

Modifications to Deep-water Grouper Management Measures



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

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ABBREVIATIONS USED IN THIS DOCUMENT

ABC	acceptable biological catch
ACL	annual catch limit
ACT	annual catch target
AM	accountability measure
AP	Advisory Panel
APAIS	Access Point Angler Intercept Survey
BiOp	biological opinion
BPA	bycatch practicability analysis
CFpA	net cash flow per angler
CFR	code of federal regulations
CHTS	coastal household telephone survey
Council	Gulf Fishery Management Council
CS	consumer surplus
CVA	climate vulnerability analysis
DLMTToolkit	Data Limited Methods Toolkit
DPS	distinct population segment
EA	environmental assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
EFP	exempted fishing permit
EIS	environmental impact statement
E.O.	executive order
ESA	Endangered Species Act
F	fishing mortality
FES	fishing effort survey
FHS	for-hire survey
FMP	Fishery Management Plan
FMSY	maximum sustainable yield
FWC	Florida Fish and Wildlife Conservation Commission
GRFS	Gulf Reef Fish Survey
GT	grouper-tilefish
Gulf	Gulf of America (Formerly Gulf of Mexico)
HAPC	habitat area of particular concern
HHI	Hertindahl-Hirschman Index
IFQ	individual fishing quota
IPCC	Intergovernmental Panel on Climate Change
IRFA	initial regulatory flexibility analysis
LAPP	Limited Access Privilege Program
LKE	lowest known entity
LQ	local quotient
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MFMT	maximum fishing mortality threshold
MMPA	Marine Mammal Protection Act
mp	million pounds

MPA	marine protected area
MRIP	Marine Recreational Information Program
MRFSS	Marine Recreational Fisheries Statistics Survey
MSST	minimum stock size threshold
MSY	maximum sustainable yield
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OFL	overfishing limit
OST	Office of Science and Technology
OY	optimum yield
PAH	polycyclic aromatic hydrocarbons
PS	producer surplus
PW	product weight
Reef Fish FMP	Fishery Management Plan for Reef Fish Resources in the Gulf
RFA	Regulatory Flexibility Act
RFFA	reasonably foreseeable future actions
RG	red grouper
RQ	regional quotient
RIR	regulatory impact review
RS	red snapper
SDC	status determination criteria
Secretary	Secretary of Commerce
SEDAR	Southeast Data, Assessment, and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SMZ	special management zone
SOI	segments of interest
SPR	spawning potential ratio
SSB	spawning stock biomass
SSC	Scientific and Statistical Committee
SRFS	State Reef Fish Survey
SRHS	Southeast Region Headboat Survey
SWG	shallow-water grouper
T	time
TF	tilefish
TL	total length
VOC	volatile organic compounds
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 status². 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 SWG complex will be limited from this point forward herein.

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

¹ The Gulf of Mexico was renamed the Gulf of America pursuant to Executive Order 14172, and Secretary of the Interior Order No. 3423. All geographical references to the Gulf of America or “Gulf” in this amendment refer to the same body of water referred to as the Gulf of Mexico in the regulations at 50 CFR part 622.

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.

under the Grouper-Tilefish Individual Fishing Quota (IFQ) program (Amendment 29 to the Reef 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) and Fishing Effort Survey (FES). MRIP-FES includes the Access Point Angler Intercept Survey (APAIS) and the FES, and covers 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.

Year	Commercial						Recreational (MRIP-FES)					Total Landings
	Snowy Grouper	Speckled Hind	Warsaw Grouper	Yellowedge Grouper	Total Comm Landings	Snowy Grouper	Speckled Hind	Warsaw Grouper	Yellowedge Grouper	Total Rec 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%

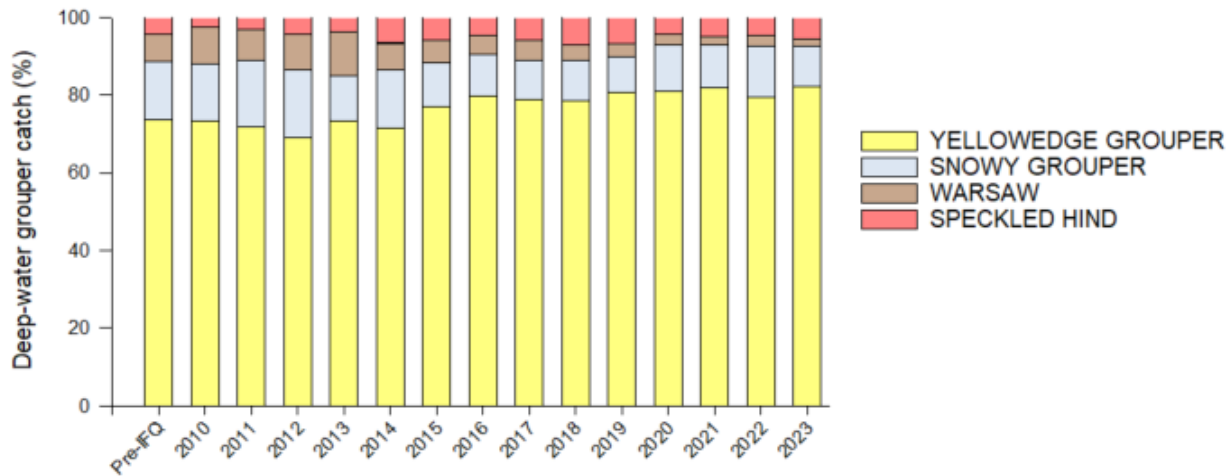


Figure 1.1.1. Percentages of commercial landings by species for the DWG complex from the 2023 Grouper-Tilefish IFQ Program Report³. Data for the years prior to the start of the IFQ program are summarized as “Pre-IFQ”.

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 and DWG allocation under the IFQ program. IFQ allocation is

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

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. 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 that this buffer could be re-evaluated with time. 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.

SWG and DWG Flexibility Measures

Amendment 29 to the Reef Fish FMP (GMFMC 2009) established flexibility measures between the SWG and DWG complexes, in order 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 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 SWG complex structure and specify catch limits for scamp and yellowmouth grouper.

