TAB B, No. 9(a)
12/08/2015

Regional Management of Recreational Red Snapper

Draft Environmental Impact Statement for Amendment 39

to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico

November 2015

This is a publication of the Gulf of Mexico Fishery Management Council Pursuant to National Oceanic and Atmospheric Administration Award No. NA10NMF4410011.

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Gulf of Mexico Reef Fish Amendment 39
Draft Environmental Impact Statement (DEIS) Cover Sheet

Regional Management of Recreational Red Snapper Amendment 39 to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico.

Abstract: This Draft Environmental Impact Statement (DEIS) is prepared pursuant to the National Environmental Policy Act to assess the environmental impacts associated with a regulatory action. The DEIS analyzes the impacts of a reasonable range of alternatives intended to establish regional management for the recreational harvest of red snapper. The purpose of this action is to provide flexibility in the management of the recreational sector's harvest of red snapper by restructuring the federal fishery management strategy to allow for the regional variation of management measures, and developing accountability measures for recreational overages to better account for biological, social, and economic differences among the regions of the Gulf of Mexico.

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Type of Action

( ) Administrative
(X) Draft
( ) Legislative
( ) Final

Filing Dates with EPA
Notice of intent (NOI) to prepare EIS published: May 13, 2013
Draft environmental impact statement (DEIS) filed with EPA:
DEIS comment period ended:
EPA comments on DEIS:

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ABBREVIATIONS USED IN THIS DOCUMENT

ABC	acceptable biological catch
ACL	annual catch limit
ACT	annual catch target
ALS	Accumulated Landings System
AM	accountability measure
CEP	Conservation Equivalency Plan
Council	Gulf of Mexico Fishery Management Council
EFH	Essential Fish Habitat
EFP	exempted fishing permit
EIS	Environmental Impact Statement
EJ	Environmental Justice
ESA	Endangered Species Act
FMP	Fishery Management Plan
Gulf	Gulf of Mexico
IFQ	individual fishing quota
LDWF	Louisiana Department of Wildlife and Fisheries
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
mp	million pounds
MRFSS	Marine Recreational Fisheries Survey and Statistics
MRIP	Marine Recreational Information Program
MSST	minimum stock size threshold
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NS	National Standard
OFL	overfishing limit
PDF	probability density function
SAV	submerged aquatic vegetation
SEAMAP	Southeast Area Monitoring and Assessment Program
Secretary	Secretary of Commerce
SEDAR	Southeast Data Assessment and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office of NMFS
SRHS	Southeast Region Headboat Survey
SSB	spawning stock biomass
SSC	Scientific and Statistical Committee
SPR	spawning potential ratio
TAC	total allowable catch
TL	total length
TPWD	Texas Parks and Wildlife Department
TRC	Technical Review Committee
VEC	valued environmental components
ww	whole weight
YPR	yield per recruit

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EXECUTIVE SUMMARY

The recreational sector harvesting red snapper in the Gulf of Mexico includes private anglers and for-hire vessels. The recreational sector, which has experienced quota overages and shorter seasons recently, is managed under a quota, bag and size limits, and closed seasons. The recreational season length is determined through projections that rely on previous years' data. Even though the recreational quota has increased in recent years, the season length has decreased, in part because the average size of the fish harvested has increased (i.e., it takes fewer fish to fill the quota). Additionally, inconsistent state regulations have made harvest projections more difficult. To provide more flexibility in the management for the recreational harvest of red snapper, the Gulf of Mexico Fishery Management Council (Council) developed this amendment to consider implementing regional management.

The purpose of this action is to provide flexibility in the management of the recreational sector's harvest of red snapper by restructuring the federal fishery management strategy to allow for the regional variation of management measures, and developing accountability measures for recreational overages to better account for biological, social, and economic differences among the regions of the Gulf of Mexico. By establishing regional management through delegation or a conservation equivalency approach, the States would have the ability to tailor the management measures to address the regional differences in the fishery. The need for the proposed action is to prevent overfishing while achieving the optimum yield, particularly with respect to recreational opportunities, while rebuilding the red snapper stock. Table 1 summarizes the management actions included in this amendment and indicates the preferred alternatives selected by the Council.

Table 1: Summary of Actions considered in Reef fish Amendment 39

Action 1: Regional Management
Alternative 1: No Action – Retain current federal regulations for management of recreational red snapper in federal waters of the Gulf of Mexico (Gulf).
Alternative 2: Establish a regional management program that **delegates** some management authority to a state or group of states (regions). Each region must establish the red snapper season structure and bag limit for the harvest of an assigned portion of the recreational sector annual catch limit (ACL). If a region elects to not participate or is determined to have a red snapper harvest plan that is inconsistent with the requirements of delegation, the recreational harvest of red snapper in the federal waters adjacent to such region would be subject to the federal default regulations for red snapper.
Alternative 3: Establish a regional management program in which a state or group of adjacent states (regions) submit proposals to **NMFS** describing the **conservation equivalency measures** the region will adopt for the management of its portion of the recreational sector ACL. The proposals must specify the red snapper season and bag limit. To be a conservation equivalency plan (CEP), the plan must be reasonably expected to limit the red snapper harvest to the region's assigned portion of the recreational sector ACL. If a region does not participate or its plan is determined by NMFS to not satisfy the conservation equivalency

requirements, then the recreational harvest of red snapper in the federal waters adjacent to such region would be subject to the federal default regulations for red snapper.

Preferred Alternative 4: Establish a regional management program in which a state or group of adjacent states (regions) submit proposals to a **technical review committee** describing the **conservation equivalency measures** the region will adopt for the management of its portion of the recreational sector ACL. The proposals must specify the red snapper season and bag limit. To be a CEP, the plan must be reasonably expected to limit the red snapper harvest to the region's assigned portion of the recreational red snapper ACL. The technical review committee reviews and may make recommendations on the plan, which is either returned to the region for revision or forwarded to NMFS for final review. If a region does not participate or its plan is determined by NMFS to not satisfy the conservation equivalency requirements, then the recreational harvest of red snapper in the federal waters adjacent to such region would be subject to the federal default regulations for red snapper.

Preferred Alternative 5: Establish a provision to sunset regional management after:

Option 5a: 10 calendar years of the program.

Preferred Option 5b: 5 calendar years of the program.

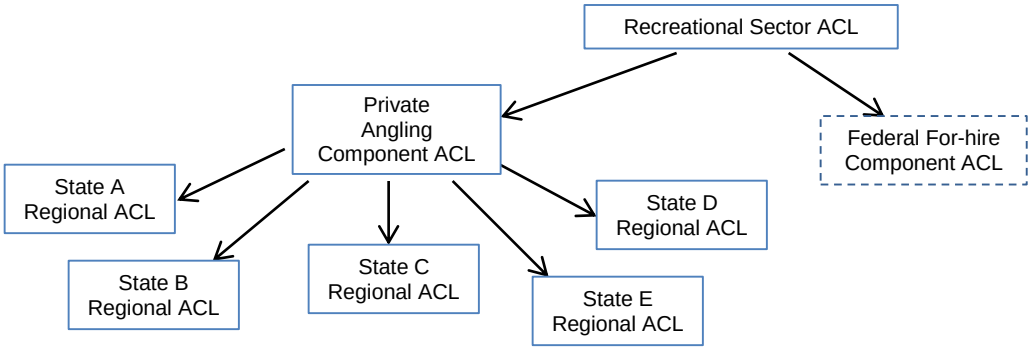
Option 5c: 3 calendar years of the program.

Option 5d: 2 calendar years of the program.

Action 2: Regional Management and Sector Separation

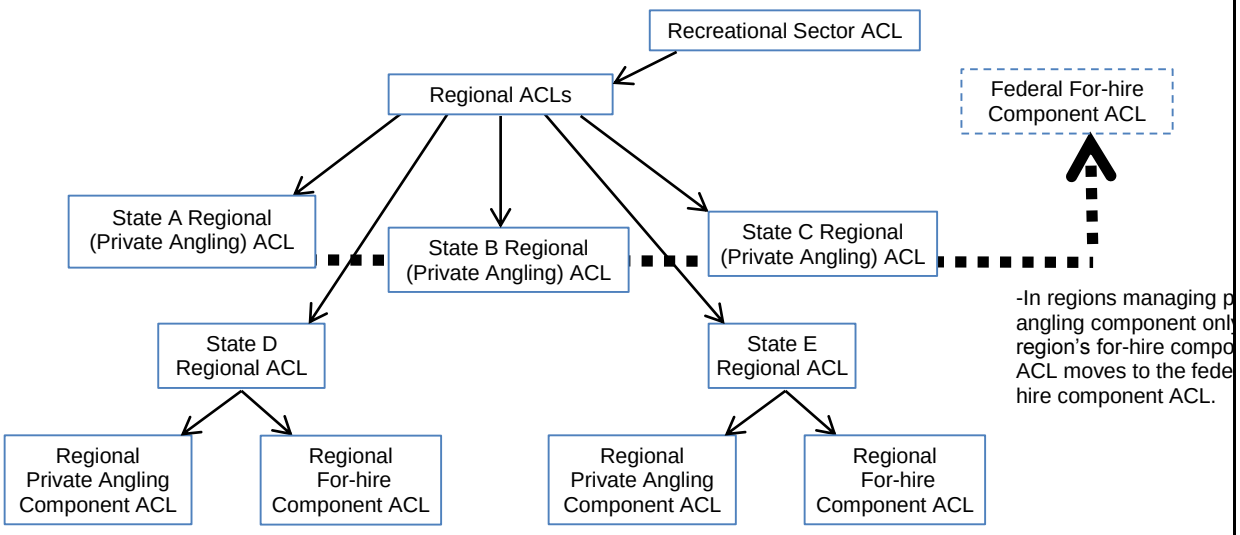
Alternative 1: No Action – Retain current federal management of recreational red snapper in federal waters of the Gulf. For the years 2015-2017, establish separate component ACTs for the federal for-hire and private angling components as specified in Amendment 40.

Alternative 2: **Extend** the separate management of federal for-hire and private angling components of the recreational sector. This amendment would **apply to the private angling component**, only. The private angling component would be managed by each region under regional ACLs based on the allocation selected in Action 6.

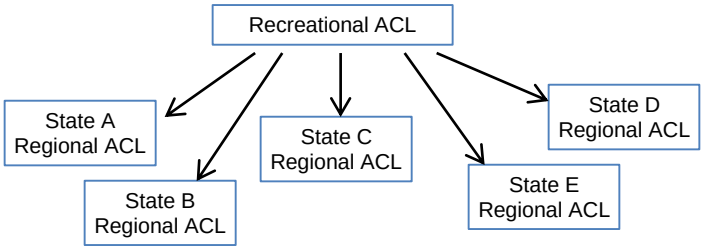


Alternative 3: **Extend** the separate management of the federal for-hire and private angling components of the recreational sector. This amendment could **apply to both components**. The recreational sector ACL will be divided into regional ACLs using the allocation selected in Action 6. The regional ACLs will be further divided into regional component ACLs (i.e.,

apply the allocation formula established through Amendment 40 to the region's average proportion of landings by each component). A region may manage both components or may opt to manage the private angling component only. If managing the private angling component only, the region's for-hire component ACL would become part of the federal for-hire component ACL.



Alternative 4: **<u>End</u>** the separate management of the federal for-hire and private angling components upon implementation of this amendment, and have this amendment **<u>apply to the entire recreational sector</u>**. The private angling and federal for-hire components would be managed as a single unit by each region under regional ACLs based on the allocation selected in Action 6.



Action 3: Establish Regions for Management

Alternative 1: No Action – Retain the current management of recreational red snapper in federal waters of the Gulf as one region.

Alternative 2: Establish an east (Florida, Alabama, Mississippi) and west (Louisiana, Texas) region and allow for different management measures for each region.

Alternative 3: Establish an east (Florida, Alabama) and west (Mississippi, Louisiana, Texas) region and allow for different management measures for each region.

Alternative 4: Establish five regions representing each Gulf State.

Preferred Alternative 5: Establish five regions representing each Gulf State, which may voluntarily form multistate regions with adjacent states.
Action 4: Modify the Federal Minimum Size Limit
Alternative 1: No Action – Retain current federal regulations for the minimum size limit for recreational red snapper in federal waters of the Gulf. The federal minimum size limit is 16 inches TL.
Alternative 2: Reduce the federal minimum size limit to 14 inches TL.
Preferred Alternative 3: Reduce the federal minimum size limit to 15 inches TL.
Alternative 4: Increase the federal minimum size limit to 17 inches TL.
Alternative 5: Increase the federal minimum size limit to 18 inches TL.
Action 5: Closures in Federal Waters of the Gulf
Alternative 1: No action – Regions may not establish closed areas in federal waters adjacent to their region.
Preferred Alternative 2: A region may establish closed areas within federal waters adjacent to their region in which the recreational harvest of red snapper is prohibited. **Option 2a:** Areas of the Gulf may be closed for up to six months of the year. **Option 2b:** No more than 50% of the federal waters adjacent to a region may be closed during the year.
Action 6: Apportioning the Recreational ACL (Quota) among Regions
Alternative 1: No Action – Retain current federal regulations for allocating the recreational sector ACL between the private angling component and federal for-hire component for the years 2015-2017. Do not divide the recreational sector ACL among regions.
Alternative 2: Apportion the recreational sector ACL (or component ACLs) among the regions selected in Action 3 based on the average of historical landings for the years **1986-2013**.
Alternative 3: Apportion the recreational sector ACL (or component ACLs) among the regions selected in Action 3 based on the average of historical landings for the years **1996-2013**.
Alternative 4: Apportion the recreational sector ACL (or component ACLs) among the regions selected in Action 3 based on the average of historical landings for the years **2006-2013**.

Preferred Alternative 5: Apportion the recreational sector ACL (or component ACLs) among the regions selected in Action 3 based on **50%** of average historical landings for the years **1986-2013** and **50%** of average historical landings for the years **2006-2013**.
Preferred Alternative 6: In calculating regional apportionments, exclude from the selected time series: **Preferred Option 6a**: 2006 landings **Preferred Option 6b**: 2010 landings
Alternative 7: Apportion the recreational sector ACL into eastern and western regional ACLs (or component ACLs) divided approximately at the Mississippi River, based on regional biogeographical differences in the stock used in the stock assessments.
Alternative 8: Apportion the recreational sector ACL (or component ACLs) among the regions selected in Action 3 such that each region's allocation provides an equivalent number of fishing days.
Action 7: Post-Season Accountability Measures (AMs)
Alternative 1: No Action – Retain the current post-season AMs for managing overages of the recreational sector ACL in federal waters of the Gulf. While red snapper are overfished (based on the most recent Status of U.S. Fisheries Report to Congress), if the recreational sector ACL (quota) is exceeded, reduce the **recreational sector** ACL in the following year by the full amount of the overage, unless the best scientific information available determines that a greater, lesser, or no overage adjustment is necessary. The component ACTs for the years 2015-2017 will be adjusted to reflect the previously established percent buffer.
Preferred Alternative 2: While red snapper are overfished (based on the most recent Status of U.S. Fisheries Report to Congress), if the combined recreational landings exceed the recreational sector ACL, then reduce in the following year the **regional ACL** of any region that exceeded its regional ACL by the amount of the region's ACL overage in the prior fishing year, unless the best scientific information available determines that a greater, lesser, or no overage adjustment is necessary. The recreational ACTs will be adjusted to reflect the previously established percent buffer. **Option 2a:** If a region has both a private-angling ACL and a federal for-hire ACL, the reduction will be **applied to the component(s)** that exceeded the applicable ACL. **Option 2b:** If a region has both a private-angling ACL and a federal for-hire ACL, the reduction will be **applied equally to both components**.

Action 1 – Regional Management

Action 1 determines the structure for establishing regional management. **Alternative 1** (No Action) would retain current management measures for the recreational harvest of red snapper in federal waters of the Gulf of Mexico (Gulf). Under **Alternative 2**, regional management is

defined as the delegation of limited management authority to a State or adjacent States, which would then establish appropriate management measures to constrain recreational harvest to the assigned portion of the recreational sector ACL. The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) allows for the delegation of management to a State to regulate fishing vessels beyond their state waters, provided its regulations are consistent with the fishery management plan (FMP; Appendix D). The delegation of management authority to the States (**Alternative 2**) requires a three-quarters majority vote of the voting members of the Gulf of Mexico Fishery Management Council (Council) members. **Alternatives 3** and **4** allow regions to develop conservation equivalency plans (CEPs), in which each region specifies the management measures to be used to constrain harvest to the regional quota. **Alternative 3** and **Preferred Alternative 4** differ based on the review process for the CEPs. Under **Alternative 3**, regions would submit plans directly to NMFS for review while under **Preferred Alternative 4**, regions would first submit CEPs to a technical review committee. The technical review committee would provide the initial review of the CEPs and may make recommendations on the plans, which are either returned to the regions for revision or forwarded to NMFS for final review and approval. **Preferred Alternative 5** provides sunset options for ending regional management after a specified number of years (**Options 5a-5d**) and may be selected with any of **Alternatives 2-4**. At the time of the sunset, all regulations associated with all actions in this plan amendment would expire, including any accountability measures (AMs; Action 7). Under **Preferred Alternative 5**, regional management would end after 10 calendar years (**Options 5a**), 5 years (**Preferred Option 5b**), 3 years (**Option 5c**), or 2 years (**Options 5d**).

With respect to the physical and biological/ecological environments, the direct and indirect effects of this action regardless of the alternative selected as preferred would likely be minimal. The effects on the physical environment are related to fishing effort where greater effort results in greater gear interactions. The effects on the biological/ecological environment would be related to more removals and discards of targeted species. Establishing a different management between regions under these alternatives could affect how fishing is conducted. An increase in fishing effort in a particular area or over a particular time period could cause localized adverse effects on the physical and biological/ecological environments. Adverse effects to the physical and biological/ecological environments would be lessened if resultant regional red snapper management measures developed by the regions (**Alternative 2**) or through CEPs (**Alternative 3** and **Preferred Alternative 4**) resulted in a reduction in fishing effort for red snapper or reef fish. **Preferred Alternative 5** would limit these effects to 10 (**Option 5a**), five (**Preferred Option 5b**), three (**Option 5c**) or two (**Option 5d**) years, unless the Council decided to extend this program.

In regards to the economic environment, the expected economic effects of the proposed alternatives cannot be quantified, and it is difficult to conclude a ranking of the alternatives based on the expected economic effects given the uncertainties discussed above. However, if the biological status and recovery of red snapper is protected and the regional allocation overages are minimized, then the more control given to the regions, the greater the expected economic benefits. Thus, from this perspective, **Alternative 2**, **Alternative 3**, and **Preferred Alternative 4** would each be expected to result in higher economic benefits than **Alternative 1**. The differences between **Alternatives 2-4** may be marginal to non-existent. Each, although authorized under different structures (delegation versus conservation equivalency), could result

in the same red snapper management measures. As a result, if equally adoptable, each could result in the virtually the same economic effects, with the differences potentially reduced to higher procedural and administrative costs associated with the function of the technical review committee under **Preferred Alternative 4** compared to **Alternative 2** and **Alternative 3**. **Alternative 2**, however, may result in the least likelihood of the potential economic benefits of red snapper regulations better tailored to local conditions being realized because of the higher threshold required for Council approval. **Preferred Alternative 5** would limit the duration of the regional management program. None of the proposed options would be expected to affect the expected economic effects of regional management. The only certain effect of the adoption of any sunset option, compared to **Alternative 1**, would be a requirement for Council action, with associated costs, to terminate the sunset. These costs would be expected to be minor, however, because management of the recreational harvest of red snapper would be expected to continue to be a routine topic of Council discussion and deliberation under regional management.

With respect to the social environment, additional impacts are not expected from maintaining red snapper management measures under **Alternative 1** (No Action). However, regional management is being considered in response to growing frustrations with status quo federal management and indirect benefits to the social environment are expected from enabling regional modification of management measures. The differences between the two broad approaches for the structure of the program: delegation (**Alternative 2**) or conservation equivalency measures (**Alternative 3** and **Preferred Alternative 4**) would not be expected to result in direct or indirect social effects. Establishing a fixed date when regional management would end (**Preferred Alternative 5**) has the potential to affect the social environment indirectly.

The administrative environment would not be affected if **Alternative 1** (No Action) is selected. **Alternative 2, Alternative 3,** and **Preferred Alternative 4** would be expected to reduce the administrative burden to the federal government and the Council, as limited management authority is transferred to specific regions. **Alternatives 2** and **Preferred Alternative 4** would further reduce the federal administrative burden compared to **Alternative 3**. **Alternative 2** would put a greater administrative burden on the States/regions to provide administrative support for their management of the red snapper recreational season, and **Preferred Alternative 4** would also put additional administrative burden on a committee designated outside the federal system. However, both would reduce federal administrative burden of implementing management measures for the red snapper recreational fishing efforts. **Preferred Alternative 5** would affect the administrative environment for different periods of time from 2 to 10 years; those effects would increase or decrease as the number of years increase or decrease. The enforcement administrative burden is not likely to change; however, if it may be necessary to shift from off-shore enforcement, because most enforcement would be dockside if regional management is implemented. If an angler harvests red snapper in federal waters of a region with closed state waters, they could land the fish in a neighboring region with open waters.

Action 2- Regional Management and Sector Separation

Action 2 addresses the current separate components of the recreational sector of the reef fish fishery. In 2015, Amendment 40 (GMFMC 2014) was implemented and established the federal for-hire and private angling components of the recreational sector for a period of three years

(2015-2017). Action 2 is only applicable if this amendment is implemented while the separate components of the recreational sector are still in effect. The Council has not yet selected a preferred alternative for this action. Input and information gathered from an additional round of public hearings, are expected to inform the Council's decision for a preferred alternative. A preferred alternative will be identified prior to publication of the FEIS.

Currently (**Alternative 1**), the recreational sector ACL is divided into two component ACTs for the years 2015-2017 and will revert to a single recreational sector ACL at the start of 2018. **Alternative 1** would continue the separate management of the federal for-hire and private angling components until the end of 2017, as specified in Amendment 40 (GMFMC 2014). **Alternative 2** would extend the separate management of the federal for-hire and private angling components. Under this alternative, regional management would apply only to the private angling component. Management of the federal for-hire component would be managed Gulf-wide, and options to modify the management of this component are currently under evaluation by the Council through Amendments 41 (charter vessels) and 42 (headboats). **Alternative 3** differs from **Alternative 2**, by allowing each region to decide whether or not to manage the for-hire component in that region. Under **Alternative 3**, the recreational sector ACL would first be divided into regional ACLs based on the alternatives selected in Action 6. These regional ACLs would be further divided into regional component ACLs. **Alternative 4** would end the use of separate component ACLs (quotas) at the time this amendment is implemented, even if the three-year period of sector separation has not expired. Regional ACLs would be established for each region, which encompass all recreational anglers and vessels of the region. Thus, adopting **Alternative 4** would apply regional management and the actions herein to each region's recreational sector as a whole.

While this action is not likely to directly affect the physical environment, indirect effects could occur if changes in allocation between components result in an increase or decrease in the amount of fishing gear used to harvest red snapper. **Alternative 1** (No Action) would not change the current fishing conditions. **Alternatives 2 and 3** would be most beneficial to the physical environment by limiting the amount of fishing effort by the components and **Alternative 1** would be the least beneficial because there could be a proportional increase in the private angling component harvest after Amendment 40's allocation expires, resulting in greater fishing effort to harvest the recreational quota. The effects of **Alternative 4** would be intermediate to the other alternatives and would be dependent on the degree regions limit red snapper fishing by the private anglers.

This action would have no direct effect and few indirect effects on the biological or ecological environment. Red snapper are part of the multispecies reef fishery management unit. Even if red snapper are not available for harvest, fishermen would still continue to fish for other species and overall fishing effort would be minimally affected. Therefore, indirect effects from this action on other species and species' habitat (including protected species) are likely negligible. For red snapper, the most likely indirect effect on the stock from this action would be changes in discard mortality correlated with the increase or decrease of fishing effort.

Because this action would only establish a structural component of the management system that would be allowed under regional management, the resultant economic effects that would

subsequently be expected to accrue to anglers, fishing or other businesses, and associated communities would be indirect economic effects of the proposed alternatives. Key to this discussion is the determination in Amendment 40 that, over all, sector separation is expected to result in an increase in economic benefits due to the enhanced ability to better tailor management measures to the needs of each sector and improved harvest monitoring capability. Thus, maintaining sector separation, as would occur under **Alternative 1**, **Alternative 2**, and **Alternative 3,** would be expected to result in more economic benefits than ending sector separation, as would occur under **Alternative 4**. **Alternative 3** would be expected to result in greater economic benefits than **Alternative 2**. **Alternative 3** would allow greater flexibility at the regional level, because both components would be included, to tailor red snapper recreational management measures to local preferences. Additionally, the Gulf-wide economic benefits of **Alternative 3** would be expected to increase the more States are included (i.e., the greater the number of States that elect to manage both sectors as separate components). **Alternative 4** would be expected to result in the least economic benefits of the four alternatives considered because the benefits of sector separation would not occur.

Resulting social effects from this Action would be indirect and relate to whether flexibility for managing toward local preferences is increased or decreased from current management (**Alternative 1**). **Alternative 2** would be expected to balance regional flexibility with regulatory complexity, by allowing each region to establish preferred management measures for its private anglers, while management approaches most appropriate to federal for-hire vessels would be established through independent management plans. **Alternative 3** would entail the greatest amount of both flexibility and regulatory complexity among the alternatives, as there could be up to 10 ACLs representing 10 different sets of management measures. **Alternative 4** would be expected to provide more flexibility than **Alternative 1**, but less flexibility than **Alternatives 2** and **3**, as each region would establish management measures that apply to all recreational anglers in that region. **Alternative 4** would also be expected to be the least complex from a regulatory perspective, as each region would manage its anglers under a single regional ACL.

Pertaining to the administrative environment, the effects of **Alternative 1**, on the administrative environment would be minimal. **Alternative 2** could result in additional rulemaking to address the management of the for-hire component and negatively affect the administrative environment. This may also result in additional rulemaking to develop management measures for the private anglers in regions increasing the burden on the States' administrative environment. **Alternative 3** and **Alternative 4** would shift the administrative burden to the regions to develop management measures or CEPs for both components; this may increase the administrative burden for reviewing the CEPs. The indirect effects from this action would occur in terms of 1) increasing regulatory complexity; 2) a shift in the regulatory burden from the federal to regional level, and 3) impacts on enforcement. Indirect effects would require monitoring of the recreational harvest, enforcement of the harvesting rules, and developing management measures to minimize the risk of harvests by the components of exceeding the recreational quota. However, regardless of which alternative is selected, the indirect effects from each alternative would likely be similar.

Action 3: Establish Regions for Management

Action 3 establishes the regions for the restructured management. Under **Alternative 1** (No Action), management measures would remain the same for the recreational harvest of red snapper throughout the federal waters of the Gulf. **Alternatives 2** and **3** would establish two regions: eastern and western Gulf. In both alternatives, Florida and Alabama make up the eastern region, and Louisiana and Texas make up the western region. The alternatives differ in that Mississippi is part of the eastern region under **Alternative 2** and part of the western region under **Alternative 3**. **Alternative 4** would establish each Gulf State as its own region. This alternative would provide the most flexibility to individual states to determine their choice of management measures. **Preferred Alternative 5** is most similar to **Alternative 4**, but would allow one or more regions to choose to form multistate regions with adjacent states. While this additional measure of flexibility could allow regions to pool their portions of the recreational quota, it would also require cooperation among states included in the region.

Action 3 would have no direct effect on the physical or biological/ecological environments. This action is administrative because it partitions the Gulf for management of red snapper in federal waters. Similar to Action 1, this action could have minimal indirect effects to these environments by allowing for spatial and temporal variation from status quo in management measures in different regions. Although the net effects from **Alternatives 2** or **3** (2 regions), **Alternative 4** (5 regions), or **Preferred Alternative 5** (up to 5 regions) might not be different from **Alternative 1** (No Action), there are likely to be differences in effects within particular regions, and these effects may change in time.

With regards to the economic environment, the primary conclusions are that economic benefits would be expected to increase under regionalization, but the costs associated with regulatory development (including implementation), harvest monitoring, and enforcement may increase as well. The economic benefits associated with the recreational harvest of red snapper would be expected to increase, because regions would have an increased ability to implement management measures preferred by their constituents. The expanded regulatory authority, however, may become complicated and increase the cost of the process of regulatory development and implementation. Attempts to reduce the likelihood of harvest overages could also increase monitoring costs, and dockside enforcement may increase enforcement costs. Overall, however, the increased economic benefits associated with better management measures would be expected to dominate potential increased management costs and result in a net increase in economic benefits. Considering these aspects, regionalization would be expected to result in a net increase in economic benefits, despite the potential increased management costs. Thus, **Alternative 4** would be expected to result in the highest increase in net economic benefits, followed by **Preferred Alternative 5**, **Alternative 2** and **Alternative 3**, and **Alternative 1.**

Pertaining to the social environment and as noted previously, the management measures that may ultimately result from the actions and alternatives considered in this proposed amendment remain unknown. Because most of the actions and alternatives relate to and build upon previous actions, the total effects that may ultimately result from this action will relate to and depend on decisions made in other actions. Thus, direct effects are not expected and indirect effects are difficult to predict. Additional impacts are not expected to result from maintaining red snapper management as a single region (**Alternative 1**). However, regional management is being considered in response to growing frustrations with Gulf-wide recreational management that does not allow for

regional differences in red snapper abundance and optimal fishing seasons. Thus, indirect benefits to the social environment are expected from increasing management flexibility provided by establishing regional management. **Preferred Alternative 5** could result in the creation of up to five regions, if each State decides to be its own region, making **Preferred Alternative 5** functionally equivalent to **Alternative 4**. In this case, any effects resulting from **Preferred Alternative 5** would be expected to be the same as **Alternative 4**. Likewise, if **Preferred Alternative 5** resulted in two regions, the impacts would be expected to be similar to those under **Alternatives 2** or **3**. Under any of **Alternatives 2-5**, it is possible that multiple regions could adopt the same management measures, rendering the effects of these alternatives indiscernible to the social environment.

Additional impacts to the administrative environment are not expected from maintaining a single Gulf-wide region for recreational red snapper management (**Alternative 1**). Direct effects would not result from selecting the number of management regions **(Alternative 2**, **3, 4**, or **Preferred Alternative 5**), because the management measures that might ultimately result in the selected regions are not specified in this action and remain unknown. Rather, the resulting number of regions could result in indirect effects in terms of 1) increasing regulatory complexity or requiring greater intra-region cooperation; 2) a shift in the regulatory burden from the federal to regional level, and 3) impacts on enforcement. Establishing more regions (**Alternative 4** or **Preferred Alternative 5**) could result in greater regulatory complexity due to involvement by more individual administrative units. On the other hand, selecting fewer regions (two under **Alternative 2** and **3**) would require greater cooperation among the States sharing a region. **Alternative 2** would also require the formation of a regional administrative entity to provide the venue for included States to agree on their shared set of management measures and harvest monitoring strategy.

Action 4: Modify the Federal Minimum Size Limit

Action 4 modifies the federal minimum size limit for the recreational harvest of red snapper. The current minimum size limit for red snapper is 16 inches total length (TL) in the Gulf for recreational anglers (**Alternative 1**) and for all Gulf States except Texas. In state waters off Texas the recreational red snapper minimum size limit is 15 inches TL (**Preferred Alternative 3**). All of the minimum size limit alternatives considered in the action are estimated to be reproductively mature fish at age-2 (SEDAR 31 2013) or approximately 14 inches which is the smallest minimum size considered in this action (**Alternative 2**). Spawning potential ratio (SPR) is the spawning potential of the stock relative to the stock with no fishing mortality. Yield-per-recruit (YPR) addresses the fishing mortality rate that produces the maximum yield of the fishery. The YPR for red snapper is maximized at 15 inches TL (**Preferred Alternative 3**), based on the YPR and SPR analyses conducted by the Southeast Fisheries Science Center (SEFSC) in 2013 for the recreational sector, which used a discard mortality estimate of 10%. The largest minimum size limit considered in this action is 18 inches TL (**Alternative 5**) that resulted in the largest spawning potential for the stock. Due to the status of the red snapper stock and selectivity patterns, minimum size limits from 13-18 inches TL are considered effective for managing red snapper because the YPR varies little between that size range. If the management goal is to achieve a higher SPR, then increasing the minimum size to 17 inches TL (**Alternative 4**) or 18 inches TL (**Alternative 5**) would be beneficial.

No direct or indirect effects on the physical environment are expected to occur from alternatives in Action 4. In general direct effects on the physical environment occur when fishing gear and anchors interact with the substrate. Pertaining to the biological/ecological environment, increases in regulatory discards due to a modification in the minimum size limit for the recreational sector are a concern, and could have minimal direct effects. However, modifications in fishing behavior due to reducing (**Alternatives 2** and **3**) or increasing (**Alternatives 4** and **5**) the minimum size limit compared to the status quo (16 inches TL, **Alternative 1**) are largely unknown. These results suggest any minimum size limit modification the Council considers (**Alternatives 2-5**) compared to **Alternative 1** (No Action) would likely have minimal effects on the biological/ecological environment. Changing the minimum size limit may affect the harvest rate and status of the red snapper stock. Allowing the harvest of smaller fish (**Alternative 2** and **Preferred Alternative 3**) would be expected to both increase the harvest rate (the increase in fish numbers attributable to a reduction in the minimum size limit would be expected to exceed the decrease in average weight per fish and result in a net increase in the total harvest rate) and increase the harvest of fish that may never spawn. As a result, total red snapper spawning could be reduced. Increasing the minimum size limit (**Alternative 4** and **Alternative 5**) would be expected to have the opposite effects, decreasing the number of fish harvested and allowing more fish to spawn before they are harvested, yet increasing the average weight per fish. However, the availability of larger fish would be likely be more limiting than the availability of smaller fish, so, although the average weight per fish would be expected to increase with a higher minimum size, overall the catch rate would likely decline.

Pertaining to the economic environment, it is generally believed that long seasons are economically more beneficial than short seasons (longer seasons afford more flexibility to schedule trips, for example), they are preferred by anglers and associated businesses. Increasing the catch rate (**Alternative 2** and **Preferred Alternative 3**) would be expected to shorten the season, if monitoring or harvest projection methods are effective, or increase the likelihood the allocation is exceeded if quota monitoring is either not implemented or is ineffective. Decreasing the catch rate (**Alternative 4** and **Alternative 5**) would be expected to lengthen the season and possibly decrease the likelihood that the allocation is exceeded. Also, limiting harvest to the allocation would be expected to result in greater economic benefits than exceeding the allocation and triggering AMs. In addition, in consideration of increased spawning potential with size, **Alternative 4** and **Alternative 5** might be expected to produce greater economic benefits than **Alternative 2** and **Preferred Alternative 3** because of potentially enhanced spawning, more stable recruitment, and faster stock recovery. Finally, changing the size limit may result in stock effects by impacting the total fishing mortality (harvest mortality and bycatch mortality combined) independent of the effects of the total harvest or the harvest of fish capable of spawning. Specifically, increasing the minimum size limit (**Alternative 4** and **Alternative 5**) would be expected to result in increased releases and associated release mortality. Overall, however, only minimal biological effects would be expected to result from any of the proposed changes in the minimum size limit. Compared to **Alternative 1**, **Preferred Alternative 3** would be expected to result in more small fish being harvested, fewer fish surviving long enough to spawn, and a shorter season. These effects would be expected to increase under **Alternative 2**, which would allow the harvest of even smaller fish. Similar comparisons exist between **Alternative 4** and **Alternative 5** (i.e., as the minimum size limit is increased, more fish would be

expected to be able to spawn but total mortality increased). Despite these considerations and general determinations, it is not possible with available data to rank these alternatives according to most to least net economic benefits.

With regards to the social environment, maximum flexibility is assumed to correspond with positive social effects. However, in general, direct effects on fishing behavior and activity would be negligible from decreasing the minimum size limit (**Alternative 2** and **Preferred Alternative 3**), as anglers prefer and target larger fish, and there is no requirement to retain fish which are caught. Reducing the minimum size limit may result in an increase in dead discards from high-grading which has the potential for negative indirect effects if the rate of dead discards negatively affects the progress of the rebuilding plan. Because Texas already establishes a 15-inch TL minimum size limit (**Preferred Alternative 3**), this alternative would be less disruptive to the social environment, as it is a small change for four of the Gulf States, and Texas would not need to change its minimum size limit, compared with **Alternative 2**.

Effects on the administrative environment for retaining (**Alternative 1**) or modifying the minimum size limit (**Alternatives 2 through 5**) would not likely change the direct or indirect effects from choosing any of the various minimum size limits (A**lternatives 1 through 5**).

Action 5: Closures in Federal Waters of the Gulf

Action 5 considers allowing regions to close parts of the federal waters adjacent to their State waters. Currently, each Gulf State has the authority to open and close its state waters to fishing, while the authority to open and close federal waters to fishing resides with NMFS. If regional management is implemented, the fixed recreational closed season for red snapper in federal waters would be removed and become part of the federal default regulations, applied in the event a region's delegation is inactive or its CEP is not approved. Removal of the fixed closed season would allow individual regions to establish their fishing season, during which anglers may harvest red snapper from the region's state waters and federal waters. A region may want to establish sub-regional fishing seasons for red snapper, such that the season is open in one part of the region while closed in another under **Alternative 1**, provided the region's delegation or CEP is active. Establishing sub-regional fishing seasons is possible under **Alternative 1** because the region would specify where red snapper may be landed within the region, and where landings are prohibited; with active regional management, inconsistent regulations do not occur because the region's active delegation or approved CEP would authorize the region's regulations to apply to its anglers in both state and federal waters. **Preferred Alternative 2** would allow a region to close areas within federal waters adjacent to its region. Closing all or part of federal waters adjacent to a region would create inconsistent regulations between state and federal waters, raising enforcement concerns. These alternatives would not allow regions to establish marine protected areas within federal waters nor restrict commercial vessels from harvesting red snapper from these areas. The options under **Preferred Alternative 2** would establish parameters for the potential areas of federal waters which may be closed. If no option is selected, the region could potentially close areas of federal waters year round, and the closed area could be the entire federal waters adjacent to the region's state waters. If **Option 2a** is selected, a region could establish closed areas within federal waters adjacent to its region for up to six months of the year. Selecting **Option 2b** would limit the extent of the area of federal waters that may be closed, to

up to 50% of the federal waters adjacent to a region's state waters, but does not place restrictions on the number of areas which could be closed.

With regards to the physical and biological/ecological environments, **Alternative 1** (**No Action**) would not allow regions to establish closed areas and is not expected to result in any direct or indirect impacts. However, **Preferred Alternative 2** would allow regions to establish closed areas which could result in either positive or negative effects on the physical and biological/ecological environments based on the geographic and temporal shift of fishing effort. If the fishing effort is confined to a smaller portion of the federal waters, then the adverse effects would be concentrated in that open area. In turn, it is likely to cause slight benefits to the physical and biological/ecological environments in the closed areas. By limiting the temporal length of the closure (**Option 2a**) and the spatial area of the closure (**Option 2b**), the direct and indirect effects would be more evenly distributed than **Preferred Alternative 2**. Overall, any effects to the physical and biological/ecological environments from establishing a closed area within a region are likely to be minimal.

Pertaining to the economic environment, due to the absence of sufficient data, details of the regional management measures that would be developed, specification of the closures that might be imposed, or the resultant fishing behavior and harvest rates that would develop under these conditions, none of the economic effects expected to occur under the proposed alternatives can be quantified. Available data does not support a conclusion that fishing and harvest by anglers in one region results in greater economic benefits than such by anglers in any other region. As a result, overall, assuming neutral Gulf-wide biological effects, the economic effects expected to occur under **Alternative 1** would only be distributional (any loss/gain to one region would be offset by a gain/loss to another), and no change in total net economic benefits would be expected. These effects, however, would not be expected to be uniformly distributed across all anglers or regions because of the non-uniform opportunity cross-regional effort transfer by anglers due to differences in geographic proximity.

The effects of partial or temporary closure of the regional portion of the federal waters (**Preferred Alternative 2**) would be expected to be less than those of total closure. Closing the federal waters to harvest would be expected to result in re-direction of effort to either state waters in the same region or, if the appropriate state permits/licenses are possessed, to the state or the federal waters portions of neighboring regions. Because **Preferred Alternative 2**, and options, would allow closures of smaller geographic scope and/or shorter duration than total closure, the economic effects would be expected to be less than the effects expected to occur under total closure. The greater the ability to reduce the scope of the closure (size or duration) relative to a total closure, the more the economic effects would be reduced relative to those that would be expected to occur under a total closure. Thus, the greatest potential reduction of these effects would be expected to occur if both **Option 2a** (closure duration limit) and **Option 2b** (closure size limit) are adopted. It is not possible to rank the two options with respect to each other. Thus, although none of the alternatives would be expected to result in a change in total net economic benefits, the effects of the alternatives may not be economically equivalent due to distributional effects and varying levels of significance.

The direct and indirect effects on the social environment would vary. **Preferred Alternative 2** would allow for additional closures in federal waters to be established, beyond the circumstances just described. If a region establishes closed areas within federal waters adjacent to the region, negative effects would be expected to result in neighboring regions, especially for anglers who fish near the region that is establishing the closed areas. **Preferred Alternative 2** would allow a region to close an unspecified number of areas within federal waters adjacent to its region without closing the entire area of federal waters adjacent to the region. Depending on the location of any resultant closed area, **Preferred Alternative 2** may increase or decrease the total social benefits for a respective region. If it is assumed that the closed areas under **Preferred Alternative 2** would be of a greater temporal extent than **Option 2a**, such that the areas are closed for over half of the year, negative effects would be expected to result for nearby anglers of bordering regions. Similarly, if a resultant closed area under **Preferred Alternative 2** is of greater spatial extent than **Option 2b**, negative effects would also be expected for nearby anglers of bordering regions. Ultimately, for some regions, the proximity to other regions could render **Preferred Alternative 2** an ineffective option and could enable unintended fishing activity to occur (see section 2.5), resulting in negative effects. For other regions, however, the ability to trade the benefits of harvest in the selected areas of federal waters for other management considerations could be expected to result in greater benefits than **Alternative 1** for that region. Nevertheless, the negative social effects of angler non-compliance and enforcement difficulties would be expected to be greater under **Preferred Alternative 2** than **Alternative 1**.

Direct and indirect effects on the administrative environment would not be likely from **Alternative 1** (No Action). **Preferred Alternative 2** would allow regions to establish closed areas in the adjacent federal waters and likely have both direct and indirect effects on the administrative environment. The direct adverse effects on the administrative environment would impact NMFS' Office of Law Enforcement, the United States Coast Guard, and state marine law enforcement operations. The enforcement of multiple closed areas would be increasingly complex with the increase in number of closed areas and season dates. Selecting **Option 2a** or **2b** pertaining to the temporal and spatial extents of the closed areas would provide some limitation to the closed areas, but would also increase the complexity for enforcement in comparison to **Alternative 1**. If the establishment of a closed area is deemed to require further analysis and rulemaking, then the burden on the administrative environment would increase and have indirect effects associated with the analysis and implementation.

Action 6: Apportioning the Recreational ACL (Quota) among Regions

Action 6 determines a method to apportion the recreational ACL among the regions. The adoption of regional management for the recreational sector will require the recreational sector ACL (or component ACLs; see Action 2) to be apportioned, or allocated, among the selected regions to create regional ACLs. Allocation is an inherently controversial issue because a limited resource is divided among competing user groups, each of which benefits from receiving the largest portion possible. In this action, the Council is determining the method to calculate the apportionment, not the percentage each region would receive. These percentages would change based on the data used in the calculation equation. **Alternative 1** (No Action) would continue to apportion the recreational sector ACL between the components established in Amendment 40 (GMFMC 2014) for the years 2015-2017 and would not apportion the recreational sector ACL

among regions of the Gulf. **Alternatives 2-4** and **Preferred Alternative 5** propose methods for apportioning the recreational ACL based on the average proportion of historical landings for different time series. **Alternatives 2-5** present four ways to apportion the recreational sector ACL using averages of historical landings for varying time series (Table 2). **Preferred Alternative 6** provides options for excluding particular years from the historical landings averages, due to impacts that affected recreational fishing opportunities during or immediately preceding those years. Hurricane Katrina struck late in the 2005 fishing season, and impacted the 2006 season and Deepwater Horizon MC252 oil spill impacted the 2010 season. **Preferred Option 6a** would exclude landings from 2006 from each time series, and **Preferred Option 6b** would exclude landings from 2010 from the time series.

Table 2. Resulting proportions of the recreational ACL that could be apportioned to each state based on four options (Alternatives 2-5) of historical landings time series.

Alternative	Years	Alabama	Florida	Louisiana	Mississippi	Texas
2	1986-2013	30.2%	33.4%	16.3%	4.0%	16.0%
3	1996-2013	32.5%	39.6%	12.3%	2.6%	13.0%
4	2006-2013	29.4%	46.1%	12.7%	1.6%	10.3%
5	50% (1986-2013), 50% (2006-2013)	29.8%	39.8%	14.5%	2.8%	13.1%

Note: Actual landings on which Tables 2 was based can be found in the Appendix (Table F-1).

Alternative 7 considers apportioning the recreational sector ACL based on the projected yields for the acceptable biological catch (ABC) for the eastern and western Gulf, as derived from the updated projections from the 2009 assessment (Linton 2012a), and may be selected as preferred if Alternatives 2 or 3 are selected as preferred in Action 3. The resulting apportionments of the ABC from that assessment would be 48.5% for the eastern and 51.5% for the western Gulf (Linton 2012a). **Alternative 8** would apportion the recreational sector ACL (or component ACLs) among regions such that the initial allocation provides an equivalent number of fishing days for each region, based on estimates for the 2015 fishing season. Assuming that all regions are participating in regional management, the expected number of initial days would be within the range of 18 to 22 days when managing towards the ACT.

The overall Gulf recreational ACL would be the same for all **Alternatives 1-8** direct effects on the physical environment over the Gulf as a whole are expected to be the same. However, this action could regionally affect the physical environment indirectly by redirecting the amount of red snapper fishing that can occur off different regions of the Gulf. Allocating based on historical landings (**Alternatives 2**, **3, 4** and **Preferred Alternative 5**) or by stock abundance (**Alternative 7**) could allow red snapper fishing to increase if a region receives an allocation greater than what landings would be under **Alternative 1** (No Action). Thus, there would likely be an increase in any adverse effects from fishing to the physical environment for these regions based on the spatial distribution of red snapper allocation throughout the Gulf. In contrast, regions whose allocations would be reduced compared to **Alternative 1** (No Action) would experience a reduction in any adverse effects from red snapper fishing. **Alternative 8** would distribute the quota among regions to provide an equal number of fishing days. As this would equate to having a federal season of the same number of days for the entire Gulf, the effects are

likely to be similar to **Alternative 1. Preferred Alternative 6 (Preferred Option 6a** and **Preferred Option 6b)** are not likely to have any effect on the physical environment.

Action 6 is administrative because it determines apportionment of the recreational quota among the regions. Therefore, this action would have no direct effect on the biological/ecological environment. Because the different allocations proposed in the alternatives would be based on the same quota, the overall indirect effects on the biological/ecological environment are expected to be the same for **Alternatives 1-4 and Preferred Alternative 5**. However, this action could indirectly affect different areas of this environment by redirecting the amount of red snapper fishing that can occur off different regions of the Gulf. Allocating based on historical landings (**Alternatives 2, 3, 4,** and **Preferred Alternative 5**) or by stock abundance (**Alternative 7**) could allow red snapper fishing to increase if a region receives an allocation greater than what landings would be under **Alternative 1** (No Action) because red snapper fishing would likely increase to harvest the additional fish. As a result, this would likely increase any adverse effects from fishing to the local red snapper population for these regions. In contrast, regions whose allocations would be reduced compared to **Alternative 1** (No Action) would experience a reduction in any adverse effects from red snapper fishing. **Alternative 8** would distribute the quota among regions to provide an equal number of fishing days. As this would equate to having a federal season of the same number of days for the entire Gulf, the effects are likely to be similar to **Alternative 1. Preferred Alternative 6 (Preferred Option 6a** and **Preferred Option 6b)** are not likely to have any effect on the biological/ecological environment.

With regards to the economic environment, even if a specific alternative would result in an allocation for a region that is lower than recent harvests, it cannot be concluded that the economic benefits to that region would be reduced. By tailoring the management regulations to better meet the preferences of the constituents in that region, it is possible, and likely, that the lower allocation could still result in an increase in economic benefits relative to **Alternative 1**. Only in the event of a substantial reduction in allocation relative to normal harvest would a net reduction in economic benefits be expected to occur. This might be argued to be the case for Florida, which would, under the combination of **Preferred Alternative 5** and **Preferred Alternative 6 Preferred Options 6a** and **6b**, be allocated 37.8% of the ACL, whereas Florida harvested 42.5% of the total Gulf-wide ACL in 2014 (data for 2014, however, was not included in the apportionment alternatives). Similarly, for Alabama, although the preferred alternatives would result in a higher allocation, 31.6%, than was harvested in 2014, this allocation would be considerably lower than the proportion of the total Gulf-wide ACL harvested in 2011-2013 (35.9%-53.6%). Essentially, the issue comes down to what level of harvest is/should be considered normal, which is not an economic question and is a question that is difficult to answer because of the changing conditions of the stock (biomass growth and eastward range expansion) and the absence of stability in both the federal season and state regulations.

Pertaining to the social environment, the decision to allocate a scarce resource among user groups is controversial as participants from each region contend for the greatest allocation for their region. Negative effects would be minimized by establishing an allocation that most closely reflects actual participation and fishing effort. In addition, there is a trade off in the flexibility afforded by regional management to assign locally appropriate management measures, and an increased need for monitoring and enforcement to accompany the requirement to

constrain landings to a fixed portion of the recreational sector ACL. Changes in direct and indirect effects would not be expected from **Alternative 1** (No Action) as the landings among States are not required to remain within a specified proportion of the recreational sector ACL. Under **Alternatives 2-5**, allocations based on longer time series (i.e., include earlier years) are more advantageous to the western Gulf States than shorter time series that include the most recent years. Shorter, more recent time series are more advantageous to the eastern Gulf States (Table 3). **Preferred Alterative 6** provides options for eliminating the years 2006 (**Preferred Option 6a**) and/or 2010 (**Preferred Option 6b**) from calculating the regional apportionments, based on the disruptions to fishing activity that occurred during those years. **Alternative 7** will provide greater social benefits to anglers of western Gulf States and would negatively affect the fishing opportunities of anglers in the eastern Gulf States. On the other hand, the issue of flexibility of variable annual landings is less of an issue under **Alternative 7**, because the recreational red snapper ACL would be divided into two parts instead of five. Although **Alternative 8** would provide the greatest short-term benefits to the eastern Gulf States of Alabama and Florida, which could receive up to 87% of the recreational ACL, there is a downward projection for the eastern Gulf stock. Thus, if most of the allowable harvest continues to occur in the eastern Gulf, a redistribution of the stock could occur from east to west and could be exacerbated under **Alternative 8**. This could potentially result in some negative long-term social effects (see Section 3.2 and GMFMC 2015a).

Table 3. Ranking of allocation for each State in terms of the amount of quota each State would receive under the alternatives. A rank of 1 represents the alternative giving the most quota to the State, while a 6 represents the alternative for which the State receives the least quota. For Alternatives 2-4 and Preferred Alternative 5, no years of landings are excluded. The row for Preferred Alternative 6 provides the rankings by State for Preferred Alternative 5, excluding landings from both 2006 and 2010 (currently the Council's preferred alternative).

Alternative	Intervals	AL	FL	LA	MS	TX
2	Longest time series	4	6	1	1	1
3	Intermediate time series	2	4	5	4	3
4	Most recent time series	6	2	4	5	5
Pref. 5	**Average of longest and most recent time series**	5	3	3	3	2
Pref. 6	**Exclude years of environmental events**	3	5	2	2	4
7	Projected yields for ABC for eastern and western Gulf	Not available by State; allocation to western Gulf would be greater than to eastern Gulf.				
8	Same season length at time of apportionment	1	1	6	6	6

Retaining a Gulf-wide recreational red snapper quota (**Alternative 1**) would not be likely to affect the administrative environment. However, selecting this alternative would not allow for implementation of a regional management program. The remaining alternatives determine the method by which the Gulf-wide quota will be divided among selected regions and would increase the burden on the administrative environment. **Alternatives 2-4, and Preferred Alternative 5** and **6,** and **Alternative 8** would have minimal adverse effects by only requiring the initial calculations of apportionment. However, **Alternative 7** would require additional

analysis and possible updates based on the stock biogeographical differences and the future stock assessments. **Preferred Alternative 6, Preferred Options 6a** and **6b** (eliminating specified years from calculating the regional apportionments), are expected to have minimal effects to the administrative environment. It is not overly burdensome to include or exclude a specified year's data from the calculations.

Action 7: Post-Season Accountability Measures (AMs)

Action 7 addresses potential overages with post-season AMs. In 2014, the Council adopted an in-season AM to create an ACT determined by deducting 20% from the ACL. To correct or mitigate any overages during a specific fishing year (50 CFR 600.310(g)), the Council also adopted a post-season AM which would reduce the recreational sector ACL in the year following an overage by the full amount of the overage (**Alternative 1**) unless the best scientific information available determines that a greater, lesser, or no overage adjustment is necessary. **Preferred Alternative 2** would apply the post-season AM only to a region or regions which exceeded its portion of the recreational sector ACL. With the apportionment of regional ACLs, **Preferred Alternative 2** would prevent the overage adjustment from affecting regions that do not exceed their regional ACL. However, if a region's overage is greater than the following year's regional ACL, then the region may not have a recreational red snapper season in the following year. At this time, the Council has not selected an option for this alternative. **Option 2a** would apply the post-season AM to the component (for-hire or private angling) that exceeds its component ACL in the prior fishing year. In the event the Gulf-wide recreational sector ACL is exceeded, the component that exceeded its portion of the ACL would have its component ACL reduced in the following year by the amount of the overage. This alternative would prevent the overage adjustment from affecting a component of the recreational sector that does not exceed its component ACL. **Option 2b** combines the overage adjustments of the region (**Preferred Alternative 2**) and component (**Alternative 3**) that exceeds its respective portion of the ACL, by applying the post-season AM to both a region and component that has exceeded its portion of the recreational ACL in the previous year.

The direct and indirect effects on the physical environment from this action would be related to changes in fishing effort. The effects on the physical environment resulting from **Alternative 1** are expected to be similar to current fishing conditions. No change in fishing effort is expected to occur because no new fishing regulations would be implemented; therefore, habitat-gear interactions are estimated to remain unchanged. **Preferred Alternative 2, Option 2a**, and **Option 2b** would provide slight benefits to reef fish habitat by reducing the fishing effort in the following year if the landings indicate the quota was exceeded. This would increase the likelihood of achieving the goals of the rebuilding plan and preventing overfishing. If the fishing effort is reduced and the amount of time spent fishing is reduced, then the decrease in fishing effort would indirectly benefit the physical environment by reducing habitat-gear interactions. The direct and indirect effects on the biological/ecological environments from this action would be related to changes in fishing effort. **Alternative 1** would continue the current direct and indirect effects on the biological/ecological environments. The effects are relative to the change in fishing effort which may result in over or under harvest. This alternative does not implement a reduction for the following recreational season's red snapper harvest in the case of the quota being exceeded which in turn, may increase the direct negative effects to the

biological/ecological environment in relation to the other alternatives. Should an overharvest occur, this alternative could adversely affect the red snapper stock; however, this has been the status quo for several years. **Preferred Alternative 2, Option 2a**, and **Option 2b** would adjust for any overage during the following year, thus minimizing the effects on the biological/ecological environments relative to the overage as discussed in Section 2.6. These alternatives result in a one-for-one reduction of the following year's quota for any overage if the landings exceed the Gulf recreational ACL. This reduces adverse effects on the biological/ecological environment that may occur from the overharvest.

With regards to the economic environment, **Alternative 1** would not change the current post-season AMs for managing red snapper recreational harvest overages in the Gulf federal waters. As a result, in the short term, no change in economic benefits to fishermen from either sector, or associated businesses, would be expected to occur. However, the current payback AM does not factor in the potential management configurations that may occur under the proposed regional management alternatives in this amendment. As a result, **Alternative 1** may result in reduced economic benefits compared to the other alternatives because of how the payback burden would be distributed across the various regions and components. For the other proposed alternatives, harvest overage paybacks would be required, but only if red snapper are overfished (as under **Alternative 1**) and the total red snapper recreational harvest ("combined recreational landings") from all regions and components exceed the combined ACL (recreational sector ACL). Otherwise, the proposed alternatives vary by how the payback is shared regionally and/or by component.

With respect to sharing paybacks, the effects are less an issue of economics and more an issue of equity. As previously stated for other actions in this proposed amendment, available information does not support a determination that red snapper valuation differs by region (i.e., anglers in one region value red snapper more than anglers in another region), or component. As a result, assuming red snapper are equally valued by all anglers across the Gulf, the magnitude of the economic effects to anglers would be unaffected by whether they are borne only by the region(s) responsible for the overage, or shared by all regions and components. Distributional effects would occur (i.e., a portion of the effects of a payback would be borne by regions or components where the overage did not occur if the payback is shared by all regions and components), but the total change in economic value would be unaffected. However, from an equity perspective, penalizing anglers, and associated businesses, in all regions/components for overages that only occur in others may be perceived as inequitable because it would result in re-distribution of economic benefits without apparent justification. Thus, from this perspective, **Option 2b** (reduce only the component in the region that exceeds its ACL) would be more equitable than **Preferred Alternative 2** (reduce the regional ACL; both components would be affected) and **Option 2a** (reduce the Gulf-wide component ACL; all regions would be affected).

Pertaining to the social environment, additional effects would not usually be expected from retaining **Alternative 1** (No Action). However, if regional management is implemented and the recreational sector ACL is subsequently exceeded, all regional (or component) ACLs would be reduced in the following year, even if only one region's (or component's) landings caused the recreational sector ACL to be exceeded. In the event the recreational sector ACL is exceeded under **Alternative 1**, negative effects would result for regions (or components) that constrained

landings to within the region's portion of the ACL. In turn, positive effects would result for a region (or component) that exceeded its portion of the ACL, as the reduction to the recreational sector ACL in the following year would be distributed among all regions. Thus, retaining **Alternative 1** may be perceived as unfair in a region (or component) that successfully constrains landings to its regional ACL (or component ACL), but has its regional ACL reduced the following year due to an overage in the recreational sector ACL.

Alternatives 2-4 would modify the post-season AM such that it applies only to a region that exceeds its regional ACL (**Preferred Alternative 2**), or only to the component that exceeds its component ACL (if applicable, **Option 2a**). If both regional ACLs and component ACLs are established, **Option 2b** would require the overage adjustment to be applied to the specific region and/or component that has exceeded its portion of the ACL. Regions (**Preferred Alternative 2**), a component (**Option 2a**), or both regions and a component (**Option 2b**) that constrain landings to within their respective portions of the ACL would not be affected by a reduced ACL in the following year, meaning that each of these alternatives would result in greater benefits to the respective region or component than **Alternative 1**. For a region or component's overage that causes the recreational sector ACL to be exceeded, the severity of the effects would relate to the extent of the quota overage, as fishing opportunities would be reduced in the following year to make up for the quota overage. It could be socially disruptive if large recreational sector ACL overages one year are followed by severe paybacks the next.

The direct and indirect effects on the administrative environment from this action would be related to analyzing the landings data and applying the post-season AM. **Alternative 1** would not change the administrative environment. However, this alternative results in continuously updating the yield stream to account for any overages and determine the acceptable biological catch (ABC) for red snapper each year, and developing a framework action to apply the revised ABC through updating the quotas. This maintains a burden on the administrative environment.

These alternatives may indirectly affect the enforcement of the regulations negatively. By implementing adjustments for overages, the subsequent season may be shortened. **Preferred Alternative 2**, **Option 2a**, and **Option 2b** could result in a closed season off a region if the previous year's regional quota was exceeded by over 100%. If the adjacent regions were open for the harvest of red snapper, then the increased complexity of the regulations may confuse fishermen and result in an increase in noncompliance and negative effects on enforcement and the administrative environment. The necessity to increase enforcement in a State without a recreational red snapper fishing season would increase the burden on the administrative environment. These alternatives may indirectly affect the enforcement of the regulations negatively. By implementing adjustments for overages, the subsequent season may be shortened. In addition, if the SSC modifies the ABC due to an overage (**Alternative** 1) the season length could be reduced. **Preferred Alternative 2**, **Option 2a**, and **Option 2b** could result in no fishing days for red snapper off a region if the previous year's regional quota was exceeded by over 100%. The increased complexity of the regulations may frustrate fishermen and result in an increase in noncompliance and negative effects on enforcement and the administrative environment. This noncompliance could also result in adverse biological effects.

Cumulative Effects

A cumulative effects analysis identified four valued environmental components. These were: habitat; managed resources (red snapper and other reef fish species); vessel owners, captain and crew (for-hire); anglers; infrastructure; and administration. The cumulative effects of establishing regional management for the recreational harvest of red snapper on the biophysical environment are likely neutral because it should not have much effect on overall fishing effort. For the socioeconomic environment, expected potential benefits would be determined by the flexibility of the management to suit the regional needs and the increase of fishing opportunities. One possible factor mitigating expected potential benefits of managing the recreational sector based on two components is Magnuson-Stevens Act §407(d)(1), which requires recreational or commercial red snapper fishing to end when a sector catches its quota. Thus, when NMFS determines the total recreational red snapper fishing quota is reached, NMFS is required to prohibit the retention of red snapper caught during the rest of the fishing year regardless of whether one component still has quota available. One region's exceedance of its quota could impact fishing opportunities other regions by forcing the closure of harvest if the recreational sector ACL were exceeded. Such an exceedance would also implicate post-season recreational AMs. The actions in Amendment 39 are not expected to have any impacts on the commercial sector, which is managed through an individual fishing quota program, size limits, and season-area closures.

FISHERY IMPACT STATEMENT

[To be completed.]

CHAPTER 1. INTRODUCTION

1.1 Background

Currently, the recreational harvest of red snapper in federal waters of the Gulf of Mexico (Gulf) is constrained by a 2-fish bag limit, 16-inch total length (TL) minimum size limit, and a fishing season that begins on June 1 and closes when the annual catch target (ACT) is projected to be caught. The federal regulations pertaining to recreational red snapper[1] are provided in Appendix G. Since 1996, the recreational fishing season for red snapper in federal waters has become progressively shorter. Despite annual increases in the recreational annual catch limit (ACL) since 2010 (Table 1.1.1), shorter federal seasons have continued as the quota continues to be caught in a shorter amount of time.

Regional Management

- Would allow regions (i.e., Gulf States) to specify some management measures for anglers' recreational harvest of red snapper.
- The ***Delegation*** provision in the Magnuson-Stevens Act can be used to provide authority to a state to regulate fishing vessels beyond their state waters, provided its regulations are consistent with the fishery management plan and rebuilding timeline. Delegation requires a ¾ vote of Council members to pass.
- ***Conservation equivalency*** refers to allowing individual regions to propose and establish varied regional management measures such that the aggregate harvest and impacts on the stock from all regions is equivalent to the conservation protections on the resource provided by Gulf-wide management measures.

Fishermen from different areas of the Gulf have requested more flexibility in recreational red snapper management so that regulations provide greater socioeconomic benefits to their particular area. The Gulf of Mexico Fishery Management Council (Council) is considering regional management as a way to provide greater flexibility in the management of recreational red snapper. In this amendment, regional management refers to allowing recreational regulations (specifically bag limits and season dates) to be different for identified regions of the Gulf, in contrast to uniform recreational regulations applied to all federal waters in the Gulf. This document considers two approaches for implementing regional management (Action 1): 1) ***delegation*** of limited authority to regions to specify management measures and 2) development of ***conservation equivalency plans***, in which each region specifies the management measures to be used to constrain harvest to the region's portion of the recreational sector ACL. Under either approach, regionally specific management measures may be more appropriate to the fishing

[1] Recreational red snapper refers to red snapper harvested by the recreational sector.

preferences of local fishermen. For example, regional regulations could accommodate regional differences in tourist seasons or weather conditions, thereby optimizing fishing opportunities around the Gulf.

Table 1.1.1. Recreational red snapper federal season lengths, quotas, and landings.

Year	Season dates in federal waters	Number of days open	Recreational Quotas	Recreational Landings
1996	January 1 – December 31	365	4.47 mp	5.339 mp
1997	January 1 – November 27	330	4.47 mp	6.804 mp
1998	January 1 – September 30	272	4.47 mp	4.854 mp
1999	January 1 – August 29	240	4.47 mp	4.972 mp
2000	April 21 – October 31	194	4.47 mp	4.750 mp
2001	April 21 – October 31	194	4.47 mp	5.252 mp
2002	April 21 – October 31	194	4.47 mp	6.535 mp
2003	April 21 – October 31	194	4.47 mp	6.105 mp
2004	April 21 – October 31	194	4.47 mp	6.460 mp
2005	April 21 – October 31	194	4.47 mp	4.676 mp
2006	April 21 – October 31	194	4.47 mp	4.131 mp
2007	April 21 – October 31	194	3.185 mp	5.809 mp
2008	June 1 – August 4	65	2.45 mp	4.056 mp
2009	June 1 – August 14	75	2.45 mp	5.597 mp
2010	June 1 – July 23; Oct 1 – Nov. 21 (Fri, Sat., & Sun.)	77	3.403 mp	2.651 mp
2011	June 1 – July 18	48	3.866 mp	6.734 mp
2012	June 1 – July 16	46	3.959 mp	7.524 mp
2013	June 1 – June 28; Oct 1 – Oct 14	42	5.390 mp	9.659 mp
2014	June 1 – June 9	9	5.390 mp	3.867 mp
2015	June 1 – June 10 (private angling) June 1 – July 14 (federal for-hire)	10 44	4.045 mp 2.965 mp	T.B.D.

Note: Quotas and landings are in millions of pounds (mp) whole weight. Beginning in 2014, the season length was estimated based on an ACT, reduced from the recreational sector ACL (quota) by 20%. Source: Southeast Fisheries Science Center (SEFSC) annual catch limit dataset, including calibrated landings from the Marine Recreational Information Program (MRIP), Texas Parks and Wildlife Department (TPWD), and the Southeast Region Headboat Survey (SRHS) (May 2015).

Regional management would allow for certain management measures to vary around the Gulf, enabling the establishment of recreational red snapper management measures most suited to a given region. Regional management may not result in additional fishing days, particularly if a region establishes its season during periods of greatest fishing effort. However, providing flexibility to the regions to establish management measures is expected to result in social and economic benefits by providing optimal fishing opportunities for a region's portion of the recreational ACL (quota). Nevertheless, proposed regional management measures must achieve the same conservation goals as the current federal management measures (i.e., constrain the catches of participating fishermen to the region's allocated portion of the recreational sector ACL). Under regional management, red snapper would remain a federally managed species.

The Council and the National Marine Fisheries Service (NMFS) would continue to oversee management of the stock. This includes continuing to comply with the mandate to ensure the red snapper recreational ACL is not exceeded and that conservation objectives are achieved. The Council's Scientific and Statistical Committee would continue to determine the acceptable biological catch (ABC) for red snapper, while the Council and NMFS would determine the total recreational sector ACL which would be allocated among the regions, and potentially components, of the recreational sector. All federal regulations for the harvest of red snapper would remain effective. The existing bag limit and season start date would be designated the default federal regulations, and would be applied to a region not participating in regional management or to a region for which regional management is not active. NMFS would retain authority for the remaining management regulations including implementing ACL adjustments, regulating permits, and managing the commercial red snapper individual fishing quota (IFQ) program.

There are benefits and challenges to adopting regional management. The benefits include providing regional flexibility in the design of management measures, which may allow for greater social and economic benefits. For example, the distance from shore that anglers must travel to fish and the optimal times of year for fishing due to weather conditions or tourist seasons may vary, favoring different fishing seasons around the Gulf. Enforcement may be simplified as there would no longer be inconsistent state-federal water fishing seasons and enforcement would primarily be carried out dockside. Enforcement would be more complicated if regions are allowed to establish closed areas in federal waters while state waters remain open, as dockside enforcement would not be sufficient.

The challenges of a regional management approach include a more complex regulatory program, because the recreational ACL (and potentially regional component ACLs), would need to be divided and managed separately for each region. Regional management also requires cooperation among federal and state marine resource managers. Effort shifting between regions may reduce the effectiveness of regionalized management. Also, the geographic distribution of the stock may change as the stock rebuilds, resulting in a pattern of landings that may not reflect the original allocation that is distributed. Monitoring catches on a regional level may be more costly than on a Gulf-wide level and require increased sample sizes for data collection.

ACL and ACT Designations for Regions and Components

Prior to the implementation of Amendment 40, red snapper catch levels were established as quotas that were functionally equivalent to an ACL. Amendment 40 formally adopted the language of ACLs for red snapper, such that in all regulatory actions for red snapper subsequent to Amendment 40, the quota for each sector shall be the ACL for that sector, and the sum of the quotas shall be the stock ACL (GMFMC 2014).

Amendment 40 also established two components within the recreational sector: a private angling and a federal for-hire component, and apportioned the recreational sector ACL between the components. The final rule specified component ACTs, which are reduced from the component ACLs (component quotas) by the established buffer. Thus, there are component ACLs (component quotas) and component ACTs.

If regional management is implemented, regional ACLs (and potentially regional component ACLs) will be established for each region's designated portion of the recreational sector ACL, such that the sum of the regional ACLs (and potentially regional component ACLs) is equal to the recreational sector ACL. Regional ACLs and regional component ACLs will be reduced by the established buffer, resulting in respective regional ACTs and regional component ACTs. Regions will estimate the season length based on the regional ACT (or regional component ACTs, as appropriate), and must constrain landings to not exceed the regional ACL (Figure 1.1.1).

