 |

Source: MRIP database, SERO, NMFS (July 2025).
Note: Louisiana, Texas, and headboat information is currently unavailable.

[25] Percent standard errors (PSE) for annual aggregate DWG effort estimates during 2019-2023 range from 57 to 100 for target trips and 31 to 55 for catch trips. Estimates at the state level are even less precise.

**Table 3.3.2.2.** DWG complex recreational catch trips, by mode and state, 2019-2023.

| | Alabama | Florida | Mississippi | Total |
|---|---|---|---|---|
| | **Charter Mode** | | | |
| 2019 | 0 | 12757 | 0 | 12,757 |
| 2020 | 474 | 2,815 | 0 | 3,289 |
| 2021 | 120 | 2,188 | 0 | 2,309 |
| 2022 | 683 | 9,121 | 0 | 9,805 |
| 2023 | 860 | 2,202 | 0 | 3,062 |
| Average | 427 | 5,817 | 0 | 6,244 |
| | **Private/Rental Mode** | | | |
| 2019 | 1,793 | 4,657 | 297 | 6,747 |
| 2020 | 3,101 | 8,014 | 0 | 11,115 |
| 2021 | 0 | 2,809 | 0 | 2,809 |
| 2022 | 1,623 | 0 | 0 | 1,623 |
| 2023 | 1,197 | 35,611 | 0 | 36,809 |
| Average | 1,543 | 10,218 | 59 | 11,821 |
| | **All Modes** | | | |
| 2019 | 1,793 | 17,414 | 297 | 19,504 |
| 2020 | 3,575 | 10,830 | 0 | 14,404 |
| 2021 | 120 | 4,997 | 0 | 5,118 |
| 2022 | 2,306 | 9,121 | 0 | 11,427 |
| 2023 | 2,057 | 37,813 | 0 | 39,871 |
| Average | 1,970 | 16,035 | 59 | 18,065 |

Source: MRIP database, SERO, NMFS (July 2025).
Note: Louisiana, Texas, and headboat information is currently unavailable.

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 full-day angler trips.[26] 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 2019 through 2023, but there were no well-defined trends (Table 3.3.2.3). On average (2019 through 2023), Florida accounted for the majority of headboat angler days reported, followed by Texas and Alabama;

[26] Headboat trip categories include half-, three-quarter-, full-, and 2-day trips. A full-day trip equals one angler day, a half-day trip equals 0.5 angler days, etc. Angler days are not standardized to an hourly measure of effort and actual trip durations may vary within each category.

Mississippi and Louisiana combined accounted for only a small percentage (Table 3.3.2.3). Headboat effort in terms of angler days for the entire Gulf tended to be concentrated most heavily during the summer months of June through August (Figure 3.3.2.1).

**Table 3.3.2.3.** Gulf headboat angler days and percent distribution by state (2019 through 2023).

| | Angler Days | | | | Percent Distribution | | | |
|---|---|---|---|---|---|---|---|---|
| | **FL** | **AL** | **MS-LA*** | **TX** | **FL** | **AL** | **MS-LA** | **TX** |
| **2019** | 161,564 | 18,607 | 2,632 | 52,456 | 68.7% | 7.9% | 1.1% | 22.3% |
| **2020** | 126,794 | 13,091 | 1,728 | 51,498 | 65.7% | 6.8% | 0.9% | 26.7% |
| **2021** | 181,632 | 13,844 | 3,197 | 71,344 | 67.3% | 5.1% | 1.2% | 26.4% |
| **2022** | 164,872 | 14,751 | 3,679 | 65,634 | 66.2% | 5.9% | 1.5% | 26.4% |
| **2023** | 149,735 | 12,513 | 3,244 | 58,279 | 66.9% | 5.6% | 1.4% | 26.0% |
| **Average** | 156,919 | 14,561 | 2,896 | 59,842 | 66.9% | 6.3% | 1.2% | 25.6% |

Source: NMFS SRHS (2023).
*Headboat data from Mississippi and Louisiana are combined for confidentiality purposes.

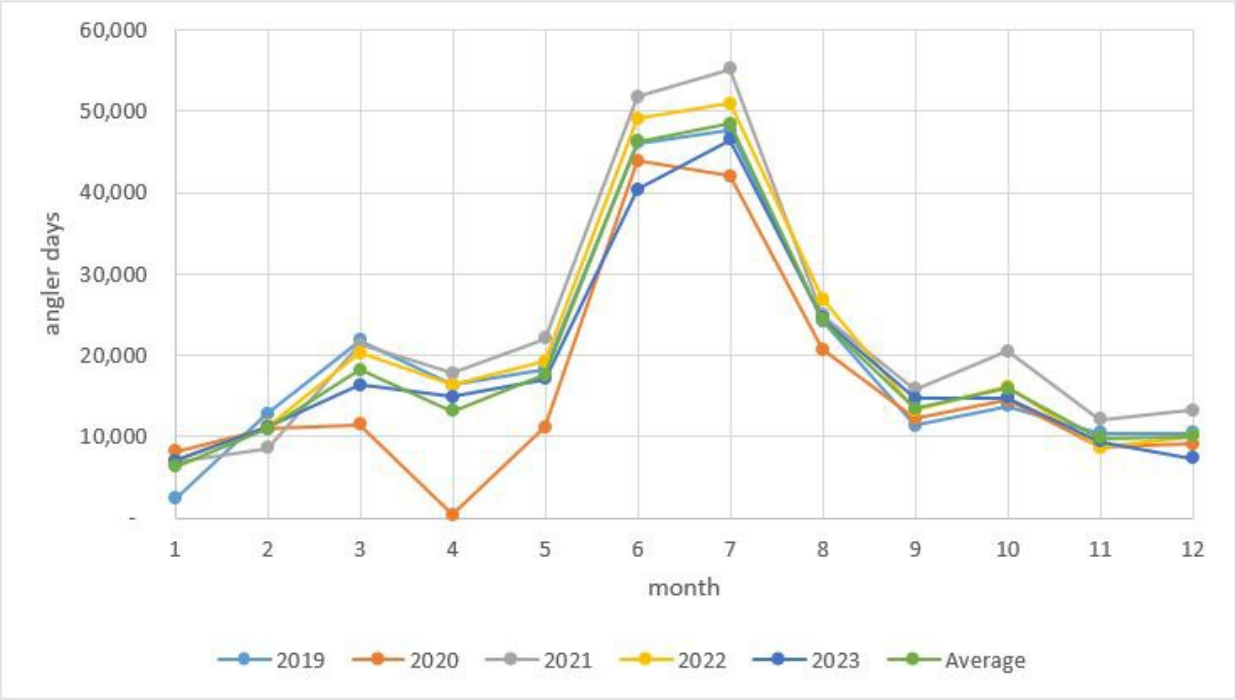


**Figure 3.3.2.1**. Gulf headboat angler days by month and year (2019-2023).
Source: NMFS SRHS (2023).

## Permits

There are no specific federal permitting requirements for private recreational anglers to fish for or harvest deep water grouper species, including yellowedge grouper, snowy grouper, warsaw grouper, and speckled hind. The same is true for private recreational vessel owners. Instead,

private anglers are required either to possess 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.

For anglers to fish for or possess reef fish species in or from the Gulf EEZ on for-hire vessels, those vessels are required to have a Gulf charter/headboat permit for reef fish (Gulf reef fish for-hire permit). As of August 26, 2021, there were 1,273 valid or renewable[27] Gulf reef fish for-hire permits. The total number of valid or renewable Gulf reef fish for-hire permits has been relatively stable with less than a 1% change from year to year during 2016 through 2020 (Table 3.3.2.4). Note more recent permit information is currently unavailable.

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. During 2024, 73 Gulf headboats were registered in the SRHS (R. Cheshire, NMFS SEFSC, pers. comm. 2025). The majority of these headboats were located in Florida (44), followed by Texas (18), Alabama (7), and Mississippi/Louisiana (4).

**Table 3.3.2.4.** Number of valid or renewable Gulf reef fish 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**

[27] A renewable permit is an expired permit that may not be actively fished but is renewable for up to one year after expiration.

Participation, effort, and harvest are indicators of the value of saltwater recreational fishing. However, a more specific indicator of value is consumer surplus (CS), which is the difference between the maximum amount an angler would be willing to pay for a fish and the amount they actually do pay.[28] CS represents a savings of one's income that can be spent later on other goods and services, leading to an overall increase in utility or satisfaction for the angler and a benefit to the economy. All else equal, the amount anglers are willing to pay, and the costs of fishing can vary depending on expected catch rates, harvest rates, and existing regulations. The economic value of changes in expected catch rates, harvest rates, or existing regulations can be measured by any associated changes in CS. However, because recreationally caught fish are non-market goods and there are no transaction data available, CS cannot be measured directly. Instead, using survey elicitation methods and stated or revealed preference models, it is possible to estimate willingness to pay (WTP) values[29] that are a close approximation to the individual CS an angler would derive from an additional fish that is caught and kept. Direct estimates of the WTP for yellowedge grouper, snowy grouper, warsaw grouper, and speckled hind are not currently available. There are, however, estimates for grouper species in general. Haab et al. (2012) estimated the WTP for one additional grouper caught and kept in the Southeastern U.S. using four separate econometric modeling techniques. The finite mixture model, which considers variation in the preferences of fishermen, had the best prediction rates of the four models and, as such, was selected for presentation here. The mean WTP for an additional grouper was estimated to be $168.76 (2024$). Another study estimated the mean WTP for catching and keeping a second grouper on an angler trip at approximately $131 (2024$) and lower thereafter (approximately $87 for a third grouper, $64 for a fourth grouper, and $51 for a fifth grouper) (Carter and Liese 2012). For the purposes of this amendment, the $131 per fish estimate is assumed to be the best value to use for estimating the CS associated with catching and keeping a species in the DWG complex. The higher value provided by Haab et al. (2012) is likely less reasonable for these particular species.

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 $107,000 (2024$) in gross revenue and $32,000 (2024$) in net income (gross revenue minus variable and fixed costs) annually. The average headboat is estimated to receive approximately $325,000 (2024$) in gross revenue and $95,000 (2024$) 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, SEFSC, 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 $575,000 (2024$). Further, their data suggest average annual gross revenue per vessel had increased to about $694,000 (2024$) by 2014. However, Abbott and Willard's estimates are based on a sample of 17 headboats that

[28] Holding income and the prices of other goods constant.

[29] These are measures of compensating surplus, or the amount of money that an angler would be willing to pay in order to harvest the additional fish, while maintaining the same level of utility.

chose to participate in the headboat collaborative program in 2014, while the Savolainen, et al. estimates are based on a random sample of 20 headboats. The headboats that participated in the collaborative program may be economic highliners, in which case Abbott and Willard's estimates would overestimate average annual gross revenue for Gulf headboats. D. Carter, SEFSC, pers. comm. 2018 recently estimated that average annual gross revenue for Gulf headboats was approximately $514,000 (2024$) 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 (TNR) for trips taken by headboats and charter vessels in 2017 are available from Souza and Liese (2019). 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,[30] or $938 and $2,179 (2024$), respectively (Table 3.3.2.5). When TNR is divided by the number of anglers on a trip, it represents cash flow per angler (CFpA), which approximates PS per angler trip. The estimated CFpA value for an average Gulf charter angler trip is $171 (2024$) and the estimated CFpA value for an average Gulf headboat angler trip is $77 (2024$; Souza and Liese 2019). Estimates of CFpA for individual Reef Fish species or species group target trips, in particular, are not available.

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

**Table 3.3.2.5.** Trip economics for offshore trips by Gulf charter vessels and Southeast headboats in 2017 (2024$).

| | 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** | $938 | $2,179 |
| **Average # of Anglers per Trip** | 5.5 | 28.2 |
| **Trip Net Cash Flow per Angler Trip** | $171 | $77 |

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 the region where recreational fishing occurs. Note, 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 DWG complex species were calculated using average trip-level impact coefficients derived from the 2022 Fisheries Economics of the U.S. report (NMFS 2024a) and underlying data provided by the National Oceanic and Atmospheric Administration Office of Science and Technology. Economic impact estimates in 2022 dollars were adjusted to 2024 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 (2019–2023) resulting from DWG complex charter, private vessel, and shore target trips are provided in Table 3.3.2.6. These impacts should not be added together because this would result in double counting. The average impact coefficients, or multipliers, used in the model are invariant to the "type" of effort (e.g.,

target or catch) and can therefore be directly used to measure the impact of other effort measures such as DWG complex catch trips. To calculate the multipliers from Table 3.3.2.6, simply divide the desired impact measure (value-added impact, sales impact, income impact, or employment) associated with a given state and mode by the number of target trips for that state and mode.

The estimates provided in Table 3.3.2.6 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 or species groups. As such, the estimates provided in Table 3.3.2.6 may be considered a lower bound on the economic activity associated with those trips that targeted DWG complex species.

Estimates of the business activity associated with headboat effort are not available. Headboat vessels are not covered by 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 3.3.2.6.** Estimated average annual economic impacts (2019-2023) from Gulf charter and private vessel DWG complex target trips, by state*, using state-level multipliers. All monetary estimates are in 2024 dollars in thousands.

| | FL | AL |
|---|---|---|
| | **Charter Mode** | |
| Target Trips | 41 | 19 |
| Value Added Impacts | $28 | $8 |
| Sales Impacts | $44 | $13 |
| Income Impacts | $19 | $6 |
| Employment (Jobs) | 0 | 0 |
| | **Private/Rental Mode** | |
| Target Trips | 1,352 | 1,023 |
| Value Added Impacts | $48 | $40 |
| Sales Impacts | $81 | $86 |
| Income Impacts | $24 | $17 |
| Employment (Jobs) | 0 | 0 |
| | **All Modes** | |
| Target Trips | 1,393 | 1,042 |
| Value Added Impacts | $76 | $48 |
| Sales Impacts | $124 | $99 |
| Income Impacts | $42 | $23 |
| Employment (Jobs) | 1 | 1 |

*There was no recorded target effort for DWG species in Texas or Mississippi and Louisiana data are currently unavailable.

National-level multipliers must be used to account for interstate and interregional trading when calculating a national total of economic impacts. Between 2019 and 2023, and using national-level multipliers, DWG complex target effort generated employment, income, value-added, and output (sales) impacts of 2 jobs, $128,000, $244,000, and $473,000 per year, respectively, on average.

## 3.4 Description of the Social Environment

This amendment affects the commercial and recreational management of species managed within the DWG complex in the Gulf. These species are snowy grouper, speckled hind, warsaw grouper, and yellowedge grouper. The following description presents baseline information on fishing participants and fishing communities. This description includes the current status of the fishery in order to present the communities that are expected to be primarily affected by the actions in this amendment because they are the most engaged in and/or reliant on the fishery and is used to inform the social effects. Community level data are presented whenever possible in order to meet the requirements of National Standard 8 of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), which requires the consideration of the importance of fishery resources to human communities when changes to fishing regulations are considered.

The following description includes permits related to the commercial and recreational reef fish fishing by state and in order to provide a geographic distribution of fishing involvement. Top communities based on the number of permits are presented. Commercial and recreational landings by state are included to provide information on the geographic distribution of fishing involvement. Descriptions of DWG-IFQ accounts with shares, DWG-IFQ accounts with allocation but without shares, and DWG-IFQ species dealers are included at the state and community level. The top communities in the Gulf by commercial landings are identified, the contribution of DWG species compared to the total landings for the community are depicted, and their commercial engagement and reliance are described. Descriptions of the top communities based on recreational engagement are also included. Lastly, social vulnerability data are presented for all top-ranking communities.

The most recent data available has been utilized in the following section; however, the year range or date presented may not match what is included elsewhere because some sources of data are not available at the community or state level.

### 3.4.1 Commercial Sector

**Description of the IFQ Program**

Commercial fishing for DWG is part of a multi-species grouper fishery with species commonly co-occurring and co-caught and is conducted through the Grouper-Tilefish (GT) IFQ program. The GT IFQ program includes five share categories including a DWG-IFQ share category for

DWG species, which includes flexibility measures for scamp, a shallow-water grouper (SWG) species under the Other SWG-IFQ share category. SWG-IFQ includes flexibility measures for two DWG species, warsaw grouper and speckled hind. There is a high degree of overlap in participation between share categories within the GT IFQ program, with the majority of shareholders holding shares in three or more share categories since the start of the program (NMFS 2024). There is also great overlap between vessels that land GT IFQ and those that land Red Snapper IFQ, a separate, but related IFQ program (94% of GT IFQ vessels landed Red Snapper IFQ in 2023, NMFS 2024). Recently, the commercial quota has been reduced for multiple GT IFQ share categories including gag (GMFMC 2023) and shallow-water grouper (GMFMC 2025); whereas the quota for red grouper is being increased through an emergency action.

Participants in the IFQ program include shareholders (those who hold shares and receive annual allocation from those shares), allocation only holders (those who purchase or use annual allocation from other shareholders; however, these accounts may be related to shareholder accounts), vessel owners, permit owners, hired captains, crew, and fish dealers. Shareholders can include such categories of participants as commercial and for-hire fishermen, fish dealers, brokers (those who own shares and sell their allocation to others), and restaurant owners. Shareholders can be involved in the program in multiple ways and through a variety of business arrangements; for example, a shareholder can include an individual or company that owns a vessel and permit, owns shares, fishes their allocation, and purchases additional allocation from others. Another example of a shareholder is a business that owns a vessel, owns a permit, owns shares, and acts as a fish dealer. Some fish dealers acquire shares and allocation for use by the vessels that supply fish for their fish house, with in some cases, a fleet of vessels reliant on the allocation that they procure. Dealers must have an IFQ account and an IFQ dealer endorsement in order to receive landings of IFQ species.

Interactions between participants within the IFQ program are critical to the way that fishermen operate within the system and comply with the rules and regulations. Anecdotally, it has been reported that fishermen frequently rely on their social networks, the people they know, to find shares and allocation for sale. In particular, it has been described that fishermen frequently rely on their fish dealers for allocation. Some fishermen also rely on their dealer or more technically inclined connections to help them to fill out paperwork required for permit applications or IFQ requirements.

DWG allocation is distributed annually to shareholders. The amount of allocation received by each shareholder is based on a proportion of the quota for the year, with the initial issuance of share amounts based on past participation. Shares and allocation can be bought and sold, and the number of shares held by particular shareholders and number of people holding shares has changed over the years, with a steady reduction in the number of accounts with DWG-IFQ shares over time (472 shareholders at the beginning of the program in 2010 compared to 305 in 2023, NMFS 2024). The greatest proportion of DWG-IFQ shares are held by large shareholders (61% of shares in 2023, large is categorized as holding greater than or equal to 1.5% of shares), followed by medium shareholders (37%, medium is categorized as holding between 0.05-1.4999% of shares), and small (2%, small is categorized as holding less than 0.05% of shares, NMFS 2024). Conversely, the greatest number of DWG-IFQ shareholders are small (61% of

shareholders in 2023), followed by medium shareholders (34%), and large shareholders (4%). New shareholders are able to participate through the purchase of shares from other shareholders and those without shares are able to participate and land DWG species through the purchase or use of another shareholder's allocation through a transfer.

Annual allocation can be transferred resulting from the purchase of allocation (commonly referred to as leasing quota) or through other arrangements, for example, such as the transfer of allocation to a related account (such as another account held by the same shareholder) or for example, a transfer to a vessel that is delivering fish to the shareholder's fish house. A sizable proportion of participants (33% of DWG allocation holders in 2023, NMFS 2024) acquire DWG allocation via transfer and do not hold DWG shares; however, some may receive allocation from a related account that holds shares. Allocation is transferred more than the total amount of the quota and may often be transferred multiple times before being used to account for landings. For example, in 2023, 170% of the DWG quota was transferred through 881 allocation transfers (NMFS 2024).

**Permits**

Gulf reef fish permits are limited access, but transferrable. The name listed on the permit must match the name listed on the IFQ account in order to harvest IFQ species. Gulf reef fish permits are issued to entities, such as individuals and/or businesses in Florida (81.4% of Gulf reef fish vessels), Texas (7.8%), Alabama (4.5%), Louisiana (3.8%), and Mississippi (0.9%) (SERO permit office, July 8, 2021). Residents of other states (Arkansas, Georgia, Illinois, Maryland, Missouri, North Carolina, New York, Oklahoma, and South Carolina) also hold commercial reef fish permits, but these states represent a smaller percentage of the total number of issued permits.

Gulf reef fish permits are held by those with mailing addresses in 232 communities (SERO permit office, July 8, 2021). Communities with the most commercial reef fish permits are located in Florida and Texas (Table 3.4.1.1). The communities with the most reef fish permits are Panama City, Florida (9.1% of reef fish permits), Key West, Florida (4.8%), and St. Petersburg, Florida (3.3%).

**Table 3.4.1.1.** Top communities by number of Gulf reef fish permits.

| State | Community | Reef Fish Permits (RR) |
|---|---|---|
| FL | Panama City | 82 |
| FL | Key West | 43 |
| FL | St. Petersburg | 30 |
| FL | Largo | 26 |
| TX | Galveston | 22 |
| FL | Destin | 22 |
| FL | Cortez | 21 |
| FL | Pensacola | 21 |

| State | Community | Reef Fish Permits (RR) |
|---|---|---|
| FL | Seminole | 20 |
| FL | Clearwater | 16 |
| FL | Tampa | 16 |
| FL | Lynn Haven | 13 |
| FL | Naples | 13 |
| FL | Steinhatchee | 13 |
| FL | Apalachicola | 11 |
| FL | Tarpon Springs | 11 |

Source: SERO permit office, July 8, 2021.

**Landings**

The majority of the commercial catch of DWG species is landed along the west coast of Florida (average of 66.3% from 2016-2020), followed by Texas (21.8%), Louisiana (11.8%), and Alabama and Mississippi (0.1%, NMFS SERO IFQ database accessed 4/2/25).

**IFQ Accounts**

To land IFQ-managed species, such as DWG, fishermen need a permitted vessel with an activated VMS unit, and sufficient IFQ allocation in the vessel's account to land the fish. Like permits, some accounts are held in the name of an individual, or more than one individual, while others form business entities and open accounts in the name of the business. This makes it more difficult to talk about the social environment as there may be multiple individuals behind the account, and they may not reside in the same area. In the following analysis, accounts are described at the state and community level based on the mailing address of the self-designated primary entity (e.g., individual, business, or primary entity listed on the permit or IFQ application when held by more than one entity).

An IFQ account, also called shareholder account, is required to hold shares and allocation. The number of accounts is used here as a proxy to represent the number of participants and may represent more than one entity.

*Shareholders*

As of July 8, 2021, a total of 331 IFQ accounts held shares of DWG-IFQ (IFQ database; includes active and suspended accounts). The majority of accounts with DWG-IFQ shares have a mailing address in Florida (74.9% of accounts with DWG-IFQ shares, Table 3.4.1.2), followed by Texas (10.3%), Louisiana (5.4%), Alabama (4.8%), and Mississippi (1.2%). Accounts with mailing addresses in other states (Arkansas, Georgia, North Carolina, New York, Oregon, South Carolina, Tennessee, and Utah) also hold DWG-IFQ shares, but these states represent a smaller percentage of the total number of accounts with shares.

The greatest proportion of DWG-IFQ shares are held in accounts with mailing addresses in Florida, followed by Texas (Table 3.4.1.2). Accounts in Alabama, Louisiana, Mississippi, and other states also hold DWG-IFQ shares, but these states represent a smaller percentage of shares.

**Table 3.4.1.2.** Number of IFQ accounts with DWG shares by state, including the percentage of shares by state by share category.

| State | Accounts | DWG Shares (%) |
|---|---|---|
| AL | 16 | 0.903 |
| FL | 248 | 51.083 |
| LA | 18 | 5.803 |
| MS | 4 | 0.350 |
| TX | 34 | 32.663 |
| Other | 11 | 9.065 |
| Total | 331 | 99.867 |

Source: NMFS SERO IFQ database accessed 7/8/21.
Note: Includes active and suspended accounts.