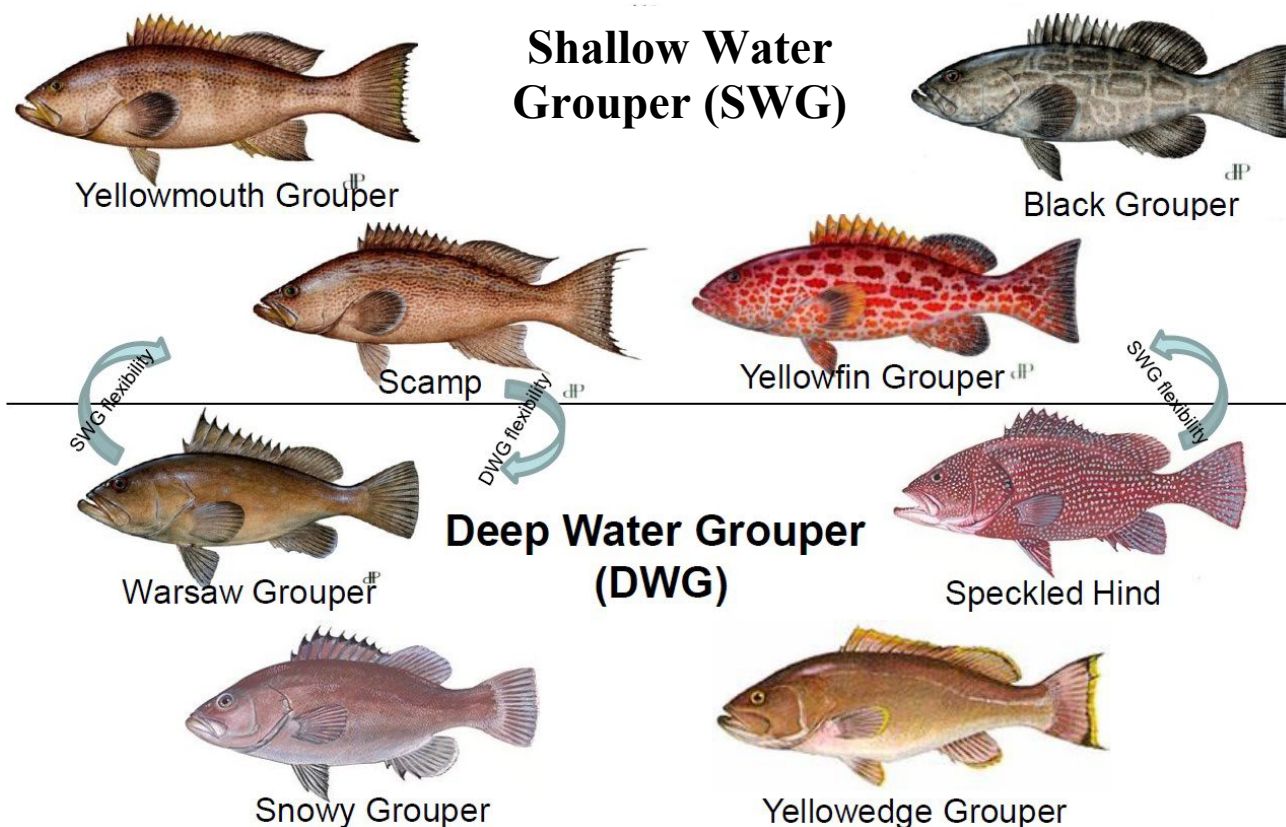


Figure 1.1.2. Depiction of the SWG and DWG flexibility measures as defined in Amendment 29 to the Reef Fish FMP.

Recreational Sector

Recreational landings comprise an increasing proportion of landings in recent history, yet still comprise a minority fraction of landings for DWG (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. Because the commercial sector operates under an IFQ program, the pounds available to the commercial sector are released to shareholder accounts on January 1 each year and cannot be recalled. 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 vast 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).

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. 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 2023⁴), 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 30% of captains who fish offshore (those who hold a ROLP) and 10% who fish inshore (who do

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

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.⁶ 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

⁶ <https://tpwd.texas.gov/fishboat/fish/didyouknow/coastal/creel.phtml>

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 2021⁷ (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 Rule⁸, 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.

⁷ 2021 is the terminal year of the stock assessment.

⁸ 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 reconsidering 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.⁹

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 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 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.

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.

⁹ <https://gulfcouncil.org/fishery-management/implemented-amendments/reef-fish/>

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.

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 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:

Yellowedge grouper were assessed in the Gulf through 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 of attempting to avoid catching yellowedge grouper when targeting other DWG species, and vice versa. Therefore, the SSC also

recommended maintaining yellowedge grouper as part of the DWG complex. Catch advice for yellowedge grouper informed by SEDAR 85 is added to the OFL and ABC (calculated using Tier 3b of the ABC Control Rule) for the rest of the DWG complex to obtain the complex catch limits. This allows for maintaining the current management structure for this complex.

Alternative 1 would maintain the current MSY proxy, OFL and ABC for the DWG complex, at the yield when fishing at $F_{30\%SPR}$, 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 would continue to be 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 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 are expected to account for some 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 approximately 50%. This is due to 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 OFL of 731,035 lb gw, and the 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%¹⁰ and is set at 514,176 lb gw¹¹. 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)	Comm ACL	Comm Quota	Rec ACL
2025-2029+	731,035	555,026	535,600	514,176	Unspecified

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)	Comm ACL	Comm Quota	Rec ACL
2025-2029+	731,035	555,026	535,600	514,176	19,426

¹⁰ 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.

¹¹ 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.

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 56,649 lb gw, or approximately 10.21% of the complex ACL. The commercial sector is allocated approximately 89.79% of the complex ACL, or 498,377 lb gw. The commercial quota is reduced from the commercial ACL by 4% and is set at 478,441 lb gw. The recreational and commercial ACLs sum to equal the DWG complex ACL.

Year	OFL	ABC (Complex ACL)	Comm ACL	Comm Quota	Rec ACL
2025-2029+	731,035	555,026	498,377	478,441	56,649

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)	Comm ACL	Comm Quota	Rec ACL
2025-2029+	731,035	555,026	517,062	496,380	37,964

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-fish 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. The recreational landings used to establish the allocation scenario in **Alternative 1** was based on recreational data from MRFSS. Because of the transition to MRIP-FES data for the recreational sector (which generally estimates 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 **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).

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 spatiotemporal 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 56,649 lb gw, or approximately 10.21% of the DWG complex ACL. The commercial ACL would equal 498,377 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 478,441 lb gw. **Alternative 3** use more recent recreational landings compared to **Alternative 1** and **Alternative 2** (which use 2001 – 2004), which have ranged from as low as 29,663 lb gw to as high as 88,807 lb gw. Under **Alternative 3**, the recreational ACL would have been exceeded in 3 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. The primary purpose of this 4% reduction was to allow for flexibility in IFQ allocation usage for landing species in the DWG and Other Shallow-water Grouper complexes (see GMFMC 2008b). Absent this purpose, there is no defined need for this 4% reduction. **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. **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, predictably, the number of fishing days needed to harvest the ACL is directly related to the size of the recreational ACL. Table 2.2.1, which mirrors Table B.4 from Appendix B, shows the predicted recreational closure dates assuming that a closure is required when the ACL is projected to be met. The longest recreational fishing season duration corresponds with **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 **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
Alternative 3	56,649	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**, **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. **Alternative 3** and **Alternative 4** would set the recreational sector’s allocation of the total DWG complex ACL higher relative to **Alternative 1** and **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 **Alternative 3** 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 9 times under **Alternative 2**, 5 times under **Alternative 3**, and 7 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.

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	<i>none</i>	<i>undefined</i>	96.50%	535,600	514,176
2	555,026	3.50%	19,426	96.50%	535,600	514,176
3	555,026	10.21%	56,649	89.79%	498,377	478,441
4	555,026	6.84%	37,964	93.16%	517,062	496,380

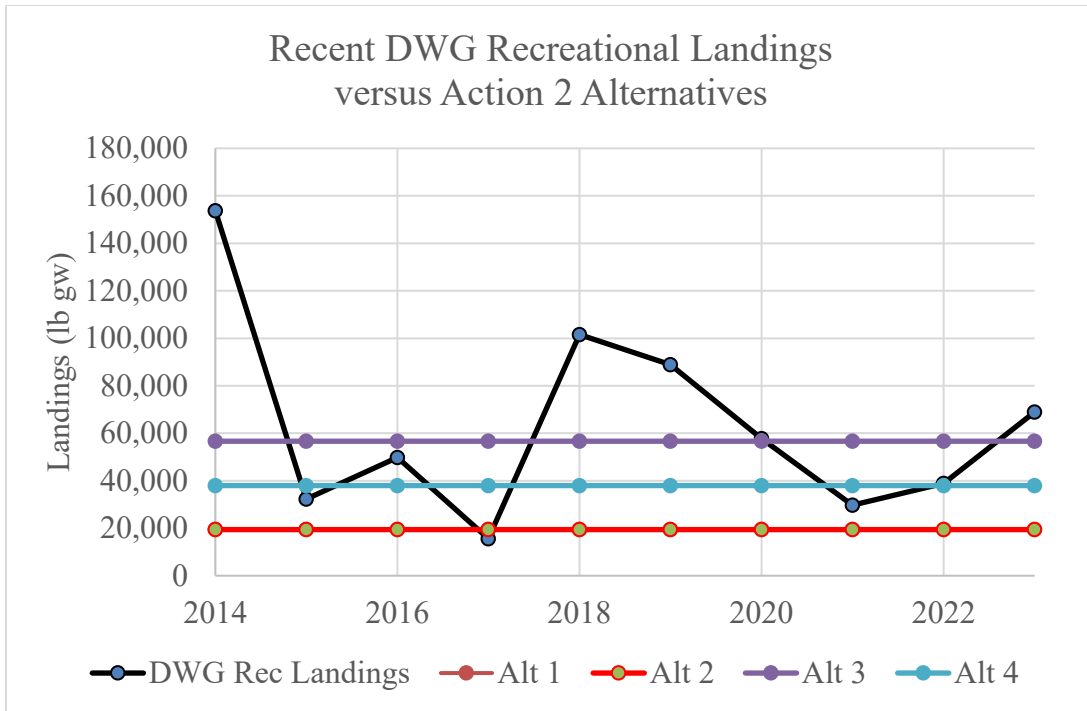


Figure 2.2.1. Comparison of recent landings of the DWG complex by the recreational sector in lb gw to the alternatives in Action 2. Recreational landings data derived from Table 1.1.2. The data for **Alternative 1** and **Alternative 2** overlap.