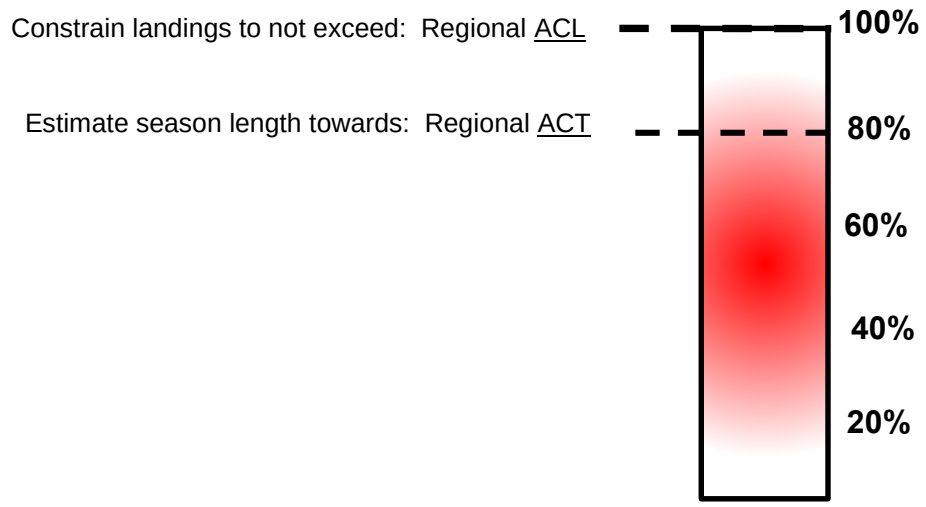


Figure 1.1.1. Comparison of management use for regional ACLs and ACTs.

History of Council Discussion on Regional Management

The Council has explored the concept of regional management for red snapper for several years. Regional management was discussed by the Ad Hoc Recreational Red Snapper Advisory Panel at its October 2008 meeting, and the Red Snapper Advisory Panel at its December 2009 meeting. Staff presented papers exploring red snapper regional management to the Council at the January 2009, August 2010, and October 2010 meetings.[2]

In June 2012, the Louisiana Department of Wildlife and Fisheries presented a proposal to the Council for a recreational red snapper regional management pilot program. The Council requested that Louisiana provide further details of their proposed regional management plan for red snapper, and instructed staff to begin developing a plan amendment for regional management of recreational red snapper. At the August 2012 meeting, the Council requested development of a scoping document for regional management of recreational red snapper, which was provided and discussed at the October 2012 meeting. Scoping meetings were held in January 2013 (Appendix C). The Council reviewed an options paper at its April 2013 meeting, and the initial public hearing draft at its June 2013 meeting. Public hearings were held around the Gulf in August 2013 and the comments were presented to the Council at its August 2013 meeting.

[2] http://www.gulfcouncil.org/resources/briefing_book_archive.php

By the February 2014 meeting, the Council had selected preferred alternatives for all actions except for how to allocate the recreational red snapper quota among the regions. At its February 2014 meeting, Council staff was directed to postpone further work on the regional management document until progress is made on how to allocate the quota among the regions. In turn, the Council moved forward with Amendment 40 (GMFMC 2014) and approved the action at its October 2014 meeting. Amendment 40 established distinct private angling and federal for-hire components, allocated the recreational sector ACL between the components, and established separate in-season closure provisions for each component; the amendment also included a three-year sunset on the provisions established.

At its January 2015 meeting, the Council reviewed a revised set of actions for regional management reflecting the regulatory changes made to recreational red snapper management since work on the document was postponed. These changes included new accountability measures (AMs) and the establishment of separate components and ACLs (quotas) for the recreational harvest of red snapper. At its June 2015 meeting, the Council requested staff to hold an additional round of public hearings, which were held following the October 2015 Council meeting.

1.2 Purpose and Need

The **purpose** of this action is to provide flexibility in the management of the recreational sector's harvest of red snapper by restructuring the federal fishery management strategy to allow for the regional variation of management measures, and developing AMs for recreational overages to better account for biological, social, and economic differences among the regions of the Gulf.

The **need** is to adhere to the National Standards (NSs) of the Magnuson-Stevens Act and to reconsider fishery management within the context of the regions of the Gulf: to prevent overfishing while achieving, on a continuing basis, the optimum yield from the harvest of red snapper by the recreational sector (NS 1); take into account and allow for variations among, and contingencies in the fisheries, fishery resources, and catches (NS 6); and provide for the sustained participation of the fishing communities of the Gulf and to the extent practicable, minimize adverse economic impacts on such communities (NS 8).

1.3 History of Management

This history of management covers events pertinent to recreational red snapper and the Council's consideration of regional management for the recreational harvest of red snapper. A complete history of management for the fishery management plan is available on the Council's website.[3]

Prior to 1997, the recreational red snapper season was open year-round. Catch levels were controlled through minimum size limits and bag limits. The Sustainable Fisheries Act of 1996 required the establishment of quotas for recreational and commercial red snapper that, when

[3] http://www.gulfcouncil.org/fishery_management_plans/reef_fish_management.php

reached, result in a prohibition on the retention of fish caught by each sector, respectively, for the remainder of the fishing year. From 1997 through 1999, NMFS implemented the recreational quota requirement through an in-season monitoring process that projected closing dates a few weeks in advance. For the years 1997 through 1999, the recreational red snapper season was closed earlier each year (Table 1.1.1). In 1999, an emergency rule temporarily raised the recreational red snapper minimum size limit from 15 to 18 inches TL towards the end of the season from June 4 through August 29 in an attempt to slow down the retained harvest rate. Without this emergency rule, the season would have closed on August 5. However, the rule resulted in a large increase in dead discards and the size limit was allowed to revert back to 15 inches TL the following year. Additional details regarding the seasons and regulation changes for red snapper are presented in Hood et al. (2007).

A February 2000 regulatory amendment (GMFMC 2000) replaced the system of in-season monitoring and closure projections with a fixed season based on a pre-season projection of when the recreational quota would be reached. The season for 2000 and beyond was initially set at April 15 through October 31, with a 16-inch TL minimum size limit, 4-fish bag limit, and zero bag limit of red snapper by the captain and crew of for-hire vessels. Shortly before the regulatory amendment was submitted to NMFS, the Council, at the request of representatives of the for-hire industry, withdrew the zero bag limit proposal for captain and crew. NMFS recalculated the season length under the revised proposal, and as a result, implemented the regulatory amendment with a recreational fishing season of April 21 through October 31. This recreational fishing season remained in effect through 2007.

In 2008, Reef Fish Amendment 27/Shrimp Amendment 14 (GMFMC 2007) revised the rebuilding plan for red snapper. For the recreational sector, the rule implemented a June 1 through September 30 fishing season in conjunction with a 2.45 million pound (mp) recreational quota, 16-inch TL minimum size limit, 2-fish bag limit, and zero bag limit for captain and crew of for-hire vessels. The implementing regulations for this amendment created the June 1 through September 30 season by establishing fixed closed seasons of January 1 through May 31, and October 1 through December 31.

The amendment also addressed differences in shrimp and red snapper fishing effort between the western and eastern Gulf, and the impacts of fishing on the red snapper rebuilding plan. The Council considered options for modifying recreational red snapper fishing effort, including different season opening dates and weekend only or consecutive seasons, for the following regions: Texas and the rest of the Gulf; east and west of the Mississippi River; and Gulf-wide regulations. The Council ultimately opted to maintain consistent Gulf-wide regulations, with a recreational season from June 1 through September 15. Early versions of the amendment proposed establishing regulations for commercial red snapper fishing for the eastern and western Gulf. The action was considered but rejected because establishing different regulations would compromise the objectives of the IFQ program and reduce the flexibility and efficiency of IFQ program participants.

The Southeast Data Assessment and Review (SEDAR) 7 red snapper assessment provided an option to set two regional total allowable catches with the Mississippi River as the dividing line (SEDAR 7 2005; SEDAR 7 Update 2009). These assessments assume there are two sub-units of

the red snapper stock within this region, separated commercially by the Mississippi River (shrimp statistical grids 12 and 13) and recreationally at the Mississippi/Louisiana state line. The most information collected and developed thus far is based on the assessment process and follows this particular split, which is included as an alternative for regional management.

The Sustainable Fisheries Act required the NMFS Regional Administrator to close the recreational red snapper season when the quota is projected to be met. When Reef Fish Amendment 27/Shrimp Amendment 14 (GMFMC 2007) was submitted to NMFS, the Council requested that the five Gulf States adopt compatible regulations in state waters. Florida adopted a compatible 2-fish bag limit, but maintained its state red snapper fishing season of April 15 through October 31, 78 days longer than the federal fishing season. Texas also maintained its 4-fish bag limit and year-round fishing season in its state waters. Prior to the start of the 2008 season, NMFS recalculated its projections for the recreational red snapper season in light of the state regulations, and projected that there would be a 75% probability that the recreational quota would not be exceeded if the season closed on August 5. As a result, NMFS set the 2008 season to be June 1 through August 4. In 2009, NMFS again recalculated its projections for the season length prior to the start of the recreational season and announced that the recreational season would be June 1 to August 15.

A February 2010 regulatory amendment (GMFMC 2010) increased the total allowable catch from 5.0 mp to 6.945 mp, which increased the recreational quota from 2.45 mp to 3.403 mp. However, NMFS estimated that in 2009, the recreational sector overharvested its quota by approximately 75%. In recalculating the number of days needed to fill the recreational quota, even with the quota increase, NMFS projected that the 2010 season would need to be shortened to June 1 through July 24, and published notice of those dates prior to the start of the recreational fishing season.

In April 2010, the Deepwater Horizon MC252 deep-sea drilling rig exploded and sank off the coast of Louisiana. Because of the resulting oil spill, approximately one-third of the Gulf was closed to fishing for much of the summer months. The direct loss of fishing opportunities due to the closure, plus the reduction in tourism throughout the coastal Gulf, resulted in a much lower catch than had been projected. After the recreational season closed on July 24, NMFS estimated that 2.3 mp of the 3.4 mp recreational quota remained unharvested (NMFS 2010). However, due to the fixed October 1 through December 31 closed season, NMFS could not reopen the recreational season without an emergency rule to suspend the closure. Consequently, the Council requested an emergency rule to provide the NMFS Regional Administrator with the authority to reopen the recreational red snapper season. After considering various reopening scenarios, the Council requested that the season be reopened for eight consecutive weekends (Friday, Saturday and Sunday) from October 1 through November 21 (24 fishing days).

A January 2011 regulatory amendment (GMFMC 2011a) increased the red snapper total allowable catch to 7.185 mp, with a 3.521 mp recreational quota and a 3.664 mp commercial quota. The final rule also established a 48-day recreational red snapper season, running June 1 through July 19. On August 12, 2011, NMFS published an emergency rule that, in part, increased the recreational red snapper quota by 345,000 lbs for the 2011 fishing year and provided the agency with the authority to reopen the recreational red snapper season later in the

year, if the recreational quota had not been filled by the July 19 closing date. However, based on available recreational landings data through June, NMFS calculated that 80% of the recreational quota had been caught. With the addition of July landings data plus Texas Parks and Wildlife Department survey data, NMFS estimated that 4.4 to 4.8 mp were caught, well above the 3.865 mp quota. Thus, no unused quota was available to reopen the recreational fishing season.

A March 2012 regulatory amendment (GMFMC 2012d) increased the commercial and recreational quotas and removed the fixed recreational season closure date of October 1. The recreational season opened June 1 through July 11. However, the north-central Gulf experienced extended severe weather during the first 26 days of the 2012 recreational red snapper fishing season, including Tropical Storm Debby. Because of the severe weather, NMFS extended the season by six days and closed on July 17.

A March 2013 framework action (GMFMC 2013a) increased the commercial and recreational red snapper quotas from a combined 8.08 mp to 8.46 mp. This was the result of new rebuilding projections based on the 2009 update assessment (SEDAR 7 Update 2009) that were revised to account for actual landings during 2009-2012. The resulting sector allocations were 4.315 mp (commercial) and 4.145 mp (recreational). NMFS published the final rule increasing the quota based on state-specific recreational red snapper seasons, which NMFS had implemented through a March 2013 emergency rule, as requested by the Council. The emergency rule reduced the recreational red snapper season in federal waters off a Gulf State that implements less restrictive regulations for their state water seasons. This reduction of the federal season was to compensate for the additional harvest that would occur in state waters as a result of the inconsistent regulations. On May 31, 2013, the U.S. District Court in Brownsville, Texas voided the emergency rule, and the Gulf-wide federal recreational red snapper season was established from June 1 through June 28.

In July 2013, the Council reviewed a new benchmark assessment (SEDAR 31 2013) which showed that the red snapper stock was rebuilding faster than projected, partly due to strong recruitment in some recent years. Combined with a new method for calculating the ABC, the Council's Scientific and Statistical Committee increased the ABC for 2013 to 13.5 mp, but warned that the catch levels would have to be reduced in future years if recruitment returned to average levels.

After incorporating a buffer to reduce the possibility of having to later reduce the quota, the Council further increased the 2013 commercial and recreational quotas to a combined 11.0 mp (5.61 mp and 5.39 mp, respectively) (GMFMC 2013b). This increase occurred too late to extend the June recreational season, so the Council requested that NMFS reopen the recreational season. NMFS announced a supplemental season of October 1 through 14, 2013.

In 2014, NMFS initially announced a 40-day recreational season. However, in March 2014, as a result of a legal challenge, the U.S. District Court found that there was not an adequate system of AMs in place to prevent the recreational red snapper sector from exceeding its quota. To comply with the court decision, the Council approved the setting of a 20% buffer for the recreational sector catch. The Council also adopted a quota overage adjustment, such that if the recreational sector ACL is exceeded, the ACL will be reduced in the following year by the full amount of the

overage. Following adoption of the new AMs, several States extended their season for recreational red snapper in state waters. The projected increase in state water caught red snapper reduced the amount of quota available to be caught in federal waters. As a result, the 2014 red snapper season in federal waters was shortened to 9 days.

Amendment 40 (GMFMC 2014) formally adopted the designation of ACLs for red snapper, established private angling and federal for-hire component ACTs for the years 2015-2017, and established separate in-season closure provisions for each component. The Council approved a framework action in April 2015 that increased the red snapper stock quota for the years 2015-2017. For 2015, the quota was increased from 11.0 mp to 14.3 mp. NMFS estimated the recreational red snapper fishing season length in federal waters for each component and established a 10-day season for private angling component and a 44-day season for the federal for-hire component (Appendix J).

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action 1 – Regional Management

Alternative 1: No Action – Retain current federal regulations for management of recreational red snapper in federal waters of the Gulf of Mexico (Gulf).

Alternative 2: Establish a regional management program that **delegates** some management authority to a state or group of states (regions). Each region must establish the red snapper season structure and bag limit for the harvest of an assigned portion of the recreational sector annual catch limit (ACL). If a region elects to not participate or is determined to have a red snapper harvest plan that is inconsistent with the requirements of delegation, the recreational harvest of red snapper in the federal waters adjacent to such region would be subject to the federal default regulations for red snapper.

Alternative 3: Establish a regional management program in which a state or group of adjacent states (regions) submit proposals to **NMFS** describing the **conservation equivalency measures** the region will adopt for the management of its portion of the recreational sector ACL. The proposals must specify the red snapper season and bag limit. To be a conservation equivalency plan (CEP), the plan must be reasonably expected to limit the red snapper harvest to the region's assigned portion of the recreational sector ACL. If a region does not participate or its plan is determined by NMFS to not satisfy the conservation equivalency requirements, then the recreational harvest of red snapper in the federal waters adjacent to such region would be subject to the federal default regulations for red snapper.

Preferred Alternative 4: Establish a regional management program in which a state or group of adjacent states (regions) submit proposals to a **technical review committee** describing the **conservation equivalency measures** the region will adopt for the management of its portion of the recreational sector ACL. The proposals must specify the red snapper season and bag limit. To be a CEP, the plan must be reasonably expected to limit the red snapper harvest to the region's assigned portion of the recreational red snapper ACL. The technical review committee reviews and may make recommendations on the plan, which is either returned to the region for revision or forwarded to NMFS for final review. If a region does not participate or its plan is determined by NMFS to not satisfy the conservation equivalency requirements, then the recreational harvest of red snapper in the federal waters adjacent to such region would be subject to the federal default regulations for red snapper.

Preferred Alternative 5: Establish a provision to sunset regional management after:

Option 5a: 10 calendar years of the program.

Preferred Option 5b: 5 calendar years of the program.

Option 5c: 3 calendar years of the program.

Option 5d: 2 calendar years of the program.

Discussion:

Federal default regulations refer to the Gulf-wide regulations governing the recreational harvest of red snapper in the Code of Federal Regulations (50 CFR Part 622). To implement regional management by delegation or conservation equivalency plans (CEP), the current regulations in the Code of Federal Regulations (50 CFR Part 622) would need to be suspended while consistent delegation or an approved CEP is in effect. Federal default regulations for the recreational harvest of red snapper would be applied to the federal waters adjacent to the state waters of that region, in the event a region's delegation is inactive, its CEP is not approved, or if a region does not participate in regional management.

If the federal default regulations are implemented for a region, the National Marine Fisheries Service (NMFS) would publish a notice with the Office of the Federal Register announcing such an action. Currently, the federal regulations include a 2-fish bag limit, minimum size limit of 16 inches total length (TL), and a June 1 season opening; the season closes when the recreational annual catch target (ACT) is projected to be met. [4] These regulations have been established and revised over time through past actions, which considered a variety of alternatives that were analyzed as part of the decision-making process.

Alternative 1 (No Action) would retain current management measures for the recreational harvest of red snapper in federal waters of the Gulf of Mexico (Gulf). Currently, these measures include a 2-fish per angler per day bag limit and a June 1 fishing season start date. **Alternative 2, Alternative 3,** and **Preferred Alternative 4** propose different approaches to regional management for recreational red snapper. Under all alternatives, red snapper would remain under federal management jurisdiction, subject to Gulf-wide closure when the recreational sector annual catch limit (ACL) is met. Essentially, while a State or States would be given some management authority to determine the regulations to be applied in their region, none of these alternatives provide the complete authority to manage red snapper advocated for by some supporters of regional management. Regions would be able to establish the season start and end dates, season structure, and bag limit at the regional level. However, all regions must adopt the federal minimum size limit selected in Action 4. Any management measures implemented for a region must adhere to the goals of the rebuilding plan and be consistent with federal and other applicable laws. This includes the requirement that season length estimates of the regions be based on the ACT, which is reduced by 20% from the ACL.

Under **Alternative 2**, regional management is defined as the delegation of limited management authority to a State or adjacent States, which would then establish appropriate management measures to constrain recreational harvest to the assigned portion of the recreational sector ACL. The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) allows for the delegation of management to a State to regulate fishing vessels beyond their state waters, provided its regulations are consistent with the fishery management plan (FMP; Appendix D). The delegation of management authority to the States (**Alternative 2**) requires a three-quarters majority vote of the voting members of the Gulf of Mexico Fishery Management Council (Council) members.

[4] Recreational red snapper management measures are codified as follows in the *Federal Register*: season opening 50 CFR 622.34(b) and bag limit 50 CFR 622.38(b)(3). The regulations are also provided in Appendix G.

Alternative 3 and **Preferred Alternative 4** would adopt a process by which each region submits a CEP describing its intended management measures for the recreational harvest of red snapper. While **Alternative 3** and **Preferred Alternative 4** would grant less management authority directly to the States or regions than **Alternative 2**, all three alternatives provide comparable flexibility to the regions to modify the season structure and bag limit for the harvest of the region's designated portion of the red snapper recreational ACL.

Alternative 3 and **Preferred Alternative 4** differ based on the review process for the CEPs. Under **Alternative 3**, regions would submit plans directly to NMFS for review while under **Preferred Alternative 4**, regions would first submit CEPs to a technical review committee, which will consist of one member from each State designated by the state fisheries director. The technical review committee would provide the initial review of the CEPs and may make recommendations on the plans, which are either returned to the regions for revision or forwarded to NMFS for final review and approval. Because of the additional time needed for the technical review committee to meet and review the CEPs, **Preferred Alternative 4** would potentially entail a longer process for consistency determination than under **Alternative 3**. On the other hand, the process under **Preferred Alternative 4** provides for greater participation and input by state-level managers and stakeholders, increasing the involvement of local-level entities in the regional management process. The proposed process under **Preferred Alternative 4** is more similar to the Mid-Atlantic Fishery Management Council's management of summer flounder than is **Alternative 3**.

Under **Alternative 2, Alternative 3** and **Preferred Alternative 4**, it is possible that not all States will participate. Recreational anglers fishing for red snapper in federal waters adjacent to non-participating States or regions would be required to adhere to the federal default regulations. Because participating States or regions would still receive their allocation (Action 6), a regional ACL would be calculated for non-participating regions after deducting the participating regions' ACLs from the recreational sector ACL. NMFS would reduce the remaining balance of the recreational ACL by the established buffer, and establish a federal season length for federal waters adjacent to non-participating States based on this ACT. Thus, a single non-participating State's season length in federal waters adjacent to the region would be estimated based on the recreational sector ACT the region would have received under delegation or an approved CEP.

Under all alternatives, the respective permit and/or license requirements for anglers and recreational vessels will remain in place. Anglers fishing from private vessels must comply with the required permit or licensing requirements to possess and land red snapper in a given State. State-licensed for-hire boats would not be allowed to harvest red snapper from federal waters. In the event a State does not participate in regional management, its delegation is inactive, or its CEP is not approved, federally-permitted for-hire vessels would not be able to harvest red snapper from state waters except when federal waters are also open, such as during the season provided for federal waters adjacent to that State under the federal default regulations.

Preferred Alternative 5 provides sunset options for ending regional management after a specified number of years (**Options 5a-5d**) and may be selected with any of **Alternatives 2-4**. At the time of the sunset, all regulations associated with all actions in this plan amendment

would expire, including any accountability measures (AMs; Action 7). Under **Preferred Alternative 5**, regional management would end after 10 calendar years (**Option 5a**), 5 years (**Preferred Option 5b**), 3 years (**Option 5c**), or 2 years (**Option 5d**). For all options, regional management would expire at the end of the tenth, fifth, third, or second calendar year of the program, regardless of the implementation date of this amendment. For example, if this amendment is implemented in May 2016 with **Preferred Option 5b** selected as preferred, regional management would end December 31, 2020. If the Council decides subsequently to continue regional management, the Council would need to extend regional management through the appropriate document and process.

Requirements of Delegation Provision (Alternative 2)

If delegation of red snapper management is adopted (**Alternative 2**), then the management measures delegated to the individual States or groups of States must be consistent with the Reef Fish FMP, including the rebuilding plan and the Magnuson-Stevens Act. Consistency with the FMP requires, among other things, preventing overfishing, rebuilding declining reef fish stocks, monitoring the reef fish fishery, conserving reef fish habitats and increasing fish habitats, and minimizing conflicts between user groups.

The Magnuson-Stevens Act (16 U.S.C. §1856(a)(3)) outlines the procedure for suspending the delegation if a State's regulations are not consistent with the FMP (Appendix D). If NMFS determines that a State's regulations are not consistent with the FMP, NMFS shall promptly notify the State and the Council of the determination and provide an opportunity for the region to correct any inconsistencies identified in the notification. If, after notice and opportunity for corrective action, the region does not correct the inconsistencies identified by NMFS, then the delegation to the region shall not apply until NMFS and the Council find that the region has corrected the inconsistencies.

In application, the response times between NMFS' determination of inconsistency and the implementation of corrective action by the State would be case specific. The timelines for correction of inconsistencies would be decided by NMFS on a case by case basis, as it determines whether inconsistencies exist. The timeline for the region's response would be dependent on the nature of the inconsistency. Due to the short season lengths and high catch rates for the recreational harvest of red snapper, the implementation of corrective actions may need to occur very quickly. Under such circumstances, the region would need to establish a process to implement corrective actions very quickly.

As a hypothetical example, if the region implemented the delegated management measures shortly before the season opened, any notification of inconsistency and the implementation of corrective action would need to occur quickly. To accomplish this, the region would need to have the authority to close the season and adjust the bag limit perhaps without having an opportunity to discuss the issue at a formal State commission meeting. Alternatively, if the region implemented regulations several months before the opening of the red snapper recreational season, then a longer response time would be possible. This scenario may also allow for the discussion of the issue at a formal State commission meeting. These scenarios

exemplify the need for case-by-case timelines for the region's response to a notification of inconsistency.

A region may decide to opt out of delegation and request the federal default measures be applied to adjacent federal waters (Figure 2.1.1) for the recreational harvest of red snapper. To opt out of delegation, the region should send a letter to NMFS requesting the federal default regulations be applied to their region for the fishing year. A season length would be calculated by NMFS based on the region's ACL as apportioned in Action 6 and reduced by the established buffer. Inherently, if only one region opts-out, then it would still essentially be constrained by the terms of delegation as per the regional area and quota apportionment.

Under delegation or conservation equivalency, federal waters could potentially remain open year-round, and anglers' access to harvesting red snapper from federal waters would be constrained by the management measures established for their region. Each region would prohibit further landings and possession of red snapper after its portion of the quota has been caught. Under certain conditions, the federal waters adjacent to a given region could be closed. To be consistent with National Standard 4 of the Magnuson-Stevens Act, these closures would apply to all recreational vessels.

Requirements of Conservation Equivalency (Alternative 3 and Preferred Alternative 4)

Under **Alternative 3**, each region would have the opportunity to submit a CEP to establish regionalized management measures, including season start and end dates, season structure, and bag limit, for the recreational harvest of red snapper on a yearly basis. These plans would be reviewed by NMFS to insure the proposed management measures are a conservation equivalent to the federal regulations. Table 2.1.1 provides an example timeline for the submittal and approval of the CEPs under **Alternative 3**. This process would be altered for the first year of the program if this action is implemented mid-year. In addition, revisions of this process may be implemented by NMFS as necessary. In this instance, NMFS would contact the states and notify them of any changes needed to make their plan a conservation equivalent to the federal regulations. Under **Preferred Alternative 4**, the CEP would be submitted to the technical review committee and a separate timeline may be established by the committee. However, the established timeline may also be applied for this alternative (Table 2.1.1). The finalized plans with the technical review committee recommendation for approval would need to be submitted to NMFS by November 1st to allow time to publish a notice in the federal register by January 1st identifying States with approved CEPs. States without approved CEPs would be subject to the federal default regulations.

The timeline for the CEP review is specifically designed to allow the State or region an opportunity to use preliminary data from their monitoring plans and Wave 4 of MRIP prior to submitting their plan. In addition, the timeline allows the State or region an opportunity to submit a revised CEP for approval. If the proposed management measures extend beyond the range analyzed in this amendment, then NMFS may recommend preparing an appropriate documentation for the applicable laws to support the decision (ex. National Environmental Policy Act (NEPA) analysis). NMFS would collaborate with the state/region in developing the appropriate documentation with the understanding that the development of the document could

delay NMFS' ability to approve the CEP and may need further Council action for implementation.

Table 2.1.1. Example timeline for the review of CEPs by NMFS or the Technical Review Committee for Alternative 3 and Preferred Alternative 4.

Timeline	Description
July 1st	The region provides a brief written description of its preliminary CEP for the following year (e.g., the regulations they hope to implement the following year if supported by the current year landings and effort data) to NMFS and the Council. At this time, NMFS may flag any high-level concerns or alternative process requirements (e.g., additional NEPA documentation required if the proposed regulations are outside the scope of analysis in Amendment 39 and documentation for other applicable laws).
September 1st	The region submits the CEP to NMFS or the Technical Review Committee (TRC).
October 1st	NMFS or the TRC responds to the region with the preliminary determination whether the plan is a conservation equivalent to the federal default regulations. At this time, NMFS or the TRC may approve the plan or request a revised CEP.
October 15th	The region provides a revised CEP to NMFS or the TRC for approval, if necessary.
November 1st	If applicable, the TRC provides the recommended regional CEPs to NMFS for final approval and processing. If the CEP was not approved or did not submit a CEP, then the region would be subject to the federal default regulations.
January 1st (or sooner)	NMFS publishes a notice in the federal register identifying States or regions with approved CEPs. States without approved CEPs would be subject to the federal default regulations.

Each CEP shall include the following:

- Point of Contact for the CEP
- Point of Contact with the authority to close the fishery
- Proposed CEP including season structure and bag limit.
- Specify if the CEP is intended to be applicable for one or two years. Prior to approving the second year of the plan, it would be evaluated based on data from the first year. The plan may require revisions based on the NMFS review.
- Analysis demonstrating the ability of the CEP to constrain recreational harvest of red snapper to the allocated quota with a description of the methodology.
- Summarize the previous year's performance (e.g., Was the harvest constrained at or below the regional quota?).
- Explain how the CEP will be enforced.

- If applicable, provide a description of the in-season monitoring program and plan to close the fishery if the quota is reached.
- If necessary, additional analysis and documentation supporting the proposed CEP which may include NEPA, Magnuson-Stevens Act, or other applicable laws. This would only apply for CEP management strategies beyond the range analyzed in Amendment 39.
- Any other supporting documentation for the CEP, such as scientific research.

Considerations for Integration of Regional Monitoring Programs

The integration of additional regional monitoring programs could impact the apportionment of regional recreational quotas. In Amendment 40 to the Reef Fish FMP, the Council recently chose to allocate allowable catches for red snapper based on a formula that used a set number of years, putting specific proportional weighting on long-term landings and recent landings to calculate a final allocation between components of the reef fish fishery. In Amendment 28 to the Reef Fish FMP (currently under NMFS review for approval, disapproval, or partial approval), the Council addressed a recent calibration in recreational landings estimates by adjusting the allocation between the commercial and recreational sectors. This adjustment will shift allocation from the commercial sector to the recreational sector based on the increase in the total allowable harvest that was attributable to the calibration of the Marine Recreational Information Program catch estimates that were used in the 2014 update assessment.

Similar to Amendment 40, Action 6 in this amendment considers various ways to apportion the recreational sector ACLs among regions using weighted proportional averages of historical landings for varying time series. It is likely that future improvements to MRIP will result in additional calibrations of historic recreational catch estimates, which could affect regional apportionments. In addition, several states are currently developing alternative recreational monitoring programs, some specific to red snapper recreational catch, with the intent of replacing federal MRIP sampling dependency. Although state monitoring programs should be expected to provide a finer spatial or temporal resolution than the current MRIP program design, part of approving a state program as a replacement would include evaluating its consistency with NMFS' MRFSS and MRIP historical records. If a state program is certified by NMFS as an acceptable alternative to MRIP, any variations from MRIP landings would then need to be applied to historical landings data for that state/region to recalibrate those historical landings. The Council recognizes that any calibration of historical landings could lead to an adjustment to the allocation that results from the formula selected in Action 6. Thus, the Council authorizes the RA to apply calibrated landings to the regional allocation formula. This could result in shifts in apportionment of the recreational quota for that state/region, and subsequently transfer apportionment among states/regions according to the recalibrated landings data for the accepted state/region survey.

Application of Federal Default Regulations

Under **Alternative 2, Alternative 3,** or **Preferred Alternative 4**, the selected suite of management measures to be established for a region could consist of numerous combinations

and ranges. Although there is flexibility in the assemblage of the fishing season structure, and bag limit to be adopted for a region, each region must establish its season and bag limit. If a region does not establish a season and bag limit, then NMFS will deem the region's regulations inconsistent. If the inconsistency is not resolved and NMFS suspends the region's regional management, the federal default regulations will go into effect for the portion of federal waters adjacent to the region (Figure 2.1.1), until the region receives approval by NMFS that the inconsistency has been remedied. Each region must also establish a minimum size limit that is consistent with the federal minimum size limit, or NMFS will deem the region's regulations inconsistent.

A region or regions could opt out and not participate in regional management. Although regional management would be inactive and such a region would fish under the federal default regulations, related actions in this amendment would remain effective. If one or more regions opt out of regional management, the regulations implementing the preferred alternatives selected under Actions 6 (apportioning the recreational ACL) and 7 (post-season AMs) would remain effective and applicable toward those regions until modified through a plan amendment.

If a region chooses to opt out of regional management, then federal default regulations would be necessary. A region may decide not to participate and request the federal default measures be applied to the region's adjacent federal waters for the recreational harvest of red snapper. This would constitute the region opting out. To opt out, the region would send a letter requesting the federal default regulations be applied to their region for the fishing year. NMFS would publish a notice in the *Federal Register* to implement the federal default regulations in the federal waters adjacent to the region (Figure 2.1.1). The season length would be calculated by NMFS based on the regional ACLs as apportioned in Action 6 and reduced by the established buffer. Inherently, if only one region opts out, then the region would still essentially be constrained by the terms of regional management as per the regional area and recreational ACL apportionment. If more than one region opts out, the respective regional ACLs could be combined and NMFS would calculate the season for those areas of federal waters adjacent to the regions, which have opted out. It would be expected that these regions would adopt regulations consistent with the federal default regulations that would apply to all recreational vessels in federal waters off such region. In turn, if a region does not set the season and bag limit, or sets a different minimum size limit than that selected in Action 4, then it is assumed that the region is opting out of regional management and the federal default management measures would apply. As per the Magnuson-Stevens Act, it would still be necessary for NMFS to prohibit the recreational harvest of red snapper if or when the Gulf-wide recreational sector ACL is reached or estimated to have been met, regardless of state participation in regional management.

Boundary Description for Figure 2.1.1.

The boundaries in Figure 2.1.1 were agreed upon by the representatives from each state marine resource agency at the February 2013 Council meeting. All lines begin at the boundary between state waters and federal waters. Line A-B, defining federal waters off Texas, is already codified as a line from 29°32.1' N latitude, 93°47.7' W longitude to 26°11.4' N latitude, 92°53.0' W longitude, which is an extension of the boundary between Louisiana and Texas (50 CFR 622.2). Likewise, line G-H, defining federal waters off Florida, is codified as a line at 87°31.1' W

longitude extending directly south from the Alabama/Florida boundary (50 CFR 622.2). The other two lines have not been codified, but were agreed upon by the Council. Line E-F is a line at 88°23.1' W longitude extending directly south from the boundary between Alabama and Mississippi.

Line C-D is a line at 89°10.0' W longitude extending directly south from the South Pass Light in the Mississippi River delta in Louisiana. Unlike the other lines, this line is not based on the boundary between Louisiana and Mississippi because doing so would be impracticable. Louisiana has jurisdiction over the Chandeleur Islands, which extend into waters south of Mississippi. A line based on the state waters boundary just north of the islands could result in inequitable impacts on Mississippi anglers as it would identify federal waters that are off both Mississippi and Louisiana as being exclusively off Louisiana. A line based on the state land boundary would be even further west and would reduce the extent of federal waters off Louisiana. Therefore, this line was considered a fair compromise by representatives of both States.

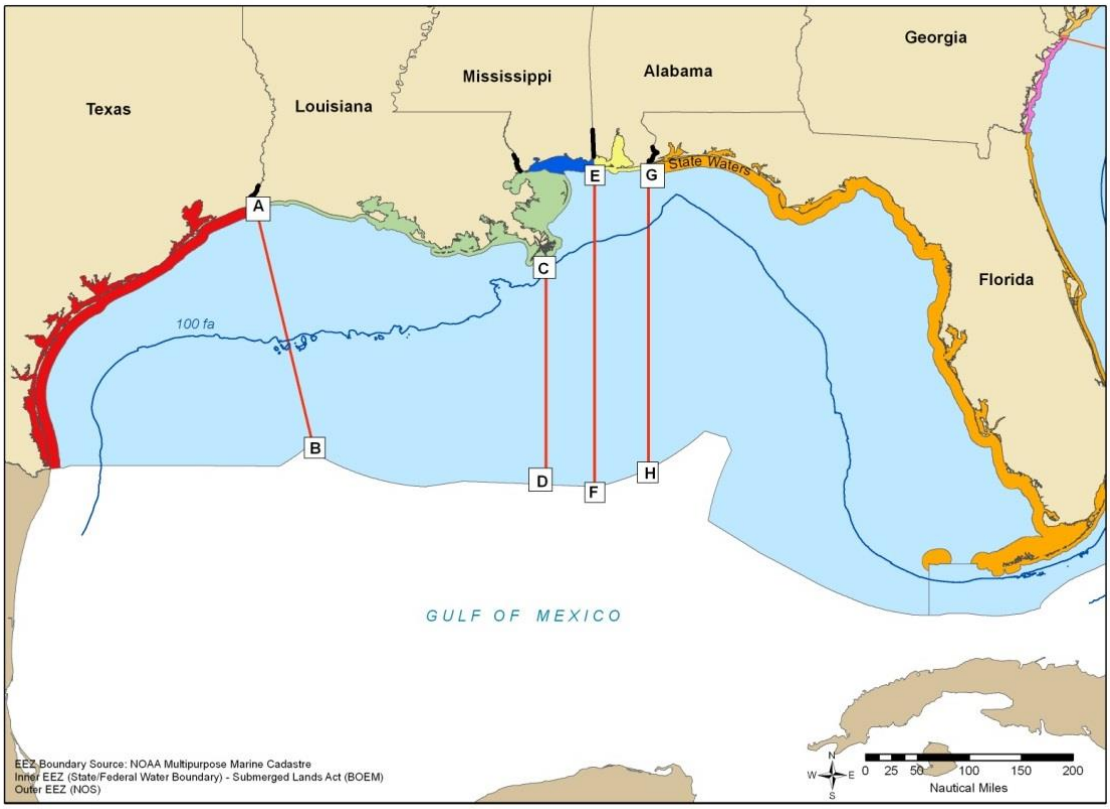
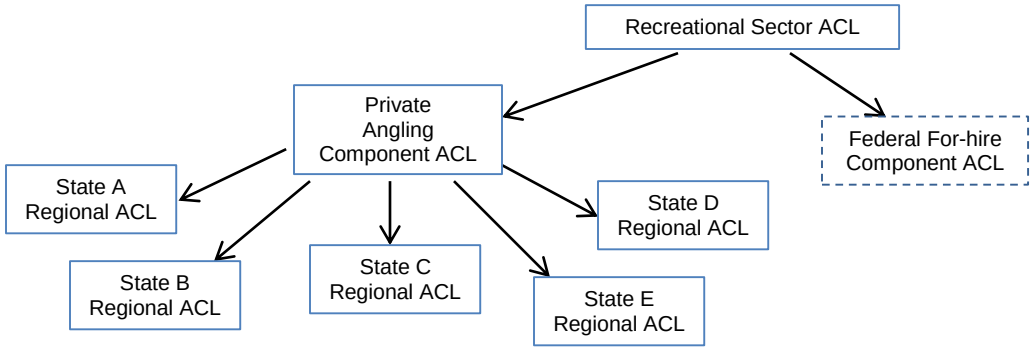


Figure 2.1.1. Map of state waters (shaded in color for each State) with established and proposed boundaries between states extending into federal waters. Federal waters adjacent to a State or region refer to the portion of federal waters bounded by the State or region's state waters and the boundary line(s) shown in the figure that separate federal waters off of each State.

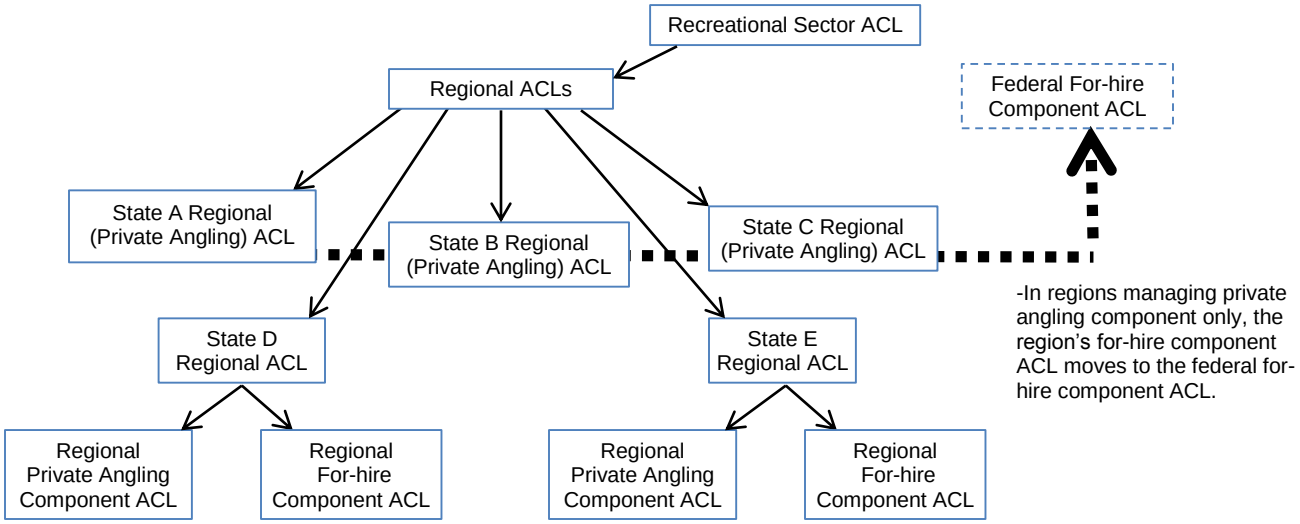
2.2 Action 2 – Regional Management and Sector Separation

Alternative 1: No Action – Retain current federal management of recreational red snapper in federal waters of the Gulf. For the years 2015-2017, establish separate component ACTs for the federal for-hire and private angling components as specified in Amendment 40.

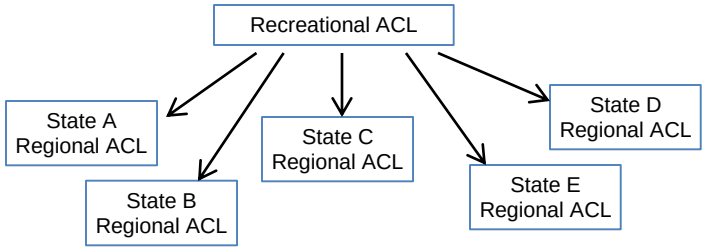
Alternative 2: **Extend** the separate management of federal for-hire and private angling components of the recreational sector. This amendment would **apply to the private angling component**, only. The private angling component would be managed by each region under regional ACLs based on the allocation selected in Action 6.



Alternative 3: **Extend** the separate management of the federal for-hire and private angling components of the recreational sector. This amendment could **apply to both components**. The recreational sector ACL will be divided into regional ACLs using the allocation selected in Action 6. The regional ACLs will be further divided into regional component ACLs (i.e., apply the allocation formula established through Amendment 40 to the region's average proportion of landings by each component). A region may manage both components or may opt to manage the private angling component only. If managing the private angling component only, the region's for-hire component ACL would become part of the federal for-hire component ACL.



Alternative 4: **<u>End</u>** the separate management of the federal for-hire and private angling components upon implementation of this amendment, and have this amendment **<u>apply to the entire recreational sector</u>**. The private angling and federal for-hire components would be managed as a single unit by each region under regional ACLs based on the allocation selected in Action 6.



Note: ***<u>The sunset provision for sector separation is removed under Alternatives 2, 3, and 4.</u>*** *Regional ACLs and regional component ACLs, if applicable, will be reduced by the established buffer resulting in respective regional and regional component ACTs.*

<u>Discussion</u>:

In October 2014, the Council took final action on Amendment 40 (GMFMC 2014) to apportion the recreational ACL between the federal for-hire and private angling components of the recreational sector for a period of three years (2015-2017). <u>Action 2 is only applicable if this amendment is implemented while the separate components of the recreational sector are still in effect</u>. The Council has not yet selected a preferred alternative for this action. Input and information gathered from an additional round of public hearings for this amendment are expected to inform the Council's decision for a preferred alternative. A preferred alternative will be identified in the Final Environmental Impact Statement (FEIS).

Assuming that five regions representing each Gulf State will be established under this amendment, the recreational sector ACL would be divided into a different number of regional ACLs, component ACLs, or regional component ACLs depending on the alternative selected. Currently (**Alternative 1**), the recreational sector ACL is divided into two component ACTs for the years 2015-2017 and will revert to a single recreational sector ACL at the start of 2018. **Alternative 1** would continue the separate management of the federal for-hire and private angling components until the end of 2017, as specified in Amendment 40 (GMFMC 2014). It is possible that this alternative would allow for the component ACTs to remain in place when regional management is implemented, only to be vacated at the specified time (the end of 2017). This may complicate the establishment of regional management measures prior to 2018.

Table 2.2.1 compares **Alternatives 2-4** by identifying whether the regions would manage the federal for-hire component and/or the private angling component, and how the recreational sector ACL would be divided. **Alternative 2** would remove the sunset provision specified in Amendment 40 upon implementation of this amendment and continue the separate management of the federal for-hire and private angling components. Under this alternative, regional management would apply only to the private angling component. Management of the federal for-hire component would be managed Gulf-wide, and options to modify the management of this component are currently under evaluation by the Council through Amendments 41 (charter

vessels) and 42 (headboats). Under **Alternative 2,** six ACLs would be established: five regional ACLs from the private angling component ACL, and one federal for-hire component ACL.

Table 2.2.1. Comparison of management under Alternatives 2-4.

	Comp-onent	Regions	Federal	Sector separation	Allocating the recreational sector ACL
Alternative 2	Private	**X**		Continues. Management of the federal for-hire component is evaluated in Amendments 41 and 42.	57.7% allocated among regional ACLs according to Action 6.
	For-hire		**X**		42.3% for the federal for-hire component ACL.
Alternative 3	Private	**X**		Continues. Regions may manage both components, or manage the private angling component, only.	Create regional ACLs based on Action 6, then regional component ACLs. Regions manage the private angling component ACL, and optionally, the for-hire component ACL.
	For-hire	**X** (Option)	**X** (Option)		Federal for-hire component ACL in regions managing private angling component, only.
Alternative 4	Private	**X**		Ends when this amendment is implemented.	100% allocated among regional ACLs according to Action 6.
	For-hire				

Like **Alternative 2**, **Alternative 3** would remove the sunset provision specified in Amendment 40 upon implementation of this amendment and the for-hire and private angling components would continue to be managed separately in regions intending to manage both components. **Alternative 3** differs from **Alternative 2**, by allowing each region to decide whether or not to manage the for-hire component in that region. If a region intends to manage both components, the region would specify the management measures to be applied to each component in its CEP or state regulations established for delegated management authority. Under **Alternative 3**, the recreational sector ACL would first be divided into regional ACLs based on the alternatives selected in Action 6. These regional ACLs would be further divided into regional component ACLs (regional private angling component ACLs and regional for-hire component ACLs) by applying the allocation formula in Amendment 40[5] to each State/region's red snapper landings by each component. This would result in the recreational sector ACL being divided into ten ACLs (and corresponding ACTs) to represent each State/region and each component. For a region intending to manage the private angling component only, the respective regional for-hire component ACL would become part of the federal for-hire component ACL and be managed under a shared set of measures established for the federal for-hire component.

[5] 50% of the average proportion of historical landings from 1986-2013 and 50% of the average proportion of historical landings from 2006-2013, excluding landings from 2010.

As with **Alternatives 2** and **3**, **Alternative 4** would remove the sunset provision specified in Amendment 40. **Alternative 4** would end the use of separate component ACLs (quotas) at the time this amendment is implemented, even if the three-year period of sector separation has not expired. Regional ACLs would be established for each region, which encompass all recreational anglers and vessels of the region. Thus, adopting **Alternative 4** would apply regional management and the actions herein to each region's recreational sector as a whole. Under **Alternative 4**, five regional ACLs (and corresponding ACTs) would be established, representing each State/region; component ACLs would no longer be used.

Action 6 addresses the apportionment of the recreational sector ACL among the regions. For the alternatives in this Action 2, the allocations that would result from applying Preferred Alternatives 5 and 6 in Action 6 are provided in Table 2.2.2. Using the current recreational sector ACL of 7.01 million pounds (mp),[6] the resulting number of pounds for the allocations is also provided. Regional ACLs (or component ACLs) would be reduced by 20% to establish regional ACTs (or component ACTs). Regions would estimate the fishing season length based on the regional ACT.

[6] The Council approved Amendment 28 at its August 2015 meeting. If implemented by the Secretary of Commerce, the recreational sector ACL will be 7.349 mp in 2016.

Table 2.2.2. Resulting allocations of the recreational sector ACL for the Action 2 alternatives, based on selection of Preferred Alternatives 5 and 6 in Action 6. The resulting number of pounds for the allocations is provided based on the current recreational sector ACL of 7.01 mp, an ACT buffer of 20%, and the corresponding number of days for the 2015 season based on SERO-LAPP-2015-04 projection scenarios A-C (Appendix J).

Alternative 2: Regional ACLs (for private angling) and Federal For-hire Component ACL						
	Federal For-hire	**Florida**	**Alabama**	**Mississippi**	**Louisiana**	**Texas**
% Allocation	42.3%	21.8%	18.2%	1.8%	8.9%	7.0%
ACL (mp)	2.965	1.528	1.275	0.126	0.623	0.490
ACL (days)	57-77	11-16	13-14	118-118	50-50	136-136
ACT (mp)	2.372	1.222	1.020	0.101	0.498	0.392
ACT (days)	44-60	8-12	11-11	94-94	40-40	109-109

Alternative 3: Regional Component ACLs (Private angling and For-hire)						
		Florida (37.8%)	**Alabama** (31.6%)	**Mississippi** (3.1%)	**Louisiana** (15.4%)	**Texas** (12.1%)
Private Angling	**% Allocation**	18.0%	18.7%	2.9%	9.7%	3.3%
	ACL (mp)	1.262	1.309	0.200	0.681	0.229
	ACL (days)	9-13	14-14	188-188	54-54	63-63
	ACT (mp)	1.010	1.047	0.160	0.545	0.183
	ACT (days)	7-10	11-11	150-150	43-43	51-51
For-hire	**% Allocation**	19.8%	12.9%	0.2%	5.7%	8.8%
	ACL (mp)	1.388	0.906	0.017	0.398	0.619
	ACL (days)	53-105	86-92	85-85	71-73	65-65
	ACT (mp)	1.110	0.725	0.014	0.318	0.495
	ACT (days)	42-83	67-72	68-68	57-58	49-50

Alternative 4: Regional ACLs					
	Florida	**Alabama**	**Mississippi**	**Louisiana**	**Texas**
% Allocation	37.8%	31.6%	3.1%	15.4%	12.1%
ACL (mp)	2.649	2.215	0.217	1.079	0.848
ACL (days)	15-24	21-21	171-171	59-60	64-65
ACT (mp)	2.119	1.772	0.174	0.863	0.678
ACT (days)	12-19	16-17	137-137	47-48	50-50

Source: SERO-LAPP-2015-04, N. Farmer, pers. comm.

Notes: All catch rates are subject to high levels of uncertainty, especially Mississippi. Regional allocations remove landings from 2006 and 2010, while component allocations remove landings from 2010, only.

The following figures show the allocations provided in Table 2.2.2. Figure 2.2.1 provides each State's red snapper landings by its federal for-hire and private angling components, using the allocation formula in Amendment 40 (50% of the average proportion of historical landings from 1986-2013 and 50% of the average proportion of historical landings from 2006-2013, excluding landings from 2010). This serves as the basis for the regional component ACL allocations in **Alternative 3**. Figure 2.2.2 shows the proportion of the recreational sector ACL that would be allocated into regional ACLs, regional component ACLs, and a federal for-hire component ACL, as applicable for **Alternatives 2-4**. These figures provide the proportions of the recreational sector ACL which could be allocated among the regions. The regional ACLs will be reduced by 20% to provide the regional ACTs, and the regions would manage toward meeting the ACT.

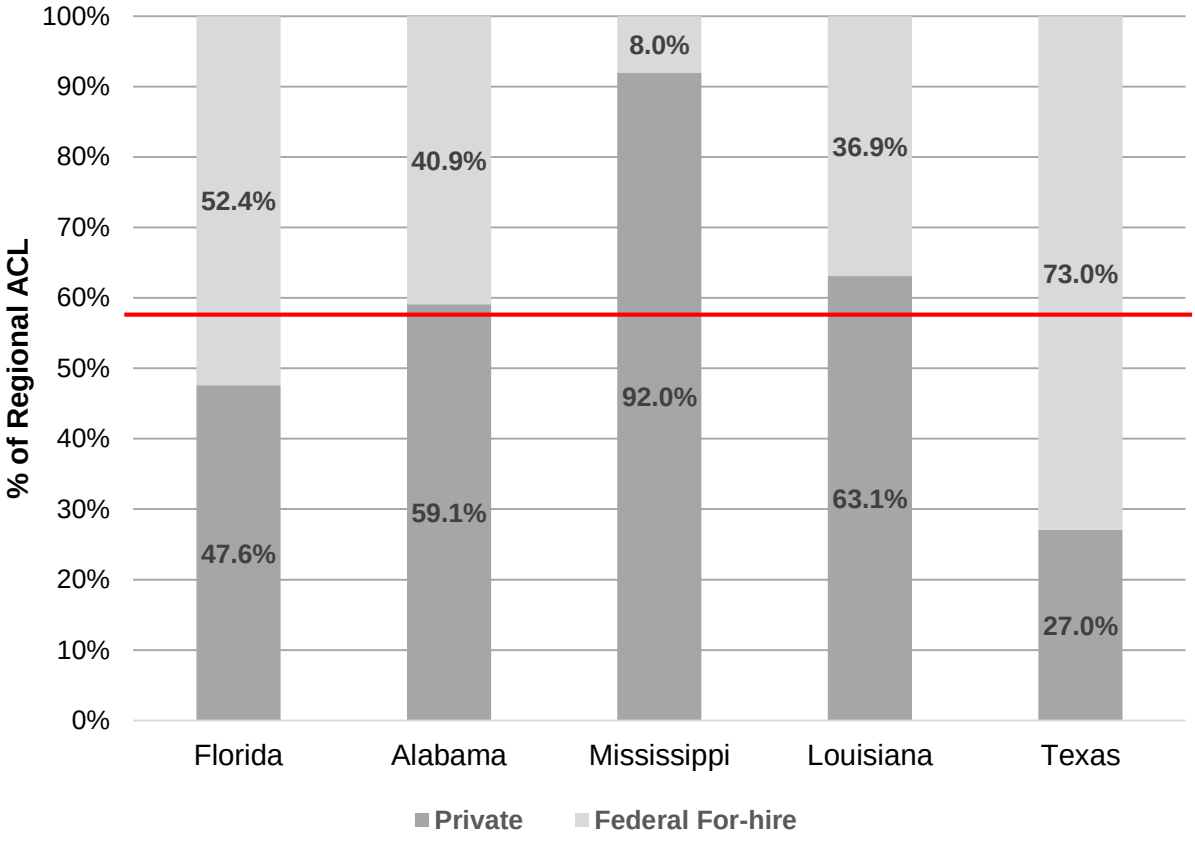


Figure 2.2.1. Federal for-hire and private angling components' proportion of red snapper landings by State, using the allocation formula established in Amendment 40. The red line represents the Gulf-wide average proportion of landings by each component.

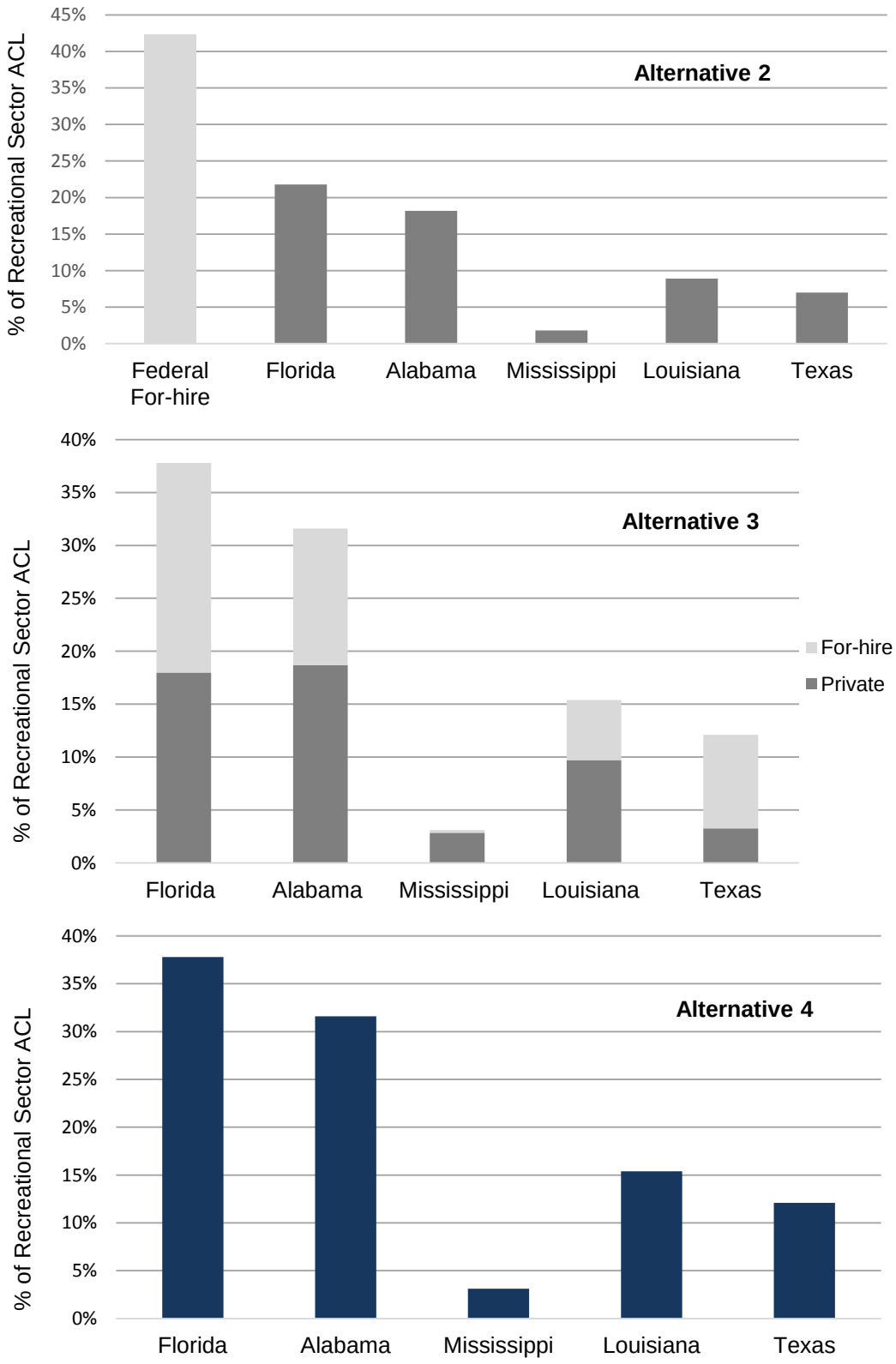


Figure 2.2.2. Proportions of the recreational sector ACL to be assigned to each State/region for Alternatives 2-4, using the preferred alternatives for regional apportionment in Action 6.

2.3 Action 3 – Establish Regions for Management

Alternative 1: No Action – Retain the current management of recreational red snapper in federal waters of the Gulf as one region.

Alternative 2: Establish an east (Florida, Alabama, Mississippi) and west (Louisiana, Texas) region and allow for different management measures for each region.

Alternative 3: Establish an east (Florida, Alabama) and west (Mississippi, Louisiana, Texas) region and allow for different management measures for each region.

Alternative 4: Establish five regions representing each Gulf State.

Preferred Alternative 5: Establish five regions representing each Gulf State, which may voluntarily form multistate regions with adjacent states.

Discussion:

Under **Alternative 1** (No Action), management measures would remain the same for the recreational harvest of red snapper in all federal waters of the Gulf. Currently those regulations include a June 1 fishing season start date, a 16-inch TL minimum size limit, and a 2-fish per angler per day bag limit. Additionally, captain and crew are prohibited from retaining a bag limit while under charter. These regulations apply Gulf-wide in federal waters. The remaining alternatives propose to divide the Gulf into regions, using the boundaries specified in Figure 2.1.1. The establishment of regions would allow for management measures to be established at the regional level.

Alternatives 2 and **3** would establish two regions: eastern and western Gulf. In both alternatives, Florida and Alabama make up the eastern region, and Louisiana and Texas make up the western region. The alternatives differ in that Mississippi is part of the eastern region under **Alternative 2** and part of the western region under **Alternative 3**. Because **Alternatives 2** and **3** include more than one state in a region, the states sharing a region would need to agree on the set of shared management measures and to close the region's red snapper season when the regional ACT (reduced from the regional ACL) is reached or projected to be reached.

The red snapper stock assessment assumes there are two sub-units of the Gulf red snapper stock, separated roughly at the Mississippi River. **Alternative 2** would divide the Gulf into regions that most closely approximate the eastern and western sub-units used in the red snapper stock assessment, thereby affording the possibility to adopt regional management measures based on the differences in biological abundance. The Red Snapper Benchmark Assessment (SEDAR 31 2013) estimated that the western Gulf sub-unit would carry a disproportionate burden of stock recovery. This is true for two reasons: first, because it is currently estimated to have higher stock biomass; and second, because the average fishing mortality rate at age is estimated to be lower in the western Gulf compared to the eastern Gulf (SEDAR 31 2013). Results from all plankton surveys (1986-2003) found red snapper larvae were more abundant and occurred in five

times more samples in the western Gulf compared to the eastern Gulf (Hanisko et al. 2007). A larval transport study in the northern Gulf examined the potential for repopulating the eastern Gulf stock through larval transport from the more populous western sub-unit (Johnson et al. 2009). The results of this study indicated while there is a larval transport pathway around the Mississippi River delta, the primary pathway is in deeper waters beyond the shelf break suggesting uncertainty about successful settlement of red snapper larvae in waters this deep (Johnson et al. 2009). Further the likelihood of larval transport to the west Florida shelf was much lower due to topographic impediments including the Mississippi Delta, DeSoto Canyon and the Apalachicola peninsula (Johnson et al. 2009). Therefore, the eastern and western sub-units of the red snapper stock are projected to rebuild at different rates based on current estimates of population abundance. However, the ultimate result of increasing fishing pressure on the eastern sub-unit compared to the western sub-unit is that the eastern sub-unit is projected to continue to be prosecuted on mostly small, young fish, which is projected to result in a truncated population age distribution.

A problem with using the eastern and western sub-units of the stock assessment is that the dividing line (the Mississippi River) used in the assessment does not fall precisely along a state boundary; the dividing line runs through Louisiana, which straddles both the eastern and western sub-units of the stock. Thus, there would be a difference in using the proportion of the red snapper stock suggested by the stock assessment that could be harvested from each sub-unit, and the proportion of aggregated states' landings coinciding with the selection of **Alternative 2**, which most closely approximates the boundary used in the stock assessment. This difference would be even greater if **Alternative 3** is selected as preferred, as the western region's boundary would also include Mississippi. Although the regional boundary under **Alternative 3** is further to the east than **Alternative 2** (and thus deviates further from the sub-units of the stock assessment), including Mississippi in the same region as Louisiana rectifies the issue that the eastern portion of Louisiana's state water boundary essentially obstructs Mississippi's access to federal waters from its state waters (Figure 2.1.1).

Alternative 4 would establish each Gulf State as its own region. This alternative would provide the most flexibility to individual states to determine their choice of management measures. Should a region fail to implement regional regulations consistent with the FMP, that region would harvest red snapper under the federal default management measures. **Preferred Alternative 5** is most similar to **Alternative 4**, but would allow one or more regions to choose to form multistate regions with adjacent states. While this additional measure of flexibility could allow regions to pool their portions of the recreational quota, it would also require cooperation among states included in the region. For example, the region would need to agree on establishing a common set of management measures and close their entire region's waters once its portion of the recreational quota is reached. If one or more states are combined into a region (**Alternatives 2, 3,** and **Preferred Alternative 5**), then the outermost state boundaries would be used to define the geographic region (Figure 2.1.1). The Council could choose to establish new jurisdictional lines to define regions.

Generally, establishing more regions (such as under **Alternative 4** or **Preferred Alternative 5**) will mean a more subdivided ACL and entail more complicated management. For example, under current management, state and federal waters Gulf-wide are open during the federal red

snapper season. By allowing regions to set their own fishing seasons, one region could have an open fishing season while a neighboring region's fishing season is closed. Bag limits may also vary among regions. Therefore, enforcement will primarily be conducted dockside (regardless of the number of regions created). At-sea enforcement could be most complicated near the boundaries between regions with different management measures, as it could be difficult for enforcement agents to determine which region's jurisdiction applies to a recreational vessel. In these cases, enforcement agents would consider the most liberal of the regions' management measures in place at the time, to serve as guidelines for determining regulatory compliance. For example, if no region has a bag limit greater than four red snapper per person per day, then a vessel possessing red snapper in excess of this bag limit, regardless of where in federal waters it is fishing, could be in violation if stopped by enforcement agents.

There are also issues with using the Marine Recreational Information Program (MRIP) catch estimates for states where species are infrequently sampled. This may occur if a given species is rarely captured or if there are relatively few sample locations in a state. These situations increase proportional variability, resulting in additional scientific or management uncertainty that could affect the use of these data. These problems can be mitigated by increasing: 1) the intensity of sampling, 2) spatial extent of the sample frame (e.g., Gulf-wide variability is less than estimates for individual states), or 3) lengthening the time-period used to develop catch estimates (i.e., wave-length). In practice, each of these measures has impediments. For example, funding may be inadequate to support additional monitoring and temporal or spatial resolution may not match management needs. This should be considered when developing management frameworks.

In addition, Texas Parks and Wildlife Department (TPWD) uses its own survey for estimating catches, using a different methodology than MRIP. If regional management is established at the State level, this could create a question of whether the catch estimates for Texas are comparable to those of the other states. In 2013, the Louisiana Department of Wildlife and Fisheries (LDWF) began to use its own survey, the Louisiana Recreational Creel Survey (LA Creel), which ran alongside MRIP that year. In 2014, Louisiana withdrew from MRIP and landings estimates are only available from LA Creel; there are no 2014 MRIP landings estimates for Louisiana. Currently in 2015, LA Creel is running alongside MRIP in Louisiana in an attempt to validate and certify LA Creel.

2.4 Action 4 – Modify the Federal Minimum Size Limit

Alternative 1: No Action – Retain current federal regulations for the minimum size limit for recreational red snapper in federal waters of the Gulf. The federal minimum size limit is 16 inches TL.

Alternative 2: Reduce the federal minimum size limit to 14 inches TL.

Preferred Alternative 3: Reduce the federal minimum size limit to 15 inches TL.

Alternative 4: Increase the federal minimum size limit to 17 inches TL.

Alternative 5: Increase the federal minimum size limit to 18 inches TL.

Discussion:

The current minimum size limit for red snapper is 16 inches TL in the Gulf for recreational anglers (**Alternative 1**) and for all Gulf States except Texas. In state waters off Texas the recreational red snapper minimum size limit is 15 inches TL (**Preferred Alternative 3**). During early deliberations on regional management, the Council expressed their intent to establish limitations on the minimum size limits which may be adopted by the regions due to biological concerns associated with high-grading and discard mortality. Additionally, the Council felt varying the minimum size limit among regions may pose issues in terms of the stock assessment. Red snapper stock is still under a rebuilding plan and stock assessments must take into account minimum size limits for each sector and gear type. Ultimately, the Council decided that the regions would adhere to the federal minimum size limit and not adopt different regional size limits. The state or region will be able to establish bag and season management measures in Action 1; however, this action evaluates modifying the federal minimum size limit. For regional management to be effective in a region, that region must adhere to the federal minimum size limit. If regional management is inactive in a state or region, the federal minimum size limit would still apply to federal waters as part of the federal default regulations.

All of the minimum size limit alternatives considered in the action are estimated to be reproductively mature fish. All (100%) red snapper are estimated to be reproductively mature at age-2 (SEDAR 31 2013) at approximately 358 mm or 14 inches TL using the age-length equation in Szedlmayer and Shipp (1994). Due to age truncation in the red snapper stock smaller, younger fish are caught more quickly due to their disproportionately larger abundance when compared with older, larger fish. The smallest minimum size considered in this action is 14 inches TL (**Alternative 2**). Spawning potential ratio (SPR) is the spawning potential of the stock relative to the stock with no fishing mortality. Yield-per-recruit (YPR) addresses the fishing mortality rate that produces the maximum yield of the fishery. The YPR for red snapper is maximized at 15 inches TL (**Preferred Alternative 3**), based on the YPR and SPR analyses conducted by the Southeast Fisheries Science Center (SEFSC) in 2013 for the recreational sector, which used a discard mortality estimate of 10%. The largest minimum size limit considered in this action is 18 inches TL (**Alternative 5**) that resulted in the largest spawning potential for the stock. Due to the status of the red snapper stock and selectivity patterns, minimum size limits

from 13-18 inches TL are considered effective for managing red snapper because the YPR varies little between that size range. It should be noted that SPR increases for red snapper as the minimum size limit increases.[7] If the management goal is to achieve a higher SPR, then increasing the minimum size to 17 inches TL (**Alternative 4**) or 18 inches TL (**Alternative 5**) would be beneficial. For example, it has been well documented that larger, older females produce more eggs and spawn more frequently throughout the season than younger, smaller red snapper (Collins et al. 2001; Porch et al. 2013: SEDAR 31-AW03). However, larger red snapper are targeted by recreational anglers, making release mortality a more important consideration than it might be for other snapper species. Thus, the SPR and YPR analyses reveal a trade-off between the two metrics. If the management goal is to maximize YPR, then **Preferred Alternative 3** would be most appropriate; whereas, if the management goal is to maximize SPR, then **Alternative 5** would most appropriate.

Discard mortality also plays an important role in considering minimum size limits in the Gulf. Recreational discard mortality of red snapper was estimated by eastern and western sub-region in SEDAR 7 (2005) and SEDAR 31 (2013). The assessments found a consistent, Gulf-wide trend among discard mortality data, where depth of capture and release mortality were positively correlated. The release mortality for recreationally caught red snapper was averaged by eastern and western Gulf and estimated at 21% (Table 6.5 in SEDAR 7 2005). The most recent stock assessment estimated discard mortality for the recreational sector at 10% for the eastern and western Gulf (SEDAR 31 2013), when circle hooks and venting tools were used. However, the data workshop report noted that release mortality was related less to region and more on a combination of factors including, but not limited to, depth, thermal stress, venting versus non-venting, and handling time.

Based on length-weight relationship of red snapper used during SEDAR 31 (2013), a 16-inch TL red snapper (**Alternative 1**) is estimated to weigh 1.8 lbs ww and an 18-inch TL (**Alternative 5**) red snapper is estimated to weigh 2.6 lbs ww (Figure 2.4.1). The average size of recreational red snapper landed in 2012 was 8 lbs ww and approximately 24 inches TL (SERO 2012b). The differences in the minimum size limits (**Alternatives 2-5**) and corresponding estimated landed weights range from 1.2 lbs ww at 14 inches TL and 2.6 lbs ww at 18 inches TL are expected to result in minimal differences in the rate at which fish are landed, as most recreational anglers are targeting larger "trophy" fish (Figure 2.4.1). Generally, lower minimum size limits result in the rapid harvest of higher numbers of smaller fish, thereby filling the quota more quickly. Higher minimum size limits typically result in the decelerated harvest of larger fish, thereby filling the quota more slowly and concurrently increasing the season length. Recently, the average landed weight of recreational red snapper has been estimated separately for the eastern and western Gulf due to differences in the data collection programs and by separate modes (i.e., headboats, charter vessels, and private anglers). In 2014, the average weight of landed red snapper in the eastern Gulf for private, charter vessel, and headboats were 7.5, 8.5, and 4.9 lbs ww, respectively. The average weight of landed red snapper in the western Gulf for private, charter vessels, and headboats were 6.98, 10.0, and 5.4 lbs ww, respectively (SERO-LAPP-2015-04).