Accounts with DWG-IFQ shares are held by people with mailing addresses in a total of 142 communities (IFQ database accessed 7/8/21). Communities with the most accounts with DWG-IFQ shares are located in Florida and Texas (Table 3.4.1.3). The community with the most accounts with DWG-IFQ shares is Panama City, Florida (9.7% of accounts with shares), followed by Cortez and Destin, Florida (each with 3.6%).

**Table 3.4.1.3.** Top communities by number of IFQ accounts with DWG shares, including the percentage of shares by community.

| State | Community | Accounts | DWG Shares (%) |
|---|---|---|---|
| FL | Panama City | 32 | 12.066 |
| FL | Cortez | 12 | 4.083 |
| FL | Destin | 12 | 2.589 |
| FL | Key West | 10 | 0.172 |
| FL | Largo | 10 | 2.216 |
| FL | Pensacola | 10 | 1.260 |
| FL | St. Petersburg | 10 | 2.098 |
| TX | Galveston | 9 | 7.551 |
| FL | Seminole | 8 | 2.501 |
| FL | Tarpon Springs | 8 | 1.054 |
| FL | Tampa | 6 | 0.172 |
| FL | Apalachicola | 5 | 2.258 |
| FL | Fort Walton Beach | 5 | 0.437 |
| FL | Holiday | 5 | 0.045 |
| TX | Houston | 5 | 19.783 |

Source: NMFS SERO IFQ database accessed 7/8/21.

The largest or maximum percent of DWG-IFQ shares held in a community is 19.783% in Houston, Texas (IFQ database accessed 7/8/21). The percentage of shares by community varies widely and a large number of accounts with shares may not necessarily correlate to a large percentage of shares in a particular category (Table 3.4.1.3). Some communities with a relatively smaller number of accounts may have a larger percentage of shares.

*Allocation Only Holders*

In 2020, a total of 145 IFQ accounts out of 463 IFQ accounts (31%) held DWG-IFQ allocation without DWG-IFQ shares (IFQ database accessed 2/25/22). However, some of these accounts may be related to accounts with DWG shares. The majority of accounts with DWG-IFQ allocation, but without DWG-IFQ shares have mailing addresses in Florida (74.5% of accounts with DWG allocation, but without DWG shares, Table 3.4.1.4), followed by Texas (11%), Louisiana (6.9%), and Alabama and Mississippi (4.8%). Account holders with DWG allocation, but without DWG shares also have mailing addresses in other states (North Carolina, Ohio, and South Carolina), but these states represent a smaller percentage of the total number of accounts with DWG allocation, but without DWG shares.

**Table 3.4.1.4.** Number of IFQ accounts with DWG allocation, but without DWG shares by state, 2020.

| State | Accounts |
|---|---|
| AL/MS | 7 |
| FL | 108 |
| LA | 10 |
| TX | 16 |
| Other | 4 |
| Total | 145 |

Source: NMFS SERO IFQ database accessed 2/25/22.

IFQ accounts with DWG-IFQ allocation, but without DWG-IFQ shares, have mailing addresses in a total of 71 communities (IFQ database accessed 2/25/22). Communities with the most accounts with allocation, but without shares are located in Florida and Texas (Table 3.4.1.5). The community with the most accounts with allocation, but without shares is Panama City, Florida (8.3% of accounts with allocation, but without shares, Table 3.4.1.5), followed by Galveston, Texas (7.6%) and Madeira Beach, Florida (5.5%).

**Table 3.4.1.5.** Top communities by number of IFQ accounts with DWG allocation, but without DWG shares, 2020.

| State | Community | Accounts |
|---|---|---|
| FL | Panama City | 12 |
| TX | Galveston | 11 |
| FL | Madeira Beach | 8 |
| FL | Largo | 6 |
| FL | St. Petersburg | 6 |
| FL | Pensacola | 5 |
| FL | Destin | 4 |
| FL | Indian Rocks Beach | 4 |
| FL | Indian Shores | 4 |
| FL | Lecanto | 4 |

Source: NMFS SERO IFQ database accessed 2/25/22.

**Dealers**

The majority of dealer facilities with DWG-IFQ species landings are located in Florida (average of 69.1% of Gulf DWG IFQ species dealer facilities for 2016-2020, Table 3.4.1.6), followed by Louisiana and Texas (each with 11%), and Alabama and Mississippi (8.9%).

**Table 3.4.1.6.** Number of Gulf DWG IFQ species dealer facilities by state for 2016-2020.

| Year | AL/MS | FL | LA | TX |
|---|---|---|---|---|
| 2016 | 7 | 44 | 7 | 7 |
| 2017 | 7 | 48 | 9 | 10 |
| 2018 | 5 | 48 | 9 | 9 |
| 2019 | 7 | 53 | 6 | 6 |
| 2020 | 4 | 40 | 6 | 5 |

Source: NMFS SERO IFQ database accessed 4/2/25.

Gulf DWG-IFQ species dealers are located in a total 68 communities (IFQ database accessed 4/2/25, includes dealers with landings of DWG species from 2016-2020). Communities with the most Gulf DWG-IFQ species dealer facilities are located in Florida, Alabama, Louisiana, and Texas (Table 3.4.1.7). The community with the most Gulf DWG-IFQ species dealer facilities is Madeira Beach, Florida (7% of Gulf DWG-IFQ dealer facilities, Table 3.4.1.7), followed by Key West, Florida and Panama City, Florida (each with 4.9%).

**Table 3.4.1.7.** Top communities by number of dealer facilities with DWG-IFQ species landings during 2016-2020.

| State | Community | *Dealer Facilities |
|---|---|---|
| FL | Madeira Beach | 10 |
| FL | Key West | 7 |
| FL | Panama City | 7 |
| AL | Bayou La Batre | 5 |
| FL | Destin | 5 |
| FL | Fort Myers Beach | 5 |
| AL | Bon Secour | 4 |
| FL | Pensacola | 4 |
| FL | Tarpon Springs | 4 |
| LA | Golden Meadow | 4 |
| TX | Galveston | 4 |

Source: NMFS SERO IFQ database accessed 4/2/25.
*Multiple dealers can use the same facility and a dealer can operate at multiple facilities.

**Regional Quotient**

Regional Quotient (RQ) is the proportion of DWG-IFQ species landed within a community out of the total amount of DWG-IFQ species landed within the Southeast region. It is an indicator of the percent contribution in pounds or value of DWG-IFQ species landed within that community relative to the regional fishery. The RQ is reported individually only for the top 10 communities by total landings for the years of 2016 through 2020. All other communities that landed DWG-IFQ species are grouped as "Other." Figure 3.4.1.1 shows the RQ in percentage of pounds from 2016 to 2020. The dominant communities for DWG-IFQ species pounds landed include the communities of Madeira Beach, Florida; Galveston, Texas; Panama City, Florida; and Cortez, Florida (Figure 3.4.1.1). The top community of Madeira Beach, Florida is frequently referred to

as the "Grouper Capital of the World," and includes an average of 23.4% of landings of DWG-IFQ species over the time series. Several of the top 10 communities are located in Pinellas County (Madeira Beach, Redington Shores, and Tarpon Springs) and are within close proximity to each other. In addition, although Cortez, Florida (ranked fourth) is located in an adjacent county, Manatee County, it is also located within close proximity to Pinellas County. Two of the top three communities are located in the Florida Panhandle (Panama City and Apalachicola).

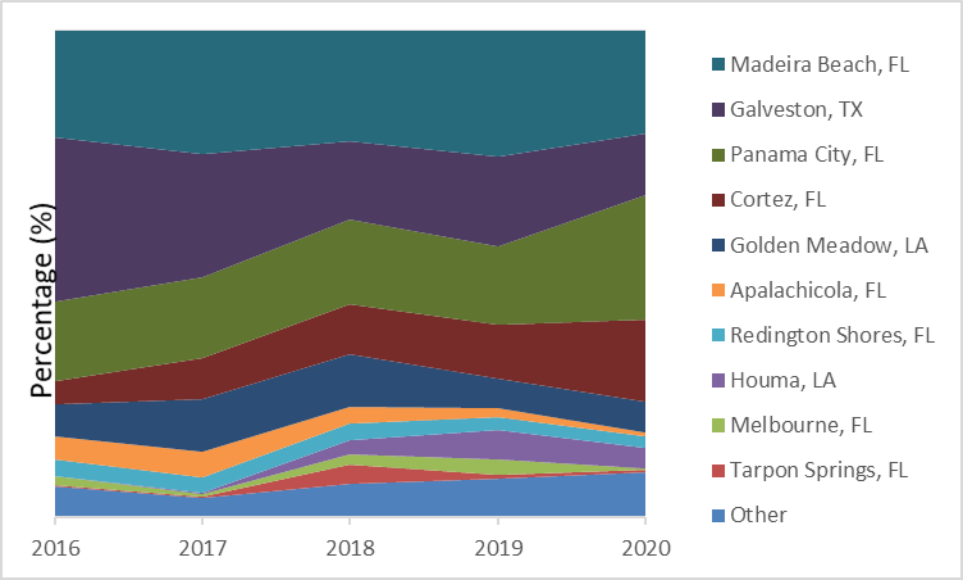


**Figure 3.4.1.1.** Regional Quotient (pounds) for top communities by landings of Gulf DWG-IFQ Program species from 2016 through 2020.
Source: IFQ database accessed 4/2/25.

### Local Quotient

The community Local Quotient (LQ) is the percentage of DWG-IFQ species landed within that community out of the total of all species landed within that community. It is an indicator of the contribution of the value of DWG-IFQ species to the overall landings in a community. Figure 3.4.1.2 shows the LQ in percentage of value from 2019 to 2023 for the top communities by landings of Gulf DWG-IFQ species as depicted in Figure 3.4.1.1. The LQ for all included communities fluctuated considerably throughout the time series. The community of Panama City, Florida includes a comparatively high DWG-IFQ LQ for all years with ≥ 13% of value in landings and ranging up to a high of 21% of value. The community of Madeira Beach, Florida also includes a comparatively high LQ of ≥ 10% of value in landings per year and ranging up to a high of 18%. Cortez, Redington Shores, and Melbourne, Florida also include a comparatively high LQ for some years.

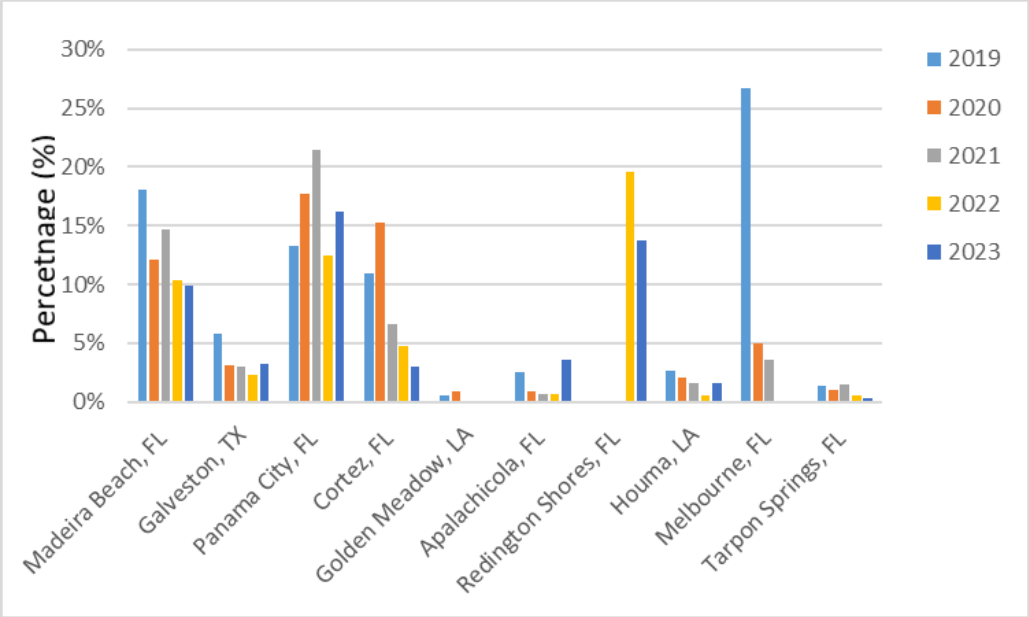


**Figure 3.4.1.2.** Local Quotient (value) for top communities by landings of Gulf DWG-IFQ Program species for 2019 to 2023.
Source: SERO, Community ALS.

**Engagement and Reliance**

In addition to examining the RQs and LQs to understand how Gulf communities are engaged and reliant on fishing, indices were created using secondary data from permit and landings information for the commercial sector (Jepson and Colburn 2013, Jacob et al. 2013). Fishing engagement is primarily based on the absolute numbers of permits, landings, and value. The analysis used the number of vessels designated commercial by homeport and owner address, value of landings, and total number of commercial permits for each community. Fishing reliance includes the same variables as fishing engagement divided by population to give an indication of the per capita influence of this activity.

Taking the communities with the highest RQs, factor scores of both engagement and reliance for commercial fishing were plotted. Two thresholds of one and one-half standard deviation above the mean are plotted onto the graphs to help determine a threshold for significance. The factor scores are standardized; therefore, a score above one is also above one standard deviation. A score above one-half standard deviation is considered engaged or reliant, with anything above one standard deviation to be very engaged or reliant.

Figure 3.4.1.2 is an overall measure of a community's commercial fishing engagement and reliance and includes the communities with the strongest relationship to the commercial sector for DWG species as depicted in Figure 3.4.1.1. Most communities in Figure 3.4.1.3 would be considered to be highly engaged in commercial fishing, as many are at or above one standard deviation of the mean factor score. Redington Shores and Melbourne, Florida show the least amount of engagement in commercial fishing overall. Madeira Beach, Florida; Cortez, Florida;

Golden Meadow, Louisiana; and Apalachicola, Florida demonstrate a moderate to high level of commercial reliance.

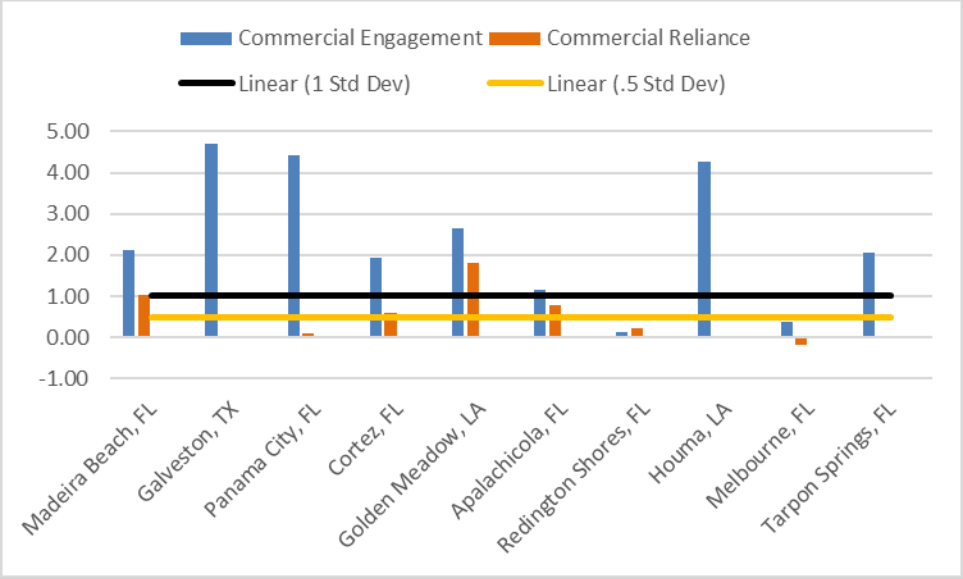


**Figure 3.4.1.3.** Commercial fishing engagement and reliance for top DWG species communities.
Source: SERO Community Social Vulnerability Indicators Database 2021.

## 3.4.2 Recreational Sector

**Permits**

Charter/headboat for reef fish permits are issued to entities, such as individuals and businesses in Florida (60% of charter/headboat for reef fish vessels), Texas (15.7%), Alabama (10.6%), Louisiana (7.4%), and Mississippi (2.6%, SERO permit office, July 8, 2021). Residents of other states (Arkansas, Arizona, California, Colorado, Georgia, Illinois, Michigan, Missouri, Montana, North Carolina, New Jersey, New York, Ohio, Oklahoma, Tennessee, Virginia, and Wisconsin) also hold charter/headboat permits, but these states represent a smaller percentage of the total number of issued permits.

Charter/headboat for reef fish permits are held those with mailing addresses in 355 communities (SERO permit office, July 8, 2021). Communities with the most charter/headboat for reef fish permits are located in Florida, Alabama, and Texas (Table 3.4.2.1). The communities with the most charter/headboat permits are Panama City, Florida (4.6% of charter/headboat permits), Destin, Florida (4.4%), and Orange Beach, Alabama (4.1%).

**Table 3.4.2.1.** Top communities by number of Gulf charter/headboat for reef fish permits.

| State | Community | Charter/Headboat for Reef Fish Permits (RCG) |
|---|---|---|
| FL | Panama City | 65 |
| FL | Destin | 62 |
| AL | Orange Beach | 57 |
| FL | Naples | 45 |
| FL | Key West | 43 |
| FL | Pensacola | 30 |
| FL | Sarasota | 27 |
| FL | St. Petersburg | 23 |
| TX | Galveston | 21 |
| FL | Panama City Beach | 19 |
| TX | Corpus Christi | 19 |
| FL | Cape Coral | 18 |
| FL | Clearwater | 18 |
| FL | Fort Myers | 18 |
| FL | Crystal River | 16 |
| FL | Tampa | 16 |
| FL | Gulf Breeze | 14 |

Source: SERO permit office, July 8, 2021.

**Landings**

The majority of recreational DWG landings are from the waters adjacent to the west coast of Florida (average of 61.8% from 2019-2023), followed by Louisiana and Mississippi (21.4%), Alabama (14.5%), and Texas (2.4%, SEFSC Recreational MRFSS ACL Dataset and LA Creel).

**Engagement and Reliance**

Landings for the recreational sector based on fisheries survey data are not an accurate representation of the species caught at the community level, making it difficult to identify communities as dependent on recreational fishing for DWG. Because limited data are available concerning how communities are engaged and reliant on specific species in the recreational sector, indices were created using secondary data from permit and infrastructure information for the southeast recreational fishing sector at the community level (Jepson and Colburn 2013, Jacob et al. 2013). Recreational fishing engagement is represented by the number of recreational vessels designated as "recreational" by homeport and owners address and the number of recreational fishing survey sites in a particular community. Fishing reliance includes the same variables as fishing engagement, divided by population. Factor scores of both engagement and reliance were plotted by community.

Figure 3.4.2.1 identifies the Gulf communities that are the top communities by engagement upon recreational fishing in general. Two thresholds of one and one-half standard deviation above the mean were plotted to help determine a threshold for significance. Communities are presented in ranked order by fishing engagement and all included communities demonstrate high levels of recreational engagement, although this is not specific to fishing for DWG. Because the analysis used discrete geo-political boundaries, Panama City and Panama City Beach had separate values for the associated variables. Calculated independently, each still ranked high enough to appear in the top list, suggesting a greater importance for recreational fishing in that area. The communities of Venice, Louisiana; Tavernier; Florida; Islamorada, Florida; Orange Beach, Alabama; Port Aransas, Texas; Destin, Florida; Key West, Florida; Marathon, Florida; and Crystal River, Florida demonstrate the highest reliance on recreational fishing. The communities of Naples and Fort Myers Beach, Florida demonstrate a moderate to high reliance.

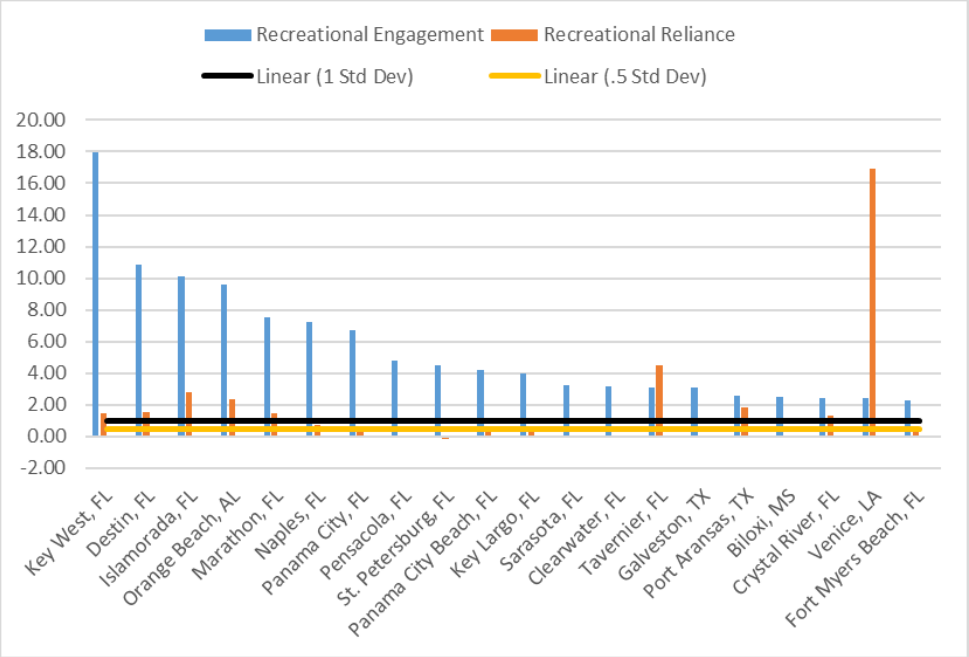


**Figure 3.4.2.1.** Recreational fishing engagement and reliance for top Gulf communities.
Source: SERO, Community Social Vulnerability Indicators Database 2022.

## 3.4.3 Social Vulnerability

A suite of indices was created using census data to examine the social vulnerability of coastal communities. The three indices are poverty, population composition, and personal disruption. The variables included in each of these indices have been identified through the literature as being important components that contribute to a community's vulnerability. Poverty includes poverty rates for different groups; population composition includes more single female-headed households, households with children under the age of five, minority populations, and those that speak English less than well; and personal disruption includes disruptions such as higher separation rates, higher crime rates, and unemployment. Increased rates in the indicators are signs of populations experiencing vulnerabilities. Again, for those communities that exceed the

threshold it would be expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change.

Figures 3.4.3.1 and 3.4.3.2 provide social vulnerability rankings for place-based communities identified in Section 3.4 as important to commercial and recreational fishing for DWG specifically, fishing for reef fish, or marine fishing in general. Several communities exceed the threshold of one standard deviation above the mean for at least one of the indices (Bayou La Batre, Alabama; Holiday, Florida; Steinhatchee, Florida; Venice; Louisiana; and Houston, Texas). These communities would be the most likely to exhibit vulnerabilities to social or economic disruption resulting from regulatory change.

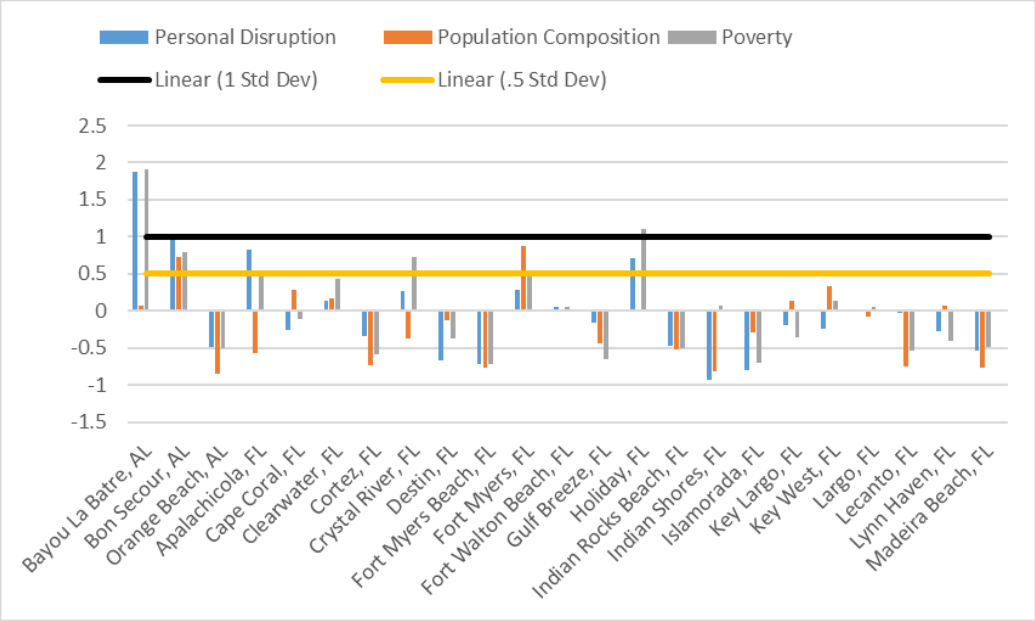


**Figure 3.4.3.1.** Social vulnerability indices for top commercial and recreational reef fish and DWG communities.
Source: SERO, Community Social Vulnerability Indicators Database 2022.