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).¹² 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.

¹² <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 recreational ACL, and the 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 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.

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, 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 (2012) 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. Thus, the recreational sector was managed under this AM, with the commercial sector using the IFQ Program as its AM. Stock complexes like the DWG complex did not have AMs other than IFQs

applied to commercial harvest at the time of the Generic ACL/AM Amendment. The DWG complex did not apportion catch between sectors and the ACL is specific to the complex as a whole. At the time, the need for season duration projections was only required for those stocks exceeding their ACL and those stocks could be targeted in monitoring activities. 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 AMs and the commercial allocation were 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.

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. In this action, **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. Alternative 1 and Alternative 2 of Action 2 would both present the same concerns about the ability to accurately monitor the recreational harvest against 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. Alternative 3, and more so 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 recreational ACL, and the 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 the best scientific information available (BSIA) suggests 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 recreational ACL and DWG complex ACL; and in the second year following implementation and subsequent fishing years, the 3-year running average landings would be compared to the recreational ACL and the DWG complex ACL.

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 (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 Alt 3	Comm Quota: Action 2 Alt 3	Complex ACL: Action 2 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		56,649	478,441	555,026		37,964	496,380	555,026	
2015	32,258	19,426	514,176	555,026		56,649	478,441	555,026		37,964	496,380	555,026	
2016	49,441	19,426	514,176	555,026		56,649	478,441	555,026		37,964	496,380	555,026	
2017	15,619	19,426	514,176	555,026	Yes	56,649	478,441	555,026	Yes	37,964	496,380	555,026	Yes
2018	101,224	19,426	514,176	555,026	No	56,649	478,441	555,026	No	37,964	496,380	555,026	No
2019	88,807	19,426	514,176	555,026	Yes	56,649	478,441	555,026	No	37,964	496,380	555,026	No
2020	57,491	19,426	514,176	555,026	Yes	56,649	478,441	555,026	No	37,964	496,380	555,026	Yes
2021	29,663	19,426	514,176	555,026	Yes	56,649	478,441	555,026	Yes	37,964	496,380	555,026	Yes
2022	38,848	19,426	514,176	555,026	Yes	56,649	478,441	555,026	No	37,964	496,380	555,026	Yes
2023	68,438	19,426	514,176	555,026	Yes	56,649	478,441	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 km²), 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 54° F to 84° F (12° C to 29° C) depending on time of year and depth of water. Mean annual sea surface temperatures ranged from 73° F through 83° F (23-28° C), including bays and bayous (Figure 3.1.1), between 1982 and 2009, according to satellite-derived measurements (NODC 2011).¹³ In general, mean sea surface temperature increases from north to south with large seasonal variations in shallow waters.

¹³ <http://accession.nodc.noaa.gov/0072888>

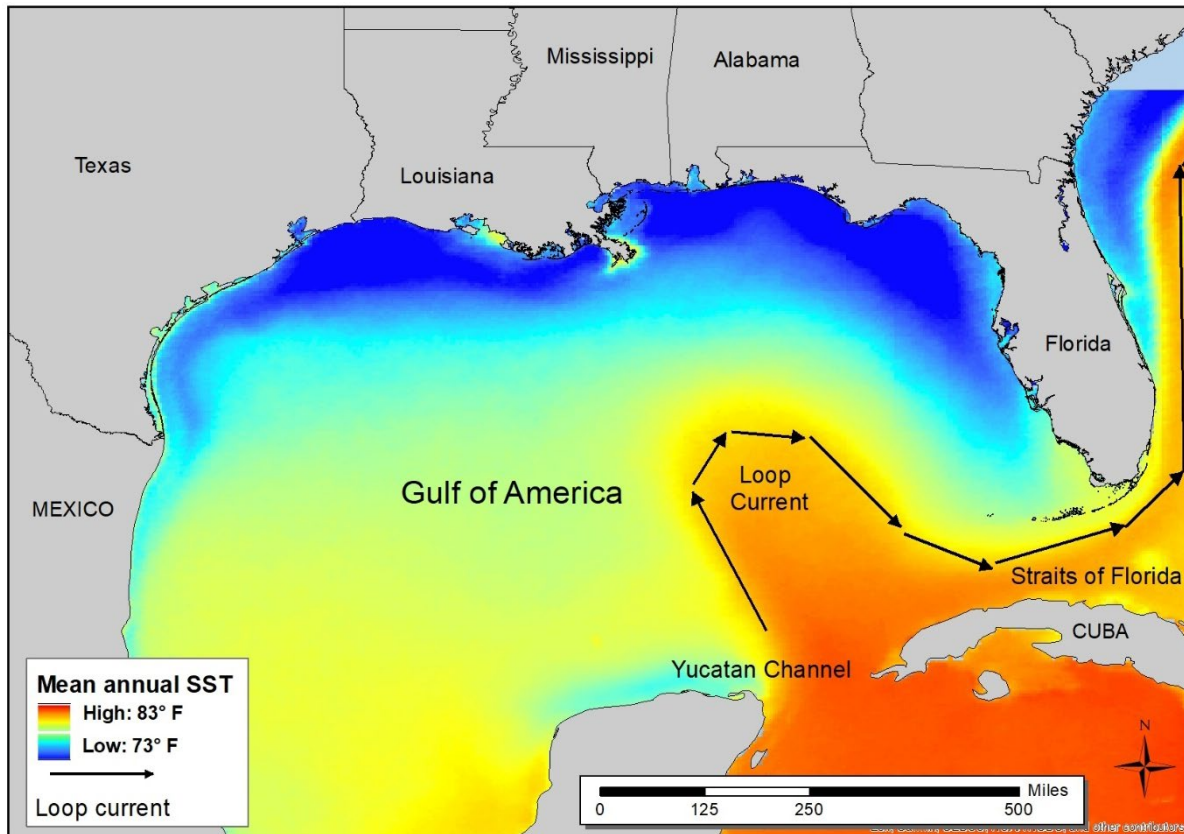


Figure 3.1.1. Mean annual sea surface temperature derived from the Advanced Very High-Resolution Radiometer Pathfinder Version 5 sea surface temperature data set.¹⁴

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.

¹⁴ <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 Mexico Hypoxia Task Force to be reached by 2035.¹⁵ 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.