[7] http://gulfcouncil.org/docs/Presentations/Gulf%20Red%20Snapper%20Size%20Limit%20Analysis%20-%20Presentation.pdf

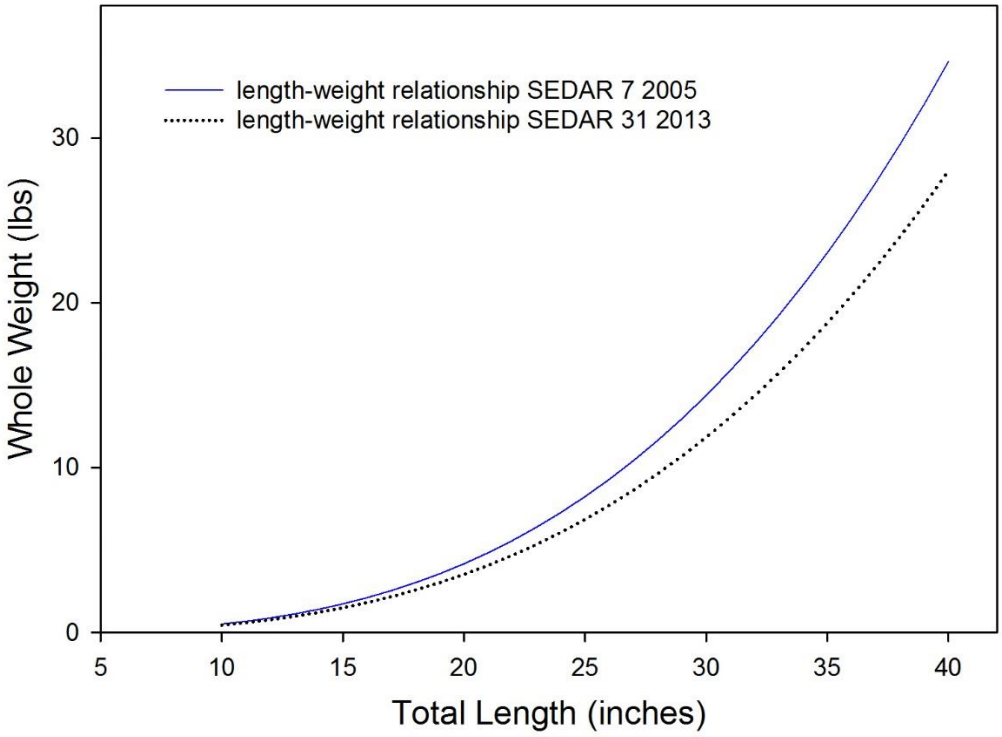


Figure 2.4.1. Red snapper length-weight relationship. Source: Conversion factors from SEDAR 7 (2005) and SEDAR 31 (2013).

2.5 Action 5 – Closures in Federal Waters of the Gulf

Alternative 1: No Action – Regions may not establish closed areas in federal waters adjacent to their region.

Preferred Alternative 2: A region may establish closed areas within federal waters adjacent to their region in which the recreational harvest of red snapper is prohibited.

Option 2a: Areas of the Gulf may be closed for up to six months of the year.
Option 2b: No more than 50% of the federal waters adjacent to a region may be closed during the year.

Discussion:

Currently, each Gulf State has the authority to open and close its state waters to fishing, while the authority to open and close federal waters to fishing resides with NMFS. If regional management is implemented, the fixed recreational closed season for red snapper in federal waters would be removed and become part of the federal default regulations, applied in the event a region's delegation is inactive or its CEP is not approved. Removal of the fixed closed season would allow individual regions to establish their fishing season, during which anglers may harvest red snapper from the region's state waters and federal waters. To constrain landings to its portion of the recreational sector ACL, regions would establish the dates for the recreational harvest of red snapper based on its portion of the recreational ACT and enforcement would be carried out dockside. When a region closes its season, the region would prohibit further landings of red snapper in the region (i.e., close the season), but federal waters adjacent to the region could remain open, allowing anglers from other regions to fish for red snapper that they intend to land in another region's open season. Thus under **Alternative 1**, it may be possible for federal waters to remain open year round to recreational red snapper fishing, and regions would control harvest by establishing when red snapper may be landed in the region.

A region may want to establish sub-regional fishing seasons for red snapper, such that the season is open in one part of the region while closed in another, and vice versa. A region would be able to do so under **Alternative 1**, provided the region's delegation or CEP is active. Establishing sub-regional fishing seasons is possible under **Alternative 1**, because the region would specify where red snapper may be landed within the region, and where landings are prohibited; with active regional management, inconsistent regulations between state and federal waters do not occur because the region's active delegation or approved CEP would authorize the region's regulations to apply to its anglers in both state and federal waters. As an example, Florida could propose different fishing seasons for the Panhandle and west Florida area, aiming to optimize fishing opportunities for each sub-region based on different tourist seasons and times of rough weather. Federal waters adjacent to Florida would remain open during the respective closed season of each sub-region. Anglers fishing from a sub-region during the open season could fish in the state waters of the sub-region as well as adjacent federal waters, including federal waters adjacent to other regions. When a sub-region is closed to red snapper fishing, landings of red snapper would be prohibited in that sub-region. Thus, an angler fishing during the open season

of the proposed Panhandle sub-region could fish for red snapper anywhere in federal waters, provided that the angler lands the catch in the Panhandle sub-region.

Preferred Alternative 2 would allow a region to close areas within federal waters adjacent to its region. Because the States already have the authority to establish fishing closures and prohibit landings within their state waters, it is not necessary to close federal waters should a region establish sub-regional fishing seasons for red snapper. Thus, a region intending to close part(s) (**Preferred Alternative 2**) of the federal waters adjacent to its region may wish to do so to restrict the amount of red snapper harvested from federal waters, to allow a longer state water fishing season. Closing all or part of federal waters adjacent to a region would create inconsistent regulations between state and federal waters, raising enforcement concerns. This alternative would not allow regions to establish marine protected areas within federal waters nor restrict commercial vessels from harvesting red snapper from these areas.

Closing areas of federal waters adjacent to a region (**Preferred Alternative 2**) could unintentionally allow, or prohibit, some harvest of red snapper to occur. These issues could be most problematic near state boundaries. For example, a region could propose to use this alternative to prohibit all recreational vessels from possessing red snapper from federal waters adjacent to the region (Figure 2.1.1) while allowing its state waters to remain open. The intent would be to provide a longer fishing season by constraining the harvest coming from offshore federal waters, where red snapper are generally larger and more abundant. To provide a hypothetical example, if Alabama closed federal waters adjacent to its state waters but allowed state waters to remain open, while Florida and Mississippi have both their state waters and adjacent federal waters open (Figure 2.5.1), then vessels from Alabama could harvest red snapper from federal waters off Florida and Mississippi, and land in Alabama, provided they do not transit through the portion of federal waters adjacent to Alabama's state waters. Although Alabama intended to extend its fishing season by constraining where harvest may occur in its own region (only in its state waters), the additional harvest from federal waters adjacent to neighboring Mississippi or Florida could result in Alabama's regional ACL being caught faster. Conversely, vessels from Mississippi and Florida, where the red snapper season is open in both state and adjacent federal waters, would be prohibited from possessing red snapper from Alabama's adjacent federal waters, even though those fish would only count against the regional ACL of the State where landed, i.e., Mississippi or Florida. Thus, this hypothetical use of the closed area alternative unintentionally allowed for greater landings by Alabama anglers and unintentionally restricted fishing opportunities for anglers fishing from Mississippi and Florida.

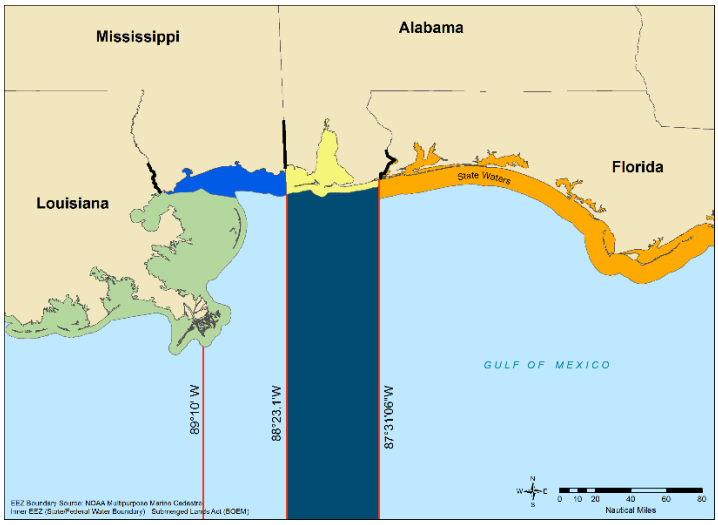


Figure 2.5.1. Visualization of the hypothetical example described for Preferred Alternative 2. The dark shaded area represents federal waters adjacent to Alabama's state waters (see Figure 2.1.1).

The options under **Preferred Alternative 2** would establish parameters for the potential areas of federal waters which may be closed. If no option is selected, the region could potentially close areas of federal waters year round, and the closed area could be the entire federal waters adjacent to the region's state waters. If **Option 2a** is selected, a region could establish closed areas within federal waters adjacent to its region for up to six months of the year. Selecting **Option 2b** would limit the extent of the area of federal waters that may be closed, to up to 50% of the federal waters adjacent to a region's state waters, but does not place restrictions on the number of areas which could be closed.

Should a region intend to use federal water closures as part of its regional management plan, such closures must be an approved part of the region's recreational management of red snapper, and may require additional review and analysis to ensure environmental compliance, potentially through an environmental assessment. To implement a closed area under a CEP, NMFS will likely need to do additional rule making.

2.6 Action 6 – Apportioning the Recreational ACL (Quota) among Regions

Alternative 1: No Action – Retain current federal regulations for allocating the recreational sector ACL between the private angling component and federal for-hire component for the years 2015-2017. Do not divide the recreational sector ACL among regions.

Alternative 2: Apportion the recreational sector ACL (or component ACLs) among the regions selected in Action 3 based on the average of historical landings for the years **1986-2013**.

Alternative 3: Apportion the recreational sector ACL (or component ACLs) among the regions selected in Action 3 based on the average of historical landings for the years **1996-2013**.

Alternative 4: Apportion the recreational sector ACL (or component ACLs) among the regions selected in Action 3 based on the average of historical landings for the years **2006-2013**.

Preferred Alternative 5: Apportion the recreational sector ACL (or component ACLs) among the regions selected in Action 3 based on **50%** of average historical landings for the years **1986-2013** and **50%** of average historical landings for the years **2006-2013**.

Preferred Alternative 6: In calculating regional apportionments, exclude from the selected time series:

Preferred Option 6a: 2006 landings
Preferred Option 6b: 2010 landings

Alternative 7: Apportion the recreational sector ACL into eastern and western regional ACLs (or component ACLs) divided approximately at the Mississippi River, based on regional biogeographical differences in the stock used in the stock assessments.

Alternative 8: Apportion the recreational sector ACL (or component ACLs) among the regions selected in Action 3 such that each region's allocation provides an equivalent number of fishing days.

Discussion:
The adoption of regional management for the recreational sector will require the recreational sector ACL (or regional component ACLs; see Action 2) to be apportioned, or allocated, among the selected regions to create regional ACLs. Allocation is an inherently controversial issue because a limited resource is divided among competing user groups, each of which benefits from receiving the largest portion possible. In this action, the Council is determining the method to calculate the apportionment, not the percentage each region would receive. These percentages would change based on the data used in the calculation equation. Allocation decisions should follow the Principles and Guidelines for Allocation adopted by the Council (Appendix E).

Alternative 1 (No Action) would continue to apportion the recreational sector ACL between the components established in Amendment 40 (GMFMC 2014) for the years 2015-2017 and would not apportion the recreational sector ACL among regions of the Gulf. Currently, there is no

expressed state allocation; the proportion of the total recreational landings made up by each State varies from year to year, as shown in Table 2.6.1. These proportions are based on the calibrated MRIP landings. Actual landings are provided in Appendix F, and the report on the calibration of MRIP landings is provided in Appendix I.

Table 2.6.1. Percentage of annual recreational red snapper landings by state (1986-2014), based on whole weight (ww) of fish.

Year	Florida	Alabama	Mississippi	Louisiana	Texas
1986	55.3%	11.5%	0.1%	18.1%	15.0%
1987	43.7%	18.5%	2.6%	13.5%	21.7%
1988	30.0%	16.4%	0.7%	33.1%	19.8%
1989	12.3%	18.5%	11.7%	24.1%	33.3%
1990	17.8%	39.7%	3.4%	16.9%	22.2%
1991	15.1%	30.1%	6.2%	33.2%	15.5%
1992	8.1%	32.7%	16.6%	24.5%	18.2%
1993	17.5%	29.3%	12.7%	22.7%	17.9%
1994	13.9%	32.1%	8.1%	21.1%	24.7%
1995	10.3%	31.9%	2.9%	28.3%	26.6%
1996	18.7%	32.8%	4.0%	16.6%	27.9%
1997	14.8%	39.1%	9.8%	16.8%	19.5%
1998	28.7%	29.8%	3.9%	14.9%	22.8%
1999	28.6%	39.7%	4.1%	15.8%	11.8%
2000	35.8%	29.6%	1.1%	18.6%	14.9%
2001	39.9%	42.3%	2.1%	6.0%	9.7%
2002	38.7%	40.1%	3.6%	6.2%	11.4%
2003	36.3%	37.9%	6.0%	8.9%	10.9%
2004	53.9%	30.0%	0.4%	5.8%	9.9%
2005	48.0%	29.1%	0.1%	10.4%	12.5%
2006	51.0%	20.0%	0.8%	12.2%	16.0%
2007	56.7%	19.5%	0.1%	15.6%	8.0%
2008	57.5%	17.1%	1.0%	15.7%	8.6%
2009	47.0%	21.6%	0.8%	18.8%	11.8%
2010	55.9%	21.3%	0.4%	5.0%	17.3%
2011	29.3%	53.6%	1.0%	8.9%	7.2%
2012	32.5%	35.9%	4.2%	19.2%	8.2%
2013	39.1%	45.8%	4.4%	5.6%	5.1%
2014	42.5%	30.0%	1.2%	16.3%	10.0%

Source: Southeast Fisheries Science Center (SEFSC) ACL dataset, including calibrated MRIP, TPWD, LA Creel Survey, and Southeast Region Headboat Survey (SRHS) landings. The calibrated MRIP landings provided here were not used for management at the time (See Appendix I for the MRIP Calibration Workshop report). Alabama and the Florida Panhandle SRHS landings are initially reported to the same headboat fishing area. Landings have been assigned to each state based on the SRHS vessel landing records (May 2015). Actual landings are provided in the Appendix (Table F-1).

Alternatives 2-4 and **Preferred Alternative 5** propose methods for apportioning the recreational ACL based on the average proportion of historical landings for different time series. Regardless of the alternative selected, in some years, each State's landings exceeds its average landings. This means that requiring the States/regions to constrain their catches to a fixed percentage of the recreational sector ACL could restrict the fluctuations in annual landings that occur in some years.

Alternatives 2-4 and **Preferred Alternative 5** present four ways to apportion the recreational sector ACL using averages of historical landings for varying time series (Table 2.6.2). **Preferred Alternative 6** provides options for excluding particular years from the historical landings averages, due to impacts that affected recreational fishing opportunities during or immediately preceding those years. Hurricane Katrina struck late in the fishing season of 2005, therefore landings from 2006 are proposed for exclusion. The Deepwater Horizon MC252 oil spill began in April 2010, prior to the opening of the 2010 recreational red snapper season (see Figure 3.3.1 for the extent of the fishing closures). **Preferred Option 6a** would exclude landings from 2006 from each time series (Table 2.6.3), and **Preferred Option 6b** would exclude landings from 2010 from the time series (Table 2.6.4). Resulting averages for landings if both options are selected are provided in Table 2.6.5. The exclusion of landings from 2006 (**Preferred Option 6a**), 2010 (**Preferred Option 6b**), or both (**Preferred Options 6a** and **6b**) could be selected alongside any one of **Alternatives 2-5**. In Amendment 40 (GMFMC 2014), the Council chose to exclude landings from 2010 (**Preferred Option 6b**) from the allocation formula, but did not exclude landings from 2006 (**Preferred Option 6a)**.

Table 2.6.2. Resulting proportions of the recreational ACL that could be apportioned to each State/region based on four options (Alternatives 2-5) of historical landings time series.

Alternative	Years	Florida	Alabama	Mississippi	Louisiana	Texas
2	1986-2013	33.4%	30.2%	4.0%	16.3%	16.0%
3	1996-2013	39.6%	32.5%	2.6%	12.3%	13.0%
4	2006-2013	46.1%	29.4%	1.6%	12.7%	10.3%
5	50% (1986-2013), 50% (2006-2013)	39.8%	29.8%	2.8%	14.5%	13.1%

Note: Actual landings on which Tables 2.6.2 – 2.6.5 are based can be found in Appendix F.

Table 2.6.3. Resulting proportions of the recreational ACL that could be apportioned to each State/region based on four options (Alternatives 2-5) of historical landings time series, excluding landings from 2006.

Alternatives 2 -5 with Pref. Alt. 6 Pref. Option 6a	Years	Florida	Alabama	Mississippi	Louisiana	Texas
Alternative 2	1986-2013	32.8%	30.6%	4.1%	16.5%	16.0%
Alternative 3	1996-2013	38.9%	33.3%	2.8%	12.3%	12.8%

Alternative 4	2006-2013	45.4%	30.7%	1.7%	12.7%	9.5%
Alternative 5	50%:50%	39.1%	30.6%	2.9%	14.6%	12.7%

Table 2.6.4. Resulting proportions of the recreational ACL that could be apportioned to each State/region based on four options (Alternatives 2-5) of historical landings time series, excluding landings from 2010.

Alternatives 2-5 with Pref. Alt. 6 Pref. Option 6b	Years	Florida	Alabama	Mississippi	Louisiana	Texas
Alternative 2	1986-2013	32.6%	30.5%	4.2%	16.7%	16.0%
Alternative 3	1996-2013	38.6%	33.2%	2.8%	12.7%	12.7%
Alternative 4	2006-2013	44.7%	30.5%	1.7%	13.7%	9.3%
Alternative 5	50%:50%	38.7%	30.5%	2.9%	15.2%	12.6%

Table 2.6.5. Resulting proportions of the recreational ACL that could be apportioned to each State/region based on four options (Alternatives 2-5) of historical landings time series, excluding landings from 2006 and 2010.

Alternatives 2-5 with Pref. Alt. 6 Pref. Options 6a & 6b	Years	Florida	Alabama	Mississippi	Louisiana	Texas
Alternative 2	1986-2013	31.9%	31.0%	4.3%	16.9%	16.0%
Alternative 3	1996-2013	37.8%	34.0%	2.9%	12.7%	12.5%
Alternative 4	2006-2013	43.7%	32.3%	1.9%	14.0%	8.1%
Pref. Alternative 5	50%:50%	37.8%	31.6%	3.1%	15.4%	12.1%

Table 2.6.6 provides estimates for a range of potential season lengths for managing to the ACT, based on the allocations provided by **Alternatives 2-6** (Table 2.6.5). The methodology for deriving the estimates is provided below the table. The catch rates are subject to high levels of uncertainty, especially for Mississippi, and should be viewed with caution.

Table 2.6.6. Projected range for length of regional recreational red snapper seasons (min-max days) as managed towards the ACT, based on allocations provided in Table 2.6.5.

Alternatives 2-5 with Pref. Alt. 6 Pref. Options 6a & 6b	Florida	Alabama	Mississippi	Louisiana	Texas
Alternative 2	10-16	16-16	183-183	50-50	73-73
Alternative 3	12-19	18-18	123-123	37-38	57-57
Alternative 4	14-21	17-17	80-80	41-42	37-37
Pref. Alternative 5	12-19	16-17	132-132	46-46	55-55

Note: All catch rates are subject to high levels of uncertainty, especially Mississippi. Range of projections based on scenarios A-C from SERO-LAPP-2015-04 (Appendix J): 1) Constant catch rates from Wave 3 2014 for charter boat with increasing average weights from regressions on 2007-2014 data, constant catch rates and average weights from 2014 June 1-9 data for private boats, and constant catch rates and average weights from June 2014 from headboats; 2) Constant catch rates and average weights from Wave 3 2014 for private and charter, constant catch rates and average weights from June 2014 from headboat; and 3) constant catch rates and average weights from June 1-9, 2014 for private and charter boats and constant catch rates and average weights from June 2014 for headboat.

Alternative 7 considers apportioning the recreational sector ACL based on the projected yields for the acceptable biological catch (ABC) for the eastern and western Gulf, as derived from the updated projections from the 2009 assessment (Linton 2012a), and may be selected as preferred if Alternatives 2 or 3 are selected as preferred in Action 3. The resulting apportionments of the ABC from that assessment would be 48.5% for the eastern and 51.5% for the western Gulf (Linton 2012a).

As discussed in Action 3, all the alternatives for creating regions fall along state boundaries. Although the eastern and western regions proposed under Action 3's Alternative 2 most closely approximate the eastern and western components used in the stock assessment, they do not overlap exactly. There would be a difference in using the proportion of red snapper suggested by the stock assessment that could be harvested from each sub-unit, and the proportion of aggregated states' landings coinciding with the selection of Action 2's Alternative 2. Nevertheless, **Alternative 7** would provide a biologically based apportionment for regional management. Action 2's Alternative 3 would also divide the Gulf into eastern and western regions, but its regional boundary, between Mississippi and Alabama, deviates further from the eastern and western components of the stock assessment than Action 2's Alternative 2. The projected regional recreational red snapper seasons resulting from **Alternative 7** would be 9-12 days in the eastern region and 93 days in the western region. As stated for Table 2.6.6, these estimates are subject to high levels of uncertainty.

Alternative 8 would apportion the recreational sector ACL (or component ACL) among regions such that the initial allocation provides an equivalent number of fishing days for each region, based on estimates for the 2015 fishing season. Assuming that all regions are participating in regional management, the expected number of initial days would be within the range of 18 to 22 days when managing towards the ACT. To calculate regional allocations such that an equivalent

number of fishing days results for each region, three scenarios were analyzed. (This analysis was completed before Alabama announced its July 2015 state water season.) The first scenario is based on projected 2015 average fish weights and 2014 catch rates for-hire vessels, and 2014 catch rates and average fish weights for landings made from private angling vessels and headboats. The second scenario is based on the observed catch rates and average fish weights for all sectors and components using 2014 landings from Wave 3. The third scenario is based on the observed catch rates and average fish weights for all sectors and components during the June 1-9, 2014 federal red snapper fishing season. These projection methodologies are discussed in greater detail in Appendix J (SERO-LAPP-2015-04). Each scenario produces a slightly different allocation, as each scenario is based on different information, including landings by mode and time series. Thus, a range of potential allocations derived from the three scenarios is provided in Table 2.6.7. Under projected 2015 catch rates, eastern Gulf States would require more allocation and western Gulf States would require less allocation than currently provided under **Preferred Alternative 5**. This is primarily due to the rapid growth of eastern Gulf catch rates in recent years.

Table 2.6.7. Resulting proportions of the recreational sector ACL that could be apportioned to each State such that each region's allocation provides an equivalent number of fishing days (Alternative 8; 18 – 22 days) at the time of apportionment.

State	Florida	Alabama	Mississippi	Louisiana	Texas
Allocation range	45.3-54.9%	34.6-41.7%	0.4-0.5%	6.1-7.6%	4.0-4.9%
Projected range of season length	18 – 22 days				
Difference from Table 2.6.5 Alt 5	7.5-17.1%	3.0-10.1%	-2.7--2.6%	-9.3--7.8%	-8.1--7.2%

Source: SERO-LAPP-2015-04, N. Farmer, pers. comm.

Table 2.6.8. Projected range of 2015 regional red snapper season lengths (min-max days) for Alternatives 2-8, based on management towards regional ACTs.

	Florida	Alabama	Mississippi	Louisiana	Texas
Alternative 2	10-16	16-16	183-183	50-50	73-73
Alternative 3	12-19	18-18	123-123	37-38	57-57
Alternative 4	14-21	17-17	80-80	41-42	37-37
Pref. Alternative 5	12-19	16-17	132-132	46-46	55-55
Alternative 7 + Action 3, Alt. 2	9-12			93	
Alternative 7 + Actions 3, Alt. 3	9-12		93		
Alternative 8	18-22	18-22	18-22	18-22	18-22

Source: SERO-LAPP-2015-04, N. Farmer, pers. comm.
Note: All catch rates are subject to high levels of uncertainty, especially Mississippi. Landings from 2006 and 2010 (Preferred Alternative 6, Options 6a and 6b) have been removed for calculating Alternatives 2-5.

It is possible that one or more States/regions may opt out and not participate in regional management. If only one State opts out, the remaining four States would still receive their portion of the ACL, as specified in the selected preferred alternative. This means that a single non-participating State's landings would be restricted to the remaining balance of the recreational ACL (or component ACL), equivalent to the portion of the ACL it would receive if participating in regional management. Should more than one State choose to opt out, the participating States would still receive their respective portions of the recreational ACL. The regional ACL that would have been distributed to each non-participating State would be pooled and NMFS would estimate the length of the fishing season based on the aggregate amount of pooled ACL, reduced by the established buffer and projected landings to occur in state waters. Anglers from these States would then fish under the federal default regulations and a shared federal fishing season.

The Council selected **Preferred Alternative 5** because it incorporates both the longest time series of historical landings (1986-2013, **Alternative 2**) and the most recent time series provided (2006-2013, **Alternative 4**). The recent short seasons in federal waters for red snapper occur during times of low effort in the western Gulf and high effort in the eastern Gulf. By giving weight to the longest time series of historical landings, the Council's preferred alternative accounts for the increased proportion of landings in the eastern Gulf in more recent years.

An additional issue may arise for individual regions to monitor and constrain catches to their apportioned regional ACL. NMFS regularly issues exempted fishing permits (EFPs) for activities that would otherwise be prohibited. Fish harvested under an EFP may be exempt from specific regulations such as bag limits, size limits, and fishing seasons. Because the fish landed under an EFP are normally accounted for in the stock assessment process, before any quotas or allocations are established, these fish are not deducted from the quota. However, there are instances where NMFS may determine that an EFP is specific to a fishing quota or allocation, and may require the regions to account for those fish during a fishing season. If a quantity of fish under an EFP is required to be monitored and accounted for by regions under regional management, the region will be responsible for accounting for these landings, along with their other monitoring to assure they do not exceed their portion of the ACL.

2.7 Action 7 – Post-Season Accountability Measures (AMs)

Alternative 1: No Action – Retain the current post-season AMs for managing overages of the recreational sector ACL in federal waters of the Gulf. While red snapper are overfished (based on the most recent Status of U.S. Fisheries Report to Congress), if the recreational sector ACL (quota) is exceeded, reduce the **recreational sector** ACL in the following year by the full amount of the overage, unless the best scientific information available determines that a greater, lesser, or no overage adjustment is necessary. The component ACTs for the years 2015-2017 will be adjusted to reflect the previously established percent buffer.

Preferred Alternative 2: While red snapper are overfished (based on the most recent Status of U.S. Fisheries Report to Congress), if the combined recreational landings exceed the recreational sector ACL, then reduce in the following year the **regional ACL** of any region that exceeded its regional ACL by the amount of the region's ACL overage in the prior fishing year, unless the best scientific information available determines that a greater, lesser, or no overage adjustment is necessary. The recreational ACTs will be adjusted to reflect the previously established percent buffer.

Option 2a: If a region has both a private-angling ACL and a federal for-hire ACL, the reduction will be **applied to the component(s)** that exceeded the applicable ACL.

Option 2b: If a region has both a private-angling ACL and a federal for-hire ACL, the reduction will be **applied equally to both components**.

Discussion:

Section 407(d) of the Magnuson-Stevens Act requires that the Council ensure the FMP (and its implementing regulations) have conservation and management measures that establish a separate sector ACL for recreational fishing (private and for-hire vessels) and prohibit the possession of red snapper caught for the remainder of the fishing year once the sector ACL is reached. The National Standard 1 guidelines identify two types of AMs: in-season and post-season. These AMs are not mutually exclusive and should be used together where appropriate. In 2014, the Council adopted an in-season AM to create an ACT determined by deducting 20% from the ACL. To correct or mitigate any overages during a specific fishing year (50 CFR 600.310(g)), the Council also adopted a post-season AM which would reduce the recreational sector ACL in the year following an overage by the full amount of the overage (**Alternative 1**) unless the best scientific information available determines that a greater, lesser, or no overage adjustment is necessary.

Alternative 1 (No Action), would continue to apply the recently adopted post-season AM Gulf-wide. Although the possibility of triggering an overage adjustment would encourage regions to constrain harvest to the region's ACL, the Gulf-wide approach may be perceived as inequitable across regions. For example, if a particular region greatly exceeded its regional ACL, then the necessary overage adjustment may restrict the length of the following year's fishing season both in the region with the overage and the other regions which did not exceed their regional ACL. If

this occurs, this may reduce the flexibility provided to the regions under regional management. However, it might incentivize the overharvesting region toward compliance through pressure from the other regions.

Preferred Alternative 2 would apply the post-season AM only to a region or regions which exceeded its portion of the recreational sector ACL. With the apportionment of the recreational sector ACL into regional ACLs (and regional component ACLs under Action 2, Alternative 3), **Preferred Alternative 2** would prevent the overage adjustment from affecting regions that do not exceed their regional ACL. However, if a region's overage is greater than the following year's regional ACL, then the region may not have a recreational red snapper season in the following year. The overage adjustments would need to be taken into account when regions develop their management plan, including the length of the fishing season for the following year. **Preferred Alternative 2** would encourage a region to constrain harvest to the regional ACL to ensure that the overage adjustment is not applied to the recreational season for the following year. Regardless of a region exceeding its ACL, an overage adjustment would only be applied if the Gulf-wide recreational sector ACL was exceeded. At this time, the Council has not selected an option for this alternative.

Options 2a and **2b** under **Preferred Alternative 2** could apply if Alternative 3 in Action 2 is selected as preferred. Either option would apply the post-season AM to the regional component (for-hire and/or private angling) that exceeds its regional component ACL in the prior fishing year. In the event the Gulf-wide recreational sector ACL is exceeded, **Option 2a** would apply the overage adjustment only to the component that exceeded its regional component ACL. The regional component ACL would be reduced in the following year by the full amount of the overage, unless the best scientific information available determines that a greater, lesser, or no overage adjustment is necessary. This option would prevent the overage adjustment from affecting a regional component that does not exceed its regional component ACL. **Option 2b** would apply the overage adjustment evenly to both regional components' ACL, regardless if only one regional component exceeded its regional component ACL. Although the possibility of triggering an overage adjustment would encourage the regions to constrain harvest to the respective ACLs, applying the overage equally to both regional components may be perceived as inequitable, should a regional component remain within its portion of the ACL, yet have its portion of the ACL reduced in the following year due to overages by the other regional component.

Under **Alternative 1**, **Preferred Alternative 2**, and **Options 2a** and **2b**, if the combined recreational landings from all regions and regional components, if applicable, do not exceed the Gulf-wide recreational sector ACL in that year, neither the recreational sector ACL nor the regional and/or component ACLs would be reduced to account for a regional or component ACL overage.

CHAPTER 3. AFFECTED ENVIRONMENT

The actions considered in this environmental impact statement (EIS) would affect recreational fishing for red snapper in federal and state waters of the Gulf of Mexico (Gulf). Descriptions of the physical, biological, economic, social, and administrative environments were completed in the EIS for Reef Fish Amendment 27/Shrimp Amendment 14 (GMFMC 2007), the Generic Essential Fish Habitat (EFH) Amendment (GMFMC 2004a), and the Generic Annual Catch Limits/Accountability Measures (ACL/AM) Amendment (GMFMC 2011b). Below, information on each of these environments is summarized or updated, as appropriate.

3.1 Description of the Fishery: Red Snapper

A description of the fishery and affected environment relative to red snapper was last fully discussed in joint Reef Fish Amendment 27/Shrimp Amendment 14 (GMFMC 2007). This section updates the previous description to include additional information since publication of that EIS.

General Features

Commercial harvest of red snapper from the Gulf began in the mid-1800s (Shipp 2001). In the 1930s, party boats built exclusively for recreational fishing began to appear (Chester 2001). Since 2007, the commercial sector has operated under an individual fishing quota (IFQ) program. In 2011, 362 vessels participated in the IFQ program (NMFS 2012a). The recreational sector operates in three modes, charter boats, headboats, and private vessels. In 2012, private vessels accounted for 70.1% of recreational red snapper landings, followed by charter boats (20.3%) and headboats (9.6%). On a state-by-state basis, Alabama accounted for the most landings (36.1%), followed by Florida (32.3%), Louisiana (19.2%), Texas (8.2%), and Mississippi (4.2%) (Table 3.1.1).

Table 3.1.1. Recreational red snapper landings in 2012 by state and mode.

State	Landings (lbs whole weight)				% by State
	Charter	Headboat	Private	All Modes	
FL (west)	806,118	205,830	1,420,620	2,432,569	**32.3%**
AL	445,816	71,482	2,197,377	2,714,675	**36.1%**
MS	1,406	5,894	306,854	314,154	**4.2%**
LA	236,145	21,199	1,188,763	1,446,106	**19.2%**
TX	39,128	419,671	157,937	616,736	**8.2%**
Total	**1,528,613**	**724,077**	**5,271,550**	**7,524,239**	
% by Mode	**20.3%**	**9.6%**	**70.1%**		**100%**

Source: NMFS 2014.

The red snapper stock has been found to be in decline or overfished in every stock assessment conducted, beginning with the first assessment in 1986 (Parrack and McClellan 1986). However, following the SEDAR 31 benchmark assessment (SEDAR 31 2013), the Scientific and Statistical Committee (SSC) concluded that, as of 2011, overfishing was no longer occurring (GMFMC 2013c). Based on an update assessment presented to the SSC in January 2015 (GMFMC 2015a) and landings data through 2014, the determination that overfishing is not occurring has continued through 2014. Implemented in 1990, Amendment 1 (GMFMC 1989) established the first red snapper rebuilding plan. From 1990 through 2009, red snapper harvest was managed through the setting of an annual total allowable catch (TAC), which has been divided into allocations of 51% commercial, and 49% recreational. Beginning in 2010, TAC was phased out in favor of an ACL. The red snapper rebuilding plan formally adopted the use of the term ACL in Amendment 40 (GMFMC 2014). Until that time, by allocating the acceptable biological catch (ABC) between the commercial and recreational sectors, and then setting quotas for each sector that do not exceed those allocations, the terminology and approaches used in the red snapper rebuilding plan were consistent with the use of ACLs, and optionally annual catch targets (ACTs) as discussed in the National Standard 1 guidelines. Such alternative terminology is allowed under the guidelines.

Also in 1990, Amendment 1 established a commercial red snapper quota of 2.65 million pounds (mp) whole weight (ww). There was no explicit recreational allocation specified, only a bag limit of 7 fish and a minimum size limit of 13 inches total length (TL). Based on the 51:49 commercial to recreational sector allocation, the commercial quota implied a TAC of about 6.0 mp in 1990, followed by explicit TACs of 4.0 mp in 1991 and 1992, 6.0 mp in 1993 through 1995, and 9.12 mp from 1996 through 2006. The TAC was reduced to 6.5 mp in 2007 and 5.0 mp in 2008 and 2009.

In 2010, the ABC was increased to 6.945 mp. In 2011, it was initially raised to 7.185 mp, and then increased in August by another 345,000 lbs (7.530 mp total) which was allocated to the recreational sector. In 2012 the ABC was raised to 8.080 mp. A scheduled increase in 2013 to 8.690 mp was cancelled due to an overharvest in 2012 by the recreational sector. After an analysis of the impacts of the overharvest on the red snapper rebuilding plan, the 2013 ABC was increased to 8.460 mp. In July 2013, the Council reviewed a new benchmark assessment (SEDAR 31 2013) which showed that the red snapper stock was rebuilding faster than projected, partly due to strong recruitment in some recent years. Combined with a new method for calculating the ABC, the Scientific and Statistical Committee (SSC) increased the ABC for 2013 to 13.5 mp, but warned that the catch levels would have to be reduced in future years if recruitment returned to average levels. After incorporating a buffer to reduce the possibility of having to later reduce the quota, the Gulf of Mexico Fishery Management Council (Council) further increased the 2013 commercial and recreational quotas to a combined 11.0 mp (5.61 mp and 5.39 mp respectively) (GMFMC 2013b). This increase occurred too late to extend the June recreational season, so the Council requested that the National Marine Fisheries Service (NMFS) reopen the recreational season on October 1 for whatever number of days would be needed to harvest the additional quota. NMFS estimated that the additional recreational quota would take 14 days to be caught, and therefore announced a supplemental season of October 1 through 14.

Table 3.1.2. Red snapper landings by sector, 1986-2014. Landings are in mp ww. Commercial quotas began in 1990. Recreational allocations began in 1991 and recreational quotas began in 1997. Summing the recreational allocation/quota and the commercial quota yields the total allowable catch (TAC) for the years 1991-2009 and the acceptable biological catch (ABC) for 2010-2014.

	Recreational		Commercial		Total	
Year	**Allocation/ Quota**	**Actual landings**	**Quota**	**Actual landings**	**Quota**	**Actual landings**
1986	na	3.491	na	3.700	na	6.470
1987	na	2.090	na	3.069	na	4.883
1988	na	3.139	na	3.960	na	6.528
1989	na	2.940	na	3.098	na	5.754
1990	na	1.625	3.1	2.650	na	4.264
1991	1.96	2.917	2.04	2.213	4.0	5.130
1992	1.96	4.618	2.04	3.106	4.0	7.724
1993	2.94	7.161	3.06	3.374	6.0	10.535
1994	2.94	6.076	3.06	3.222	6.0	9.298
1995	2.94	5.464	3.06	2.934	6.0	8.398
1996	4.47	5.339	4.65	4.313	9.12	9.652
1997	4.47	6.804	4.65	4.810	9.12	11.614
1998	4.47	4.854	4.65	4.680	9.12	9.534
1999	4.47	4.972	4.65	4.876	9.12	9.848
2000	4.47	4.750	4.65	4.837	9.12	9.587
2001	4.47	5.252	4.65	4.625	9.12	9.877
2002	4.47	6.535	4.65	4.779	9.12	11.314
2003	4.47	6.105	4.65	4.409	9.12	10.514
2004	4.47	6.460	4.65	4.651	9.12	11.111
2005	4.47	4.676	4.65	4.096	9.12	8.772
2006	4.47	4.131	4.65	4.649	9.12	8.780
2007	3.185	5.809	3.315	3.153	6.5	8.962
2008	2.45	4.056	2.55	2.461	5.0	6.517
2009	2.45	5.597	2.55	2.461	5.0	8.058
2010	3.403	2.651	3.542	3.362	6.945	6.013
2011	3.866	6.734	3.664	3.562	7.53	10.296
2012	3.959	7.524	4.121	4.000	8.08	11.524
2013	5.390	9.659	5.610	5.399	11.00	15.038
2014	5.390	3.867	5.054	5.016	10.444	8.883

Sources: For recreational landings, Southeast Fisheries Science Center (SEFSC) including landings from the calibrated Marine Recreational Information Program (MRIP), LA Creel Survey, Texas Parks and Wildlife Department (TPWD), and the Southeast Region Headboat Survey (SRHS) (December 2014). The calibrated MRIP landings provided here were not used for management at the time (See Appendix I for the MRIP Calibration Workshop report). For commercial landings, Southeast Data Assessment and Review (SEDAR) 31 Data Workshop Report (1990-2011), commercial quotas/catch allowances report from NMFS/Southeast Regional Office (SERO) IFQ landings website (2012 commercial): http://sero.nmfs.noaa.gov/sf/ifq/CommercialQuotasCatchAllowanceTable.pdf.
Commercial quotas/landings in gutted weight were multiplied by 1.11 to convert to ww. Data for 2014 provided by N. Farmer, pers. comm.

Both the commercial and recreational sectors have had numerous allocation overruns. Table 3.1.2 shows a comparison of quotas and actual harvests from 1990 through 2013. The recreational sector has had allocation overruns in 21 out of 23 years in which an allocation was specified, while the commercial sector has had overruns in 10 of 23 years. The commercial sector has not had overruns since 2005.

Recreational Red Snapper Sector

Red snapper are an important component of the recreational sector's harvest of reef fish in the Gulf. Recreational red snapper fishing includes charter boats, headboats (or party boats), and private anglers fishing primarily from private or rental boats. As with the commercial fishery, red snapper are primarily caught with hook-and-line gear in association with bottom structures. Recreational red snapper harvest allocations since 1991 have been set at 49% of the TAC, or 1.96 mp in 1991 and 1992, 2.94 mp for 1993 through 1995, and 4.47 mp from 1996 through 2006. In 2007, the recreational quota was reduced to 3.185 mp. It was reduced again to 2.45 mp in 2008 and 2009. Since 2010, the recreational quota has been increased each year: 3.403 mp in 2010, 3.866 mp in 2011, 3.959 mp in 2012, and 5.390 mp in 2013 (Table 3.1.3).

Before 1984, there were no restrictions on the recreational harvest of red snapper. In November 1984, a 12-inch fork length (FL) minimum size limit was implemented, but with an allowance for five undersized fish per person. In 1990, the undersized allowance was eliminated, the minimum size limit changed to 13 inches total length (TL) (approximately equal to 12 inches FL), and the recreational sector was managed through bag and size limits with a year-round open season. In 1997, the recreational red snapper allocation was converted into a quota with accompanying quota closure should the sector exceed its quota. Recreational quota closures occurred in 1997, 1998, and 1999, becoming progressively shorter each year even though the quota remained a constant 4.47 mp.

A fixed recreational season of April 21 through October 31 (194 days) was established for 2000 through 2007. However, NMFS returned to variable length seasons beginning in 2008. Under this management approach, due to a lag in the reporting of recreational catches, catch rates over the course of the season were projected in advance based on past trends and changes in the average size of a recreationally harvested red snapper. The recreational season opened each year on June 1 and closed on the date when the quota was projected to be reached. In 2008, the season length was reduced from 194 days to 65 days in conjunction with a reduction in quota to 2.45 mp. The season length then increased to 75 days in 2009. In 2010, the recreational red snapper season was originally projected to be 53 days. However, due to reduced effort and large emergency area closures resulting from the Deepwater Horizon MC252 oil spill, catches were below projections, and a one-time supplemental season of weekend only openings (Friday, Saturday, and Sunday) was established from October 1 through November 22. This added 24 fishing days to the 2010 season for a total of 77 days. In 2011, the season was reduced to 48 days despite an increase in the quota, due to an increase in the average size of a recreationally harvested fish. In 2012 the season was initially scheduled to be 40 days, but was extended to 46 days to compensate for the loss of fishing days due to storms (Table 3.1.3).

At the request of the Council at its February 2013 meeting, NMFS developed an emergency rule to adjust seasons off each Gulf State based on the extent to which their state-water seasons and bag limits were consistent with federal regulations. This was done to compensate for the additional harvest that would occur in state waters as a result of inconsistent regulations. A legal challenge was made to the emergency rule and it was subsequently set aside by the U.S. District Court. As a result, the federal recreational red snapper season continued to be the same in federal waters off all five Gulf States. Initially, NMFS set a 28-day season beginning on June 1 for the recreational sector. However, in September 2013, NMFS announced an increase in the TAC which added 1.245 mp to the recreational quota, and a supplemental 14-day season beginning October 1. This resulted in a total of 42 recreational fishing days.

In 2014, NMFS initially announced a 40-day recreational season. However, in March 2014, as a result of a legal challenge, the U.S. District Court found that there was not an adequate system of accountability measures in place to prevent the recreational red snapper sector from exceeding its quota. To comply with the court decision, the Council approved the setting of a 20% buffer for the recreational sector catch. Also in 2014, a 2-year project was initiated under an exempted fishing permit (EFP) to evaluate the ability of a collaborative of headboats to self-regulate themselves. A portion of the red snapper recreational quota (256,487 lbs) was allocated to the headboat collaborative. In addition, several States extended their season for recreational red snapper harvest in state waters. The projected increase in state water caught red snapper reduced the amount of quota available to be caught in federal waters. As a result, the 2014 red snapper season in federal waters was shortened to 9 days (Table 3.1.3). The headboat collaborative was allowed to continue fishing under the EFP, and headboat collaborative trips continued throughout the year, although the number of trips dropped off markedly after August[8].

In 2015, Amendment 40 separated the recreational sector into a federal for-hire component and a private angling component, with the recreational sector ACL split between the two components. The headboat collaborative EFP's year-2 allocation of 215,027 lbs was deducted from the federal for-hire component's quota. Some States further increased their state water recreational seasons, which further reduced the amount of quota available to be caught in federal waters by the private angling component. Federally permitted vessels were unaffected by the expanded state seasons since they are prohibited from fishing in state waters when the federal season is closed. This resulted in a federal season of 44 days for the federally permitted for-hire component, and 10 days for the private angling component.

During the six years when the recreational harvest was an allocation, not a quota (1991 – 1996), actual recreational harvests in pounds of red snapper exceeded the allocation every year. During the period when the recreational harvest was managed as a quota (1997 – 2013), actual recreational harvest in pounds of red snapper exceeded the quota in 15 out of 17 years, including 5 of the last 6 years (Table 3.1.3). Historical recreational landings estimates have recently been revised to reflect changes in methodology under the Marine Recreational Information Program (MRIP).

[8] Presentation from NMFS at the March 2015 Council meeting on a review of year 1 of the headboat collaborative EFP. Available on the Gulf Council website's briefing book archives for the March 2015 meeting under Reef Fish Committee.

Table 3.1.3. Red snapper recreational landings, allocation/quota, and days red snapper season was open in federal waters (1986-2014). Landings are in mp ww. Recreational allocations began in 1991, and became quotas in 1997.

Year	Allocation/ Quota	Actual landings	Days season open in federal waters
1986	na	2.770	365
1987	na	1.814	365
1988	na	2.568	365
1989	na	2.656	365
1990	na	1.614	365
1991	1.96	2.917	365
1992	1.96	4.618	365
1993	2.94	7.161	365
1994	2.94	6.076	365
1995	2.94	5.464	365
1996	4.47	5.339	365
1997	4.47	6.804	330
1998	4.47	4.854	272
1999	4.47	4.972	240
2000	4.47	4.750	194
2001	4.47	5.252	194
2002	4.47	6.535	194
2003	4.47	6.105	194
2004	4.47	6.460	194
2005	4.47	4.676	194
2006	4.47	4.131	194
2007	3.185	5.809	194
2008	2.45	4.056	65
2009	2.45	5.597	75
2010	3.403	2.651	53 + 24 = 77
2011	3.866	6.734	48
2012	3.959	7.524	46
2013	5.390	9.639	42
2014	5.390	3.867	9

Source: Southeast Fisheries Science Center (SEFSC) including calibrated landings from MRIP, LA Creel Survey, Texas Parks and Wildlife Department (TPWD), and the Southeast Region Headboat Survey (SRHS) (May 2015). The Calibrated MRIP landings provided here were not used for management at the time. See Appendix I for the MRIP Calibration Workshop report. In 2014, the season was estimated based on an ACT of 4.312 mp, which is 20% below the ACL.

For-hire vessels have operated under a limited access system with respect to the issuance of new for-hire permits for fishing reef fish or coastal migratory pelagics since 2003. A total of 3,340 reef fish and coastal migratory pelagic charter/headboat permits were issued under the moratorium, and these permits are associated with 1,779 vessels. Of these vessels, 1,561 have

both reef fish and coastal migratory pelagics permits, 64 have only reef fish permits, and 154 have only coastal migratory pelagics permits. About one-third of Florida charter boats targeted three or less species; two-thirds targeted five or less species; and 90% targeted nine or less species. About 40% of these charter boats did not target particular species. The species targeted by the largest proportion of Florida charter boats were king mackerel (46%), grouper (29%), snapper (27%), dolphin (26%), and billfish (23%). In the eastern Gulf, the species receiving the most effort were grouper, king mackerel, and snapper. About 25% of Florida headboats targeted three or fewer species; 75% targeted four or fewer species; and 80% targeted five or fewer species. About 60% of headboats did not target any particular species. The species targeted by the largest proportion of Florida headboats are snapper and other reef fish (35%), red grouper (29%), gag grouper (23%), and black grouper (16%). In the eastern Gulf, the species receiving the most effort were snapper, gag, and red grouper (Sutton et al. 1999).

The majority of charter boats in Alabama, Mississippi, Louisiana, and Texas reported targeting snapper (91%), king mackerel (89%), cobia (76%), and tuna (55%). The species receiving the largest percentage of effort by charter boats in the four-state area were snapper (49%), king mackerel (10%), red drum (6%), cobia (6%), tuna (5%), and speckled trout (5%). The majority of headboat operators reported targeting snapper (100%), king mackerel (85%), shark (65%), tuna (55%), and amberjack (50%). The species receiving the largest percentage of total effort by headboats in the four-state area were snapper (70%), king mackerel (12%), amberjack (5%), and shark (5%) (Sutton et al. 1999).

Commercial Red Snapper Sector

In the Gulf, red snapper are primarily harvested commercially with hook-and-line and bandit gear, with bandit gear being more prevalent. Longline gear captures a small percentage of total landings (< 5%). Longline gear is prohibited for the harvest of reef fish inside of 50 fathoms west of Cape San Blas. East of Cape San Blas, longline gear is prohibited for harvest of reef fish inside of 20 fathoms, with a seasonal shift in the longline boundary to 35 fathoms during June through August to protect foraging sea turtles.

Between 1990 and 2006, the principal method of managing the commercial sector for red snapper was with quotas set at 51% of TAC and seasonal closures after each year's quota was filled. The result was a race for fish in which fishermen were compelled to fish as quickly as possible to maximize their catch of the overall quota before the season was closed. The fishing year was characterized by short periods of intense fishing activity with large quantities of red snapper landed during the open seasons rather than lower levels of activity with landings spread more uniformly throughout the year. The result was short seasons and frequent quota overruns (Table 3.1.4). From 1993 through 2006, trip limits, limited access endorsements, split seasons and partial monthly season openings were implemented in an effort to slow the race for fish. At the beginning of the 1993 season, 131 boats qualified for red snapper endorsements on their reef fish permits that entitled them to land 2,000 lbs of red snapper per trip.

In 2007, an IFQ program was implemented for the commercial red snapper sector. Each vessel that qualified for the program was issued an allocation of a percentage of the commercial quota based on historical participation. The allocations were issued as shares representing pounds of

red snapper, which the fishermen could harvest, sell or lease to other fishermen, or purchase from other fishermen. Beginning in 2007, the commercial red snapper season is no longer closed, but a commercial vessel cannot land red snapper unless it has sufficient allocation in its vessel account to cover the landing poundage. As a result, there have not been any quota overruns under the IFQ program (Table 3.1.4). The red snapper IFQ program is currently undergoing a 5-year review to determine if changes are needed to the program.

Table 3.1.4. Commercial red snapper harvest vs. days open, by sector, 1986-2014.

Year	Quota	Actual landings	Days Open (days that open or close at noon are counted as half-days) ("+" = split season)
1986	na	3.700	365
1987	na	3.069	365
1988	na	3.960	365
1989	na	3.098	365
1990	3.1	2.650	365
1991	2.04	2.213	235
1992	2.04	3.106	52½ + 42 = 94½
1993	3.06	3.374	94
1994	3.06	3.222	77
1995	3.06	2.934	50 + 1½ = 51½
1996	4.65	4.313	64 + 22 = 86
1997	4.65	4.810	53 + 18 = 71
1998	4.65	4.680	39 + 28 = 67
1999	4.65	4.876	42 + 22 = 64
2000	4.65	4.837	34 + 25 = 59
2001	4.65	4.625	50 + 20 = 70
2002	4.65	4.779	57 + 24 = 81
2003	4.65	4.409	60 + 24 = 84
2004	4.65	4.651	63 + 32 = 95
2005	4.65	4.096	72 + 48 = 120
2006	4.65	4.649	72 + 43 = 115
2007	3.315	3.183	IFQ
2008	2.55	2.484	IFQ
2009	2.55	2.484	IFQ
2010	3.542	3.392	IFQ
2011	3.664	3.594	IFQ
2012	4.121	4.036	IFQ
2013	5.610	5.399	IFQ
2014	5.054	5.016	IFQ

Source: SEDAR 31 Data Workshop Report (1990-2006), commercial quotas/catch allowances report from NMFS/Southeast Regional Office IFQ landings website (2007-2014): http://sero.nmfs.noaa.gov/sf/ifq/CommercialQuotasCatchAllowanceTable.pdf.
Commercial quotas/landings in gutted weight were multiplied by 1.11 to convert to ww.

3.2 Description of the Physical Environment

The Gulf has a total area of approximately 600,000 square miles (1.5 million km^2), including state waters (Gore 1992). It is a semi-enclosed, oceanic basin connected to the Atlantic Ocean by the Straits of Florida and to the Caribbean Sea by the Yucatan Channel (Figure 3.2.1). 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 is both a warm temperate and a tropical body of water (McEachran and Fechhelm 2005). Based on satellite derived measurements from 1982 through 2009, mean annual sea surface temperature ranged from 73 through 83º F (23-28º C) including bays and bayous (Figure 3.2.1). In general, mean sea surface temperature increases from north to south depending on time of year with large seasonal variations in shallow waters (NODC 2012: http://accession.nodc.noaa.gov/0072888).

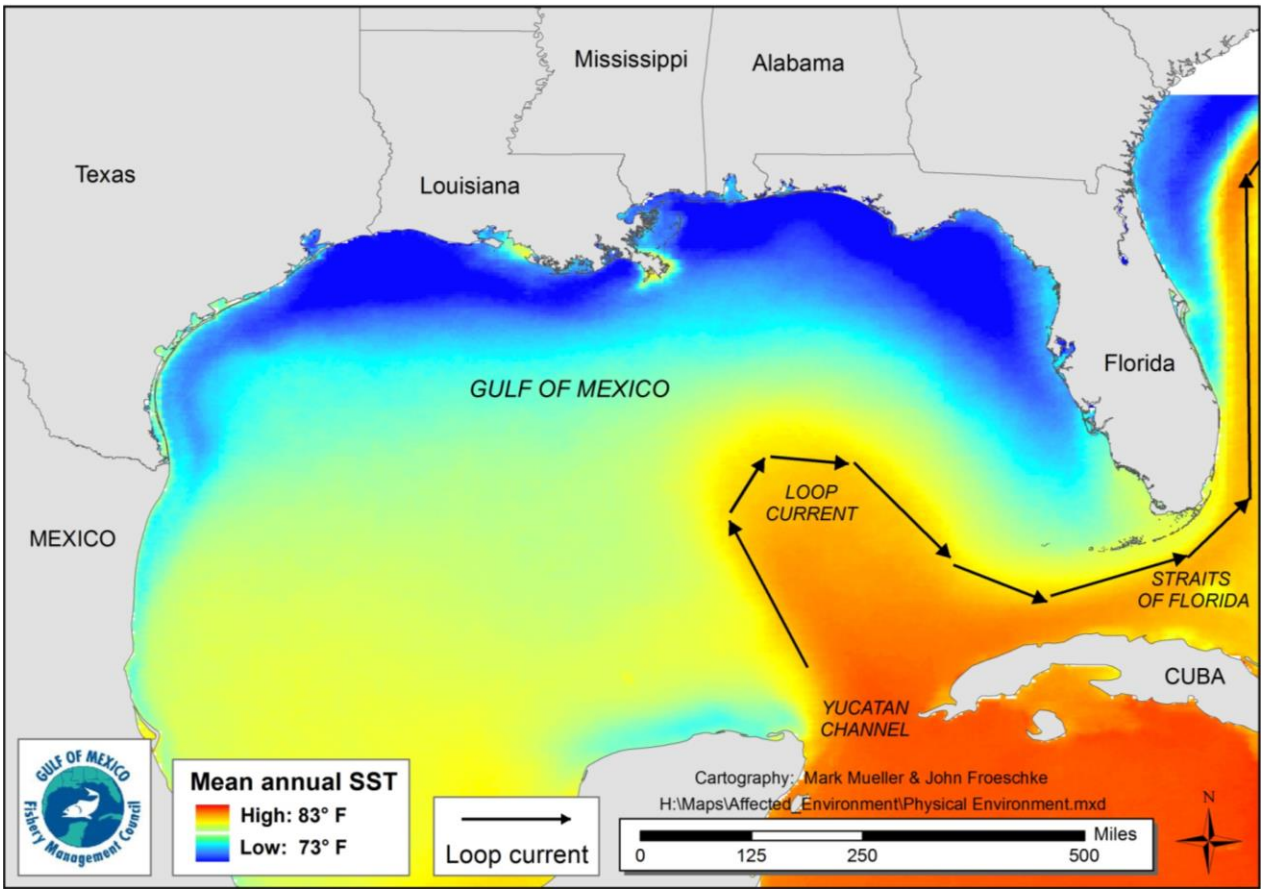


Figure 3.2.1. Physical environment of the Gulf including major feature names and mean annual sea surface temperature as derived from the Advanced Very High Resolution Radiometer Pathfinder Version 5 sea surface temperature data set (http://accession.nodc.noaa.gov/0072888).

Environmental Sites of Special Interest Relevant to Reef Fish species (Figure 3.2.2)

The following area closures include gear restrictions that may affect targeted and incidental harvest of reef fish species.

Longline/Buoy Gear Area Closure – Permanent closure to use of these gears for reef fish harvest inshore of 20 fathoms (36.6 meters) off the Florida shelf and inshore of 50 fathoms (91.4 meters) for the remainder of the Gulf, and encompasses 72,300 square nautical miles (nm^2) or 133,344 km^2 (GMFMC 1989). Bottom longline gear is prohibited inshore of 35 fathoms (54.3 meters) during the months of June through August in the eastern Gulf (GMFMC 2009), but is not depicted in Figure 3.2.1.2.

Madison-Swanson and Steamboat Lumps Marine Reserves - No-take marine reserves (total area is 219 nm^2 or 405 km^2) sited based on gag spawning aggregation areas where all fishing is prohibited except surface trolling from May through October (GMFMC 1999; 2003).

The Edges Marine Reserve – All fishing is prohibited in this area (390 nm^2 or 1,338 km^2) from January through April and possession of any fish species is prohibited, except for such possession aboard a vessel in transit with fishing gear stowed as specified. The provisions of this do not apply to highly migratory species (GMFMC 2008b).

Tortugas North and South Marine Reserves - No-take marine reserves (185 nm^2) cooperatively implemented by the state of Florida, National Ocean Service, the Gulf of Mexico Fishery Management Council (Council), and the National Park Service in Generic Amendment 2 Establishing the Tortugas Marine Reserves (GMFMC 2001). Only a small portion (13 nm^2) of the Tortugas North Marine Reserve is in federal waters while the entire Tortugas South Marine Reserve (54.5 nm^2) is in federal waters.

Reef and bank areas designated as Habitat Areas of Particular Concern (HAPCs) in the northwestern Gulf include - East and West Flower Garden Banks, Stetson Bank, and McGrail Bank, - Pristine coral areas protected by preventing the use of some fishing gear that interacts with the bottom and prohibited use of anchors (totaling 80.4 nm^2). Subsequently, three of these areas were established as marine sanctuaries (i.e., East and West Flower Garden Banks and Stetson Bank). Bottom anchoring and the use of trawling gear, bottom longlines, buoy gear, and all traps/pots on coral reefs are prohibited in the East and West Flower Garden Banks, McGrail Bank, and on significant coral resources on Stetson Bank (GMFMC 2005b). Sonnier Bank, MacNeil Bank, 29 Fathom, Rankin Bright Bank, Geyer Bank, Bouma Bank, Rezak Sidner Bank, Alderice Bank, and Jakkula Bank (totaling 183 nm^2) are other areas that have been designated as HAPCs but currently have no regulations associated with them. A weak link in the tickler chain of bottom trawls on all habitats throughout the Gulf exclusive economic zone (EEZ) is required. A weak link is defined as a length or section of the tickler chain that has a breaking strength less than the chain itself and is easily seen as such when visually inspected. An education program for the protection of coral reefs when using various fishing gears in coral reef areas for recreational and commercial fishermen was also developed.

Florida Middle Grounds HAPC - Pristine soft coral area (348 nm^2 or 644.5 km^2) that is protected by prohibiting the following gear types: bottom longlines, trawls, dredges, pots and traps (GMFMC and SAFMC 1982).

Pulley Ridge HAPC - A portion (101 nm^2) of the HAPC (2,300 nm^2 or 4,259 km^2) where deepwater hermatypic coral reefs are found is closed to anchoring and the use of trawling gear, bottom longlines, buoy gear, and all traps/pots (GMFMC 2005b).

Alabama Special Management Zone – For vessels operating as a charter vessel or headboat, a vessel that does not have a commercial permit for Gulf reef fish, or a vessel with such a permit fishing for Gulf reef fish, fishing is limited to hook-and-line gear with no more than three hooks. Nonconforming gear is restricted to recreational bag limits, or for reef fish without a bag limit, to 5% by weight of all fish aboard (GMFMC 1993).

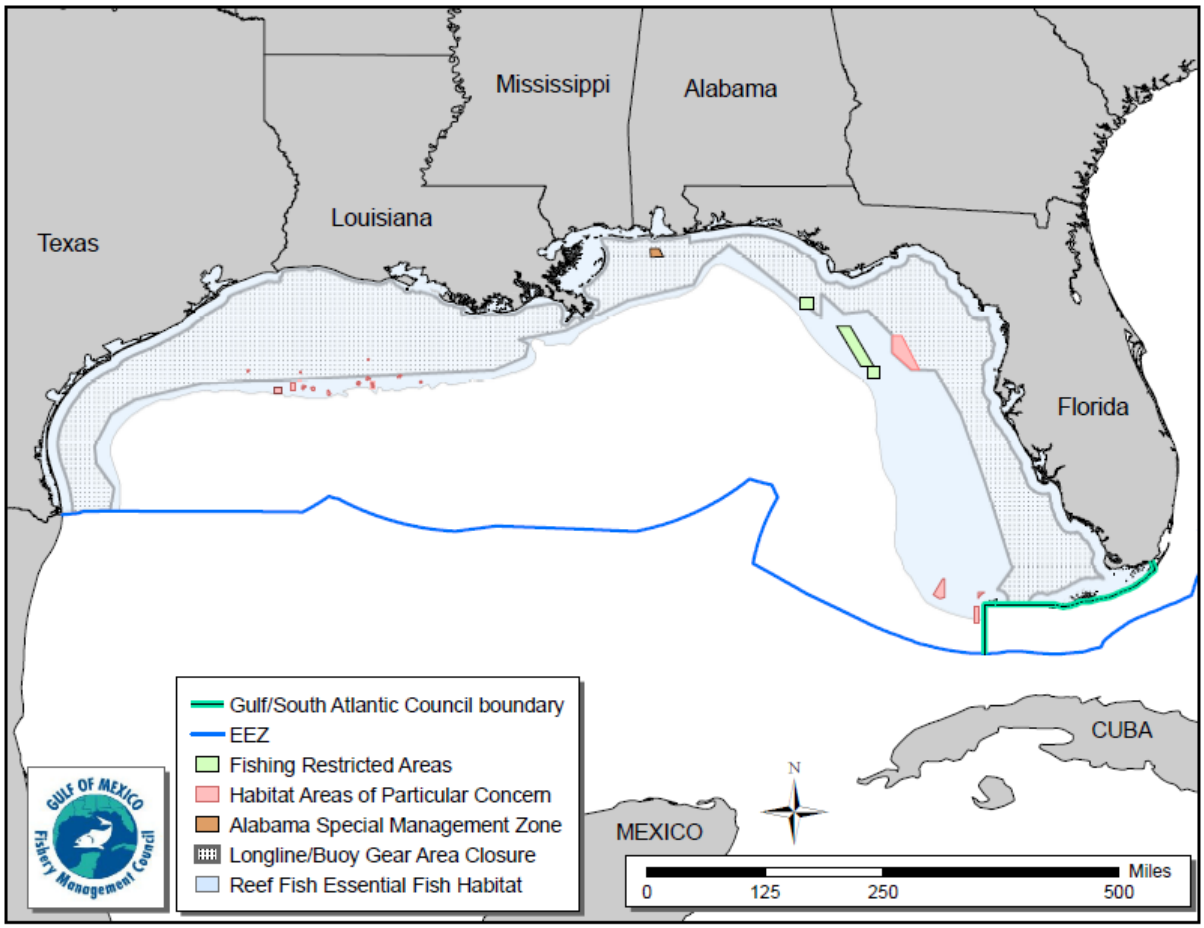


Figure 3.2.2. Map of most fishery management closed areas in the Gulf.

The Deepwater Horizon MC252 oil spill affected at least one-third of the Gulf from western Louisiana east to the Florida Panhandle and south to the Campeche Bank of Mexico. Oil flowed from the ruptured wellhead at a rate of 52,700 – 62,200 barrels/day for a total of 4,928,100 barrels (www.restorethegulf.gov 2010). The impacts of the Deepwater Horizon MC252 oil spill

on the physical environment may be significant and long-term. Oil was dispersed on the surface, and because of the heavy use of dispersants (both at the surface and at the wellhead), oil was also documented as being suspended within the water column (Camilli et al. 2010; Kujawinski et al. 2011). Floating and suspended oil washed onto coastlines in several areas of the Gulf along with non-floating tar balls. Whereas suspended and floating oil degrades over time, tar balls are persistent in the environment and can be transported hundreds of miles (Goodman 2003).

Surface or submerged oil during the Deepwater Horizon MC252 oil spill event could have restricted the normal processes of atmospheric oxygen mixing into and replenishing oxygen concentrations in the water column, thus affecting the long-standing hypoxic zone located west of the Mississippi River on the Louisiana continental shelf (NOAA 2010). Research by Hazen et al. (2010), however, has indicated that microbial biodegradation of hydrocarbons in the water column may have occurred without substantial oxygen drawdown. Residence time of hydrocarbons in sediments is also a point of interest. Among the indices developed for past oil spills (Harper 2003) and oil spill scenarios (National Environmental Research Institute 2011) is the "oil residence index"; however, this index does not appear to have been utilized during the assessment of the Deepwater Horizon MC252 oil spill.

Most recently, the Associated Press reported on September 6, 2012 that researchers from Louisiana State University had linked oil discovered on Elmer's Island and Grand Isle to the Deepwater Horizon MC252 oil spill after the landfall and dissipation of Hurricane Isaac (Burdeau and Reeves 2012).

3.3 Description of the Biological/Ecological Environment

The biological environment of the Gulf, including the species addressed in this amendment, is described in detail in the final EIS for the Generic EFH Amendment (GMFMC 2004a) and is incorporated here by reference.

Red Snapper Life History and Biology

Red snapper demonstrate the typical reef fish life history pattern (Table 3.3.1). Eggs and larvae are pelagic while juveniles are found associated with bottom features or over barren bottom. Spawning occurs over firm sand bottom with little relief away from reefs during the summer and fall. Adult females mature as early as two years and most are mature by four years (Schirripa and Legault 1999). Red snapper have been aged up to 57 years. Until recently, most caught by the directed fishery were 2- to 4-years old (Wilson and Nieland 2001), but a recently completed stock assessment suggests that the age and size of red snapper in the directed fishery has increased in recent years (SEDAR 31 2013). A more complete description of red snapper life history can be found in the EIS for the Generic EFH Amendment (GMFMC 2004a).

Status of the Red Snapper Stock

Southeast Data Assessment and Review (SEDAR) 31 Benchmark Stock Assessment

Commercial harvest of red snapper from the Gulf began in the mid-1800s (Shipp 2001). In the 1930s, party boats built exclusively for recreational fishing began to appear (Chester 2001). The first stock assessment conducted by NMFS in 1986 suggested that the stock was in decline (Parrack and McLellan 1986) and since 1988 (Goodyear 1988) the stock biomass has been found to be below threshold levels.

The most recent benchmark red snapper stock assessment was completed in 2013 (SEDAR 31 2013). The primary assessment model selected for the Gulf red snapper stock evaluation assessment was Stock Synthesis (Methot 2010). Stock Synthesis is an integrated statistical catch-at-age model which is widely used for stock assessments in the United States and throughout the world. Commercial landings data included commercial handline and longline landings from the accumulated landings system from 1964 through 2011. For landings between 1880 and 1963, previously constructed historical landings were used. Total annual landings from the IFQ program for years 2007-2011 were used to reapportion 2007-2011 accumulated landings system data across strata. Recreational landings data included the MRIP/Marine Recreational Fishery Statistics Survey (MRFSS) from 1981-2011, Southeast Headboat Survey for 1981-2011, and Texas Parks and Wildlife Department survey. For the years 2004-2011, MRIP landings are available. For earlier years, MRFSS data were calibrated to MRIP estimates using a standardized approach for calculating average weight that accounts for species, region, year, state, mode, wave, and area.

Standardized indices of relative abundance from both fishery dependent and independent data sources were included in the model. The fishery dependent indices came from the commercial handline fleet, recreational headboats, and recreational private/for-hire sectors. Fishery independent indices came from the Southeast Area Monitoring and Assessment Program (SEAMAP) bottom trawl survey, SEAMAP reef fish video survey, NMFS bottom longline survey, and the SEAMAP plankton survey.

Red snapper discards in the Gulf were calculated from data collected by the self-reported commercial logbook data and the NMFS Gulf reef fish observer program. In addition to these directed fisheries discards, estimates of red snapper bycatch from the commercial shrimp fleet were also generated.

The results of the SEDAR 31 assessment, including an assessment addendum that was prepared after a review of the SEDAR Assessment Panel Report by the SEDAR Review Panel, was presented to the SSC in May 2013. Under the base model, it was estimated that the red snapper stock has been overfished since the 1960s.