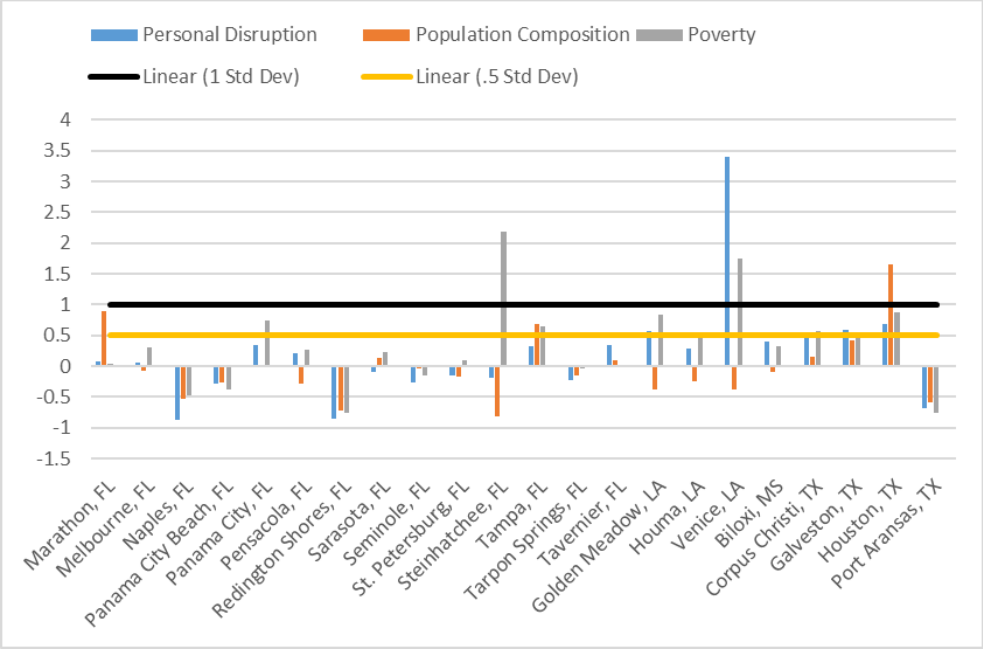


**Figure 3.4.3.2.** Social vulnerability indices for top commercial and recreational reef fish and DWG communities continued.
Source: SERO, Community Social Vulnerability Indicators Database 2022.

The description of fishing activities presented here highlights which communities may be most involved in Gulf DWG fishing. It is expected that the impacts from the regulatory action in this amendment, whether positive or negative, will most likely affect those communities identified above.

## 3.5 Description of the Administrative Environment

### 3.5.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; 16 U.S.C. 1801 *et seq*.), originally enacted in 1976 as the Fishery Conservation and Management Act. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within the EEZ. The EEZ is defined as an area extending 200 nautical miles from the seaward boundary of each of the coastal states. The Magnuson-Stevens Act also claims authority over U.S. anadromous species and continental shelf resources that occur beyond the EEZ.

The Secretary of Commerce (Secretary) is responsible for federal fishery management decision-making. Eight regional fishery management councils that represent the expertise and interests of constituent states provide recommendations to the Secretary. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary is responsible for reviewing and approving fishery management plans and amendments to those plans and promulgating regulations to implement

proposed plans and amendments. In most cases, the Secretary has delegated this authority to NMFS.

The Council is responsible for advising on fishery resources in federal waters of the Gulf. These waters extend 200 nautical miles offshore from the seaward boundaries of Alabama, Florida, Louisiana, Mississippi, and Texas, as those boundaries have been defined by law. The length of the Gulf coastline is approximately 1,631 miles. Florida has the longest coastline extending 770 miles along its Gulf coast, followed by Louisiana (397 miles), Texas (361 miles), Alabama (53 miles), and Mississippi (44 miles).

The Council consists of seventeen voting members: 11 public members appointed by the Secretary; one each from the fishery agencies of Texas, Louisiana, Mississippi, Alabama, and Florida; and one from NMFS. The public is also involved in the fishery management process.

### 3.5.2 State Fishery Management

The purpose of state representation at the Council level is to ensure state participation in federal fishery management decision-making and to promote the development of compatible regulations in state and federal waters. The state governments of Texas, Louisiana, Mississippi, Alabama, and Florida have the authority to manage their respective state fisheries. Each of the five states exercises legislative and regulatory authority over their states' natural resources through discrete administrative units. Although each agency is the primary administrative body with respect to the states' natural resources, all states cooperate with numerous state and federal regulatory agencies when managing marine resources. A more detailed description of each state's primary regulatory agency for marine resources is provided on their respective web pages (Table 3.6.1.1).

**Table 3.5.2.1.** State marine resource agencies and web pages.

| State Marine Resource Agency | Web Page |
|---|---|
| Alabama Marine Resources Division | http://www.outdooralabama.com/ |
| Florida Fish and Wildlife Conservation Commission | http://myfwc.com/ |
| Louisiana Department of Wildlife and Fisheries | http://www.wlf.louisiana.gov/ |
| Mississippi Department of Marine Resources | http://www.dmr.ms.gov/ |
| Texas Parks and Wildlife Department | http://tpwd.texas.gov/ |

# CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

## 4.1 Action 1: Modification of Deep-Water Grouper (DWG) Maximum Sustainable Yield (MSY) Proxy, Overfishing Limit (OFL), Acceptable Biological Catch (ABC), and Complex Annual Catch Limit (ACL)

### 4.1.1 Effects on the Physical Environment

The alternative to the status quo in this action establishes a new proxy for MSY for DWG, and by association, redefines the maximum fishing mortality threshold (MFMT), the minimum stock size threshold (MSST), and optimum yield (OY). This action would have no direct impact on the physical environment. However, when there is a stock assessment, the $F_{MSY}$ proxy is used to establish the OFL, ABC, ACLs, and annual catch targets (ACTs). $F_{MSY}$ proxies that allow larger catch levels may result in greater fishing activity, which would increase potential effects.

Under **Alternative 1**, there would be no change to the fishing effort or direct effects on the physical environment. **Preferred Alternative 2** would define the $F_{MSY}$ proxy for DWG as $F_{40\%SPR}$ and reduce the stock complex catch limits. The multi-species nature of the reef fish fishery is expected to be maintained, and therefore the manner in which the fishery is prosecuted is not expected to change. Thus, modifying the status determination criteria (SDC) and catch limits for DWG in **Preferred Alternative 2** is not expected to result in measurable effects to the physical environment compared to **Alternative 1**.

### 4.1.2 Effects on the Biological and Ecological Environment

Effects from fishery management actions as they relate to DWG have been discussed in detail in GMFMC (2011a) and are incorporated here by reference. Management actions that affect the biological and ecological environments primarily relate to the impacts of fishing on a species' population size, life history, and the role of the species within its habitat. Removal of fish from a population through fishing reduces the overall population size. Fishing gear types have different selectivity patterns, which refer to a fishing method's ability to target and capture a species by size (length) and age. Selectivity patterns also include discards, which are mostly comprised of sublegal sized fish or fish caught during seasonal closures, and the mortality associated with releasing these fish.

Fishing can affect life history characteristics of reef fish, such as growth and maturation rates. Grouper reproduction may also be impacted by fishing. As an example, for another grouper species, Fitzhugh et al. (2006) reported the size at which 50% of female gag (*Mycteroperca microlepis*) are sexually mature, and the size at which 50% of females transition to males, was smaller in their studies compared to earlier years. In addition, for hermaphroditic species (like DWG species), fishing pressure has been suggested as influential to changes in sex ratios. Again, looking to gag, the proportion of males in the population decreased from historical levels of 17% (Hood and Schlieder 1992) to 2-10% in the 1990s (Coleman et al. 1996), to

approximately 2% in 2020 (SEDAR 72 2022). A decline in the ratio of male to female grouper could be an ongoing source of concern depending on the reproductive strategy of a particular species. Furthermore, for species that aggregate, the species is particularly vulnerable to fishing because it is concentrated at specific locations. This problem is magnified because of the depth at which a grouper species is found. At the depths common to DWG fishing (typically greater than 300 feet), DWG species are expected to be vulnerable to mortality from barotrauma when hooked at depth and then reeled to the surface.

Bycatch does occur within the reef fish fishery. If fish are released due to catch limits, seasons, or other regulatory measures, these fish are considered bycatch. In general, reducing bycatch provides biological benefits to managed species as well as benefits to the reef fish fishery through less waste, higher yields, and, thus, less forgone yield. In some cases, actions are approved that can increase bycatch through regulatory discards such as increased minimum sizes and closed seasons. Under these circumstances, biological benefit to the managed species through the approved action is estimated to outweigh any increases in discards from the action.

**Alternative 1** (No Action) would retain the current $F_{MSY}$ proxy ($F_{30\%SPR}$), which the SSC found to not be consistent with the best scientific information available. Further, **Alternative 1** would maintain the conditions under which yellowedge grouper are estimated to have been experiencing overfishing since 2021 (SEDAR 85 2023). **Preferred Alternative 2** would redefine the $F_{MSY}$ proxy for DWG as $F_{40\%SPR}$, in keeping with the justifications provided by the SSC in February 2024 (see Chapter 1, Section 2.1, and Section 4.1.1 above). Neither alternative is expected to have substantial impacts on the biological environment. The multi-species nature of the reef fish fishery is expected to be maintained, and therefore the manner in which the fishery is prosecuted is not expected to change. For DWG, $F_{30\%SPR}$ (**Alternative 1**) could have the greatest adverse impacts, with fewer adverse impacts for $F_{40\%SPR}$ (**Preferred Alternative 2**). Under **Preferred Alternative 2**, establishing an $F_{MSY}$ proxy of $F_{40\%SPR}$ for DWG would be consistent with the guidance provided by Harford et al. (2019), and that of the SSC (see Sections 1.1 and 2.1). Further, the OFL, ABC, and complex ACL recommended by the SSC under **Preferred Alternative 2** are expected to end overharvest of yellowedge grouper. Therefore, **Preferred Alternative 2** would be expected to result in positive direct effects to the biological environment for DWG compared to **Alternative 1**, which would be expected to maintain the negative biological effects currently being observed for the complex, and for yellowedge grouper in particular.

The actions in this plan amendment would not significantly modify the way in which the reef fish fishery is prosecuted in terms of gear types, overall effort, seasons, or areas fished. Therefore, there are no additional impacts on Endangered Species Act (ESA)-listed species or designated critical habitats anticipated as a result of this action (see Section 3.2 for a more detailed description of ESA-listed species and critical habitat in the action area). The predicted effects on ESA-listed species and designated critical habitats are applicable to all actions in this amendment.

### 4.1.3 Effects on the Economic Environment

**Alternative 1** would maintain the current OFL, ABC, and complex ACL. No economic effects are expected from this alternative. **Preferred Alternative 2** would revise the OFL, ABC, and complex ACL. The complex ACL would be reduced by 549,974 lb gw with Preferred Alternative 2. However, to analyze the effects of this action, it is necessary to determine how much **Preferred Alternative 2** would reduce the amount of fish available to the commercial and recreational sectors. To calculate this reduction, the analysis uses the current commercial sector allocation of 96.5% and the current undefined recreational sector allocation, understood to be the remaining 3.5%.

**Commercial Sector**

For the commercial sector, the comparison of effects is based on the resulting quota from **Preferred Alternative 2** (514,175 lb gw) relative to that of **Alternative 1** (1.024 mp gw), as well as to that of historical landings under **Alternative 1** (as shown in Table 1.1.2). This provides an upper and lower bound of the effects. Because commercial landings have generally been less than the current commercial quota, the upper bound of effects is based on the full use of the quota under **Alternative 1**, and the lower bound is based on the 5-year average of historical commercial landings (2018-2023, excluding 2020). The historical commercial landings used for the lower bound includes landings of scamp, which are other shallow-water grouper (Other SWG) species landed using DWG quota as part of the DWG/SWG flexibility measures established in Amendment 29 to the Reef Fish FMP (GMFMC 2009). From 2021-2024, landings of scamp under DWG quota averaged 992 lb gw, with a standard deviation of 595 lb gw (SERO Catch Share Database, accessed August 2025).

To calculate expected changes in commercial consumer surplus (CS), own-price flexibility[31] for the Gulf DWG commercial sector would be required to derive the expected average price change. Keithly and Tabarestani (2018) estimated an uncompensated own-price flexibility for "GOM Other Grouper," inclusive of DWG, of -0.396. If own-price flexibility is unavailable, price is assumed constant with changes in the commercial quota, and if the expected average price change is zero, then multiplying that by the change in expected harvest by the commercial sector under the proposed quota to arrive at the expected change in commercial CS for DWG would result in a value of zero. However, for DWG, the expected change in commercial CS can be derived using the own-price flexibility for "GOM Other Grouper." The upper and lower bounds of the expected changes in commercial CS are displayed in Table 4.1.3.1, as are the expected average price changes, which are based on the calculated percent change in price multiplied by the average ex-vessel price from 2019-2023.

[31] 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.

**Table 4.1.3.1.** Upper and lower bounds of expected change in the commercial sector's consumer surplus, relative to Alternative 1. Values are in 2024$.

| Alternative | Upper Bound of Expected Change in Landings by Commercial Sector (lb gw) | Upper Bound of Expected Average Price Change ($/lb) | Upper Bound of Expected Change in CS (2024$) |
|---|---|---|---|
| **Preferred Alt 2** | -509,824 | $1.31 | -$1,009,871 |
| **Alternative** | **Lower Bound of Expected Change in Landings by Commercial Sector (lb gw)** | **Lower Bound of Expected Average Price Change ($/lb)** | **Lower Bound of Expected Change in CS (2024$)** |
| **Preferred Alt 2** | -232,054 | $0.82 | -$516,851 |

To determine the upper bound of the respective expected change in ex-vessel revenue as a result of the proposed change to the quota and its effect on commercial landings, the quota from **Preferred Alternative 2** is multiplied by the sum of the upper bound of the expected average price change from Table 4.1.3.1 and the average ex-vessel price per lb gw of $6.66 for DWG from 2019-2023 (2024$). From that value is then subtracted the average ex-vessel price per lb gw multiplied by **Alternative 1's** quota.

To determine the lower bound of the respective expected changes in ex-vessel revenue as a result of the proposed change to the quota and its effect on commercial landings, the quota from **Preferred Alternative 2** is multiplied by the sum of the lower bound of the expected average price change from Table 4.1.3.1 and the average ex-vessel price per lb gw of $6.66 for DWG from 2019-2023 (2024$). From what value is then subtracted the average ex-vessel price per lb gw of $6.66 multiplied by the average commercial landings from 2018-2023, excluding 2020, which are 746,230 lb gw. The upper and lower bounds of the expected change in revenue are displayed in Table 4.1.3.2.

**Table 4.1.3.2.** Upper and lower bounds of the expected change in the commercial sector revenue, relative to Alternative 1. Values are in 2024$.

| Alternative | Upper Bound in Expected Change in Comm Revenue | Lower Bound in Expected Change in Comm Revenue |
|---|---|---|
| **Preferred Alt 2** | -$2,720,275 | -$1,123,784 |

The commercial producer surplus (PS) for vessels that harvested DWG complex species in the Gulf is estimated as 53.7% of the ex-vessel value (section 3.3.1). The upper and lower bounds of the expected change in commercial PS are shown in Table 4.1.3.3.

**Table 4.1.3.3.** Upper and lower bounds in expected change in the commercial sector PS relative to Alternative 1. Values are in 2024$.

| | Upper Bound in Expected Change in Comm PS | Lower Bound in Expected Change in Comm PS |
|---|---|---|
| **Preferred Alt 2** | -$1,460,788 | -$603,472 |

The upper and lower bounds of the total expected changes in net economic benefits for the commercial sector from **Preferred Alternative 2** relative to **Alternative 1** are calculated by adding the upper and lower bounds of the expected change in commercial CS from Table 4.1.3.1 to the upper and lower bounds of the expected change in commercial PS from Table 4.1.3.3. The values are displayed in Table 4.1.3.4.

**Table 4.1.3.4.** Upper and lower bounds in total expected change in net economic benefits for the commercial sector relative to Alternative 1. Values are in 2024$.

| Alternative | Upper Bound in Total Expected Change in Net Economic Benefits to the Commercial Sector | Lower Bound in Total Expected Change in Net Economic Benefits to the Commercial Sector |
|---|---|---|
| **Preferred Alt 2** | -$2,470,658 | -$1,120,323 |

**Recreational Sector**

Estimated changes in economic value to recreational fishermen are approximated by multiplying the expected change in the number of fish harvested by a per fish CS estimate. The most recent proxy for a CS estimate for a DWG species is the estimated value of the CS for a one fish change in grouper harvest, derived from keeping a second grouper on an angler trip. A value of $131 (Carter and Liese 2012; values updated to 2024$) reflect recreational willingness-to-pay (WTP) for one additional grouper harvest. This might overestimate the WTP of a DWG fish for Gulf recreational fishermen as a whole, if Gulf recreational fishermen are retaining more than one DWG fish per trip, since WTP decreases as additional fish are retained.

Unlike the commercial sector analysis, which uses two methods to calculate potential effects—the change in allowable harvest (upper bound) and the difference between historical landings and proposed allowable harvest (lower bound)—only the latter method is used for the recreational sector. The change in allowable harvest for the recreational sector cannot be calculated because the current undefined recreational harvest limit is based in MRFSS data and the proposed undefined recreational harvest limit is based on MRIP-FES data. To determine the effects from **Preferred Alternative 2** as a result in the difference between historical landings in MRIP-FES and proposed allowable harvest in MRIP-FES, the expected change in the number of fish harvested is calculated by dividing the difference between the recreational sector's allowable harvest and the average landings for the recreational sector from 2018-2023, excluding 2020, by

9.79 lb gw, which is the weighted average weight of a recreational landed DWG fish in the Gulf from the 2020 to 2024 fishing years.[32] Of note, the recreational sector's average landings from 2018-2023, excluding 2020, exceed by almost 70% the undefined recreational sector's ACL, which is considered to be the 3.5% of the complex ACL that is not allocated to the commercial sector; therefore, the economic effects estimated resulting from **Preferred Alternative 2** will be an overestimate. Multiplying the expected change in the number of fish expected to be landed by the recreational sector by the estimated value of the CS provides the expected change in CS for the recreational sector, as seen in Table 4.1.3.5.

**Table 4.1.3.5.** Expected change in the recreational sector's CS, relative to Alternative 1. CS values are in 2024$.

| Alternative | Expected Change in Rec Sector Landings, Expressed as Number of Fish | Expected Change in Rec Sector CS |
|---|---|---|
| **Preferred Alt 2** | -4,696 | -$615,126 |

The 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 lost due to a change in the recreational sector's allowable harvest would be reasonable. However, charter vessel trips that are targeting DWG may be cancelled by anglers and are the focus of the recreational sector PS analysis. Table 3.3.2.1 shows that an average of 60 target trips by charter mode for DWG in the Gulf were made from 2019-2023, which accounts for roughly 2.46% of all recreational target trips for DWG in the Gulf from 2019-2023. In contrast, an average of 6,244 catch trips by charter mode for DWG in the Gulf were made from 2019-2023. This suggests that DWG fish are incidentally harvested species. Therefore, a change in demand for for-hire trips would not be expected. While it is possible that some trip cancellations might occur, the effects would likely be minimal.

The negative effects to the recreational sector are contingent on the sector's landings being constrained to its allowable harvest. A management constraint, in the form of a modification to the recreational sector accountability measure, is considered in Action 3. Should the No Action alternative in Action 3 be selected as the preferred alternative, the negative effects to the recreational sector discussed in this section would either not occur or be diminished.

[32] Landings were reported for speckled hind, yellowedge grouper, warsaw grouper, and snowy grouper. The percentage each species represented for the overall DWG recreational landings was averaged over 2018-2023, excluding 2020, and multiplied by the average recreationally landed weight of that species over 2020-2024 (M. Larkin, SERO pers. comm. 2025), and then summed to get a representative weight for a recreationally landed DWG fish.

**Net Economic Benefits**
The total expected change in net economic benefits for both the recreational and commercial sectors can be calculated for the effects from the difference between historical landings and proposed allowable harvest and are displayed in Table 4.1.3.6.

**Table 4.1.3.6.** Total expected change in net economic benefits for the both the recreational and commercial sectors relative to Alternative 1. Values are in 2024$.

| Alternative | Total Expected Change in Net Economic Benefits Using Difference Between Historical Landings and Proposed Allowable Harvest |
|---|---|
| **Preferred Alt 2** | -$1,735,449 |

## 4.1.4 Direct and Indirect Effects on the Social Environment

The proposed changes to DWG management are expected to result in a range of social impacts across commercial and recreational sectors. These impacts would depend on the scale of reductions to allowable catch, how access is distributed between sectors, and how effectively accountability measures (AMs) are implemented and perceived.

Action 1 considers revisions to the MSY proxy and catch limits for the DWG complex. **Alternative 1** (No Action) would retain the current MSY proxy and catch limits, which were based on earlier assessments and recreational data from the discontinued Marine Recreational Fisheries Statistics Survey (MRFSS). This alternative is not consistent with best scientific information available and is inconsistent with the need to end overfishing for yellowedge grouper in the DWG complex. However, from a social perspective, **Alternative 1** would preserve existing access levels and support business planning based on known conditions. Continued overharvest of yellowedge grouper could impact the sustainability of the DWG fishery and reduce the long-term social benefits provided by this resource.

**Preferred Alternative 2** would implement updated catch limits using MRIP-FES data and new stock assessment results. **Preferred Alternative 2** would reduce allowable harvest approximately 50% relative to **Alternative 1** and is likely to constrain fishing opportunities for all users. Commercial operators, particularly those heavily invested in DWG IFQ shares, may experience reduced revenue and operational flexibility. While the IFQ system allows year-round harvest and quota trading, some shareholders may find it more difficult to maintain profitability at lower allocation levels. In the recreational sector, lower catch limits may reduce opportunities for deep-drop trips targeting DWG, especially in areas with growing interest in these fisheries. Anglers and for-hire operators may experience shorter seasons. Overall, while **Preferred Alternative 2** aligns with scientific recommendations and aim to prevent overfishing, it introduces near-term constraints but is expected to provide long-term social benefits as compared to **Alternative 1** as it is expected to grow the stock size over time consistent with the management objectives for the complex.

### 4.1.5 Direct and Indirect Effects on the Administrative Environment

Actions to control harvest by the Council and NMFS are mostly routine and conducted through the Council process as established by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Additionally, through the use of ACLs and AMs, the Council and NMFS can determine if overfishing is occurring annually and take measures to reduce the likelihood of the DWG complex becoming overfished. This minimizes the risk that DWG would be depleted, triggering further management action.

**Alternative 1** would result in retaining the current $F_{MSY}$ proxy for DWG; however, because $F_{30\%SPR}$ and the current catch limits for DWG species are not considered by the Council's SSC or NMFS to be consistent with the best scientific information available, **Alternative 1** is not a viable alternative. **Preferred Alternative 2** would redefine the $F_{MSY}$ proxy for DWG as $F_{40\%SPR}$. An SPR proxy (like $F_{40\%SPR}$ in **Preferred Alternative 2**) that allows for a higher SPR target would be expected to have more positive effects on the administrative environment because it would be expected to allow a more sustainable rate of harvest, reducing the likelihood of overfishing in the future.