¹⁵ <http://gulfhypoxia.net>

Deep-water Grouper Biology

The Gulf DWG species are assumed to each be single stock units due to a lack of detailed information on stock structure. 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 these transitions can occur differs by species and is considered uncertain. Generally, eggs and larvae of DWG species are thought to be pelagic. Juvenile yellowedge grouper settle out on hardbottom habitats, with snowy grouper, warsaw grouper, and speckled hind juveniles seeking 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).¹⁶ 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

¹⁶ <https://www.fisheries.noaa.gov/national/population-assessments/fishery-stock-status-updates>

recreational daily bag limit (1 speckled hind per person; 1 warsaw grouper per person; 4 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

NMFS 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.¹⁷ 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's¹⁸) 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 (North Atlantic DPS), 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,

¹⁷ <https://www.fisheries.noaa.gov/about/office-protected-resources>

¹⁸ 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.

boulder star, and rough cactus). Critical habitat designated under the ESA for smalltooth sawfish, Gulf sturgeon, and the Northwest Atlantic Ocean DPS of loggerhead sea turtles occur in the Gulf, though only loggerhead critical habitat occurs in federal waters.

The most recent biological opinion (BiOp) for the 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.¹⁹

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

¹⁹ 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.²⁰

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.

Deepwater Horizon MC252 Oil Spill

The presence of polycyclic aromatic hydrocarbons (PAH), which are highly toxic chemicals that tend to persist in the environment for long periods of time, in marine environments can have detrimental impacts on marine finfish, especially during the more vulnerable larval stage of development (Whitehead et al. 2012). The future reproductive success of fish species may be negatively affected by episodic events resulting in high-mortality years or low recruitment. These episodic events could leave gaps in the age structure of the population, thereby affecting future reproductive output (Mendelsohn et al. 2012). Other studies have described the vulnerabilities of various marine finfish species, with morphological and/or life history characteristics similar to species found in the Gulf, to oil spills and dispersants (Hose et al. 1996; Carls et al. 1999; Heintz et al. 1999; Short 2003).

In addition to the crude oil, over a million gallons of the dispersant, Corexit 9500A®, was applied to the ocean surface and an additional hundreds of thousands of gallons of dispersant was pumped to the mile-deep wellhead (National Commission 2010). No large-scale applications of dispersants in deep water had been conducted until the *Deepwater Horizon* MC252 oil spill. Thus, no data exist on the environmental fate of dispersants in deep water. Twenty-first century dispersant applications are thought to be less harmful than their predecessors. However, the combination of oil and dispersants has proven to be more toxic to marine fishes than either dispersants or crude oil alone. Marine fish which are more active (e.g., a pelagic species versus a demersal species) appear to be more susceptible to negative effects from interactions with weathered oil/dispersant emulsions. These effects can include mobility impairment and inhibited respiration (Swedmark et al. 1973). The effect of oil, dispersants, and the combination of oil and dispersants on fishes of the Gulf remains an area of concern. More information about the

²⁰ 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.

Deepwater Horizon MC252 oil spill is available on the NOAA Southeast Regional Office (SERO) website.²¹

Climate Change

Climate change projections predict increases in sea-surface temperature and sea level; decreases in sea-ice cover; and changes in salinity, wave climate, and ocean circulation International Panel on Climate Change (IPCC).²² These changes are likely to affect plankton biomass and fish larvae abundance that could adversely impact fish, marine mammals, seabirds, and ocean biodiversity. Kennedy et al. (2002) and Osgood (2008) have suggested global climate change could affect temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; change precipitation patterns and cause a rise in sea level which could change the water balance of coastal ecosystems; altering patterns of wind and water circulation in the ocean environment; and influence the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs. The National Oceanic and Atmospheric Association (NOAA) Climate Change Web Portal²³ predicts the average sea surface temperature in the Gulf and South Atlantic will increase by 2–4°F (1–3°C) for 2010–2070 compared to the average over the years 1950–2010. For reef fishes and snapper-grouper species, Burton (2008) and Morley et al. (2018) speculated climate change could cause shifts in spawning seasons, changes in migration patterns, and changes to basic life history parameters such as growth rates.

The distribution of native and exotic species may change with increased water temperature, as may the prevalence of disease in keystone animals such as corals and the occurrence and intensity of toxic algae blooms (Sokolow 2009; Hollowed et al. 2013; Maynard et al. 2015; Wells et al. 2015). Some stocks have already shown increases in abundance in the northern Gulf (Fodrie et al. 2010) and Texas estuaries (Tolan and Fisher 2009). Integrating the potential effects of climate change into the fisheries assessment process is currently difficult due to the assessment rarely projecting through a time span that would include detectable climate change effects (Hollowed et al. 2013). However, there are ecosystem models available or being developed that incorporate future, potential, climate change effects (King and McFarlane 2006; Pinsky and Mantua 2014; Grüss et al. 2017; Chagaris et al. 2019). While complex, this information may need to be incorporated into stock assessments where possible. Better planning and collaboration with managers are currently being pursued to include this type of data in the assessment process.

The Southeast Fisheries Science Center (SEFSC) has developed climate vulnerability analyses (CVA)²⁴ that can be used to determine the vulnerability of two DWG species (yellowedge grouper and speckled hind) to climate change stressors. Due to the close association of all four

²¹ <https://www.fisheries.noaa.gov/news/deepwater-horizon-10-years-later-10-questions>

²² <http://www.ipcc.ch/>

²³ <https://www.esrl.noaa.gov/psd/ipcc/>

²⁴ <https://www.fisheries.noaa.gov/national/climate/climate-vulnerability-assessments>

DWG species, their collective vulnerabilities are assumed to be similar. According to the SEFSC CVA, the species vulnerabilities for yellowedge grouper and speckled hind, and by extension warsaw grouper and snowy grouper, are summarized as follows:

- Yellowedge Grouper:
 - High overall vulnerability, trait-based sensitivity (life history), and climate exposure (environmental factors) scores. This is out of four categories: Low, Moderate, High, and Very High.
 - The highest sensitivity scores (nominal range from 1 to 4) were in Population Growth Rate (3.8), Stock Size/Status (3), and Complexity in Reproductive Strategy (2.8).
 - The highest exposure scores were in Ocean Acidification (4), Sea Surface Temperature (4), and Salinity (3.5).

<i>Hyporthodus flavolimbatus</i>		Attribute Mean	Data Quality	Expert Scores Plots (tallies by bin)	
Sensitivity Attributes	Habitat Specificity	1.9	2.4		<div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="width: 10px; height: 10px; background-color: green; margin-bottom: 2px;"></div> Low <div style="width: 10px; height: 10px; background-color: yellow; margin-bottom: 2px;"></div> Moderate <div style="width: 10px; height: 10px; background-color: orange; margin-bottom: 2px;"></div> High <div style="width: 10px; height: 10px; background-color: red; margin-bottom: 2px;"></div> Very High </div>
	Prey Specificity	1.5	1.8		
	Adult Mobility	2.5	1.4		
	Dispersal of Early Life Stages	1.9	1.2		
	Early Life History Survival and Settlement Requirements	2.3	0.6		
	Complexity in Reproductive Strategy	2.8	1.4		
	Spawning Cycle	2.4	2.4		
	Sensitivity to Temperature	2.1	2.4		
	Sensitivity to Ocean Acidification	1.9	1.8		
	Population Growth Rate	3.8	2.6		
	Stock Size/Status	3	2.4		
	Other Stressors	1.6	1.6		
	Sensitivity Score		High		
Exposure Factors	Air Temperature	1	0		
	Hypoxia	1.9	1.8		
	Ocean Acidification	4	2		
	Precipitation	1	0		
	Primary Productivity	1.8	2		
	Salinity	3.5	3		
	Sea Level Rise	1	0		
	Sea Surface Temperature	4	3		
	Exposure Score		High		
Overall Vulnerability Rank		High			

Figure 3.2.1. Yellowedge grouper biological processes analyzed for climate change sensitivities.

- Speckled Hind:

- High overall vulnerability, trait-based sensitivity (life history), and climate exposure (environmental factors) scores. This is out of four categories: Low, Moderate, High, and Very High.
- The highest sensitivity scores (nominal range from 1 to 4) were in Stock size/status (3.6), Population Growth Rate (3.6), and Complexity in Reproductive Strategy (2.9).
- The highest exposure scores were Sea Surface Temperature (4.0) and Ocean Acidification (4.0), and Salinity (2.5).