Current (2011) stock status was estimated relative to two possible proxies for F_{MSY}: $F_{SPR26\%}$ (i.e., the fishing mortality rate that would produce an equilibrium spawning potential ratio (SPR) of 26%) and F_{MAX}, which corresponded to $F_{SPR20.4\%}$ (i.e., the fishing mortality rate that would produce an equilibrium SPR 20.4%). A proxy of $F_{SPR26\%}$ was previously used as the overfishing

and F_{MSY} proxy in SEDAR 7 and the SEDAR 7 update assessment in 2009. F_{MAX} was evaluated as an alternative proxy because at high spawner-recruit steepness values near 1.0, such as the value of 0.99 fixed in the red snapper assessment, F_{MAX} approximates the actual estimate of F_{MSY}. However, the actual estimate of F_{MSY} is sensitive to the parameters of the spawner-recruit relationship. The SSC did not have confidence in using the direct F_{MSY} estimate due to the fact that the spawner-recruit function is poorly estimated and data exist for a very limited range of potential spawning stock biomass (SSB) for the stock. In addition, the SSC felt that the equivalent SPR for F_{MAX} (20.4%) was inappropriately low for species with life history parameters similar to red snapper. The SSC felt that the $F_{SPR26\%}$ proxy, while still somewhat low for species with life history parameters similar to red snapper, was more realistic than the 20.4% SPR associated with $F_{MAX.}$ Furthermore, the $F_{SPR26\%}$ proxy is consistent with the current fishery management plan (FMP) and rebuilding plan for red snapper.

Spawning stock biomass was estimated to remain below both the minimum stock size threshold (MSST) and the spawning stock size associated with maximum sustainable yield ($SSB_{MSY\ proxy}$) using either proxy described above. Therefore, the SSC concluded that the stock remains overfished. With respect to overfishing, the current fishing mortality rate (geometric mean of 2009-2011) was estimated to be below both F_{MSY} proxies. Therefore, the SSC estimated the stock is not currently experiencing overfishing.

SEDAR 31 Update Assessment

In January 2015, NMFS presented an update of the SEDAR 31 assessment to the SSC (GMFMC 2015a). The methods used were the same as SEDAR 31, except for instances when the assessment team was responding to specific terms of reference from the Council. The SEDAR 31 red snapper base model was used with data updated through 2013. Recreational catch data was adjusted using methods from the September 2014 MRIP Calibration workshop and the rescaled MRIP landings were used. A selectivity block (2011-2013) was applied on all recreational fleets to accommodate recent changes in fishing behavior that indicated a shift in in selectivity to older (heavier) fish in recent years. The revised recreational landings were generally 10% to 20% higher than in SEDAR 31, but the revised discards also showed proportionately higher rates than in SEDAR 31. The results of the update assessment indicated that Gulf-wide, the stock biomass estimates are continuing to increase, but remain below the management target of 26% SPR. Stock biomass is continuing to increase in the western Gulf, but in the eastern Gulf, stock biomass estimates have shown a slight downward trend in recent years, which resulted from strong year-classes exiting the stock, as well as recent low recruitment estimates.

The combined east and west stock biomass estimates, while increasing, remain below the minimum stock size threshold, indicating that the stock remains in an overfished condition. However, estimated fishing mortality remains below the maximum fishing mortality threshold, indicating that overfishing is not occurring.

Definition of Overfishing

In January 2012, the Generic ACL/AM Amendment (GMFMC 2011b) became effective. One of the provisions in this amendment was to redefine overfishing. In years when there is a stock assessment, overfishing is defined as the fishing mortality rate exceeding the maximum fishing mortality threshold. In years when there is no stock assessment, overfishing is defined as the catch exceeding the OFL. The update assessment indicates that, as of the terminal year of the assessment data, 2013, overfishing was not occurring. In 2014, both the recreational and commercial sector landings remained below their respective quotas (Table 3.1.2). Therefore, total landings remained below the OFL in 2014, and overfishing was again not occurring in the red snapper stock. Note that, because the overfishing threshold is now re-evaluated each year instead of only in years when there is a stock assessment, this status could change on a year-to-year basis.

General Information on Reef Fish Species

The National Ocean Service collaborated with NMFS and the Council to develop distributions of reef fish (and other species) in the Gulf (SEA 1998). The National Ocean Service obtained fishery-independent data sets for the Gulf, including SEAMAP, and state trawl surveys. Data from the Estuarine Living Marine Resources Program contain information on the relative abundance of specific species (highly abundant, abundant, common, rare, not found, and no data) for a series of estuaries, by five life stages (adult, spawning, egg, larvae, and juvenile) and month for five seasonal salinity zones (0-0.5, 0.5-5, 5-15, 15-25, and >25 parts per thousand). National Ocean Service staff analyzed these data to determine relative abundance of the mapped species by estuary, salinity zone, and month. For some species not in the Estuarine Living Marine Resources Program database, distribution was classified as only observed or not observed for adult, juvenile, and spawning stages.

In general, reef fish are widely distributed in the Gulf, occupying both pelagic and benthic habitats during their life cycle. Habitat types and life history stages are summarized in Table 3.3.1 and can be found in more detail in GMFMC (2004a). In general, both eggs and larval stages are planktonic. Larvae feed on zooplankton and phytoplankton. Exceptions to these generalizations include the gray triggerfish that lay their eggs in depressions in the sandy bottom, and gray snapper whose larvae are found around submerged aquatic vegetation (SAV). Juvenile and adult reef fish are typically demersal, and are usually associated with bottom topographies on the continental shelf (<328 feet; <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. Juvenile red snapper are common on mud bottoms in the northern Gulf, particularly from Texas to Alabama. Also, some juvenile snappers (e.g. mutton, gray, red, dog, lane, and yellowtail snappers) and groupers (e.g. goliath grouper, red, gag, and yellowfin groupers) have been documented in inshore seagrass beds, mangrove estuaries, lagoons, and larger bay systems (GMFMC 1981). More detail on hard bottom substrate and coral can be found in the FMP for Corals and Coral Reefs (GMFMC and SAFMC 1982).

Table 3.3.1. Summary of habitat utilization by life history stage for species in the Reef Fish FMP.

Common name	Eggs	Larvae	Early Juveniles	Late juveniles	Adults	Spawning adults
Red Snapper	Pelagic	Pelagic	Hard bottoms, Sand/ shell bottoms, Soft bottoms	Hard bottoms, Sand/ shell bottoms, Soft bottoms	Hard bottoms, Reefs	Sand/ shell bottoms
Queen Snapper	Pelagic	Pelagic	Unknown	Unknown	Hard bottoms	
Mutton Snapper	Reefs	Reefs	Mangroves, Reefs, SAV, Emergent marshes	Mangroves, Reefs, SAV, Emergent marshes	Reefs, SAV	Shoals/ Banks, Shelf edge/slope
Blackfin Snapper	Pelagic		Hard bottoms	Hard bottoms	Hard bottoms, Shelf edge/slope	Hard bottoms, Shelf edge/slope
Cubera Snapper	Pelagic		Mangroves, Emergent marshes, SAV	Mangroves, Emergent marshes, SAV	Mangroves, Reefs	Reefs
Gray Snapper	Pelagic, Reefs	Pelagic, Reefs	Mangroves, Emergent marshes, Seagrasses	Mangroves, Emergent marshes, SAV	Emergent marshes, Hard bottoms, Reefs, Sand/ shell bottoms, Soft bottoms	
Lane Snapper	Pelagic		Mangroves, Reefs, Sand/ shell bottoms, SAV, Soft bottoms	Mangroves, Reefs, Sand/ shell bottoms, SAV, Soft bottoms	Reefs, Sand/ shell bottoms, Shoals/ Banks	Shelf edge/slope
Silk Snapper	Unknown	Unknown	Unknown	Unknown	Shelf edge	
Yellowtail Snapper	Pelagic		Mangroves, SAV, Soft bottoms	Reefs	Hard bottoms, Reefs, Shoals/ Banks	
Wenchman	Pelagic	Pelagic			Hard bottoms, Shelf edge/slope	Shelf edge/slope
Vermilion Snapper	Pelagic		Hard bottoms, Reefs	Hard bottoms, Reefs	Hard bottoms, Reefs	

Common name	Eggs	Larvae	Early Juveniles	Late juveniles	Adults	Spawning adults
Gray Triggerfish	Reefs	Drift algae, *Sargassum*	Drift algae, *Sargassum*	Drift algae, Reefs, *Sargassum*	Reefs, Sand/ shell bottoms	Reefs, Sand/ shell bottoms
Greater Amberjack	Pelagic	Pelagic	Drift algae	Drift algae	Pelagic, Reefs	Pelagic
Lesser Amberjack			Drift algae	Drift algae	Hard bottoms	Hard bottoms
Almaco Jack	Pelagic		Drift algae	Drift algae	Pelagic	Pelagic
Banded Rudderfish		Pelagic	Drift algae	Drift algae	Pelagic	Pelagic
Hogfish			SAV	SAV	Hard bottoms, Reefs	Reefs
Blueline Tilefish	Pelagic	Pelagic			Hard bottoms, Sand/ shell bottoms, Shelf edge/slope, Soft bottoms	
Tilefish (golden)	Pelagic, Shelf edge/ Slope	Pelagic	Hard bottoms, Shelf edge/slope, Soft bottoms	Hard bottoms, Shelf edge/slope, Soft bottoms	Hard bottoms, Shelf edge/slope, Soft bottoms	
Goldface Tilefish	Unknown					
Speckled Hind	Pelagic	Pelagic			Hard bottoms, Reefs	Shelf edge/slope
Yellowedge Grouper	Pelagic	Pelagic		Hard bottoms	Hard bottoms	
Atlantic Goliath Grouper	Pelagic	Pelagic	Mangroves, Reefs, SAV	Hard bottoms, Mangroves, Reefs, SAV	Hard bottoms, Shoals/ Banks, Reefs	Reefs, Hard bottoms
Red Grouper	Pelagic	Pelagic	Hard bottoms, Reefs, SAV	Hard bottoms, Reefs	Hard bottoms, Reefs	

Common name	Eggs	Larvae	Early Juveniles	Late juveniles	Adults	Spawning adults
Warsaw Grouper	Pelagic	Pelagic		Reefs	Hard bottoms, Shelf edge/slope	
Snowy Grouper	Pelagic	Pelagic	Reefs	Reefs	Hard bottoms, Reefs, Shelf edge/slope	
Black Grouper	Pelagic	Pelagic	SAV	Hard bottoms, Reefs	Hard bottoms, Mangroves, Reefs	
Yellowmouth Grouper	Pelagic	Pelagic	Mangroves	Mangroves, Reefs	Hard bottoms, Reefs	
Gag	Pelagic	Pelagic	SAV	Hard bottoms, Reefs, SAV	Hard bottoms, Reefs	
Scamp	Pelagic	Pelagic	Hard bottoms, Mangroves, Reefs	Hard bottoms, Mangroves, Reefs	Hard bottoms, Reefs	Reefs, Shelf edge/slope
Yellowfin Grouper			SAV	Hard bottoms, SAV	Hard bottoms, Reefs	Hard bottoms

Source: Adapted from Table 3.2.7 in the final draft of the EIS from the Generic EFH Amendment (GMFMC 2004a) and consolidated in this document.

Status of Reef Fish Stocks

The Reef Fish FMP currently encompasses 31 species (Table 3.3.2). Eleven other species were removed from the FMP in 2012 through the Generic ACL/AM Amendment (GMFMC 2011b). Stock assessments and stock assessment reviews have been conducted for 13 species and can be found on the Council (www.gulfcouncil.org) and SEDAR (www.sefsc.noaa.gov/sedar) websites. The assessed species are:

- Red Snapper (SEDAR 7 2005; SEDAR 7 Update 2009; SEDAR 31 2013; SEDAR 31 Update 2015)
- Vermilion Snapper (Porch and Cass-Calay 2001; SEDAR 9 2006a; SEDAR 9 Update 2011a)
- Yellowtail Snapper (Muller et al. 2003; SEDAR 3 2003; O'Hop et al. 2012)
- Mutton Snapper (SEDAR 15A 2008; SEDAR 15A Update 2015)
- Gray Triggerfish (Valle et al. 2001; SEDAR 9 2006b; SEDAR 9 Update 2011b)
- Greater Amberjack (Turner et al. 2000; SEDAR 9 2006c; SEDAR 9 Update 2010; SEDAR 33a 2014)
- Hogfish (Ault et al. 2003; SEDAR 6 2004a; SEDAR 37 2013)
- Red Grouper (NMFS 2002; SEDAR 12 2007; SEDAR 12 Update 2009)
- Gag (Turner et al. 2001; SEDAR 10 2006; SEDAR 10 Update 2009; SEDAR 33b 2014)
- Black Grouper (SEDAR 19 2010)
- Yellowedge Grouper (Cass-Calay and Bahnick 2002; SEDAR 22 2011a)
- Tilefish (Golden) (SEDAR 22 2011b)
- Atlantic Goliath Grouper (Porch et al. 2003; SEDAR 6 2004b; SEDAR 23 2011)

The NMFS Office of Sustainable Fisheries updates its Status of U.S. Fisheries Report to Congress on a quarterly basis utilizing the most current stock assessment information. The most recent update can be found at: (http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/). The status of both assessed and unassessed stocks as of the writing of this report is shown in Table 3.3.2.

Table 3.3.2. Species of the Reef Fish FMP grouped by family.

Common Name	Scientific Name	Stock Status
Family Balistidae – Triggerfishes		
Gray Triggerfish	*Balistes capriscus*	Overfished, no overfishing
Family Carangidae – Jacks		
Greater Amberjack	*Seriola dumerili*	Overfished, no overfishing
Lesser Amberjack	*Seriola fasciata*	Unknown
Almaco Jack	*Seriola rivoliana*	Unknown
Banded Rudderfish	*Seriola zonata*	Unknown
Family Labridae - Wrasses		
Hogfish	*Lachnolaimus maximus*	Unknown
Family Malacanthidae - Tilefishes		
Tilefish (Golden)	*Lopholatilus chamaeleonticeps*	Not overfished, no overfishing
Blueline Tilefish	*Caulolatilus microps*	Unknown
Goldface Tilefish	*Caulolatilus chrysops*	Unknown
Family Serranidae - Groupers		
Gag	*Mycteroperca microlepis*	Overfished, no overfishing
Red Grouper	*Epinephelus morio*	Not overfished, no overfishing
Scamp	*Mycteroperca phenax*	Unknown
Black Grouper	*Mycteroperca bonaci*	Not overfished, no overfishing
Yellowedge Grouper	**Hyporthodus flavolimbatus*	Not overfished, no overfishing
Snowy Grouper	**Hyporthodus niveatus*	Unknown
Speckled Hind	*Epinephelus drummondhayi*	Unknown
Yellowmouth Grouper	*Mycteroperca interstitialis*	Unknown
Yellowfin Grouper	*Mycteroperca venenosa*	Unknown
Warsaw Grouper	**Hyporthodus nigritus*	Unknown
**Atlantic Goliath Grouper	*Epinephelus itajara*	Unknown
Family Lutjanidae - Snappers		
Queen Snapper	*Etelis oculatus*	Unknown
Mutton Snapper	*Lutjanus analis*	Not overfished, no overfishing
Blackfin Snapper	*Lutjanus buccanella*	Unknown
Red Snapper	*Lutjanus campechanus*	Overfished, no overfishing
Cubera Snapper	*Lutjanus cyanopterus*	Unknown
Gray Snapper	*Lutjanus griseus*	Unknown
Lane Snapper	*Lutjanus synagris*	Unknown
Silk Snapper	*Lutjanus vivanus*	Unknown
Yellowtail Snapper	*Ocyurus chrysurus*	Not overfished, no overfishing
Vermilion Snapper	*Rhomboplites aurorubens*	Not overfished, no overfishing
Wenchman	*Pristipomoides aquilonaris*	Unknown

Notes: * In 2013 the genus for yellowedge grouper, snowy grouper, and warsaw grouper was changed by the American Fisheries Society from *Epinephelus* to *Hyporthodus* (American Fisheries Society 2013).

**Atlantic goliath grouper is a protected grouper and benchmarks do not reflect appropriate stock dynamics. In 2013 the common name was changed from goliath grouper to Atlantic goliath grouper by the American Fisheries Society to differentiate from the Pacific goliath grouper, a newly named species (American Fisheries Society 2013).

Bycatch

Bycatch is defined as fish harvested in a fishery, but not sold or retained for personal use. This definition includes both economic and regulatory discards, and excludes fish released alive under a recreational catch-and-release fishery management program. Economic discards are generally undesirable from a market perspective because of their species, size, sex, and/or other characteristics. Regulatory discards are fish required by regulation to be discarded, but also include fish that may be retained but not sold. Bycatch practicability analyses of the reef fish fishery have been provided in several reef fish amendments and focused to some degree on the component of the fishery affected by the actions covered in the amendment. A bycatch practicability analysis has been conducted and included in Appendix H. The bycatch related to this action may impact red snapper, other reef fish species, protected resources, and birds. However, these impacts are not expected to change from status quo.

Protected Species

There are 29 different species of marine mammals that may occur in the Gulf. All 29 species are protected under the Marine Mammal Protection Act and seven are also listed as endangered under the Endangered Species Act (ESA) (i.e., sperm, sei, fin, blue, humpback, and North Atlantic right whales and the West Indian manatee). Other species protected under the ESA occurring in the Gulf include five sea turtle species (Kemp's ridley, loggerhead, green, leatherback, and hawksbill); two fish species (Gulf sturgeon and smalltooth sawfish), and two coral species (elkhorn coral and staghorn coral). Information on the distribution, biology, and abundance of these protected species in the Gulf is included in the final EIS to the Generic EFH Amendment (GMFMC 2004a) and the February 2005, October 2009, and September 2011 ESA biological opinions on the reef fish fishery (NMFS 2005; NMFS 2009; NMFS 2011a). Marine Mammal Stock Assessment Reports and additional information are also available on the NMFS Office of Protected Species website: http://www.nmfs.noaa.gov/pr/species/.

The Gulf reef fish fishery is classified in the Marine Mammal Protection Act 2013 List of Fisheries as a Category III fishery (78 FR 53336, August 29, 2013). This classification indicates the annual mortality and serious injury of a marine mammal stock resulting from any 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. Dolphins are the only species documented as interacting with these fisheries. Bottlenose dolphins prey upon on the bait, catch, and/or released discards of fish from the reef fish fishery. They are also a common predator around reef fish vessels, feeding on the discards.

All five species of sea turtles are adversely affected by the Gulf reef fish fishery. Incidental captures are relatively infrequent, but occur in all commercial and recreational hook-and-line and longline components of the reef fish fishery. Captured sea turtles can be released alive or can be found dead upon retrieval of the gear as a result of forced submergence. Sea turtles released alive may later succumb to injuries sustained at the time of capture or from exacerbated trauma from fishing hooks or lines that were ingested, entangled, or otherwise still attached when they

were released. Sea turtle release gear and handling protocols are required in the commercial and for-hire reef fish fisheries to minimize post-release mortality.

Smalltooth sawfish are also affected by the Gulf reef fish fishery, but to a much lesser extent. Smalltooth sawfish primarily occur in the Gulf off peninsular Florida. Incidental captures in the commercial and recreational hook-and-line components of the reef fish fishery are rare events, with only eight smalltooth sawfish estimated to be incidentally caught annually, and none are expected to result in mortality (NMFS 2005). Fishermen in this fishery are required to follow smalltooth sawfish safe handling guidelines. The long, toothed rostrum of the smalltooth sawfish causes this species to be particularly vulnerable to entanglement in fishing gear.

On September 30, 2011, the Protected Resources Division released a biological opinion, which concluded that the continued operation of the Gulf reef fish fishery is not likely to jeopardize the continued existence of sea turtles (loggerhead, Kemp's ridley, green, hawksbill, and leatherback) or smalltooth sawfish (NMFS 2011a). An incidental take statement was issued specifying the amount and extent of anticipated take, along with reasonable and prudent measures and associated terms and conditions deemed necessary and appropriate to minimize the impact of these takes. The Council addressed measures to reduce take in the reef fish fishery's longline component in Amendment 31 (GMFMC 2009). Other listed species and designated critical habitat in the Gulf were determined not likely to be adversely affected.

On July 10, 2014, NMFS published a final rule designating 38 occupied marine areas within the Atlantic Ocean and Gulf of Mexico as critical habitat for the Northwest Atlantic Ocean loggerhead sea turtle distinct population segment (79 FR 39856). NMFS concluded in September 16, 2014, memos that activities associated with the subject FMP will not adversely affect any of the aforementioned critical habitat units. On September 10, 2014, NMFS published a final rule (79 FR 53852) listing 20 new coral species under the ESA. Four of those new species occur in federal waters in the Gulf of Mexico (*Mycetophyllia ferox, Orbicella annularis, O. faveolata, and O. franksi*); all were listed as threatened. In memos dated September 16, 2014, and October 7, 2014, NMFS determined that activities associated with the subject FMP will not adversely affect any of the newly listed coral species. In the October 7, 2014, memo NMFS also determined that although the September 10, 2014, Final Listing Rule provided some new information on the threats facing *Acropora*, none of the information suggested that the previous determinations were no longer valid.

Deepwater Horizon MC252 Oil Spill

Overview

On April 20, 2010 an explosion occurred on the Deepwater Horizon MC252 semi-submersible oil rig approximately 36 nautical miles (41 statute miles) off the Louisiana coast. Two days later the rig sank. An uncontrolled oil leak from the damaged well continued for 87 days until the well was successfully capped by British Petroleum on July 15, 2010. The Deepwater Horizon MC252 oil spill affected at least one-third of the Gulf area from western Louisiana east to the Florida Panhandle and south to the Campeche Bank in Mexico (Figure 3.3.1).

As reported by the National Oceanic and Atmospheric Administration Office of Response and Restoration (NOAA 2010), the oil from the Deepwater Horizon MC252 spill is relatively high in alkanes which can readily be used by microorganisms as a food source. As a result, the oil from this spill is likely to biodegrade more readily than crude oil in general. The Deepwater Horizon MC252 oil is also relatively much lower in polycyclic aromatic hydrocarbons. Polycyclic aromatic hydrocarbons are highly toxic chemicals that tend to persist in the environment for long periods of time, especially if the spilled oil penetrates into the substrate on beaches or shorelines. Like all crude oils, MC252 oil contains volatile organic compounds (VOCs) such as benzene, toluene, and xylene. Some VOCs are acutely toxic, but because they evaporate readily, they are generally a concern only when oil is fresh.[9]

In addition to the crude oil, over one 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 well head (National Commission 2010). No large-scale applications of dispersants in deep water had been conducted prior to the Deepwater Horizon MC252 oil spill.

Oil could exacerbate the development of the hypoxic "dead" zone in the Gulf, similar in effect as higher than normal input of water laden with fertilizer runoff from the Mississippi River basin. For example, oil on the surface of the water could restrict the normal process of atmospheric oxygen mixing into and replenishing oxygen concentrations in the water column. In addition, microbes in the water that break down oil and dispersant consume oxygen; this metabolic process further depletes oxygen in the adjacent waters.

General Impacts on Fishery Resources

The presence of PAHs in marine environments can have detrimental impacts on marine finfish, especially during the more vulnerable larval stage of development (Whitehead et al. 2011). When exposed to realistic yet toxic levels of PAHs (1–15 µg/L), greater amberjack (*Seriola dumerili*) larvae develop cardiac abnormalities and physiological defects (Incardona et al. 2014). The future reproductive success of long-lived species, including red drum (*Sciaenops ocellatus*) and many reef 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 (Mendelssohn 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).

An increase in histopathological lesions were found in red snapper (*Lutjanus campechanus*) in the area affected by the oil, but Murawski et al. (2014) found that the incidence of lesions had declined between 2011 and 2012. The occurrence of such lesions in marine fish is not uncommon (Sindermann 1979; Haensly et al. 1982; Solangi and Overstreet 1982; Khan and Kiceniuk 1984, 1988; Kiceniuk and Khan 1987; Khan 1990). Red snapper diet was also affected after the spill. A decrease in zooplankton consumed, especially by adults (>400 mm TL) over

[9] Source: http://sero.nmfs.noaa.gov/sf/deepwater_horizon/OilCharacteristics.pdf

natural and artificial substrates may have contributed to an increase in the consumption of fish and invertebrate prey- more so at artificial reefs than natural reefs (Tarnecki and Patterson 2015).

The effect of oil, dispersants, and the combination of oil and dispersants on fishes of the Gulf remains an area of concern. Marine fish species typically concentrate PAHs in the digestive tract, making stomach bile an appropriate testing medium. A study by Synder et al. (2015) assessed bile samples from golden tilefish (*Lopholatilus chamaeleonticeps*), king snake eel (*Ophichthus rex*), and red snapper for PAH accumulation over time, and reported concentrations were highest in golden tilefish during the same time period when compared to king snake eel, and red snapper. These results suggest that the more highly associated an organism is with the sediment in an oil spill area, the higher the likelihood of toxic PAH accumulation. Twenty-first century dispersant applications are thought to be less harmful than their predecessors. However, the combination of oil and dispersants have 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). Another study found that while Corexit 9500A® and oil are similar in their toxicity, when Corexit 9500A® and oil were mixed in lab tests, toxicity to microscopic rotifers increased up to 52-fold (Rico-Martínez et al. 2013). These studies suggest that the toxicity of the oil and dispersant combined may be greater than anticipated.

Deepwater Coral Communities

Deepwater corals are particularly vulnerable to episodic mortality events such as oil spills, since corals are immobile. Severe health declines have been observed in three deepwater corals in response to dispersant alone (2.3–3.4 fold) and the oil–dispersant mixtures (1.1–4.4 fold) compared to oil-only treatments (DeLeo et al. 2015). Increased dispersant concentrations appeared to exacerbate these results. As hundreds of thousands of gallons of dispersant were applied near the wellhead during the Deepwater Horizon oil spill, the possibility exists that deepwater corals may have been negatively impacted by the oil spill and subsequent spill remediation activities.

Several studies have documented declines in coral health or coral death in the presence of oil from the Deepwater Horizon MC252 (White et al. 2011; Hsing et al. 2013; Fisher et al. 2014). Sites as far as 11 km southwest of the spill were documented to have >45% of the coral colonies affected by oil (White et al. 2011; Hsing et al. 2013), and, though less affected, a site 22 km in 1900 m of water had coral damage caused by oil (Fisher et al. 2014). Coral colonies from several areas around the wellhead had damage to colonies that seemed to be representative of microdroplets as all colonies were not affected, and colonies that were affected had patchy distributions of damaged areas (Fisher et al. 2014). Because locations of deep-sea corals are still being discovered, it is likely that the extent of damage to deep-sea communities will remain undefined.

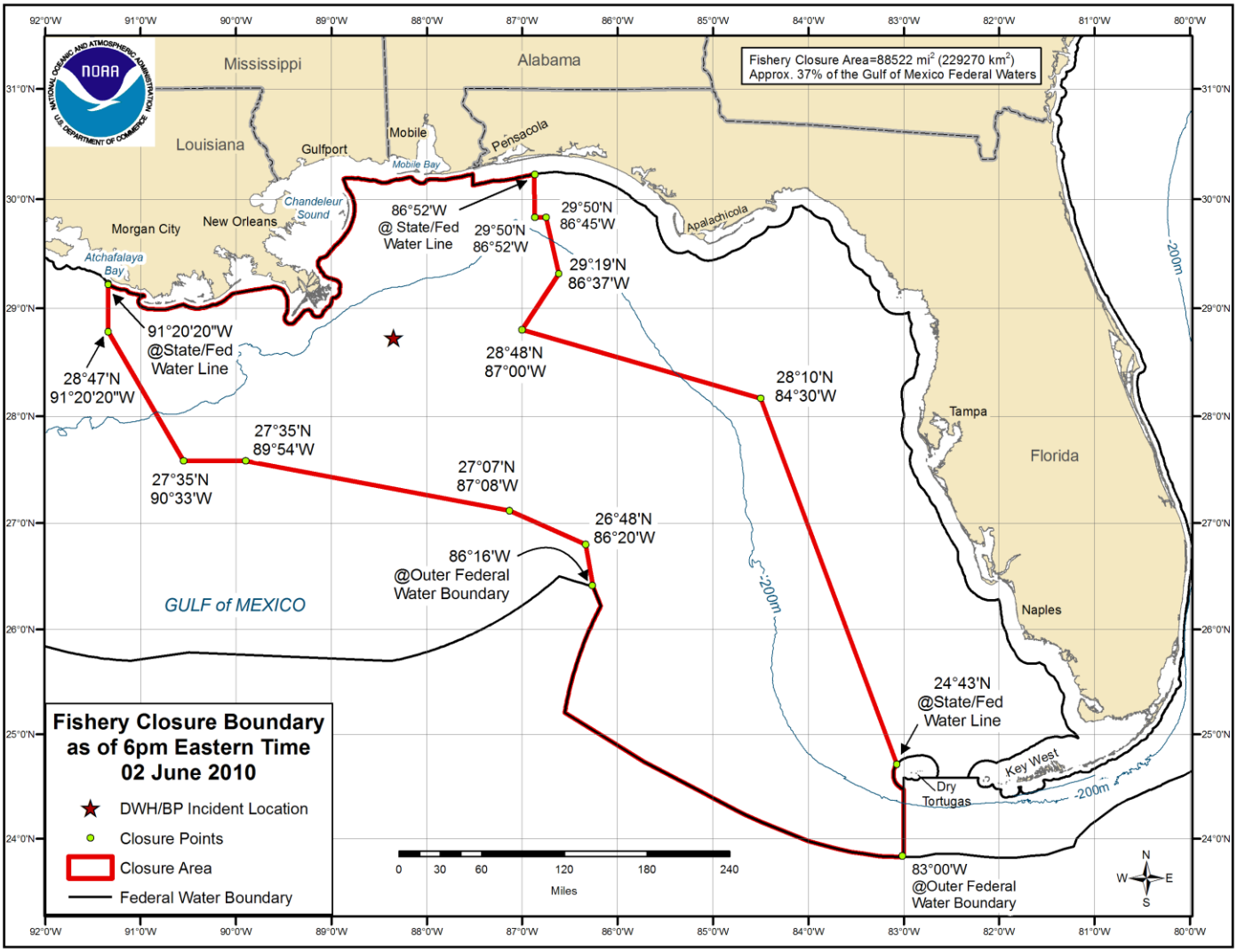


Figure 3.3.1. Fishery closure at the height of the Deepwater Horizon MC252 oil spill.

3.4 Description of the Economic Environment

3.4.1 Commercial Sector

A description of the commercial sector is provided in GMFMC (2013) and is incorporated herein by reference. Because this proposed amendment would only change management of the recreational sector, an update of the information on the commercial sector provided in GMFMC (2013) is not provided.

3.4.2 Recreational Sector

Angler Effort

Recreational effort derived from the Marine Recreational Information Program (MRIP) database can be characterized in terms of the number of trips as follows:

- Target effort – The number of individual angler trips, regardless of duration, where the intercepted angler indicated that the species or a species in the species group was targeted as either the first or second primary target for the trip. The species did not have to be caught.
- Catch effort – The number of individual angler trips, regardless of duration and target intent, where the individual species or a species in the species group was caught. The fish did not have to be kept.
- Total recreational trips – The total estimated number of recreational trips in the Gulf, regardless of target intent or catch success.

Other measures of effort are possible, such as directed trips (the number of individual angler trips that either targeted or caught a particular species), among other measures. Estimates of the number of red snapper target trips and catch trips for the shore, charter, and private/rental boat modes in the Gulf for 2011-2014 are provided in Table 3.4.2.1 and Table 3.4.2.2. Estimates of red snapper target effort for additional years, and other measures of directed effort, are available at http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/queries/index.

Table 3.4.2.1. Number of red snapper recreational target trips, by state[1] and mode, 2011-2014.

	Alabama	West Florida	Louisiana	Mississippi	Total
	Charter Mode				
2011	19,010	29,642	1,424	0	50,076
2012	16,609	24,653	7,204	74	48,539
2013	23,638	32,689	7,191	38	63,556
2014	9,050	7,358	[2]	0	nc
Average	17,077	23,586	5,273[3]	28	45,964
	Private/Rental Mode				
2011	116,886	113,021	19,900	16,790	266,597
2012	72,030	136,594	43,547	13,515	265,687
2013	222,245	461,349	24,691	21,586	729,871
2014	56,918	165,498	[2]	7,555	nc
Average	117,020	219,116	29,379[3]	14,862	380,377
	All Modes				
2011	135,896	142,663	21,324	16,790	316,673
2012	88,640	161,247	50,751	13,589	314,227
2013	245,883	494,038	31,882	21,624	793,427
2014	65,968	172,856	[2]	7,555	nc
Average	134,097	242,702	34,652[3]	14,890	426,341

[1]Texas information unavailable.
[2]The MRIP survey was not conducted in Louisiana in 2014.
[3]Average for 2011-2013.
nc – not computed because of the absence of Louisiana data.
Source: MRIP database, NMFS, SERO.
Note: These effort estimates have not been re-calibrated. Re-calibrated effort data are currently unavailable.
Note: There were no target trips recorded from the shore mode.

Table 3.4.2.2. Number of red snapper recreational catch trips, by state[1] and mode, 2011-2014.

	Alabama	West Florida	Louisiana	Mississippi	Total
	Charter Mode				
2011	43,550	101,500	3,066	221	148,336
2012	25,252	105,385	10,501	74	141,211
2013	52,331	107,466	12,321	38	172,157
2014	36,340	66,559	[2]	0	nc
Average	39,368	95,228	8,629[3]	83	143,308
	Private/Rental Mode				
2011	130,500	203,567	31,957	6,169	372,193
2012	83,783	282,332	51,377	13,515	431,007
2013	227,889	537,469	55,679	29,250	850,287
2014	110,593	233,265	[2]	10,254	nc
Average	138,191	314,158	46,338[3]	14,797	513,484
	All Modes				
2011	174,050	305,067	35,023	6,390	520,530
2012	109,035	387,717	61,878	13,589	572,219
2013	280,221	644,935	68,000	29,288	1,022,444
2014	146,933	299,824	[2]	10,254	nc
Average	177,559	409,386	54,967[3]	14,880	656,792

[1]Texas information unavailable.
[2]The MRIP survey was not conducted in Louisiana in 2014.
[3]Average for 2011-2013.
nc – not computed because of the absence of Louisiana data.
Source: MRIP database, NMFS, SERO.
Note: These effort estimates have not been re-calibrated. Re-calibrated effort data are currently unavailable.
Note: There were no catch trips recorded from the shore mode.

Similar analysis of recreational effort is not possible for the headboat mode because headboat data are not collected at the angler level. Headboat angler effort is calculated as angler days, which are a standardized count of trips that result from the combination of partial-day, full-day, and multiple-day trips. Unlike the situation for charter vessels, the estimates of headboat angler days include just trips on federally permitted vessels. The stationary "fishing for demersal (bottom-dwelling) species" nature of headboat fishing, as opposed to trolling, suggests that most, if not all, headboat trips and, hence, angler days, are demersal or reef fish trips by intent. The distribution of headboat effort (angler days) by geographic area is presented in Table 3.4.2.3. For purposes of data collection, the headboat data collection program divides the Gulf into several areas.

Table 3.4.2.3. Gulf headboat angler days, by state, 2011–2014.

	Angler Days				
	West Florida	**Florida/Alabama[1]**	**Mississippi/Louisiana[2]**	**Texas**	**Total**
2011	79,722	77,303	3,657	47,284	207,966
2012	84,205	77,770	3,680	51,776	217,431
2013	94,752	80,048	3,406	55,749	233,955
2014	102,841	88,524	3,257	51,231	245,853
Average	90,380	80,911	3,500	51,510	226,301

Source: (SRHS.
West Florida = Florida from the Dry Tortugas through the Florida Middle Grounds, Florida/Alabama = northwest Florida and Alabama.
[1]For 2013, SRHS data was reported separately for NW Florida and Alabama, but has been combined here for consistency with previous years.
[2]Mississippi and Louisiana are combined for confidentiality purposes.

Permits

The for-hire sector is comprised of charter vessels and headboats (party boats). Although charter vessels tend to be smaller, on average, than headboats, the key distinction between the two types of operations is how the fee is determined. On a charter boat trip, the fee charged is for the entire vessel, regardless of how many passengers are carried, whereas the fee charged for a headboat trip is paid per individual angler.

A federal for-hire vessel permit has been required for both types of vessels for reef fish since 1996 and is a limited access permit. On May 6, 2015, there were 1,320 valid (non-expired) or renewable Gulf Charter/Headboat Reef Fish permits, including historical captain permits. A renewable permit is an expired permit that may not be actively fished, but is renewable for up to one year after expiration. Although the for-hire permit application collects information on the primary method of operation, the permit itself does not identify the permitted vessel as either a headboat or a charter vessel and vessels may operate in both capacities. However, only federally permitted headboats are required to submit harvest and effort information to the NMFS Southeast Region Headboat Survey (SRHS). Participation in the SRHS is based on determination by the Southeast Fishery Science Center (SEFSC) that the vessel primarily operates as a headboat. As of May 6, 2015, 69 Gulf headboats were registered in the SRHS (K. Fitzpatrick, NMFS SEFSC, pers. comm.).

Information on Gulf charter boat and headboat operating characteristics is included in Savolainen et al. (2012) and is incorporated herein by reference.

There are no specific federal permitting requirements for recreational anglers to fish for or harvest reef fish. Instead, anglers are required to possess either a state recreational fishing permit that authorizes saltwater fishing in general, or be registered in the federal National Saltwater Angler Registry system, subject to appropriate exemptions. For the for-hire sector, customers are authorized to fish under the charter or headboat vessel license and are not required to hold

their own fishing licenses. As a result, it is not possible to identify with available data how many individual anglers would be expected to be affected by this proposed action.

Economic Value

Economic value can be measured in the form of consumer surplus (CS) per additional red snapper kept on a trip for anglers (the amount of money that an angler would be willing to pay for a fish in excess of the cost to harvest the fish). The estimated value of the CS per fish for a second red snapper kept on a trip is approximately $79.72 (Carter and Liese 2012; values updated to 2013 dollars[10]).

With regards to for-hire businesses, economic value can be measured by producer surplus (PS) per passenger trip (the amount of money that a vessel owner earns in excess of the cost of providing the trip). Estimates of the PS per for-hire passenger trip are not available. Instead, net operating revenue (NOR), which is the return used to pay all labor wages, returns to capital, and owner profits, is used as a proxy for PS. The estimated NOR value is $151 (2013 dollars) per charter angler trip (Liese and Carter 2012). The estimated NOR value per headboat angler trip is $52 (2013 dollars) (C. Liese, NMFS SEFSC, pers. comm.). Estimates of NOR per red snapper target trip are not available.

Business Activity

The desire for recreational fishing generates economic activity as consumers spend their income on various goods and services needed for recreational fishing. This spurs economic activity in the region where recreational fishing occurs. It should be clearly noted that, in the absence of the opportunity to fish, the income would presumably be spent on other goods and services and these expenditures would similarly generate economic activity in the region where the expenditure occurs. As such, the analysis below represents a distributional analysis only.

Estimates of the business activity (economic impacts) associated with recreational angling for red snapper were derived using average impact coefficients for recreational angling for all species, as derived from an add-on survey to the Marine Recreational Fisheries Statistics Survey (MRFSS) to collect economic expenditure information, as described and utilized in NMFS (2011b). Estimates of the average expenditures by recreational anglers are also provided in NMFS (2011b) and are incorporated herein by reference.

Recreational fishing generates business activity (economic impacts). Business activity for the recreational sector is characterized in the form of full-time equivalent jobs, output (sales) impacts (gross business sales), and value-added impacts (difference between the value of goods and the cost of materials or supplies). Estimates of the average red snapper target effort (2011-2014) and associated business activity (2013 dollars) are provided in Table 3.4.2.5. West Florida experienced the highest level of business activity associated with recreational red snapper fishing for all the Gulf States[11], followed by Alabama.

[10] Converted to 2013 dollars using the 2013 annual Consumer Price Index (CPI) for all US urban consumers provided by the Bureau of Labor and Statistics (BLS).
[11] Excludes Texas for which target effort data is unavailable.

The estimates provided in Table 3.4.2.5 only apply at the state-level. These numbers are not additive across the region. Addition of the state-level estimates to produce a regional (or national total) could either under- or over-estimate the actual amount of total business activity because of the complex relationship between different jurisdictions and the expenditure/impact multipliers. Neither regional nor national estimates are available at this time.

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

Table 3.4.2.5. Summary of red snapper target trips (2011-2014 average) and associated business activity (2013 dollars). The output, value added, and jobs impact estimates are not additive across states.

	Alabama	West Florida	Louisiana	Mississippi	Texas
	Private/Rental Mode				
Target Trips	117,020	219,116	29,379	14,862	*
Output Impact	$6,324,091	$11,848,997	$2,220,463	$523,061	*
Value Added Impact	$3,422,393	$6,709,550	$1,067,020	$266,046	*
Jobs	68	102	17	5	*
	Charter Mode				
Target Trips	17,077	23,586	5,273	28	*
Output Impact	$10,913,013	$17,296,265	$2,550,132	$11,340	*
Value Added Impact	$7,468,284	$11,563,482	$1,753,524	$7,988	*
Jobs	106	152	20	0	*
	All Modes				
Target Trips	134,097	242,702	34,652	14,890	*
Output Impact	$17,237,104	$29,145,261	$4,770,595	$534,401	*
Value Added Impact	$10,890,677	$18,273,032	$2,820,543	$274,034	*
Jobs	174	254	37	5	*

*Because target information is unavailable, associated business activity cannot be calculated.
Note: There were no target trips recorded from the shore mode.
Source: effort data from the MRIP, economic impact results calculated by NMFS SERO using the model developed for NMFS (2011b).

3.5 Description of the Social Environment

A description of the social environment for the commercial and recreational sectors' harvest of red snapper is provided in GMFMC (2013a). Amendment 40 (GMFMC 2014) and Amendment 28 (GMFMC 2015) include descriptions of the federal for-hire and private angling components of the recreational sector, a history of managing the recreational harvest of red snapper, and a discussion of communities engaged and reliant on red snapper or fishing in general. These documents are incorporated here by reference. This plan amendment would affect management of the recreational sector, only. Thus, a summary of the information provided in the referenced documents for the recreational sector is included here.

Red snapper is harvested recreationally in all five Gulf States. The proportion of total recreational landings by State for the years 1986 through 2014 is provided in Table 2.6.1. Landings by State are not constant; the proportion of the quota represented by each State's landings varies from year to year. Across time, the proportion of landings made up by the eastern Gulf States (Alabama and western Florida) has increased compared to the western Gulf States (Texas and Louisiana), as the rebuilding plan has proceeded and the stock has returned and expanded in the east.

Red snapper landings for the recreational sector are not available at the community level, making it difficult to identify communities as dependent on recreational fishing for red snapper. Data reflecting commercial landings of red snapper may or may not reflect areas of importance for recreational fishing of red snapper. It cannot be assumed that the proportion of commercial red snapper landings among other species in a community would be similar to its proportion among recreational landings within the same community because of sector differences in fishing practices and preferences.

While there are no landings data at the community level for the recreational sector, Table 3.5.1 offers a ranking of communities based upon the number of reef fish charter permits and reef fish charter permits divided by population. This is a crude measure of the reliance upon recreational reef fish fishing, is general in nature and not specific to red snapper. Ideally, additional variables quantifying the importance of recreational fishing to a community would be included (such as the amount of recreational landings in a community, availability of recreational fishing related businesses and infrastructure, etc.); however, these data are not available at this time. Because the analysis used discrete geo-political boundaries, Panama City and Panama City Beach had separate values for the associated variables. Calculated independently, each still ranked high enough to appear in the list suggesting a greater importance for recreational fishing in that region.

At this time it is not possible to examine the intensity of recreational fishing activity at the community level for a specific species. However, it is likely that those communities that have a higher rank in terms of charter for-hire activity and have a dynamic commercial fishery for red snapper will likely have a vigorous recreational red snapper fishery. The communities that meet those criteria include: Destin, Panama City and Panama City Beach, and Pensacola, Florida; Galveston and Freeport, Texas; and Venice and Grand Isle, Louisiana. Other communities that

rank high for recreational fishing activity are located near one of the top 15 communities with commercial landings of red snapper (Figure 3.4.1.1 in GMFMC 2015). These include Orange Beach and Dauphin Island, Alabama, near Bayou LaBatre and Grand Bay, Alabama, each of which ranks among the top 15 commercial red snapper communities. Within close proximity to one another, Port Aransas, Port O'Connor, and Corpus Christi, Texas each rank among the top communities for charter for-hire activity (Table 3.5.1), suggesting a dynamic recreational fishery in the area. Social effects resulting from actions taken in this plan amendment are likely to be greatest in these communities.

Table 3.5.1. Average community rank by total number of reef fish charter permits and divided by community population.

State	Community	Reef Fish charter permits	Permit Rank	Pop	Permit/Pop	Permit/Pop rank	Combined rank
AL	Orange Beach	105	2	5185	0.0203	3	5
LA	Venice	36	7	202	0.1782	1	8
FL	Destin	114	1	12307	0.0093	10	11
AL	Dauphin Island	19	12	1375	0.0138	5	17
TX	Port Aransas	33	9	3444	0.0096	9	18
LA	Grand Isle	14	17	597	0.0235	2	19
TX	Freeport	40	5	12183	0.0033	15	20
TX	Port O'Connor	15	15	1253	0.0120	7	22
FL	Panama City	60	3	36795	0.0016	20	23
FL	Steinhatchee	13	19	1047	0.0124	6	25
FL	Pensacola	43	4	52903	0.0008	22	26
FL	Panama City Beach	32	10	11364	0.0028	16	26
FL	Apalachicola	17	14	2357	0.0072	12	26
FL	Naples	35	8	20405	0.0017	19	27
LA	Chauvin	15	15	3220	0.0047	13	28
TX	Galveston	38	6	49990	0.0008	23	29
FL	Cedar Key	8	27	463	0.0173	4	31
TX	Matagorda	8	27	710	0.0113	8	35
MS	Biloxi	26	11	43921	0.0006	25	36
FL	Mexico Beach	9	25	1181	0.0076	11	36
FL	Carrabelle	10	23	2612	0.0038	14	37
FL	Sarasota	18	13	52877	0.0003	26	39
FL	Madeira Beach	11	21	4335	0.0025	18	39
FL	Port St Joe	10	23	3560	0.0028	17	40
FL	Tarpon Springs	14	17	23071	0.0006	24	41
FL	St Petersburg	12	20	245715	0.0000	27	47
FL	Treasure Island	8	27	6847	0.0012	21	48
TX	Houston	11	21	2068026	0.0000	29	50
TX	Corpus Christi	9	26	299324	0.0000	28	54

Source: Southeast Regional Office, 2012.

To better understand how these communities are engaged and reliant on fishing, indices were created using secondary data from permit and landings information for the commercial and recreational sectors (Jepson and Colburn 2013; Jacob et al. 2012). Fishing engagement is primarily the absolute numbers of permits, landings, and value. Fishing reliance has many of the same variables as engagement divided by population to give an indication of the per capita impact of this activity.

Using a principal component and single solution factor analysis each community receives a factor score for each index to compare to other communities. With the selected communities from both sectors, factor scores of both engagement and reliance were plotted onto bar graphs. Factor scores are denoted by colored bars and are standardized, therefore the mean is zero. Two thresholds of one and ½ standard deviation above the mean are plotted onto the graphs to help determine a threshold for significance. Because the factor scores are standardized a score above 1 is also above one standard deviation. Using the thresholds of fishing dependence of ½ and one standard deviation, Figure 3.5.1 suggests that several communities are substantially engaged, reliant, or both on recreational fishing, in general.

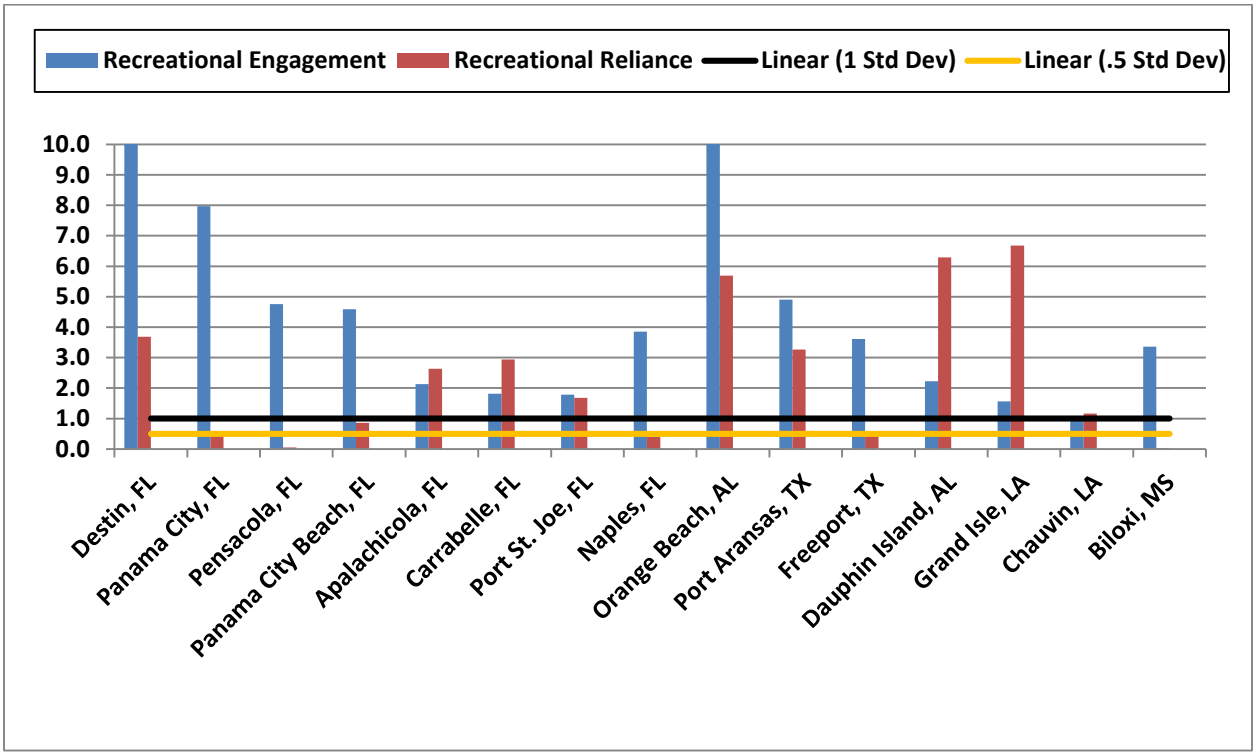


Figure 3.5.1. Top 15 recreational fishing communities' engagement and reliance.
Source: Southeast Regional Office, social indicators database (2012).

3.5.1 Environmental Justice Considerations

Executive Order 12898 requires federal agencies conduct their programs, policies, and activities in a manner to ensure individuals or populations are not excluded from participation in, or denied

the benefits of, or subjected to discrimination because of their race, color, or national origin. In addition, and specifically with respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. The main focus of Executive Order 12898 is to consider "the disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories…" This executive order is generally referred to as environmental justice (EJ).

Recreational red snapper fishermen and associated businesses and communities along the coast may be affected by this proposed action. However, information on race, ethnicity, and income status for groups at the different participation levels (private anglers, for-hire captains, crew, and customers, and employees of recreational fishing businesses, etc.) is not available, because these types of data are not collected by NMFS or other agencies. To identify potential areas of EJ concern, this analysis uses a suite of indices created to examine the social vulnerability of coastal communities (Jepson and Colburn 2013). The three indices are poverty, population composition, and personal disruptions. The variables included in each of these indices have been identified through the literature as being important components that contribute to a community's vulnerability. Indicators such as increased poverty rates for different groups, more single female-headed households, households with children under the age of five, disruptions such as higher separation rates, higher crime rates, and unemployment all are signs of populations experiencing vulnerabilities. Communities that exceed the threshold for one or more of the indices would be expected to exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change, and greater vulnerability is suggested by exceeding the thresholds for multiple indices.

These indicators of vulnerability have been developed using secondary data at the community level because it does not exist for fishermen individually and is not collected through permit application or other programs that might be vehicles for this type of data. Because these types of data are not collected at the individual level by NMFS or other agencies, it is difficult to understand the social vulnerabilities that might exist on either a household or individual basis. Therefore, it is hard to recognize or attribute impacts that will directly affect individuals who are fishermen or work in a related business because what those specific vulnerabilities may be remains unknown. Therefore, this measure of vulnerability is a broader measure at the community level and not specific to fishermen or the related businesses and their employees.

The recreational communities most engaged and reliant on fishing in general are identified in Figure 3.5.1. Figure 3.5.1.1 provides the community scores for the three social vulnerability indices. The communities of Apalachicola, Carrabelle, and Panama City, Florida; Grand Isle, and Venice, Louisiana; Dauphin Island, Alabama; and Freeport, Texas exceed the threshold of ½ standard deviation above the mean for at least one of the social vulnerability indices. It would be expected that these communities may exhibit vulnerabilities to social or economic disruption because of regulatory change, and would be the communities most likely subject to EJ concerns. Those communities that exhibit several index scores exceeding the threshold would be the most vulnerable. These include Apalachicola and Carrabelle, Florida; and Freeport, Texas. Social

effects resulting from action taken in this plan amendment are likely to be greatest in these communities.

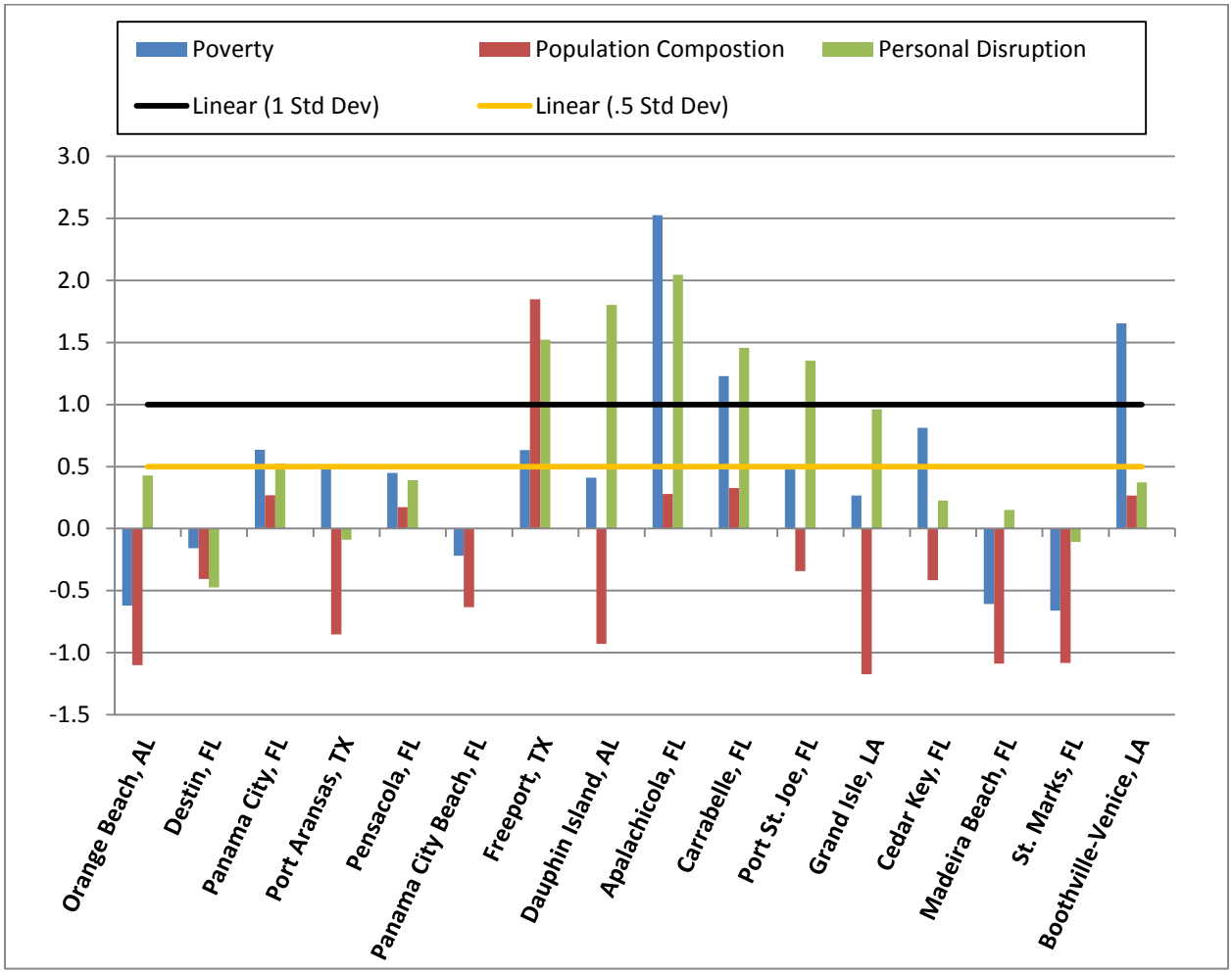


Figure 3.5.1.1. Social vulnerability indices for recreational fishing communities. Source: Southeast Regional Office, social indicators database (2012).

The actions in this amendment would implement a regional management program for the recreational management of red snapper in which states or regions will be authorized to adapt certain management measures to regional conditions. It is assumed that the flexibility provided to adopt management measures most appropriate to a given region would result in optimal fishing opportunities for local anglers which in turn, would result in benefits to local communities. As will be addressed in the social effects analysis for each action (Chapter 4), direct impacts are not expected to accrue to the social environment from most actions of this amendment, which establish the parameters of the program. However, indirect effects (positive or negative) may result due to 1) the specific regulations implemented in each region, 2) how any new regulations differ from existing regulations, and 3) the success or failure of cooperation under the new management regime. Disproportionate impacts to EJ populations are not expected to result from any of the actions in this amendment. Nevertheless, because the regulations to be implemented in each region remain unknown, the lack of impacts on EJ populations cannot be

assumed. Finally, there are no known claims for customary usage or subsistence consumption of Gulf red snapper by any population including tribes or indigenous groups.

3.6 Description of the Administrative Environment

3.6.1 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 federal waters (the exclusive economic zone, or EEZ), an area extending 200 nautical miles from the seaward boundary of each of the coastal states, and authority over U.S. anadromous species and continental shelf resources that occur beyond federal waters.

Responsibility for federal fishery management is shared by the Secretary of Commerce (Secretary) and eight regional fishery management councils that represent the expertise and interests of constituent states. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary is responsible for promulgating regulations to implement proposed plans and amendments after ensuring management measures are consistent with the Magnuson-Stevens Act and with other applicable laws summarized in Appendix B. In most cases, the Secretary has delegated this authority to NMFS.

The Council is responsible for fishery resources in federal waters of the Gulf. These waters extend to 200 nautical miles offshore from the nine-mile seaward boundary of the states of Florida and Texas, and the three-mile seaward boundary of the states of Alabama, Mississippi, and Louisiana. The length of the Gulf coastline is approximately 1,631 miles. Florida has the longest coastline of 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 through participation on advisory panels and through Council meetings that, with few exceptions for discussing personnel matters, national security, or litigation briefings, are open to the public. The regulatory process is also in accordance with the Administrative Procedures Act, in the form of "notice and comment" rulemaking, which provides extensive opportunity for public scrutiny and comment, and requires consideration of and response to those comments.

Regulations contained within FMPs are enforced through actions of the National Oceanic and Atmospheric Administration (NOAA) Office of Law Enforcement, the United States Coast Guard, and various state authorities. To better coordinate enforcement activities, federal and state enforcement agencies have developed cooperative agreements to enforce the Magnuson-Stevens Act. These activities are being coordinated by the Council's Law Enforcement Advisory Panel and the Gulf States Marine Fisheries Commission's Law Enforcement Committee, which

have developed a 5-year "Gulf of Mexico Cooperative Law Enforcement Strategic Plan – 2008-2012."

The red snapper stock in the Gulf is classified as overfished, but no longer undergoing overfishing. A rebuilding plan for red snapper was first implemented under Amendment 1 (GMFMC 1989), and has undergone several revisions. The current rebuilding plan was established in Reef Fish Amendment 27/Shrimp Amendment 14 (GMFMC 2007), and calls for rebuilding the stock to a level capable of supporting maximum sustainable yield on a continuing basis by 2032. Periodic adjustments to the ACL and other management measures needed to affect rebuilding are implemented through amendments and framework actions.

3.6.2 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 Gulf States exercises legislative and regulatory authority over their respective state's 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 in Amendment 22 (GMFMC 2004b).

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

4.1 Action 1 – Regional Management

4.1.1 Direct and Indirect Effects on the Physical Environment

Direct and indirect effects on the physical environment by the red snapper fishery have been discussed in detail in Reef Fish Amendment 22 and Reef Fish Amendment 27/Shrimp Amendment 14 (GMFMC 2004b and 2007) and are incorporated here by reference. The primary gear used by the recreational sector is hook-and-line. Hook-and-line gear has the potential to snag and entangle bottom structures. Each individual set has a very small footprint and thus only a small potential for impact, but the cumulative impacts from recreational fishing could result in a large amount of gear being placed in the water, increasing the potential for impact. The line and weights used by this gear type also can cause abrasions (Barnette 2001). Additionally, vessels used for hook-and-line fishing often anchor, adding to the potential damage of the bottom at fishing locations. If hook-and-line gear is lost, long-term indirect effects to habitat may occur if marine life becomes entangled in the gear or the gear is overgrown with algae (Hamilton 2000; Barnette 2001). Circle hooks are required in the reef fish fishery. Because of the design of circle hooks, this gear is less likely to snag bottom habitat than other hook types.

Action 1 would have no direct effect on the physical environment. This action is administrative because it determines who has the authority to set red snapper regulations in federal waters. This action could indirectly affect the physical environment in different areas or times of the Gulf of Mexico (Gulf) by redirecting how and when fishing is conducted between different Gulf States or regions. **Alternative 1** (No Action) would continue Gulf-wide federal management of red snapper. **Alternative 2** would delegate certain management measures to the regions. Depending on the deviation of the management measures from status quo, this may cause some spatial and temporal shift in the impacts to the physical environment. **Alternative 3** and **Preferred Alternative 4** would allow the regions to propose conservation equivalency plans (CEP) to harvest their portion of the red snapper annual catch limit (ACL). The regional regulations could indirectly effect the physical environment should remain similar to status quo regardless of the potential spatial and temporal shift of the impacts. Should different management regimes be implemented between regions under these alternatives, this could affect how fishing is conducted. For example, reducing the red snapper bag limit for one region could lead to a prolonged fishing season for that region. This could result in an increase in the number of red snapper fishing trips, and because red snapper is a part of a multispecies fishery, result in an overall increase in the amount of reef fish fishing, particularly if the ability to catch red snapper would encourage more reef fish fishermen to go fishing. Under this scenario, an increase in fishing in a particular area or over a particular time period would likely add to any adverse effects on the physical environment from fishing. Adverse effects to the physical environment would be lessened if resultant regional red snapper management measures developed by the regions (**Alternative 2**) or through CEPs (**Alternative 3** and **Preferred Alternative 4**) resulted in a reduction in fishing effort for red snapper or reef fish. **Preferred Alternative 5** would limit these effects to ten (**Option 5a**), five (**Preferred Option 5b**), three (**Option 5c**) or two (**Option 5d**) years, unless the Council decided to extend this program.

4.1.2 Direct and Indirect Effects on the Biological/Ecological Environment

Direct and indirect effects on the biological/ecological environment from the harvest of red snapper have been discussed in detail in Reef Fish Amendment 22 and Reef Fish Amendment 27/Shrimp Amendment 14 (GMFMC 2004b and 2007) as well as in the March 2013 Framework Action (GMFMC 2013a) and January 2015 Framework Action (GMFMC 2015b) and are incorporated here by reference. The impacts of the 2010 Deepwater Horizon MC252 oil spill on the biological/ecological environments in the Gulf of Mexico are discussed in Sections 3.2 and 3.3 of the Affected Environment. Red snapper management actions that affect the biological/ecological environment mostly relate to the impacts of fishing on a species' population size, life history, and species interactions within its habitat. Removal of fish from the population through fishing reduces the overall population size. Fishing gears have different selectivity patterns which refers to a fishing method's ability to target and capture organisms by size and species. Effects from different selectivities include the number of discards mostly sublegal fish and fish caught during seasonal closures and the mortality associated with releasing these fish.

Because this action determines the Council's preferred method for establishing the authority to set recreational red snapper regulations in federal waters, direct effects are not expected to result on the biological/ecological environment. Indirect effects could result for the biological environment depending on the management measures (i.e., bag limits and seasons) established for each region. Without knowing the bag limits and seasons that each region would establish, the biological effects from **Alternative 2, Alternative 3,** and **Preferred Alternative 4** remain unknown compared to **Alternative 1** (No Action). However, any biological effects from the alternatives would be expected to be minimal because the regulations established by each region would need to constrain harvest to the region's apportionment of the recreational sectors ACL, and the collective management from all states/regions must be consistent with the biological and conservation requirements of the rebuilding plan and not harm the biological status of the resource. Further, any regional overage would be accounted for under the accountability measures selected in Action 7. This would ensure the impacts from any regions overharvest would be mitigated in the following year. Additionally, NMFS and the Council will remain involved with data collection and scheduling stock assessments for red snapper through the Southeast Data, Assessment, and Review (SEDAR) process to ensure the red snapper stock continues to recover.

Preferred Alternative 5 allows the Council the flexibility of establishing a sunset provision on the selected regional management approach to occur after 2 (**Option 5d**), 3 (**Option 5c**), 5 (**Preferred Option 5b),** or 10 years (**Option 5a**). Biological/ecological effects would not be expected to result from the adoption of a sunset provision for this action.

Stock assessments factor in the effects of management measures on stock status including bycatch. Types of bycatch and bycatch from various gear types and sectors is discussed in Appendix H. Establishing different regional bag limits and seasons for the recreational sector could make the stock assessment process more burdensome, but are not expected to negatively impact the rebuilding plan. The red snapper stock is managed under sector ACLs, ACTs, and

AMs to minimize the risk of overfishing. However, if a region's management measures are found to adversely affect the red snapper stock by exceeding the ACL, the Council and NMFS would need to take action to address these effects. For example, NMFS may need to modify the AMs in Action 7 or revise the review process for the conservation equivalency plans that the regions provide. Because the recreational red snapper measures that might ultimately result from all of the actions and alternatives in this amendment remain unknown and the effects on the ecosystem remain largely unknown. As ecosystem modeling improves and scientists better identify the effects of populations in response to each other (i.e., competition and predatory-prey relationships). The effects of management actions on the biological/ecological environment and the resulting ecosystem are expected to be better qualified.

4.1.3 Direct and Indirect Effects on the Economic Environment

Because the recreational red snapper management measures that might ultimately result from all of the actions and alternatives considered in this proposed amendment are unknown, the following assessment provides a qualitative discussion of the expected economic effects of this proposed action. Additionally, **Preferred Alternative 5** deals only with the duration of any regional management authorization adopted. As a result, **Preferred Alternative 5** is only comparable to **Alternative 1** and not **Alternative 2**, **Alternative 3**, or **Preferred Alternative 4**.

Most of the actions and alternatives considered in this proposed amendment address management considerations that progressively build upon previous actions. For example, Action 1 addresses the option to adopt a regional approach (through delegation or conservation equivalency) to the management of the recreational harvest of red snapper, Action 3 (Section 4.3) defines the regions, and Action 6 (Section 4.6) specifies the regional allocations. A decision to not adopt regional management (through delegation or conservation equivalency) would render the subsequent actions that define the scope and/or parameters of regional management moot. Alternatively, the effects of regionalization would be expected to vary by the scope of regionalization (number and/or geographic extent of regions) and the flexibility the regions would have to vary the red snapper recreational harvest regulations (season, bag, size limit, etc.). Thus, because these actions are progressively related, the net potential effects of one action will be determined by the decisions made for subsequent actions and vice versa. Although this interrelation does not prevent comparison of the expected effects of the alternatives considered under each action, the total effects that may ultimately accrue to an individual action and alternative are dependent on subsequent decisions for the other actions.

The underlying expectation for most of the actions considered in this proposed amendment is that the establishment of smaller "regulatory jurisdictions" (hereafter referred to as "regionalization") may be capable of providing the constituents (residents and tourists) in each region with red snapper recreational harvest regulations better suited to local preferences, resulting in increased benefits. These benefits may be economic, social, or biological. Discussion of the expected biological and social effects of each action is provided elsewhere in this document. The resultant management expected to collectively (from all states/regions) result from the proposed actions should be, at worst, biologically neutral compared to the status quo, i.e., the resultant management should not harm the biological status of the resource or compromise the biological progress and goals of current management. From this context, the

following discussion of the expected economic effects of Action 1 and subsequent actions assumes that the biological status of the resource and progress toward the biological goals is not harmed by the proposed collective actions. As a result, discussion of the potential economic effects arising from any potential change in the biological status of red snapper will be limited to, where appropriate for this and subsequent actions, discussion of the reasonableness of maintaining this assumption (no biological harm) under the alternatives considered.

Action 1 would establish a structure that would allow, but not require, regions to exercise limited control of the recreational harvest of red snapper in federal waters. As a result, the adoption of any of the alternatives considered would allow certain subsequent actions or behaviors to occur, with associated economic consequences, but not require these actions or behaviors. For example, a region could be given authority to manage the harvest of red snapper by the recreational sector in federal waters but choose not to exercise that authority. Because Action 1 would allow, but not require, subsequent actions, all of the economic effects discussed below would be indirect effects. Additionally, because the potential authorities to act are discretionary and not mandatory, failure to exercise the authority would be expected to result in the foregone net increase in any benefits associated with regional management. These benefits would also be foregone under **Alternative 1** if the Council elects, in the future, to not establish regional management measures more attuned to local preferences, for which current authority exists, if sufficient justification can be developed.

To reiterate, regionalization would be expected to result in management measures better tailored to localized preferences. The greater the regulatory control by these regions, assuming no biological harm to the red snapper resource, the greater the potential gain in economic benefits. Depending on the form of regionalization adopted, certain responsibilities and conditions would apply that may affect management costs for the regions, specifically the costs of regulatory development and implementation, monitoring, and enforcement. Acceptance of delegation of authority (**Alternative 2**) would require each region to develop and undertake a process to identify and implement the management measures each region wishes to impose. This may result in increased management costs to the regions, depending on the extent that the regions established mirror current regulatory jurisdictions (for example, individual states versus multi-state "unions;" see Section 4.3) and the existence and/or complexity of the processes these regions undertake to develop and implement current regulatory authority (individual states have processes to establish regulations in their state waters, whereas multi-state "unions" do not and would have to develop such). Additional discussion on these potential costs is provided in Section 4.3.3. Regardless of the current processes in place and/or similarity of current regulatory jurisdictions with the regions that may be established by this proposed amendment, the increased management authority of the regions would be expected to increase the regulatory development costs of the affected regions (broader regulatory authority would be expected to result in a more time-consuming and costly management process). For NMFS and the Council, the regulatory burden, and associated costs, may decline, particularly if the regions are effective in restraining harvest to their allocation. If the regions are not effective in restraining harvest, then the total management cost could increase. It cannot be determined whether the total management cost under **Alternative 2** would be more than, less than, or equal to the cost under **Alternative 1**. This is also the case under **Alternative 3** and **Preferred Alternative 4**, which would allow the states to adopt conservation equivalency management instead of receiving delegated authority.