## 4.2 Action 2: Modification of Deep-Water Grouper Sector ACLs and Sector Allocations

### 4.2.1 Effects on the Physical Environment

Modifying the sector allocation and catch limits from those stated in **Alternative 1** is not expected to result in substantial effects on the physical environment as both sectors are not expected to change the current practices they respectively use in the multi-species reef fish fishery. The catch limits proposed in **Alternative 2**, **Preferred Alternative 3**, and **Alternative 4** would result in a substantial reduction in DWG harvest for both fishing sectors, and presumably fewer available days to fish recreationally for them. DWG species are targeted by both sectors and fishing occurs for other reef fish species when recreational fishing, or when a commercial vessel does not have sufficient DWG IFQ allocation available to retain and land DWG species. Thus, the effects on the physical environment of **Alternative 2**, **Preferred Alternative 3**, and **Alternative 4** are not expected to be measurably different from **Alternative 1** as fishing would continue to occur regardless of whether DWG is open for harvest by either fishing sector. However, there could be a slight positive effect on the physical environment due to the reduced number of direct target trips when recreational harvest is closed, or vessels have used all their IFQ allocation. This may be negated though by the multi-species nature of many reef fish fishing trips, the co-occurrence of DWG species with other popular reef fish species, like other mid-water snappers, and the regulatory requirement for fishermen to discard a species when it cannot be retained. Any impacts to the physical environment are expected to be minor because modifications to the sector allocation and catch limits would not change the fishing methods used or alter the execution of the reef fish fishery as a whole.

### 4.2.2 Effects on the Biological and Ecological Environment

Decreasing the catch limits reduces the number of fish that can be harvested. In the case of DWG species, and particularly for yellowedge grouper, a decrease in the DWG complex catch limits is necessary to end overfishing. Decreasing the catch limits for DWG may also cause an increase in regulatory discards if some species are caught while targeting other reef fish species. The 2023 SEDAR 85 stock assessment characterized the nature of commercial and recreational discards of yellowedge grouper, which are commonly from waters exceeding 300 feet in depth. Discards are primarily from the commercial fleet due to insufficient allocation in the DWG share category of the Grouper-Tilefish IFQ program. Recreational discards would only be due to reaching the combined recreational bag limit for the recreational vessel, or if there was a season or quota closure. Neither the commercial nor recreational sectors are constrained by a minimum size limit for any DWG species. Regardless, and again due to the depths fished, the assumed discard mortality rate for all fleets was estimated at 100% in SEDAR 85.

As discussed in 4.1.2, both fishing sectors in the Gulf target multiple species of reef fish throughout the year; thus, regulatory discards of DWG may increase for some fleets with the implementation of lower catch limits. Commercial fishing would continue to be controlled by the Grouper-Tilefish IFQ program, with commercial fishermen at liberty to determine when they want to land DWG species based on the amount of DWG allocation they have available.

Recreational fishing for reef fish is classically a multi-species activity, and directed fishing effort on DWG species may be redirected to other species if DWG species are closed to harvest.

Any modification to the sector allocation is not expected to significantly affect the biological environment. Any effect of moving allocation from one sector to another, as it relates to depth fished and any resultant mortality, would be expected to have a similar effect on DWG species. Further, the reductions in the catch limits associated with **Alternative 1**, **Alternative 2**, **Preferred Alternative 3**, and **Alternative 4** are projected to provide the greatest positive effect on the complex based on the proposed changes in Alternative 2 of Action 1 and prevent overfishing of yellowedge grouper. **Alternative 1** would not establish a recreational ACL. However, so long as the complex ACL is not exceeded, no negative biological effect would be expected. Like **Alternative 1**, all of the complex ACLs under **Alternative 2**, **Preferred Alternative 3**, and **Alternative 4** are based on projections from the 2023 SEDAR 85 stock assessment update, and recent landings for warsaw grouper, snowy grouper, and speckled hind. These catch limits follow the recommendations from the Council's SSC for an OFL with an $F_{MSY}$ proxy of $F_{40\%SPR}$, and an ABC with fishing at 75% of the yield at $F_{40\%SPR}$. Thus, **Alternative 1**, **Alternative 2**, **Preferred Alternative 3**, and **Alternative 4** are projected to result in the same stock size over time. Although **Alternative 2**, **Preferred Alternative 3**, and **Alternative 4** would allocate a greater percentage of the total ACL to the recreational sector compared to **Alternative 1**, no reduction of total allowable annual harvest results due to similar discard mortality rates and management biases resulting in discards. So, the difference in effects between the complex ACLs **Alternative 1**, **Alternative 2**, **Preferred Alternative 3**, and **Alternative 4** is negligible within the projection period of 2025 – 2029. Therefore, the effects under these alternatives are not expected to be measurably different.

For the commercial sector, the IFQ program constrains commercial landings to the commercial quota. The recreational AMs are discussed in Section 4.3, below.

### 4.2.3 Effects on the Economic Environment

**Alternative 1** would maintain the current sector allocations and ACLs. With the commercial sector allocation defined at 96.5% and the recreational sector undefined, the recreational sector has operated through use of the remaining 3.5% of the allocation. Historical recreational landings have regularly exceeded this 3.5% allocation. However, the effects of the reduction in the allowable recreational harvest as compared to historical landings is accounted for in Section 4.1.3. For the purposes of this analysis, it is assumed that recreational harvest would be constrained to the recreational portion of the complex ACL. Therefore, no economic effects are expected from **Alternative 1**. No economic effects are expected from **Alternative 2** either, since it retains the 96.5% commercial sector allocation and defines the recreational sector allocation as 3.5%. **Preferred Alternative 3** and **Alternative 4** would revise the sector allocations and ACLs and are expected to result in economic effects.

**Commercial Sector**
For the commercial sector, the comparison of effects is based on the resulting quota from **Alternative 2, Preferred Alternative 3,** and **Alternative 4** relative to that of **Alternative 1**. Since historical landings exceed the new commercial ACL set in Action 1, they are irrelevant for

comparing the allocation alternatives in Action 2, since all will be constraining on harvest. Furthermore, the analyses here incorporate the expectation that the full potential of the quota will be realized under **Alternative 1**, since historical landings exceed the new quota.

To calculate expected changes in commercial consumer surplus (CS), own-price flexibility[33] for the Gulf DWG commercial sector would be required to derive the expected average price change. Keithly and Tabarestani (2018) estimated an uncompensated own-price flexibility for "GOM Other Grouper," inclusive of DWG, of -0.396. If own-price flexibility is unavailable, price is assumed constant with changes in the commercial quota, and if the expected average price change is zero, then multiplying that by the change in expected harvest by the commercial sector under the proposed quota to arrive at the expected change in commercial CS for DWG would result in a value of zero. However, for DWG, the expected change in commercial CS can be derived using the own-price flexibility for "GOM Other Grouper." The expected changes in commercial CS are displayed in Table 4.1.3.2, as are the expected average price changes, which are based on the calculated percent change in price multiplied by the new status quo price (the new price of $7.48 from Action 1 Preferred Alternative 2).

**Table 4.2.3.1.** Expected change in the commercial sector's consumer surplus, relative to **Alternative 1**. Values are in 2024$.

| Alternative | Expected Change in Landings by Commercial Sector (lb gw) | Expected Average Price Change ($/lb) | Expected Change in CS (2024$) |
|---|---|---|---|
| **Alt 2** | 0 | $0 | $0 |
| **Preferred Alt 3** | -35,735 | $0.21 | -$102,220 |
| **Alt 4** | -17,796 | $0.10 | -$51,802 |

To determine the respective expected change in ex-vessel revenue as a result of the proposed change to the quota and its effect on commercial landings, the quotas from **Alternative 2, Preferred Alternative 3,** and **Alternative 4** are multiplied by the sum of the expected average price change from Table 4.2.3.1 and the average ex-vessel price per lb gw of $7.48 for DWG from 2019-2023 (2024$). From that value is then subtracted the average ex-vessel price per lb gw of $7.48, multiplied by **Alternative 1's** quota. The expected changes in revenue are displayed in Table 4.2.3.2.

[33] 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.

**Table 4.2.3.2.** Expected change in commercial sector revenue relative to **Alternative 1** in 2024$.

| Alternative | Expected Change in Comm Revenue |
|---|---|
| **Alt 2** | $0 |
| **Preferred Alt 3** | -$168,891 |
| **Alt 4** | -$82,227 |

The commercial producer surplus (PS) for vessels that harvested DWG complex species in the Gulf is estimated as 53.7% of the ex-vessel value (section 3.3.1). The expected changes in commercial PS are shown in Table 4.2.3.3.

**Table 4.2.3.3.** Expected change in commercial sector PS relative to **Alternative 1** in 2024$.

| Alternative | Expected Change in Comm PS |
|---|---|
| **Alt 2** | $0 |
| **Preferred Alt 3** | -$90,694 |
| **Alt 4** | -$44,156 |

The total expected changes in net economic benefits for the commercial sector from **Alternative 2, Preferred Alternative 3,** and **Alternative 4** relative to **Alternative 1** are calculated by adding the expected change in commercial CS from Table 4.2.3.1 to the expected change in commercial PS from Table 4.2.3.3. The values are displayed in Table 4.2.3.4.

**Table 4.2.3.4.** Total expected change in net economic benefits for the commercial sector relative to **Alternative 1**. Values are in 2024$.

| Alternative | Total Expected Change in Net Economic Benefits to the Commercial Sector |
|---|---|
| **Alt 2** | $0 |
| **Preferred Alt 3** | -$192,914 |
| **Alt 4** | -$95,958 |

**Recreational Sector**

Estimated changes in economic value to recreational fishermen are approximated by multiplying the expected change in the number of fish harvested by a per fish CS estimate. The most recent proxy for a CS estimate for a DWG species is the estimated value of the CS for a one fish change in grouper harvest, derived from keeping a second grouper on an angler trip. A value of $131 (Carter and Liese 2012; values updated to 2024$) reflect recreational willingness-to-pay (WTP) for one additional grouper harvest. This might overestimate the WTP of a DWG fish for Gulf recreational fishermen as a whole, if Gulf recreational fishermen are retaining more than one DWG fish per trip, since WTP decreases as additional fish are retained.

The expected change in the number of fish harvested is calculated by dividing the change in the recreational sector's allowable harvest by 9.79 lb gw, which is the weighted average weight of a recreational landed Other SWG fish in the Gulf from the 2020 to 2024 fishing years.[34] Multiplying the expected change in the number of fish expected to be landed by the recreational sector by the estimated value of the CS provides the expected change in CS for the recreational sector, as seen in Table 4.2.3.5.

**Table 4.2.3.5.** Expected change in recreational sector CS, relative to **Alternative 1** in 2024$.

| Alternative | Expected Change in Rec Sector Landings, Expressed as Number of Fish | Expected Change in Rec Sector CS |
|---|---|---|
| **Alt 2** | 0 | 0 |
| **Preferred Alt 3** | 3,804 | $498,339 |
| **Alt 4** | 1,894 | $248,055 |

The 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 the recreational sector's allowable harvest would be reasonable. However, charter vessel trips that are targeting DWG may be added by anglers and are the focus of the recreational sector PS analysis. Table 3.3.2.1 shows that an average of 60 target trips by charter mode for DWG in the Gulf were made from 2019-2023, which accounts for roughly 2.46% of all recreational target trips for DWG in the Gulf from 2019-2023. In contrast, an average of 6,244 catch trips by charter mode for DWG in the Gulf were made from 2019-2023. This suggests that DWG fish are incidentally harvested species. Therefore, a change in demand for for-hire trips would not be expected. While it is possible that some trip additions might occur, minimal effects are expected.

The effects to the recreational sector are contingent on the sector's landings being constrained to its allowable harvest. A management constraint, in form of a modification to the recreational sector accountability measure, is considered in Action 3. Should the No Action alternative in

[34] Landings were reported in paired species as black grouper and yellowfin grouper and as scamp and yellowmouth grouper. The percentage each pair represented for the overall recreational landings was averaged over 2018-2023, excluding 2020, and multiplied by the average recreationally landed weight of the predominantly landed species for each pairing (black grouper and scamp) over 2020-2024 (M. Larkin, SERO pers. comm. 2025), and then summed to get a representative weight for a recreationally landed Other SWG fish.

Action 3 be selected as the preferred alternative, additional positive effects to the recreational sector discussed in this section could occur.

**Net Economic Benefits**
The total expected change in net economic benefits for both the recreational and commercial sectors are displayed in Table 4.2.3.6.

**Table 4.2.3.6.** Total expected change in net economic benefits for the both the recreational and commercial sectors relative to Alternative 1. Values are in 2024$.

| Alternative | Total Expected Change in Net Economic Benefits |
|---|---|
| **Alt 2** | $0 |
| **Preferred Alt 3** | $305,424 |
| **Alt 4** | $152,097 |

## 4.2.4 Effects on the Social Environment

Generally, as stated for Action 1, the reduction in catch limits is expected to result in negative social effects for both fishing sectors, but in particular for the commercial sector. This is due in large part to the amount of quota available to the commercial fishermen being reduced by at least approximately 50%. Further reallocation under some alternatives in Action 2 may further exacerbate these expected negative social effects.

Under **Alternative 1** (No Action), 96.5% of the ACL would remain assigned to the commercial sector, and the recreational share would remain undefined. This structure has provided operational stability for commercial IFQ participants, particularly in Madeira Beach, Panama City, and Galveston. These socially vulnerable ports would see no relief from the reduction in the ABC for DWG, and recreational anglers would remain subject to early season closures. **Alternative 1** also limits the ability of NMFS to monitor and manage the recreational sector effectively, especially under reduced catch limits. **Alternative 2** would codify a recreational ACL based on the existing 3.5% of the ACL that is available to the recreational sector. This may be perceived by anglers and for-hire operators as overly restrictive, particularly given the change to MRIP-FES and the more recent estimates of increased recreational effort and landings. **Preferred Alternative 3** would increase the recreational share to 10.21% based on recent recreational landings data (2019–2023), potentially improving perceptions of fairness among the recreational sector but reducing the commercial allocation. The additional allocation to the recreational sector measurably increases the fishing season duration, benefitting for-hire operators and widening public access across multiple Gulf states. This alternative disperses benefits more broadly due to the general distribution of recreational fishing effort and reduces dependence risk in single-species ports. However, negative social effects would be expected to be greatest for the commercial sector under **Preferred Alternative 3**, as it would reduce the commercial quota most of the alternatives proposed in Action 2. **Alternative 4** applies proportional reductions across both sectors based on recent landings, offering a compromise that may be more acceptable to stakeholders seeking an equitable reallocation. Social benefits and

costs are muted relative to **Preferred Alternative 3**, offering a compromise with limited redistribution of allowable catch.

All alternatives would require adaptation by IFQ participants, who may face reduced allocations and fewer crew working days and may lead to changes in commercial participants' sense of place in ports most vulnerable to the proposed catch reductions. Recreational users may need to adjust expectations for access or trip planning. Changes in sector allocations can influence stakeholder trust and perceptions of procedural fairness, particularly where long-standing entitlements or economic investments are at stake. Table 4.2.4.1 characterizes the relationships between the alternatives in Action 2 and select relevant social dimensions which may have bearing on the proposed action.

**Table 4.2.4.1.** Breakdown of social effects of Action 2 relative to the current social environment for the reef fish fishery in the Gulf.

| Dimension | Alt 1 – No action | Alt 2 – Specify Rec ACL | Pref Alt 3 – Recent-history shift | Alt 4 – Equal-reduction shift |
|---|---|---|---|---|
| **Commercial season & revenue** | Quota reduction is expected to be limiting, negatively affecting crew workdays and revenue. | Same as Alt 1. | Commercial quota cut is spread across IFQ participants. Madeira Beach, Panama City and Galveston dealers most affected; crew workdays may be reduced. | Intermediate impact between Alternatives 2 and 3 (-18,000 lb gw). |
| **IFQ dynamics** | Annual available allocation reduced with commercial quotas, allocation price increases. | Same as Alt 1. | Small to medium shareholders experience greater allocation price increases due to less annual allocation available. | Less pronounced allocation price pressure than **Pref Alt 3**. |
| **For-hire sector & private anglers** | Recreational harvest managed by AMs; early closures likely in high-catch years, reducing trip species diversity later in the year. | Administrative clarity with an actual recreational ACL, but very prone to early closure; little relief for charter operations. | Extra allocation versus Alt 2 keeps the recreational season open several additional weeks. Charter/headboat operators in Destin, Orange Beach and Galveston expect more bookings compared to Alt 2. | Gains about half as large as in **Pref Alt 3**. Season likely extended by a week or so compared to Alt 2; modest benefit to for-hire fleet. |
| **Community-level distribution** | Benefits kept in core commercial ports; rec-dependent towns see limited value. | Same pattern as Alt 1. | Shifts some economic activity toward highly recreational ports. | Partial shift; still heavily commercial-weighted. |
| **National Standard 8 (community impacts)** | Maintains status quo benefits to commercial communities but offers limited access to broad recreational constituency. | Same as Alt 1. | Balances localized commercial losses with recreational gains; reduces disparity between sectors, keeps major ports viable. | Minor re-balancing: commercial communities protected; recreational gains modest. |

### 4.2.5 Effects on the Administrative Environment

Modifying the complex catch limits and sector allocations does not typically result in significant effects on the administrative environment. **Alternative 1** maintains the current sector allocation and method for calculating catch limits, but it would have a greater administrative burden due to the lack of an established recreational ACL upon which to base an AM in Action 3. **Alternative 2**, **Preferred Alternative 3**, and **Alternative 4** would result in a short-term increased burden on the administrative environment due to the establishment of a revised sector allocation and its associated catch limits. However, engaging in rulemaking to implement this change in management is a routine function for NMFS that occurs whenever revised catch recommendations come from the SSC. **Alternative 1**, **Alternative 2**, **Preferred Alternative 3**, and **Alternative 4** would no longer require NMFS to convert landings from MRIP-FES to MRFSS to account for recreational landings. This is because the alternatives in Action 2 are informed by Alternative 2 in Action 1. Some administrative burden is anticipated under any of the alternatives in Action 2 with respect to outreach as it relates to notifying stakeholders of the changes to the sector allocation and ACLs. None of the anticipated effects are expected to be significant.

## 4.3 Action 3: Modification of Deep-Water Grouper Recreational Accountability Measures

### 4.3.1 Effects on the Physical Environment

Modifications to the recreational sector AMs are expected to result in neutral effects on the physical environment as no change is expected to current recreational fishing practices used in the multi-species reef fish fishery. Effects from **Alternative 1**, **Alternative 2**, **Alternative 3**, and **Preferred Alternative 4** would be dependent on the alternative selected in Action 2 with regard to the probability of an AM being triggered relative to the recreational ACL. Fishing would be expected to occur for other reef fish species when recreational fishing for DWG species is closed. Thus, the effects on the physical environment of **Alternative 1**, **Alternative 2**, **Alternative 3**, and **Preferred Alternative 4** in Action 3 are expected to be neutral.

### 4.3.2 Effects on the Biological and Ecological Environment

If a recreational ACL is established in Alternative 2 – 4 in Action 2, and the recreational ACL is exceeded, then an AM would be expected to be triggered in some manner based on the alternatives in Action 3 to mitigate the negative impacts of that overage on the DWG complex.

If the OFL is exceeded in a fishing year, then overfishing of the DWG complex will be estimated to have occurred. Given that the commercial sector is expected to be limited to the commercial quota by way of the Grouper-Tilefish Individual Fishing Quota (Grouper-Tilefish IFQ) program, based on the historical recreational landings in Table 1.1.2 plus the proposed commercial quotas in Action 2, the OFL proposed in Preferred Alternative 2 in Action 1 is not expected to be exceeded. Thus, the measures in this document would be expected to prevent overfishing of yellowedge grouper, and the DWG complex and direct negative effects are not expected.

The expected effects on the biological environment of the alternatives in Action 3 depend in part on NMFS' ability to predict when to close the recreational sector to fishing for DWG species. The uncertainty in the recreational landings data, expressed as proportional standard error, often exceeds 50%, a point beyond which the NOAA Office of Science and Technology does not recommend the data's use for management decisions. However, these data are all that are available in a uniform data unit for the recreational sector for DWG species, and the imprecision in these data can lead to imprecision in the estimation of recreational fishing season duration.

All alternatives in Action 3 assume that the commercial sector will land its commercial quota in a given fishing year. **Alternative 1**, **Alternative 2**, and **Alternative 3** use a post-season AM based on complex landings exceeding the complex ACL (**Alternative 1**), recreational landings exceeding the recreational ACL (**Alternative 2**), or recreational and complex landings exceeding their respective ACLs (**Alternative 3**). These three alternatives are evaluated and triggered, or not, on an annual basis. In relation to the biological environment, there is no appreciable difference between these alternatives. **Preferred Alternative 4** is based on whether the average recreational DWG landings exceed the recreational ACL, and whether the total complex ACL is also exceeded, over a three-year moving period. This means that both the recreational ACL and

complex ACL could be exceeded in a fishing year without triggering the AM in the following year, so long as the three-year average does not exceed the recreational and complex ACL, respectively. In the short-term, under this scenario, it is possible that increased negative biological effects could be expected from **Preferred Alternative 4.** However, over the long-term, the biological effects of **Preferred Alternative 4** relative to **Alternative 1**, **Alternative 2**, and **Alternative 3** are expected to be neutral.

### 4.3.3 Effects on the Economic Environment

**Commercial Sector**

As this action addresses the recreational AMs for the DWG complex, no economic effects to the commercial sector are expected.

**Recreational Sector**

Qualitative analysis of the effects of reducing the catch limits and adjusting the recreational allocation are presented in Sections 4.1.3 and 4.2.3. This section discusses additional impacts that may result from modifying the recreational AM. **Alternative 1** would maintain the current recreational AMs for the DWG complex. No effects are expected from this alternative. **Alternative 1** is expected to be the least restrictive of the proposed alternatives, as the post-season AM is related to the projection of when the complex ACL will be reached but the IFQ system allows commercial landings year-round. **Alternatives 2** and **3** and **Preferred Alternative 4** are contingent upon the establishment of a recreational ACL in Action 2. **Alternative 2** is expected to the most restrictive of the proposed alternatives, as the AM would be triggered if the recreational ACL is exceeded in a single year and would therefore have the greatest negative effects to the recreational sector as a result of a shorter recreational fishing season and the corresponding reduction in recreational CS from fewer fish harvested. **Alternative 3** is expected to the second-most restrictive of the proposed alternatives, as the AM would be triggered if the both the recreational ACL and the complex ACL are to be exceeded in a single year and would have the second greatest negative effects to the recreational sector. **Preferred Alternative 4** is expected to be the third-most restrictive of the proposed alternatives, as the AM would be triggered if the average recreational landings exceed the average recreational ACL, and the average total landings exceed the average complex ACL over a three-year moving period. **Alternative 3** and **Preferred Alternative 4** have fewer negative effects than Alternative 2 since they provide for additional usage of the complex ACL. So long as the complex ACL is not exceeded, either in a single year (**Alternative 3**) or in a three-year moving period (**Preferred Alternative 4**), the AM would not be triggered if the recreational ACL is exceeded.

### 4.3.4 Effects on the Social Environment

**Alternative 1** (No Action) would retain the current AM, which triggers a closure only if the total complex ACL is exceeded, offering limited control over recreational overages given that commercial IFQ landings are not finalized until the end of the year. **Alternative 2** would

implement a closure in the year following any recreational ACL overage, providing a strong but potentially abrupt consequence that may disrupt for-hire operations and trip planning. Although closures may still occur in busy years, their timing is more transparent. **Alternative 3** would only trigger closure if both the recreational ACL and the total complex ACL are exceeded, offering a more tempered approach but potentially delaying corrective action. Because simultaneous overages are rare, recreational access becomes more reliable, supporting recreational fishing in highly reliant ports. **Preferred Alternative 4** would modify the recreational fishing season if the average recreational DWG landings exceed the average recreational ACL, and the average complex ACL is exceeded over a three-year moving period. This approach avoids immediate closures, offering greater predictability for anglers and for-hire businesses while still constraining the recreational sector when the AM is triggered.