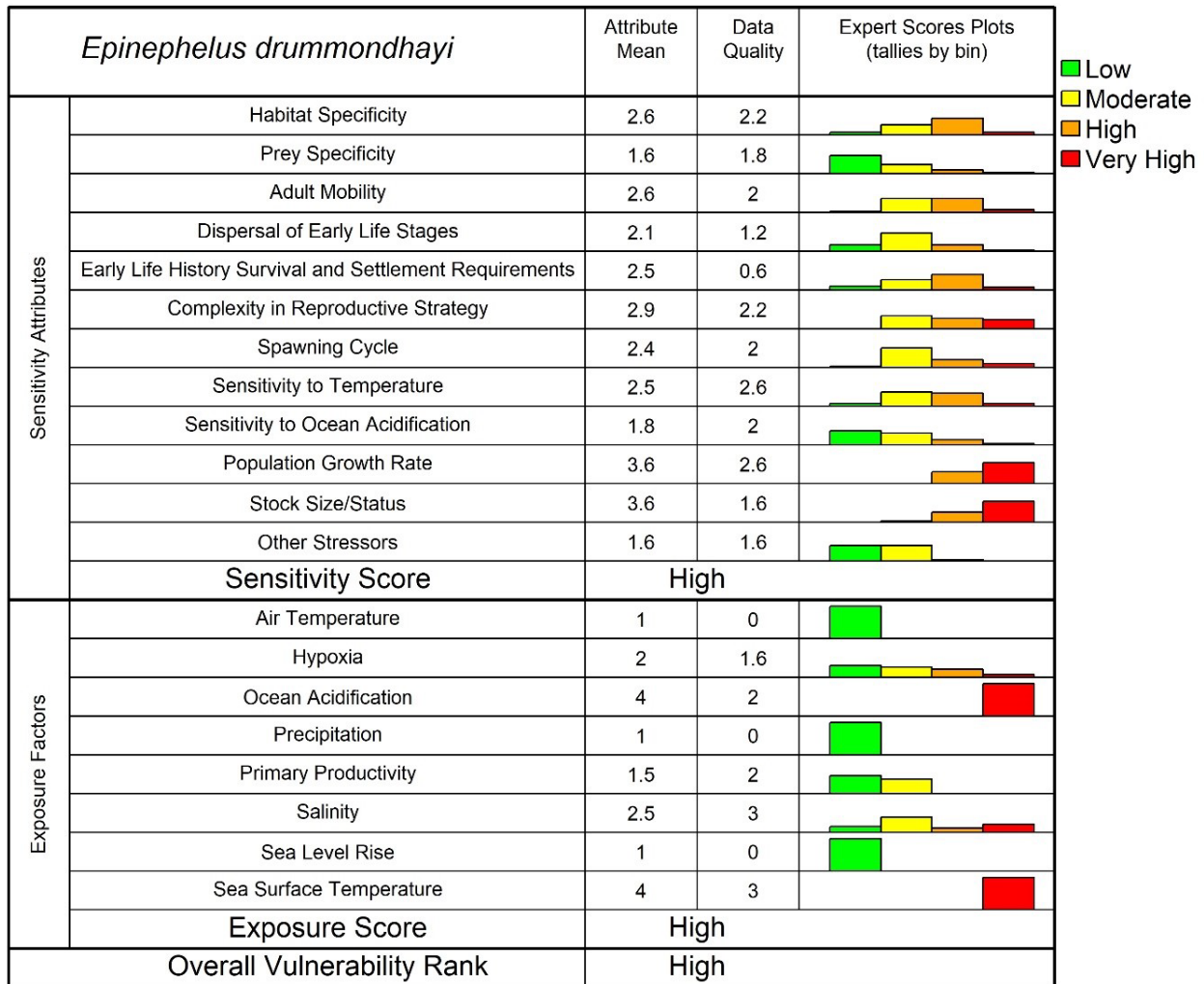


Figure 3.2.1. Speckled hind biological processes analyzed for climate change sensitivities.

Yellowedge grouper and speckled hind had Low Potential for Distributional Change (this is the worst out of the four rankings). When combined with the High overall climate vulnerability, it points to a difficulty in moving to offset the impacts of climate change. Generally, the Gulf is projected by the SEFSC models used (CMIP5) to become warmer, saltier, less oxygenated, and more acidic everywhere during the current fifty years. Conditions will have similar, but amplified, patterns in the 2056–2099 period (Quinlan et al., in press).

3.3 Description of the Economic Environment

3.3.1 Commercial Sector

3.3.2 Recreational Sector

3.4 Description of the Social Environment

3.4.1 Commercial Sector

3.4.2 Recreational Sector

3.4.3 Equity and Underserved Communities

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 exclusive economic zone (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 Direct and Indirect 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 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 Direct and Indirect Effects on the Biological and Ecological Environment

Direct and indirect 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. Potential impacts of the 2010 *Deepwater Horizon* MC252 oil spill on the biological/ecological environment are discussed in Section 3.2 and in the *Deepwater Horizon* Programmatic Damage Assessment and Restoration Plan (DWH Trustees 2016) and are also incorporated here by reference. These impacts include recruitment failure and reduced fish health.

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 Direct and Indirect Effects on the Economic Environment

4.1.4 Direct and Indirect Effects on the Social Environment

The proposed changes to deep-water grouper (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 available science. However, from a social perspective, this alternative would preserve existing access levels and support business planning based on known conditions. It may also lead to uncertainty regarding the sustainability of harvests, and continued overharvest of yellowedge grouper could erode long-term trust in management institutions if not addressed.

Preferred Alternative 2 would implement updated catch limits using MRIP-FES data and new stock assessment results. These reductions—roughly 50% relative to current harvest levels—are 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 or face increased regulatory attention, depending on how recreational AMs are applied. Overall, while **Preferred Alternative 2** aligns with scientific recommendations and aims to prevent overfishing, it introduces near-term constraints that may challenge the adaptability and expectations of both sectors.

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 Direct and Indirect 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**, **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**, **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 Direct and Indirect 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, the commercial and recreational 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 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**, **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**, **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**, **Alternative 3**, and **Alternative 4** are projected to result in the same stock size over time. Although **Alternative 2**, **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**, **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 quota. The recreational AMs are discussed in Section 4.3, below.

4.2.3 Direct and Indirect Effects on the Economic Environment

4.2.4 Direct and Indirect Effects on the Social Environment

Under **Alternative 1** (No Action), 96.5% of the ACL would remain assigned to the commercial sector, and the recreational share would remain undefined. While this structure has provided operational stability for commercial IFQ participants, it limits the ability 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 recreational effort and landings. **Alternative 3** would increase the recreational share to 10.21% based on recent data (2019–2023), potentially improving perceptions of fairness among the recreational sector

but reducing the commercial allocation. **Alternative 4** applies proportional reductions across both sectors based on recent landings, offering a compromise that may be more acceptable to stakeholders who value equitable treatment. All alternatives would require adaptation by IFQ participants, who may face reduced allocations, and recreational users, who 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.

4.2.5 Direct and Indirect 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, 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, 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 Direct and Indirect 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 Direct and Indirect 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 Direct and Indirect Effects on the Economic Environment

4.3.4 Direct and Indirect 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.

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. **Preferred Alternative 4** would modify the recreational fishing season if the average recreational DWG landings exceed the recreational ACL, and total 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, stakeholder preferences are likely to reflect trade-offs between flexibility and enforcement, with particular concern in high-participation regions over how consequences are timed and whether they are perceived as fair and proportionate to actual effort and impact.

Across all actions, the magnitude of catch reductions and shifts in allocation may challenge both sectors in the short term. Social impacts will likely be shaped by stakeholders' perceptions of equity, trust in data sources, and ability to adapt under tighter constraints. Regional differences in participation and reliance on DWG species—particularly in parts of Florida and areas with active offshore fleets—may also influence how these measures are experienced on the water.