Thus, it may not be unreasonable to project that the management cost might not change. However, regardless of the relationship of the management costs of **Alternative 3** and **Preferred Alternative 4** (and **Alternative 2**) relative to **Alternative 1**, **Preferred Alternative 4** would be expected to result in higher management costs than **Alternative 3** because of the recurring costs associated with the technical review committee requirement.

It is noted that the management costs discussed in the previous paragraph refer only to the costs associated with the development of appropriate regulations. A key cost in the management of red snapper (and other species) is the cost of data collection and harvest monitoring. Regardless of the alternative chosen, the current NMFS data collection and harvest monitoring programs would continue. As a result, all costs associated with these programs will remain unchanged (except, as appropriate, as a result of programmatic budgetary changes to improve the general quality of these programs, budget appropriation changes, changes in methodology or technology, etc.). Although certain regulatory authority would be transferred to the specified regions under **Alternatives 2-4**, no region would be required to implement new data collection or harvest monitoring programs. Thus, duplication of data collection or harvest monitoring costs would not be required. However, the potential consequences of triggering the proposed AMs (see Action 7, Section 4.7.3) may motivate a region to take additional steps, beyond current monitoring procedures, to decrease the likelihood that they exceed their allocation. If enhanced monitoring occurs, the regional costs of harvest monitoring would increase. However, this would be a discretionary expense, and not a necessary outcome of this or other actions, and would only be expected to occur if the expected costs of enhanced monitoring were less than the expected costs of exceeding the allocation.

It is also noted that the importance of limiting harvest to the allocation cannot be overstated. Because of the popularity of red snapper as a target and harvest species, the suggested dependency of businesses on red snapper at certain times of the year, and the business and community needs of regular patronage, the red snapper recreational sector of the reef fish fishery needs both stable harvest amounts and fishing seasons. This means that, to maximize benefits, a region cannot be expected to rely on or thrive under feast and famine cycles, harvesting large overruns one year, followed by a payback the next. Although an overrun would be associated with increased business traffic and angler expenditures (and higher economic benefits because the harvest regulations should be better tailored to local constituent preferences), the subsequent payback would not be expected to satisfy constituent demand in the following year and may seriously jeopardize the ability of businesses to survive until the regions' allocation "recovers" (the payback ends). Thus, large annual harvest fluctuations should be avoided.

Under the regionalization envisioned under **Alternative 2**, **Alternative 3**, and **Preferred Alternative 4**, the red snapper management measures within each region would primarily be enforced dockside and not at sea. Exceptions to dockside enforcement would likely include if a fisherman is in possession of fish when federal waters are closed – either in part or in total, subject to the regulations established as a result of this proposed amendment (as a result of Action 5, or closure under default regulations, etc.) - to the harvest or possession of red snapper, or is in possession of fish that are in violation of the bag or minimum size limits of all regions. As a result, federal enforcement costs associated with the recreational harvest of red snapper could decline. Although this would not be expected to reduce the total federal enforcement costs

(assuming an enforcement budget not driven by the needs of individual species, sectors, or fisheries), it may be possible to shift enforcement effort to other purposes and increase the economic benefits associated with these tasks/needs. With respect to regional enforcement costs, the total enforcement costs may increase. On-the-water enforcement by state agents would be expected to continue for other species/fisheries and marine activities. Thus, these costs may not change. However, shifting the enforcement of red snapper recreational harvest regulations to the docks may require an increased dockside presence and associated costs. As a result, overall, enforcement costs under **Alternative 2**, **Alternative 3**, or **Preferred Alternative 4** would be expected to be higher than the enforcement costs under **Alternative 1**. No differences in the enforcement costs between **Alternative 2**, **Alternative 3**, or **Preferred Alternative 4**, however, have been identified or would be expected.

Finally, discussion of the potential effects of the alternatives on the likelihood of the alternate management structures effectively restraining harvest to the regional allocations and preserving the biological goals deserves note. Increasing a regions' ability to tailor the red snapper recreational regulations to the preferences of local constituents would be expected to increase the difficulty of achieving these two goals (restraining harvest and preserving the biological goals) because demand for red snapper fishing would be expected to increase (because of the more favorable fishing regulations; although not a certainty, increasing the length of the season or increasing the bag limit would be expected to result in increased effort). As a result, the greater the regional flexibility, the greater the likelihood that targets will be exceeded, overages occur, paybacks be required, and economic benefits not maximized. Regions may attempt to have flexible seasonal end dates and expect to be capable of monitoring harvests in real-time, such that overages can be minimized. However, recreational data collection is expensive and harvest monitoring difficult. Further, the economic benefits of a "fixed" season would be reduced if the season is not allowed to occur as forecast (as a result of harvest monitoring leading to an earlier closure than forecast) and expectations that the season could be closed "early" increases the likelihood that trips are taken earlier in the season, thus causing deviation from historic effort (and harvest) patterns. This effect, combined with the potential general increase in demand because of the more favorable fishing regulations, increases the likelihood that the allocation would be exceeded. As a result, in practice, it may be more likely, at least in the short term, that fixed seasons are implemented, overages occur, and management in subsequent years continues to chase an elusive goal of limiting harvest to the allocation. If the resource is affected as this occurs, the adverse economic effects become compounded. Because the likelihood of these problems, and associated economic effects, would be expected to increase with greater regional flexibility, **Alternative 1** (current common management throughout federal waters) would be expected to least likely precipitate these problems. The likelihood of these problems would be expected to be the same for **Alternative 2**, **Alternative 3**, and **Preferred Alternative 4**.

Other than the economic effects associated with the administrative and procedural costs of determining the adequacy of proposed conservation equivalent measures submitted by the regions, as previously discussed, **Alternative 3** and **Preferred Alternative 4** may be expected to vary in the expected economic effects if the associated alternative review processes vary in the likelihood that approved plans are adequate for controlling harvest, or that excessively conservative management plans (resulting in forgone benefits) are avoided. However, it is not obvious that these two alternatives will vary in these aspects. NMFS would make the ultimate

determination of proposal adequacy under both alternatives, and would also be expected to be represented on the technical review committee required by **Preferred Alternative 4.** The access to expanded expertise through the use of a technical review committee **(Preferred Alternative 4)** could, in theory, result in more informed and better decisions. However, the expansion of participation in the review process could result in gridlock, delay decision making and effective management, and result in associated economic costs. If review authority is limited to NMFS, as would occur under **Alternative 3**, and results in equivalent decisions made in a more timely and efficient manner, then the economic benefits of this alternative would be greater than those of **Preferred Alternative 4**.

Beyond the differences thus far discussed, **Alternative 2**, **Alternative 3**, and **Preferred Alternative 4** differ only in their ability to be adopted/implemented. The ability to be adopted affects the likelihood that the associated expected economic benefits can be realized. Specifically, **Alternative 2** (delegation) requires a three-quarters majority vote of the voting members of the Gulf Council members for adoption, whereas **Alternative 3** and **Preferred Alternative 4** only require a simple majority. This is a procedural difference, however, and not one with an economic dimension other than, as stated, how this difference affects the likelihood that the potential economic benefits of regional management will be realized. Thus, assuming that the management measures that would be implemented by the regions would be invariant to the regional management approach adopted (delegation vs. conservation equivalency), both **Alternative 3** and **Preferred Alternative 4** would be expected to have a higher likelihood of achieving increased economic benefits than **Alternative 2**.

Collectively, because the expected economic effects of the proposed alternatives cannot be quantified, it is difficult to conclude a ranking of the alternatives based on the expected economic effects given the uncertainties discussed above. However, if the biological status and recovery of red snapper is protected and the regional allocation overages are minimized, then the more control given to the regions, the greater the expected economic benefits. Thus, from this perspective, **Alternative 2**, **Alternative 3**, and **Preferred Alternative 4** would each be expected to result in higher economic benefits than **Alternative 1**. The differences between **Alternatives 2-4** may be marginal to non-existent. Each, although authorized under different structures (delegation versus conservation equivalency), could result in the same red snapper management measures. As a result, if equally adoptable, each could result in the virtually the same economic effects, with the differences potentially reduced to higher procedural and administrative costs associated with the function of the technical review committee under **Preferred Alternative 4** compared to **Alternative 2** and **Alternative 3**. **Alternative 2**, however, may result in the least likelihood of the potential economic benefits of red snapper regulations better tailored to local conditions being realized because of the higher threshold required for Council approval.

Preferred Alternative 5 would limit the duration of the regional management program. Neither **Preferred Option 5b** nor **Options 5a, 5c,** or **5d** would be expected to affect the expected economic effects of regional management. Although there are economic benefits of management stability (stability allows fishermen and businesses greater opportunity to plan their activities and maximize their benefits), none of the options would limit the ability of the Council to rescind or extend regional management authority beyond the specified period of the options. In actual practice, the only period of management stability that might occur (i.e., unchanged

regional management authority) may be the period of time required to develop and implement a new plan amendment to change the appropriate authorities. This would be expected to take between one to three years, or less if interim regulation is justified. The only certain effect of the adoption of any sunset option, compared to **Alternative 1**, would be a requirement for Council action, with associated costs, to terminate the sunset. These costs would be expected to be minor, however, because management of the recreational harvest of red snapper would be expected to continue to be a routine topic of Council discussion and deliberation under regional management.

4.1.4 Direct and Indirect Effects on the Social Environment

As discussed in the previous section, most of the actions and alternatives under consideration in this plan amendment relate to and build upon previous actions, meaning that the total effects that may ultimately result from this action will relate to and depend on decisions made in other actions. Furthermore, the actions and alternatives considered in this amendment establish the parameters for a regional management program, but the actual harvest restrictions that might ultimately result from each region's management plan are unknown. Thus, direct effects are not expected and indirect effects are difficult to predict. Given these uncertainties, the following assessment provides a qualitative discussion comparing the potential indirect effects of the alternatives.

In part, regional management is being considered as a management option because of private recreational anglers' frustrations with existing recreational red snapper management. For example, the fishing season continues to be shortened despite the progress of the rebuilding plan. Additional impacts are not expected from maintaining red snapper management measures under **Alternative 1** (No Action). However, regional management is being considered in response to growing frustrations with status quo federal management and indirect benefits to the social environment are expected from enabling regional modification of management measures.

Nevertheless, potential indirect benefits from the ability to establish regionally preferred management measures for red snapper would be undermined, and potentially eliminated, if the adopted suite of management measures in a region results in the quota being caught faster. Structuring management measures to maximize preferred fishing times and practices would be expected to result in a region's quota being caught in a shorter amount of time, thus shortening the season and increasing the likelihood of an allocation overage if quota monitoring is either not implemented or is ineffective. Because a longer season is generally preferred by fishermen, there is a trade-off between providing greater flexibility to establish locally preferred management measures and a resulting increase in effort as the management measures provide anglers access under optimal conditions.

This action provides two broad approaches for the structure of the program: delegation (**Alternative 2**) or conservation equivalency measures (**Alternative 3** and **Preferred Alternative 4**). Under either approach, it is possible that the same suite of management measures could be adopted for the regions. The primary difference between the approaches concerns where management authority is held and the process for regions to establish their

recreational management measures for red snapper. These differences would not be expected to result in direct or indirect social effects.

As a form of co-management, successful regional management requires cooperation and sharing of responsibilities between state and federal fisheries managers (Berkes 2009). Delegation (**Alternative 2)** would involve a devolution of some management controls from NMFS to the regions. Devolving control of management to a more local scale is reported to provide social benefits by enabling greater participation and involvement of resource users, which in turn may lead to increased compliance (Jentoft et al. 1998). Under conservation equivalency measures (**Alternative 3** and **Preferred Alternative 4)**, authority for managing red snapper would remain with the Council and NMFS. Regions would provide their proposed management measures first to a review body, then to NMFS for final approval (**Preferred Alternative 4**), or directly to NMFS for review and approval (**Alternative 3**). Cooperation between state and federal level agencies would still be a critical component for successful regional management under the conservation equivalency model. Under all three alternatives, indirect effects would be expected to result from, and be in proportion to, the success or failure of the cooperation among managing institutions and the regions, which remains unknown at this time.

Establishing a fixed date when regional management would end (**Preferred Alternative 5**) has the potential to affect the social environment indirectly. If a sunset option is selected as preferred and regional management is functioning well, the Council would need to take action to continue regional management. Such action must be timely to avoid disruptions to the program which could occur if the sunset date is triggered before the respective action is implemented. On the other hand, if the program is meeting the needs of some regions but not others, inclusion of a sunset provision could prompt the Council to review the program and consider modifications in a timely manner to address the concerns of the dissatisfied regions. If the program is not functioning well, the Council may need to end the program sooner than the selected sunset option provides for, requiring development of the appropriate document. This may be most likely under the longest option for the sunset (10 years, **Option 5a**). Establishing a sunset on regional management after shorter periods of time (2 years, **Option 5d**; 3 years, **Option 5c** would allow less time for evaluating the success or failure of regional management, and could result in negative indirect effects if regional management is meeting the needs of the regions but the sunset is triggered before the Council could take action to extend or remove the sunset. **Preferred Option 5b** (5 years), would provide an intermediary timeframe for which the Council could evaluate the program and determine whether it should continue; thus any potential indirect effects would be intermediary between **Option 5a** and **Options 5c** and **5d**. Whether or not an option is selected as preferred, the Council retains the ability to modify or end the program by developing the appropriate plan amendment.

4.1.5 Direct and Indirect Effects on the Administrative Environment

Three alternatives for regional management programs are proposed through this action and could affect the administrative environment. **Alternative 1** (No Action) would retain Gulf-wide management of red snapper the status quo and not apply regional management; full authority for managing the red snapper recreational fishery would remain the responsibility of the Council and NMFS; there would be no changes to the administrative environment if **Alternative 1** is

selected. **Alternative 2, Alternative 3,** and **Preferred Alternative 4** establish a regional management system where the regions are granted certain management authority for red snapper recreational management, and **Preferred Alternative 5** could apply to any of **Alternative 2, Alternative 3,** and **Preferred Alternative 4**. As such, **Preferred Alternative 5** would affect the administrative environment for different periods of time from 2 to 10 years; those effects would increase/decrease as the number of years increase. **Alternative 2, Alternative 3,** and **Preferred Alternative 4** would be expected to reduce the administrative burden to the federal government and the Council, as limited management authority is transferred to specific regions. **Alternatives 2** and **Preferred Alternative 4** would further reduce the federal administrative burden compared to **Alternative 3**. **Alternative 2** would put a greater administrative burden on the States/regions to provide administrative support for their management of the red snapper recreational season, and **Preferred Alternative 4** would additionally put additional administrative burden on a committee designated outside the federal system. However, both would reduce federal administrative burden of implementing management measures for the red snapper recreational fishing efforts. **Alternative 3** and **Preferred Alternative 4** could potentially increase the federal administrative burden because NMFS would need to review and approve each region's proposal, and negotiate with regions should the regions' proposals not be acceptable. However, this may or may not increase total administrative burden compared to the current federal management system. The enforcement administrative burden is not likely to change; however, if it may be necessary shift from off-shore enforcement, as most enforcement would be dockside. If an angler harvests red snapper in federal waters of a region with closed state waters, they could land the fish in a neighboring region with open waters.

4.2 Action 2 –Regional Management and Sector Separation

4.2.1 Direct and Indirect Effects on the Physical Environment

Section 4.1.1 describes the effects from fishing on the physical environment and are not repeated here. This action to determine how sector separation would apply or not apply to regional management would have no direct effect on the physical environment. This action could indirectly affect the physical environment if changes in allocation between components results in an increase or decrease in the amount of fishing gear used to harvest red snapper. As stated in Amendment 40 (GMFMC 2014), the private angling component seems to be less efficient in harvesting red snapper than the for-hire component based on bag limit analyses reported in SERO (2012). The analysis indicated that charter vessels tend to catch slightly more red snapper on average than private vessels or headboats. Therefore, any increase in the proportion of the recreational quota caught by the private angler component would be expected to require more effort to catch fish compared to the for-hire component. This would increase the amount of interaction between fishing gear and the physical environment.

Alternative 1 (No Action) would not change the current fishing conditions. Under **Alternative** 1, the recreational sector's quota allocation of 42.3% to the federal for-hire component and 57.7% to the private angling component expire after the 2017 fishing year. If sector separation expires and the component sub-quotas go away, it is possible that the proportion of red snapper harvested by the private angling component could increase similar to the harvest trend prior to

Amendment 40 (GMFMC 2014). **Alternatives 2 and 3** would maintain the recreational sector's quota allocation between the components, capping harvest (effort) by the components and are expected to continue the benefits to the physical environment described in Amendment 40. **Alternative 4** would end the component sub-quotas implemented through Amendment 40 and allow regions to determine if separate management measures are needed between the private anglers and for-hire vessels. Therefore, with respect to effects on the physical environment, **Alternatives 2 and 3** would be most beneficial to the physical environment by limiting the amount of fishing effort by the components and **Alternative 1** would be the least beneficial because there could be a proportional increase in the private angling component harvest after Amendment 40's allocation expires. The effects of **Alternative 4** would be intermediate to the other alternatives and would be dependent on the degree regions limit red snapper fishing by the private anglers.

It should be noted that effects on the physical environment from this action regardless of the alternative would likely be minimal. Red snapper are part of the multispecies reef fish management unit. Therefore, even if red snapper are not available for harvest, fishermen would still continue to fish for other species and overall fishing effort would be minimally affected. In addition, recreational fishing for red snapper is controlled by a quota that should not be exceeded. Thus, there is a limit on the amount of directed fishing effort regardless of who harvests red snapper.

4.2.2 Direct and Indirect Effects on the Biological/Ecological Environment

Section 4.1.2 describes the effects from fishing on the biological/ecological environment and is not repeated here. This action to determine how sector separation would apply or not apply to regional management would have no direct effect and few indirect effects on the biological/ecological environment. Red snapper are part of the multispecies reef fish management unit. Even if red snapper are not available for harvest, fishermen would still continue to fish for other species and overall fishing effort would be minimally affected. Therefore, indirect effects from this action on other species and species' habitat (including protected species) are likely negligible. For red snapper, the most likely indirect effect on the stock from this action would be on discard mortality. Regulatory discards are fish that are caught, but not kept because they are too small, would put a fisherman over the bag limit, or are caught out of season. A certain percentage of these fish die and are called dead discards. The most recent red snapper stock assessment (SEDAR 31 2013) estimated dead discard rates for the recreational sector at 10%. However, the number of discards relative to the landed fish may differ between the private angling and federal for-hire components. For example, the relative number of landed fish between the charter boat and private angling vessels over the time period 1981-2011 was 45% to 55%, respectively (Data Workshop Report Figure 4.11.1 in SEDAR 31 2013). But the relative number of discards over the same time period was much lower for charter boats (31%) than the private angling vessels (69%) (Data Workshop Report Figure 4.11.4 in SEDAR 31 2013). Thus, the relative number of discarded fish compared to landed fish is less for charter fishing than for private angling[12].

[12] It should be noted that similar information was not available for headboat trips and so a similar comparison could not be made for this portion of the federal for-hire component.

Given the above, alternatives that would shift the proportion of recreationally harvested red snapper to the private angling component would likely increase the number of dead discards caught under the recreational quota. As mentioned in Section 4.2.1, **Alternatives 2** and **3** would continue the current recreational sector's quota allocation of 42.3% to the federal for-hire component and 57.7% to the private angling component that was implemented through Amendment 40 (GMFMC 2014). Therefore, the proportion of dead discards relative to the quota should remain constant. If the component allocations expire, as would occur under **Alternatives 1** (No Action) in 2017 and **Alternative 4** effective with the implementation of Amendment 39 rulemaking, then it is likely the proportion of dead discards relative to the quota will increase. This likelihood is based on trends noted in Amendment 40 (GMFMC 2015) of an increasing proportion of the recreational harvest being caught by the private angling component in recent years. Thus, **Alternatives 1** and **4** would likely have a more adverse effect on the red snapper stock relative to **Alternatives 2** and **3** because the number of red snapper dead discards is likely to increase. However, these effects would likely be minimal given that overall recreational red snapper fishing effort is limited by the recreational quota and that red snapper discards and associated discard mortality occur not only when red snapper fishing is open, but when the season is closed. During red snapper closures, fishermen targeting other reef fish species often catch red snapper as bycatch that cannot be landed.

4.2.3 Direct and Indirect Effects on the Economic Environment

Because the harvest restrictions that might ultimately result from all of the actions and alternatives considered in this proposed amendment are unknown, the following assessment provides a qualitative discussion of the expected economic effects of this proposed action. Portions of the discussion of the expected economic effects for Action 1 provided in Section 4.1.3 are relevant to the discussion of the economic effects expected to result from this action. Only some of the information provided in Section 4.1.3 is summarized in the following discussion and the reader is encouraged to read Section 4.1.3 for a full discussion of this information.

This proposed action would determine the components of the recreational sector that would be subject to regional management. Because this action would only establish a structural component of the management system that would be allowed under regional management, the resultant economic effects that would subsequently be expected to accrue to anglers, fishing or other businesses, and associated communities would be indirect economic effects of the proposed alternatives.

As previously discussed, the foundation of this proposed amendment is that regional control of the recreational harvest of red snapper would result in increased economic benefits because regional management can result in the implementation of harvest regulations that better match the preferences of local constituents. As discussed in Section 4.3.3, the establishment of more regions would be expected to result in greater economic benefits than the establishment of fewer regions because of the increased opportunity for regulatory localization. Extending this determination, the broader the opportunity for localized management, the closer a region can tailor management to the preferences of their constituents, and the more economic benefits can be increased. Embedded in this conclusion, however, is the assumption, as previously stated for

the other actions, that the resultant regulations meet the objectives of the FMP, which include, but are not limited to, limiting harvest to the allocation and not harming the resource or compromising resource recovery.

In the case of the current action, the concept "broader the opportunity" relates to the two recreational angler groups that harvest red snapper, as established by Amendment 40, the separate federal for-hire and private angler components. **Alternative 1**, **Alternative 2,** and **Alternative 3** would continue the separate management of these two angler components (sectors), whereas **Alternative 4** would end the separate management of the sectors. The duration of sector separation may vary under **Alternative 1** compared to **Alternative 2** and **Alternative 3;** the separation is scheduled to sunset in three years (i.e., in 2018) under Amendment 40 (though the sunset could be lifted through future action), while the sunset would be eliminated and sector separation would continue until ended by subsequent Council action under **Alternative 2** and **Alternative 3**. Prolonging sector separation may result in more economic benefits from both the longer time period and the possibility that certain economically favorable management measures might not be adopted under a shorter time horizon (e.g., a region may be reluctant to implement measures that cannot be continued in subsequent years due to the sunset of sector separation). Ending sector separation (**Alternative 4**) would eliminate the ability of a region to manage the two groups differently; all anglers, regardless of whether they fished from private vessels or for-hire vessels would be subject to the same bag limits and seasons. Key to this discussion is the determination in Amendment 40 that, over all, sector separation is expected to result in an increase in economic benefits due to the enhanced ability to better tailor management measures to the needs of each sector and improved harvest monitoring capability. Thus, maintaining sector separation, as would occur under **Alternative 1**, **Alternative 2**, and **Alternative 3,** would be expected to result in more economic benefits than ending sector separation, as would occur under **Alternative 4**.

Alternative 3 would be expected to result in greater economic benefits than **Alternative 2**. **Alternative 3** would allow greater flexibility at the regional level, because both components would be included, to tailor red snapper recreational management measures to local preferences. Additionally, the Gulf-wide economic benefits of **Alternative 3** would be expected to increase the more States are included (i.e., the greater the number of States that elect to manage both sectors as separate components).

Alternative 4 would be expected to result in the least economic benefits of the four alternatives considered because the benefits of sector separation would not occur.

4.2.4 Direct and Indirect Effects on the Social Environment

Under regional management, ACLs and annual catch targets (ACTs) would be created from the recreational ACL for each region, resulting in regional ACLs and regional ACTs. Regional ACLs would reflect the proportion of the recreational sector ACL apportioned to each region, and the regional ACT would be calculated based on the established buffer. However, the recreational sector ACL is currently divided into component ACTs for the years 2015-2017 (**Alternative 1**). This action determines the components of the recreational sector that would be

subject to regional management, given that the recreational sector ACL is currently divided between the private angling and federal for-hire components.

Because this action establishes a structural element for regional management, any resulting social effects would be indirect and relate to whether flexibility for managing toward local preferences is increased or decreased from current management (**Alternative 1**). A central assumption underlying this proposed amendment is that social benefits would increase by allowing greater regional flexibility in the recreational harvest of red snapper, because management measures could be established that better match the preferences of local constituents. On the other hand, there may be a trade-off in terms of maximizing flexibility at the expense of an overly complex regulatory system. As the recreational sector ACL is divided into more pieces (regional and component ACLs), it may be more difficult to constrain landings within a greater number of smaller ACLs, increasing the likelihood of triggering a post-season overage adjustment. Negative indirect effects would be expected from triggering an overage adjustment as the amount of fish that may be caught the following year is reduced.

The recreational components (private angling and federal for-hire) are being managed separately for the first time in 2015. Although each component is assigned a portion of the recreational sector ACL and are fishing under separate season closure provisions, all other management measures including the bag limit and season start date in federal waters remain the same for both components. The Council has initiated development of management plans for the federal for-hire component; Amendment 41 evaluates red snapper management for charter vessels and Amendment 42 evaluates reef fish management for headboats.

If **Alternative 1** (No Action) is selected and regional management is approved for final action prior to the end of 2017, the recreational sector ACL would continue to be divided between the two components of the recreational sector through 2017. Under **Alternative 1**, it would be unclear how the regional ACLs would be calculated, and to which component(s) of the recreational sector regional management would apply.

Alternatives 2-4 would remove the sunset on the separate management of the components of the recreational sector so the Council may specify whether regional management would apply to the private angling component only (**Alternative 2**), to the recreational sector as a whole (**Alternative 4**), or to let each region decide to manage its private angling component only or both components (**Alternative 3**).

Alternative 2 would apply regional management to the private angling component only and each region would be able to establish harvest restrictions deemed to be more appropriate for its private anglers. If this alternative is selected, it is assumed the Council would continue developing management plans for the federal for-hire component through Amendments 41 and 42. This alternative would be expected to balance regional flexibility with regulatory complexity, by allowing each region to establish preferred management measures for its private anglers, while management approaches most appropriate to federal for-hire vessels would be established through independent management plans.

Alternative 3 would allow each region to decide whether to manage its private angling component only, or to manage both the private angling and federal for-hire components separately within that region. This alternative would entail the greatest amount of both flexibility and regulatory complexity among the alternatives, as there could be up to 10 ACLs representing 10 different sets of management measures. For example, if each State is a separate region and each region establishes different seasons and bag limits for each component, flexibility would be maximized, but it may be difficult to enforce such a diverse regulatory landscape, and to constrain landings to within each regional and component ACL. In contrast to the Gulf-wide allocation between the private angling and federal for-hire components established in Amendment 40, **Alternative 3** would use each region's landings by each component to establish the regional component ACL. Positive effects would be expected as the regional component ACLs would reflect each region's landings, more closely approximating local fishing activity than the Gulf-wide average.
Alternative 4 would be expected to provide more flexibility than **Alternative 1**, but less flexibility than **Alternatives 2** and **3**, as each region would establish management measures that apply to all recreational anglers in that region. **Alternative 4** would also be expected to be the least complex from a regulatory perspective, as each region would manage its anglers under a single regional ACL.

4.2.5 Direct and Indirect Effects on the Administrative Environment

The application of regional management to the private angling and for-hire components is determined through this action. While the recent implementation of Amendment 40 divided the recreational sector into two components, a sunset provision will reunite the components in 2018 if the Council does not take further action. **Alternative 1** would apply regional management to the separate components for 2015-2017, and then manage them as one sector after the sunset. The effect of **Alternative 1**, on the administrative environment would be minimal. **Alternative 2** would extend the separate management of the components beyond the sunset and apply the provisions of this amendment only to the private angling component. This could result in additional rulemaking to address the management of the for-hire component and negatively affect the administrative environment. This may also result in additional rulemaking to develop management measures for the private anglers in regions increasing the burden on the States' administrative environment.

Alternative 3 and **Alternative 4** would shift the administrative burden to the regions to develop management measures or CEPs for both components; this may increase the administrative burden for reviewing the CEPs. The indirect effects from this action would occur in terms of 1) increasing regulatory complexity; 2) a shift in the regulatory burden from the federal to regional level, and 3) impacts on enforcement. Indirect effects would require monitoring of the recreational harvest, enforcement of the harvesting rules, and developing management measures to minimize the risk of harvests by the components of exceeding the recreational quota. However, regardless of which alternative is selected, the indirect effects from each alternative would likely be similar.

4.3 Action 3 – Establish Regions for Management

4.3.1 Direct and Indirect Effects on the Physical Environment

Direct and indirect effects on the physical environment resulting from the harvest of red snapper by the reef fish fishery have been discussed in detail in Reef Fish Amendment 22, Reef Fish Amendment 27/Shrimp Amendment 14 (GMFMC 2004b and 2007), and in the February 2010 Regulatory Amendment (GMFMC 2010). Section 4.1.1 describes the effects from fishing on the physical environment and are not repeated here.

Action 3 would have no direct effect on the physical environment. This action is administrative because it determines how the Gulf would be partitioned for management of red snapper in federal waters. Similar to Action 1, this action could indirectly affect the physical environment by allowing for spatial and temporal variation from status quo in management measures in different regions. Although the net effects from **Alternatives 2** or **3** (2 regions), **Alternative 4** (5 regions), or **Preferred Alternative 5** (up to 5 regions) might not be different from **Alternative 1** (No Action), there are likely to be differences in effects within particular regions, and these effects may change in time. If management measures that result from **Alternatives 2**, **3**, **4**, or **Preferred Alternative 5** allow fishing effort within a region to increase compared to **Alternative 1**, then there would likely be an increase in adverse effects to the physical environment (as described in Section 4.1.1). However, if selecting **Alternative 2**, **Alternative 3, Alternative 4**, or **Preferred Alternative 5** reduce the amount of fishing effort in the regional waters from management measures in comparison to **Alternative 1**, then adverse effects from fishing on the physical environment should be reduced.

4.3.2 Direct and Indirect Effects on the Biological/Ecological Environment

Section 4.1.2 describes the effects from fishing on the biological/ecological environment and is not repeated here. Action 3 would have no direct effect on the biological/ecological environment. This action is mainly administrative because it determines the partitioning of the Gulf for management of the recreational sector for harvest of red snapper in federal waters. Similar to Action 1, this action could indirectly affect the biological/ecological environment by allowing for different regional management measures. Although the net effects from **Alternative 2** or **3** (2 regions), **Alternative 4** (5 regions), or **Preferred Alternative 5** (up to 5 regions) might not be different from **Alternative 1** (No Action), there are likely to be differences in effects off the waters in particular regions. If management measures that result from **Alternatives 2**, **3, 4**, or **Preferred Alternative 5** allow fishing within a region to increase compared to what would be allowed under **Alternative 1**, then there would likely be an increase in adverse effects to the biological/ecological environment (as described in Section 4.1.2). However, if selecting **Alternative 2**, **Alternative 4**, or **Preferred Alternative 5** reduces the amount of fishing effort in the regional waters from management measures in comparison to **Alternative 1**, then adverse effects from fishing on the biological/ecological environment should be reduced. Similar to Action 1, it is difficult to compare the alternatives because information is either incomplete or unavailable for use in comparisons. The management measures that may be implemented within any of the possible regions will not be known until after this amendment is finalized and those regions develop such management measures. It is not possible to analyze the

numerous combinations of season structure and bag limit management measures that the region(s) could implement to meet their respective ACLs. However, the combined effects of adjusting the management measures are not likely to exceed the effects from the effects on the biological/ecological environments of the current management measures. Regardless of the regional management measures established through delegation or the CEPs, the overall Gulf recreational ACL for red snapper should not be exceeded which would limit the effects on the biological/ecological environment. In addition, the AMs currently in place and those being considered in Action 7 would mitigate for any potential overages. When considering the magnitude of the impacts, it should be noted that red snapper is only one species in the Gulf reef fish complex. Thus, adjusting the management measures and establishing separate regions for red snapper is not likely to greatly impact the effects on the physical, biological, and ecological environments.

To minimize the risk to the biological/ecological environment, NMFS has been working to better understand the biological/ecological environment so that management uncertainty derived from either of these regional management alternatives may be determined in the future. This includes conducting stock assessments under SEDAR that incorporate changes in management to assess the condition of managed stocks as well as supporting the development of ecosystem models to provide some insights into the cascading effects of populations in response to each other. In addition, red snapper and other managed stocks are managed under ACLs and AMs to reduce the risk of overfishing.

4.3.3 Direct and Indirect Effects on the Economic Environment

Because the harvest restrictions that might ultimately result from all of the actions and alternatives considered in this proposed amendment are unknown, the following assessment provides a qualitative discussion of the expected economic effects of this proposed action.

Portions of the discussion of the expected economic effects for Action 1 provided in section 4.1.3 are relevant to the discussion of the economic effects expected to result from this action. Some of this information is summarized in the following discussion and the reader is encouraged to read Section 4.1.3 for the complete discussion. Similar to the discussion in Section 4.1.3, all the economic effects discussed below would be indirect effects because the proposed alternatives for this action would create a possible structure for management, but not require exercise of the associated authorities.

The primary conclusions from Section 4.1.3 relevant to the discussion of Action 3 are that economic benefits would be expected to increase under regionalization, but the costs associated with regulatory development (including implementation), harvest monitoring, and enforcement may increase as well. The economic benefits associated with the recreational harvest of red snapper would be expected to increase, because regions would have an increased ability to implement management measures preferred by their constituents. The expanded regulatory authority, however, may become complicated and increase the cost of the process of regulatory development and implementation. Attempts to reduce the likelihood of harvest overages could also increase monitoring costs, and dockside enforcement may increase enforcement costs. Overall, however, the increased economic benefits associated with better management measures

would be expected to dominate potential increased management costs and result in a net increase in economic benefits.

With the conclusions provided in the previous paragraph as the baseline, the following discussion of the expected economic effects of the proposed alternatives evaluates the extent to which these benefits and costs would be expected to vary.

In general, the economic benefits of regulatory flexibility would be expected to increase as the opportunity for "localization" (locally tailored management) increases. This is concluded "in general" because it is possible to delegate authority at too diffuse a level, such that too many different management regimes are established. As an example, allowing community control over the recreational harvest of red snapper may create excessive confusion, conflict, and monitoring issues. However, because the proposed alternatives do not go below the state level, the issue of excessive localization is not expected to arise. Therefore, among the alternatives considered, the greater the regional authority, the greater the expected increase in economic benefits. From this perspective, **Alternative 4** (five regions) would be expected to result in the largest increase in economic benefits, followed by **Preferred Alternative 5** (five or fewer regions), **Alternative 2** and **Alternative 3** (two regions), and **Alternative 1** (one region). Although the state composition of each region would be different under **Alternative 2** and **Alternative 3**, each alternative would establish two regions. The economic effects of these two alternatives would be expected to be the same because no basis has been identified to support a conclusion that either state combination would be expected to be more or less capable of enacting the regulatory flexibility enabled by this proposed amendment. The possible overlaps between certain alternatives should be noted. For example, **Alternative 4** and **Preferred Alternative 5** would be expected to result in the same economic effects if **Preferred Alternative 5** results in independent state action (i.e., each state becomes a region). Similarly, **Preferred Alternative 5** and **Alternatives 2** and **3** would be expected to have the same economic effects if **Preferred Alternative 5** results in common co-action by the respective states and the creation of the respective two regions that would be established under **Alternative 2 or Alternative 3**. It is also noted that, the functional outcomes of **Alternatives 2-5** could be identical to those of **Alternative 1** if the regions decide not to exercise the authority established by Action 1 and these alternatives (accepting regional management authority would be discretionary and not obligatory).

Evaluations of the considerations of management costs (regulatory development, monitoring, and enforcement) are less straight-forward. Although increasing the number of regions could be argued to result in duplicative regulatory development costs, thereby suggesting that the fewer the regions, the lower the regulatory development costs, it may be the case that the more regions there are, the easier it may be to identify a uniformly accepted set of regulations. As a result, it may involve less time and money to develop five regional plans than fewer "unified" plans that require more deliberation to reach agreement. Nevertheless, it is indeterminate which arrangement would be more or less costly.

With respect to the cost of harvest monitoring, the conclusions are more straight-forward. It is noted that this discussion refers only to any enhanced harvest monitoring that may be implemented. As discussed in Section 4.1.3, the current recreational harvest data collection

programs would continue regardless of any regionalization decision or regional decisions to enhance their harvest monitoring capacity. Because of the costs that would be required, a mandatory, universal, census accounting of all harvest by all marine recreational fishermen in the Gulf is unlikely to ever be implemented. Even the development of a program that imposed mandatory reporting by just red snapper fishermen may not be practical. Instead, or until mandatory reporting is required, some form of survey and sampling program will likely continue to be used (and be subject to modification as budgets change and/or technology advances). Absent structural or other reasons that might make the survey and sampling program used in one state or region unsuitable in others, monitoring costs would be lower the fewer the number of regions because of the elimination of duplication. As a result, the cost to independently monitor five separate regions would be expected to be the highest and the cost would be expected to decline as the number of regions is reduced. Thus, the ranking, from most cost to least, would be expected to be **Alternative 4,** followed by **Preferred Alternative 5**, **Alternative 2** and **Alternative 3**, and **Alternative 1**, noting the possible overlap of the potential number of separate regions under the different alternatives.

Finally, with respect to enforcement costs, because shore-side enforcement would be required at the state-level if a state becomes a separate region or joins with other states to become a region, the enforcement burden would not be expected to vary by the number of regions created. In a multi-state region, it would not be expected that common agents would or could be created who could enforce regulations in all states within their region. As a result, enforcement agents from each state would be responsible for dock-side enforcement within their state. Therefore, the resultant increase in state enforcement costs would be determined by the number of states that accepted regional authority and not the number of resultant regions. Federal enforcement costs associated with the red snapper recreational harvest, recalling the discussion in Section 4.1.3, would be inversely proportional to the number of states that accept regionalization. Assuming all states accept regionalization, increased state enforcement costs associated with dockside enforcement would be the highest and federal at-sea enforcement costs the lowest for **Alternative 4**, followed by **Preferred Alternative 5**, **Alternative 2** and **Alternative 3**, and **Alternative 1.**

Consistent with the discussion in Section 4.1.3, because regionalization would be expected to result in a net increase in economic benefits, despite the potential increased management costs, **Alternative 4** would be expected to result in the highest increase in net economic benefits, followed by **Preferred Alternative 5**, **Alternative 2** and **Alternative 3**, and **Alternative 1.**

4.3.4 Direct and Indirect Effects on the Social Environment

As noted previously, the management measures that may ultimately result from the actions and alternatives considered in this proposed amendment remain unknown. Because most of the actions and alternatives relate to and build upon previous actions, the total effects that may ultimately result from this action will relate to and depend on decisions made in other actions. Thus, direct effects are not expected and indirect effects are difficult to predict. Given these uncertainties, the following assessment provides a qualitative discussion comparing the potential indirect effects of the alternatives.

Currently, federal management measures for recreational red snapper fishing are implemented Gulf-wide, meaning the Gulf is managed as a single region (**Alternative 1**). Additional impacts are not expected to result from maintaining red snapper management as a single region (**Alternative 1**). However, regional management is being considered in response to growing frustrations with Gulf-wide recreational management that does not allow for regional differences in red snapper abundance and optimal fishing seasons. Thus, indirect benefits to the social environment are expected from increasing management flexibility provided by establishing regional management.

Alternatives 2-5 propose the establishment of regions for which some management measures may vary. Generally, establishing more regions (**Alternative 4** or **Preferred Alternative 5**) will enable greater flexibility at the local level than establishing fewer regions (**Alternatives 2** or **3**), which would require more agreement on shared management measures among the States sharing a region. Greater flexibility in the selection of management measures to provide optimal fishing opportunities to a region's constituents is expected to result in the greatest indirect social benefits.

Preferred Alternative 5 would allow each Gulf State to determine whether to be an independent region or to join with another adjacent State or States into a shared region. **Preferred Alternative 5** could result in the creation of up to five regions, if each State decides to be its own region, making **Preferred Alternative 5** functionally equivalent to **Alternative 4**. In this case, any effects resulting from **Preferred Alternative 5** would be expected to be the same as **Alternative 4**. Likewise, if **Preferred Alternative 5** resulted in two regions, the impacts would be expected to be similar to those under **Alternatives 2** or **3**. Under any of **Alternatives 2-5**, it is possible that multiple regions could adopt the same management measures, rendering the effects of these alternatives indiscernible to the social environment.

4.3.5 Direct and Indirect Effects on the Administrative Environment

Additional impacts are not expected from maintaining a single Gulf-wide region for recreational red snapper management (**Alternative 1**). Direct effects would not result from selecting the number of management regions **(Alternative 2**, **3, 4**, or **Preferred Alternative 5**), because the management measures that might ultimately result in the selected regions are not specified in this action and remain unknown. Rather, the resulting number of regions could result in indirect effects in terms of 1) increasing regulatory complexity or requiring greater intra-region cooperation; 2) a shift in the regulatory burden from the federal to regional level, and 3) impacts on enforcement. This analysis provides a qualitative discussion of these potential effects to the administrative environment.

There may be a tradeoff in effects between creating more or fewer regions. Establishing more regions (**Alternative 4** or **Preferred Alternative 5**) could result in greater regulatory complexity due to involvement by more individual administrative units. On the other hand, selecting fewer regions (two under **Alternative 2** and **3**) would require greater cooperation among the States sharing a region. **Alternative 2** would also require the formation of a regional administrative

entity to provide the venue for included States to agree on their shared set of management measures and harvest monitoring strategy.

Under regional management, there will be some transfer of the administrative burden from the federal level to the regional level. However, if Action 1 Preferred Alternative 3 or Alternative 4 were selected, then the burden on the federal administrative environment would be increased correlated with the number of regions pertaining to the review of CEPs. All alternatives (except No Action) propose regional boundaries that fall along State boundary lines. Each State currently has a process for establishing fishing regulations in state waters which could be used for the administrative needs of the region's red snapper management program. It is not possible to predict the extent of the effects from the transfer of this administrative burden, as it remains unknown how each region may execute its administrative duties.

The creation of individual regions would be expected to increase the difficulty of at-sea enforcement if each region adopts different management measures. The creation of more regions could make it more difficult for at-sea law enforcement to determine the management measures governing a vessel's harvest compared with fewer regions (**Alternatives 2** and **3**). Based on Council discussions, it is assumed that enforcement would primarily be dockside which could potentially mitigate some of these enforcement concerns.

Finally, while **Alternatives 2, 3,** and **4** specify the number of regions to be created, under **Preferred Alternative 5** there could be from two to five regions. Thus, it is not possible to compare the effects from this alternative with the other alternatives, as any effects would depend on the number of regions ultimately created if implemented.

4.4 Action 4 – Modify the Federal Minimum Size Limit

4.4.1 Direct and Indirect Effects on the Physical Environment

Section 4.1.1 describes the effects from fishing on the physical environment and are not repeated here. No direct or indirect effects on the physical environment are expected to occur from alternatives in Action 4. In general direct effects on the physical environment occur when fishing gear and anchors interact with the substrate. Recreational fishing gear is expected to have minimal impact on the substrate and attached organisms; however, setting a large amount of gear over one area or continued anchoring on fragile substrate is expected to increase the potential for negative impacts to the physical environment (Hamilton 2000). **Alternative 1** (No Action) would retain the current minimum size limit for the recreational harvest of red snapper and is not expected to result in any direct or indirect impacts. **Alternatives 2**, **4**, **5,** and **Preferred Alternative 3** provide a range of minimum size limits for red snapper. The gear types used by private anglers and anglers on for-hire vessels are the same for this size range of fish; thus, no additional impacts to the physical environment are expected.

4.4.2 Direct and Indirect Effects on the Biological/Ecological Environment

Action 4 would modify the federal recreational minimum size limit for red snapper. For a region to have active delegation or an approved conservation equivalency plan, the region must adopt the federal minimum size limit for the region's state waters. Having a consistent minimum size limit Gulf-wide would make the Southeast Data, Assessment, and Review (SEDAR) process simpler, as regional differences in minimum size limits increase uncertainty and having multiple regional minimum size limits must be accounted for during estimation of selectivity patterns in the stock assessment process. NMFS will continue data collection efforts, and the Council will continue to request stock assessments, to ensure the red snapper stock continues to rebuild. Yield-per-recruit (YPR) and spawning potential ratio (SPR) analyses conducted by the Southeast Fisheries Science Center (SEFSC) in 2013 for the recreational sector found minimum size limits from 13-18 inches TL are considered effective for managing red snapper, because the YPR varies little within this size range. However, SPR was found to increase as minimum size limits are increased.[13] The Council is considering modifying the current 16-inch TL minimum size limit (**Alternative 1**) by decreasing the minimum size limit to 14 inches TL (**Alternative 2**) or 15 inches TL (**Preferred Alternative 3**) or increasing the minimum size limit to 17 inches TL (**Alternative 4**) or 18 inches TL (**Alternative 5**).

Recreational discard mortality of red snapper is currently estimated by eastern and western sub-region (SEDAR 31 2013). The assessment found a consistent, Gulf-wide trend among discard mortality data, where depth of capture and release mortality were positively correlated. Discard mortality for the recreational sector was estimated at 10% Gulf-wide (SEDAR 31 2013). However, the data workshop report noted that release mortality was related less to region and more on a combination of factors including, but not limited to, depth, thermal stress, venting versus non-venting, and handling time.

Increases in regulatory discards due to a modification in the minimum size limit for the recreational sector are a concern, and could have minimal direct effects on the biological/ecological environment. However, modifications in fishing behavior due to reducing (**Alternatives 2** and **Preferred Alternative 3**) or increasing (**Alternatives 4** and **5**) the minimum size limit compared to the status quo (16 inches TL, **Alternative 1**) are largely unknown. In general, lowering the minimum size limits of a rebuilding stock would be expected to reduce regulatory discards. However, a majority of recreational anglers target larger "trophy" red snapper, making high-grading a concern. Nevertheless, the largest minimum size limit currently being considered is 18 inches TL (**Alternative 5**). An 18-inch TL red snapper is estimated to weigh 2.6 lbs ww (SEDAR 31 2013), which is smaller than the average size (8 lbs ww) of recreational red snapper landed in 2012 (SERO 2012b). Thus, the average weight of a fish caught under a minimum size limit of 18 inches TL would be smaller than the red snapper most recreational anglers are currently retaining.

The results of the SEDAR 31 Update Assessment completed for red snapper in January of 2015 with new data through 2013 attempted to accommodate recent changes in recreational fishing behavior by adding a selectivity block from 2011-2013 for all recreational modes. The results indicated that recreational vessels in both the eastern and western Gulf have shifted to landing

[13] http://gulfcouncil.org/docs/Presentations/Gulf%20Red%20Snapper%20Size%20Limit%20Analysis%20-%20Presentation.pdf

older age classes and therefore, heavier fish (SEDAR 31 Update 2015 Presentation[14]; SEDAR 31 Update 2015). These results suggest that adopting any of the proposed minimum size limits (**Alternatives 2-5**), compared to **Alternative 1** (No Action), would be expected to have minimal indirect effects on the biological and ecological environment, because they are in 1-inch increments, and no greater than 2 inches TL difference in either direction from **Alternative 1.**

It should be noted in 1999, during the early stages of the red snapper rebuilding plan, the Council requested an interim rule that increased the recreational minimum size limit from 15 to 18 inches TL during the recreational red snapper fishing season (64 FR 30455). The Council requested this increase in the recreational minimum size limit to slow harvest and increase the fishing season length by 24 days. The interim rule was initially supported by fishermen; however, the Council received numerous complaints from fishermen after the season about releasing dead red snapper. Consequently, since that time the Council has not considered raising the red snapper minimum size limit above 18 inches TL (**Alternative 5**).

4.4.3 Direct and Indirect Effects on the Economic Environment

As discussed in section 2.4, the recreational minimum size limit for red snapper is 16 inches TL in federal waters and all Gulf states except Texas, where the minimum size limit is 15 inches TL. This would continue under **Alternative 1**. For federal waters, this minimum size was adopted to best meet the biological needs of the species, consistent with the rebuilding plan, and the economic and social needs of the associated user groups. The inconsistency between the federal limit and the Texas limit may have had, and would continue to have, some adverse effect on economic benefits associated with the resource if the inconsistency reduced progress toward achieving recovery of the stock. However, these effects may have been, and may be expected to continue to be, minor because of the small amount of red snapper harvested in Texas waters compared to that harvested elsewhere in the Gulf, assuming the allowance of smaller red snapper in state waters has not resulted in smaller fish also being harvested in federal waters. Otherwise, the inconsistency in the minimum size limits may have only resulted in angler confusion or frustration with the need to be aware of and comply with the different standards.

Changing the minimum size limit may affect the harvest rate and status of the red snapper stock. Allowing the harvest of smaller fish (**Alternative 2** and **Preferred Alternative 3**) would be expected to both increase the harvest rate (the increase in fish numbers attributable to a reduction in the minimum size limit would be expected to exceed the decrease in average weight per fish and result in a net increase in the total harvest rate) and increase the harvest of fish that may never spawn. As a result, total red snapper spawning could be reduced. Increasing the minimum size limit (**Alternative 4** and **Alternative 5**) would be expected to have the opposite effects, decreasing the number of fish harvested and allowing more fish to spawn before they are harvested, yet increasing the average weight per fish. However, the availability of larger fish would be likely be more limiting than the availability of smaller fish, so, although the average weight per fish would be expected to increase with a higher minimum size, overall the catch rate would likely decline.

[14] The presentation was made at the January 2015 SSC meeting: http://gulfcouncil.org/council_meetings/Briefing%20Materials/BB-01-2015/B%20-4%20SSC%20Summary.pdf

Increasing the catch rate (**Alternative 2** and **Preferred Alternative 3**) would be expected to shorten the season, if monitoring or harvest projection methods are effective, or increase the likelihood the allocation is exceeded if quota monitoring is either not implemented or is ineffective. Decreasing the catch rate (**Alternative 4** and **Alternative 5**) would be expected to lengthen the season and possibly decrease the likelihood that the allocation is exceeded (it may be possible to more effectively monitor longer seasons than short "flash" seasons). Generally, because it is believed that long seasons are economically more beneficial than short seasons (longer seasons afford more flexibility to schedule trips, for example), they are preferred by anglers and associated businesses. Also, as discussed in Section 4.7.3, limiting harvest to the allocation would be expected to result in greater economic benefits than exceeding the allocation and triggering AMs. With respect to the benefits of supporting increased spawning, it is logical to assume that allowing more fish to grow large enough to spawn at least once would be better than harvesting fish before they reach spawning size. This logic suggests that, if populations of smaller fish are not dominant and the release mortality too high, bigger minimum sizes would allow more fish to spawn than smaller minimum sizes. This suggests **Alternative 4** and **Alternative 5** might be expected to produce greater economic benefits than **Alternative 2** and **Preferred Alternative 3** because of potentially enhanced spawning, more stable recruitment, and faster stock recovery. Finally, changing the size limit may result in stock effects by impacting the total fishing mortality (harvest mortality and bycatch mortality combined) independent of the effects of the total harvest or the harvest of fish capable of spawning. Specifically, increasing the minimum size limit (**Alternative 4** and **Alternative 5**) would be expected to result in increased releases and associated release mortality. Regardless of the alternative selected, because red snapper is a popular target species and total recreational effort is unrestricted, all allowable harvest limits would be expected to be met. As a result, increasing the amount of release mortality would be expected to increase the total red snapper mortality. Overall, however, as discussed in Section 4.4.2, only minimal biological effects would be expected to result from any of the proposed changes in the minimum size limit.

Each of these effects would be expected to increase or decrease as the proposed minimum size increases or decreases. For example, compared to **Alternative 1**, **Preferred Alternative 3** would be expected to result in more small fish being harvested, fewer fish surviving long enough to spawn, and a shorter season. These effects would be expected to increase under **Alternative 2**, which would allow the harvest of even smaller fish. Similar comparisons exist between **Alternative 4** and **Alternative 5** (i.e., as the minimum size limit is increased, more fish would be expected to be able to spawn but total mortality increased).

Despite these considerations and general determinations, it is not possible with available data to rank these alternatives according to most to least net economic benefits.

4.4.4 Direct and Indirect Effects on the Social Environment

Maximum flexibility is assumed to correspond with positive social effects. Because a minimum size limit is part of the established suite of current management measures, the Council included the minimum size limit among the management measures which could be modified at the regional level. Following further discussions, however, the Council recognized that allowing different minimum size limits to be established by the regions would create problems for the red

snapper stock assessment associated with the use of different regional recreational minimum size limits. Thus, it was determined that the Council would evaluate the federal minimum size limit in this action, and all regions must adopt the selected minimum size limit to satisfy the requirements of delegation or CEPs (Action 1). The minimum size limit selected will also be the minimum size limit in the federal default regulations.

Currently, the federal minimum size limit for red snapper is 16 inches TL. Additional effects would not be expected from retaining the federal minimum size limit (**Alternative 1**), as fishing practices and behavior in federal waters would not be affected. However, Texas has a 15-inch TL minimum size limit for red snapper in its state waters, while the remaining four Gulf States have established a 16-inch TL minimum size limit, consistent with federal regulations. If **Alternative 1** (No Action) is retained, as a region, Texas would need to adopt a 16-inch TL minimum size limit for its state waters, or would be ineligible to participate in regional management.

Alternative 2 and **Preferred Alternative 3** would reduce the minimum size limit to 14 inches TL and 15 inches TL, respectively. Reducing the minimum size limit would be expected to allow more legal size fish to be caught, as more individuals in the red snapper population are above the size limit. Given that smaller red snapper are more frequently encountered in state waters in certain areas of the Gulf, reducing the minimum size limit may allow red snapper to be more accessible to some anglers who fish closer to shore. However, in general, direct effects on fishing behavior and activity would be negligible from decreasing the minimum size limit (**Alternative 2** and **Preferred Alternative 3**), as anglers prefer and target larger fish, and there is no requirement to retain fish which are caught. Reducing the minimum size limit may result in an increase in dead discards from high-grading which has the potential for negative indirect effects if the rate of dead discards negatively affects the progress of the rebuilding plan. Because Texas already establishes a 15-inch TL minimum size limit (**Preferred Alternative 3**), this alternative would be less disruptive to the social environment, as it is a small change for four of the Gulf States, and Texas would not need to change its minimum size limit, compared with **Alternative 2**.

In recent years, the average size of a red snapper caught by a recreational angler has increased, demonstrating success in the rebuilding plan. Table 4.4.4.1 summarizes the average weight and length of red snapper caught in 2014 by anglers fishing from private vessels, charter vessels, and headboats. For all three modes, the average length of harvested red snapper is greater than either of the proposed increases to the minimum size limit of 17 inches TL (**Alternative 4**) and 18 inches TL (**Alternative 5**). Thus, increasing the size limit to either 17 inches TL or 18 inches TL would not be expected to affect the majority of anglers' fishing practice and behavior. Anglers who fish closer to shore and are less likely to encounter larger red snapper would be the most likely to be affected by an increase in the minimum size limit.

Table 4.4.4.1. Average weight and estimated size of red snapper caught in 2014 by region (east-west) and mode.

	Private angling	Charter vessels	Headboats
Eastern Gulf	7.5 lbs 25-26 inches TL	8.5 lbs 26-27 inches TL	4.9 lbs 22-23 inches TL
Western Gulf	6.98 lbs 25-26 inches TL	10.0 lbs 28-29 inches TL	5.4 lbs 23-24 inches TL

Source: Red snapper total length to weight conversion from SEDAR 31 (2013).

4.4.5 Direct and Indirect Effects on the Administrative Environment

Retaining (**Alternative 1**) or modifying the minimum size limit (**Alternatives 2 through 5**) does not change the effects on the administrative environment for any enforcement activities; enforcement groups must enforce whatever size limit is in effect. Depending on the alternatives selected in Actions 1 and 2, the burden on the federal government and the Council should be reduced under a regional management scenario under any of the alternatives, as control of the red snapper recreational fishing season would now be under the authority of a region. Size limits would affect season lengths, but the regions would be establishing the seasons. The only administrative burden on the federal government or Council would be if a region opts out of regional management and NMFS would have an increased administrative burden to evaluate the effects of the default regulations in regard to a recreational fishing season for red snapper for the defaulted region. Enforcement and federal management would be similar to **Alternative 1**, but may be reduced slightly if the size limit is consistent for the federal and state waters.

The administrative burden on the regions is expected to increase under a regional management scenario. However there would be no expected differences in the administrative burden from enforcing and monitoring a 15 inch bag limit (**Preferred Alternative 3**) compared to say an 18 inch bag limit (**Alternative 5**), and therefore there is not likely to be any differences in direct or indirect effects to the administrative environment from choosing any of the various minimum size limits (A**lternatives 1 through 5**).

4.5 Action 5 – Closures in Federal Waters of the Gulfs

4.5.1 Direct and Indirect Effects on the Physical Environment

Section 4.1.1 describes the effects from fishing on the physical environment and are not repeated here. In general direct effects on the physical environment occur when fishing gear and anchors interact with the substrate. **Alternative 1** (No Action) would not allow regions to establish closed areas and is not expected to result in any direct or indirect impacts. However, **Preferred Alternative 2** would allow regions to establish closed areas. This could result in either positive or negative effects on the physical environment based on the geographic and temporal shift of fishing effort. If the fishing effort is confined to a smaller portion of the federal waters, then the adverse effects would be concentrated in that open area. In turn, it is likely to cause slight benefits to the physical environment in the closed areas. By limiting the temporal length of the

closure (**Option 2a**) and the spatial area of the closure (**Option 2b**), the direct and indirect effects would be more evenly distributed than **Preferred Alternative 2**. This Amendment, and the closed areas that could be established by a region (**Preferred Alternative 2)**, only apply to the harvest of recreational red snapper. Recreational anglers (private or for-hire) would still be allowed to fish for other reef fish species within the possible closed areas (**Preferred Alternative 2**). Additionally, the actions within this amendment have no bearing on the commercial sector of the red snapper portion of the reef fish fishery, and commercial anglers will still be allowed to fish within the boundaries of any closed areas that could be established within a region. Therefore any effects to the physical environment from establishing a closed area within a region are likely to be minimal. However, the establishment of closed areas in Action 5, in combination with the management measures established by delegation or CEPs, may require additional analysis for the potential effects to the physical environment.

4.5.2 Direct and Indirect Effects on the Biological/Ecological Environment

Section 4.1.2 describes the effects from fishing on the biological/ecological environment and is not repeated here. This action considers allowing regions to establish closed areas in the adjacent federal waters. **Alternative 1** (No Action) is not likely to have direct or indirect effects on the biological/ecological environment.

Preferred Alternative 2 would allow regions to establish closed areas in adjacent federal waters. The spatial and temporal extent of the closures could have both benefits and adverse effects to the biological/ecological environment based on the shift in fishing effort. For example, assuming that Florida and Alabama are separate regions, if Florida establishes a closed area in the federal and state waters in the Panhandle but the Alabama waters are still open, then it is reasonable to assume that fishermen may shift their effort from Florida state waters to Alabama state waters and concentrate the impacts on the biological/ecological environment. The concentration of effort could contribute to a localized depletion of the stock. On the other hand, the area closed by Florida would have less fishing effort due to the closure and benefit the localized stock. In addition, while the closed areas would restrict the harvest of red snapper, the most likely indirect effect on the stock from this action would be on discard mortality as anglers harvest other reef fish. During red snapper closures, fishermen targeting other reef fish species often catch red snapper as bycatch that cannot be landed. The temporal (**Option 2a)** and spatial (**Option 2b)** restrictions would decrease the shift of fishing effort and likely decrease the impact on the biological/ecological environment. However, the establishment of closed areas in Action 5, in combination with the management measures established by delegation or CEPs, may require additional analysis for the potential effects to the biological/ecological environment.

4.5.3 Direct and Indirect Effects on the Economic Environment

Because of the absence of sufficient data, details of the regional management measures that would be developed, specification of the closures that might be imposed, or the resultant fishing behavior and harvest rates that would develop under these conditions, none of the economic effects expected to occur under the proposed alternatives can be quantified. As a result, the

following discussion is limited to a qualitative description of the expected economic effects of the alternatives for this proposed action.

Under **Alternative 1**, regions would not be able to close any portion of the federal waters in their region. As a result, the federal waters portion of any region would only close if the Gulf-wide recreational quota has been harvested (or has been projected to have been harvested), resulting in Gulf-wide closure of the federal waters to red snapper harvest, or a region is subject to default regulations (because the region has elected to not accept regional management, or whose management plan is either inconsistent with the delegation or conservation equivalency requirements) and the federal waters are closed under these default regulations.

Under **Alternative 1**, regions would only have the authority to close their state waters and prohibit red snapper landings. This prohibition would extend, however, to red snapper legally harvested in Gulf federal waters, including the portion that exists within the region despite an inability to close the portion of federal waters that exist in the region. Despite the prohibition of landings in that region, red snapper could still be harvested in the federal waters portion of that region and landed in any neighboring region that remains open to landings. This would not affect the total amount of red snapper harvested by the Gulf recreational sector because total harvest would be quota-limited. However, continued red snapper harvest in the federal waters portion of a region that has prohibited landings could reduce the expected effects of the prohibition (e.g., the intent of the prohibition may be to reduce harvest pressure and improve harvest rates when the prohibition is lifted). Additionally, if a region has already landed its quota, the inability to close the federal waters within that region could result in continued red snapper harvest, landed in another region, which could result in localized resource depletion. Conversely, landing red snapper in a different region than it was harvested would reduce harvest pressure in the region of landing. These effects – increased/decreased harvest pressure and associated possible depletion/improved stock – could result in associated negative and positive economic effects due to, for example, reduced (or enhanced) catch rates and fishing quality, longer (or shorter) open seasons, and increased (or decreased) fishing demand.

Available data does not support a conclusion that fishing and harvest by anglers in one region results in greater economic benefits than such by anglers in any other region. As a result, overall, assuming neutral Gulf-wide biological effects (because total harvest would not be expected to exceed the quotas and biological targets), the economic effects expected to occur under **Alternative 1** would only be distributional (any loss/gain to one region would be offset by a gain/loss to another), and no change in total net economic benefits would be expected. These effects, however, would not be expected to be uniformly distributed across all anglers or regions because of the non-uniform opportunity cross-regional effort transfer by anglers due to differences in geographic proximity. For example, if each state forms a separate region, it would be more practical for Mississippi fishermen to fish off Alabama than it would be for Texas anglers. Some areas are "better positioned" to attract anglers from multiple regions (e.g., Louisiana from portions of Texas, and all of Mississippi or Alabama; Alabama from Mississippi or portions of Florida; etc.), whereas the southern or mid-portions of Texas and Florida may primarily only attract anglers from other parts of their own state. Thus, neither the benefits, nor costs, of cross-regional fishing would be expected to be uniformly distributed across all anglers and regions in the Gulf.

The effects of partial or temporary closure of the regional portion of the federal waters (**Preferred Alternative 2**) would be expected to be less than those of total closure. Thus, although an alternative that would allow total closure has been proposed, the expected effects of total closure are discussed to provide context for the discussion of the effects of **Preferred Alternative 2,** which will follow the discussion of the effects of a total closure of the regional portion of the federal waters.

Under total regional federal waters closure, anglers would not be able to harvest red snapper in the closed regional portion of the federal waters and land those red snapper in any region, regardless of the status of the regions' quota. The total (Gulf-wide) red snapper recreational harvest, and associated economic benefits, would not be affected because, as discussed under **Alternative 1**, total harvest would be quota limited. However, distributional economic effects would be expected to occur. Closing the federal waters to harvest would be expected to result in re-direction of effort to either state waters in the same region or, if the appropriate state permits/licenses are possessed, to the state or the federal waters portions of neighboring regions. If the effort and harvest is redirected to the state waters of the region with the federal waters closure, because catch rates are generally lower in state waters than in the federal waters, a longer open season for that region may occur, which may be economically preferable despite the increased cost to harvest the same quantity of fish (lower catch rates require more effort, and therefore higher costs, to harvest the same quantity of fish). If the effort is redirected to neighboring regions, the season length in the region with the federal waters closure may be unaffected, but harvest costs still increase because it may be more expensive to fish in a neighboring region than in the federal waters in the region with the closure. Fishing in a neighboring region and landing the fish in ones' own region would shorten the season in the landing region if the catch rates in the neighboring region are higher than in the federal waters of the region with the closure; however, if this were the case and the catch rate were a dominant factor in the fishing location decision, this effort would likely already be occurring in the neighboring region regardless of the own-region federal waters closure. Thus, in general, effort shift to a neighboring region in response to closure of the federal waters would not be expected to shorten the season in the region with the federal waters closure.

Effort shift may have localized stock effects. Although the resource (red snapper and other species co-harvested with red snapper) in the closed portion of the federal waters would be subject to reduced harvest pressure, the resource elsewhere may decline because of the effort shift. Although, as previously discussed, Gulf-wide any biological effects should be neutral, localized depletions could reduce fishing quality and, in turn, associated economic benefits. Thus, the region with the closed federal waters could benefit at the expense of any neighboring region that receives the shifted effort. This may occur even within a region if effort shifts from the federal waters to state waters; higher harvest pressure in state waters, which normally may already have lower stock densities for some species, and resultant increased harvest may cause stock densities and associated harvest rates to decline further, unless migration of fish from the closed federal waters results in stock replenishment sufficient to maintain, or enhance, the densities and harvest rates in state waters.

In the "effort recipient" neighboring regions, effort shift as a result of federal waters closure may result in degraded catch rates and a slower harvest pace, resulting in longer seasons to harvest the regional quota, similar to what might occur in the region(s) that establishes a federal waters closure. Thus, again, economic effects, which could be either positive or negative, could occur depending on the economic trade-off between better fishing and shorter seasons versus poorer fishing and longer seasons.

Because it is assumed that, Gulf-wide, any regional federal waters closure will be biologically neutral, all of the economic effects expected to occur would be expected to be short-term effects. Effort-shift related catch rate declines would not be expected to persist year to year because the impetus to shift would decline if fishing quality erodes as a result of higher fishing pressure. As the fishing quality erodes, less effort would be attracted from neighboring regions, fishing pressure would be reduced, and the resource would have the opportunity to recover. Thus, any associated economic effects would be cyclical.

Because **Preferred Alternative 2**, and options, would allow closures of smaller geographic scope and/or shorter duration than total closure, the economic effects would be expected to be less than the effects expected to occur under total closure. This determination applies to all aspects of the discussion of the expected economic effects under total closure. For example, the incentive to shift effort, regardless of whether the incentive is to shift to own-region state waters or to a neighboring region, would be less if the size or duration of a closure is reduced. If less effort shifts to another area (within the same region or into another region), the increased pressure on the resource in that area would be reduced. A smaller increase in fishing pressure would reduce any decline in harvest rate, the change in pace at which the quota is landed, and the potential for longer seasons. Thus, overall, any of the reduced economic benefits that might accrue to some anglers or regions under total closure, and increased benefits that might accrue to others, would be reduced under **Preferred Alternative 2**. The greater the ability to reduce the scope of the closure (size or duration) relative to a total closure, the more the economic effects would be reduced relative to those that would be expected to occur under a total closure. Thus, the greatest potential reduction of these effects would be expected to occur if both **Option 2a** (closure duration limit) and **Option 2b** (closure size limit) are adopted. It is not possible to rank the two options with respect to each other.

Although it is straightforward to conclude that the effects of **Preferred Alternative 2** would be expected to be less than those of a total closure, similar comparison with **Alternative 1** cannot be made. Despite the conclusion that the economic effects under each alternative will only be distributional with no change in total (Gulf-wide) net economic benefits, distributional effects have localized economic consequences. Thus, although none of the alternatives would be expected to result in a change in total net economic benefits, the effects of the alternatives may not be economically equivalent due to distributional effects and varying levels of significance. However, it is not possible to rank the alternatives, with or without the proposed options, because of the inability to forecast what closures may occur, how anglers may react, and how respective seasons may be affected.

4.5.4 Direct and Indirect Effects on the Social Environment

Currently, NMFS has the authority to open and close federal waters to fishing, and the Gulf States have the authority to open and close their respective state waters to fishing. The Gulf States do not have the authority to close areas within federal waters, nor would the regions that may be created through this amendment have the authority to close federal waters to the harvest of red snapper under **Alternative 1** (No Action).

Upon implementation of this amendment, federal waters would only be closed in the event the default regulations are applied to a particular region because 1) the region is not participating in regional management, or 2) the region does not have delegated authority or an approved CEP. In these cases, the portion of federal waters adjacent to such region would be closed to the recreational possession of red snapper, except during the default federal season. That portion of federal waters would be closed not just to anglers fishing from the adjacent region, but to all recreational vessels from any region. Thus, the decision to not participate in regional management by a region, or a region's failure to have active regional management would result in negative effects for anglers of other regions who would be prohibited from catching red snapper in some areas of federal waters. In other words, under regional management, the closure of federal waters adjacent to a region results in negative effects for anglers of other regions who would otherwise choose to fish in those federal waters. Anglers fishing near the border of a closed area would be most affected.

Except in the circumstances just described, federal waters would remain open to the harvest of red snapper year-round, and the regions would establish the season dates during which anglers may possess and land red snapper in the region. When a region is open, its anglers may catch red snapper from the region's state waters or from anywhere in federal waters. When that region is closed, anglers from regions with open seasons would be able to catch red snapper from anywhere in federal waters, including federal waters adjacent to the region in which red snapper fishing is closed.

Preferred Alternative 2 would allow for additional closures in federal waters to be established, beyond the circumstances just described. If a region establishes closed areas within federal waters adjacent to the region, negative effects would be expected to result in neighboring regions, especially for anglers who fish near the region that is establishing the closed areas.