Across alternatives, social impacts will likely be shaped by the recreational sector's trust in landings data, and their respective ability to adapt to new catch limits and fishing season closures when they occur. Regional differences in participation and reliance on DWG species, particularly in parts of Florida and other areas with active offshore fleets, may also influence how AMs are experienced on the water. Table 4.3.4.1 characterizes the relationships between the alternatives in Action 3 and select relevant social dimensions which may have bearing on the proposed action.

**Table 4.3.4.1.** Breakdown of social effects of Action 3 relative to the current social environment for the recreational reef fish fishery in the Gulf.

| Dimension | Alt 1 – No Action (*combined* landings trigger) | Alt 2 – Rec-only trigger | Alt 3 – Rec and complex trigger | Pref Alt 4 – Dual 3-yr moving-average trigger |
|---|---|---|---|---|
| **Access predictability for anglers & for-hire operators** | Closure timing depends on *commercial* progress, which is uncertain until year end. | Closure depends solely on recreational catch, which use delayed and uncertain data. | Closure less likely; only triggered after simultaneous overages. | Like Alt 3, but without the reaction to single high-catch years. |
| **Typical season duration, under Alt 3 in Action 2** | Open most of calendar year before closure based on high-catch years. | Could shorten season by 2–3 weeks in years of strong effort. | Similar to Alt 1 | Season even less likely to close, as trigger is not as vulnerable to single high-catch years |
| **Economic stability for for-hire businesses** | Season duration corrections could hurt operations reliant on summer bookings in Destin, Panama City and Orange Beach. | Cancellations likely since season duration will be hard to anticipate based on untimely and uncertain recreational landings data | Less disruption since closure based on all landings. Businesses can advertise consistent DWG access for most years. | Least disruption. Low vulnerability to single high-catch years means more consistent season durations. |
| **Conflict between sectors** | Status quo, with recreational sector able to fish anything not caught by the commercial sector. | Removes dependence on magnitude of commercial landings by recreational sector; viewed as fairer application of ACLs. | Less conflict: directly accounts for recreational landings against that ACL, plus total landings against the complex ACL | Shifts focus from single-year reaction to multi-year performance, easing inter-sector tension. |
| **Community-level impact** | Little impact given the difficulty in predicting a closure before year-end commercial landings are known | Greater season duration uncertainty from untimely and imprecise data, resulting in less predictable fishing season durations. | Lower risk, as complex ACL must also be exceeded before a season duration correction is applied in the following year. | Lowest risk, as focus on multi-year landings performance eliminates reactionary response to single high catch years. |

### 4.3.5 Direct and Indirect Effects on the Administrative Environment

This action would affect the administrative environment mostly through post-season closures for the recreational sector that are more likely to be triggered than under current management. This is because the current management under **Alternative 1**, based on no defined recreational ACL

under Alternative 1 in Action 2, can only be implemented based on the assumption that the commercial sector will land its quota every year. However, this assumption is not stated in the codified text as a condition of implementing the AM in **Alternative 1**. The commercial sector will not have a seasonal closure due to the use of the Grouper-Tilefish IFQ program for DWG species, and because no commercial seasonal closure is considered in this document. A closure of the recreational sector for DWG species would only have minor effects on the administrative environment as closures already occur for many reef fish species and are expected to occur for DWG species in the foreseeable future regardless of the alternative chosen in this action. Based on the probability of the recreational ACL being exceeded using Figure 2.2.1, it is most likely that **Alternative 2** would be triggered, followed by **Alternative 3**, and **Preferred Alternative 4**. There is no effect on the administrative burden for law enforcement as law enforcement officers do not monitor catch limits but would only continue to monitor compliance with any established closed season. Some administrative burden is anticipated with respect to outreach as it relates to notifying stakeholders of the changes to the recreational fishing season, and any post-season recreational closures that occur. None of the expected effects are expected to be significant.

## 4.4 Cumulative Effects Analysis

As directed by the Companion Manual for NOAA Administrative Order 216-6A, Policy and Procedures for Compliance with the National Environmental Policy Act and Related Authorities, NMFS must assess the cumulative impacts of actions. Cumulative effects are those effects that result from incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions (RFFA), regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative effects can result from individually minor but collectively significant actions that take place over a period of time. The cumulative effects analysis in this environmental assessment evaluates the following five criteria.

1. The area in which the effects of the proposed action will occur - The affected area of these proposed actions encompasses the state and federal waters of the Gulf, as well as Gulf communities that are dependent on reef fish fishing. Most relevant to these proposed actions are DWG species and those who fish for them. For more information about the area in which the effects of this proposed action will occur, please see Chapter 3, Affected Environment, which describes these important resources as well as other relevant features of the human environment.

2. The impacts that are expected in that area from the proposed action - The proposed actions would modify Gulf DWG SDC, catch limits, catch allocations between the recreational and commercial sectors, and the recreational AMs. The environmental consequences of the proposed actions are analyzed in Sections 4.1.1, 4.1.2, 4.2.1, 4.2.2, 4.3.1, and 4.3.2, and are not expected to be significant. The combined actions are not expected to have significant effects on the physical environment, as they are not expected to alter how the DWG portion of the reef fish fishery is prosecuted (Sections 4.1.1, 4.2.1, and 4.3.1). These measures are expected to have non-significant but positive effects on the biological environment because the actions would reduce DWG harvest and mortality and end overfishing of yellowedge grouper (Section 4.1.2, and 4.2.2). Regulatory discards are expected to increase because the DWG recreational fishing season duration would be expected to be reduced, and thus DWG species would need to be discarded when caught while fishing for other species. In particular, species in the mid-water snapper fishery can be caught while fishing for DWG species, which may result in DWG discards by the recreational sector (Section 4.3.2). Despite this change, overall DWG species mortality is expected to decrease. Further, changing fishing practices on one stock does not generally change overall fishing effort or fishing practices. Although it is likely that a short-term negative effect on the social and economic environments will occur due to the actions taken herein, as the stock rebuilds to the spawning stock biomass level commensurate with MSY, benefits to the economic (Sections 4.1.3, 4.2.3, and 4.3.3) and social environments (Sections 4.1.4, 4.2.4, and 4.3.4) are expected. The actions are not expected to significantly affect the administrative environment (Sections 4.1.5, 4.2.5, and 4.3.5), adversely or beneficially.

3. Other past, present and RFFAs that have or are expected to have impacts in the area - There are numerous actions under development in the Gulf annually. Many of these activities are expected to have impacts associated with them and are listed below.

Other fishery related actions - The cumulative effects associated with modifying DWG ACLs and quotas were analyzed in the environmental impact statement (EIS) for the Generic ACL/AM Amendment (GMFMC 2011a). These cumulative effects analyses are incorporated here by reference. Other pertinent actions are summarized in the history of management (Section 1.3). Currently, there are several present and RFFAs that are being considered by the Council for the Reef Fish FMP or implemented by NMFS, which could affect reef fish stocks. These include Amendment 58A, which proposes to revise shallow-water grouper management measures; Amendment 59A, which would revise permit requirements for participation in the Grouper-Tilefish commercial IFQ programs; Amendment 59B, which would revise active participation requirements in the Grouper-Tilefish commercial IFQ programs; and Amendment 60, which would address commercial IFQ programmatic distributional issues. Two framework actions are also being developed: a reef fish framework that proposes to modify the shallow-water grouper catch limits and recreational fishing season ahead of Amendment 58A; and a generic framework that addresses essential fish habitat. Lastly, NMFS developed an emergency rule to increase the red grouper catch limits for 2025. There are no documents currently being considered for implementation by NMFS that could directly affect DWG species. Descriptions of these actions can be found on the Council's Website.

Non-fishery related actions - Actions affecting the reef fish fishery have been described in previous cumulative effects analyses. An important event includes impacts of the Northern Gulf Hypoxic Zone (See Sections 3.1 and 3.2). DWG species, while mobile, have an unknown susceptibility to hypoxic conditions, so any effects from the Northern Gulf Hypoxic Zone on DWG species are unknown.

4. The impacts or expected impacts from these other actions - The cumulative effects from managing the reef fish fishery have been analyzed in multiple other actions. They include a detailed analysis of the reef fish fishery, cumulative effects on non-target species, protected species, and habitats in the Gulf. Overall, bycatch of protected species in the DWG portion of the reef fish fishery is negligible and effects to habitat are minimized due to the gear types used for harvest (Section 3.2). The effects of this action are positive, as they ultimately reduce overfishing of yellowedge grouper, which is expected to result in increased fishing opportunities in the future. Short-term negative impacts on the social and economic environments are expected due to shortened recreational fishing seasons and limited allowable harvest of DWG species. However, as the yellowedge grouper stock rebuilds, benefits to the economic and social environments are expected. Furthermore, it is assumed that recreational fishing trips would occur regardless of whether DWG is open for recreational harvest, as recreational fishing for DWG species is generally part of a multi-species fishing strategy and fishermen typically switch to targeting other species when harvest is closed.

5. The overall impact that can be expected if the individual impacts are allowed to accumulate- These actions, combined with other past actions, present actions, and RFFAs, are not expected to have significant beneficial or adverse effects on the physical and biological environments. Any effects are expected to be positive but are not expected to substantially change the way the reef fish fishery is prosecuted (Sections 4.1.1, 4.1.2, 4.2.1, 4.2.2, 4.3.1, and 4.3.2). For the social and economic environments, some negative short-term but positive long-term effects are expected to result for fishing communities from reducing allowable harvest and shortening the fishing season

(Sections 4.2.3, 4.2.4, 4.3.3, and 4.3.4). These effects are likely minimal, as the proposed action, along with other past actions, present actions, and RFFAs, are not expected to alter the way the fishery is prosecuted. Because it is unlikely there would be any changes in how the fishery is prosecuted, these actions, combined with past actions, present actions, and RFFAs, are not expected to have significant adverse effects on public health or safety.

6. Summary- The proposed actions are not expected to have individual significant effects on the physical, biological, economic, or social environments. Any effects of the proposed action, when combined with other past actions, present actions, and RFFAs are not expected to be significant. The effects of the proposed actions are, and will continue to be, monitored through collection of landings data by NMFS, individual state programs, stock assessments and stock assessment updates, life history studies, economic and social analyses, and other scientific observations. Landings data for the recreational sector in the Gulf are presently collected through MRIP, Louisiana Creel Survey, Mississippi Creel Survey, Alabama Creel Survey, Southeast Regional Headboat Survey, Florida's State Reef Fish Survey, and the Texas Parks and Wildlife Department. The cumulative social and economic effects of past, present, and future amendments may be described as increasing fishing opportunities, resulting in positive social and economic impacts. The proposed actions in this environmental assessment are expected to result in important long-term benefits to fishing communities and associated businesses.

# CHAPTER 5. REGULATORY IMPACT REVIEW

## 5.1

# CHAPTER 6. REGULATORY FLEXIBILITY ANALYSIS

# CHAPTER 7. LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS CONSULTED

1. National Marine Fisheries Service:
   - Southeast Fisheries Science Center
   - Southeast Regional Office
     i. Protected Resources
     ii. Habitat Conservation
     iii. Sustainable Fisheries

2. NOAA General Counsel
3. U.S. Coast Guard
4. Alabama Department of Conservation and Natural Resources/Marine Resources Division
5. Florida Fish and Wildlife Conservation Commission
6. Louisiana Department of Wildlife and Fisheries
7. Mississippi Department of Marine Resources
8. Texas Parks and Wildlife Department

# CHAPTER 8. LIST OF PREPARERS

**PREPARERS**

| Name | Expertise | Responsibility | Agency |
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| Matt Freeman | Economist | Economic analyses | Gulf Council |
| David Records | Economist | Economic analyses | SERO |
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| Christina Package-Ward | Anthropologist | Social analyses | SERO |
| Alisha Gray | Fishery Biologist | Data analyses | SERO |

**REVIEWERS**

| Name | Expertise | Responsibility | Agency |
|---|---|---|---|
| Mara Levy | Attorney | Legal review | NOAA GC |
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| Jessica Stephen | Limited Access Privilege Programs | Review | SERO |
| Frank Helies | Fishery Biologist | Review | SERO |
| John Froeschke | Fishery Biologist | Review | Gulf Council |
| Carrie Simmons | Fishery Biologist | Review | Gulf 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: CONSIDERED BUT REJECTED APPENDIX

**November 2024 Council Meeting**

## Action 2: Modification of Deep-Water Grouper Sector ACLs and Sector Allocations

**Alternative 4:** The complex ACL is set equal to the complex ABC. Establish a recreational ACL and sector allocation based on the average of the highest (2014) and lowest (2000) annual recorded recreational landings from 2000 – 2023 (see Table 1.1.2.). This results in a recreational ACL of 83,809 lb gw, or 15.10% of the complex ACL. The commercial sector is allocated 84.90% of the complex ACL, or 471,217 lb gw. The commercial quota is reduced from the commercial ACL by 4% and is set at 452,368 lb gw. The recreational and commercial ACLs sum to equal the DWG complex ACL. These values are shown in the table below in lb gw.

| Complex | Year | OFL | ABC (Complex ACL) | Comm ACL | Comm Quota | Rec ACL |
|---|---|---|---|---|---|---|
| **DWG** | 2025-2029+ | 731,035 | 555,026 | 471,217 | 452,368 | 83,809 |

**Council Rationale:**

The Council evaluated Alternative 4 in Action 2 and expressed concern with using a data point as old as one from 2000 and providing such considerable weight to it (50%) in determining a sector allocation strategy for deep-water grouper (DWG). Given this concern, and the availability of other alternatives for consideration, the Council decided to remove Alternative 4 of Action 2 to the Considered but Rejected Appendix.

**January 2025 Council Meeting**

**Alternative 5:** The complex ACL is set equal to the complex ABC. Establish a recreational ACL and sector allocation based on the average landings from the recreational and commercial sectors from 2001 – 2004 (see Table 1.1.2). This results in a recreational ACL of 31,026 lb gw, or 5.59% of the complex ACL. The commercial sector is allocated 94.41% of the complex ACL, or 524,000 lb gw. The commercial quota is reduced from the commercial ACL by 4% and is set at 503,040 lb gw. The recreational and commercial ACLs sum to equal the DWG complex ACL. These values are shown in the table below in lb gw.

| Complex | Year | OFL | ABC (Complex ACL) | Comm ACL | Comm Quota | Rec ACL |
|---|---|---|---|---|---|---|
| **DWG** | 2025-2029+ | 731,035 | 555,026 | 524,000 | 503,040 | 31,026 |

**Alternative 6:** The complex ACL is set equal to the complex ABC. Establish a recreational ACL and sector allocation based on the average landings from the recreational and commercial sectors from 2000 – 2023 (see Table 1.1.2). This results in a recreational ACL of 32,747 lb gw, or approximately 5.90% of the complex ACL. The commercial sector is allocated approximately 94.10% of the complex ACL, or 522,279 lb gw. The commercial quota is reduced from the commercial ACL by 4% and is set at 501,388 lb gw. The recreational and commercial ACLs sum to equal the DWG complex ACL. These values are shown in the table below in lb gw.

| Complex | Year | OFL | ABC (Complex ACL) | Comm ACL | Comm Quota | Rec ACL |
|---|---|---|---|---|---|---|
| **DWG** | 2025-2029+ | 731,035 | 555,026 | 522,279 | 501,388 | 32,747 |

**Council Rationale:**

The Council evaluated Alternatives 5 and 6 in Action 2 and expressed concern with using a data from a time when the commercial individual fishing quota (IFQ) program was not in existence, especially given that the IFQ program is expected to continue in the future. Given this concern, and the availability of other alternatives for consideration, the Council decided to remove Alternatives 5 and 6 of Action 2 to the Considered but Rejected Appendix.

## Action 3: Modification of Deep-Water Grouper Recreational Accountability Measures

**Alternative 3**: Establish in-season recreational AMs for the DWG complex. For the recreational sector, if the recreational ACL is projected to be met in a fishing year, then the Regional Administrator would close the recreational sector for the DWG complex for the remainder of that fishing year.

**Council Rationale:**

The Council evaluated Alternative 3 in Action 3 and expressed concern with using an in-season accountability measure for a complex composed of rare-event species with low levels of landings through the Marine Recreational Information Program's Fishing Effort Survey. Landings estimates from MRIP-FES in this circumstance can be very imprecise and sporadic, complicating in-season quota monitoring. Given this data precision

concern, and the availability of other alternatives for consideration, the Council decided to remove Alternative 3 in Action 3 to the Considered but Rejected Appendix.

**Alternative 4:** Revise the post-season recreational AMs for the DWG complex. For the recreational sector, if recreational landings exceed the recreational ACL in two consecutive years out of the previous three fishing years, then in the following fishing year the Regional Administrator would close the recreational sector for the DWG complex for the remainder of that fishing year when the recreational ACL is projected to be met.

**Council Rationale:**

The Council evaluated Alternative 4 in Action 3 and was informed by NOAA General Counsel that, since Alternative 4 did not require any action by the Council for at least two years, it was not compliant with the requirement in National Standard 1 for annual quota monitoring. Given this concern, the Council decided to remove Alternative 4 in Action 3 to the Considered but Rejected Appendix.

# APPENDIX B: RECREATIONAL AND COMMERCIAL SEASON DURATION ANALYSES

**Recreational and Commercial Season Analyses for the Gulf of America Deep-Water Grouper Complex**
Southeast Regional Office
LAPP/DM Branch
March 5, 2025

The Gulf of America (Gulf) deep water grouper (DWG) complex consists of snowy grouper, speckled hind, warsaw grouper and yellowedge grouper. These species are currently managed as a complex in federal waters under the Fishery Management Plan for the Reef Fish Resources of the Gulf (Reef Fish FMP). In 2025, an amendment to the Reef Fish FMP will establish annual catch limits (ACLs) and sector allocations in pounds (lb) gutted weight (gw) for the commercial and recreational sectors using updated data from the Marine Recreational Information Program (MRIP) Fishing Effort Survey (FES). This analysis provides the average commercial landings and how much that represents of each proposed commercial IFQ quota option, and separately projects recreational fishing season closures based on all management options currently being considered.

*Commercial and recreational landings data*
Monthly commercial landings were obtained for the DWG species from the National Marine Fisheries Service (NMFS) Catch Share Database (January 2025; **Table B.1**). Gulf recreational landings for the DWG complex were obtained from the Southeast Fisheries Science Center (SEFSC) recreational ACL files (accessed December 2024; **Table B.2**). The SEFSC recreational landings dataset includes landings from the Texas Parks and Wildlife recreational creel survey (TPWD), Louisiana Department of Wildlife and Fisheries creel survey (LA Creel), Southeast Region Headboat Survey (SRHS), and the Marine Recreational Information Program (MRIP; Florida, Alabama and Mississippi). The MRIP file contains estimates from MRIP's Access Point Angler Intercept Survey (APAIS), MRIP FES (private angler effort estimates), and For-Hire Telephone Survey (FHS; for-hire effort estimates). For 2020 and 2021, imputed MRIP FES catch estimates are used to account for disruptions in the dockside sampling due to COVID. Monthly landings were estimated for MRIP FES, TPWD and LA Creel by assuming equal daily catch rates for months within a wave and then combined with SRHS, which are provided monthly. Predicted future landings for both the commercial and recreational sector were estimated by averaging monthly landings in 2021-2023. The average monthly landings were then divided by the number of days in each month to provide a daily catch rate for each sector. Commercial Gulf DWG species are currently managed in a catch share program, and therefore, any reductions in the commercial quota will result in fewer pounds being distributed to each participant who holds shares in the program rather than the fishery experiencing closures. Average commercial landings of DWG species are calculated to project future landing rates and are provided to compare against each of the proposed IFQ quotas (**Table B.3**). Separately, the recreational sector will be closed if the ACL is met or is projected to be met. Predicted

recreational closure dates are provided in **Table B.4** based on cumulatively summed projected recreational landings of DWG species.

**Table B.1.** Commercial landings (lb gw) of Gulf DWG species by wave from 2021-2023 and projected future landings using averaged landings from 2021-2023

| Year | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 | Total Landings |
|---|---|---|---|---|---|---|---|
| 2021 | 76,798 | 130,864 | 179,696 | 192,354 | 91,474 | 129,241 | 800,427 |
| 2022 | 54,690 | 92,873 | 102,511 | 143,481 | 74,892 | 91,461 | 559,908 |
| 2023 | 67,071 | 118,301 | 129,143 | 165,349 | 71,862 | 49,907 | 601,633 |
| 3yr Avg Projected Landings | 66,186 | 114,013 | 137,117 | 167,061 | 79,409 | 90,203 | 653,989 |

Source: SEFSC Commercial ACL dataset [January 2025].
Note: Commercial landings include all Gulf DWG species.

**Table B.2.** Monthly recreational landings (lb gw) of Gulf DWG species from 2021-2023 and projected future landings using averaged landings from 2021-2023.

| Year | Wave 1 | Wave 2 | Wave 3 | Wave 4 | Wave 5 | Wave 6 | Total Landings |
|---|---|---|---|---|---|---|---|
| 2021 | 6,269 | 3,973 | 3,680 | 9,862 | 4,976 | 943 | 29,701 |
| 2022 | 1,071 | 2,473 | 12,261 | 6,761 | 15,903 | 408 | 38,877 |
| 2023 | 562 | 2,009 | 46,390 | 12,597 | 6,094 | 953 | 68,582 |
| 3yr Avg Projected Landings | 2,634 | 2,818 | 20,777 | 9,740 | 8,937 | 767 | 45,672 |

Source: SEFSC MRIP FES recreational ACL database [December 2024].
Note: Recreational landings include all Gulf DWG species (TPWD, SRHS, LA Creel, MRIP FES).

**Table B.3.** Average commercial landings of the Gulf DWG commercial sector compared against each proposed IFQ Quota alternative.

| Alternatives | Proposed Commercial ACL (lb gw) | Proposed IFQ Quota (lb gw) | Average Commercial Landings | % Average Landings compared against Proposed IFQ Quota |
|---|---|---|---|---|
| **Alternative 1: No Action** | 535,600 | 514,176 | 653,989 | 127% |
| **Alternative 2** | 535,600 | 514,176 | 653,989 | 127% |
| **Alternative 3** | 498,358 | 478,424 | 653,989 | 137% |
| **Alternative 4** | 517,062 | 496,380 | 653,989 | 132% |

Source: NMFS Catch Share Database (January 2025).

**Table B.4.** Projected Gulf DWG closure dates expected for the recreational sector with each proposed ACL alternative.

| Alternatives | Proposed Recreational ACL (lb gw) | 3-year Average (2021-2023) | Upper 95% 3-year Average (2021-2023) |
|---|---|---|---|
| **Alternative 1: No Action** | undefined | **Jun 10** | **May 12** |
| **Alternative 2** | 19,426 | **Jun 10** | **May 12** |
| **Alternative 3** | 56,668 | No Closure | **Jul 1** |
| **Alternative 4** | 37,964 | **Sep 14** | **Jun 5** |

Source: SEFSC MRIP FES Recreational ACL Dataset (December 2024).

The reliability of these results is dependent upon the accuracy of the underlying data and input assumptions. The analysis intends to create a realistic baseline as a foundation for comparisons, under the assumption that projected future landings will accurately reflect actual future landings. These closure dates are our best estimate, but uncertainty still exists as economic conditions, weather events, changes in catch-per-unit effort, fisher response to management regulations, and a variety of other factors may cause departures from any assumption.