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, an emergency rule is being developed by NMFS 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. Three important events include impacts of the *Deepwater Horizon* MC252 oil spill, the Northern Gulf Hypoxic Zone, and climate change (See Sections 3.1 and 3.2). Impacts from the *Deepwater Horizon* MC252 oil spill are still being examined; however, as indicated in Section 3.2, the oil spill had some adverse effects on fish species. Further, the impacts on the food web from phytoplankton, to zooplankton, to mollusks, to top predators may be significant in the future. Impacts to DWG species from the oil spill may similarly affect other species that may be preyed upon by DWG. Further, the proportion of the spawning biomass for DWG occurring within or outside the main areas affected by the *Deepwater Horizon* MC252 oil spill plume is uncertain. 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.

There is a large and growing body of literature on past, present, and future impacts of global climate change induced by human activities. Some of the likely effects commonly mentioned are sea level rise, increased frequency of severe weather events, and change in air and water temperatures. The Environmental Protection Agency's climate change web page provides basic background information on these and other measured or anticipated effects. In addition, the Intergovernmental Panel on Climate Change has numerous reports addressing their assessments of climate change. Global climate change could affect the Gulf fisheries as discussed in Sections 3.1 and 3.2. In addition, the distribution of native and exotic species may change with increased water temperature, as may the prevalence of disease in keystone animals such as corals and the occurrence and intensity of toxic algae blooms. Climate change may significantly impact Gulf reef fish species in the future, but the level of impacts cannot be quantified at this time, nor is the time frame known in which these impacts would occur. The actions herein are not expected to significantly contribute to climate change through the increase or decrease in the carbon footprint from fishing, as these actions should not change how the fishery is prosecuted.

As described in Section 3.1, the contribution to greenhouse gas emissions from fishing is minor compared to other emission sources (e.g., oil platforms).

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. REFERENCES

- Abbott, J., D. Willard. 2017. Rights-based management for recreational for-hire fisheries: Evidence from a policy trial. *Fisheries Research* 196: 106-116.
- Barnette, M. C. 2001. A review of the fishing gear utilized within the Southeast Region and their potential impacts on essential fish habitat. NOAA Technical Memorandum. NMFS-SEFSC-449. National Marine Fisheries Service. St. Petersburg, Florida. 68 pp.
<https://repository.library.noaa.gov/view/noaa/8527>
- Bohaboy, E.C., T.L. Guttridge, N. Hammerschlag, M.P.M. Van Zinnicq Bergmann, and W.F. Patterson III. 2020. Application of three-dimensional acoustic telemetry to assess the effects of rapid recompression on reef fish discard mortality. *ICES Journal of Marine Science* 77(1): 83-96.
- Breitburg, D., L.A. Levin, A. Oschiles, M. Gregoire, F.P. Chavez, D.J. Conley, V. Garcon, D. Gilbert, D. Gutierrez, K. Isensee, G.S. Jacinto, K.E. Limburg, I. Montes, S.W.A. Naqvi, G.C. Pitcher, N.N. Rabalais, M.R. Roman, K.A. Rose, B.A. Seibel, M. Telszewski, M. Yasuhara, J. Zhang. 2018. Declining oxygen in the global ocean and coastal waters. *Science* 359(6371).
<https://doi.org/10.1126/science.aam7240>
- Carter, D., C. Liese, S. Lovell. 2022. The option price of recreational bag limits and the value of harvest. *Marine Resource Economics* 37(1): 35-52.
- Carter, D., Lovell, S., Liese, C. 2020. Does angler willingness-to-pay for changes in harvest regulations vary by state? Results from a choice experiment in the Gulf of Mexico. *Marine Policy* 121:104-196.
- Chagaris, D., S. Sagarese, N. Farmer, B. Mahmoudi, K. de Mutsert, S. VanderKooy, W. F. Patterson III, M. Kilgour, A. Schueller, R. Ahrens, and M. Laretta. 2019. Management challenges are opportunities for fisheries ecosystem models in the Gulf of Mexico. *Marine Policy* 101:1-7.
- Coleman, F. C., C.C. Koenig, and L.A. Collins. 1996. Reproductive styles of shallow-water groupers (*Pisces: Serranidae*) in the eastern Gulf of Mexico and the consequences of fishing on spawning aggregations. *Environmental Biology of Fishes* 47:129-141.
- Fodrie, F. J., K. L. Heck, Jr., S. P. Powers, W. M. Graham, and K. L. Robinson. 2010. Climate-related, decadal-scale assemblage changes of seagrass-associated fishes in the northern Gulf of Mexico. *Global Change Biology* 16(1):48-59.
- Gilmore, R.G., and R.J. Jones. 1992. Color variation and associated behavior in the epinepheline groupers, *Mycteroperca microlepis* (Goode and Bean) and *M. phenax* (Jordan and Swain). *Bulletin of Marine Science* 51(1):83-103.

GMFMC. 1981. Environmental impact statement and fishery management plan for the reef fish resources of the Gulf of Mexico and environmental impact statement. Gulf of Mexico Fishery Management Council, Tampa, Florida. 328 pp.

<https://gulfcouncil.org/wp-content/uploads/FISHERY%20MANAGEMENT/REEF%20FISH/RF%20FMP%20and%20EIS%201981-08.pdf>

GMFMC. 1989. Amendment number 1 to the reef fish fishery management plan, includes environmental assessment, regulatory impact review, and regulatory flexibility analysis. Gulf of Mexico Fishery Management Council, Tampa, Florida. 357 pp.

<https://gulfcouncil.org/wp-content/uploads/FISHERY%20MANAGEMENT/REEF%20FISH/RF%20Amend-01%20Final%201989-08-rescan.pdf>

GMFMC. 1999 Generic sustainable fisheries act amendment, to the following FMPs: Gulf coral and coral reef resources, coastal migratory pelagics, red drum, reef fish, shrimp, spiny lobster, stone crab. Includes regulatory impact review, initial regulatory flexibility analysis and environmental assessment. Gulf of Mexico Fishery Management Council, Tampa, Florida. 318 pp. <https://gulfcouncil.org/wp-content/uploads/Generic-SFA-amendment-1999.pdf>

GMFMC. 2003. Amendment 21 to the reef fish fishery management plan. Includes regulatory impact review, initial regulatory flexibility analyses, and environmental assessment. Gulf of Mexico Fishery Management Council, Tampa, Florida. 215 pp.

<https://gulfcouncil.org/wp-content/uploads/RF-Amend-21-Final-2003-09.pdf>

GMFMC. 2004a. Final environmental impact statement for the generic essential fish habitat amendment to the following fishery management plans of the Gulf of Mexico: Shrimp fishery of the Gulf of Mexico, red drum fishery of the Gulf of Mexico, reef fish fishery of the Gulf of Mexico, stone crab fishery of the Gulf of Mexico, coral and coral reef fishery of the Gulf of Mexico, spiny lobster fishery of the Gulf of Mexico and South Atlantic, coastal migratory pelagic resources of the Gulf of Mexico of Mexico and South Atlantic. Gulf of Mexico Fishery Management Council. Tampa, Florida. 682 pp.

GMFMC. 2004b. Final amendment 22 to the reef fish fishery management plan to set red snapper sustainable fisheries act targets and thresholds, set a rebuilding plan, and establish bycatch reporting methodologies for the reef fish fishery. Includes final supplemental environmental impact statement and regulatory impact review. Gulf of Mexico Fishery Management Council. Tampa, Florida. 291 pp.