It is not necessary for a region to close federal waters when its red snapper fishing season is closed; rather, the region would prohibit the possession and landing of red snapper in its region, or a portion of its region. A region that closes federal waters adjacent to its state waters would be prohibiting anglers from other regions from catching red snapper in the federal waters adjacent to its region. This would result in negative effects for anglers in other regions. A region may also close federal waters adjacent to its state waters to allow its state waters to remain open. This could potentially allow the region to have a longer fishing season, as fewer and smaller fish are generally caught closer to shore. Such restrictions on a region's anglers may be desirable, if the length of the season were to be longer, or undesirable, if anglers prefer to catch larger fish further offshore. However, establishing an at-sea boundary beyond which red snapper may not be caught while other fish may be caught poses problems for law enforcement, as it would be difficult to determine where the fish were caught. Further, such an at-sea

boundary would be expected to be associated with a lack of compliance (accidental or deliberate) as it is not possible to visually mark the boundary line.

Just as it remains unknown how regions will apply the flexibility afforded to set regional bag limits and fishing seasons, it is also unknown how regions may use a provision to close areas of federal waters adjacent to the region. This makes it difficult to predict potential social effects. **Preferred Alternative 2** would allow a region to close an unspecified number of areas within federal waters adjacent to its region without closing the entire area of federal waters adjacent to the region. Depending on the location of any resultant closed area, **Preferred Alternative 2** may increase or decrease the total social benefits for a respective region. If it is assumed that the closed areas under **Preferred Alternative 2** would be of a greater temporal extent than **Option 2a**, such that the areas are closed for over half of the year, negative effects would be expected to result for nearby anglers of bordering regions. Similarly, if a resultant closed area under **Preferred Alternative 2** is of greater spatial extent than **Option 2b**, negative effects would also be expected for nearby anglers of bordering regions.

Ultimately, for some regions, the proximity to other regions could render **Preferred Alternative 2** an ineffective option and could enable unintended fishing activity to occur (see section 2.5), resulting in negative effects. For other regions, however, the ability to trade the benefits of harvest in the selected areas of federal waters for other management considerations could be expected to result in greater benefits than **Alternative 1** for that region. Nevertheless, the negative social effects of angler non-compliance and enforcement difficulties would be expected to be greater under **Preferred Alternative 2** than **Alternative 1**.

4.5.5 Direct and Indirect Effects on the Administrative Environment

Action 5 considers allowing regions to establish closed areas in adjacent federal waters. **Alternative 1** (No Action) would not allow regions to establish closed areas in federal waters and is not likely to have any direct or indirect effects on the administrative environment. **Preferred Alternative 2** would allow regions to establish closed areas in the adjacent federal waters and likely have both direct and indirect effects on the administrative environment. The direct adverse effects on the administrative environment including NMFS' Office of Law Enforcement, the United States Coast Guard, and state marine law enforcement operations. The enforcement of multiple closed areas would be increasingly complex with the increase in number of closed areas and season dates. Selecting **Option 2a** or **2b** pertaining to the temporal and spatial extents of the closed areas would provide some limitation to the closed areas, but would also increase the complexity for enforcement in comparison to **Alternative 1**. This complexity would be reflected by the increased burden on enforcement. However, it is expected after individual regions establish their regional management measures and stakeholders educate themselves about these changes in regulations only indirect effects on the administrative environment are expected. In combination with the varying management measures set in each region, enforcement would be challenged with a broad range of regulations to enforce. It is likely that the administrative environment of the regions would be adversely affected by increasing notification of the closed areas to stakeholders. If the establishment of a closed area is deemed to require further analysis and rulemaking, then the burden on the administrative

environment would increase and have indirect effects associated with the analysis and implementation.

4.6 Action 6 – Apportioning the Recreational ACL (Quota) among Regions

4.6.1 Direct and Indirect Effects on the Physical Environment

Section 4.1.1 describes the effects from fishing on the physical environment and are not repeated here. Action 6 is determines the apportioning of the recreational quota among the regions. While this action may seem administrative, it may have some indirect effects on the physical environment. While the overall Gulf recreational ACL would be the same for all **Alternatives 1-8** direct effects on the physical environment over the Gulf as a whole are expected to be the same. However, this action could regionally affect the physical environment indirectly by redirecting the amount of red snapper fishing that can occur off different regions of the Gulf. Allocating based on historical landings (**Alternatives 2**, **3, 4** and **Preferred Alternative 5**) or by stock abundance (**Alternative 7**) could allow red snapper fishing to increase if a region receives an allocation greater than what landings would be under **Alternative 1** (No Action). Thus, there would likely be an increase in any adverse effects from fishing to the physical environment for these regions based on the spatial distribution of red snapper allocation throughout the Gulf. In contrast, regions whose allocations would be reduced compared to **Alternative 1** (No Action) would experience a reduction in any adverse effects from red snapper fishing. **Alternative 8** would distribute the quota among regions to provide an equal number of fishing days. As this would equate to having a federal season of the same number of days for the entire Gulf, the effects are likely to be similar to **Alternative 1. Preferred Alternative 6 (Preferred Option 6a** and **Preferred Option 6b)** are not likely to have any effect on the physical environment.

To determine specific effects between alternatives is difficult to analyze quantitatively. **Alternatives 2**, **3**, **4** and **Preferred Alternative 5** set allocations based on historical landings, the direction of the effect relative to other alternatives and options may be related to differences in allocation as provided in Tables 2.6.2 - 2.6.6 and the set allocations in **Preferred Alternative 5**. For example, if **Alternative 2** was selected, the allocation of the quota awarded to Florida is 33.4% (Table 2.6.2). But, if **Alternative 3** was selected instead, 39.6% would be awarded to Florida. This increase of 6.2% in allocation is likely to lead to more red snapper fishing off Florida under **Alternative 3** compared to **Alternative 2** which would likely increase any adverse effects on the physical environment. On the other hand, if **Alternative 2** were selected over **Alternative 3**, Texas would have its allocation reduced by 3.0% (from 13.0% to 16.0%; Table 2.6.2), As a result, the amount of red snapper fishing off Texas would likely fall and any adverse effects from fishing on the physical environment would be reduced.

However, the actions in the amendment and the apportioning of the recreational harvest of red snapper among regions, only applies to the recreational harvest of red snapper. The commercial harvest of red snapper and the recreational harvest of other reef fish species will continue to throughout the Gulf of Mexico and any regions that may be formed. Therefore, while there may be positive and negative effects to the physical environment from shifting the apportionment of

recreational red snapper among the regions, these effects are likely to minimal given that they will only apply to the recreational sector harvesting a single species.

4.6.2 Direct and Indirect Effects on the Biological/Ecological Environment

Section 4.1.2 describes the effects from fishing on the biological/ecological environment and is not repeated here. Action 6 is administrative because it determines apportionment of the recreational quota among the regions. Therefore, this action would have no direct effect on the biological/ecological environment. Because the different allocations proposed in the alternatives would be based on the same quota, the overall indirect effects on the biological/ecological environment are expected to be the same for **Alternatives 1-4** and **Preferred Alternative 5**. However, this action could indirectly affect different areas of this environment by redirecting the amount of red snapper fishing that can occur off different regions of the Gulf. Allocating based on historical landings (**Alternatives 2, 3, 4,** and **Preferred Alternative 5**) or by stock abundance (**Alternative 7**) could allow red snapper fishing to increase if a region receives an allocation greater than what landings would be under **Alternative 1** (No Action) because red snapper fishing would likely increase to harvest the additional fish. As a result, this would likely increase any adverse effects from fishing to the local red snapper population for these regions. In contrast, regions whose allocations would be reduced compared to **Alternative 1** (No Action) would experience a reduction in any adverse effects from red snapper fishing. **Alternative 8** would distribute the quota among regions to provide an equal number of fishing days. As this would equate to having a federal season of the same number of days for the entire Gulf, the effects are likely to be similar to **Alternative 1. Preferred Alternative 6 (Preferred Option 6a** and **Preferred Option 6b)** are not likely to have any effect on the biological/ecological environment.

As described in Section 4.6.1 for the physical environment, although comparing allocations between alternatives may indicate some directionality of effects to the biological/ecological environment, these comparisons assume that fishing regulations remain the same between regions. For example, reducing the red snapper size limit could lead to a change in the local population's size structure that could have positive or negative implications to the productivity of that population. Any such changes could also affect the abundance of other reef fish species that compete with red snapper for shelter and food. Local predators of red snapper could increase if red snapper abundance is increased, while species competing for similar resources as red snapper could potentially decrease in abundance if less food and/or shelter are less available. Species likely to be affected by changes in red snapper abundance the most include vermilion snapper, gray triggerfish, and gag, which all co-occur with red snapper. Greater amberjack may also be affected as it is frequently caught on red snapper fishing trips. In addition, if a region gets more quota than under the No Action, then these stocks would potentially also experience greater harvest. These effects were explored in more detail in Reef Fish Amendment 27/Shrimp Amendment 14 (GMFMC 2007).

As with Action 1, it is difficult to compare the alternatives because information is either incomplete or unavailable for use in comparisons. To minimize the risk to the biological/ecological environment, NMFS has been working to better understand the biological/ecological environment so that management uncertainty derived from either of these

State or regional management alternatives may be determined in the future. This includes conducting stock assessments under SEDAR that incorporate changes in management to assess the condition of managed stocks and well as supporting the development of ecosystem models to provide some insights into the cascading effects of populations in response to each other. In addition, red snapper and other managed stocks are managed under ACLs and AMs to reduce the risk of overfishing.

4.6.3 Direct and Indirect Effects on the Economic Environment

The economic effects of a specific level of allowable harvest (ACL) depend on the manner in which the harvest is allowed to be taken. Estimates of the economic value of red snapper and red snapper trips are available (see Section 3.4). However, information is not available that might demonstrate how the economic value might vary by recreational component (for example, the value received by harvest by a private angler compared to by a charter angler), nor by state (for example, the value received as a result of harvest by a Florida angler compared to harvest by a Louisiana angler). As a result, current information simply supports an examination of how total economic value (Gulf-wide and all components) may change with changes in the total allowable harvest.

The foundation of the actions proposed in this amendment are, however, that the economic value varies at least by state or region such that for a given quantity of harvest, economic value can be increased if the manner (season, bag limit, size limit, etc.) in which the allowable harvest is taken can be changed to reflect localized (state or region) preferences. Accepting this foundation negates the use of a "common" economic value per fish, pound, or trip. As a result, because neither the management regulations that might ultimately result from this proposed amendment nor the associated economic values are known, the following assessment provides a qualitative discussion of the expected economic effects of this proposed action.

Portions of the discussion of the expected economic effects for Action 1 provided in Section 4.1.3 are relevant to the discussion of the economic effects expected to result from this action. Some of this information is summarized in the following discussion and the reader is encouraged to read Section 4.1.3 for the complete discussion. Unlike Action 1 and Action 3, which would establish the management structure, this action would determine the amount of harvest allotted to each region. As a result, the expected economic effects to anglers of establishing the regional allocations would be direct effects. Beyond the typical indirect shore-side effects associated with variable angler demand, no other indirect economic effects are expected.

This assessment assumes that the management measures implemented by each region to harvest their red snapper allocation will be invariant to the allocation received. Specifically, this assumption means that the bag limit or any measure to affect harvest by private anglers versus for-hire anglers will not vary with the amount of allocation received; the amount of allocation will only affect the length of the open season. From this perspective, for a given region, the larger the allocation, the more economic benefits would be expected to be received by anglers, businesses, and associated communities in that region. Because the allocation of the total quota across all regions is a zero-sum game, an increase in allocation for one (or more) region(s) relative to an alternative allocation must, by necessity, result in a decrease in allocation to one or

more other regions. As a result, because estimates of the economic value by state or region are not available, it is not possible to determine whether the economic benefits associated with allocation gains to one or more region(s) exceed the losses to other regions. Thus, it is not possible to determine, either quantitatively or qualitatively, the net economic effects of proposed **Alternatives 2-8** and associated options or rank them based on these effects.

It is noted, however, that even if a specific alternative would result in an allocation for a region that is lower than recent harvests (see Tables 2.6.1-2.6.5), it cannot be concluded that the economic benefits to that region would be reduced. By tailoring the management regulations to better meet the preferences of the constituents in that region, it is possible, and likely, that the lower allocation could still result in an increase in economic benefits relative to **Alternative 1**. Only in the event of a substantial reduction in allocation relative to normal harvest would a net reduction in economic benefits be expected to occur. This might be argued to be the case for Florida, which would, under the combination of **Preferred Alternative 5** and **Preferred Alternative 6 Preferred Options 6a** and **6b**, be allocated 37.8% of the ACL, whereas Florida harvested 42.5% of the total Gulf-wide ACL in 2014 (data for 2014, however, was not included in the apportionment alternatives). Similarly, for Alabama, although the preferred alternatives would result in a higher allocation, 31.6%, than was harvested in 2014, this allocation would be considerably lower than the proportion of the total Gulf-wide ACL harvested in 2011-2013 (35.9%-53.6%). Essentially, the issue comes down to what level of harvest is/should be considered normal, which is not an economic question and is a question that is difficult to answer because of the changing conditions of the stock (biomass growth and eastward range expansion) and the absence of stability in both the federal season and state regulations.

The economic effects of the alternatives considered under this action would not be expected to be affected by the form of regional management adopted under Action 1, nor the specification of regions adopted under Action 3.

4.6.4 Direct and Indirect Effects on the Social Environment

This action concerns how much of the recreational sector ACL would be apportioned among the regions selected in Action 3. The decision to allocate a scarce resource among user groups is controversial as participants from each region contend for the greatest allocation for their region. Negative effects would be minimized by establishing an allocation that most closely reflects actual participation and fishing effort. Assuming that participation and fishing effort remain constant, no discernible effects would be expected to result from establishing regional ACLs, as the proportion of landings represented by each region should remain the same. However, this assumption is not plausible, as many factors affect change in effort and participation. As shown in Table 2.6.1, the portion of total recreational landings by each State varies from year to year, meaning that the selection of any regional apportionment (**Alternatives 2-9**) could result in indirect effects by removing the flexibility of variable annual landings, compared to **Alternative 1** (No Action). Such indirect impacts may also be expected relative to how each region's apportioned quota is adequate to satisfy status quo fishing behavior and effort. Another factor concerns the additional fishing opportunities provided by States in state waters when federal waters are closed. In recent years, the proportion of landings by some States has increased due

to inclusion of fish caught under these additional fishing opportunities. Recreational anglers Gulf-wide did not have equal access to these opportunities.

While an underlying assumption of regional management holds that increased social benefits will result from providing greater flexibility in developing locally preferred harvest constraints, apportioning the recreational sector ACL into multiple regional ACLs will require increased monitoring of landings and potentially an increased likelihood of exceeding a regional ACL. Thus, there is a trade off in the flexibility afforded by regional management to assign locally appropriate management measures, and an increased need for monitoring and enforcement to accompany the requirement to constrain landings to a fixed portion of the recreational sector ACL.

Additional effects would not be expected from **Alternative 1** (No Action) as the landings among States are not required to remain within a specified proportion of the recreational sector ACL. Under **Alternative 1**, the private angling and federal for-hire components would continue to be managed under component ACTs for the years 2015-2017, and revert to a single recreational sector ACL in 2018. Thus, retaining **Alternative 1** would not be compatible with the other actions of this amendment which propose to manage the recreational sector ACL across regions and potentially, components as well.

Apportioning the recreational sector ACL among regions (**Alternatives 2-9**) would require each region to constrain landings to its fixed portion of the recreational sector ACL. The allocations proposed in **Alternatives 2-4** and **Preferred Alternative 5** are based on historical landings of different time series. The magnitude of any social effects would relate to the extent by which each region's average landings for an alternative's time series is greater or lesser than its current landings. The average landings by State correspond inversely with each other, such that the larger the proportion allocated to one region, the smaller the proportion that is, in turn, the allocation for another region. This means that positive and negative effects will result relative to, and in terms of how each apportioned quota is sufficient to satisfy fishing opportunities relative to status quo fishing effort and behavior. The magnitude of the effects would in part reflect changes in effort subsequent to the implementation of an allocation. Changes in effort are not likely attributable to this action. Under **Alternatives 2-5**, allocations based on longer time series (i.e., include earlier years) are more advantageous to the western Gulf States than shorter time series that include the most recent years. Shorter, more recent time series are more advantageous to the eastern Gulf States (Table 4.6.4.1).

Preferred Alterative 6 provides options for eliminating the years 2006 (**Preferred Option 6a**) and/or 2010 (**Preferred Option 6b**) from calculating the regional apportionments, based on the disruptions to fishing activity that occurred during those years. The Council was in agreement to remove these years from calculating the regional apportionments, despite the fact that not all States experienced the same degree of fishing disruption. Thus, some positive indirect effects may result from **Preferred Alternative 6,** as it is an expression of cooperation among the Gulf States.

Alternative 7 would apportion the recreational sector ACL (or component ACLs) into an eastern and western regional ACL, roughly representing the regional biogeographical differences in the stock. This alternative does not consider fishing effort, which is greater in the eastern States.

Thus, **Alternative 7** will provide greater social benefits to anglers of western Gulf States and would negatively affect the fishing opportunities of anglers in the eastern Gulf States. On the other hand, the issue of flexibility of variable annual landings is less of an issue under **Alternative 7**, because the recreational red snapper ACL would be divided into two parts instead of five. Thus, more than one state would be fishing within each apportionment of the quota and be able to share the effects from annual fluctuations in red snapper abundance and fishing effort.

Establishing an allocation based on the most recent fishing activity and effort, such that each region would begin with an equivalent number of fishing days (**Alternative 8**), would provide the greater benefits to the eastern Gulf States and result in negative effects for the western Gulf States compared with **Alternatives 2-6** (Table 4.6.4.1). Although **Alternative 8** would provide the greatest short-term benefits to the eastern Gulf States of Alabama and Florida, which could receive up to 87% of the recreational ACL (Table 2.6.7), there is a downward projection for the eastern Gulf stock. Thus, if most of the allowable harvest continues to occur in the eastern Gulf, a redistribution of the stock could occur from east to west and could be exacerbated under **Alternative 8**. This could potentially result in some negative long-term social effects (see Section 3.2 and GMFMC 2015a).

Table 4.6.4.1. Ranking of allocation for each State in terms of the amount of quota each State would receive under the alternatives. A rank of 1 represents the alternative giving the most quota to the State, while a 6 represents the alternative for which the State receives the least quota. For Alternatives 2-4 and Preferred Alternative 5, no years of landings are excluded. The row for Preferred Alternative 6 provides the rankings by State for Preferred Alternative 5, excluding landings from both 2006 and 2010 (currently the Council's preferred alternative).

Alternative	Intervals	AL	FL	LA	MS	TX
2	Longest time series	4	6	1	1	1
3	Intermediate time series	2	4	5	4	3
4	Most recent time series	6	2	4	5	5
Pref. 5	**Average of longest and most recent time series**	5	3	3	3	2
Pref. 6	**Exclude years of environmental events**	3	5	2	2	4
7	Projected yields for ABC for eastern and western Gulf	Not available by State; allocation to western Gulf would be greater than to eastern Gulf.				
8	Same season length at time of apportionment	1	1	6	6	6

4.6.5 Direct and Indirect Effects on the Administrative Environment

Action 6 considers approaches to apportion the recreational red snapper quota to the regions. Retaining a Gulf-wide recreational red snapper quota (**Alternative 1**) would not be likely to affect the administrative environment. However, selecting this alternative would not allow for implementation of a regional management program. The remaining alternatives determine the method by which the Gulf-wide quota will be divided among selected regions and would increase the burden on the administrative environment. **Alternatives 2-4, and Preferred**

Alternative 5 and **6,** and **Alternative 8** would have minimal adverse effects by only requiring the initial calculations of apportionment. However, **Alternative 7** would require additional analysis and possible updates based on the stock biogeographical differences and the future stock assessments. **Preferred Alternative 6, Preferred Options 6a** and **6b** (eliminating specified years from calculating the regional apportionments), are expected to have minimal effects to the administrative environment. It is not overly burdensome to include or exclude a specified year's data from the calculations.

Indirect effects would include continued monitoring and assessment of the red snapper stock. Existing data collection and harvest monitoring programs would remain in place, which currently include state-level landings calculations. In addition, the indirect effect of adding complexity to the regulations would likely have adverse effects on the administrative environment including NMFS' Office of Law Enforcement, the United States Coast Guard, and state marine law enforcement operations.

4.7 Action 7 – Post-season Accountability Measures (AMs)

4.7.1 Direct and Indirect Effects on the Physical Environment

Section 4.1.1 describes the effects from fishing on the physical environment and are not repeated here. Action 7 establishes the post-season AMs for the recreational harvest of red snapper. The direct and indirect effects on the physical environment from this action would be related to changes in fishing effort. The effects on the physical environment resulting from **Alternative 1** are expected to be similar to current fishing conditions. No change in fishing effort is expected to occur because no new fishing regulations would be implemented; therefore, habitat-gear interactions are estimated to remain unchanged. **Preferred Alternative 2, Option 2a**, and **Option 2b** would provide slight benefits to reef fish habitat by reducing the fishing effort in the following year if the landings indicate the quota was exceeded. This would increase the likelihood of achieving the goals of the rebuilding plan and preventing overfishing. If the fishing effort is reduced and the amount of time spent fishing is reduced, then the decrease in fishing effort would indirectly benefit the physical environment by reducing habitat-gear interactions.

However, the actions in the amendment and the establishment of post-season accountability measures, only applies to the recreational harvest of red snapper. The commercial harvest of red snapper and the recreational harvest of other reef fish species will continue, regardless if AMs are implemented. Therefore, while there may be positive effects to the physical environment from establishing AMs in the event that the ACL for the harvest of recreational red snapper is exceeded, these effects are likely to be minimal given that they will only restrict the recreational harvest of a single species.

4.7.2 Direct and Indirect Effects on the Biological/Ecological Environment

Section 4.1.2 describes the effects from fishing on the biological/ecological environment and is not repeated here. The direct and indirect effects on the biological/ecological environments from this action would be related to changes in fishing effort. **Alternative 1** would continue the current direct and indirect effects on the biological/ecological environments. The effects are relative to the change in fishing effort which may result in over or under harvest. This alternative does not implement a reduction for the following recreational season's red snapper harvest in the case of the quota being exceeded which in turn, may increase the direct negative effects to the biological/ecological environment in relation to the other alternatives. Should an overharvest occur, this alternative could adversely affect the red snapper stock; however, this has been the status quo for several years.

In contrast, **Preferred Alternative 2, Option 2a**, and **Option 2b** would adjust for any overage during the following year, thus minimizing the effects on the biological/ecological environments relative to the overage as discussed in Section 2.6. These alternatives result in a one-for-one reduction of the following year's quota for any overage if the landings exceed the Gulf recreational ACL. This reduces adverse effects on the biological/ecological environment that may occur from the overharvest. However, if the red snapper recreational season length is drastically reduced to account for an overage, then the likelihood of non-compliance of recreational anglers with the regulations increases as does the potential for derby fishing. These activities could have negative indirect effects that would lessen the benefits of the AM by increasing the harvest of red snapper as well as increasing bycatch and discards. The overages could also be evaluated by future stock assessments and review through the SSC. For **Preferred Alternative 2** and **Option 2b,** the effects would vary geographically as the reduction in regional quota would be applied only to that region which exceeds its apportioned quota. This could result in unevenly distributed effects depending on which regions exceed the quota and the associated AMs. It is possible that if a region exceeds its quota by over 100%, then the following year no harvest of red snapper in the region would be allowed unless the ACL is greatly increased. The effects of not allowing any harvest of recreational red snapper for a year in a specific area are not known; however, the issues would be considered in the future stock assessments.

4.7.3 Direct and Indirect Effects on the Economic Environment

Because the harvest restrictions that might ultimately result from all of the actions and alternatives considered in this proposed amendment are unknown, the following assessment provides a qualitative discussion of the expected economic effects of this proposed action. Portions of the discussion of the expected economic effects for Action 1 provided in Section 4.1.3 are relevant to the discussion of the economic effects expected to result from this action. Some of this information is summarized in the following discussion and the reader is encouraged to read Section 4.1.3.

This proposed action addresses the potential imposition of new recreational sector AMs. The current AMs would continue, in different forms of scope (more than, less than, or equal to the overage), under any of the alternatives adopted for this proposed action. These current AMs include harvest monitoring and closure of the federal waters if the red snapper recreational ACL is met, or is projected to have been met, and potential payback of harvest overages in the

following year (subject to determination of the biological necessity of such payback). All of the proposed alternatives, including **Alternative 1**, would only require paybacks if the red snapper stock is overfished. AMs are a component of the management structure and their adoption is an administrative action. Because it is an administrative action, the adoption or change of an AM would not cause any direct economic effects. The direct economic effects of AMs occur only when the AMs are triggered, if such occurs, and harvest restrictions are imposed. For the current proposed action, the trigger event would be an ACL overage.

ACLs (either regional or summed across multiple regions or components) represent the amount of allowable harvest that has been estimated to be acceptable given the biological status of the resource, rates of natural and bycatch mortality, and management goals. These management goals may include growth, decline, or maintenance at the current level of biomass and stock composition. Embedded within the decision process of selecting these management goals, and the path and pace through which they are to be reached, are considerations of the economic and social (and ecosystem) consequences of the alternative options. In effect, the management decision that identifies the allowable harvest reflects a balance of the expected best biological, economic, and social outcomes.

From this "best" perspective, despite the uncertainties that exist in the estimation and forecast of future biological and environmental conditions processes, exceeding the red snapper recreational ACL would logically be expected to have an adverse effect on either or both the status of the resource and the progress towards achieving the management goals. This, in turn, would be expected to have adverse economic effects. Assuming this is the case, it follows that overages should be avoided and, when they occur, an attempt should be made to minimize their effects. An overage payback is a reasonable tool to help minimize the adverse effects of an ACL overage. The intent of a payback would be to insure that the combined harvest over successive years does not exceed the combined ACLs for that period. This process keeps the stock's rebuilding more in line with the projections used to set the ACLs.

The proposed alternatives for this action only consider "following year" paybacks (i.e., a payback in the year following a quota overage) and not multiple-year considerations (e.g., only impose a payback if the quota is exceeded in consecutive years or in at least two of the most recent three consecutive years). It is beyond the scope of this analysis to evaluate which approach is better given the uncertainties associated with stock assessments in general, forecasting stock recovery, harvest projection and monitoring, etc. Sizeable harvest overages of the red snapper recreational quota have routinely occurred in recent years without apparent disruption of stock recovery. However, because of the lengthy time required to conduct a stock assessment, the potential cumulative harm of successive overages, and the potential of compounded payback effects on an already severely restricted open season (i.e., successive overages in a fishery with a very short open season could jeopardize the ability to have any open season when AMs are applied), annual correction (payback) may be more prudent and effective in minimizing the potential adverse economic effects of overages than multi-year considerations.

In general, it is expected that exceeding the recreational ACL and triggering AMs should be avoided. The economic benefits to fishermen, and associated businesses and communities, are expected to be greater when the ACLs, and associated seasons, are stable (or increasing),

because this allows better personal and business planning and utilization of resources. Although anglers may have flexibility in their choice of recreational activity, businesses associated with the recreational fishing industry need regular customer traffic to meet monthly expenses. Paybacks are costly and disruptive in the short term because they disrupt this stability. Although a payback, if an overage does not repeat the second year, would result in a total two-year harvest equal to the sum of twice the normal annual ACL and increased benefits the first year due to the ACL overage, the decline in the ACL the second year, and likely associated decline in angler demand for fishing services, could jeopardize the financial status of businesses that are dependent on the harvest of the subject species.

Additionally, a recreational ACL overage that harms the resource and adversely affects progress towards recovery goals could have adverse economic consequences for both the commercial and recreational industries and not just the recreational sector. Adverse stock effects would be expected to harm the total allowable harvest of the species. If the total allowable harvest is reduced as a result of an overage by the recreational sector, both sectors would experience harvest reductions and associated declines in economic benefits. Thus, in the long term, protection of the biological status of the resource and continued progress towards recovery goals, as provided by paybacks, would be expected to result in a net increase in economic benefits compared to no paybacks.

Alternative 1 would not change the current post-season AMs for managing red snapper recreational harvest overages in the Gulf federal waters, which include limiting the payback to the sector responsible for the overage. Because Alternative 1 would not change the current post-season AMs, in the short term, no change in economic benefits to fishermen from either sector, or associated businesses, would be expected to occur. However, the current payback AM does not factor in the potential management configurations that may occur under the proposed regional management alternatives in this amendment. As a result, **Alternative 1** may result in reduced economic benefits compared to the other alternatives because of how the payback burden would be distributed across the various regions and components.

For **Preferred Alternative 2**, and associated options, harvest overage paybacks would also be required and only if red snapper are overfished (as under **Alternative 1**) and the total red snapper recreational harvest ("combined recreational landings") from all regions and components exceed the combined ACLs (recreational sector ACL). Otherwise, **Preferred Alternative 2** varies from **Alternative 1** because under **Preferred Alternative 2** the payback would only be applied at the regional level and not across the entire recreational sector, as would occur under **Alternative 1**. Thus, a payback would be shared across all regions under **Alternative 1**, regardless of complicity in the overage, but limited to the region where the overage occurs under **Preferred Alternative 2**. The options under **Preferred Alternative 2** vary by whether, if a region has ACLs for each component, private and for-hire, the payback would be shared equally (**Option 2b**) or only applied to the component that exceeded the applicable ACL (**Option 2a**).

The effects associated with the extent of payback sharing are less an issue of economics and more an issue of equity. As previously stated for other actions in this proposed amendment, available information does not support determination that red snapper valuation differs by region (i.e., anglers in one region value red snapper more than anglers in another region), or component.

As a result, assuming red snapper are equally valued by all anglers across the Gulf, the magnitude (total value) of the economic effects (change in total value) on anglers of a payback would be unaffected by whether they are borne only by the region(s) responsible for the overage, or shared by all regions and components. Distributional effects would occur (i.e., a portion of the effects of a payback would be borne by regions or components where the overage did not occur if the payback is shared by all regions and components), but the total change in economic value would be unaffected. From the perspective of distributional effects, the more broadly a payback is shared, the greater the potential that any adverse distributional economic impacts are diluted or reduced. Thus, **Alternative 1** (Gulf-wide regional sector payback) may result in lower distributional impacts than **Preferred Alternative 2** (regional payback), and **Option 2b** (reduce both regional components equally) fewer distributional impacts than **Option 2a** (reduce only the component in the region that exceeds its ACL).

However, from an equity perspective, penalizing anglers, and associated businesses, in all regions/components for overages that only occur in others may be perceived as inequitable because it would result in re-distribution of economic benefits without apparent justification. Thus, from the perspective of equity, **Preferred Alternative 2** would be expected to be more equitable than **Alternative 1**, and **Option 2a** would be more equitable than **Option 2b**.

4.7.4 Direct and Indirect Effects on the Social Environment

In general, it is expected that exceeding the recreational sector ACL and triggering AMs should be avoided, because fishing opportunities would likely be reduced for the following season. Thus, direct effects are not expected from adopting or modifying a post-season AM, because the overage adjustment only results in effects if and when it is triggered. Indirect impacts would be expected from triggering the AM under any of the alternatives, as the available quota for the subsequent fishing season is decreased. For any of the alternatives or options in this action, the post-season overage adjustment would only be triggered in the event the recreational sector ACL is exceeded, red snapper is classified as overfished based on the most recent Status of U.S. Fisheries Report to Congress, and the best scientific information available determines that a greater, lesser, or no overage adjustment is necessary.

Currently, if the red snapper recreational sector ACL is exceeded in a given year, the recreational sector ACL will be reduced the following year by the amount of the overage unless the best scientific information available determines that a greater, lesser, or no overage adjustment is necessary (**Alternative 1**). Usually, additional effects would not be expected from retaining **Alternative 1** (No Action). However, if regional management is implemented and the recreational sector ACL is subsequently exceeded, all regional ACLs would be reduced in the following year, even if only one region's landings caused the recreational sector ACL to be exceeded. In the event the recreational sector ACL is exceeded under **Alternative 1**, negative effects would result for regions (and components, if applicable) that constrained landings to within each respective portion of the ACL. In turn, some positive effects would result for a region (or component) that exceeded its portion of the ACL, as the reduction to the recreational sector ACL in the following year would be shared among all regions. Thus, retaining **Alternative 1** may be perceived as unfair in a region (or component) that successfully constrains

landings to its regional ACL (or component ACL), but has its regional ACL reduced the following year due to an overage in the recreational sector ACL.

Preferred Alternative 2 would modify the post-season AM such that it applies only to a region that exceeds its regional ACL, and the recreational sector ACL is also exceeded. In the event an overage adjustment is triggered, positive effects would be expected for regions that do not exceed the respective regional ACLs, compared to **Alternative 1**, as the respective regional ACL would not be reduced due to an overage by another region.

Options 2a and **2b** could be selected if Alternative 3 in Action 2 is selected as preferred, as Action 2's Alternative 3 would establish regional component ACLs. **Option 2b** mirrors **Alternative 1** at the regional level, in that the overage adjustment would be applied equally to both regional components, regardless of the component that triggered the overage adjustment. As with **Alternative 1**, **Option 2b** may be perceived as unfair by a regional component that did not exceed its ACL, as its ACL would still be reduced in the following year. Similarly, **Option 2a** mirrors **Preferred Alternative 2**, in that an overage adjustment would only be applied to the respective ACL that was exceeded; the regional component ACL under **Option 2a**, and the regional ACL under **Preferred Alternative 2**.

In the event the total recreational sector ACL is exceeded in a given year, regions (**Preferred Alternative 2**), and regional components (**Option 2a**) that constrain landings to within their respective portions of the ACL would not be affected by a reduced ACL in the following year. This means that either of these would avoid negative effects to the respective region (**Preferred Alternative 2**) or regional component (**Option 2a**) compared to **Alternative 1** and **Option 2b**. For a region or regional component that exceeds its respective ACL and causes the recreational sector ACL to be exceeded, fewer negative effects would be expected as the overage adjustment would be distributed equally across all regions (**Alternative 1**) or both regional components for a particular region (**Option 2b**). The severity of these effects would relate to the extent of the quota overage, as fishing opportunities would be reduced in the following year to make up for the quota overage. It could be socially disruptive if large recreational sector ACL overages one year are followed by severe paybacks the next.

4.7.5 Direct and Indirect Effects on the Administrative Environment

The direct and indirect effects on the administrative environment from this action would be related to analyzing the landings data and applying the post-season AM. **Alternative 1** would not change the administrative environment. However, this alternative results in continuously updating the yield stream to account for any overages and determine the acceptable biological catch (ABC) for red snapper each year, and developing a framework action to apply the revised ABC through updating the quotas. This maintains a burden on the administrative environment.

These alternatives may indirectly affect the enforcement of the regulations negatively. By implementing adjustments for overages, the subsequent season may be shortened. **Preferred Alternative 2**, **Option 2a**, and **Option 2b** could result in a closed season off a region if the previous year's regional quota was exceeded by over 100%. If the adjacent regions were open for the harvest of red snapper, then the increased complexity of the regulations may confuse

fishermen and result in an increase in noncompliance and negative effects on enforcement and the administrative environment. The necessity to increase enforcement in a State or States without a recreational red snapper fishing season would increase the burden on the administrative environment.

Preferred Alternative 2, **Option 2a**, and **Option 2b** would provide specific methods to determine the following years' quota and subsequent regional and component quotas. The direct effect may benefit the administrative environment if the quotas do not require a framework action to be implemented. However, the required calculations, landings analysis, and reports to determine the adjusted ACL if an overage occurs may increase the burden on the administrative environment.

These alternatives may indirectly affect the enforcement of the regulations negatively. By implementing adjustments for overages, the subsequent season may be shortened. In addition, if the SSC modifies the ABC due to an overage (**Alternative** 1) the season length could be reduced. **Preferred Alternative 2**, **Option 2a**, and **Option 2b** could result in no fishing days for red snapper off a region if the previous year's regional quota was exceeded by over 100%. The increased complexity of the regulations may frustrate fishermen and result in an increase in noncompliance and negative effects on enforcement and the administrative environment. The necessity to increase enforcement in a State or States without a recreational red snapper fishing season would increase the burden on the administrative environment.

4.8 Cumulative Effects Analysis (CEA)

As directed by NEPA, federal agencies are mandated to assess not only the indirect and direct impacts, but cumulative impacts of actions as well. NEPA defines a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 C.F.R. 1508.7). Cumulative effects can either be additive or synergistic. A synergistic effect is when the combined effects are greater than the sum of the individual effects.

This section uses an approach for assessing cumulative effects that was initially used in Amendment 26 to the Reef Fish FMP and is based upon guidance offered in CEQ (1997). The report outlines 11 items for consideration in drafting a CEA for a proposed action.

1. Identify the significant cumulative effects issues associated with the proposed action and define the assessment goals.
2. Establish the geographic scope of the analysis.
3. Establish the timeframe for the analysis.
4. Identify the other actions affecting the resources, ecosystems, and human communities of concern.
5. Characterize the resources, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stress.

6. Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.
7. Define a baseline condition for the resources, ecosystems, and human communities.
8. Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities.
9. Determine the magnitude and significance of cumulative effects.
10. Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects.
11. Monitor the cumulative effects of the selected alternative and adapt management.

Cumulative effects on the biophysical environment, socio-economic environment, and administrative environments are analyzed below.

1. Identify the significant cumulative effects issues associated with the proposed actions and define the assessment goals.

The CEQ cumulative effects guidance states this step is accomplished through consideration of the following:

I. The direct and indirect effects of the proposed actions (Section 4.1-4.7);
II. Which resources, ecosystems, and human communities are affected (Section 3); and
III. Which effects are important from a cumulative effects perspective (information revealed in this CEA).

2. Establish the geographic scope of the analysis.

The primary effects of the actions in this amendment would affect the social, economic, and administrative environments of the Gulf. The physical and biological/ecological environments would be less affected as described in Sections 3.1-3.3 & 4.1 – 4.7.

The geographic scope affected by these actions is described in detail in Reef Fish Amendments 22 and 27 (GMFMC 2004b and 2007) and pertains directly to the Gulf. Red snapper are one of the most sought after species in the reef fish fishery. This species occurs on the continental shelves of the Gulf and the U. S. Atlantic coast to Cape Hatteras, N. C. (Moran 1988). Eggs and larvae are pelagic and juveniles are found associated with bottom features or bare bottom. In the Gulf, adults are found in submarine gullies and depressions; natural vertical relief structures such as coral reefs, rock outcroppings, and gravel bottoms; and artificial structures such as oilrigs and artificial reefs (GMFMC 2004a).

Commercial reef fish vessels and dealers are primarily found in Gulf States (GMFMC 2008b, 2013b). Based on mailing addresses or home ports given to the Southeast Regional Office (SERO) as of January 6, 2014[15], 100% of historical charter captain reef fish, 97% of for-hire reef fish, 98.5% of commercial reef fish permitted vessels, and 100% of vessels with reef fish longline endorsements are found in Gulf States. For permitted reef fish dealers, 94.5% are found in Gulf States. All dealers who are able to process IFQ transactions are located in Gulf States

[15]http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/freedom_of_information_act/common_foia/index.html

(Section 3.5.1.3). With respect to eligible red snapper individual fishing quota shareholders actually holding red snapper shares, 98% have mailing addresses in Gulf States (GMFMC 2013b). According to NMFS (2013b), approximately 35% of trips and 42% of the catch in 2012 for U. S. marine recreational fishing trips occurred in the Gulf by approximately 3.1 million anglers catching 161 million fish.

3. Establish the timeframe for the analysis

The timeframe for this analysis is 1984 to 2017. Red snapper have been managed in the Gulf since the implementation of the Reef Fish Fishery Management Plan in **1984** which put in place a 13-inch minimum size limit total length (TL). The red snapper stock has been periodically assessed since 1988. The 2013 SEDAR 31 red snapper stock assessment was the last benchmark assessment. The assessment included reconstructed data for analysis for the commercial sector from 1872 through 1962 (Porch et al. 2004), data from 1963-2011 for commercial landings, and data from 1981-2011 for recreational landings (SEDAR 31 2013). In addition, catch effort for the Gulf shrimp fishery (SEDAR 31 2013), including reconstructed data from 1948-1972 (Porch and Turner 2004), was used to estimate juvenile red snapper discards from this fishery.

The following is a list of reasonably foreseeable future management actions. These are described in more detail in Step 4. Should new regulations be needed for the management of this stock, they will likely not be implemented until **2017** at the earliest, or the end of the timeframe discussed in this analysis.

- The next assessment for red snapper through SEDAR is a benchmark assessment is scheduled for 2015 (completed in 2016). Other reef fish species scheduled for assessments include: gag, greater amberjack, hogfish, and mutton snapper in 2014; red grouper, vermilion snapper, gray triggerfish, scamp, and black grouper in 2015; and gag, greater amberjack, yellowedge grouper, gray snapper, and yellowtail snapper in 2016.

- The Council is currently developing several actions that will affect the reef fish fishery. Actions affecting red snapper include:, Amendment 36 (IFQ program revision), Amendment 42 (charter vessel red snapper management), and a generic status determination criteria amendment (update ACL language). In addition, the Council is working on reef fish actions that update ACLs with new MRIP numbers, look at gag regional management, and require electronic reporting for charter boats. These actions are described in more detail in Step 4 of this CEA.

4. Identify the other actions affecting the resources, ecosystems, and human communities of concern.

a. Past actions affecting red snapper fishing are summarized in Sections 1.3. The following list identifies more recent actions (Note actions taken prior to Amendment 32, the last EIS done for the Reef Fish FMP are described in detail in that amendment (GMFMC 2011a) and are incorporated here by reference).

The following are past actions specific to red snapper:

- In January 2011, the Council submitted a framework action (GMFMC 2011c) to NMFS

to increase the red snapper total allowable catch to 7.185 mp, with a 3.521 mp recreational quota and a 3.664 mp commercial quota. The final rule from this action established a 48-day recreational red snapper season was June 1 through July 18.

- On August 12, 2011, NMFS published an emergency rule that, in part, increased the recreational red snapper quota by 345,000 pounds for the 2011 fishing year and provided the agency with the authority to reopen the recreational red snapper season later in the year, if the recreational quota had not been filled by the July 19 closing date. However, in August of that year, based on headboat data plus charter boat and private recreational landings through June, NMFS calculated that 80% of the recreational quota had been caught. With the addition of July landings data plus Texas survey data, NMFS estimated that 4.4 to 4.8 mp were caught, well above the 3.865 mp quota. Thus, no unused quota was available to reopen the recreational fishing season.
- On May 30, 2012, NMFS published a final rule to implement a framework action submitted by the Council to increase the commercial and recreational quotas and establish the 2012 recreational red snapper fishing season (GMFMC 2012a). The recreational season opened on June 1 through July 11. However, the north-central Gulf experienced extended severe weather during the first 26 days of the 2012 recreational red snapper fishing season, including Tropical Storm Debby. Because of the severe tropical weather, the season was extended by six days and closed on July 17.
- On May 29, 2013, NMFS published a final rule to implement a framework action submitted by the Council to increase the commercial and recreational quotas (GMFMC 2013c). The combined quotas were raised from 8.080 million pounds whole weight to 8.460 lbs whole weight. The recreational fishing season was set differently for waters off different States because of non-compatible regulations. However, a federal court ruled against different seasons, so the season for federal waters was from June 1 through July 5. Later in 2013, NMFS approved a framework action (GMFMC 2013a) to increase the combined quotas from 8.46 mp to 11 mp. This allowed an additional recreational fishing season from October 1 through October 15.
- An exempted fishing permit was given to the Gulf of Mexico Headboat Collaborative Pilot program that began on January 1, 2014. NMFS authorized the 2-year pilot program to assess the viability of an allocation-based management strategy for achieving conservation and economic goals more effectively than current management. The Headboat Collaborative was allocated a portion of the red snapper and gag recreational quotas based on historical landings data and participating headboats are able to use the allotted quota to harvest red snapper and gag outside the normal recreational fishing seasons.
- In response to a decision by the U.S. District Court for the District of Columbia (Court) in Guindon v. Pritzker, 2014 WL 1274076 (D.D.C. Mar. 26, 2014), NMFS took emergency action May 15, 2014 (79 FR 27768) to address recent recreational red snapper quota overages. At their April 2014 meeting, the Council requested an emergency rule to implement an in-season accountability measure for the recreational harvest of red snapper in the Gulf that would apply to the 2014 season that opened on June 1, 2014. The action set an ACT equal to 80% of the 5.390 mp quota (ACT = 4.312 mp). The resultant 9-day season was based on the ACT and has only a 15% probability of exceeding the quota.
- A framework action was implemented in March 2015 to establish a recreational red

snapper ACT and overage adjustment as accountability measures for the recreational sector.

- In April 2015 Amendment 40 separated the recreational sector into a private angling component and a for-hire component for the harvest of red snapper.
- A framework action in April 2015 increased the TAC from 11.0 mp to 14.3 mp.

b. The following are recent reef fish actions not summarized in Section 1.3 but are important to the reef fish fishery in general (Note actions taken prior to Amendment 32 are described in detail in that amendment (GMFMC 2011a) and incorporated here by reference).

- A rule effective April 2, 2012, that adjusted the 2012 commercial quota for greater amberjack, based on final 2011 landings data. For 2011, the commercial quota was exceeded by 265,562 pounds. Therefore, NMFS adjusted the 2012 commercial quota to account for the overage resulting in a quota of 237,438 pounds.
- A temporary rule effective May 14, 2012, reduced the gray triggerfish annual catch limits and commercial and recreational annual catch targets. The temporary rule was put in place to reduce overfishing while the Council worked on long-term measures to end overfishing and rebuild the stock in Amendment 37.
- A framework action effective on November 19, 2012, eliminated the earned income qualification requirement for the renewal of Gulf commercial reef fish permits and increased the maximum number of crew members for dual-permitted (commercial and charter) vessels. The Council determined the existing earned income requirement in the reef fish fishery is no longer necessary and relaxing the number of crew on dual-permitted vessels increased the safety on commercial trips, particularly for commercial spear fishermen.
- Amendment 38 (GMFMC 2012b), effective March 1, 2013, allows NMFS to shorten the season for gag and red grouper if landings exceeded the catch limit in the previous year. The amendment also changed the trigger method for recreational accountability measures to an annual comparison of landings to the catch limit rather than using a three-year moving average. Finally, the amendment allows the establishment or modification of accountability measures through the faster framework procedure rather than through slower plan amendments.
- Amendment 37 (GMFMC 2012c), rulemaking effective June 10, 2013, was developed to end overfishing of gray triggerfish and rebuild the gray triggerfish stock. The amendment adjusted the commercial and recreational gray triggerfish annual catch limits and annual catch targets, established a 12-fish commercial gray triggerfish trip limit and a 2-fish recreational daily bag limit, established an annual fishing season closure from June 1 through July 31 for the commercial and recreational sectors, and established an overage adjustment for the recreational sector.
- A framework action effective July 5, 2013, adjusted the recreational gag season to July 1 through December 3, 2013, the time projected to harvest the recreational annual catch target of 1.287 mp. The framework action also restricted the geographical extent of the fixed February 1 through March 31 shallow-water grouper closed season to apply only to waters seaward of the 20-fathom boundary. This allows grouper fishing to occur

year-round while providing some protection to species that spawn during February and March.

- A framework action effective September 3, 2013, set a 10-vermilion snapper bag limit within the 20-fish aggregate reef fish bag limit as a precautionary measure to reduce the chance of overfishing for this species. The action also increased the Gulf yellowtail snapper annual catch limit from 725,000 pounds to 901,125 pounds based on a recent stock assessment. Finally, the action eliminated the requirement to use venting tools when fishing for reef fish as 1) some scientific studies have questioned the usefulness of venting tools in preventing barotrauma in fish and 2) the action would give more flexibility to fishermen on when to vent or to use some other device like fish descenders.
- A framework action effective March 5, 2014, requiring headboats to report their logbooks electronically in the Gulf reef fish and coastal migratory pelagic fisheries.
- Accountability measures for red grouper and gray triggerfish were implemented. For red grouper recreational fishing, the bag limit was reduced from four to three fish on May 5, 2014, and a season closure was projected for September 16, 2014. For gray triggerfish, the recreational season was closed on May 1, 2014.

c. The following are reasonably foreseeable future actions (RFFA) important to red snapper and the reef fish fishery in general[16].

- The Council is currently developing the following actions for red snapper.
    - Amendment 36 would revise the IFQ program based on recommendations from the red snapper IFQ program. These recommendations would be based on a review of the program completed in 2013 (GMFMC 2013b).
    - A generic status determination criteria amendment proposes to update the current red snapper quota-based language for setting commercial and recreational allocations with ACL-based language in accordance with the Magnuson-Stevens Act.
    - Amendment 41 and 42 were proposed by the Council to examine a charter/for-hire management programs for red snapper and possibly other reef fish in the Gulf of Mexico.
- The Council is working on other reef fish actions. These are as follows:
    - An amendment to require electronic reporting for charter boats to improve the quality and timeliness of landings data for this sector.
    - A framework to modify gag and black grouper management measures.
    - A framework to adjust the amberjack management measures.
- Congress has proposed HR 3099 and S 1161 which directs the Gulf States Marine Fisheries Commission to: (1) prepare and adopt a data collection strategy for the Gulf red snapper fishery, including interstate collaboration measures and a plan for annual stock assessments; and (2) prepare, adopt, and submit to the Secretary of Commerce a fishery management plan providing for the conservation and management of Gulf red snapper and describing the standards of compliance for Gulf coastal States to use in developing fishery management measures.

[16] Information on these developing actions can be found on the Council's website at www.gulfcouncil.org.

- The House Committee on Natural Resources is also reviewing H.R. 3094 the "Gulf States Red Snapper Management Authority Act" sponsored by Representative Graves which transfers control of red snapper to the Gulf States.

d. The following are non-FMP actions which can influence the reef fish fishery.

Amendment 30B (GMFMC 2008b) describes in detail non-FMP actions relating liquefied natural gas terminals, hurricanes, fuel prices, and imports and were reiterated in Amendment 32. To summarize:

- Some liquefied natural gas terminals use sea water to heat the gas back to its gaseous phase. For open systems, high volumes of sea water are required and are likely to result in large mortalities of marine organism eggs and larvae.
- For hurricanes, direct losses to the fishing industry and businesses supporting fishing activities occur ranging from loss of vessels to destruction of fishery infrastructure (Walker et al. 2006). However, although these effects may be temporary, those fishing-related businesses whose profitability is marginal may be put out of business should a hurricane strike.
- Rising fuel costs have negative impacts on communities by increasing business costs and lowering profits.
- Most seafood consumed in the United States is imported and the quantity of imports has been steadily increasing. The effects of imports on domestic fisheries can cause fishermen to lose markets through commercial sector closures as dealers and processors use imports to meet demand, and limit the price fishermen can receive for their products through competitive pricing of imports.

In addition, Amendment 32 (GMFMC 2011a) discussed in detail a 2005 red tide event on the west-Florida shelf and the resultant oil spill from the explosion on the Deepwater Horizon MC252 oil rig. The red tide event may have affected reef fish, including red snapper populations. It has only been in the last 10 years that mortalities of higher vertebrates have been indisputably demonstrated to be due to acute red tide blooms and their brevetoxins (Landsberg et al. 2009). The extent of this event and possible effects of fish community structure has been described in Gannon et al. (2009).

Millions of barrels of oil were released into the Gulf from the Deepwater Horizon MC252 event (see http://response.restoration.noaa.gov/deepwaterhorizon). The effects on the environment on reef fish and the reef fish fisheries may not be known for several years when affected year classes of larval and juvenile fish enter the adult spawning population orfishery. For red snapper, this occurs at approximately 3 years of age, so a year class failure in 2010 may not be detected in the spawning populations or by harvesters of red snapper until 2013 at the earliest. The results of the studies detecting these impacts on recruitment should be available soon and will be taken into consideration in the next SEDAR assessment. In addition to impacts on recruitment, adult reef fish may also have been negatively affected by the oil spill. For example, Weisberg et al. (2014) suggested the hydrocarbons associated with Deepwater Horizon MC252 oil spill did transit onto the Florida shelf and may be associated with the occurrences of reef fish (including red snapper) with lesions and other deformities. The overall impact of the oil spill may not be realized for quite some time and study results are just now becoming available.

There is a large and growing body of literature on past, present, and future impacts of global climate change induced by human activities (Kennedy et al. 2002). Some of the likely effects commonly mentioned in relation to marine resources are sea level rise, ocean acidification, coral bleaching, increased frequency of severe weather events, and change in air and water temperatures (Kennedy et al. 2002; Osgood 2008). 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 its assessments of climate change (http://www.ipcc.ch/publications_and_data/publications_and_data.shtml). Additional reports are provided on the Global Climate Change website http://climate.nasa.gov/scientific-consensus.

Global climate changes could affect Gulf fisheries; however, the extent of these effects is not known at this time. Possible impacts include temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; changes in precipitation patterns and 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 influencing the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs (Kennedy et al. 2002; Osgood 2008). An area of low oxygen, known as the dead zone, forms in the northern Gulf each summer, and has been increasing in recent years (see Section 3.3). Climate change may contribute to this increase by increasing rainfall that in turn increases nutrient input from rivers. This increased nutrient load causes algal blooms that, when decomposing, reduce oxygen in the water (Needham et al. 2012; Kennedy et al. 2002). It is unclear how climate change would affect reef fishes and likely would affect species differently. Climate change can affect factors such as migration, range, larval and juvenile survival, prey availability, and susceptibility to predators. Burton (2008) speculated climate change could cause shifts in spawning seasons, changes in migration patterns, and changes to basic life history parameters such as growth rates. 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. Hollowed et al. (2013) provided a review of projected effects of climate change on the marine fisheries and dependent communities. Integrating the potential effects of climate change into the fisheries assessment is currently difficult due to the time scale differences (Hollowed et al. 2013). The fisheries stock assessments rarely project through a time span that would include detectable climate change effects. Climate change may significantly affect Gulf reef fish species in the future, but the level and time frame of these effects cannot be quantified at this time. Actions from this amendment are not expected to significantly contribute to climate change through the increase or decrease in the carbon footprint from fishing.

5. Characterize the resources, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stress.

This step should identify the trends, existing conditions, and the ability to withstand stresses of the environmental components. According to the CEQ guidance describing stress factors, there are two types of information needed. The first are the socioeconomic driving variables identifying the types, distribution, and intensity of key social and economic activities within the

region. The second are the indicators of stress on specific resources, ecosystems, and communities.

Reef Fish Fishery

Data used to monitor commercial reef fish effort includes the number of vessels with landings, the number of trips taken, and trip duration. Declines in effort may be a signal of stress within the fishery. For the red snapper component of the commercial sector, the number of vessels and trips did decline after the red snapper IFQ program was first implemented. However, the number of vessels and trips with red snapper landings have increased from 2007 to 2012 (GMFMC 2013b). These trends are described in Sections 3.1, 3.4, 5.0, 6.0 and in GMFMC (2013b). The commercial IFQ program recently underwent a 5-year review (GMFMC 2013b). The stated goals of this program, implemented through Amendment 26 (GMFMC 2006) were to reduce overcapacity and eliminate problems associated with overcapacity. The review found the program was moderately to highly successful in meeting the program goals; however, further improvements were identified regarding overcapacity, discard mortality price reporting, and social and community impacts. Therefore, the red snapper component of the commercial sector does not seem to be stressed.

Within the commercial reef fish sector as a whole, the number of commercial vessels has been declining as evidenced by the number of permits (Table 4.8.1). The number of permits has declined from 1,099 in 2008 to 917 in 2012 and the number landing at least one pound of reef fish has declined from 681 to 557 over the same time period. Although this could be an indicator of stress in the fishery, the commercial sector has undergone several changes in the past few years with the IFQ programs for red snapper, grouper, and tilefish. Given that a primary goal of these programs is to reduce overcapacity, the reduction in permits may just reflect this expected change.

Table 4.8.1. Number of Gulf of Mexico reef fish commercial (landing at least one pound of reef fish), for-hire, and historical captain permits by year.

	Year				
Sector	2008	2009	2010	2011	2012
Commercial	1099 (681)	998 (696)	969 (580)	952 (561)	917 (557)
For-hire	1458	1417	1385	1353	1336
Historical captain	61	56	47	43	42

Source: Southeast Regional Office, Limited Access Permit Program Branch.

Table 4.8.2. Number of Gulf of Mexico reef fish commercial trips catching at least one pound of reef fish and the number of offshore angler trips for the charter and private angling components of the reef fish recreational sector for the years 2008-1012.

	Year				
Sector	2008	2009	2010	2011	2012
Commercial	8,079	8,177	5,991	6,541	6,629
Charter	326,868	319,768	229,679	300,668	355,413
Private angler	1,434,875	1,011,948	767,080	782,989	1,017,007

Sources: Commercial trip data from the Southeast Regional Office, Limited Access Permit Program Branch and recreational angler trip data from NOAA Office of Science and Technology's Recreational Fisheries Statistics web page at https://www.st.nmfs.noaa.gov/recreational-fisheries/index.

For the reef fish recreational sector, the number of angler trips in offshore waters are used as a proxy for recreational reef fish fishing and show a decline in 2010 from 2008 and 2009 values followed by an increase in trips in 2011 and 2012. This suggests the sector is recovering from the 2010 Deepwater Horizon MC252 oil spill. Within the for-hire component, the number of for-hire and historical captain permitted vessels has declined from 2008 to 2012 and could be viewed as an indicator of stress. However, the number of offshore trips by the charter component has increased above 2008 and 2009 values suggesting economic conditions for this component were improving. However, as pointed out in Chapter 1, pounds landed and trips taken by for-hire vessels relative to private anglers were lower in 2013, likely as a consequence of state waters during extend State seasons being closed to federally permitted for-hire vessels when the federal red snapper recreational season was closed.

Managed Resource

Major stresses to the red snapper stock have primarily come from overfishing, which has been occurring at least since the first stock assessment in 1988 and overfishing only recently ended. It is likely that quota overruns by both commercial and recreational sectors have slowed the recovery of the stock. Trends in landings and the status of red snapper stock are based on NMFS and SEDAR stock assessments (summarized in Sections 3.1 and 3.3) and incorporated here by reference. The most recent stock assessment indicates the stock is continuing to rebuild. It is likely the red snapper stock was adversely affected by the Deepwater Horizon MC252 oil spill in 2010; however, these effects are only just being realized (see step 4d). A recommendation in the 2013 stock assessment (SEDAR 31 2013) is that future assessments of Gulf red snapper should be conducted with the explicit goal of attempting to model any enduring oil spill effects and their effect on the stock. At this point, it is unclear if and how climate change is affecting red snapper stocks. Burton (2008) speculated climate change could cause shifts in spawning seasons, changes in migration patterns, and changes to basic life history parameters such as growth rates in Gulf fish stocks, but changes to such patterns have not been observed for red snapper.

Ecosystem

With respect to stresses to the ecosystem from actions in this amendment, changes in the red snapper allocation are not likely to create additional stress. Handline gear, the primary gear used by the fishery, and longlines can damage habitat through snagging or entanglement; however, as described in Section 4.1.1, these impacts are minimal. Changes in the population size structure as a result of shifting red snapper fishing selectivities and increases in stock abundance could lead to changes in the abundance of other reef fish species that compete with red snapper for shelter and food. Predators of red snapper could increase if red snapper abundance is increased, while species competing for similar resources as red snapper could potentially decrease in abundance if food and/or shelter are less available. Efforts to model these interactions are still ongoing [e.g., Ecopath (Walters et al. 2006) and Atlantis[17]), and so predicting possible stresses

[17] NOAA's Integrated Ecosystem Assessment Program (https://www.st.nmfs.noaa.gov/iea/gulfofmexico.html)

on the ecosystem in a meaningful way is not possible at this time. As described in Part 4d of this cumulative effects analysis, the Deepwater Horizon MC252 incident has affected more than one-third of the Gulf area from western Louisiana east to the panhandle of Florida and south to the Campeche Bank in Mexico. The impacts of the oil spill on the physical and biological environments are expected to be significant and may be long-term. Stressors to the ecosystem could include such factors as year-class failures and damage to reef fish EFH. Climate change may also be a stressor to the ecosystem, but is poorly understood. Hollowed et al. (2013) outlined the difficulties in understanding the effects of climate change and developed a conceptual pathway of direct and indirect effects of climate change and other anthropogenic factors on marine ecosystems. They suggest integrated interdisciplinary research teams be used better understand the effects. At this time, climate change does not appear to be a stressor on the reef fish fishey. However, it could be in the future. The National Ocean Service (2011) indicated that 59% of the Gulf coast shoreline is vulnerable to sea level rise. This means coastal communities that support this fishery could be impacted in the future from higher storm surges and other factors associated with sea level rise. These communities do appear to be somewhat resilient given their ability to recover after the 2004 and 2005 hurricane seasons as well as from the Deepwater Horizon MC252 oil spill (see step 4).

Administrative Environment

The stresses to the administrative environment from these actions would likely focus on the setting of annual quotas, ACTs, as well as monitoring landings to determine if AMs have been triggered. However, these stresses are not expected to significantly differ from the current stresses. In 2013, several States established recreational red snapper regulations that were inconsistent with federal regulations. This caused additional stress on the administrative environment requiring additional regulations, analysis, presence of law enforcement, and increased confusion among the fishing public. The actions in this amendment would allow regions to adjust regulations to meet their regional needs while maintaining consistency with the FMP and likely reduce stress in this environment. It is unknown whether the regions would be able to constrain harvest to the quota. However, with the current federal management, the recreational sector has exceeded the allocation in 14 of 22 years in which an allocation was specified. The stock could likely withstand some overages without jeopardizing the rebuilding plan; however, continuous overages could result in a change of the stock status. However, the regions have indicated they intend to establish new monitoring procedures, which could improve the estimations for landings, but the SEFSC would need to review the sampling designs and data to insure compatibility with the current methods.

6. Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.

This section examines whether resources, ecosystems, and human communities are approaching conditions where additional stresses could have an important cumulative effect beyond any current plan, regulatory, or sustainability threshold (CEQ 1997). Sustainability thresholds can be identified for some resources, which are levels of impact beyond which the resources cannot be sustained in a stable state. Other thresholds are established through numerical standards, qualitative standards, or management goals. The CEA should address whether thresholds could

be exceeded because of the contribution of the proposed actions to other cumulative activities affecting resources.

Reef Fish Fishery

As indicated above, both commercial and for-hire fisheries are subject to stress as a result of increases in fishing costs, increases in harvesting efficiency, more restrictive regulations (particularly for red snapper), and changes in the stock status of certain species (effort shifting). Reductions in dollars generated by these entities would likely be felt in the fishery infrastructure. For the reef fish fishery, an indicator of stress would be a decline in the number of permitted vessels. For the commercial sector, the number of vessels and trips landing red snapper initially declined after the IFQ program went into effect in 2007 (419 vessels and 4,714 trips in 2006 compared to 319 vessels and 2,578 trips in 2007; GMFMC 2013b). However, the number of vessels and trips landing red snapper has increased in recent years (368 vessels and 3,389 trips in 2011) demonstrating that conditions in commercial red snapper sector are improving. GMFMC (2013b) also cites other factors such as pricing, fleet and effort consolidation, and market conditions that also support an improved socioeconomic environment. As mentioned in Step 5 of this CEA, the number of vessels in the commercial sector has declined; however, with the shift towards IFQ management, it is difficult to determine if this reflects stress in the sector or is a result of overcapacity reduction - an expected result of IFQ management. Five-year reviews similar to the one conducted for red snapper are planned for the grouper and tilefish IFQ programs after the 2014 fishing year (year 5 of the) is complete.

Analyses conducted on the effects of a limited access program for for-hire vessels indicated operations were generally profitable (GMFMC 2005a). However, testimony from for-hire operators in light of recent red snapper regulations have suggested some for-hire operators may go out of business, particularly in the northeastern Gulf. Other reasonably foreseeable actions listed in Step 4c of this analysis are not expected to adversely affect the for-hire component and so should not place additional stress to the recreational sector. Non-FMP actions (see Step 4d) may place added stress on the for-hire component of the recreational sector (e.g., hurricanes and higher fuel costs). However, timing and magnitude of the potential negative cumulative the effects from these events are difficult to predict.

Little information is available on the stresses on the private angler sector. Because private angling is an optional activity, likely factors that affect a person's involvement are likely economic. Therefore, costs such as fuel, marina fees, and boat upkeep are likely to affect a person's decision to go red snapper fishing or not, particularly within the current short recreational red snapper season. As a result, more red snapper trips could be taken if there are gains in pounds for this component. Other reasonably foreseeable actions listed in Step 4c of this analysis are not expected to adversely affect the private angling component and so should not place additional stress to the recreational sector as a whole. Non-FMP actions (see Step 4d) may place added stress on the private angling component (e.g., hurricanes, higher fuel costs, and climate change). However, timing and magnitude of the potential negative cumulative the effects from these events are difficult to predict (see steps 4 and 6).

Managed Resources

Amendment 1 to the Reef Fish FMP (GMFMC 1989), implemented in 1990 before the Sustainable Fisheries Act (SFA) was passed, established the minimum spawning stock biomass at 20 percent SPR for all reef fish species. A 1991 regulatory amendment (GMFMC 1991) established a commercial quota and a 1997 regulatory amendment established a recreational quota. The quotas were set based on the 51:49 commercial:recreational allocation being applied to the total allowable catch. The Generic Sustainable Fisheries Act (SFA) Amendment (GMFMC 1999) proposed SFA definitions for optimum yield, minimum stock size threshold and maximum fishing mortality threshold for three reef fish species and generic definitions for all other reef fish. The definition of maximum fishing mortality threshold for red snapper, $F_{26\%SPR}$, was approved and implemented. Definitions for optimum yield and minimum stock size threshold were disapproved because they were not biomass-based. ACLs were not implemented for red snapper as the commercial and recreational quotas were considered functional equivalents; however, ACLs are currently being defined by the Council in a Generic Status Determination Criteria Amendment (see 4c of this CEA).

A benchmark assessment was conducted for red snapper in 2013 under the SEDAR stock assessment process (see Section 3.3 for a summary of the assessment). Based on the parameter estimates through 2011, the red snapper stock was found to be overfished, but that overfishing had ended. A brief description of the stock and its status can be found in Section 3.3 and step 5 of this CEA. Measures proposed in this amendment are not likely to adversely affect the red snapper stock status as long as landings do not exceed the OFL. This is because the actions would affect the allocation of red snapper between components and not how many red snapper can be caught. At this time, it is unclear how climate change may affect these regulatory thresholds (see steps 4 and 5).

Ecosystem

The stresses associated with the proposed actions in relation to regulatory thresholds are not likely to cause beneficial or adverse effects on the ecosystem. The actions would not change the way the reef fish fishery as a whole is prosecuted. Actions in the amendment would affect red snapper recreational fishing and not fishing for the other 30 reef fish species. Thus, significant effects on the ecosystem are not expected. The overall Gulf-wide fishing effort would remain constrained by the recreational quotas and annual catch limits. Climate change is likely to affect the Gulf ecosystem; however, as described in steps 4 and 5, these effects are poorly understood.

Administrative Environment

The stresses associated with the proposed actions in relation to regulatory thresholds are not likely to cause beneficial or adverse effects on the administrative environments. Activities such as monitoring landings, setting quotas, and enforcing fisheries regulations will continue as before. If the creating two components of the recreational sector result in more satisfying management measures for each component, this should reduce stresses on managers to respond complaints by stakeholders on red snapper management.

7. Define a baseline condition for the resources, ecosystems, and human communities.

The purpose of defining a baseline condition for the resource and ecosystems in the area of the proposed actions is to establish a point of reference for evaluating the extent and significance of expected cumulative effects.

Reef Fish Fishery

As noted in Section 3.1, a description of the fishery and affected environment relative to red snapper was last fully discussed in joint Reef Fish Amendment 27/Shrimp Amendment 14 (GMFMC 2007). Red snapper landings for the recreational sector are not available at the community level, making it difficult to identify communities as dependent on recreational fishing for red snapper. Data reflecting commercial landings of red snapper may or may not reflect areas of importance for recreational fishing of red snapper. It cannot be assumed that the proportion of commercial red snapper landings among other species in a community would be similar to its proportion among recreational landings within the same community because of sector differences in fishing practices and preferences. Thus, in addition to communities with the greatest commercial red snapper landings, the referenced analysis identifies communities with the greatest recreational fishing engagement, based on numbers of: 1) federal for-hire permits, 2) vessels designated recreational by owner address, and 3) vessels designated recreational by homeport, plus availability of recreational fishing infrastructure. The Gulf communities to score highest for recreational fishing engagement based on the described analysis Section 3.5.

Information is lacking on the social environment of these fisheries, although some economic data are available, although primarily for the commercial sector. Fishery-wide ex-vessel revenues are available dating to the early 1960s, and individual vessel ex-vessel revenues are available from 1993 when the logbook program was implemented for all commercial vessels.

Managed Resources

The first stock assessment of red snapper was conducted in 1986 and has been assessed periodically since then (see Section 3.1). The most recent assessment (see Section 3.3 for a summary) occurred in 2013 through the SEDAR process and included data through 2011. The assessment shows trends in biomass, fishing mortality, fish weight, and fish length dating to the earliest periods of data collection. For this assessment, reliable commercial landings data were estimated back to 1963 and projected landings were estimated back to 1872 (Porch et al. 2004). Recreational data were available since 1981. Beginning with the 1988 assessment (Goodyear 1988), red snapper have been considered overfished and undergoing overfishing. However, the most recent assessment (SEDAR 31 2013) showed that overfishing had ended and that the stock condition, although still overfished, was improving. An update assessment was completed in 2014 and presented to the Council's SSC in January 2015. At this time, it is unknown what affects non-FMP actions (beneficial or adverse) such as the Deepwater Horizon MC252 oil spill or climate change may have on the health of red snapper stocks. Long-term monitoring of reef fish stocks relative to the Deepwater Horizon MC252 oil spill are ongoing.

Ecosystem

A baseline for analysis of the physical environment, as discussed in Section 3.2, was conducted in the EIS for the Generic EFH Amendment (GMFMC 2004a). Detailed information pertaining to the closures and preserves is provided in the February 2010 Regulatory Amendment (GMFMC 2010). In the Gulf, fish habitat for adult red snapper consists of submarine gullies and

depressions; natural vertical relief structures such as coral reefs, rock outcroppings, and gravel bottoms; and artificial structures such as oilrigs and artificial reefs (GMFMC 2004a). Many of these vertical relief areas are identified as protected areas.

Other species in the ecosystem are discussed in Section 3.3. The Reef Fish FMP currently encompasses 31 species (Table 3.3.2). Eleven other species were removed from the FMP in 2012 through the Generic ACL/AM Amendment (GMFMC 2011b). Stock assessments and stock assessment reviews have been conducted for 13 species and can be found on the Council (www.gulfcouncil.org) and SEDAR (www.sefsc.noaa.gov/sedar) websites.