# APPENDIX C: BYCATCH PRACTICABILITY ANALYSIS

Background/Overview

The Gulf Council (Council) is required by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to establish a standardized bycatch reporting methodology for federal fisheries and to identify and implement conservation and management measures that, to the extent practicable and in the following order: 1) minimize bycatch, and 2) minimize the mortality of bycatch that cannot be avoided. Bycatch is defined as fish harvested in a fishery, but not sold or retained for personal use. This definition includes both economic and regulatory discards. Economic discards are generally undesirable from a market perspective because of their species, size, sex, and/or other characteristics. Regulatory discards are fish required by regulation to be discarded (e.g., minimum size limit, bag limit).

Guidance provided at 50 CFR 600.350(d)(3) identifies ten factors to consider in determining whether a management measure minimizes bycatch or bycatch mortality to the extent practicable. These are:

1. Population effects for the bycatch species.
2. Ecological effects due to changes in the bycatch of that species (effects on other species in the ecosystem).
3. Changes in the bycatch of other species of fish and the resulting population and ecosystem effects.
4. Effects on marine mammals and birds.
5. Changes in fishing, processing, disposal, and marketing costs.
6. Changes in fishing practices and behavior of fishermen.
7. Changes in research, administration, and enforcement costs and management effectiveness.
8. Changes in the economic, social, or cultural value of fishing activities and non-consumptive uses of fishery resources.
9. Changes in the distribution of benefits and costs.
10. Social effects.

The Fishery Management Councils are encouraged to adhere to the precautionary approach outlined in Article 6.5 of the Food and Agriculture Organization (FAO) of the United Nations Code of Conduct for Responsible Fisheries when uncertain about these factors. Bycatch and bycatch mortality can negatively affect a stock by reducing the number of fish that survive and become susceptible to harvest. Fishery management regulations are intended to constrain effort and control fishing mortality, but in some cases increase bycatch or bycatch mortality. When proposing fishing regulations, managers must balance the competing objectives of maximizing yield, ending overfishing, and reducing bycatch to the extent practicable.

This amendment would modify the status determination criteria for the deep-water grouper (DWG) complex, implement reduced catch levels necessary to end overfishing of the yellowedge grouper stock, set allocations of DWG between the commercial and recreational sectors using

recreational data based on the Marine Recreational Information Program – Fishing Effort Survey (MRIP-FES), and modify the DWG recreational accountability measures (AM). The harvest of the Gulf of America (Gulf) DWG is regulated with bag limits and quotas. These measures are generally effective in limiting fishing mortality and DWG species discards. In addition, especially in the recreational sector, catch and effort are inherently limited due to the greater distance from shore from which DWG are generally found. Due to the depth at which DWG are captured, the species often experience extreme barotrauma during retrieval, resulting in very low survival if released. However, because there are no minimum size limits for DWG and because annual catch limits have not been reached since implementation of the individual fishing quota (IFQ) program in 2009, bycatch and discards of DWG species are estimated to be low. This section outlines the amount and type of bycatch and discards experienced in the DWG portion of the reef fish fishery.

## Commercial Sector

### Commercial Discard Rates

DWG species overlap with several other commonly targeted and caught reef fish species (Figure C1). It should be noted that especially in the case of DWG, it appears more likely that certain species known to swim above the ocean bottom (e.g., red snapper, greater amberjack, vermilion snapper) are captured while targeting DWG species, but not vice versa. Because fishing effort is focused above the reef (and commonly at shallower locations), DWG species are not likely to be captured while targeting those species. Commercial discard rates are based on data from the Southeast Fisheries Science Center's (SEFSC) Reef Fish Observer Program (RFOP) from the inception of the Grouper-Tilefish IFQ program from 2010-2017, as compiled and analyzed by Pulver and Stephen (2019) (Table C1). These analyses employed logistic models that were constructed using data from RFOP and analyzing factors including fish length, available allocation, gear type, calendar year quarter, and year to deduce the reasons for discarding. The results from RFOP models in conjunction with self-reported discard information from the SEFSC Supplemental Discard Logbook program determined that discarding due to fish length selection, not related to a minimum size limit, is occurring for speckled hind (*Epinephelus drummondhayi*), yellowedge grouper (*Epinephelus flavolimbatus*), and snowy grouper (*Hyporthodus niveatus*). Based on the results of the study, potential changes to the Grouper-Tilefish IFQ program such as additional flexibility measures were identified as potential management strategies for decreasing discards.

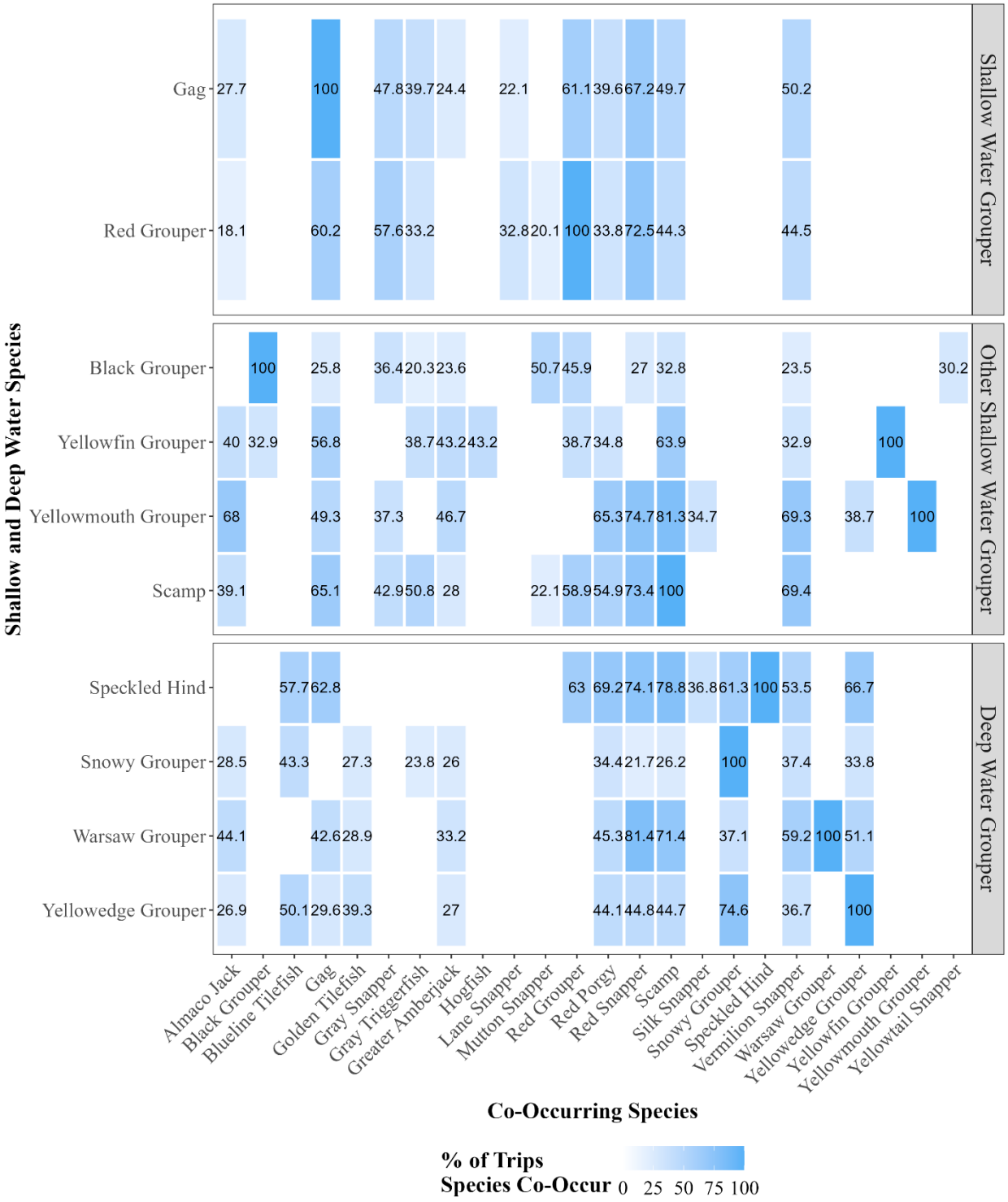


**Figure C1.** Top 10 species that co-occur with shallow and deep-water grouper species caught by the commercial sector in the Gulf, by species family. Darker colors represent higher percentage of co-occurrence on commercial fishing trips.

**Table C1**: The number of captures and percentage for each disposition observed by the RFOP from 2010 through 2017 DWG species.

| DWG Species | Number Observed | Kept | Discarded |
|---|---|---|---|
| Yellowedge Grouper | 29,503 | 98.70% | 1.30% |
| Snowy Grouper | 4,804 | 98.10% | 1.90% |
| Speckled Hind | 2,000 | 74.10% | 25.90% |
| Warsaw Grouper | 280 | 97.90% | 2.10% |

DWG discard rates utilized in the Southeast Data, Assessment and Review (SEDAR) 85 (2023) yellowedge grouper stock assessment were estimated for the Gulf vertical line and bottom longline portions of the fishery (reef fish and shark longline gear) using catch-per-unit-effort (CPUE) from the RFOP and total fishing effort from the commercial reef fish logbook program to estimate total catch (Atkinson et al., 2023). For discard estimation, CPUE is computed for total discards, including fish released alive, released dead, released in unknown condition, and used for bait. Figure C2 provides the estimates of yellowedge grouper commercial and recreational catch and discards used in SEDAR 85 (2023) by year and gear type in weight and shows the rising influence of the recreational sector in harvest of yellowedge grouper (and likely other DWG species) in recent years. Overall, discards in weight by the longline fishery accounted for less than 1% of the total catch (kept + discards) between 1993 and 2021 (Figure C3). Discards in the vertical line fishery were considered negligible, as only 7 observer trips between 2007 and 2021 reported discarding of a yellowedge grouper (SEDAR 85 2023). Table C2 provide the reason for discards (self-reported) for DWG and other species. Note that although there is no minimum size or closed season for any DWG species, these are reported as reasons for some DWG discards.

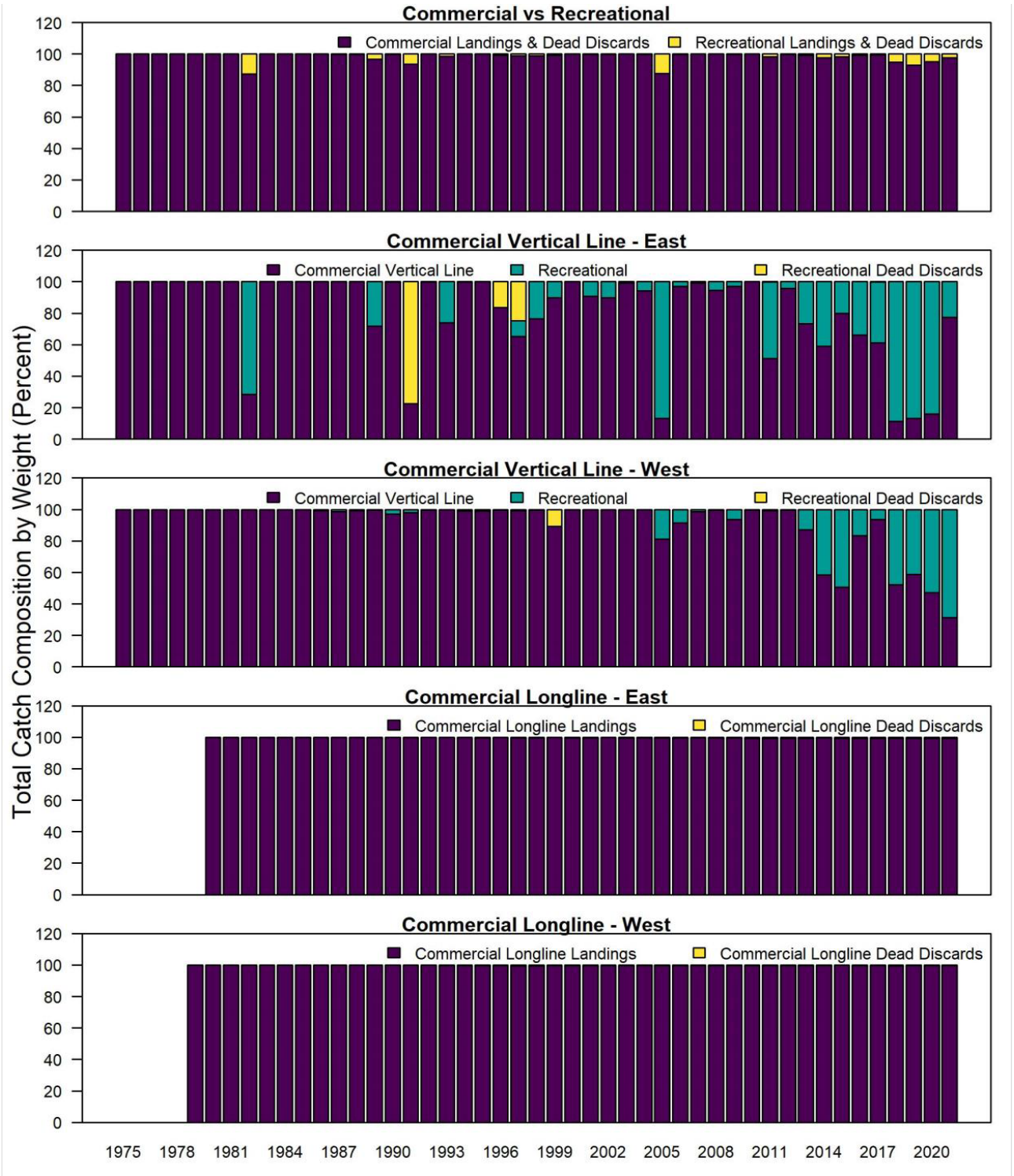


**Figure C2.** Percent composition and comparison of commercial and recreational landings and dead discards for Gulf Yellowedge Grouper.

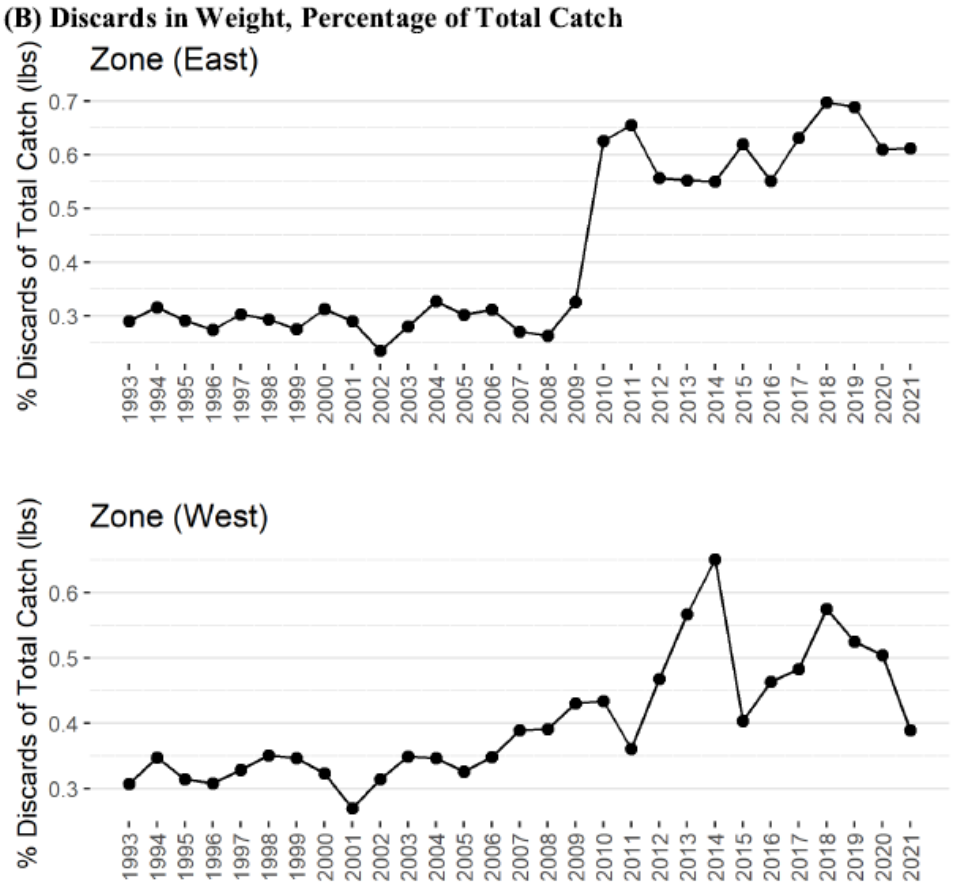


**Figure C3.** Observer CPUE expansion estimates of Gulf yellowedge grouper bottom longline annual discards (+/-SE) in weight expressed as percentage of total catch (kept + discards) for 2007 - 2021. (Atkinson et al., 2023).

**Table C2.** The number of discards, number of trips reporting discards, and percentage of discards for each discard reason out of the total number for DWG species and Grouper-Tilefish IFQ species frequently captured with DWG as reported to the SEFSC Supplemental Discard Logbook from 2010 through 2017.

| IFQ Species | Number Reported | Number of Trips | Not Legal Size | Out of Season | Other Regulation | Market Conditions |
|---|---|---|---|---|---|---|
| Red Grouper | 458,928 | 4,986 | 94.72% | 0.10% | 4.50% | 0.69% |
| Gag | 37,062 | 2,499 | 55.97% | 2.06% | 40.73% | 1.24% |
| Scamp | 4,077 | 582 | 65.49% | 0.29% | 33.80% | 0.42% |
| Snowy Grouper | 512 | 18 | 67.77% | 0.00% | 12.70% | 19.53% |
| Speckled Hind | 234 | 18 | 16.67% | 0.85% | 53.85% | 28.63% |

| | | | | | | |
|---|---|---|---|---|---|---|
| Warsaw Grouper | 18 | 10 | 27.78% | 0.00% | 61.11% | 11.11% |
| Yellowedge Grouper | 1,066 | 42 | 45.87% | 0.00% | 20.36% | 33.77% |
| Blueline Tilefish | 8,999 | 57 | 0.21% | 0.32% | 22.78% | 76.69% |
| Golden Tilefish | 2,725 | 37 | 50.46% | 0.00% | 20.11% | 29.43% |

**Gear Type**

Discard estimation was analyzed for the two predominant gear types in the DWG component of the reef fish fishery - vertical line and bottom longline. Pulver and Stephen (2019) found that among the factors that influenced discarding of DWG and other Grouper-Tilefish IFQ species, gear type had the lowest relative influence on discards (Figure C4). The highest relative influence of gear type for a DWG species was about 10% for snowy grouper, and no other species exceeded 5%. This indicates that gear type was not a driving factor in discards, although the authors noted that discards from longline gear were more prevalent than were discards from vertical line gear.

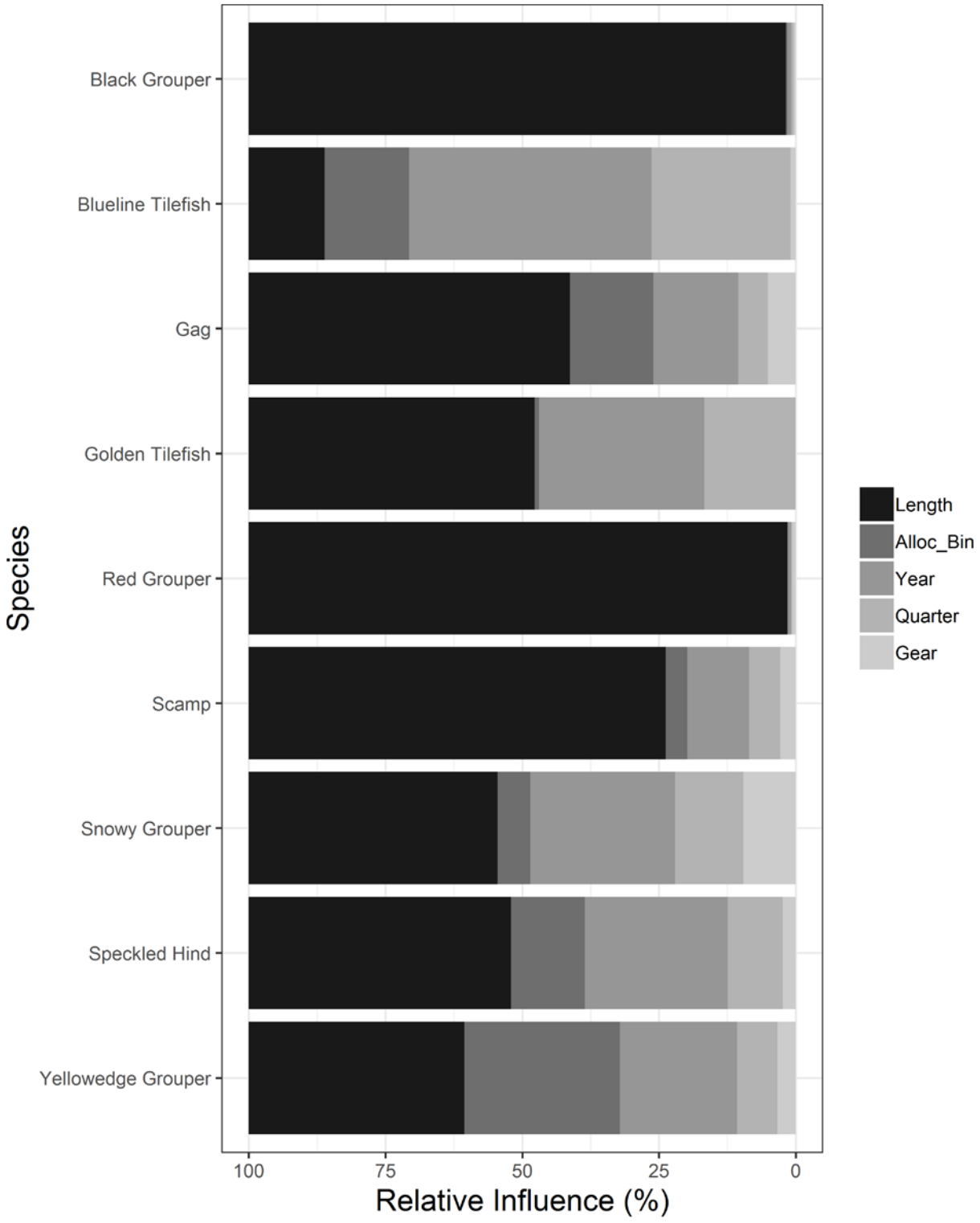


**Figure C4.** The relative influence for each variable affecting discarding from the boosted logistic regression tree models for nine of the Grouper-Tilefish-IFQ species.

**Recreational Discards**

Recreational landings from the recreational headboat, charter, and combined recreational private and shore fleets (2016-2023) are presented in Table C3. Recreational landings by Gulf state (2016-2023) are presented in Table C4. Although there are little available data on recreational discards, the discard rates are thought to be similar to those for the commercial vertical line fishery and may be even lower since there is no minimum size limit, and marketability of retained fish is not an issue for the recreational sector. However, differences between recreational sector discards and commercial vertical line discards are speculative because there is great uncertainty in what influences decisions to discard DWG species in each sector. Like commercial discard mortality, recreational discard mortality rates are thought to be very high and is assumed to be 100% for species such as yellowedge grouper (SEDAR 85).