<https://gulfcouncil.org/wp-content/uploads/FISHERY%20MANAGEMENT/REEF%20FISH/Amend%2022%20Final%2070204.pdf>

GMFMC. 2005. Final generic amendment number 3 for addressing essential fish habitat requirements, habitat areas of particular concern, and adverse effects of fishing in the following fishery management plans of the Gulf of Mexico: Shrimp fishery of the Gulf of Mexico, United

States waters, red drum fishery of the Gulf of Mexico, reef fish fishery of the Gulf of Mexico, coastal migratory pelagic resources (mackerels) in the Gulf of Mexico and South Atlantic, stone crab fishery of the Gulf of Mexico, spiny lobster fishery of the Gulf of Mexico and South Atlantic, coral and coral reefs of the Gulf of Mexico. Gulf of Mexico Fishery Management Council, Tampa, Florida. 106 pp.

https://gulfcouncil.org/wp-content/uploads/FISHERY%20MANAGEMENT/GENERIC/FINAL3_EFH_Amendment.pdf

GMFMC. 2008a. Final reef fish amendment 30B: Gag – end overfishing and set management thresholds and targets, Red grouper – set optimum yield, TAC, and management measures, time/area closures, and federal regulatory compliance including environmental impact statement, regulatory impact review, and regulatory flexibility act analysis. Gulf of Mexico Fishery Management Council, Tampa, Florida. 462 pp.

https://gulfcouncil.org/wp-content/uploads/FISHERY%20MANAGEMENT/REEF%20FISH/Final%20Amendment%2030B%2010_10_08.pdf

GMFMC. 2008b. Amendment 29 to the reef fish fishery management plan – effort management in the commercial grouper and tilefish fisheries, including final environmental impact statement and regulatory impact review. Gulf of Mexico Fishery Management Council. Tampa, Florida. 302 pp.

https://gulfcouncil.org/wp-content/uploads/Reef-Fish-Amdt-29-Dec-08_508Compliant.pdf

GMFMC. 2008c. Final reef fish amendment 30A: Greater amberjack – revise rebuilding plan, accountability measures; gray triggerfish – establish rebuilding plan, end overfishing, accountability measures, regional management, management thresholds and benchmarks, including supplemental environmental impact statement, regulatory impact review, and regulatory flexibility act analysis. Gulf of Mexico Fishery Management Council, Tampa, Florida. 346 pp.

[Final Reef Fish Amendment 30A \(gulfcouncil.org\)](https://gulfcouncil.org/wp-content/uploads/Final-Reef-Fish-Amendment-30A.pdf)

GMFMC. 2010. Final amendment 31 to the fishery management plan for reef fish resources in the Gulf of Mexico (revised). Addresses bycatch of sea turtles in the bottom longline component of the Gulf of Mexico reef fish fishery, includes revised final environmental impact statement and regulatory impact review. Gulf of Mexico Fishery Management Council. Tampa, Florida. 305 pp.

<https://gulfcouncil.org/wp-content/uploads/FISHERY%20MANAGEMENT/REEF%20FISH/Final%20Amendment%2031%20-%20revised%20-%202002-2010.pdf>

GMFMC. 2011a. Final generic annual catch limits/accountability measures amendment for the Gulf of Mexico Fishery Management Council’s red drum, reef fish, shrimp, coral and coral reefs fishery management plans, including environmental impact statement, regulatory impact review, regulatory flexibility analysis, and fishery impact statement. Gulf of Mexico Fishery Management Council, Tampa, Florida. 378 pp.

http://www.gulfcouncil.org/docs/amendments/Final%20Generic%20ACL_AM_Amendment-September%209%202011%20v.pdf

GMFMC. 2011b. Final reef fish amendment 32 – gag grouper – rebuilding plan, annual catch limits, management measures. Red grouper – annual catch limits, management measures, and grouper accountability measures, including final environmental impact statement, regulatory impact review, regulatory flexibility analysis, and fishery impact statement. Gulf of Mexico Fishery Management Council, Tampa, Florida. 406 pp.

[http://www.gulfcouncil.org/docs/amendments/Final%20RF32_EIS_October_21_2011\[2\].pdf](http://www.gulfcouncil.org/docs/amendments/Final%20RF32_EIS_October_21_2011[2].pdf)

GMFMC. 2012a. Final amendment 35 to the fishery management plan for the reef fish resources of the Gulf of Mexico: Modifications to the greater amberjack rebuilding plan and adjustments to the recreational and commercial management measures, including an environmental assessment, fishery impact statement, regulatory impact review, and regulatory flexibility act analysis. Gulf of Mexico Fishery Management Council, Tampa, Florida. 226 pp.

https://gulfcouncil.org/wp-content/uploads/FISHERY%20MANAGEMENT/REEF%20FISH/Final_Amendment_35_Greater_Amberjack_Rebuilding_8_May_2012.pdf

GMFMC. 2012b. Final amendment 38 to the fishery management plan for the reef fish resources of the Gulf of Mexico: Modifications to the shallow-water grouper accountability measures, including an environmental assessment, fishery impact statement, regulatory impact review, and regulatory flexibility act analysis. Gulf of Mexico Fishery Management Council, Tampa, Florida. 94 pp.

<http://www.gulfcouncil.org/docs/amendments/Final%20Amendment%2038%2009-12-2012.pdf>

GMFMC. 2015. Final amendment 28 to the fishery management plan for the reef fish resources of the Gulf of Mexico: Red snapper allocation, including final environmental impact statement, fishery impact statement, regulatory impact review, and regulatory flexibility act analysis. Gulf of Mexico Fishery Management Council, Tampa, Florida. 328 pp.

<http://gulfcouncil.org/docs/amendments/Final%20Red%20Snapper%20Allocation%20RF%20Amendment%2028.pdf>

GMFMC. 2016. Framework action to the fishery management plan for the reef fish resources of the Gulf of Mexico: Modifications to gag minimum size limits, recreational season and black grouper minimum size limits. Including environmental assessment, regulatory impact review, and regulatory flexibility act analysis. Gulf of Mexico Fishery Management Council. Tampa, Florida. 117 pp.

<http://gulfcouncil.org/docs/amendments/Final%20Framework%20Action%20to%20the%20Fishery%20Management%20Plan%20for%20the%20Reef%20Fish%20Resources%20of%20the%20Gulf%20of%20Mexico%20-%20Modifications%20to%20Gag%20Minimum%20Size%20Limits%20-%20Recreational%20Season%20and%20Black%20Grouper%20Minimum%20Size%20Limits.pdf>

GMFMC. 2017a. Final amendment 44(revised) to the fishery management plan for the reef fish resources of the Gulf of Mexico: Minimum stock size threshold (MSST) revision for reef fish stocks with existing status determination criteria, including environmental assessment and fishery impact statement. Gulf of Mexico Fishery Management Council. Tampa, Florida. 124 pp.

https://gulfcouncil.org/wp-content/uploads/RF-Final-Amendment-44-revised-MSST-GOM-Reef-Fish-update-2_508Compliant.pdf

GMFMC. 2017b. Final framework action to the fishery management plan for reef fish resources of the Gulf of Mexico: Modifications to mutton snapper and gag management measures, including environmental assessment, regulatory impact review, and regulatory flexibility act analysis. Gulf of Mexico Fishery Management Council, Tampa, Florida. 151pp.