Administrative Environment

The administrative environment is described in Section 3.6. Responsibility for federal fishery management is shared by the Secretary of Commerce (Secretary) and the Council for the federal waters of the Gulf. These waters extend to 200 nautical miles offshore from the nine-mile seaward boundary of the States of Florida and Texas, and the three-mile seaward boundary of the States of Alabama, Mississippi, and Louisiana. The State governments of Texas, Louisiana, Mississippi, Alabama, and Florida have the authority to manage their respective State fisheries. Each of the five Gulf States exercise legislative and regulatory authority over their respective State's 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.

Regulations contained within FMPs are enforced through actions of NOAA's Office of Law Enforcement, the United States Coast Guard, and various State authorities. To better coordinate enforcement activities, federal and State enforcement agencies have developed cooperative agreements to enforce the Magnuson-Stevens Act. These activities are being coordinated by the Council's Law Enforcement Advisory Panel and the Gulf States Marine Fisheries Commission's Law Enforcement Committee, which have developed a 5-year "Gulf of Mexico Cooperative Law Enforcement Strategic Plan – 2008-2012."

The ability of the regions to constrain harvest causes uncertainty surrounding the effects of implementing regional management. The federal management has experienced overages of the quota or allocation in 14 of the last 22 years. However, the methods for estimating landings and projecting the season have improved consistently over time. The question remains if regions could constrain the harvest within the regional quotas; however, the regions have indicated they intend to improve monitoring for their specific regions under this plan, which should ameliorate any concerns about overages being worse. Nevertheless, NMFS would need to continue analyzing the catch rates and landings to determine whether the regional management measures constrain the harvest. If the quota is exceeded for Gulf recreational red snapper harvest, then NMFS would be required to prohibit harvest in the federal waters regardless of the regional management plans.

8. Identify the important cause-and-effect relationships between human activities and resources, ecosystems, and human communities.

Cause-and–effect relationships are presented in Tables 4.4.3.

Table 4.8.3. The cause and effect relationship of fishing and regulatory actions for red snapper within the time period of the CEA.

Time periods	Cause	Observed and/or expected effects
1800-2016	Climate change	Changes ocean acidity and temperature modifies fish and prey distributions and productivity; threaten fishing communities through sea level rise and changing weather patterns
1962-1983	Growth and recruitment overfishing	Declines in mean size and weight
1984	13-inch minimum size limit for the recreational and commercial fisheries	Slowed rate of overfishing
1990	3.1 mp quota for commercial fishery and 7 fish bag limit	Further slow rate of overfishing
1991-1992	2.04 mp commercial quota	Continue to slow rate of overfishing
1992	Establish red snapper Class 1 and 2 endorsements and respective trip limits	Begin derby fishery
1993-1998	3.06 mp commercial quota	Continue to slow rate of overfishing
1994	Increase minimum size to 14 inches in the commercial and recreational fisheries	Increase yield per recruit, increase the chance for spawning, and slow rate of overfishing
1995-1997	Increase minimum size to 15 inches in the commercial and recreational fisheries and reduce the bag limit to 5 fish	Increase yield per recruit, increase the chance for spawning, and slow rate of overfishing
1997-2005	Reduce recreational season length	Constrain harvest in recreational fishery
1998	Shrimp trawls in the EEZ required to use NMFS-certified BRDs west of Cape San Blas	Reduce fishing mortality rate on age 0 and age 1 red snapper
1998-2005	Reduce bag limit to 4 fish	Reduce fishing mortality rate in recreational fishery
1999-2005	Raise total quota to 9.12 mp	Reduce rebuilding rate for fishery
2000-2014	Raise recreational minimum size limit to 16 inches	Increase yield per recruit, increase the chance for spawning, slow rate of overfishing
2004	Shrimp trawls in the EEZ required to use NMFS-certified BRDs east of Cape San Blas	Further reduce fishing mortality rate on age 0 and age 1 red snapper
2004	Implement red snapper rebuilding plan	Provide mechanism to monitor harvest for rebuilding
2007-2016	Commercial- Established Individual Fishing Quota Program (IFQ)	Constrain commercial harvests within the limits set by the rebuilding plan; IFQ to further control commercial sector to prevent overages; increase in administrative work to manage the IFQ.
2007-2014	Recreational - Reduction of bag limit to 2 fish and adjustment of season length	Constrain recreational harvest to the quota. Progressively shorter seasons as average size of landed fish increases.
2013-2016	Overfishing has ended, but the stock remains overfished.	Continue stock rebuilding

9. Determine the magnitude and significance of cumulative effects.

The primary objectives of this amendment and associated EIS is to provide flexibility in the management of the recreational harvest of red snapper by restructuring the federal fishery management strategy to allow for regional variation and developing accountability measures to address overages. The short- and long-term direct and indirect effects of each these actions are provided in Section 4.

To examine the magnitude and significance of the cumulative effects, important valued environmental components (VECs) were identified for the overall actions to be taken with this amendment. VECs are "any part of the environment that is considered important by the proponent, public, scientists and government involved in the assessment process. Importance may be determined on the basis of cultural values or scientific concern" (EIP 1998). For purposes of this analysis, an initial 22 VECs were identified, and the consequences of each alternative proposed in this amendment on each VEC were evaluated. Some of these VECs were combined into a revised VEC because many of the past, current, and reasonably foreseeable future actions (RFFA) were similar. Based on this analysis, four VECs were determined to be the most important for further consideration. Note that because 163 vessels have both commercial and for-hire reef fish permits, commercial vessels were included in the analysis of vessel owner, captain, and crew. The four VECs are shown in Table 4.8.4.

VECs not included for further analysis were sharks, protected resources, and Wholesale/retail. Many longline vessels that target reef fish also target sharks. However, sharks were not considered as an important VEC because, as shark stocks have declined, the shark fishery has become more and more regulated, limiting the effects of this fishery and the stock on reef fish stocks. There may be some effort shifting from the shark fishery to the reef fish fishery due to increased restrictions, however, this effect will likely be minor because only a minority of vessels have dual federal reef fish and shark permits. Protected resources were also eliminated from further analyses in this section. As described in Section 3.3, biological opinions have concluded the primary reef fish gear (longline and hook-and-line) were not likely to jeopardize sea turtles or small tooth sawfish. Because actions considered in this amendment are not expected to change how reef fish fishing gear is used in the prosecution of the reef fish fishery, any take associated with reef fish fishing should not exceed that considered in biological opinions. All other Endangered Species Act (ESA)-listed species heave been found not likely to be adversely affected or not affected by the reef fish fishery. For marine mammals, gear used in the reef fish fishery were classified in the as Category III fisheries (see Section 3.3). This means this fishery has minimal impacts on marine mammals. Dealers and consumers (wholesale/retail) were eliminated because this action affects the recreational sector of the reef fish fishery. The actions in this amendment will not change the IFQ programs and commercial quotas the wholesale/retail business relies on. Thus, pounds needed to support dealers and the consumers who rely on obtaining their seafood from dealers should not be affected.

Table 4.8.4. VECs considered, consolidated, or not included for further evaluation.

VECs considered for further evaluation	VECs consolidated for further evaluation	VECs not included for further evaluation
Ecosystem	Hard bottom EFH Prey species Competitors Predators	Sharks Protected species
Managed Resources	Red snapper Other reef fish	
Reef Fish Fishery	Vessel owner Captain Crew Anglers Fishing Communities Fishing support businesses (ice and gear suppliers, marinas, fuel docks)	Wholesale/retail Dealers and consumers
Administration	Federal Rulemaking Federal Permitting Federal Education State Rulemaking/Framework State Education	

The following discussion refers to the effects of past, present, and RFFAs on the various VECs.

Ecosystem

Essential fish habitat, as defined in the GMFMC (2004a), for the Reef Fish FMP consists of all Gulf estuaries; Gulf waters and substrates extending from the US/Mexico border to the boundary between the areas covered by the Gulf of Mexico and the South Atlantic fishery management councils from estuarine waters out to depths of 100 fathoms. Section 3.2 and GMFMC (2004a) describe the physical environment inhabited by red snapper as well as reef fish in general. Red snapper is a carnivorous bottom dweller, generally associated (as adults) with hard-bottom substrates, submarine gullies and depressions, and oilrigs and other artificial structures (GMFMC 2004a). Eggs and larvae are pelagic while juveniles are found associated with bottom features or over barren bottom.

From fishing, the most sensitive gear/habitat combinations include EFH for reef fish species. These include fish otter trawls, shrimp otter trawls, roller frame trawls, and pair trawls over coral reefs; crab scrapes over coral reefs; oyster dredges over submerged aquatic vegetation (SAV), oyster reefs, or coral reefs; rakes over coral reefs; and patent tongs over SAV, oyster reefs, or coral reefs (GMFMC 2004a). Some of these gear/habitat interactions are unlikely to occur in actual practice (e.g., shrimp trawls towed through hard bottom areas can destroy shrimp nets and so are avoided). In general, gears that are actively fished by towing have the highest potential to alter habitats. However, some habitats, such as coral reefs and hard bottoms are sensitive to interactions with passive gears (e.g. traps) as well. Most directed reef fish fishing activities, as

described in Section 4.1.1, use longlines and handlines, although a few fish are taken by spearfishing gear. These have low levels of impacts compared to other gears.

In the past, some fishing practices have had detrimental effects on the physical environment. Gears such as roller trawls and fish traps damaged habitats while harvesting fish species. As a result of these effects, the Council developed stressed areas to reduce these impacts. Further protections have been developed, primarily by either prohibiting fishing or limiting fishing activities that can occur within certain areas. Detailed information on the the closures and preserves is provided in the February 2010 Regulatory Amendment (GMFMC 2010). In addition, regulatory changes through Generic EFH Amendment 3 (GMFMC 2005b; implemented in 2006) prohibited bottom anchoring and the use of trawling gear, bottom longlines, buoy gear, and all traps/pots to protect coral reefs in several HAPCs, and required a weak link in the tickler chain of bottom trawls on all habitats throughout the Gulf federal waters to minimize damage done to habitats should the chain get hung up on natural bottom structures.

Current allowable gear types can adversely affect hard bottom areas; however, these impacts are not considered great (See Section 4.1.1). Handline gear and longlines used in the reef fish fishery can damage habitat through snagging or entanglement. Longlines can also damage hard bottom structures during retrieval as the line sweeps across the seafloor. Additionally, anchoring over hard-bottom areas can also affect benthic habitat by breaking or destroying hard bottom structures. However, these gears are not believed to have much negative impact on bottom structures and are considerably less destructive than other commercial gears, such as traps and trawls, which are not allowed for reef fish fishing.

Damage caused from reef fish fishing, although minor, is associated with the level of fishing effort (see Section 4.1.1). Therefore, actions reducing levels of effort would result in greater benefits to the physical environment because fishing related interactions with habitat would be reduced. Thus, actions described in steps 3 and 4 of this CEA which have reduced fishing effort for some species, and possibly the fishery on the whole, have had a positive effect on hard bottom habitats. RFFAs, such as Amendments 28 and 40, should also benefit these habitats as they would also reduce or limit fishing effort. As described in Section 4, effects on the physical environment from the proposed actions would likely be minimal because prosecution of the fishery should not be changed.

Reef fish EFH, particularly coral reefs and SAVs, are particularly susceptible to non-fishing activities (GMFMC 2004a). The greatest threat comes from dredge-and-fill activities (ship channels, waterways, canals, and coastal development). Oil and gas activities as well as changes in freshwater inflows can also adversely affect these habitats. As described in Step 4d of this cumulative effects analysis, the potential harm to reef fish habitat was highlighted by the Deepwater Horizon MC252 incident (http://response.restoration.noaa.gov/deepwaterhorizon). Essential fish habitat and HAPC designations cited in Section 3.2, GMFMC (2005b), and GMFMC (2010) and are intended to promote careful review of proposed activities that may affect these important habitats to assure that the minimum practicable adverse impacts occur on EFH. However, NMFS has no direct control over final decisions on such projects. The cumulative effects of these alternatives depend on decisions made by agencies other than NMFS, as NMFS and the Gulf Council have only a consultative role in non-fishing activities. Decisions

made by other agencies that permit destruction of EFH in a manner that does not allow recovery, such as bulkheads on former mangrove or marine vegetated habitats, would constitute irreversible commitments. However, irreversible commitments should occur less frequently as a result of EFH and HAPC designations. Accidental or inadvertent activities such as ship groundings on coral reefs or propeller scars on seagrass could also cause irreversible loss.

At this time, it is unclear what effects climate change will have on red snapper EFH. Factors associated with climate change such as ocean acidification could negatively affect important biotic components of red snapper EFH such as corals (IPCC 2014). Hollowed et al. (2013) has identified important ecosystem paths that deserve future study to determine climate change cause and effects.

Managed Resources

There are 31 species of reef fish managed in the Gulf federal waters, and of the species where the stock status is known, four of the eleven species are considered overfished (gag, greater amberjack, gray triggerfish, and red snapper; see Section 3.3). Recent actions for these overfished stocks have ended overfishing and set or continued rebuilding plans (e.g., Amendments 27, 32, 35, and 37).

In the past, the lack of management of reef fish allowed many stocks to undergo both growth and recruitment overfishing. This has allowed some stocks to decline as indicated in numerous stock assessments (Section 3.3). Red snapper have been considered overfished since the first stock assessment in 1986. For red snapper, management measures including a minimum size limit, commercial quota, and aggregate bag limit were put in place as part of the initial Reef Fish FMP or Amendment 1 (Section 3.1). None of these measures halted increases in landings. However, over time, management measures have become more restrictive and held landings more closely to the quotas.

The present harvest levels are based on a rebuilding plan put in place by Amendment 27 which shifted the plan from a constant catch to a constant fishing mortality plan. The current plan, after an initial reduction in the total allowable catch from 9.12 mp to 5 mp, has allowed harvests to increase as the stock rebuilds. These measures have also limited the red snapper harvest sufficiently to end overfishing on the stock. In addition, the red snapper IFQ program has successfully held landings by the commercial sector below its quota. However, these measures, along with other IFQ programs for grouper and tilefish (Amendment 29) may have, at least for the commercial sector, redirected effort towards other non-IFQ managed reef fish species such as gray triggerfish and greater amberjack by fishermen without IFQ shares or allocation. Landings of these non-IFQ managed species are closely managed to prevent them from exceeding their ACLs and protects them from overharvest. In fact, measures for gray triggerfish and greater amberjack allow the fishery to be closed if the harvest is projected to meet their respective commercial and recreational quotas.

Fishery management RFFAs are expected to benefit managed species. These actions are expected to manage the stocks at OY per National Standard 1 and are described in steps 3 and 4 of this CEA. Although this amendment and Amendments 28, 36, and 39 do not specifically

address overfishing of red snapper, they are intended to improve the management of the commercial and recreational sectors in ways that are likely to better keep harvests within the quotas. Other RFFAs described in steps 3 and 4 similarly do not specifically address overfishing but are intended to improve the management of reef fish stocks either through revising ACLs, improving data reporting, or allowing more flexibility in management.

Non-fishing activities are likely to adversely affect reef fish stocks as listed in Step 4d. For example, LNG facilities are being proposed in the western and northern Gulf. As described in Step 4d, these facilities can have a negative effect on species with pelagic larvae, like most reef fish species. To mitigate the effects of these facilities, closed- rather than open-loop systems are being called for. At this time, the effect of LNG facilities is unknown and is likely to be less for reef fish species than other more coastal species such as red drum. Other factors such as climate change, hurricanes, and oil and gas extraction could have detrimental effects on reef fish species, but these effects are poorly understood.

Reef Fish Fishery

Adverse or beneficial effects of actions on vessel owners, captains, and crew are tied to the ability of a vessel to make money. In commercial fisheries, these benefits are usually derived from shares awarded after fishing expenses are accounted for. The greater the difference between expenses and payment (revenue) for harvested fish, the more profit is generated by the fishing vessel. For-hire businesses generate revenue by selling either at the vessel level (charter businesses) or passenger level (headboats).

The commercial fishery has benefited from past actions in the reef fish fishery relative to this action. Prior to 1990, entry into the reef fish fishery was unhindered by regulation. To constrain harvest in order to prevent overexploitation of reef fish in general and red snapper specifically, the Council implemented size limits, quotas, seasonal closures, and a permit moratorium. These measures have produced limited success. For red snapper, the commercial quota was overrun 10 times until the IFQ program established in 2007 (Table 3.1.2).

Current management measures have had an overall positive, short-term impact on the red snapper component of the commercial sector. Landing restrictions were needed to keep the commercial red snapper harvest within its quota and primarily took the form of short mini-seasons (Hood et al. 2007). The mini-seasons kept many commercial vessels from taking more fishing trips during these years limiting fishing effort. With the advent of the IFQ program, fishermen with red snapper allocation were able to have flexibility in when and where they could fish. It also stopped the commercial quota from being exceeded. However, this program adversely affected fishermen who did not qualify for the initial distribution of IFQ shares. These fishermen have been required to purchase IFQ shares or allocation if they wished to harvest red snapper.

For other overfished reef fish stocks other than red snapper, rebuilding measures required to end this condition and rebuild stocks have constrained the harvest for these species over the short-term and likely increased competition within the commercial sector to harvest other stocks.

However, by using constant fishing mortality rebuilding plans, harvests have been allowed to increase as the stocks recover.

Non-FMP factors have adversely affected the reef fish commercial and for-hire fleets. Imports can cause fishermen to lose markets when fishery closures occur as dealers and processors use imports to meet consumer demand. Consumer comfort with imports can then limit the price fishermen receive when harvest is allowed. Other factors that have had an adverse effect on the commercial fishery include hurricanes and increases in fishing costs, such as fuel, which may have pushed marginal fishing operations out of business (see step 4d). Hurricanes are unpredictable and localized in their effects. Increases in fishing costs, unless accompanied by an increase in prices or harvest quantity, decrease the profitability of fishing.

The for-hire component has benefited from past actions in the reef fish fishery relative to this action. This increase has been fueled by increased interest by the public to go fishing (i.e., more trips sold) as evidenced by an almost three-fold increase in recreational fishing effort since 1986 (SEDAR 12 2007). To constrain harvest in order to prevent overexploitation of reef fish in general and red snapper specifically, NMFS, through the Council, implemented minimum size and bag limits for most species prior to 2000. In addition, a recreational red snapper quota was implemented in 1997 and a permit moratorium to constrain the recreational effort from the for-hire industry in 2003. These measures have met with limited success toward ending overfishing.

Current management measures may have had a negative, short-term impact on the for-hire component of the reef fish fishery. Landing restrictions have been needed to keep the recreational red snapper harvest within its quota. These restrictions include a reduced bag limit and seasonal closures. These measures may have reduced interest by the public to take for-hire fishing trips and possibly resulted in a reduction in the number of trips taken, as shown in Table 4.4.2 (although the Deepwater Horizon MC252 oil spill may also be partly responsible for the decrease in trips). In addition, the restriction requiring a person aboard a federally-permitted Gulf for-hire reef fish vessel to comply with federal regulations for reef fish species regardless of where the fish are harvested (GMFMC 2008b), may have reduced the ability of federally permitted for-hire operators to sell trips because of longer non-compliant State fishing seasons. However, as discussed in Section 4, the creation of the two recreational components may allow for more federal fishing days for the federal for-hire component. Other factors that have had an adverse effect on the for-hire component of the reef fish fishery include increases in fishing costs, such as fuel, and hurricanes which may have pushed marginal fishing operations out of business (see step 4d). However, these factors may be less important than may seem apparent. For the red snapper for-hire component, reductions in charter fishing from more restrictive regulations, increased costs, and effects from hurricanes were claimed by the industry (GMFMC 2007). But red snapper data for 2007 found only lingering effects of the 2005 hurricanes; annual average effort for 2004 through 2005 were only slightly greater than in 2007. Although the available data cannot address claims of severe economic losses by individual entities, this data does not support contentions of widespread industry harm. However, for red snapper, effort may have shifted to other species or other charter businesses.

As mentioned in Section 2 and the economic and social effects analyses in Section 4, Magnuson-Stevens Act §407(d)(1) requires recreational or commercial red snapper fishing to end when a

sector catches its quota. The recreational sector includes both the federal for-hire and private angling components. Thus, if the private angling component exceeds its allocation of the recreational quota to such an extent that the overall recreational quota is projected to be met, the federal for-hire component would also be prohibited from retaining red snapper regardless of whether there is remaining quota available for that component. Reduced season lengths in the following year for the federal for-hire components could be further exacerbated by overage adjustments from exceeding the quota and non-compatible State fishing seasons. However, the likelihood of overages is reduced because each component's season will be based on the lower recreational ACT rather than the recreational quota.

Many RFFAs are likely to have a short-term negative impact on the for-hire component. Red snapper, gray triggerfish, greater amberjack, and gag have experienced overfishing, are considered overfished, and are being managed under stock rebuilding plans. Measures required to end overfishing and rebuild these stocks have constrained the harvest for these species. If these measures result in less interest by the fishing public to take fishing trips on for-hire vessels, then this will adversely affect this sector. However, as mentioned above, this effect has not been apparent for red snapper because the for-hire component has the ability to shift to other species. The ability to shift to other species would be expected to continue in response to subsequent RFFAs, though the flexibility would be reduced the more species that become subject to increased restrictions. Some short-term beneficial actions include an increase in TAC and relaxation of management measures for red grouper and vermilion snapper, as these stocks have recovered from overfishing and harvest restrictions have been relaxed.

Because many management RFFAs are designed to manage stocks at OY, these actions should be beneficial to the for-hire component. Stocks would be harvested at a sustainable level, and at higher levels for those stocks being rebuilt. If allocation between components, as proposed in this amendment, favors the for-hire component, this could provide additional red snapper fishing days and allow for more trips for this component. Specific to red snapper fishing, Amendments 28, 41, and 42 evaluate changing the commercial and recreational red snapper allocation and implementing some type of regional management of the recreational sector, respectively. In Amendment 28, the alternatives for shifting the allocation would decrease the commercial percentage and increase the recreational percentage of the stock ACL. Depending how these shifts are put in place, they could adversely affect the commercial sector if the commercial quota is reduced. The recreational sector, including the federal for-hire component, would benefit from increased quotas. Regional management would affect the recreational sector only in Amendment 39. Depending on how the recreational quota is allocated among States and the management measures implemented by the States, the effects on the federal for-hire component could be beneficial or adverse depending on where a vessel operator fishes.

Non-management-related RFFAs that could affect the for-hire component include hurricanes, oil and gas extraction, and increases in fishing costs. Hurricanes are unpredictable and localized in their effects. Oil spills, which are also unpredictable, can have extensive adverse impacts over large areas as evidenced by the Deepwater Horizon MC252 spill. Increases in fishing costs, unless accompanied by an increase in the price charged per trip or the number of trips, decrease the profitability of fishing.

It is estimated that 3.1 million residents of Gulf States participated in marine recreational fishing (NMFS 2013a). Red drum and spotted sea trout are the species most commonly reported as target species by these anglers, with approximately 35% and 33% of interviewed anglers reporting targeting these species, respectively. The most commonly caught non-bait species across all waters of the Gulf were spotted seatrout, red drum, sand seatrout, Atlantic croaker, and gray snapper. In federal waters, the most commonly harvested species are white grunt, red grouper, red snapper, gag, and yellowtail snapper. As summarized in Holiman (2000), the typical angler in the Gulf is 44 years old, male (80%), white (90%), and employed full-time (92%). They have a mean income of $42,700, and have fished in the State for an average of 16 years. The average number of trips taken in the 12 months preceding the interview was about 38 and these were mostly (75%) one-day trips with average expenditure of less than $50. Seventy-five percent of interviewed anglers reported that they held salt-water licenses, and 59 percent owned boats used for recreational saltwater fishing. More recent comparable statistics are not available.

The effects of various past, present, and RFFAs on anglers are measured through levels of participation in the fishery. Measures that reduce participation are negative and measures that increase participation are positive. However, it is difficult to assess what affects past and present management measures have had on anglers because available data indicates the amount of effort by the private anglers has increased. This increase has been from approximately 6.8 million trips in 1981 to over 14 million trips from in 2003 to 2009 (Rios 2013). The number of angler trips declined from 14,356,523 angler trips in 2009, to 13,548,899 in 2010, and 13,874,314 in 2011. The decline in 2010 and 2011 is likely due to the Deepwater Horizon MC252 oil spill. The effects of various management measures on the participation by anglers is likely similar to the effects on the for-hire industry discussed above with the exception that private anglers are not subject to permit restrictions on where they can fish that federally permitted for-hire vessel operators are (see above section). However, as discussed in Sections 4.1.3 and 4.1.4, the creation of the two recreational components may further restrict the number of federal fishing days for the private angling component due to non-compatible State season lengths. Factors unrelated to management, such as hurricanes and increasing fuel and other costs, likely affect private anglers similar to for-hire fishermen. It should be noted that a possible effect of the proposed action could be constraining most of the private angling to state waters if State non-compatible seasons continue. If the private angling allocation is too low, then a greater proportion of private angling fish would be caught in state waters, reducing the days available to fish in federal waters.

As mentioned above in the discussion of the vessel owner, captain, and crew above as well as in Section 2 and the economic and social effects analyses in Section 4, Magnuson-Stevens Act §407(d)(1) requires recreational or commercial red snapper fishing to end when a sector catches its quota. The recreational sector includes both the federal for-hire and private angling components. Thus, if the federal for-hire component exceeds its allocation of the recreational quota to such an extent that the overall recreational quota is projected to be met, the private angling component would also be prohibited from retaining red snapper regardless of whether there is remaining quota available for that component. Reduced federal season lengths for the private angling component in the following year could be further exacerbated by overage adjustments if the quota is exceeded and non-compatible State fishing seasons. However, the

likelihood of this occurring is reduced because each component's season will be based on the lower recreational ACT rather than the recreational quota.

Two RFFAs specific to red snapper fishing, Amendments 41 and 42 evaluate changing the management for the for-hire sector of the fishery. Amendment 41 would provide management measures for the charter for-hire vessels regarding the harvest of red snapper. percentage and increase the recreational percentage of the stock ACL. Amendment 42 would provide management measures for the headboats participating in the Southeast Region Headboat Survey.

Non-management-related RFFAs that could affect anglers include hurricanes, oil and gas extraction, and increases in fishing costs. Hurricanes are unpredictable and localized in their effects. Oil spills, which are also unpredictable, can have extensive adverse impacts over large areas as evidenced by the Deepwater Horizon MC252 spill. Increases in fishing costs as well as lost fishing opportunities would likely reduce the amount of angler effort.

Infrastructure refers to fishing-related businesses and includes marinas, rentals, snorkel and dive shops, boat dockage and repair facilities, tackle and bait shops, fish houses, and lodgings related to recreational fisheries industry. This infrastructure is tied to the commercial and recreational fisheries and can be affected by adverse and beneficial economic conditions in those fisheries. Therefore, the effects of past, present, and RFFAs should reflect responses by the fisheries to these actions. Past actions allowing the recreational and commercial fisheries to expand have had a beneficial effect providing business opportunities to service the need of these industries. Present actions which have constrained the commercial fisheries likely have had an adverse effect because lower revenues generated from the fishery would be available to support the infrastructure. However, as conditions improve for the fishery as described above through RFFAs, similar benefits should be accrued by the businesses comprising the infrastructure. For the recreational sector, as stated above, it is difficult to assess the impact of present and RFFAs since angler participation has increased until recently. Actions enhancing this participation should also be beneficial to the infrastructure. However, it should be noted the Council has been receiving public testimony that participation may be declining as fuel prices increase and may be reflected in the decline in the number of angler trips. It should be noted that non-FMP factors such as the Deepwater Horizon MC252 oil spill (IAI 2012) and climate change (http://www.nefsc.noaa.gov/ecosys/climate_change/implications.html) may adversely affect fishing communities, particularly those communities considered more vulnerable.

Administration

Administration of fisheries is conducted through federal (including the Council) and State agencies which develop and enforce regulations, collect data on various fishing entities, and assess the health of various stocks. As more regulations are required to constrain stock exploitation to sustainable levels, greater administration of the resource is needed. The NMFS Office of Law Enforcement, in cooperation with State agencies, would continue to monitor regulatory compliance with existing regulations and NMFS would continue to monitor both recreational and commercial landings to determine if landings are meeting or exceeding specified quota levels. Further, stock status needs to be periodically assessed to ensure stocks are being maintained at proper levels. Some present actions have assisted the administration of fisheries in

the Gulf. In 2007, an IFQ program was implemented for the commercial red snapper fishery, requiring NMFS to monitor the sale of red snapper IFQ shares. Recordkeeping requirements for IFQ shares have improved commercial quota monitoring and prevent or limit overages from occurring. A vessel monitoring system was also implemented for all commercial reef fish vessels in 2007 and is helping enforcement identify vessels violating various fishing closures. The recent implementation of ACLs and AMs for most federally managed species has required close monitoring of landings. For some species, harvest is closed if landings are projected to exceed the ACL within the season. For others, quotas or ACLs need to be adjusted during the following season to account for any ACL overages that occur in the preceding year.

10. Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects.

The objective of regional management is to provide flexibility to the regions to establish management measures that account for the differences between regions while maintaining conservation equivalent measures in comparison to the current regulations. It is reasonably expected the effects on the physical environment would not change under the current management regime. It is more likely cumulative effects from this action would occur in the biological environment for red snapper stock to be overfished. Overfishing the stock would jeopardize the goals of the rebuilding plan. Changing from one to potentially five management regions through these actions could potentially lead to overharvesting the stock if proper controls on fishing are not implemented. While NMFS would still oversee the management strategies of each region to determine consistency, the regions would have authority to establish various regulations. In order to avoid, minimize, or mitigate significant cumulative effects; the amendment includes Action 4 and Action 7. The alternatives in Action 4 establish a Gulf-wide minimum size limit which will simplify the regulations for enforcement. The alternatives in Action 7 provide post-season accountability measures to mitigate for a region not constraining harvest to the apportioned regional quota. The States have indicated they will implement additional monitoring programs to better estimate the recreational harvest during the open season. Action 7 minimizes and mitigates for the overharvest of red snapper by accounting for the potential overharvest and constraining harvest.

11. Monitor the cumulative effects of the selected alternative and modify management as necessary.

The implementation of regional management would require NMFS to continue monitoring the harvest of red snapper and analyzing the landings. Monitoring the harvest is necessary to determine if the quota is exceeded and to prohibit further harvest to insure the OFL is not also exceeded. It is uncertain if the regions would be able to constrain harvest within their quotas and whether the monitoring data would provide timely data to prevent overages. The timing of the data may be critical for NMFS to determine is the quota has been met. At this time, the MRIP data is provided at two month intervals. This is problematic for analysis when the recreational red snapper season is shorter than two months. The States have indicated they will implement additional monitoring programs to provide more timely data for landings. However, to integrate new datasets into the stock assessment, the SEFSC would need to determine the monitoring programs would be compatible.

The effects of the proposed actions are, and will continue to be, monitored through collection of landings data by NMFS, 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 of Mexico is collected through MRIP, NMFS' Headboat Survey, and the Texas Marine Recreational Fishing Survey. MRIP replaced an older system (MRFSS), and is designed to improve the monitoring of recreational fishing. Commercial data is collected through trip ticket programs, port samplers, and logbook programs; for red snapper commercial data is collected in near real-time through the IFQ system. The most recent SEDAR assessment of Gulf red snapper was in May 2014 and the next is scheduled for 2015.

Unavoidable Adverse Effects

Unavoidable adverse effects are described in detail in the cumulative effects analysis of Amendment 30B (GMFMC 2008b) and 32 (GMFMC 2011a) and is incorporated here by reference. Catch quotas, minimum size limits, bag limits, and seasonal closures, are generally effective in limiting total fishing mortality, the type of fish targeted, the number of targeted fishing trips, and/or the time spent pursuing a species. However, these management tools have the unavoidable adverse effect of creating regulatory discards. Discard mortality must be accounted for in a stock assessment as part of the allowable biological catch, and thus restricts total allowable catches.

Many of the current participants in the reef fish fishery may never recuperate losses incurred from the more restrictive management actions imposed in the short-term to end overfishing of red snapper. Because red snapper is but one of the reef fish species managed in the Reef Fish FMP, short-term losses are not expected to be significant, and other species may be substituted to make up for losses to the fishery. With the anticipated recovery of the stock, future participants in the reef fish fishery will benefit. Overall, short-term impacts of actions would be offset with much higher allowable catch levels as the stock recovers and is rebuilt.

The actions considered in this amendment should not have an adverse effect on public health or safety because these measures should not alter actual fishing practices, just which recreational sector can harvest what percentage of the overall recreational quota. Unique characteristics of the geographic area are highlighted in Section 3. Adverse effects of fishing activities on the physical environment are described in detail in Section 4.1.1. This section concludes the impact on the physical environment should be minor from actions proposed in this document. Uncertainty and risk associated with the measures are described in detail in the same sections as well as assumptions underlying the analyses.

Until now, the Council has constrained recreational harvest of red snapper by establishing catch quotas, minimum size limits, bag limits, and seasonal closures which are generally effective in limiting total fishing mortality, the type of fish targeted, the number of targeted fishing trips, and/or the time spent pursuing a species. However, these management tools have the unavoidable adverse effect of creating regulatory discards. Discard mortality must be accounted for in a stock assessment as part of the allowable biological catch, and thus restricts total allowable catches. By delegating management measures to the regions, it will be more difficult

to estimate these adverse effects. The alternatives considered in this amendment for the delegated management measures provide a range for the minimum size and bag limits. However, the management measures set by the region will either directly or indirectly affect the bycatch and discards. In addition, if regions establish varying seasons, then fishing effort shift may occur. This would need to be considered for the catch and fishing effort.

Actions considered in this amendment should not have adverse effects on public health or safety because these measures should not alter actual fishing practices, just how, when, and where activities can occur. This could have indirect effects if a region selected an open season that was more impacted by non-fishing events, such as weather (i.e., winter seasons with strong cold fronts and high seas, or a core fishing season during prime Gulf hurricane season). Unique characteristics of the geographic area are highlighted in Chapter 3. Adverse effects of fishing activities on the physical environment are described in detail in Section 3.2. This section concludes little impact on the physical environment should occur from actions proposed in this document as it will not change the way in which the fishery is prosecuted. Uncertainty and risk associated with the measures are described in detail in the same sections as well as assumptions underlying the analyses.

Relationship between Short-term Uses and Long-term Productivity

The primary objective of this amendment and associated EIS is to facilitate management of the recreational red snapper component in the reef fish fishery by reorganizing the federal fishery management strategy to better account for biological, social, and economic differences among the regions of the Gulf. The relationship between short-term economic uses and long-term economic productivity are discussed in the preceding section. However, because red snapper is but one species in the reef fish complex, these effects may be mitigated through effort shifting to other species and may not be significant.

The alternatives being considered are not likely to have short-term negative effects. However, if regional management is established and the regions cannot constrain harvest of red snapper to the apportioned quota, then long-term negative effects on the biological environment could occur from overharvests. In addition, corrective action to constrain harvest could have negative impacts on the social and economic environments. The range of alternatives has varying degrees of economic costs and administrative burdens. In general, some alternatives have relatively small short-term economic costs and administrative burdens, but would also provide smaller and more delayed long-term benefits. Other alternatives have greater short-term costs, but provide larger and more immediate long-term benefits.

Mitigation, Monitoring, and Enforcement Measures

Mitigation, monitoring and enforcement measures are described in detail in the cumulative effects analysis of Amendment 30B (GMFMC 2008b) and is incorporated here by reference. Developing regional management for the harvest of recreational red snapper is expected to be a conservation equivalent to the current management strategy concerning the impacts on the physical and biological environments. The apportionment of the recreational quota to the

regions (Action 6) would mitigate for overharvest by maintaining the total harvest to the Gulf-wide recreational ACL even though it is divided between regions. The minimum size limit for red snapper (Action 4) would establish a consistent minimum size throughout the Gulf for the recreational harvest of red snapper and aid enforcement. The impacts of the management strategies established by the regions would be further mitigated by specifying the range for the delegated management measures. The post-season accountability measures (Action 7) intend to mitigate the potential overharvest of recreational red snapper by encouraging the regions to constrain harvest each year to prevent a reduction of their quota for the following year.

To ensure the red snapper stock recovers to a level that supports harvests at the optimum yield, periodic reviews of stock status are needed. These reviews are designed to incorporate new information and to address unanticipated developments in the respective fisheries and would be used to make appropriate adjustments in the reef fish regulations should harvest not achieve optimum yield objectives. The details for how assessments are developed, reviewed, and applied are described in Amendment 30B, as are the rule-making options the Council and NMFS have for taking corrective actions (GMFMC 2007).

Providing regions flexibility to establish management measures is expected to benefit the social and economic environments. This action may slightly increase resources needed by the administrative environment through the increased complexity of the enforcement. This complexity develops from each region setting regulations for season, bag limit, and size limit. In contrast, the current management sets a Gulf-wide season for federal waters. Most States have previously established seasons consistent with the federal season, excluding Texas. However, Florida and Louisiana had inconsistent regulations in 2012. Thus, the current management system could increase the degree of State inconsistency. Regardless, the effects of the actions are not likely to require mitigation.

Current reef fish regulations are labor intensive for law enforcement officials. NMFS law enforcement officials work cooperatively with other federal and state agencies to keep illegal activity to a minimum. Violators are penalized, and for reef fish commercial and reef fish for-hire operators, permits required to operate in their respective fisheries can be sanctioned.

Reef fish management measures include a number of area-specific regulations where reef fish fishing is restricted or prohibited in order to protect habitat or spawning aggregations of fish, or to reduce fishing pressure in areas that are heavily fished. To improve enforceability of these areas, the Council has established a vessel monitoring system program for the commercial reef fish sector to improve enforcement. Vessel monitoring systems allows NMFS enforcement personnel to monitor compliance with these area-specific regulations, and track and prosecute violations.

Irreversible and irretrievable Commitments of Resources

There are no irreversible or irretrievable commitments of agency resources proposed herein. The actions establishing regional management are changeable by the Council at any time in the future. In addition, there are provisions for regions to opt out of regional management. These actions should better account for biological, social, and economic differences among the regions

of the Gulf and provide social and economic benefits while maintaining conservation equivalent management.

Any Other Disclosures

CEQ guidance on environmental consequences (40 CFR §1502.16) indicates the following elements should be considered for the scientific and analytic basis for comparisons of alternatives. These are:

a) Direct effects and their significance.
b) Indirect effects and their significance.
c) Possible conflicts between the proposed actions and the objectives of federal, regional, state, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned.
d) The environmental effects of alternatives including the proposed action.
e) Energy requirements and conservation potential of various alternatives and mitigation measures.
f) Natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures.
g) Urban quality, historic and cultural resources, and the design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures.
h) Means to mitigate adverse environmental impacts.

Items a, b, d, e, f, and h are addressed in Chapters 2 and 3, and Sections 4.1-4.7. Items a, b, and d are directly discussed in Sections 2 and 5. Item e is discussed in the economic analyses. It is unknown if these actions would result in energy conservation through fewer fishing trips; however, it is more likely to be an energy conservation equivalent. Item f is discussed throughout the document as fish stocks are a natural and depletable resource. A goal of this amendment is to make these stocks sustainable resources for the nation. Mitigations measures are discussed in Section 5.11. Item h is discussed in Chapters 3 and 5, with particular mention in Section 5.12. (further update after RIR is provided)

The other elements are not applicable to the actions taken in this document. Because this amendment concerns the management of a marine fish stock, it is not in conflict with the objectives of federal, regional, state, or local land use plans, policies, and controls (Item c). Urban quality, historic and cultural resources, and the design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures (Item g) is not a factor in this amendment. The actions taken in this amendment will affect a marine stock and its fishery, and should not affect land-based, urban environments. The exception would be the *U.S.S. Hatteras*, located in federal waters off Texas, which is listed in the National Register of Historic Places. The proposed actions are not likely to increase fishing activity and so no additional impacts to the *U.S.S. Hatteras* would be expected

With regards to the Endangered Species Act (ESA) the biological opinion (opinion) for the Reef Fish FMP, completed September 30, 2011, concluded that the continued operation of the Gulf

reef fish fishery would not affect ESA-listed marine mammals or corals, and is not likely to jeopardize the continued existence of green, hawksbill, Kemp's ridley, leatherback, or loggerhead sea turtles, or smalltooth sawfish (NMFS 2011b). On July 10, 2014, the National Marine Fisheries Service (NMFS) published a final rule (79 FR 39855) that designated 38 occupied marine areas within the Atlantic Ocean and Gulf as critical habitat for the Northwest Atlantic Ocean loggerhead sea turtle Distinct Population Segment. These areas contain one or a combination of nearshore reproductive habitat, winter area, breeding areas, and migratory corridors, or contain *Sargassum* habitat. NMFS concluded in September 16, 2014, memos that activities associated with the subject FMP will not adversely affect any of the aforementioned critical habitat units. The fishery managed by the FMP will either have no effect on the critical habitat due to location or methods, or will have discountable or insignificant effects that will not adversely affect the habitat's ability to perform its function.

On September 10, 2014, NMFS published a final rule to list 22 coral species under the ESA (79 FR 53851). Four of the newly listed species occur in the federal waters in the Gulf (*Mycetophyllia ferox, Orbicella annularis, O. faveolata, and O. franksi*); all were listed as threatened. In memos dated September 16, 2014, and October 7, 2014, NMFS concluded that activities associated with the subject FMP will not adversely affect any of the newly listed coral species. Threats to corals from fishing identified in the species status review included trophic effects, human-induced physical damage, and destructive fishing practices. However, given the species targeted by the fishery and the gear and methods used to harvest reef fish, NMFS determined that adverse effects to the newly listed coral species are extremely unlikely or discountable. The two previously listed *Acropora* coral species (*Acropora palmata* and *A. cervicornis*) remain protected as threatened. In the October 7, 2014, memo NMFS also determined that although the September 10, 2014, final listing rule provided some new information on the threats facing *Acropora*, none of the information suggested that the previous determinations were no longer valid.

With regards to the Marine Mammal Protection Act, fishing activities under the Reef Fish Fishery Management Plan should have no adverse impact on marine mammals (See Section 3.2). The proposed actions are not expected to substantially change the way the fishery is currently prosecuted (e.g., types of methods, gear used, etc.). Gear used by the reef fish fishery was still classified in the 2014 List of Fisheries as a Category III fishery (79 FR 14418, April 14, 2014) because it is prosecuted primarily with longline and hook-and-line gear. This classification indicates the annual mortality and serious injury of a marine mammal stock resulting from any fishery is less than or equal to one percent of the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock, while allowing that stock to reach or maintain its optimum sustainable population.

CHAPTER 5. REGULATORY IMPACT REVIEW

[This review is completed after selection of all preferred alternatives.]

CHAPTER 6. REGULATORY FLEXIBILITY ACT ANALYSIS

[This analysis is completed after selection of all preferred alternatives.]

CHAPTER 7. LIST OF PREPARERS

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Carrie Simmons	Fishery biologist	Biological analyses	GMFMC
Stephen Holiman	Economist	Economic analyses, Regulatory Impact Review, Regulatory Flexibility Act analysis	SERO
Peter Hood	Fishery biologist	Biological analyses, bycatch practicability analysis	SERO
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GMFMC = Gulf of Mexico Fishery Management Council; NOAA GC = National Oceanic and Atmospheric Administration General Counsel; SEFSC = Southeast Fisheries Science Center; SERO = Southeast Regional Office of the National Marine Fisheries Service; USCG = United States Coast Guard

CHAPTER 8. LIST OF AGENCIES, ORGANIZATIONS AND PERSONS TO WHOM A COPY OF THE EIS WAS SENT

National Marine Fisheries Service
- Southeast Fisheries Science Center
- Southeast Regional Office
- Office for Law Enforcement
- Endangered Species Division
- Domestic Fisheries Division

NOAA General Counsel

Environmental Protection Agency (Region 4 and 6)
United States Coast Guard
United States Fish and Wildlife Services
Department of Interior. Office of Environmental Policy and Compliance
Department of State, Office of Marine Conservation,
Marine Mammal Commission

Texas Parks and Wildlife Department
Alabama Department of Conservation and Natural Resources/Marine Resources Division
Louisiana Department of Wildlife and Fisheries
Mississippi Department of Marine Resources
Florida Fish and Wildlife Conservation Commission

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CHAPTER 10. INDEX

APPENDIX A. ALTERNATIVES CONSIDERED BUT REJECTED

The Gulf of Mexico Fishery Management Council (Council) began development of Amendment 39 in 2012. Since then, this amendment has experienced several iterations. Several actions were added and removed to meet the focus of the purpose and need. Below, in chronological order, is an outline of the changes to the amendment.

REMOVED AT APRIL 2013 COUNCIL MEETING:

- Two alternatives from

Action 2 – Establish Regions for Management

Alternative 3: Establish an east (Florida, Alabama) and west (Mississippi, Louisiana, Texas) region and allow for different management measures for each region.
* ALTERNATIVE 3 (ABOVE) SUBSEQUENTLY REPLACED IN ACTION 2 AT OCTOBER 2013 COUNCIL MEETING.

Alternative 4: Establish three regions representing the west (Texas), north (Louisiana, Mississippi, Alabama), and east (Florida) region and allow for different management measures for each region.

Rationale: The Council examined several options to establish regions. Eventually, the Council added **Alternative 3** back into **Action 3** and developed **Preferred Alternative 5** in **Action 3** to allow for adjacent States to join into multistate regions.

- Remove entire Action 7:

Action 7 – In-Season Accountability Measure Establishing Regional Closures in the EEZ
*Note: Both **Alternative 2** and **Alternative 3** could be selected as Preferred Alternatives.

Alternative 1: No action. When the recreational red snapper quota is reached, or is projected to be reached, the National Marine Fisheries Service (NMFS) files a notification with the Office of the Federal Register that prohibits the recreational harvest of red snapper in the economic exclusive zone (EEZ) for the remainder of the fishing year.

Alternative 2: If a region, as defined in Action 2, establishes an approved regional regulations, NMFS has the authority to alter the recreational red snapper season in the EEZ off those states (including a zero-day season) by the amount necessary to compensate for the additional harvest that would occur in state waters as a result of the region's regulations. (Boundaries for the EEZ off each state are in Figure 1.2.1.)

Alternative 3: If a region, as defined in Action 2, does not have an approved regional regulations and establishes regulations inconsistent with federal red snapper regulations, NMFS has the authority to adjust the recreational red snapper season in the EEZ off those states (including a

zero day season) by the amount necessary to compensate for the additional harvest that would occur in state waters as a result of the region's inconsistent regulations. (Boundaries for the EEZ off each state are in Figure 1.2.1.)

Discussion:

Under current management, state and federal waters Gulf wide are open during the red snapper season. If the regions, as defined in Action 2, set their own fishing seasons through an approved management plan or inconsistent regulations, some areas of the Gulf could be open while other areas are closed. This action allows the Council to extend boundary lines of state waters into the EEZ, to correspond with the regions. These boundaries would enable NMFS to close federal waters off of a region when its regional quota has been reached. Or, the boundaries could be used to close a portion of the EEZ off a state or region that establishes inconsistent regulations. This in-season accountability measure would help prevent the annual catch limit from being exceeded. The in-season and post-season (Action 6) accountability measures are not mutually exclusive and could be used together where appropriate. Further information on accountability measures is described in the Generic ACL/AM Amendment in Section 2.8 (GMFMC 2011).

In March 2013, NMFS implemented a temporary emergency rule that gives NMFS the authority to set separate closure dates for the recreational red snapper season in federal waters off individual Gulf states (Figure 1.2.1). This action was requested by the Council to provide a fairer and more equitable distribution of recreational red snapper fishing opportunities among anglers in all the Gulf states for the 2013 season. Although a temporary emergency rule will be in effect for the 2013 season, it will not be used as the analytical baseline. The temporary emergency rule, even if extended, would not be effective for the 2014 red snapper recreational fishing season.

Alternative 1 would continue the current method of determining the closure date for the recreational red snapper season and apply that date to all federal waters of the Gulf. NMFS determines the length of the season based on the quota, average weight of fish, and estimated catch rates. Because NMFS must ensure the entire stock harvest does not exceed the quota, including harvest in state waters, if states establish less restrictive regulations, the federal season must be adjusted to account for the additional expected harvest. For example, when calculating the projected 27-day 2013 season length, NMFS adjusted the mean catch rate to account for the year-round open season in state waters and 4-fish bag limit in Texas (SERO 2012). In addition, Louisiana has proposed an 88-day season with a 3-fish bag limit and Florida has proposed a 44-day season with a 2-fish bag limit in state waters. Based on the estimated catch rate with those regulations in the three state waters, the 2013 federal recreational red snapper season could be reduced to 22 days (SERO 2013). After the 22-day season, the entire EEZ would be closed for the recreational harvest of red snapper.

Both **Alternative 2** and **Alternative 3** would use regions developed in Action 2 to establish boundaries and allow NMFS to set different closure dates for the red snapper recreational season in the EEZ adjacent to each Gulf state. If the Council chooses to delegate management to the regions in Action 1 and Action 4, then there may be a review process to assess if the region's management plan is consistent with the goals of the FMP and red snapper rebuilding plan. A specific process would need to be established for plan approval. **Alternative 2** would apply to

regions with approved management plans. If the region has an approved management plan, but the regional quota is determined to be met before the planned season closure, then NMFS could close the harvest in federal waters to prevent overharvest. **Alternative 3** would apply to regions that do not have an approved management plan and establishes regulations inconsistent with the federal regulations. If a region were to set red snapper regulations that were not less restrictive than federal regulations, NMFS would calculate the red snapper recreational season within those boundaries using an adjusted catch rate, to account for a longer season or larger bag limit in state waters. In some cases, this could allow the EEZ off regions with consistent regulations to have more days than if the season for the entire Gulf was adjusted. For example, if the 2013 federal season was reduced off Texas, Louisiana, and Florida to account for inconsistent regulations in those waters, the federal seasons could be as follows: Texas = 12 days, Louisiana = 8 days, Mississippi = 28 days, Alabama = 28 days, and Florida = 21 days (SERO-LAPP-2013-2). If increased catch from a region with inconsistent regulations exceeds its sub-quota regardless of the adjacent EEZ being closed, then NMFS may need to adjust the federal season in other regions to account for harvest. Conversely, if a state were to implement regulations in state waters that were more restrictive than federal regulations, the federal season in the EEZ off that state could potentially be increased. The Council could choose both **Alternative 2** and **Alternative 3** to address situations where a region or state may or may not have an approved management plan.

If the current regulations are maintained (**Alternative 1**), they could confound the goals of regional management. If regions set varying seasons, it is possible the activities of one or more regions could exceed the recreational sector quota before another region's season occurs. In turn, NMFS would close the remainder of the season to prevent over-fishing. When the total recreational quota is met, all recreational harvest of red snapper would be prohibited regardless of whether one or more regions have reached their respective apportionments. By establishing varying closed areas, the enforcement issues would likely increase. Recreational fishermen would need to abide by the area closures and be mindful of transiting through closed areas. Provisions for transit through closed areas may need to be considered. If the EEZ was closed off a region due to inconsistent regulations (**Alternative 3**), then a clear definition of the state/federal boundary would help recreational fishermen to insure compliance. Currently, this boundary is the 9-nautical mile buffer off of Texas and Florida, and 3-nautical mile buffer off or Alabama, Mississippi, and Louisiana.

REMOVED AT OCTOBER 2014 COUNCIL MEETING:
Options a and b from Alternatives 2, 3, and 4, in
Action 6: Post-Season Accountability Measures (AMs) Adjusting for Regional Overages

Option a: Apply the quota adjustment beginning one year after the implementation of the plan.
Option b: Apply the quota adjustment beginning two years after the implementation of the plan.

Rationale: The removed Action 7 was reintroduced as **Action 7** in the current version of the amendment to address the accountability measures. However, it was altered to incorporate the separate recreational components established in Amendment 40. The current action focuses on post-season accountability measures. In addition the options for delaying the quota adjustment

were removed because they are now less restrictive than the overage adjustment recently adopted in the Framework Action to Set Accountability Measures for Red Snapper (GMFMC 2014).

- Restructuring of the Actions and Alternatives

Following the October 2014 Council meeting, the document was restructured to incorporate the ability for regions to establish conservation equivalent management measures. In addition, with the implementation of Amendment 40 in April 2015, the alternatives were revised to reflect the separation of the recreational sector to establish a private angling component and a for-hire component.

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APPENDIX B. OTHER APPLICABLE LAW

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et seq.) provides the authority for fishery management in federal waters of the exclusive economic zone. However, fishery management decision-making is also affected by a number of other federal statutes designed to protect the biological and human components of U.S. fisheries, as well as the ecosystems that support those fisheries. Major laws affecting federal fishery management decision-making are summarized below.

Administrative Procedures Act

All federal rulemaking is governed under the provisions of the Administrative Procedure Act (APA) (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the APA, the National Marine Fisheries Service (NMFS) is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider, and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day waiting period from the time a final rule is published until it takes effect.

Coastal Zone Management Act

Section 307(c)(1) of the federal Coastal Zone Management Act of 1972 (CZMA), as amended, requires federal activities that affect any land or water use or natural resource of a State's coastal zone be conducted in a manner consistent, to the maximum extent practicable, with approved state coastal management programs. The requirements for such a consistency determination are set forth in NMFS regulations at 15 C.F.R. part 930, subpart C. According to these regulations and CZMA Section 307(c)(1), when taking an action that affects any land or water use or natural resource of a state's coastal zone, NMFS is required to provide a consistency determination to the relevant state agency at least 90 days before taking final action.

Upon submission to the Secretary, NMFS will determine if this plan amendment is consistent with the Coastal Zone Management programs of the States of Alabama, Florida, Louisiana, Mississippi, and Texas to the maximum extent possible. Their determination will then be submitted to the responsible state agencies under Section 307 of the CZMA administering approved Coastal Zone Management programs for these States.

Data Quality Act

The Data Quality Act (DQA) (Public Law 106-443) effective October 1, 2002, requires the government to set standards for the quality of scientific information and statistics used and disseminated by federal agencies. Information includes any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, cartographic, narrative, or audiovisual forms (includes web dissemination, but not hyperlinks to information that others disseminate; does not include clearly stated opinions).

Specifically, the DQA directs the Office of Management and Budget to issue government wide guidelines that "provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies." Such guidelines have been issued, directing all federal agencies to create and disseminate agency-specific standards to: 1) ensure information quality and develop a pre-dissemination review process; 2) establish administrative mechanisms allowing affected persons to seek and obtain correction of information; and 3) report periodically to Office of Management and Budget on the number and nature of complaints received.

Scientific information and data are key components of fishery management plans (FMPs) and amendments and the use of best available information is the second national standard under the Magnuson-Stevens Act. To be consistent with the Act, FMPs and amendments must be based on the best information available. They should also properly reference all supporting materials and data, and be reviewed by technically competent individuals. With respect to original data generated for FMPs and amendments, it is important to ensure that the data are collected according to documented procedures or in a manner that reflects standard practices accepted by the relevant scientific and technical communities. Data will also undergo quality control prior to being used by the agency and a pre-dissemination review.

Endangered Species Act

The Endangered Species Act (ESA) of 1973, as amended, (16 U.S.C. Section 1531 et seq.) requires federal agencies use their authorities to conserve endangered and threatened species. The ESA requires NMFS, when proposing a fishery action that "may affect" critical habitat or endangered or threatened species, to consult with the appropriate administrative agency (itself for most marine species, the U.S. Fish and Wildlife Service for all remaining species) to determine the potential impacts of the proposed action. Consultations are concluded informally when proposed actions may affect but are "not likely to adversely affect" endangered or threatened species or designated critical habitat. Formal consultations, including a biological opinion, are required when proposed actions may affect and are "likely to adversely affect" endangered or threatened species or adversely modify designated critical habitat. If jeopardy or adverse modification is found, the consulting agency is required to suggest reasonable and prudent alternatives.

On September 30, 2011, the Protected Resources Division released a biological opinion which, after analyzing best available data, the current status of the species, environmental baseline (including the impacts of the recent Deepwater Horizon MC 252 oil release event in the northern Gulf of Mexico), effects of the proposed action, and cumulative effects, concluded that the continued operation of the Gulf of Mexico reef fish fishery is also not likely to jeopardize the continued existence of green, hawksbill, Kemp's ridley, leatherback, or loggerhead sea turtles, nor the continued existence of smalltooth sawfish (NMFS 2011a).

On July 10, 2014, NMFS published a final rule designating 38 occupied marine areas within the Atlantic Ocean and Gulf of Mexico as critical habitat for the Northwest Atlantic Ocean loggerhead sea turtle distinct population segment (79 FR 39856). NMFS concluded in September 16, 2014, memos that activities associated with the subject FMP will not adversely

affect any of the aforementioned critical habitat units. On September 10, 2014, NMFS published a final rule (79 FR 53852) listing 20 new coral species under the ESA. Four of those new species occur in federal waters in the Gulf of Mexico (*Mycetophyllia ferox, Orbicella annularis, O. faveolata, and O. franksi*); all were listed as threatened. In memos dated September 16, 2014, and October 7, 2014, NMFS determined that activities associated with the subject FMP will not adversely affect any of the newly listed coral species. In the October 7, 2014, memo NMFS also determined that although the September 10, 2014, Final Listing Rule provided some new information on the threats facing *Acropora*, none of the information suggested that the previous determinations were no longer valid

Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas, and on the importing of marine mammals and marine mammal products into the United States. Under the MMPA, the Secretary of Commerce (authority delegated to NMFS) is responsible for the conservation and management of cetaceans and pinnipeds (other than walruses). The Secretary of the Interior is responsible for walruses, sea and marine otters, polar bears, manatees, and dugongs.

Part of the responsibility that NMFS has under the MMPA involves monitoring populations of marine mammals to make sure that they stay at optimum levels. If a population falls below its optimum level, it is designated as "depleted," and a conservation plan is developed to guide research and management actions to restore the population to healthy levels.

In 1994, Congress amended the MMPA, to govern the taking of marine mammals incidental to commercial fishing operations. This amendment required the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction, development and implementation of take-reduction plans for stocks that may be reduced or are being maintained below their optimum sustainable population levels due to interactions with commercial fisheries, and studies of pinniped-fishery interactions.

Under Section 118 of the MMPA, NMFS must publish, at least annually, a List of Fisheries that places all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals that occurs in each fishery. The categorization of a fishery in the List of Fisheries determines whether participants in that fishery may be required to comply with certain provisions of the MMPA, such as registration, observer coverage, and take reduction plan requirements. The primary gears used in the Gulf of Mexico reef fish fishery are classified in the updated 2012 MMPA List of Fisheries as Category III fishery (74 FR 73912). The conclusions of the most recent List of Fisheries for gear used by the reef fish fishery can be found in Section 3.3.

Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (PRA) (44 U.S.C. 3501 et seq.) regulates the collection of public information by federal agencies to ensure the public is not overburdened with information

requests, the federal government's information collection procedures are efficient, and federal agencies adhere to appropriate rules governing the confidentiality of such information. The PRA requires NMFS to obtain approval from the Office of Management and Budget before requesting most types of fishery information from the public.

Executive Orders

E.O. 12630: Takings

The Executive Order on Government Actions and Interference with Constitutionally Protected Property Rights that became effective March 18, 1988, requires each federal agency prepare a Takings Implication Assessment for any of its administrative, regulatory, and legislative policies and actions that affect, or may affect, the use of any real or personal property. Clearance of a regulatory action must include a takings statement and, if appropriate, a Takings Implication Assessment. The National Oceanic and Atmospheric Administration Office of General Counsel will determine whether a Taking Implication Assessment is necessary for this amendment.

E.O. 12866: Regulatory Planning and Review

Executive Order 12866: Regulatory Planning and Review, signed in 1993, requires federal agencies to assess the costs and benefits of their proposed regulations, including distributional impacts, and to select alternatives that maximize net benefits to society. To comply with E.O. 12866, NMFS prepares a Regulatory Impact Review (RIR) for all fishery regulatory actions that either implement a new fishery management plan or significantly amend an existing plan (See Chapter 5). RIRs provide a comprehensive analysis of the costs and benefits to society of proposed regulatory actions, the problems and policy objectives prompting the regulatory proposals, and the major alternatives that could be used to solve the problems. The reviews also serve as the basis for the agency's determinations as to whether proposed regulations are a "significant regulatory action" under the criteria provided in E.O. 12866 and whether proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with the Regulatory Flexibility Analysis. A regulation is significant if it a) has an annual effect on the economy of $100 million or more or adversely affects in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments and communities; b) creates a serious inconsistency or otherwise interferes with an action taken or planned by another agency; c) materially alters the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or d) raises novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

E.O. 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations

This Executive Order mandates that each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and

possessions. The Executive Order is described in more detail relative to fisheries actions in Section 3.5.1.

E.O. 12962: Recreational Fisheries

This Executive Order requires federal agencies, in cooperation with States and tribes, to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities through a variety of methods including, but not limited to, developing joint partnerships; promoting the restoration of recreational fishing areas that are limited by water quality and habitat degradation; fostering sound aquatic conservation and restoration endeavors; and evaluating the effects of federally-funded, permitted, or authorized actions on aquatic systems and recreational fisheries, and documenting those effects. Additionally, it establishes a seven-member National Recreational Fisheries Coordination Council (Council) responsible for, among other things, ensuring that social and economic values of healthy aquatic systems that support recreational fisheries are considered by federal agencies in the course of their actions, sharing the latest resource information and management technologies, and reducing duplicative and cost-inefficient programs among federal agencies involved in conserving or managing recreational fisheries. The Council also is responsible for developing, in cooperation with federal agencies, States and Tribes, a Recreational Fishery Resource Conservation Plan - to include a five-year agenda. Finally, the Order requires NMFS and the U.S. Fish and Wildlife Service to develop a joint agency policy for administering the ESA.

E.O. 13132: Federalism

The Executive Order on Federalism requires agencies in formulating and implementing policies, to be guided by the fundamental Federalism principles. The Order serves to guarantee the division of governmental responsibilities between the national government and the States that was intended by the framers of the Constitution. Federalism is rooted in the belief that issues not national in scope or significance are most appropriately addressed by the level of government closest to the people. This Order is relevant to FMPs and amendments given the overlapping authorities of NMFS, the States, and local authorities in managing coastal resources, including fisheries, and the need for a clear definition of responsibilities. It is important to recognize those components of the ecosystem over which fishery managers have no direct control and to develop strategies to address them in conjunction with appropriate State, tribes, and local entities (international, too).

E.O. 13158: Marine Protected Areas

This Executive Order requires federal agencies to consider whether their proposed action(s) will affect any area of the marine environment that has been reserved by federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural or cultural resource within the protected area. There are several marine protected areas, habitat areas of particular concern, and gear-restricted areas in the eastern and northwestern Gulf of Mexico.

Essential Fish Habitat

The amended Magnuson-Stevens Act included a new habitat conservation provision known as essential fish habitat (EFH) that requires each existing and any new FMPs to describe and identify EFH for each federally managed species, minimize to the extent practicable impacts from fishing activities on EFH that are more than minimal and not temporary in nature, and identify other actions to encourage the conservation and enhancement of that EFH. To address these requirements the Council has, under separate action, approved an Environmental Impact Statement (GMFMC 2004) to address the new EFH requirements contained within the Magnuson-Stevens Act. Section 305(b)(2) requires federal agencies to obtain a consultation for any action that may adversely affect EFH. An EFH consultation will be conducted for this action.

References

GMFMC. 2004. 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 and South Atlantic. Gulf of Mexico Fishery Management Council. Tampa, Florida. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/Final%20EFH%20EIS.pdf

NMFS. 2011. Biological opinion on the continued authorization of Reef Fish fishing under the Gulf of Mexico Reef Fish Fishery Management Plan. September 30, 2011. Available at: http://sero.nmfs.noaa.gov/pr/esa/Fishery%20Biops/03584%20GOM%20Reef%20Fish%20BiOp%202011%20final.pdf

APPENDIX C. SUMMARIES OF PUBLIC COMMENTS RECEIVED

Scoping workshops were held from January 14 – 22, 2013.
Public hearings were held from August 1 – 15, 2013.

Written comments submitted in response to Reef Fish Amendment 39 can be found here: https://docs.google.com/spreadsheet/ccc?key=0Atgbk2rxQkqhdFViUTB3VERSX2ZwcXJmckl1QTBXZkE#gid=0

Scoping workshops were held in the following locations:

January 14, 2013
Baton Rouge, Louisiana
DoubleTree by Hilton
4964 Constitution Ave.
Baton Rouge, LA 70808
(225) 925-1005

January 14, 2013
Texas City, Texas
Holiday Inn Express
2440 Gulf Freeway
Texas City, TX 77591
(409) 986-6700

January 15, 2013
Corpus Christi, Texas
Hilton Garden Inn
6717 S. Padre Island Dr.
Corpus Christi, TX 78412
(361) 991-8200

January 15, 2013
Biloxi, Mississippi
Four Points by Sheraton
940 Beach Blvd.
Biloxi, MS 39530
(228) 546-3100

January 16, 2013
Orange Beach, Alabama
Hilton Garden Inn
23092 Perdido Beach Blvd.
Orange Beach, AL 36561
(251) 974-1600

January 17, 2013
Destin, Florida
Destin Community Center
101 Stahlman Ave.
Destin, FL 32541
(850) 654-5184

January 22, 2013
St. Petersburg, Florida
Hilton St. Petersburg Carillon Park
950 Lake Carillon Dr.
St. Petersburg, FL 33716
(727) 540-0050

Summaries of Scoping Workshops

Baton Rouge, Louisiana
January 14, 2013

Council and Staff
Campo Matens
Ryan Rindone

32 members of the public attended.

Joe Macaluso - www.theadvocate.com
The big issue is that the federal government is ignoring the fishermen. How do the federal fisheries managers know which survey, either the Texas Parks and Wildlife or MRIP, is correct? Red snapper can be caught in less than 25 meters of water. Also, how is funding for data collection going to be shared with the states who take on regional management? Allocation should be based on biological criteria. There is a disparity between how recreational and commercial catches figure into the overall red snapper quota. Louisiana's issue with respect to regional management is Florida: Florida has all the people, and Louisiana has all the fish.

George Huye - CCA
Regional management should be done by state, with each state constituting its own region. States should not have to share authority with other states with less resources.

Mike Montalbano - CCA
Regulations are intentionally cumbersome. The Gulf Council should pursue regional management. The Gulf Council should remove as many regulations from the fishery as possible.

Austin Johnson - Private recreational angler
Supports regional management.

Trey Williams - CCA
There are lots of red snapper out there. A 27-day season is not sufficient. Anyone with a boat can catch red snapper. The current system is broken. State-level red snapper is the way to go.

Rawlston Phillips - Private recreational angler
Regional management is the way to go. The money spent by Louisiana on the fishery goes much further than the money spent by the federal government.

Rad Trascher - CCA
Supports regional management. LDWF has a better sense of the red snapper fishery than the federal government and can better manage catch data and conduct stock assessments. Regional management is a step in the right direction.

Larry Hooper - Our Freedom Charters
Will regional management lead to catch shares? Catch share programs haven't worked well anywhere. Supports regional management. Let states handle their own fisheries. Would like to

see the charter for-hire industry recognized as its own business. We pay for everything and get punished for it. Regional management should be conducted at the state level. Red snapper should be assessed using numbers of fish instead of pounds. Scientists need to count all the fish.

Andrew Roberts - CCA
Supports regional management, with Louisiana acting as its own region and governed by LDWF.

Ben Graham - CCA
There are tons of red snapper. Supports regional management of red snapper at the state level. States can do a better job than the federal government. Allocation should be based on biological criteria.

Chris Moran - Marina operator
Supports regional management of red snapper at the state level. Louisiana has the best red snapper fishery and the smallest number of fishermen. There should be shorter seasons as you go from the western Gulf of Mexico to the eastern Gulf of Mexico. Allocation should be based on biological criteria. States could do a better job with sampling funding.

Jim McDowell - Private recreational angler
Supports regional management of red snapper at the state level, with Louisiana managed by LDWF. Allocation should not be based on landings.

David Cresson -CCA Executive Director, LA
The Gulf Council proposed regional management plan is different from the Louisiana proposal. One goal was to show that Louisiana can count fish better than the federal government. In favor of management at the lowest possible level. In favor of regional management as proposed by LDWF.

Texas City, Texas
January 14, 2013

Council and Staff
Patrick Riley
Emily Muehlstein

30 members of the public attended.

Bubba Cochrane - Charter, commercial, and recreational angler; Good News Charters and Southern Seafood LLC
What is happening with red snapper management right now isn't working and regional management should be pursued. He likes the idea of managing with 3 regions. Bubba does not want the states to manage red snapper without a regional system.

Shane Cantrell - Charter; Fishin' Addiction Charters and Charter Fishing Association
Shane is a young captain and he believes that regional management has a lot of potential as long as states can agree with one another. He would like to see regional management because it may be a way to increase accountability for the recreational sector.

Tom Hilton - Private recreational angler
The Council is working backwards and should identify fishing effort first. He thinks that an offshore boat permit would solve a lot of issues. The charter for-hire industry already has their own permit and the private recreational anglers should, too. An offshore recreational permit would allow for better determination of what the recreational sector is catching without the time lag associated with MRIP. The permit could also solve the problem of National Standard 4 that disallows discrimination between residents of different states by charging different fees for resident and nonresident fishermen. The real solution is an honest stock assessment that gives full credit to the fish on artificial structure in the Gulf. He could really get behind a regional management system if the regions actually had control, but not if this is just a way to further micromanage the fishery.

John Thomas - Private recreational angler
He echoes Tom Hilton's perspective. He sees that there is more snapper out there than ever, and even though he is allergic to fish he wants the system to be fixed.

Jonathan McKay - Private recreational angler
Jonathan suggests that permitting or buying a license that gives a certain number of fish to each angler would be a good idea. A tag system should be considered; this could be considered using regional management or it could be done Gulf-wide. Ultimately, Jonathan is worried about what the overpopulation of snapper is doing to the other fish.

Roger Dickert - Private recreational angler
Roger would not want to trade more days for a smaller bag limit. He supports a tag system because he would like to be given the opportunity to fish when he wants to so he doesn't have to risk unsafe seas. Regional management would be better because the local folks in control would better be able to make management judgments for their region.

David Conrad - Charter; Circle H Charter
David supports the idea of using a tag system. He likes the idea of regional management and would like to see the idea developed a little more.