**Table C3.** Recreational DWG Landings by Fishing Mode.

| | Total DWG Landings (lb gw) | | | | |
|---|---|---|---|---|---|
| | **Charter** | **Headboat** | **Private** | **Shore** | **Total** |
| **2016** | 12,509 | 2,273 | 7,091 | - | 21,873 |
| **2017** | 2,211 | 3,411 | 128 | - | 5,751 |
| **2018** | 7,088 | 734 | 17,852 | - | 25,674 |
| **2019** | 43,327 | 2,752 | 22,785 | - | 68,863 |
| **2020** | 10,695 | 1,544 | 10,577 | - | 22,816 |
| **2021** | 12,198 | 1,225 | 12,651 | - | 26,074 |
| **2022** | 22,123 | 2,920 | 9,099 | - | 34,143 |
| **2023** | 12,290 | 2,480 | 7,937 | - | 22,707 |
| **Average** | 15,305 | 2,168 | 11,015 | - | 28,488 |

**Table C4.** Recreational DWG Landings by Gulf State.

| | Total DWG Landings (lb gw) | | | | |
|---|---|---|---|---|---|
| | **Florida** | **Alabama** | **Louis/Miss** | **Texas** | **Total** |
| **2016** | 18,560 | 4,205 | 4,835 | 939 | 28,538 |
| **2017** | 5,504 | 537 | 5,744 | 1,978 | 13,764 |
| **2018** | 26,356 | 12,773 | 26,205 | 1,781 | 67,115 |
| **2019** | 50,550 | 13,398 | 10,370 | 1,109 | 75,428 |
| **2020** | 16,012 | 8,235 | 8,245 | 483 | 32,976 |
| **2021** | 11,356 | 3,886 | 14,296 | 1,217 | 30,755 |
| **2022** | 30,902 | 2,695 | 10,030 | 1,213 | 44,840 |
| **2023** | 25,690 | 3,298 | 3,563 | 1,230 | 33,781 |
| **Average** | 23,116 | 6,128 | 10,411 | 1,244 | 40,900 |

**Other Bycatch**

The directed DWG portion of the reef fish fishery in the Gulf has had documented interactions with marine mammals. U.S. fisheries are classified under the Marine Mammal Protection Act (MMPA) according to the level of interactions that result in incidental mortality or serious injury

of marine mammals. In the most recent List of Fisheries (89 FR 77789; September 24, 2024), the Gulf commercial reef fish fishery is listed as a Category III fishery under the MMPA. Category III contains fisheries where annual mortality and serious injury of a marine mammal stock resulting from any fishery is less than or equal to 1 percent of the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock, while allowing that stock to reach or maintain its optimum sustainable population. The risk of serious injury or mortality to marine mammals resulting from the recreational sector of the reef fish fishery, which uses similar gear (i.e., handlines, rod and reel, spears, etc.), is also expected to be low, although interactions with dolphins and sea turtles are known to occur.

The NMFS has conducted specific analyses (Section 7 consultations) to evaluate potential effects from the Gulf reef fish fishery on species and critical habitats protected under the Endangered Species Act (ESA). The most recent biological opinion (opinion) for the Reef Fish FMP was completed on September 30, 2011. The opinion determined the authorization and operation of Gulf reef fish fishery managed under the Reef Fish FMP is not likely to adversely affect ESA-listed marine mammals or coral and is not likely to jeopardize the continued existence of ESA-listed sea turtles (loggerhead, Kemp's ridley, green, hawksbill, and leatherback) or smalltooth sawfish. Since issuing the opinion, NMFS has listed additional species and designated their critical habitat under the ESA and evaluated the Gulf reef fish fishery's potential effects on each in memoranda as follows. In memoranda dated September 16, 2014, and October 7, 2014, NMFS concluded that the activities associated with the Reef Fish FMP is not likely to adversely affect critical habitat for the Northwest Atlantic Ocean loggerhead sea turtle distinct population segment (DPS) or the additional four species of corals found in the Gulf (*Mycetophyllia ferox, Orbicella annularis*, *0. faveolata*, and *0. franksi*). In a memorandum dated September 29, 2016, NMFS indicated that green sea turtle North Atlantic and South Atlantic DPSs and Nassau grouper may be affected by fishing managed under the Reef Fish FMP, thus triggering the need for reinitiation of consultation. In the same September 29, 2016, memorandum, NMFS concluded that activities associated with the Reef Fish FMP are not likely to jeopardize the green sea turtle DPSs or Nassau grouper during the reinitiation period and would not result in the irreversible or irretrievable commitment of resources. Therefore, NMFS determined that continuing to authorize the reef fish fishery in federal waters during the reinitiation period would not violate Section 7(a)(2) or 7(d) of the ESA. NMFS also indicated that listed oceanic whitetip shark and giant manta ray may be affected by fishing managed under the Reef Fish FMP revised request for reinitiation of consultation. In that same March 6, 2018, memorandum, NMFS concluded that the activities associated with the Reef Fish FMP would not adversely affect the oceanic whitetip and were not likely to jeopardize the giant manta during the reinitiation period and would not result in the irreversible or irretrievable commitment of resources. Since the revised request for reinitiation of consultation, NMFS determined in a June 20, 2019, memorandum that the newly listed Rice's whale; (*Balaenoptera ricei*)[35] may be affected by fishing managed under the Reef Fish FMP and requested that this species be included in the reinitiation. In that same June 20, 2019, memorandum, NMFS concluded that the activities

[35] 86 Fed. Reg 47,022 (Aug. 23, 2021).

associated with the Reef Fish FMP is not likely to jeopardize the continued existence of the Rice's whale, the North Atlantic and South Atlantic DPSs of green sea turtles, Nassau grouper, giant manta ray, and oceanic whitetip shark during the revised reinitiation period.

The reinitiation period was expected to conclude at the end of 2019 but consultation is still ongoing. However, with the exception of effects to Nassau grouper, NMFS Sustainable Fisheries Division and Protected Resources Division have no new information that suggests the Gulf reef fish fishery is having greater effects than predicted on any listed species or their critical habitat. In fact, new information on the green sea turtle SA DPS indicates the Gulf reef fish fishery will have no effects on green sea turtles[36]. With respect to Nassau grouper, the June 2019 memorandum estimated that 628 individuals would be killed during the reinitiation period. Although the number of Nassau grouper removed from the population has likely exceeded the most recent estimate, the prior determination that the continued operation of the Reef Fish Fishery during the reinitiation period is not likely to jeopardize the continued existence of the Nassau grouper remains valid. That conclusion was based on the facts that the most serious threats to the status and recovery of Nassau grouper are fishing at spawning aggregations and inadequate law enforcement protecting spawning aggregations, and that there are no known spawning aggregations of Nassau grouper in the Gulf or any U.S. waters. Thus, regardless of the increase in the number of Nassau grouper removed over the reinitiation period, the fishery will not appreciably diminish the likelihood of survival and recovery of the species.

The Council originally addressed protected species bycatch in Amendment 18A (GMFMC 2005), which established regulations to minimize stress to endangered species incidentally caught in the reef fish fishery. Since then, the Council and NMFS have implemented several other actions aimed at reducing sea turtle bycatch and enhancing survival of captured sea turtles including:

- Reef Fish Amendment 31 (75 FR 21512, 4/26/2010)- Established a longline endorsement requirement; restricted fishing to outside the 35-fathom depth contour from June – August; and limited vessels to 1000 hooks onboard, of which only 750 could be rigged at any time. The 1000 hook limitation was removed in a 2018 framework action (83 FR 5210, 2/26/2018), but the limitation on the 750 hooks rigged at any time remains in place.
- Reef Fish Amendment 49 (84 FR 25009, 5/30/2019)- Added three new sea turtle release and handling devices; updated requirements for several previously approved devices for clarity; and allowed changes to handling/release gear requirements to be made through the Council's framework process.

Three primary orders of seabirds are represented in the Gulf; Procellariiformes (petrels, albatrosses, and shearwaters), Pelecaniformes (pelicans, gannets and boobies, cormorants, tropic

[36] Potential effects to the green sea turtle SA DPS were based on two very small, limited scope studies indicating the presence of 4% (GOM) or 5% (Atlantic) SA DPS individuals in U.S. coastal waters. Subsequent papers cast doubt on that and analyses the Southwest Fisheries Science Center genetics lab conducted on their archived samples from the Gulf and Atlantic confirmed for SERO that there is little to no presence of SA DPS individuals in waters off the U.S. mainland.

birds, and frigate birds), and Charadriiformes (phalaropes, gulls, terns, noddies, and skimmers) (Clapp et al., 1982; Harrison, 1983). Several species, including piping plover and roseate tern are listed by the U.S. Fish and Wildlife Service as either endangered or threatened. Note the brown pelican and bald eagle had been listed as endangered or threatened but have subsequently been delisted. Human disturbance of nesting colonies and mortalities from birds being caught on fishhooks and subsequently entangled in monofilament line are primary factors affecting sea birds. Oil or chemical spills, erosion, plant succession, hurricanes, storms, heavy tick infestations, and unpredictable food availability are other threats. There is no evidence that the directed DWG portion of the reef fish fishery is adversely affecting seabirds.

Other species of reef fish are also incidentally caught and often intentionally targeted when targeting DWG. There is some overlap between trips targeting other reef fish species. In the eastern Gulf, Other Shallow-Water Grouper (Other SWG; includes black grouper, scamp, yellowfin grouper, and yellowmouth grouper), gag, red grouper, red snapper, greater amberjack, and vermilion snapper are also caught on trips on which DWG are also captured. It should be noted that this doesn't necessarily indicate that DWG species are often captured when targeting other reef fish species. Because DWG species occur at depths at which other reef fish species are not commonly found, it is likely that these other reef fish species (especially non-grouper species) are captured while targeting DWG species when the gear is being descended to or ascended from depth.

Neither black nor red grouper are overfished or undergoing overfishing (SEDAR 19, 2010 and SEDAR 88, 2025, respectively). Vermilion snapper is not overfished or undergoing overfishing (SEDAR 67, 2020) and bycatch is not expected to jeopardize the status of this stock. Greater amberjack (SEDAR 70, 2021) is overfished and undergoing overfishing. Greater amberjack release mortality is estimated to be fairly low, ranging from 10 to 20 percent. Discards are slightly higher for commercially caught greater amberjack than they are for recreationally caught greater amberjack because of differences in minimum size limits (36 inches FL commercial vs. 34 inches FL recreational). Because greater amberjack is more so pelagic and grouper are bottom fish, bycatch of greater amberjack is relatively low when fishing for DWG and likely not greatly affected by changes in grouper management measures. Red snapper is not overfished or undergoing overfishing but is under a rebuilding plan because biomass is below targeted population levels (SEDAR 52, 2017). Red snapper has been increasing in abundance in the eastern Gulf over the past two decades and fishermen have indicated they are discarding more red snapper than in the period prior to that. Most commercial grouper fishermen in the eastern Gulf were allocated comparatively fewer red snapper IFQ shares than fishermen in the western Gulf, and therefore may be unable to retain large quantities of red snapper when fishing for DWG. Bycatch is a significant source of mortality in the red snapper fishery, resulting in the Council approving actions in Amendment 27/14 to reduce directed fishery bycatch. A recent analysis which updated catch data in SEDAR 88 indicated that scamp and yellowmouth grouper (assessed together) are overfished and overfishing is occurring. However, because bycatch of scamp and yellowmouth grouper on DWG trips is assumed to be low, discards of these species on trips targeting DWG are not expected to jeopardize the complex. The status of yellowfin grouper is unknown.

**Practicability of current management measures for the DWG complex relative to their impact on bycatch and bycatch mortality.**

The following describes current management measures and their relative impact on bycatch and bycatch mortality of DWG. The commercial DWG portion of the reef fish fishery is managed under an IFQ program, whereby catch shares are allocated among shareholders with measures to prevent fishermen from harvesting more than their individual allocation. The fishery also has gear restrictions and requirements, such as hook restrictions for the longline component. The recreational DWG portion of the reef fish fishery is managed with bag limits (4 total groupers of any species, maximum of 1 warsaw grouper, 1 speckled hind) and gear restrictions. There are also several restricted fishing areas intended to protect reef fish spawning aggregations.

**Size Limits**

There are no size limits for any DWG complex species. DWG species are found at depths that are likely to induce substantial barotrauma upon retrieval to the vessel. Thus, size limits are not an appropriate management measure for DWG species, because high mortality rates due to barotrauma are estimated for fish that are released. As explained in the discussion above, discard rates for DWG species are very low. Size limits are intended to protect immature fish and reduce fishing mortality. However, for other grouper species such as gag, size limits are the greatest factor contributing to bycatch (Pulver and Stephen, 2019). Coggins et al. (2007) found minimum size limits did not help achieve sustainability for long-lived low-productivity species, such as groupers, if discard mortality exceeded five percent. Rudershausen et al. (2007) also concluded minimum size limits are moderately effective for reef fish caught in shallower portions of their depth ranges, and nearly ineffective in deep waters. For these reasons, size limits for DWG species would be counterproductive for managing the stocks. Thus, no size limits are proposed in this amendment to further limit bycatch or bycatch mortality of reef fishes, including DWG.

**Closed Seasons**

There are no closed seasons for DWG species. The commercial sector that targets groupers (including the DWG and Other SWG complexes) is managed under an IFQ program. IFQ shares are assigned to permitted vessels in percentages of the annual commercial quotas for DWG, red grouper, gag, and Other SWG, based on their applicable historical landings. Shares determine the amount of IFQ allocation for Gulf groupers (in pounds gutted weight) a shareholder is initially authorized to possess, land, or sell in a given calendar year. Fishing is open to shareholders throughout the fishing year, provided they have allocated quota available to them. For more information on the IFQ program, see the NMFS Southeast Regional Office Catch Shares webpage at https://secatchshares.fisheries.noaa.gov/home.

Discards by individual fishers who have exhausted their yearly DWG catch shares are not thought to be significant in the commercial sector, as several measures are available that may allow catch after an IFQ catch share has been harvested (Pulver and Stephen, 2019). Some Other SWG and DWG species have "flexibility measures," which allow for, under certain conditions, continued harvest of these species after an IFQ account holder's allocation for that species has been landed and sold or transferred. This allocation is intended to reduce bycatch of these Other SWG and DWG species by allowing fishers to retain catch that they would

otherwise be required to release as bycatch. In addition, shareholders that have exhausted their annual allocation are permitted to purchase (lease) additional quota from other shareholders with available quota. This provision allows fishers to retain catch that would otherwise be required to be released as bycatch. Finally, since the inception of the Grouper-Tilefish IFQ program, DWG harvest has not approached the complex ACL. Thus, individual IFQ shareholders have likely not harvested their quota since the program's inception, and even if they did, it is likely that they could obtain additional quota to legally harvest the additional fish.

There is no recreational closed season for Gulf DWG. However, the accountability measure (AM) requires that in the year following an overage of the complex ACL, the fishery be closed upon projection that the complex ACL would be harvested in the next year. However, since the separation of the DWG complex into recreational and commercial sectors, the catch limit has not been approached. Thus, no closure has been implemented for the DWG complex. Given the reduced catch limits and modified AMs considered in this amendment, it is likely that closures of the recreational season could occur. If the recreational season is closed, it could result in additional discards for the recreational sector. However, DWG species, with few exceptions, are harvested only on trips targeting these species. Therefore, the scope of increased discards is likely to be minimal and is not expected to have a substantial negative effect on DWG species.

**Bag and Trip Limits**

The recreational DWG portion of the reef fish fishery is regulated by a 4-grouper aggregate bag limit, which may not include more than 1 speckled hind, more than 1 warsaw grouper, more than 2 red grouper, or more than 2 gag. Recreational DWG discards are rare, and likely mostly occur when anglers determine that a fish is so small as to not be worth keeping, or when a fish is damaged upon retrieval (e.g., shark or marine mammal damage). In addition, some fishers may discard legal-sized smaller fish in an effort to catch larger fish of the same species (high-grading). High grading is thought to be underreported in fisheries worldwide (Batsleer et al., 2016), and its prominence in Gulf fisheries targeting grouper, and DWG specifically, is unknown. However, discards of legal-size grouper occur less frequently at larger sizes, indicating that high grading may occur.

**Allowable Gear**

Vertical hook-and-line gear (bandit rigs, handlines) and bottom longlines are the primary gear types used in the commercial sector. Fish traps accounted for a small portion (generally 10-15%) of grouper catch prior to 2007, when they were prohibited in federal waters of the Gulf. In 2008, regulations were implemented requiring commercial and recreational fishermen to use circle hooks, venting tools, and dehooking devices when harvesting reef fish in the Gulf. In 2022, the Descending Device and Venting Tool for the Direct Enhancement of Snapper Conservation and the Economy through Novel Devices Act of 2020 (DESCEND Act) was implemented in the Gulf, requiring all fishing vessels to have a venting tool or descending device rigged and ready for use when fishing in Gulf waters. Circle hooks were commonly used in the commercial grouper industry prior to implementation of this new regulation. It is unknown how extensively venting tools, descending devices, and dehooking devices were used prior to these gear requirements.

Discards are rare in the commercial component of the targeted DWG portion of the reef fish fishery but are more common when fishing with longline gear (Pulver and Stephen, 2019). Bottom longline gear has a higher estimated discard mortality rate for most species. However, since discards are exceedingly rare in DWG IFQ fishery, they are not thought to be a significant contributor to DWG mortality.

Rod-and-reel is the primary gear used in the recreational sector. Circle hooks are required gear for all hook and line anglers to harvest grouper and other reef fishes. Brulé et al. (2015) found that larger circle hooks caught significantly larger sizes of red grouper. Garner et al. (2020) also projected that larger circle hooks could modestly increase retained catch while drastically reducing the number of discarded fish. NMFS doesn't currently have adequate information on the size of circle hooks used by anglers in the Gulf or on the effect that has on bycatch of undersized species. Recreational anglers also use spears to capture grouper. However, deep-water grouper generally occur at depths at which spearfishers cannot reach. Thus, spearfishing does not represent an appreciable portion of DWG recreational harvest. Since January 2022, all recreational fishermen have been required by the DESCEND Act to have a descending device or venting tool onboard the vessel when fishing for Gulf reef fish species. It is unknown what effect this has had on discard mortality of DWG to date.

No gear restrictions are proposed in this amendment to further limit bycatch or bycatch mortality of reef fishes, including DWG grouper.

**Time/Area Closures**

There are currently three restricted fishing areas, which were developed to specifically protect spawning aggregations of gag in 2000. These area closures may also serve to protect DWG. The Madison-Swanson, Steamboat Lumps, and The Edges marine restricted fishing areas are located in the northeastern Gulf at a depth of 40 to 60 fathoms. Madison-Swanson and Steamboat Lumps prohibit bottom fishing, trolling (except for highly migratory species), and possession of reef fish at all times (GMFMC 2020) year-round, while The Edges has the same prohibitions in effect from January through April. All fishing is also prohibited in the Tortugas marine reserves in the southern Gulf. Marine reserves and time/area closures benefit fish residing within reserve boundaries by prohibiting their capture during part or all of the year. Within marine reserves, fish that are undersized potentially have an opportunity to grow to legal size without the threat of being captured by fishing gear. If these fish emigrate from the marine reserve (i.e., spillover effect), then they may be caught as legal fish outside the reserve, thereby reducing bycatch. However, fishermen may redistribute their effort to areas surrounding the marine reserve. If fishing pressure in these areas is increased, then any benefits of reduced bycatch of fish in the marine reserve may be partially or fully offset by increases in bycatch of fish residing outside the marine reserve.

Commercial fishermen with a bottom longline endorsement must fish outside the 35-fathom contour from June – August (must fish outside 20-fathom contour the rest of the year). However, given that few DWG are harvested in waters shallower than 35 fathoms, it is unlikely that this closure measurably restricts DWG harvest.

**Alternatives being considered to minimize bycatch**

No measures are proposed in this amendment to directly reduce the bycatch of DWG and other species. However, the choice of alternatives in Action 2 and Action 3 is likely to impact the amount of bycatch. Bycatch is expected to be greater in the commercial sector, because when the commercial quota has been captured, all DWG species captured subsequently must be released. Because there is a greater likelihood that these DWG species would be captured on trips not necessarily targeting DWG species (e.g., longline trips targeting gag or red grouper), there is a greater likelihood of regulatory discards occurring on these trips. The recreational sector is less likely to discard DWG species because, due to the deep depths at which they are found and the great distance they are generally found from shore, recreational anglers are likely to encounter these species on trips targeting these species, and not as bycatch on trips targeting other species.

Action 1 would set the stock catch limits, while Action 2 would designate allocation percentages to the commercial and recreational sector and set sector ACLs and ACTs (quota). In Action 1 **Alternative 2**, which is the only viable alternative in Action 1, the stock acceptable biological catch (ABC) and ACL would be reduced by about half compared to no action (Alternative 1). However, Action 1 is largely administrative in practice, because catch limits would be managed to the sector ACLs and quotas set in Action 2. Thus, the impact in exceeding the complex ACL would be dependent on the alternatives chosen in Action 2 and Action 3. The reduction in catch limits is likely to increase discards of DWG species, because under these new catch limits, the complex ACL is expected to be captured each year, which has not occurred prior. For the commercial sector (assuming Action 1 **Alternative 2** is selected), Action 2 **Alternative 2** is likely to result in the least discards of the Action 2 alternatives because it would set the highest commercial quota, where the majority of discards are expected to occur. However, because there isn't a great difference between the commercial quotas between the Action 2 alternatives (approximately 7% maximum), and because differences in the scope of discards between the commercial and recreational sector are speculative and putatively minor, the difference between the alternatives in Action 2 with regard to overall discards are expected to be minimal to negligible.

Action 3 would change the AMs for the recreational sector and require closure of the recreational fishing season based on those AMs. Predicting the frequency of closures under the Action 3 alternatives is, for the most part, speculative. **Alternative 2** is more likely to trigger a closed season than **Alternative 1** or **Alternative 3** because it only requires exceeding the recreational ACL in a given year to trigger a closure (upon reaching the recreational ACL) in the following year. **Alternative 1** would require exceeding the complex ACL in a given year, and **Alternative 3** would require exceeding the recreational and complex ACLs in a year to trigger a closure in the next year. **Alternative 4** would require the moving average of the prior three years' recreational landings to exceed both the average recreational ACL and the average complex ACL. In spite of the differences in the recreational ACLs between the alternatives, an appreciable effect on discards is not expected. This is because commercial harvest is expected to reach that sector's quota each year, and thus differences between **Alternatives 1-3** are expected to be minor. It is difficult to predict the frequency at which the recreational season

would close under **Alternative 4** due the variability in recreational landings, and the effect that a large overage (or underage) in a given three-year period would have on subsequent years' closures. However, the recreational sector is not expected to contribute meaningfully to discards due to the manner in which the sector fishes.

**Practicability Analysis**

**Criterion 1: Population effects for the bycatch species (DWG Complex)**

Measures considered in this amendment would: 1) Revise the Gulf DWG complex maximum sustainable yield (MSY) proxy, overfishing limit (OFL), ABC, and complex ACL; 2) Set recreational and commercial sector allocations, ACLs and quotas; and 3) Modify the recreational DWG AMs.

Bycatch of DWG due to management measures including reduced catch limits are expected to result in a loss of yield, since the new catch limits are lower than recent catch levels. In addition, reducing the catch limits for the DWG complex is expected to result in a very slight increase in regulatory discards. However, because DWG species generally may be targeted and avoided while fishing, the decreased ACL and associated effort is expected to result in a decrease in overall DWG mortality, in spite of the expected slight increase in bycatch.

**Action 1**
Action 1 would revise the Gulf DWG complex MSY proxy, OFL, ABC, and complex ACL. In Action 1, **Alternative 1** (No Action) would retain the current MSY proxy, OFL, ABC, and complex ACL that the Council's Scientific and Statistical Committee (SSC) determined was inappropriate, since it would allow DWG harvest at unsustainable levels. As such, **Alternative 1** is not a viable alternative. **Preferred Alternative 2** would revise the MSY proxy, OFL, ABC, and complex ACL based on the results of the SEDAR 85 yellowedge grouper stock assessment and recommendations for the DWG complex from the SSC. The fishing mortality (F) at MSY would be defined as the yield when fishing at the $F_{40\%SPR}$ where SPR is the spawning potential ratio. The OFL would be set accordingly, and the stock ACL would be set at the ABC at the yield when fishing at 75% of the $F_{MSY}$ proxy. This action is administrative, although it influences the sector catch limits in Action 2. For this reason, Action 1 will not be discussed further in terms of effects on DWG bycatch.

**Action 2**
Action 2 would designate allocation percentages to the commercial and recreational sectors and set sector ACLs and ACTs (quota). Recreational catch would be monitored by the MRIP-FES, and allocation percentages are developed using recreational historic landings estimates from MRIP-FES. **Alternative 1** of Action 2 would maintain the commercial ACL at 96.5% of the stock ACL and would not set a recreational ACL. **Alternative 2** would maintain the commercial ACL at 96.5% and set the recreational sector at 3.5% of the stock ACL and retain the current commercial quota at 4% below the commercial ACL. **Preferred Alternative 3** would set the commercial ACL at 89.79% and the recreational sector at 10.21% of the stock ACL and retain the current commercial quota at 4% below the commercial ACL. **Alternative 4** would set the

commercial ACL at 93.16% and the recreational sector at 6.84% of the ABC and retain the current commercial quota at 4% below the commercial ACL.