<http://gulfcouncil.org/wp-content/uploads/Mutton-Snapper-Framework-Action-070717-Final-1.pdf>

GMFMC. 2021a. Final amendment 48 to the fishery management plans for reef fish resources in the Gulf of Mexico: Status determination criteria and optimum yield for reef fish and red drum, including environmental assessment and fishery impact statement. Gulf of Mexico Fishery Management Council. Tampa, Florida. 169 pp.

https://gulfcouncil.org/wp-content/uploads/Amendment-RF48-RD5_04262021_Final_Transmittal_revised.pdf

GMFMC. 2021b. Final amendment 53 to the fishery management plans for the reef fish resources in the Gulf of Mexico: Red grouper allocations and annual catch levels and targets, including final environmental impact statement, fishery impact statement, regulatory impact review, and regulatory flexibility act analysis. Gulf of Mexico Fishery Management Council. Tampa, Florida. 323 pp.

https://gulfcouncil.org/wp-content/uploads/RF-AM-53-Red-Grouper_9_24_2021_Final.pdf

GMFMC and NOAA. 2022. Interim action to reduce overfishing of gag in the Gulf of Mexico. Gulf of Mexico Fishery Management Council, Tampa, Florida and NMFS Southeast Regional Office, St. Petersburg, Florida. 156 pp. https://media.fisheries.noaa.gov/2023-01/Gag%20Interim%20Rule_EA%20_final508_01182023.pdf

GMFMC and NOAA. 2021. Red snapper and grouper-tilefish individual fishing quota programs review. Gulf of Mexico Fishery Management Council, Tampa, Florida and NMFS Southeast Regional Office, St. Petersburg, Florida. 245 pp.

https://gulfcouncil.org/wp-content/uploads/Joint-RS-GT-IFQ-Review-w.appendix-10-27-21-Final_508.pdf

Hamilton, A. N., Jr. 2000. Gear impacts on essential fish habitat in the Southeastern Region. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Fisheries Science Center, Pascagoula, Mississippi. 41 pp.

Harford, W.J., S.R. Sagarese, and M. Karnauskas. 2019. Coping with information gaps in stock productivity for rebuilding and achieving maximum sustainable yield for grouper–snapper fisheries. *Fish and Fisheries* 20(2):303-321.

Jacob, S., P. Weeks, B. Blount, and M. Jepson. 2013. Development and evaluation of social indicators of vulnerability and resiliency for fishing communities in the Gulf of Mexico. *Marine Policy* 37:86-95.

Jepson, M. and L.L. Colburn. 2013. Development of social indicators of fishing community vulnerability and resilience in the U.S. Southeast and Northeast Regions. NOAA Technical Memorandum NMFS-F/SPO-129. NMFS, St. Petersburg, Florida. 72 pp.

Keithly W.R., Jr. and M. Tabarestani. 2018. The Gulf of Mexico grouper/tilefish fishery after introduction of an individual fishing quota program: The impact on ex-vessel prices. 17 pp. [Demand-Analysis.pdf \(gulfcouncil.org\)](#)

Keithly, W. R., Jr. and H. Wang. 2018. Results from the National Marine Fisheries Service 2016 Gulf of Mexico grouper/tilefish IFQ survey. NMFS, Miami, Florida. 50 pp. [Dealer-Survey.pdf \(gulfcouncil.org\)](#)

Kennedy, V.S., R.R. Twilley, J.A. Kleypas, J.H. Cowan, and S.R. Hare. 2002. Coastal and marine ecosystems & global climate change: Potential effects on U.S. resources. Pew Center on Global Climate Change, Arlington, Virginia. 52 pp. https://www.c2es.org/site/assets/uploads/2002/08/marine_ecosystems.pdf

McEachran, J.D. and J.D. Fechhelm. 2005. Fishes of the Gulf of Mexico, Vol. 2. *Scorpaeniformes to Tetraodontiformes*. University of Texas Press, Austin, Texas.

NMFS. 2011a. Biological opinion on the continued authorization of reef fish fishing under the Gulf of Mexico reef fish fishery management plan. National Marine Fisheries Service, Southeast Regional Office, St. Petersburg, Florida. 216 pp.

NMFS. 2011b. A user's guide to the National I/O Model. NMFS Office of Science and Technology. Silver Spring MD, 39 pp.

NMFS. 2022a. Fisheries economics of the United States, 2019. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-229A, 236 pp.

NMFS. 2022b. Gulf of Mexico grouper-tilefish individual fishing quota report (2021 Update). National Marine Fisheries Service, Southeast Regional Office. St. Petersburg, Florida. 84pp. SERO-LAPP-2022-2. https://noaa-sero.s3.amazonaws.com/drop-files/cs/2021_GT_AnnualReport_SEROFinal.pdf

Overstreet, E., L. Perruso, and C. Liese. 2017. Economics of the Gulf of Mexico reef fish fishery - 2014. NOAA Technical Memorandum NMFS-SEFSC-716. 84 pp.

Overstreet, E. and C. Liese. 2018a. Economics of the Gulf of Mexico reef fish fishery - 2015. NOAA Technical Memorandum NMFS-SEFSC-724. SEFSC, Miami. 78 pp.

Overstreet, E. and C. Liese. 2018b. Economics of the Gulf of Mexico reef fish fishery-2016. NOAA Technical Memorandum NMFS-SEFSC-725. SEFSC, Miami. 116 pp.
<https://repository.library.noaa.gov/view/noaa/19805>

Pulver, J. 2017. Sink or swim? Factors affecting immediate discard mortality for the Gulf of Mexico commercial reef fish fishery. *Fisheries Research* 188: 166-172.
<https://www.sciencedirect.com/science/article/abs/pii/S0165783616304374?via%3Dihub>

Savolainen, M.A., R.H. Caffey, and R.F. Kazmierczak, Jr. 2012. Economic and attitudinal perspectives of the recreational for-hire fishing industry in the U.S. Gulf of Mexico. Center for Natural Resource Economics and Policy, LSU AgCenter and Louisiana Sea Grant College Program, Department of Agricultural Economics and Agribusiness, Louisiana State University, Baton Rouge, LA. 171 pp.
www.laseagrant.org/wp-content/uploads/Gulf-RFH-Survey-Final-Report-2012.pdf

SEDAR 19. 2010. SEDAR 19 Stock Assessment of Gulf of Mexico and South Atlantic Black Grouper. Southeast Data, Assessment, and Review. North Charleston, South Carolina. 661 pp.
<https://sedarweb.org/documents/sedar-19-final-stock-assessment-report-south-atlantic-and-gulf-of-mexico-black-grouper/>

SEDAR 68. 2021. SEDAR 68 Operational Assessment of Gulf of Mexico Scamp and Yellowmouth Grouper. Southeast Data, Assessment, and Review. North Charleston, South Carolina. 231 pp. <https://sedarweb.org/documents/sedar-68oa-gulf-of-mexico-scamp-operational-assessment-final-stock-assessment-report/>

SEDAR 85. 2023. SEDAR 85 Operational Assessment of Gulf of Mexico Yellowedge Grouper. Southeast Data, Assessment, and Review. North Charleston, South Carolina. 293 pp.
<https://sedarweb.org/documents/sedar-85-gulf-of-mexico-yellowedge-grouper-final-stock-assessment-report/>

Siebenaler, J.B. and W. Brady. 1952. A high speed manual commercial fishing reel. Technical Series 4. Florida Board of Conservation, Tallahassee, Florida. 11 pp.

Souza, Philip M., Jr. and Christopher Liese. 2019. Economics of the federal for-hire fleet in the Southeast - 2017. NOAA Technical Memorandum NMFS-SEFSC-740. SEFSC, Miami. 42 pp.

Swedmark, M., A. Granmo, and S. Kollberg. 1973. Effects of oil dispersants and oil emulsions on marine animals. *Water Research* 7(11): 1649-1672.

Wells, M.L., V.L. Trainer, T.J. Smayda, B.S.O. Karlson, C.G. Trick, R.M. Kudela, A. Ishikawa, S. Bernard, A. Wulff, D.M. Anderson, W.P. Cochlan. 2015. Harmful algal blooms and climate change: Learning from the past and present to forecast the future. *Harmful Algae* 49: 68-93

Whitehead, A., B. Dubansky, C. Bodinier, T. Garcia, S. Miles, C. Pilley, V. Raghunathan, J. L. Roach, N. Walker, R.B. Walter, C. D. Rice, F. Galvez. 2012. Genomic and physiological

footprint of the *Deepwater Horizon* oil spill on resident marsh fishes. Proceedings of the National Academy of Sciences 109 (50): 20298-20302

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 of Mexico (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	498,377	478,441	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	56,649	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.