Selecting **Alternative 1** would result in reductions to the recreational and commercial ACLs based on the reduced stock ACL in Action 1 and would reallocate fish to the commercial sector due to the change in recreational currencies. Since no allocation is specified for the recreational sector in **Alternative 1**, there would be no limitation on effort in the recreational sector based on this shift in allocation. However, because of the decrease in the sector ACLs, the DWG complex sector catch limits are expected to be harvested each year. Thus, reduced effort and harvest in the commercial sector, and a closure of the recreational sector in any year following an overage of the complex ACL (resulting in reduced effort/harvest) are expected to occur. The reduced allowable harvest in the commercial sector and the reduced duration of the recreational fishing season is expected to result in a slight increase in regulatory DWG complex discards under **Alternative 1**. However, because DWG species may be targeted and avoided while fishing, the decreased sector ACLs and ACTs, and the concomitant decrease in fishing effort and harvest, there is expected to be a decrease in overall DWG mortality under **Alternative 1** in spite of the expected slight increase in bycatch. Because **Alternative 1** does not specify a recreational ACL, it may still allow fishing each year (even during years requiring a recreational closure) at levels in excess of the complex ACL and potentially the OFL, as a recreational closure would only occur after the complex ACL had been reached. However, this closure would not affect the commercial sector, which could continue to fish until the commercial ACT had been harvested.

**Alternative 2** would be expected to result in comparatively greater yields for the commercial sector relative to current management because it results in a *de facto* reallocation to the commercial sector. This is the result of the change from MRFSS to MRIP-FES, and lower comparative yields for the recreational sector. However, under **Alternative 2,** the recreational sector allocation would be set at 3.5% of the complex ACL, while the commercial sector allocation would remain at 96.5% of the complex ACL. Because a recreational ACL is specified in **Alternative 2**, options for recreational AMs may be selected in Action 3 that would influence the duration and timing of recreational season closures. The reduced catch limits (supplemented by more prescriptive AMs in Action 3) under **Alternative 2** are likely to reduce harvest, and slightly increase DWG complex species bycatch. However, as under all other alternatives in this action, and because DWG species may be targeted and avoided while fishing, the decreased sector ACLs and ACTs, and concomitant decrease in fishing effort and harvest is expected to result in a decrease in overall DWG mortality, in spite of the expected slight increase in bycatch.

**Preferred Alternative 3** would adjust the sector allocation such that the commercial sector is allocated 89.79% and the recreational sector is allocated 10.21% of the complex ACL, reflecting percentages of commercial versus recreational harvest in the most recent five years of landings (2019-2023). Recreational harvest is estimated in MRIP-FES data units (See Section 4.2 for more information on the allocation split). **Preferred Alternative 3** would be expected to result in a comparatively similar allocation of the complex ACL for both the commercial and recreational sectors compared to recent commercial and recreational landings. Although the recreational sector generally has substantially greater discards than the commercial sector, it is not known whether that pattern holds when targeting DWG species, because when compared to

other reef fish species, harvesting DWG species often requires more specialized gear, greater fishing skill, and larger vessels to reach the areas to harvest them. In addition, there are no minimum size limits, and DWG species experience higher mortality when captured and released, suggesting they may be more likely to be kept when they are captured by anglers in the recreational sector. Also, DWG species are not thought to be often captured when fishing for other species. Other species are captured when fishing for DWG, but this is likely because few species co-occur at the depths at which DWG occur, but other species may be captured when gear is being descended to or ascended from these depths. Thus, DWG can be easily avoided relative to other reef fish species. Commercial sector catch limits would be lower under **Preferred Alternative 3** than under any other Action 2 alternative. This may lead to slightly increased discards, as DWG species may be captured after a commercial entity's IFQ allocation has been harvested, which would require discard of the captured species. This is especially true for the longline component of the commercial sector, as DWG species may be captured while targeting other species, such as gag. Longline gear is known to have a higher mortality rate than other fishing gears, and this is especially true at depths at which DWG species are captured. However, commercial fishermen are likely to fish in areas where DWG species are not as prevalent (e.g., shallower areas) once their DWG allocation has been used. Thus, the increase in bycatch relative to the current management structure is expected to be minor and, as under all other alternatives in this action, the decreased sector ACLs and ACTs, and concomitant decrease in fishing effort and harvest, is expected to result in a decrease in overall DWG mortality, in spite of the expected slight increase in bycatch.

**Alternative 4** would adjust the sector allocation such that the commercial sector is allocated 93.16% and the recreational sector is allocated 6.84% of the complex ACL, reflecting percentages that represent an equal reduction in commercial and recreational harvest based on the most recent five years of landings (2019-2023). Recreational harvest is estimated in MRIP-FES data units (See Section 4.2 for more information on the allocation split). **Alternative 4** represents a middle ground between **Alternatives 1** and **2**, and **Preferred Alternative 3** with regard to the allocation split. As such, the change in bycatch expected with this alternative would fall in the middle of these alternatives. In any case, the increase in bycatch relative to the current management structure is expected to be minor and, as under all other alternatives in this action, the decreased sector ACLs and ACTs, and concomitant decrease in fishing effort and harvest is expected to result in a decrease in overall DWG mortality, in spite of the expected slight increase in bycatch.

**Action 3**

Action 3 would modify AMs for the DWG Complex. Alternatives in this action would reduce the DWG recreational fishing season in the year following a closure being triggered. Each of the alternatives is expected to reduce overall mortality of DWG species due to a reduction in the number of fishing days for anglers targeting DWG complex species that will occur. However, the effects of the shortened season in the year following an overage are likely to slightly increase DWG complex bycatch at certain times of the year by having a reduced period of time they may be harvested recreationally, and thus will require regulatory discarding outside this season. **Alternative 1** in Action 3 would maintain the current AM, which requires that in the year following an overage of the DWG complex ACL, the recreational sector will close for the

remainder of the fishing year when the sum of commercial and recreational landings reaches the complex ACL. **Alternative 2** of Action 3 would require that in the year following an overage of the recreational ACL, the recreational sector for the DWG complex would close for the remainder of that fishing year when the recreational ACL is projected to be met. **Alternative 3** of Action 3 would require that in the year following an overage of the recreational ACL and the DWG complex ACL, the recreational sector would close for the remainder of that fishing year when the recreational ACL is projected to be met. **Preferred Alternative 4** would require that if the average recreational DWG complex landings exceed the average recreational ACL, and the average complex ACL is exceeded over a three-year moving period, the duration of the recreational season would be reduced by the amount projected such that the recreational ACL is not exceeded during the following fishing year unless the best scientific information available suggests no adjustment to the recreational fishing season is necessary.

**Alternatives 2** and **3** are expected to result in similar levels of DWG bycatch, since they would be expected to trigger the season closure AM in the year after every exceedance of the recreational ACL. This is true because even though the AM requires that the complex stock ACL be exceeded under **Alternative 3** (only the recreational ACL in **Alternative 2**), the commercial sector is expected to catch its ACL each year based on recent landings. However, given the great variability among recreational landings, exceeding the recreational ACL in consecutive years is expected to be uncommon, and the AMs are expected to result in only a minor increase in bycatch even in years in which the AM requires a closure. Seasonal closures resulting from the AM under **Preferred Alternative 4** are more difficult to predict due to the variability in landings. One year of very high landings could trigger the AM when averaged in with the next two years. On the other hand, the three-year moving average could result in more infrequent triggering of the AM if any exceedances of the recreational ACL are not large or are more infrequent. In any case, even if the AM is triggered frequently, it would only result in a slight increase in discards.

Each of the Action 3 alternatives have the potential to increase bycatch of DWG because the proposed AMs, coupled with the reduced quotas, are expected to result in occasional closures of the recreational season and thus result in a period of regulatory discards. However, because DWG are not commonly captured when targeting other reef fish species, this is only expected to result in a modest increase in DWG bycatch even when the AM is triggered. Overall, no matter the alternative chosen in Action 3, only a slight increase in discards would be expected versus the current management structure.

**Criterion 2: Ecological effects due to changes in the bycatch of DWG (effects on other species in the ecosystem).**

Relationships among species in marine ecosystems are complex and poorly understood, making the nature and magnitude of ecological effects difficult to predict. The Council's SSC accepted the projections from SEDAR 85 for the purposes of developing management advice. DWG species are opportunistic predators that feed on reef fishes, benthic and pelagic fishes, and crustaceans (Grüss et al., 2015).

The primary effects on other species in the ecosystem from this amendment are expected to come from Action 2. Action 1 is administrative in nature, and would have no direct effects on DWG fishing other than those covered in Action 2, and although the Action 3 may result in closures of the recreational season in the year following the year in which an AM is triggered, the effects are largely based on the reduced catch limits in Action 2 and not the AMs under Action 3, which are only expected to have minimal (and less predictable) effects.

The effects of Action 2 on other species in the ecosystem would largely result from the decreased catch limits being considered. Action 2 would substantially reduce the DWG catch limits, which could result in increased effort towards other species within and outside the reef fish complex. However, given that only a small percentage of anglers are able to target DWG due to the distance of DWG species from shore, specialized gear, etc., the scope of the increase in effort on other species is expected to be minor. In addition, because other species may be captured while fishing for DWG (e.g., gag, red snapper, greater amberjack), there could be a reduction in harvest and discard of these species which may cancel out the minor possible increase in effort predicted. There is also a possibility that as DWG complex populations increase to previous levels, the larger stock could assert more predation pressure on other co-occurring species, which may also result in decreased populations of those species.

Although the changes in DWG catch limits and AMs are likely to have some impact on other species in the ecosystem, the effects are difficult to quantify due to the complex nature of the ecosystem they live in. It is unlikely that allowing DWG complex populations to increase to more historic population levels in the long term would negatively impact other species in the ecosystem.

**Criterion 3: Changes in the bycatch of other species of fish and invertebrates and the resulting population and ecosystem effects**

Population and ecosystem effects resulting from changes in the bycatch of other species of fish and invertebrates are difficult to predict. Fishermen can specifically target DWG, although they may still catch other species. Red snapper, vermilion snapper, greater amberjack, and gag are commonly caught when targeting DWG. Of these species, gag and greater amberjack are overfished, and those species, in addition to red snapper, are operating under a rebuilding plan (NMFS 2025 Summary of Stock Status for Non-FSSI Stocks). Regulatory discards significantly contribute to fishing mortality in all of these reef fish species, especially when captured in deeper waters. However, given that a reduction in fishing effort for DWG is expected to occur under this amendment, there may be a corresponding decrease in bycatch of species commonly caught while fishing for DWG, except as explained in Criterion 2 above.

**Criterion 4: Effects on marine mammals and birds**

Measures evaluated in this amendment are not expected to significantly affect marine mammals and birds. There is no information to indicate marine mammals and birds rely on DWG for food, and they are not generally caught by fishers harvesting DWG.

**Criterion 5: Changes in fishing, processing, disposal, and marketing costs**

Changes in fishing costs are associated most with Action 2 in this amendment. Short-term negative effects of the reduced ACLs that would be implemented under Action 2 would occur no matter the alternative chosen, since each would result in substantial reductions to harvest for both sectors.

The DWG commercial sector allocation is expected to be greatly reduced due to reductions in the commercial ACL and quota. However, the commercial ACL and quota may also be increased relative to the recreational sector depending on which alternative is selected. The reduction in ACL and quota, and thus in IFQ allocation, for commercial fishermen is expected to result in economic loss. However, if the reduced commercial allocation and lower expected supply of DWG leads to increased market prices for these species, which is suggested by Keithly and Tabarestani (2018), the loss in ex-vessel revenue and profits to commercial fishermen may be lessened. Recreational anglers may experience closures to recreational harvest of DWG through this action and resultant losses in consumer surplus. However, this reduction affects only a small number of recreational fishermen, as few have the means or desire to reach the locations and depths necessary to target DWG species. Due to the multi-species nature of the reef fish fishery, the reduced opportunity for fishermen to harvest DWG is likely to be supplemented by increasing effort and harvest for other species, so it is unlikely to have a substantive negative effect on that sector. The for-hire (charter/headboat) industry may experience minor losses from DWG recreational closures; however, recreational trips targeting DWG make up a negligible percentage of all fishing trips taken by for-hire vessels (Section 3.3.2).

No changes to processing, disposal, or marketing costs are expected from this action, because it does not alter the type of product landed, only the quantity of such, and there are ample domestic and imported substitutes available for dealers, processors, and retailers to shift to.

In general, cumulative changes in this amendment are moderate, and are likely to result in some economic loss, especially for the commercial sector. For a more complete discussion of the changes in fishing costs associated with the various management actions, see Sections 4.1.3, 4.2.3, and 4.3.3 of this Amendment.

**Criterion 6: Changes in fishing practices and behavior of fishermen**

Measures proposed in this action are expected to have slight negative impacts on fishing practices for recreational DWG anglers. The cumulative effect of the measures of Actions 1 through 3 would result in recreational catch limits that are reduced from current levels and may result in occasional closures of recreational fishing for DWG. This reduction would be most pronounced under Action 2 Alternative 2, which would set the recreational allocation at 3.5% of the gag stock ACL. The recreational sector reduction would be lowest in Action 2 under Preferred Alternative 3, which would result in the highest catch limits, and the least likelihood of a closure of the recreational DWG season. However, the difference in the cumulative effects between the alternatives would be minor because the reduction in catch limits is only expected to

affect a small percentage of recreational fishermen, and because the variability in recreational landings from year to year indicates that a closure would be triggered only infrequently (depending on the alternative selected in Action 2 and Action 3).

Measures proposed in this action are expected to result in changes to fishing practices and behavior of commercial fishermen. Preferred Alternative 2 in Action 1 would reduce the allowable harvest for DWG by approximately 50% relative to Alternative 1 through the implementation of updated catch limits using MRIP-FES data and new stock assessment results. Action 2 would set recreational and commercial catch limits and allocations, which includes reduced catch limits for the DWG commercial IFQ program. This reduction for the commercial sector would be most pronounced under Preferred Alternative 3 of Action 2, which would set the commercial allocation (and thus commercial ACL and quota) at the lowest level relative to the recreational sector. Because DWG is part of the IFQ program, and because catch levels implemented in Action 2 are substantially less than recent commercial catch levels, any reduction in allocation due the catch limit reductions considered in this action are expected to reduce fishing effort and DWG harvest.

In summary, there is expected to be a reduction in fishing effort and landings for commercial DWG IFQ shareholders and those holding allocation. There is also expected to be an occasional closure of the DWG recreational fishing season, resulting in reduced fishing days targeting DWG for both the for-hire and private angler components. These effects may be largely mitigated in the private angler component due to the ability of these fishermen to target other species when DWG harvest is prohibited. Since there are few for-hire businesses that target DWG and because recreational season closures are only expected to occur occasionally under any of the alternatives being considered, only minor negative effects are expected for for-hire fishermen and businesses.

**Criterion 7: Changes in research, administration, and enforcement costs and management effectiveness**

Proposed measures are not expected to significantly impact research, administration, and enforcement costs and management effectiveness. The potential impacts on the administrative environment depend on the action necessary to compare landings to the catch limits and the likelihood of needing to implement a commercial or recreational closure or take additional action to prevent overfishing. All action alternatives would result in a decrease in the commercial ACL and in setting a recreational ACL that is below recreational landings estimates in recent years. Because the IFQ program acts as the AM for the commercial sector, no commercial in-season closure would be implemented based on the new catch limits. Decreasing the recreational ACL is expected to result in an occasional closure of the recreational sector, although the frequency and timing of closures is difficult to predict due to the uncertainty and variability in this sector's annual estimated harvest.

Effects on research, administration, and enforcement costs and management effectiveness would be mostly due to alternatives chosen in Actions 2 and 3. If a recreational ACL is triggered in a given year, a closure would be implemented in the following year if/when recreational harvest is

expected to reach the recreational ACL. Recreational catch allowances vary substantially under each of the Action 2 alternatives, but there is expected to be little difference in potential for overfishing among these alternatives regardless of the Action 2 alternative selected or the AM selected in Action 3, which would implement season closures based on a prescribed trigger. This is because none of the action alternatives under Action 2, coupled with the AMs selected in Action 3, are expected to result in more than an occasional closure of the recreational season. The catch limits set, and AMs selected in the amendment would require estimates of catch to manage appropriately such that the season closes when the catch limit is reached (in the year following the year in which the prescribed trigger was reached). This would be difficult to do given the limitations in the data, which are variable and uncertain for the recreational DWG sector. For this reason, administrative effort and management effectiveness (in the form of effectively managing to the chosen catch limit) is expected to experience minor negative effects, no matter the alternative chosen in Actions 2 and 3.

**Criterion 8: Changes in the economic, social, or cultural value of fishing activities and non-consumptive uses of fishery resources**

If the decreased ACL and ACT for the recreational harvest of DWG are implemented, it is expected to positively impact the stock by relieving fishing pressure and allowing it to build to a more robust level but is expected to have negative economic and social implications. It is expected that decreasing the ACL as specified in any of the Action 2 action alternatives, regardless of alternatives selected in other actions, will lead to substantially lower harvest.

The decreased catch limits for the commercial sector are expected to result in fewer fishing days targeting DWG. Each of the Action 2 action alternatives are expected to result in reduced DWG commercial allocation, which is expected to result in reduced targeted fishing effort for DWG in the commercial sector than has occurred in recent years. **Alternatives 1** and **2** of Action 2 would allocate a higher proportion of the complex ACL to the commercial sector (96.5%) versus the recreational sector (3.5%) when compared to **Preferred Alternative 3** (89.79%/10.21%) and **Alternative 4** (93.16%/6.84%). Although the short-term benefit to the commercial sector would be negative due to the cuts in allowable harvest, the long-term benefits would be more positive since it is expected to result in an increased stock size and greater allowable harvest in future years.

The recreational sector, on the other hand, is expected to see only minor negative impacts from this amendment, and those impacts would mostly stem from the alternative selected in Action 2. **Preferred Alternative 3** would have the least negative effects to the recreational sector of the Action 2 alternatives, as it is expected to result in closure of the sector to fishing in only rare situations (no matter the Action 3 alternative chosen). **Alternatives 1** and **2** would result in the most negative effects, since they would set the lowest recreational catch limits, and would be expected to result in the most frequent closures of the recreational sector compared to the other Action 2 alternatives. **Alternative 4** would be a middle ground, with more expected recreational sector closures than **Preferred Alternative 3**, but with a closure being less likely than under **Alternatives 1** and **2**.

Action 1 and Action 3 alternatives are not expected to appreciably change the effects to the economic, social, and cultural value of fishing activities and non-consumptive uses of fishery resources. Action 1 is largely administrative, as the fishery will be managed to the catch limits set in Action 2. Action 3 would set AMs that could result in more or less recreational closures depending on the alternative selected. However, the variability in annual recreational sector landings makes it impossible to predict the effects that choosing any given alternative would have in comparison to each other. Thus, while all of the alternatives are expected to result in occasional closures to the recreational sector fishing season (especially under Action 2 **Alternatives 1** and **2**), the difference in frequency of closures and concatenate negative effects are expected to be negligible.

There are expected to be negative effects in the economic, social, and cultural value of fishing activities and non-consumptive uses of fishery resources associated with Amendment 58B, although the effects in the recreational sector are likely to be largely mitigated because of the multi-species nature of the reef fish fishery, which will allow fishermen to target other species when fishing for DWG is not permitted. This is less true for the commercial sector, as there is expected to be revenue lost from the DWG complex ACL and quota reductions. Any reduction in bycatch and overall mortality may result in an increase in the DWG stock in the long-term, which would positively affect the social and economic value of fishing activities. For a more complete discussion, see sections 3.3 and 3.4, and sections 4.2.3, 4.2.4, 4.3.3, 4.3.4, and 4.4.4 of this document.

**Criterion 9: Changes in the distribution of benefits and costs**

Action 2 addresses changes in distribution of catch allocations to the commercial and recreational sector, and most appropriately addresses Criterion 9. Currently, there is no recreational sector allocation specified, although the commercial sector is allocated 96.5% of the complex ACL. This ratio was developed based on historical catch from each sector using the best data available at the time. However, SEDAR 85 used revised historical data streams including MRIP-FES data which have resulted in new estimates of recent and historic recreational catch. These estimates resulted in changes to the percentages of recreational and commercial catch that occurred in the reference period (2001-2004) and in subsequent DWG commercial and recreational landings and estimated yields. Action 2 of this amendment would consider revising the commercial/recreational allocation ratio based on these new data.

Recreational catch in all Action 2 alternatives would be estimated using MRIP-FES rather than MRFSS. **Alternatives 1** and **2** would maintain the 96.5% commercial allocation. **Alternative 1** would not set a recreational allocation, while **Alternative 2** would specify the recreational allocation at 3.5%. Both of these alternative allocation split percentages are based on the reference years of 2001-2004. **Preferred Alternative 3** would update the allocation to 89.79% commercial /10.21% recreational. This ratio is based on average catch by the recreational sector for the most recent five years of data (2019-2023). **Alternative 4** would update the commercial/recreational allocation split to 93.16%/6.84%, using an equal reduction to each sectors harvest based on data from 2019-2023.

All alternatives are expected to result in short-term negative impacts to both the commercial and recreational sectors. Action 2 **Alternative 2,** regardless of the alternatives selected in Actions 1 and 3, is expected to result in the least negative economic impacts of the action alternatives for the commercial sector and the most negative net economic impacts to the recreational sector. **Preferred Alternatives 3** is expected to result in the most negative economic impacts of the action alternatives for the commercial sector and the least negative net economic impacts to the recreational sector. However, all of the alternatives will reduce the ACL, and would result in net negative economic benefits and costs, although this will likely be largely mitigated recreationally because of the multi-species nature of the reef fish fishery, which will allow fishermen to target other species when DWG fishing is not permitted.

**Criterion 10: Social effects**

Bycatch is considered wasteful because it reduces overall yield obtained from the fishery. Lower recreational and commercial catch limits and predicted recreational season closures are expected to have negative social effects under all actions and alternatives. Bycatch may occur due to limited opportunity to fish for DWG resulting from lower ACLs and shortened seasons. However, DWG can generally be targeted or avoided, so despite a slight increase in bycatch, DWG mortality is expected to decline substantially. Thus, short term negative social effects due to reduced ACLs and recreational season closures are expected to be replaced by long-term positive social effects as the DWG stock size and catch limits increase.

## CONCLUSIONS

Analysis of the ten bycatch practicability factors indicates there would likely be positive biological impacts associated with reducing the DWG catch limits, regardless of any of the action alternatives chosen. This is because the temporary reduction in recreational and commercial ACLs is expected to allow the DWG complex, and specifically yellowedge grouper, to recover, which is a positive biological outcome. Revising the allocation between the recreational and commercial sector is expected to have net neutral biological effects, because the increase in discards is expected to be slight in both sectors and the decrease in overall DWG mortality is expected to more than compensate for this increase. All alternatives are expected to decrease overall DWG mortality, although the amount of associated bycatch is speculative. The main benefits of reducing DWG bycatch are: 1) less waste and 2) increased yield in the directed fishery. Reducing discard rates would result in less forgone yield. Reducing DWG ACLs and quotas, and setting recreational sector catch limits is expected to reduce DWG mortality while protecting the stock from overfishing. The expected slight increase in bycatch through regulatory discards associated with implementing lower catch limits is minor compared to the predicted decrease in overall mortality of DWG through actions implemented in this amendment. There are likely to be negative social and economic effects to both the commercial and recreational sectors, stemming largely from the expected reductions in economic benefits that is likely if Amendment 58B is implemented. The Council had to weigh the benefits of reducing DWG mortality with the negative social and economic effects that both sectors would face.

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