Bill Platt - Charter boat captain and tournament angler
Bill likes the idea of a regional management system and he really wants accountability in the recreational sector to be improved. 20 years ago there were way more offshore fishermen and there are a lot less now. A tag system is a reasonable idea for Texas because better accountability should let them fish longer.

Scott Hickman - Charter Captain; Circle H Charters
One size fits all management doesn't work in the Gulf of Mexico. He would rather fish red snapper in the fall, and he supports regional management on a state-by–state level so that they

have the authority to come up with their own system under the federal quota and federal accountability measures. Regional management will allow us to get to the accountable fishery quicker than the federal fishery would allow. The status quo system does not work; 27 days is ridiculous, and Texas may as well not have a federal season with the bad weather. Texas Parks and Wildlife could do better for their fishermen and he applauds the Council for trying to give the recreational fishermen a solution.

Tyler Walker - For-hire deckhand and recreational fisherman.
Tyler has seen how the fish population has grown and he supports the idea of moving forward with a regional management program.

Billy Woolsey - Private recreational angler
Billy thinks regional management is a good idea. He wants accountability to be better and believes that a tag system is a reasonable solution to the problem we're facing. We need to do something different.

Johnny Williams - Owner, Williams Party Boats
Jonny believes there needs to be some safeguards because management has potential to become a derby where the state that opens first gets to catch their fish and the rest of the states are punished when the quota is caught. If a state wants to participate in the program, then it should have to agree that it will close its own state waters, not just the federal waters off the state if the individual region's allocation is reached. He thinks that NMFS should relinquish federal control of snapper completely and allow the states to manage it.

Buddy Guindon - Commercial fisherman; Katie's Seafood
Regional management and accountability would be good but he wants to ensure that the people out there can continue to make a living taking people fishing.

Johnny Walker - Charter owner
Johnny thinks the states can better manage the fishery than the federal government. If the Council can put in place measures that ensure one state's harvest does not cut into another, then regional management is a good idea. He also believes that a tag system is a reasonable solution to the recreational season problems.

Todd Hanslik - Private recreational angler
He supports the idea of regional management and would like the Council to give the states a shot at incremental management of this fishery. It will be very complex to develop the regional management program and Todd would like to be sure that the Council continues to involve fishermen in the development of the program by sharing information and inviting people to comment. He wants to pass on the ability for future generations to fish, and he fears that the fishery is slowly migrating to a liberal system that is similar to that of Canada where you must pay someone to take you bluefin tuna fishing. He would really like the state to have the opportunity to manage snapper on their own.

Gary Graham - Texas Sea Grant
He thinks tags should be considered because it is a potentially viable system that works in the hunting world. He would like to discuss density-dependent allocation because population is limited by habitat.

Corpus Christi, Texas
January 15, 2013

Council and Staff
Doug Boyd
Emily Muehlstein

37 members of the public attended.

Mary Ann Heimann – South Bay Marina
It's a good idea that the states take control of the fishery but she thinks that the states should be given full control.

Russell Sanguinet - Charter; Dolphin Dock Inc.
Council can't allocate based on the number of licenses because we can't use historical licenses to determine it; people have not been buying licenses and won't until there is something to catch. He wonders how we are going to differentiate between federally permitted vessels and state-permitted for-hire vessels if the state of Texas gets regional control? Would federal permits be allowed to fish in state waters? The whole purpose of this idea should be to make each state responsible for their own fishery and not be managed by another mismanaged fishery (NMFS).

Jackie Romeyn - Charter; Fisherman's Wharf
She would like to know what the distinction would be between the federal and state waters. She does not currently have a federal permit and wonders what the distinction will be under regional management. Jackie likes the idea of state-based regions or even smaller regions because she believes it will allow for better scientific information, better allocation, and better local regulations if the states are given more responsibility.

Troy Williamson - CCA
The concept of regional management has been developed because of frustration toward federal management. Red snapper are more abundant than ever and management has worked, but it's time to reap the benefits of success. The CCA supports driving management to the lowest level of government possible. The states should manage with as little federal influence as possible. NMFS is "rewarding" anglers with a 27-day season and a 2-fish bag limit after they have sacrificed to rebuild the stock. This short season will result in a wide-spread revolt to fisheries management. The transfer of responsibility will be no easy task; enforcement, monitoring, etc. will be difficult to control. The states should have the ability to manage both commercial and recreational harvest of red snapper.

Mike Nugent - Port Aransas Boatman Association and Charter operator
They have been asking to split the Gulf for 10 years. This is the first time the Council has responded and he hopes that people keep moving forward to get this plan to work. Each state should get their allocation from historical landings and it's really important that each state is independent from the others. The mistakes other regions make should not affect each region. The problems with MRIP could be solved by dividing it into other states who can take more control of their data collection programs. Regional management is desperately needed and would take away the state vs. federal permit issues.

Mike Miglini - Charter; Out to Sea Adventures
He would like allocation to be based on biological abundance of the fish. He supports regional management because local folks can make better regulations for local needs. He sees problems with Reef Fish Amendment 30b and section 407 of MSA which will kill charter boats and headboats. Credit should be given for artificial reef and restocking programs when determining abundance. He would like people to look at tags for recreational boats, and if that's good for private recreational boats he would like to see something for for-hire boats that would allow anglers to fish the days they want; they could use an AB tag system to stay in business.

Mike O'Dell - Charter; A Fishing Fantasy Guide Service
He supports regional management because the states can make better regulations than NMFS can.

Dennis Lug - Retired charter, now private recreational angler.
Would like to see some sort of regional management system worked out.

Steve Hardy - Private recreational angler
We are here because federal fisheries management is not working and it's time for something different. He supports any plan that has Texas as their own region. Boundaries would extend into the EEZ. We are not managing licenses, we are managing fish, so allocation should be based on abundance of fish. There are multiple stocks of red snapper based on habitat and reefs. He is worried that we are having a discussion about how we divide the pie but we are saying nothing about how to make the pie bigger. We need to do something about structure offshore.

Jim Smarr - RFA Texas
RFA believes in state management and has for 17 years. We should use the longest data set possible (historical landings) so that Texas can be treated fairly. It should be a biological abundance decision, period. The SEDAR-style stock assessments should be conducted regionally so that Texas can fish their own stock; monitored and determined by Texas. Management guidelines should not be established by the Council; the state should be given full control of their allocation. There needs to be an amendment to the MSA that cures the system that allows the other states to be affected by another region's overrun of their own allocation.

Brett Casey - For-hire; Port Aransas Boatman Association
Out of all the discussion, it still boils down to NMFS still monitoring the red snapper, and if one state catches the whole allocation, we're still back to square one. We need to figure out what we

need to do to limit this. Texas should be given their own allocation and each region's behavior should not affect what the other regions do. It's time to make a change for the good.

Tim Oestreich – Headboat Captain; Dolphin Dock Inc.
The federal limit seems to mainly limit the for-hire folks with federal permits. Some kind of separation should be made for someone who owns a business, because as it is, private fishermen can catch 4 fish all year-round, while federally permitted for-hire boats have a real short season. It would be very helpful if the season can stretch.

Biloxi, Mississippi
January 15, 2013

Council and Staff
Dale Diaz
Ryan Rindone

23 members of the public attended.

Johnny Marquez - CCA Executive Director, MS
Local managers can do a better job of managing fisheries for constituents. Concerned about how regions will be defined. Want fair and equitable access to the fishery. How would state management entities be funded to conduct regional management?

Tom Becker - Charter for-hire captain
Red snapper are very abundant. Concerned about what Mississippi will get with respect to allocation. Want to know who makes up the catch numbers.

J.R. Titmus - Private recreational angler, artificial reef builder
Louisiana is claiming 9 nautical miles for state waters. Has no idea how recreational catch data are calculated. Would like to see state control out to 9 nautical miles in Mississippi, and the federal government can control beyond that. It is not possible to fish all 27 days of the proposed 27-day red snapper season; it's just too expensive.

Tim Knighten - Private recreational angler
Does not understand how the stock assessments work. It is hard to catch triggerfish because there are so many red snapper. Red snapper are eating everything. Doesn't trust the federal government or federally generated data. Supports state management of red snapper.

Gary Smith - Gulf Council Red Snapper Advisory Panel
There is a major issue with counting the recreational catch. The entire process is a joke, and the federal government is screwing the recreational sector. Flew from Mississippi to Florida to count the number of boats fishing to prove it. Mississippi needs regional management. What happens when Texas removes all of the oil rigs?

Keith Cuevas - Marine Biologist, Gulf Coast Research Lab
Mississippi needs regulations extended into federal waters. Allocation should account for this. Other states have shallow water oil rigs and Mississippi does not. The Gulf Council needs to get involved in the rigs-to-reef process. Juvenile red snapper recruit to the oil rigs. Supports regional management authorities, based on good communication. If states pursue regional management individually, then their independent harvests could have a domino effect on the other states.

Orange Beach, AL
January 16, 2013

Council and Staff
Bob Shipp
Ryan Rindone

125 members of the public attended.

Pat Willingham - Private recreational angler
Has seen a four- to fivefold increase in red snapper over the last 40 years. All of the fish are in the 9-25 pound range. Divers tell him that the juvenile fish of other reef species are almost gone due to the red snapper. The Gulf Council needs to consider the impact of large red snapper on reefs.

Tom Steber - Charter for-hire captain
Need to look at regional management. The big issue will center around how the lines are drawn. The overarching issue is the Magnuson-Stevens Act. Fishermen need to rally together to get MSA redone or fixed. Alabama has the best reef zone in the world.

Kevin Sinyard - Private recreational angler
Watched the bag limit drop from five fish to two. It costs a fortune to go fishing for red snapper now.

Dale Ruckle - Private recreational angler
Can't even get a charter to go out fishing for red snapper. Bag limits are too low. Local businesses are losing tourism business as a result.

Troy Frady - Charter for-hire captain
Concerned about how to make a living. Bag limits have plummeted. Cautious about regional management of recreational red snapper. Is regional management going to extend the season or increase the creel limits? Is Alabama going to manage the fishery better than the National Marine Fisheries Service? The regulations are affecting our livelihood.

Gary Malin - Private recreational angler
Fished only a few days last season and limited out on red snapper each time. Red snapper are eating everything. Regional management should be done with a break between Florida and Alabama; this would be more fair for Alabama. Current fisheries regulations don't make sense.

John Kemper - Private recreational angler from Minnesota
Alabama anglers should fight for their rights.

Tim Wilson - Private recreational angler
Fishing is an inalienable right. There are plenty of fish in the ocean. The charter for-hire fleet is afraid of the federal government. Fishermen need to protect their rights. Government has taken all of those rights away. Shorter seasons make it less likely that people will fish. Local control of fisheries is better.

Tom Ard - Charter for-hire captain
The best idea so far for red snapper is regional management. Alabama does a great job counting fish. Each region should be held accountable for their allocation. Would fish tags be used? How might regional management apply to grouper in the future? Use historical biological data for setting the allocation and adjust it periodically. Fears noncompliance by states like Texas and Louisiana.

Ben Fairey - Charter for-hire captain
The fisheries management process takes too long. Regions will all fight for allocation. Alabama should not be grouped with Florida. Alabama only has 3 nautical miles worth of state waters, while other Gulf states have more. Wants assurance from the Alabama Gulf Council representatives that Alabama will be cared for in this process.

Bill Coursen - Private recreational angler, Pensacola, FL
Whenever the government takes anything over, they mess it up. Fishing rights are being denied. Caught 76 red snapper last year, and discarded close to 400. Hopes that some regions won't be unjustly shorted on their allocation.

Matt McLeod - Charter for-hire captain
There is a disparity between the number of fish caught and the reported landings. Both are total unknowns. Supports states all going noncompliant. NMFS's red snapper management plan will crumble with noncompliance, and NMFS will have to do what the fishermen want.

Chris Sherrill - Restaurateur
There will be economic problems if the season length drops to zero. He depends on recreational fishermen eating at his restaurant during the summer; no red snapper, no customers.

Gary Bryant - Charter for-hire captain
Red snapper season should last 180 days at a 4-fish per person bag limit. Supports regional management by individual states with accountability measures provided by the Gulf Council. Likes the idea of fish tags. The charter for-hire industry could receive their annual allotment of tags at the beginning of each year, and the private recreational anglers could get tags to catch red snapper at will. Harder to find more desirable fish.

Rashley - Private recreational angler
The federal government is over-managing. Flawed management affects everything.

Alan Taylor - Private recreational angler
Supports regional management of recreational red snapper by state.

Dwain Sanders - Private recreational angler
There are thousands of red snapper off Alabama. The charter for-hire industry is ruined. Commercial fishermen are paying lobbyists to raise the price of red snapper.

Robert Turpin - Escambia County Marine Resources, Private recreational angler
Supports regional management of recreational red snapper with allocation based on biomass. NMFS is currently trying to rebuild red snapper to a threshold that is too high. Will never be able to meet the rebuilding threshold.

Destin, Florida
January 17th, 2013

Council and Staff
Pam Dana
Ryan Rindone

104 members of the public attended.

Candy Hansard - Private recreational angler
The portion of Amendment 30B requiring CFH fishermen to adhere to the strictest regulations needs to be eliminated. States shouldn't be penalized for other states exceeding their allocation. Regional management is needed. Need to solve fisheries problems, not manage them. Need more artificial reefs. The Gulf Council needs to look into private artificial reef construction.

George Eller - Charter for-hire captain
Regional management of recreational red snapper may have merit under some conditions. There are too many unanswered questions right now. Need to table the amendment until the next assessment is completed. Until the CFH portion of Amendment 30B is gone, competition will be unfair. Texas is in violation of current regulations. Louisiana extending their state waters will take an act of Congress.

Matt McLeod - Charter for-hire captain
Been coming to these meetings for ten years. Lots of false hope. System has failed the fishermen. The regions would be fighting over a constantly shrinking pie. Supports states all going noncompliant. Fishermen need leverage against NMFS. States could grossly exceed the TAC set by NMFS, and the NMFS's red snapper management plan would crumble. Fishermen could then demand that NMFS work with them. The problem won't be solved by anything less.

BJ Burkhead - Charter for-hire captain
Opposed to regional management; table the amendment.

Stewart Miller - Charter for-hire captain
Opposed to regional management; table the amendment. Too many unanswered questions.

Chuck Guilford - Charter for-hire captain
Opposed to regional management. Opposes all management without consideration of ecosystem variations. Opposes any separation between the CFH and private recreational fishing groups.

Tom Adams - Charter for-hire captain, www.mexicobeachcharters.com
The Gulf Council should appoint new people to the Advisory Panels.

Dr. Rain - Private recreational angler, Destin resident
Has quit fishing deepwater outside of the red snapper season because red snapper are all you can catch when you go out there. Huge red snapper off of Destin. Fisheries management needs to focus on the data collection.

Brant Kelly - Charter for-hire captain, www.relentlesscharterfishing.com
Opposed to regional management. Table the amendment.

St. Petersburg, Florida
January 22, 2013

Council and Staff
Martha Bademan
John Sanchez
Ava Lasseter

24 members of the public attended.

Capt. Bob Bryant - Charter
In considering regional management, once again we are trying to manage something that we don't know what we're managing; we don't know the numbers. The stock assessment fails to get a huge percentage of the fish from oil rigs and artificial reefs. The majority of the stock assessment is based on natural structure that NMFS knows. The majority of fishermen are going to artificial structures and we are not capturing fish from those places. Stock assessments are useless without this, making catch data useless, too. There are more problems than benefits in regional management and it seems to be a backdoor to sector separation. What we need to do is to unite fishermen and provide good data to NMFS and have them provide good data to the fishermen in return.

Bo Gorham - Private recreational angler
For-hire operators do a great service, but private anglers put money into economy and so have an important voice. He works weekdays so only had 12 days possible to fish red snapper during last year's season, and was only able to go fishing four times. Investing in gas and boat wear and tear for a derby fishery is not sustainable. Upon hearing this year's estimated 27-day season, he started running his own numbers. He compared MRIP's effort data and number of fish caught a day and the numbers don't work out. If effort data stays constant, it shows they didn't overfish last year but came out right at quota. If that's true, he should have 42-day season again this year. But it's a crap shoot because we don't know the stock. He does agree that taking management to the regional level now is crazy; the data are not there now to manage as a whole. Dividing into

five ways creates new bureaucracy that taxpayers will have to pay for. The states don't cooperate now. It's a way to avoid the hard part which is to validate what is going on in the fishery. Data is the key.

Capt. Mark Hubbard - Hubbard's marina, John's Pass.
He is strongly against splitting up amongst the states and echoes Bo Gorham's comments. He doesn't want another layer of bureaucracy on this fishery, especially since the Council can't manage fishery now. Plus, taxpayers can't afford it; it's more and bigger government. The plan takes away from state powers and discriminates between for-hire, federal, and state permit holders. It discriminates between the states, and appears to move toward sector separation. It uses fatally flawed data to micromanage a fishery that is already screwed up. It seems to divide and conquer the Gulf of Mexico. He is against regional management now, but would have supported it with a 6-month season. A full benchmark assessment needs to be done on red snapper. The fishery needs more days for open access fishing. It's the opportunity to fish that drives our economy, and a 27-day season is just silly with all the fish out there. Resources are being spent on assessing smaller reef fish instead of the important species.

Before considering regional management of gag, a full benchmark stock assessment is needed. The Council is restricting the gag fishery based on a flawed stock assessment. The gag fishery is huge and more reliable data are needed. There aren't as many boats fishing now because they must spend so much money to go out. Ten years ago, there would be 15 boats at the Middle Grounds, but that doesn't happen anymore. The pressure isn't on the fishery the way NMFS and the Council say it is.

Concerning state boundaries and allocation of red snapper, if states get allocated pounds, could those allocations start to migrate over from the commercial fishery? If that was the case, he wants the commercial allocation that moves into the recreational sector to stay in the recreational sector. He doesn't want the commercial sector to buy out of the recreational sector. That would give them some protection, in case catch shares take hold in the recreational fishery.

Stephen Furman - Tampa CCA
He hasn't fished offshore much lately; fuel prices keep him in his kayak. He knows others don't do it as much anymore either, so offshore effort has gone down. He thinks people understand regional management would allow states to manage the fishery and they can do a better job. But it sounds to him like the feds would spread the 27-day season among the 5 states and each gets a 5-day season and that's not appealing. He thinks a 4-day weekend season would help spread out the days so people could fish longer. Concerning how to get better data, he supports the idea of an offshore permit for collecting data from fishermen, and says it's easy to do and is already done for migratory game bird hunting.

Dennis O'Hern - FRA
This plan appears to increase uncertainty and it is uncertainty applied to allowable catch that is hurting them. The idea for regional management, regional cooperation, is a great concept, but it's called the Gulf Council and you already have that. The problem seems like the Council is told what they have to do. He is not sure where regional management is coming from; it looks like sector separation. He doesn't want to give NMFS more power to close a fishery arbitrarily.

For greater amberjack, they closed the season in 5 days, in-season, based on MRFSS data which is not supposed to be used for in-season quota monitoring. The MRIP data is still just random telephone surveys; Florida is starting new data collection but it's not making it to the top.

It's been 10 years since having a full stock assessment on red snapper. The current one is a modified benchmark assessment, and it should be a full assessment; the Council needs to make some more noise about that. These plans take away state powers; if state waters are managed by the states, anyone can fish in state waters, permit or no permit. The feds cannot come in and chain you to that federal rule. That is for all the charter guys.

They had clamped down on red grouper even though they were thick as flies, and they won a lawsuit against the regulations. The same thing has been going on with red snapper and gag; the clamp is staying on it. Roy Crabtree is clamped by certain rules, as is the Council, but we threw off slavery and other rules and putting up with this is just plain wrong. The spring shallow-water grouper closure is not needed, and he can't believe it isn't done (the rule making), so Mark Hubbard and his employees cannot access what is known to be a healthy fishery. There is no reason the closure can't be rescinded. If Dr. Crabtree can close amberjack in five days, he can open shallow-water grouper. The analyses have already been done. There will be an online petition up by tomorrow to address the 2-month closure, because it would be a half million dollar bump to the fishing economy.

Libby Fetherston - Ocean Conservancy
She lauds the goal on increasing flexibility for recreational fishermen, but is concerned that regional management isn't the way to go. There are issues with monitoring and enforcement and it is unclear where from the federal budget enforcement funds would come from. Without additional funds for monitoring, they would need a bigger uncertainty buffer and she doesn't see that happening because it would further reduce the season. She is uncertain how much flexibility states would have; it may be limited to when they have their seasons and the bag limit. She doesn't see this as a mechanism for optimizing recreational fishing opportunities.

As with all their comments on scoping documents, she feels that the Council and NMFS should analyze a wide range of options that address this issue. She is concerned about how federally permitted charter operators would be affected by regional management, and that warrants further analysis. NMFS must ensure that this is consistent with federal law and the rebuilding goals for red snapper. She predicts the assessment will show great progress has been made in rebuilding red snapper, but that they aren't there yet.

Vance Tice - FRA, Minnows and Monsters
He is still very upset that no Council member attended the last public hearing and he is concerned that Council members did not receive their testimony. He had a tackle shop that is closed because of draconian measures; 60% of his business was offshore fishing and there is no more offshore fishing. He's against catch shares but they keep trying to slide it in there; the majority in Florida is against catch shares. Congress has addressed it but they move on with it. The way effort is calculated is a big problem. He has called a lot of businesses and they report that business is down, but the data show effort is up so there is a problem there. At the boat ramps, you don't see the big trailers anymore, you see smaller bay boats. He knows guys who

have sold their offshore boats because it isn't worth it anymore. When FWC goes out and does mortality studies that show that the data are way off, their studies are ignored. Bob Shipp's paper says there is way more red snapper than the Gulf Council wants to admit. It's hard to feel a part of management when what they see is 180 degrees from what is being shoved down their throats. For red snapper, they used to have a 192-day season, 4-fish bag limit, and they never overfished the limit. Now with a 40 day season and 2 fish limit, they've somehow miraculously overfished the limit. Factors like weather, price of gas, and the economy are not taken into account. People are struggling. You're not just affecting people who fish, you're affecting every Florida citizen because when you take that money out of the state, the state still needs money to run.

Scott Moore
We don't even know how many people are fishing in federal waters. He doesn't like fishing licenses, but he knows why you have to have them. Magnuson was enacted to get information from the states on who was fishing in federal waters and he can't understand how to do this without knowing how many people are fishing in federal waters. He suggests that Florida implement the same thing as fish and wildlife did with federal regulations on migratory birds. The permits should be free because you're collecting the data and the feds should pay the states to do this. That's the first thing that should have been enacted. Just because a guy catches grouper onshore doesn't mean he fishes in federal waters. The only way to get this right is to permit the data. Another thing is poundage; Florida never went by pounds; they went by individual catch. Poundage is way too confusing, you want to simplify as much as possible. There are a lot of fish out there in trouble. There's no fishery in the world that has ever collapsed fishing on a slot [limit]; he feels slot limits should be used more.

Frank Bacheler - Captain, Hubbard's Marina
Since he came back to the area he's noticed an overwhelming change in the laws that have been imposed. For groupers, there's a big change in what you can't keep in federal waters. He gets gags year round and is not seeing the population decline like everyone is talking about. Out in 130 feet of water, red snapper are everywhere, and doesn't understand how people are getting these numbers. The FWC guys are there and they're awesome, but they are counting the number of runts coming on their boat, rather than figuring out other stuff out with their time. We're so limited with the season and we need to figure out what we're doing here. He's listening to everyone out here saying the way they collect the data is wrong, and everyone here at this meeting is against everything that's going on. No one here supports the 27-day season, they need better data.

Public Hearings were held in the following locations:

Thursday, August 1, 2013
Call-in session

Monday, August 5, 2013
Courtyard Marriott
11471 Cinema Drive
D'Iberville, MS

Wednesday, August 7, 2013
Holiday Inn Select
2001 N. Cove Boulevard
Panama City, FL

Thursday, August 8, 2013
Renaissance Mobile Riverview Plaza Hotel
64 South Water Street
Mobile, AL

Monday, August 12, 2013
Hilton St. Petersburg Carillon Parkway
950 Lake Carillon Drive
St. Petersburg, FL

Monday, August 12, 2013
Hilton Garden Inn
6717 South Padre Island Drive
Corpus Christi, TX

Tuesday, August 13, 2013
Hampton Inn & Suites
2320 Gulf Freeway South
League City, TX

Wednesday, August 14 2013
DoubleTree
4964 Constitution Avenue
Baton Rouge, LA

Summaries of Public Hearings

Call-in Session
August 1, 2013

Council/Staff
Kevin Anson
Ava Lasseter
Emily Muehlstein
Charlene Ponce

17 members of the public attended.

Tom Hilton - Recreational
Mr. Hilton believes that regional management puts the cart before the horse. The council is pushing for a concept that uses knowingly-flawed data that overestimates recreational landings by at least 70%. It would be better for the Council to help the Gulf states implement a state-based data collection system modeled after the existing Louisiana offshore landings permit. Second, the concept of sector separation has been slipped into the regionalization concept. It is irresponsible for the Council to give that type of decision-making power over to the states rather than tackle the issue Gulf-wide.

Dennis O'Hern- Fishing Rights Alliance
Mr. O'Hern wonders if there is no accountability measure for the recreational sector what is the 28-day season. The recreational sector is managed after the fact, due to the horrible mismanagement of data by NMFS. He also mentioned that people often submit false information to the Council and he asked for follow-up regarding the law and any past prosecutions under said law. He also expressed concerned that regional management was based on data that the Council knows to be wrong. The Gulf Council should be the management tool that we want, but NMFS influence and control over the Council must be removed. He stated that the Council should be run by the states with constituent input, and the members of the Council should be appointed by the Governors; not hand-picked by NMFS.

B.J. Burkette - Charter; Florida
Mr. Burkette does not think that regional management is going to help because the NMFS data is still a problem. There is no need to be so restrictive with the amount of fish and regional management won't solve that problem.

George McKinney - Commercial, For-Hire, Private; Pensacola, Florida
Mr. McKinney wondered how enforcement would work in a place like Pensacola, Florida with Perdido Pass so close. He would like to see some sort of regional management. He wants small boats and private recreational anglers who are limited in days to be able to safely and effectively fish in the Gulf.

Bob Gill - Former Council member; Crystal River, Florida
Mr. Gill recommended that the Council require the states to come to full agreement on all points relative to regional management prior to the Council taking further consideration or action. He added that the Council ought to table the amendment until the states agree on all the issues. New issues seem to be cropping up and it's going to be very difficult for the Council to find an endpoint if the states do not agree with every action and alternative.

Action 4 - Council should give serious consideration to a slot limit for red snapper. Spawning success is greater for large fish and preserving the older fish in the truncated population may have some merit. Mr. Gill acknowledges the discard problem and still believes a slot will be useful.

Bill Teehan - Former Council member; Tallahassee, Florida
Mr. Teehan thinks the entire concept is very interesting. He supports Action 4's Alternative 7 which would allow individual regions to establish sub-allocations for for-hire and private anglers.

Corpus Christi, Texas
August 12, 2013

Council/Staff
Robin Riechers
Lance Robinson
Emily Muehlstein
Charlotte Schiaffo

20 members of the public attended (mostly Texas Parks and Wildlife and Harte Research Institute staff; about eight were members of the fishing public).

Cliff Strain - Port Aransas Boatmen Association
Mr. Strain commented that he understood the current data collection but believed that people were unsatisfied with the federal government because the regulations were not in line with what the people are seeing. He added that if a move toward regionally adjusting the data was not made, then regional management would not have the punch or be as effective as anglers wanted it to be. He noted that Texas had the structure and ability to manage red snapper, and while he did not think there needed to be a year round season which could deplete the resource, he did want to see a longer fishing season. He stated that he had not had to spend more than 30 minutes fishing to limit out. He expressed concern that eventually, the destruction of habitat would have an effect on fish populations and encouraged the Council to do what it could to control the removal of rigs. He stated that his association wants to support regional management.

Ron Moser - Port Aransas Boatmen Association
Mr. Moser favored individual states having control over their waters (Action 2, Alternative 3). He added that the data collected should be adjusted to account for the biomass of fish in the state of Texas, as Texas seemed to be penalized more than other states because of this not being taken into account. He supported Action 3, Alternative 1; do not apportion the quota based on historical landings. On Action 4, he recommended the Preferred Alternative 4, to allow individual regions to set recreational red snapper season start and end dates and season structure. On **Action 5, he believes that** for-hire vessels and federal permit restrictions should be left to Texas to manage the resource. On Action 6, he agreed a 2-year grace period (Option b) would be best so that the new program had opportunity for error without penalizing fishermen while the program adjusts.

Pat Harris - Private recreational angler
Mr. Harris would like to see as much effort from the Gulf Council to increase habitat quality as they did in forcing regulations on anglers. He added that trying to improve everything instead of concentrating on improving the fishery was the wrong path for the Council to take.

League City, Texas
August 13th, 2013

Council/Staff
Robin Riechers
Lance Robinson
Emily Muehlstein
Charlotte Schiaffo

21 members of the public attended.

Kristen McConnell - Senior Conservation Manager Environmental Defense Fund
Ms. McConnell expressed concern about the regional management proposal. She is cautiously supportive because Environmental Defense Fund agrees with the idea of increasing access and flexibility for anglers but finds it difficult to support an idea with so many outstanding issues. Regional management will present challenges to law enforcement; it may have unforeseen impacts on other species due to effort shifting. It is hard to move forward without a better understanding of what the states will do. States should provide details on what direction they will take and their proposals should include accountability measures in case of a quota overage. She fails to see the relative benefit of regional management for private and for-hire anglers in the long term because the concept simply promotes the use of the same management tools with the same pitfalls. A real solution that potentially uses regional management is needed, but the current amendment does not seem to provide that solution.

Bill Bahr - Charter Captain
Mr. Bahr is largely concerned with the health of the snapper fishery and properly assessing that population. He is a Texas native and he has confidence that Texas Parks and Wildlife will be able to manage red snapper. He is concerned about the discrepancy between Louisiana and NMFS landings data, and he would support Action 6, Option b which would create a 2-year grace period for the regions to establish their own programs without having the NMFS numbers shoved down their throats.

Scott Hickman - Charter Captain and owner of Commercial Red Snapper IFQ
Status quo is not working. The commercial IFQ program can be credited for success of some of the red snapper recovery and he would like a similar tool to be considered for the for-hire sector. Mr. Hickman can't participate in his own state waters, so he supports Action 5, Alternative 2 to remove the requirement for for-hire vessels to adhere to the strictest regulations. Mr. Hickman also supports Action 4, Alternative 7 which would allow for a separate sub-allocation for the private for-hire industry. Amendment 39 has a lot of holes in it and he is afraid that Texas will have a weekend season or something that will shut out the charter industry. He is tentative about supporting the amendment and wants the charter boat fleet to have assurance before he can move forward.

Paul Bitner - Charter Captain
There are a lot of holes in how the landings are calculated and he would like to see greater accountability in how those numbers are collected. Mr. Bitner does not think we can get a grip

on the numbers without implementing a tag program to keep better track of the fish. Mr. Bitner has limited days to catch fish and make business work and the current management does not allow for success. He supports Action 4, Alternative 7 because he would like the private and for-hire fishermen to be managed separately.

Johnny Williams - Headboat owner/operator
Mr. Williams thinks there are going to be winners and losers under a regional management program, and we are in a situation where we don't know who those winners or losers will be. Texas landings have decreased but it's not because the fishing is getting worse; he predicts that under status quo, the Texas proportion of the harvest will continue to decrease. He supports states' rights and wants the federal entities to stay out of his business. Mr. Williams has a hard time supporting the amendment without a better understanding of what the program would look like if delegation were given to Texas. He would be opposed to a situation where the red snapper fishing would be open only on Saturdays during the summer and he does not know where the State stands.

Tom Hilton
The data is showing that headboats are landing 68% of all the red snapper, so headboat operators have nothing to worry about. Mr. Hilton wants to Council to get a hard handle on exactly what we are doing before jumping off into the unknown using flawed data to determine allocation percentages in Action 3. There are no regional assessments of biomass and the feds have taken control of the commercial fishery without regional control. Off Texas the working allocation is not 51% commercial and 49% recreational. There are far more commercial harvesters off Texas, and here it may be closer to 70% commercial and 30% recreational. He says that there is nothing regional about this concept because the federal agencies will still hold critical control points. The Louisiana offshore landings permit should be a sounding bill for every Gulf state to implement their own data collection system. Louisiana didn't believe the feds and they proved them wrong. In Mr. Hilton's opinion, it is a dereliction of duty for all involved to move forward with this amendment with this flawed data.
He proposes a better solution:

1. Implement a data collection system across the Gulf for each state modeled after the Louisiana offshore permit.
2. Implement an 11 million pound annual catch limit over the next 3 years.
3. Give any increase in quota to the recreational fishermen because their season and bag limit has been slashed while commercial folks have had full access to their quota.
4. Reinstate the 149-day season.

Steve Cunningham - Charter Captain
Mr. Cunningham shares the other speakers' opinions. Caution is important and using only fishery dependent data needs to change. 30B needs to be removed so he can be successful as a charter operator. Mr. Cunningham supports Action 2, Alternative 4 which would create 5 regions, one for each state. He supports Action 3, Alternative 3 which would remove landings from 2006 and 2010 from the allocation decisions. He made it clear that biomass data needs to be included somehow even if it's not given the weight that the historical landings are given. We know there are more fish in the western Gulf and that needs to be accounted for. He supports Action 5, Alternative 2 which would create a 2-year grace period. A 3-year period may be even

better. He is slightly leaning towards having more faith in Texas than he does in NMFS. There are a lot of issues in the document so before any radical changes are made, we need to look at this idea very carefully. The fishermen on charter boats are recreational anglers and they, along with seafood consumers, are important contributors to the fishery.

Shane Cantrell - Charter owner/operator
Mr. Cantrell is disappointed that regional management does not allow for planning or provide for additional methods of data collection. He would prefer a multispecies IFQ program for the charter industry. The commercial program works well for commercial fishermen and he understands that changes would be made to accommodate his industry. He wants the real time accountability. He thinks harvest tags would work out very well for the private recreational anglers. As it is proposed, regional management is just a reshuffling of the deck with the same management tools and he would rather new novel approaches to management be considered.

David Conrad- Charter Captain
He fully supports Action 5, Alternative 2 to allow for-hire boats to participate in the state season. 30B needs to go away because recreational fishermen on their boat should be allowed to fish just like recreational boat owners. He sees issues with allocation for the states. He needs to see what's in the details before fully supporting this document.

Baton Rouge, Louisiana
August 14, 2013

Council/Staff
Camp Matens
Emily Muehlstein
Charlotte Schiaffo

24 members of the public attended.

Chris Macaluso - Theodore Roosevelt Conservation Partnership
As an organization, they are trying to work within the system to better manage the recreational fisheries. Trying to manage red snapper to a total allowable catch is destined for failure because the Marine Recreational Information Program does not reflect an accurate count of the fish that are being caught or how many people are fishing. For Action 3 he is concerned with basing the quotas on historical landings. Historical landings from Alabama and Florida will reflect more landings but that is a measure of fishing pressure not abundance of fish. He does not want to restrict pressure but if the target in MSA is to end overfishing and the Council allows states with less biological availability to out fish the areas with greater availability, we are going to fail. Managing the red snapper as one stock may be a problem. The fish don't migrate from west to east; there are fish in each region. Allowing an area with less fish to harvest more of the fish will not end overfishing. The only way we will successfully end this problem is to allow more fishing where there is more biological availability and less where there are less fish.

Ed Fike - Environmental Consultant and private recreational angler
He is supportive of what he has heard this evening. He is happy that Louisiana is taking the charge and that NMFS is working with fish. Biological availability of the fish is very important and he thinks that needs to be considered during allocation (Action 3). During the fall supplemental season, he fished every weekend and never saw anyone at one of the key landings sites. Based on his observations, he does not think that fishing is that important here in the fall.

Kenny Acostu - Private recreational angler
Mr. Acostu likes the opportunity to go fishing and he enjoys it, but opening June 1st with 2-3 foot waves is hard on him. Let the states manage using the weekend season and if it's recreational that's great because it will benefit him. There is no reason to go fishing for anything outside of red snapper season because you can't catch anything but red snapper; it makes his other fishing less enjoyable. He wants to fish without feeling like he is being wasteful and killing something by accident.

George Huye – CCA; Private Recreational Angler
He is in favor of regional management. For Action 3 he is concerned about the use of historical landings data because it does not fix the problem of inaccurate fisheries dependent data and it doesn't make much sense to perpetuate the current system forward. He sees enough alternatives for the Council to be able to make good decisions here. Regional management will give the people of Louisiana a better opportunity to have a chance to catch what they may have had in the past. We know the stocks are strong and this will give the Louisiana fishermen an opportunity to put their trust and faith in their own resource management department.

Rebecca Triche - Louisiana Wildlife Federation
Ms. Triche noted that red snapper is a hot topic for her members. The Federation submitted comment in January already. She would like to see a regional approach because the Louisiana Department of Wildlife and Fisheries has the capability to assess the stocks. She wants limits to be set based on biological availability because the western region can sustain more harvest than the east. There was lots of activity in legislation regarding the passion Louisiana anglers have. She urges the Council to continue moving forward with this idea to acknowledge the frustrations of recreational anglers.

Rad Trashe - CCA Louisiana
Mr. Trashe expressed his full support for regional management. We all know that we've had faulty science and poor management. This is an opportunity to do what everyone wants; what's best for the resource and what's better for the fishermen. The Department of Louisiana Wildlife has proven that they do better science than NMFS. This year there was someone at the ramp every single day. We should put the power in Louisiana's hands and let them run with it.

D'Iberville, MS
August 5, 2013

Council/Staff
Dale Diaz
Corky Perret
Ava Lasseter

7 members of the public attended.

Tom Becker - Mississippi Charter Captains Association
The Association discussed this the other night and decided that they need to go along with this and see what happens. There are problems with the data because they were never checked to see what they're catching on his headboat. He wants to see someone checking landings more often instead of telling him when they can get there. The Department of Natural Resources is hurting for people. There are so many places to unload your fish and that's what's happening.

Gary Smith - Recreational
Mr. Smith's first concern is the legality of regional management. There needs to be a non-biased person looking into it, in case in a couple of years it's determined they did something they shouldn't have done. He doesn't have a problem with regional management, but it needs more thought about how to divide the quota. Texas, the largest state, only got 12%, but Florida landed so much [2012 landings]; what's going to happen as the population changes? There are a lot of areas that need to be addressed: will there be annual adjustments, what process will be required, what happens when Texas demands more? The biggest issue is how you're going to count/estimate the data. Everyone agrees the data is flawed, but we're not addressing that. To fix it, got to count the number of boats. Don't worry about the number of fishermen, just the number of boats. Then each state could require a boat permit and you couldn't have red snapper aboard until you have the boat permit. Looking at Mississippi's data, it comes up to 22,000 fish they could catch. He has counted the number of boats and has never counted more than 50 boats. The most he's ever counted was 88; the boats just aren't there. You'll be back to 21 days even with regional management. Counting the boats is how you have got to correct the problem.

John Marquez Jr. - CCA Mississippi
He supports regional management and wants management taken to the state level, which allows them to control the fishery, best for their anglers. CCA wants to see the states have the ability to manage the commercial red snapper quota and be allowed to allocate among sectors. They would like red snapper removed from the reef fish FMP, as has been done for misty grouper and other species. He echoes Mr. Smith's comment that any plan needs to contain flexibility to allow for change within the states over time. Mississippi has concerns about how this would be funded, as they have a different sort of funding mechanism for data collection.

Panama City, FL
August 7, 2013

Council/Staff
Martha Bademan
Ava Lasseter
Ryan Rindone

7 members of the public attended.

Chris Niquet - Commercial
He noted the differences between the percentage of red snapper landed by state since the oil spill and the allocation under Alternative 4, which would be based on the ABCs [separate east Gulf and west Gulf stock assessments]. So recreational allocations would be 48.5% for the eastern Gulf and 51.5% for the western Gulf, which lands the least recreationally. He thinks this seems backward. It seems like Florida and Alabama would get the bulk of the ABC.

Bart Niquet - Commercial
He feels the charter and headboats are stepchildren in all of this; they get no consideration from the commercial side or the recreational, side and they are being put out of business. They need their own sector and own bag limits. For red snapper, the recreational sector should go to 60 days with a 2-fish limit and set that in stone. He thinks they should be given something they can depend on so they can make a living.

Bob Zales, II - Charter Captain
He is speaking for himself, as the PCBA has not taken a position yet. He is conditionally supportive of regional management if it is only being discussed for the recreational sector, and will have no impact on the commercial sector. He supports the preferred alternatives in Actions 1 and 2. For Action 3, he supports Alternative 2 Option d, which doesn't benefit Florida the most out of all the options, but seems like a fair allocation. For Action 4 he supports only the Preferred Alternatives 2, 3, and 4. He is a little confused by Action 5; he wants the provision removed so supports that. But even if regional management does not go forward, he wants this action to go forward and be finalized before the 2014 season. For Action 6, he prefers Preferred Alternative 3, Option b, to allow the longest grace period to adapt to the change in management. He's confused by Action 7 because he doesn't see how it's going to work. Under the Magnuson-Stevens Act, the fishery must be closed when the quota is met. What happens if Mississippi fishes a lot? They could effectively cause the closure of the rest of the Gulf. He recommends rescinding 406b of Magnuson-Stevens Act that includes that requirement. It may have been necessary in 1996; it's clearly no longer necessary. Finally, as a for-hire operator, he emphasized that his passengers are private recreational anglers, just like those fishing on their own boats.

Jim Clements - Commercial
Although CCA and RFA have criticized the IFQ program, Mr. Clements supports regional management if it will help the recreational fishers catch more fish and have more days to fish. But, this must not affect the commercial red snapper fishery.

Mike Eller – Charter and Commercial
Mr. Eller is speaking for himself and his own for-hire vessel. For Action 1 he prefers Alternative 3 [Council-implemented regional management]; for Action 2: he supports the preferred alternative for 5 regions. Action 3, he supports Alternative 2 Option d, combining the long and short time series.

Regional management is a slippery slope that could result in benefits or could turn into a total fiasco. He is asking himself, can his state can do a better job than what is going on now? If the states get together and make a big advance on data collection, it could be better. But if they don't do that first, then this is putting the cart in front of the horse. This is hard for him to support when he doesn't know the long-term ramifications. His state will make decisions dependent on the current political persuasion at the time. What if his state chooses to adopt a weekends only season? That would really hurt the for-hire fleet. At least with the Council, you have diverse opinions represented. He would like the individual states to have leeway in setting opening season dates, but maybe not to set different size limits. He supports increased flexibility but it is a slippery slope. He wants to see the regional plan for each state before he supports it and they don't have that yet because it is still new. He wants to hear from a state how it would actually manage red snapper better than the NMFS. He does not want the commercial sector to be impacted by this.

He supports the preferred alternative in Action 5 and thinks the 30B provision is unfair and unconstitutional. In Action 4, he supports Preferred Alternatives 2, 3, 4, 5, and 7. Anglers that fish on for-hire vessels should be protected and shouldn't be lumped in with private anglers who fish differently. He feels there should be the possibility for sub-allocations. In Action 6, he supports Alternative 4, Option b; establish a 2-year grace period before implementation of overage adjustments.

Don Whitecotton - Charter
We have all looked at how we are going to protect the life of the fish, but we are putting our industry at risk by setting the season in the middle of hurricane season. Even if the weather is bad, charter boats have to go out to make a living. We need a way for the for-hire boats to go out, and this is a big socio-economic issue. They have been lucky nothing has happened on the headboats yet [accidents]. He suggests a year round season with a number of days you can go out to fish. We can surely regulate ourselves [when we go out] if we can regulate these fish.

Warner Foster - Recreational
He is very interested in the quota issue and wants to know how they get the quota. He hears they just pull it out of somewhere. He has never had his fish counted and weighed checked on his boat. Commercial guys have to weigh in all their fish, but no one is ever at the ramp asking him what he caught. With the size of his boat, he's not going to go out in the rough weather and get beat up. The June 1 season start was during rough weather and they couldn't get out most of the season.

***The following comments were received in Panama City on August 6, 2013 at a hearing on Coastal Migratory Pelagics.**

BJ Burkett - Charter and commercial
Capt. Burkett thinks the whole program is going to be a logistical nightmare. Red snapper isn't being managed appropriately now, but they're going to throw 5 more leaders into it? It's going to be very complicated because the regulations change so often. On all the actions, except Action 5, he wants no action. He does not want regional management. The issue we should be fixing is the flawed data. Regional management will make regulations based on incorrect data instead of tackling the issue of getting more days. He has heard we're never going to get back to where we were just a few years ago [longer season], but that's what people want. Regional management might leave them with 25-30 day seasons, which doesn't take us anywhere close to what people want. Therefore, he doesn't see the benefit of doing it. Maybe one state can fish a few days longer, or keep one fish more than another region's bag limit, but he does not see benefits to the whole Gulf and for all anglers.

Randall Akins - Recreational, retired charter captain
Capt. Akins has a historical captain permit that he can't transfer to his children and that's not the way of doing things in America. His children should be able to receive his permit. When he was in the Coast Guard, he was told you couldn't sell permits, but now you can so he is confused. At least 50% of the time he has broken the law because he has to throw back red snapper that are not at least 16". He has to throw them back and the dolphins get them. Feeding dolphins is against the law and he knows someone who was fined for feeding dolphins. This can be solved by keeping the season open year round and you can keep your first five fish. He was told that would be culling the fish, but that's what he's doing now. He doesn't support setting seasons or size limits.

Mobile, AL
August 8, 2013

Council/Staff
Kevin Anson
Chris Blankenship
Ava Lasseter
Ryan Rindone

11 members of the public attended

Palmer Whiting - Recreational, Alabama CCA Chairman
Mr. Whiting thinks the state has done a good job of managing its inshore fisheries and can do a good job with offshore fisheries. They built this habitat and they can manage it. Alabama has a lot of habitat and a lot of snapper. CCA members are in favor of that and having it on a more local level, with local scientists, who are more than capable. Bring management down to the state level is preferred.

Captain Mike Thierry - Charter
Capt. Thierry thinks states can manage it better. The inconsistency of allocations needs to be addressed so everyone is on the same playing field, and the number of days each state is allowed to fish is not impacted because of another state's regulations. Basing allocations on landings when some states who were open while Alabama was closed is like rewarding them for not playing by the rules. Sub-allocations are needed because one size does not fit all. The weekends-only season that private vessel anglers prefer would not work for the charter fleet. There should be no more restrictions than the for-hire fleet already has compared to the private recreational anglers. He supports the states taking over management and feels they are up to the job. He would like to have states do their own stock assessment. They are here locally every day and could do a better job. Each region needs to be accountable to its own quota. For example, Destin's rodeo is in October and they'd like to have the season open then. We'd like our own rodeo season in July; so one size doesn't fit all. Texas wants to be open in the winter as it's a good time for them. Alabama has got some of the best people in the world working on this stuff right here.

Skipper Thierry - Charter
He supports state management of red snapper and the ability of a state to establish sub-allocations. He would like for the state to conduct its own stock assessment, eventually. He wants the accountability measure, but they need to be flexible because landings often fluctuate annually for all kinds of reasons beyond our control.

St. Petersburg, FL
August 12, 2013

Council/Staff
Martha Bademan
Ava Lasseter
Ryan Rindone
Doug Gregory

8 members of the public attended.

Buddy Bradham - Recreational Fishing Alliance, retired charter and commercial fisherman
The RFA has a lot of problems with this so for right now, they prefer No Action be taken on all actions. They're behind on getting data sets in place. Florida is working on it but it is unknown when this will be available. There is the potential for going over the quota. The season dates would have to come from each state. There was a meeting on Friday morning where it was said it may cost 2.5 million dollars per year, and that's funding Florida doesn't have. These are problems that need to be solved before we go into regional management. If the improved data collection is in place, they would support regional management with the following preferred alternatives:

Action 1: prefer no action until data is fixed. Action 2: support the preferred alternative of 5 regions. For the quota (Action 3), they have a big problem with the data sets that may be used.

Louisiana has just proved how bad the NMFS estimates are: 70% off from their catches. They would like any new data program to run for 3 years then base the quota allocations on that. Action 4: they support the Preferred Alternatives 2, 3, and 4. But, they strongly speak out against Preferred Alternative 7, as this is a form of sector separation. They are still against it and feel the Council is trying to push it into this amendment. For Action 5, they support the preferred alternative. They don't support 30B at all and it should be completely removed, not just for red snapper but also for all reef fish. For Action 6, they prefer Alternative 3, Option b, allowing a 2-year grace period. For Action 7, they support Preferred Alternative 3 for a state that opts out.

Libby Fetherston - Ocean Conservancy
The Ocean Conservancy supports the Council's attempt to consider alternative management for the recreational sector. They do not take positions on allocation decisions. They think data collection and validation is critical to the success of any regional management plan and will need minimum data standards. They encourage the Council to think about ways that the restoration funds could support these goals in terms of quality and quantity of sampling. They also encourage the use of ACTs because they provide a reasonable buffer based on past performance and warrant consideration.

Sharon McBreen - Pew Charitable Trusts
Pew recommends revising the amendment's purpose and need to reflect that rebuilding red snapper is the top priority. They recommend that the amendment include the following three key components needed for the program's success:
1. AMs are safeguards and should include payback provisions, to maintain rebuilding. So they support the preferred alternative in Action 6. They also encourage the states to set up a system to constrain catches to within their quota. They do not oppose the Option a for a 1-year grace period, to allow state programs time to adjust their management process. This will be a learning process between NOAA and the states.
2. The states will need to retool their data collection systems to avoid triggering AMs. States should consider the use of ACTs to build in a margin of error to avoid triggering AMs, especially while adjusting to the new management system. This includes the option to use an ACT.
3: They support Action 4's Preferred Alternative 7: establish sub-allocations. If a state chooses that this is right for them, they should be allowed to pursue it.

Stephen Furman - CCA Florida, Tampa chapter
CCA supports regional management. He found the example of regional management for king mackerel an interesting example, because it is a migratory fish, and red snapper is not migratory. We had no red snapper off this coast for a long time but they came back because of Hurricane Katrina. This is a good start but the states would do a good job figuring it out if the feds would step away from the table. The states should have that authority, and the data and law enforcement is available. NOAA is paying FWC for nice boats to patrol offshore and there is no reason to stop that.

APPENDIX D. DELEGATION PROVISION

Magnuson-Stevens Fishery Conservation and Management Act 16 U.S.C. §1856(a)(3), (b)

(3) A State may regulate a fishing vessel outside the boundaries of the State in the following circumstances:

(A) The fishing vessel is registered under the law of that State, and (i) there is no fishery management plan or other applicable Federal fishing regulations for the fishery in which the vessel is operating; or (ii) the State's laws and regulations are consistent with the fishery management plan and applicable Federal fishing regulations for the fishery in which the vessel is operating.

(B) The fishery management plan for the fishery in which the fishing vessel is operating delegates management of the fishery to a State and the State's laws and regulations are consistent with such fishery management plan. If at any time the Secretary determines that a State law or regulation applicable to a fishing vessel under this circumstance is not consistent with the fishery management plan, the Secretary shall promptly notify the State and the appropriate Council of such determination and provide an opportunity for the State to correct any inconsistencies identified in the notification. If, after notice and opportunity for corrective action, the State does not correct the inconsistencies identified by the Secretary, the authority granted to the State under this subparagraph shall not apply until the Secretary and the appropriate Council find that the State has corrected the inconsistencies. For a fishery for which there was a fishery management plan in place on August 1, 1996 that did not delegate management of the fishery to a State as of that date, the authority provided by this subparagraph applies only if the Council approves the delegation of management of the fishery to the State by a three-quarters majority vote of the voting members of the Council.

(C) [Pertains to Alaska, only.]

(b) EXCEPTION.—

(1) If the Secretary finds, after notice and an opportunity for a hearing in accordance with section 554 of title 5, United States Code, that—

(A) the fishing in a fishery, which is covered by a fishery management plan implemented under this Act, is engaged in predominately within the exclusive economic zone and beyond such zone; and

(B) any State has taken any action, or omitted to take any action, the results of which will substantially and adversely affect the carrying out of such fishery management plan; the Secretary shall promptly notify such State and the appropriate Council of such finding and of his intention to regulate the applicable fishery within the boundaries of such State (other than its internal waters), pursuant to such fishery management plan and the regulations promulgated to implement such plan.

(2) If the Secretary, pursuant to this subsection, assumes responsibility for the regulation of any fishery, the State involved may at any time thereafter apply to the Secretary for reinstatement of its authority over such fishery. If the Secretary finds that the reasons for which he assumed such regulation no longer prevail, he shall promptly terminate such regulation.

(3) If the State involved requests that a hearing be held pursuant to paragraph (1), the Secretary shall conduct such hearing prior to taking any action under paragraph (1).

APPENDIX E. FISHERY ALLOCATION POLICY

Gulf of Mexico Fishery Management Council Fishery Allocation Policy

This allocation policy was developed by the Gulf of Mexico Fishery Management Council to provide principles, guidelines, and suggested methods for allocation that would facilitate future allocation and reallocation of fisheries resources between or within fishery sectors.

Issues considered in this allocation policy include principles based on existing regulatory provisions, procedures to request and initiate (re)allocation, (re)allocation review frequency, tools and methods suggested for evaluating alternative (re)allocations.

1. Principles for Allocation

   a. Conservation and management measures shall not discriminate between residents of different states.

   b. Allocation shall:

      (1) be fair and equitable to fishermen and fishing sectors;
      (i) fairness should be considered for indirect changes in allocation
      (ii) any harvest restrictions or recovery benefits be allocated fairly and equitably among sectors

      (2) promote conservation
      (i) connected to the achievement of OY
      (ii) furtherance of a legitimate FMP objective,
      (iii) promotes a rational, more easily managed use

      (3) ensure that no particular individual, corporation, or other entity may acquire an excessive share.

   c. Shall consider efficient utilization of fishery resources but:
      (1) should not just redistribute gains and burdens without an increase in efficiency

      (2) prohibit measures that have economic allocation as its sole purpose.

   d. Shall take into account: the importance of fishery resources to fishing communities by utilizing economic and social data in order to:
      (1) provide for the sustained participation of fishing communities

      (2) minimize adverse economic impacts on fishing communities.

e. Any fishery management plan, plan amendment, or regulation submitted by the Gulf Council for the red snapper fishery shall contain conservation and management measures that:
   (1) establish separate quotas for recreational fishing (including charter fishing) and commercial fishing.

   (2) prohibit a sector (i.e., recreational or commercial) from retaining red snapper for the remainder of the season, when it reaches its quota.

   (3) ensure that the recreational and commercial quotas reflect allocation among sectors and do not reflect harvests in excess of allocations.

2. Guidelines for Allocation

   a. All allocations and reallocations must be consistent with the Gulf of Mexico Fishery Management Council's principles for allocation.

   b. An approved Council motion constitutes the only appropriate means for requesting the initiation of allocation or reallocation of a fishery resource. The motion should clearly specify the basis for, purpose and objectives of the request for (re)allocation.

   c. The Council should conduct a comprehensive review of allocations within the individual FMPs at intervals of no less than five years.

   d. Following an approved Council motion to initiate an allocation or reallocation, the Council will suggest methods to be used for determining the new allocation. Methods suggested must be consistent with the purpose and objectives included in the motion requesting the initiation of allocation or reallocation.

   e. Changes in allocation of a fishery resource may, to the extent practicable, account for projected future socio-economic and demographic trends that are expected to impact the fishery.

   f. Indirect changes in allocation, i.e., shifts in allocation resulting from management measures, should be avoided or minimized to the extent possible.

3. Suggested Methods for Determining (Re)Allocation

   a. Market-based Allocation

      (1) Auction of quota

      (2) Quota purchases between commercial and recreational sectors
         (i) determine prerequisites and conditions:
            (a) quota or tags or some other mechanism required in one or both sectors
            (b) mechanism to broker or bank the purchases and exchanges

(c) annual, multi-year, or permanent
(d) accountability for purchased or exchanged quota in the receiving sector

b. Catch-Based (and mortality) Allocation

(1) historical landings data
(i) averages based on longest period of credible records
(ii) averages based on a period of recent years
(iii) averages based on total fisheries mortality (landings plus discard mortality) by sector
(iv) allocations set in a previous FMP
(v) accountability (a sector's ability to keep within allocation)

c. Socioeconomic-based Allocation

(1) socio-economic analyses
(i) net benefits to the nation
(ii) economic analysis limited to direct participants
(iii) economic impact analysis (direct expenditures and multiplier impacts)
(iv) social impact analysis
(v) fishing communities
(vi) participation trends
(vii) "efficiency" analysis
(a) lowest possible cost for a particular level of catch;
(b) harvest OY with the minimum use of economic inputs

d. Negotiation-Based Allocation

(1) Mechanism for sectors to agree to negotiation and select representatives

(2) Mechanism to choose a facilitator

(3) Negotiated agreement brought to Council for normal FMP process of adoption and implementation.

APPENDIX F. RECREATIONAL RED SNAPPER LANDINGS BY STATE

Table F-1. Annual recreational red snapper landings by state (1986-2014), based on whole weight of fish.

Year	Alabama	Florida	Louisiana	Mississippi	Texas	Total
1986	401,123	1,929,702	631,294	3,482	525,242	3,490,843
1987	387,077	912,826	281,413	54,031	454,200	2,089,547
1988	516,328	940,254	1,038,395	21,783	622,380	3,139,140
1989	544,007	362,359	708,400	345,009	980,565	2,940,340
1990	644,860	289,177	274,815	55,440	360,243	1,624,535
1991	877,662	439,237	968,807	179,601	451,819	2,917,126
1992	1,510,823	372,642	1,129,185	764,794	840,845	4,618,289
1993	2,095,900	1,250,350	1,626,283	907,243	1,281,487	7,161,263
1994	1,950,457	846,569	1,284,747	491,146	1,502,841	6,075,760
1995	1,742,758	565,356	1,543,765	156,083	1,455,780	5,463,742
1996	1,752,107	998,533	885,325	212,843	1,490,081	5,338,889
1997	2,660,697	1,007,177	1,145,689	664,884	1,325,782	6,804,229
1998	1,446,734	1,391,640	721,783	189,014	1,104,926	4,854,097
1999	1,975,892	1,422,359	784,324	201,749	588,084	4,972,408
2000	1,405,596	1,701,732	881,480	53,551	707,746	4,750,105
2001	2,221,042	2,095,911	316,993	108,454	509,885	5,252,285
2002	2,620,872	2,528,289	404,563	238,011	743,411	6,535,146
2003	2,315,502	2,213,246	544,732	365,829	666,136	6,105,445
2004	1,937,219	3,484,522	376,281	25,571	636,651	6,460,244
2005	1,361,826	2,242,440	484,250	5,222	582,181	4,675,919
2006	826,956	2,106,536	504,844	32,808	659,988	4,131,132
2007	1,134,694	3,295,292	908,429	3,399	466,981	5,808,795
2008	695,131	2,332,926	638,159	39,193	350,466	4,055,875
2009	1,207,914	2,630,439	1,054,595	43,574	660,335	5,596,857
2010	564,655	1,482,108	133,601	10,834	459,653	2,650,851
2011	3,606,453	1,975,772	600,358	69,478	482,046	6,734,107
2012	2,701,304	2,445,940	1,446,107	314,154	616,737	7,524,242
2013	4,424,247	3,777,371	545,532	422,529	489,112	9,658,791
2014	1,158,780	1,644,842	632,095	45,118	385,696	3,866,531

Source: Southeast Fisheries Science Center annual catch limit dataset, including the Calibrated Marine Recreational Information Program (MRIP) landings, LA Creel Survey, Texas Parks and Wildlife Department, and Southeast Headboat Survey landings. Headboat landings from Alabama and the Florida Panhandle are initially reported to the same headboat fishing area. Landings have been assigned to each state based on the survey's vessel landing records (May 2015).

APPENDIX G. GULF OF MEXICO RED SNAPPER FEDERAL REGULATIONS RELEVANT TO REEF FISH AMENDMENT 39

Current as published in the Federal Register as of **May 5, 2015** (Regulations in §§ 622.39 and 622.41 effective as of **June 1, 2015**)

§ 622.20 Permits and endorsements.

(b)(3) If Federal regulations for Gulf reef fish in subparts A or B of this part are more restrictive than state regulations, a person aboard a charter vessel or headboat for which a charter vessel/headboat permit for Gulf reef fish has been issued must comply with such Federal regulations regardless of where the fish are harvested.

§ 622.34 Seasonal and area closures designed to protect Gulf reef fish.

(b) *Seasonal closure of the recreational sector for red snapper*. The recreational sector for red snapper in or from the Gulf EEZ is closed from January 1 through May 31, each year. During the closure, the bag and possession limit for red snapper in or from the Gulf EEZ is zero.

§ 622.37 Size limits.

(a) *Snapper*--(1) *Red snapper*–-16 inches (40.6 cm), TL, for a fish taken by a person subject to the bag limit specified in § 622.38 (b)(3) and 13 inches (33.0 cm), TL, for a fish taken by a person not subject to the bag limit.

§ 622.38 Bag and possession limits.

(b)(3) *Red snapper*--2. However, no red snapper may be retained by the captain or crew of a vessel operating as a charter vessel or headboat. The bag limit for such captain and crew is zero.

§ 622.39 Quotas.

(a)(2)(i) *Recreational quota for red snapper*. (A) *Total recreational quota (Federal charter vessel/headboat and private angling component quotas combined)*.

(*1*) For fishing year 2015--7.007 million lb (3.178 million kg), round weight.

(*2*) For fishing year 2016--6.840 million lb (3.103 million kg), round weight.

(*3*) For fishing year 2017 and subsequent fishing years--6.733 million lb (3.054 million kg), round weight.

(B) *Federal charter vessel/headboat component quota*. The Federal charter vessel/headboat component quota applies to vessels that have been issued a valid Federal charter vessel/headboat permit for Gulf reef fish any time during the fishing year. This component quota is effective for only the 2015, 2016, and 2017 fishing years. For the 2018 and subsequent fishing years, the applicable total recreational quota specified in § 622.39(a)(2)(i)(A) will apply to the recreational sector.

(*1*) For fishing year 2015--2.964 million lb (1.344 million kg), round weight.

(*2*) For fishing year 2016--2.893 million lb (1.312 million kg), round weight.

(*3*) For fishing year 2017--2.848 million lb (1.292 million kg), round weight.

(C) *Private angling component quota*. The private angling component quota applies to vessels that fish under the bag limit and have not been issued a Federal charter vessel/headboat permit for Gulf reef fish any time during the fishing year. This component quota is effective for only the 2015, 2016, and 2017 fishing years. For the 2018 and subsequent fishing years, the applicable total recreational quota specified in § 622.39(a)(2)(i)(A) will apply to the recreational sector.

(*1*) For fishing year 2015--4.043 million lb (1.834 million kg), round weight.

(*2*) For fishing year 2016--3.947 million lb (1.790 million kg), round weight.

(*3*) For fishing year 2017--3.885 million lb (1.762 million kg), round weight.

§ 622.41 Annual catch limits (ACLs), annual catch targets (ACTs), and accountability measures (AMs).

(q)(2) *Recreational sector*. (i) The AA will determine the length of the red snapper recreational fishing season based on when recreational landings are projected to reach the applicable recreational ACT specified in paragraph (q)(2)(iii) of this section, and announce the closure date in the *Federal Register*. This will serve as an in-season accountability measure. On and after the effective date of the recreational closure notification, the bag and possession limit for red snapper is zero. The recreational ACL is equal to the applicable total recreational quota specified in § 622.39(a)(2)(i).

(ii) In addition to the measures specified in paragraph (q)(2)(i) of this section, if red snapper recreational landings, as estimated by the SRD, exceed the applicable recreational ACL (quota) specified in § 622.39(a)(2)(i), and red snapper are overfished, based on the most recent Status of U.S. Fisheries Report to Congress, the AA will file a notification with the Office of the Federal Register to reduce the recreational ACL (quota) by the amount of the quota overage in the prior fishing year, and reduce the applicable recreational ACT specified in paragraph (q)(2)(iii) of this section (based on the buffer between the ACT and the quota specified in the FMP), unless the best scientific information available determines that a greater, lesser, or no overage adjustment is necessary.

(iii) *Recreational ACT for red snapper*. (A) *Total recreational ACT (Federal charter vessel/headboat and private angling component ACTs combined)*.

(*1*) For fishing year 2015--5.606 million lb (2.543 million kg), round weight.

(*2*) For fishing year 2016--5.472 million lb (2.482 million kg), round weight.

(*3*) For fishing year 2017 and subsequent fishing years--5.384 million lb (2.442 million kg), round weight.

(B) *Federal charter vessel/headboat component ACT*. The Federal charter vessel/headboat component ACT applies to vessels that have been issued a valid Federal charter vessel/headboat permit for Gulf reef fish any time during the fishing year. This component ACT is effective for only the 2015, 2016, and 2017 fishing years. For the 2018 and subsequent fishing years, the applicable total recreational quota specified in § 622.39(a)(2)(i)(A) will apply to the recreational sector.

(*1*) For fishing year 2015--2.371 million lb (1.075 million kg), round weight.

(*2*) For fishing year 2016--2.315 million lb (1.050 million kg), round weight.

(*3*) For fishing year 2017--2.278 million lb (1.033 million kg), round weight.

(C) *Private angling component ACT*. The private angling component ACT applies to vessels that fish under the bag limit and have not been issued a Federal charter vessel/headboat permit for Gulf reef fish any time during the fishing year. This component ACT is effective for

only the 2015, 2016, and 2017 fishing years. For the 2018 and subsequent fishing years, the applicable total recreational quota specified in § 622.39(a)(2)(i)(A) will apply to the recreational sector.

(*1*) For fishing year 2015--3.234 million lb (1.467 million kg), round weight.

(*2*) For fishing year 2016--3.158 million lb (1.432 million kg), round weight.

(*3*) For fishing year 2017--3.108 million lb (1.410 million kg), round weight.

APPENDIX H. BYCATCH PRACTICABILITY ANALYSIS

Introduction

Bycatch is defined as fish harvested in a fishery, but not sold or retained for personal use. This definition includes both economic and regulatory discards, and excludes fish released alive under a recreational catch-and-release fishery management program. Economic discards are generally undesirable from a market perspective because of their species, size, sex, and/or other characteristics. Regulatory discards are fish required by regulation to be discarded, but also include fish that may be retained but not sold.

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

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

The Regional Fishery Management Councils are encouraged to adhere to the precautionary approach outlined in Article 6.5 of the Food and Agriculture Organization of the United Nations Code of Conduct for Responsible Fisheries when uncertain about these factors.

Bycatch practicability analyses of the reef fish fishery have been provided in several reef fish amendments and focused to some degree on the component of the fishery affected by the actions covered in the amendment. For red snapper, bycatch practicability analyses were completed for Amendments 22, 27, and 40 to the Fishery Management Plan (FMP) for the Reef Fish Resources of the Gulf of Mexico (GMFMC 2004a, 2007, 2014a). Other bycatch practicability analyses were conducted in the following amendments (component of the fishery affected by the actions): Amendment 23 (vermilion snapper; GMFMC 2004b), Amendment 30A (greater amberjack and gray triggerfish; GMFMC 2008a), Amendment 30B (gag, red grouper, and other shallow-water grouper; GMFMC 2008b), Amendment 31 (longline sector; GMFMC 2009), Amendment 32 (gag and red grouper; GMFMC 2011a), Amendment 35 (greater amberjack; GMFMC 2012a);

Amendment 37 (gray triggerfish; GMFMC 2012b), and Amendment 38 (shallow-water grouper; GMFMC 2012c). In addition, a bycatch practicability analysis was conducted for the Generic Annual Catch Limits/Accountability Measures Amendment (GMFMC 2011b) that covered the Reef Fish, Coastal Migratory Pelagics, Red Drum, and Coral FMPs. In general, these analyses found that reducing bycatch provides biological benefits to managed species as well as benefits to the fishery through less waste, higher yields, and less forgone yield. However, in some cases, actions are approved that can increase bycatch through regulatory discards such as increased minimum sizes and closed seasons. In these cases, there is some biological benefit to the managed species that outweighs any increases in discards.

Red Snapper Bycatch

The Gulf of Mexico (Gulf) reef fish fishery directed at red snapper has been regulated to limit harvest in order that the stock can recover from an overfished condition. Regulations for the recreational sector include catch quotas, minimum size limits, bag limits, and seasonal closures. These are used to limit the harvest to levels allowed under the rebuilding plan. For the commercial sector, regulations previously included catch quotas, minimum size limits, seasonal closures, and trip limits. Now the sector is managed under an individual fishing quota (IFQ) program that was established in 2007. The program eliminates the need for seasonal closures and trip limits. Red snapper regulations have been generally effective in limiting fishing mortality, the size of fish targeted, the number of targeted fishing trips, and/or the time fishermen spend pursuing a species. However, these management tools have the unavoidable adverse effect of creating regulatory discards, which makes reducing bycatch challenging, particularly in the recreational sector.

An important aspect to red snapper bycatch is the penaeid shrimp fishery as previously described in Amendment 27/14 (GMFMC 2007). The shrimp fishery catches primarily 0-2 year old red snapper. To reduce red snapper bycatch, the Gulf of Mexico Fishery Management Council (Council) implemented regulations requiring the use of bycatch reduction devices (GMFMC 2002) and setting bycatch reduction targets (currently a 67% reduction from the baseline years 2001-2003; GMFMC 2007). Between the use of bycatch reduction devices and reductions in shrimp effort due to economic factors (Figure 7.1), the target reductions have been met.

Although red snapper bycatch in the shrimp fishery is an important source of mortality for this stock, this bycatch practicability analysis will focus on the directed reef fish fishery managed under the Fishery Management Plan for Reef Fish Resources of the Gulf of Mexico. Bycatch from the shrimp fishery has been and will be analyzed in the Fishery Management Plan for the Shrimp Fishery of the Gulf of Mexico, U.S. Waters.

Figures 7.2 and 7.3 show the relative number of discards for the recreational and commercial sectors as estimated by SEDAR 31 (2013). For the recreational sector, open season discards estimated through the Marine Recreational Information Program (MRIP) (charter and private angler) declined around 2007 as the recreational season got shorter due lower quotas. This trend is also apparent in the headboat data for the western Gulf of Mexico (Gulf). However, with shorter seasons of the past few years, the number of discards during the longer closed seasons increased (Figure 7.2). For the commercial sector, discards in the eastern handline and longline

sectors have increased since the implementation of the IFQ program relative to the western Gulf. This may reflect a shift in fishing effort that has resulted in the program. Note that for the commercial sector, closed season discards after the IFQ program was implemented refers to vessels with little or no red snapper allocation (see SEDAR 31 2013).

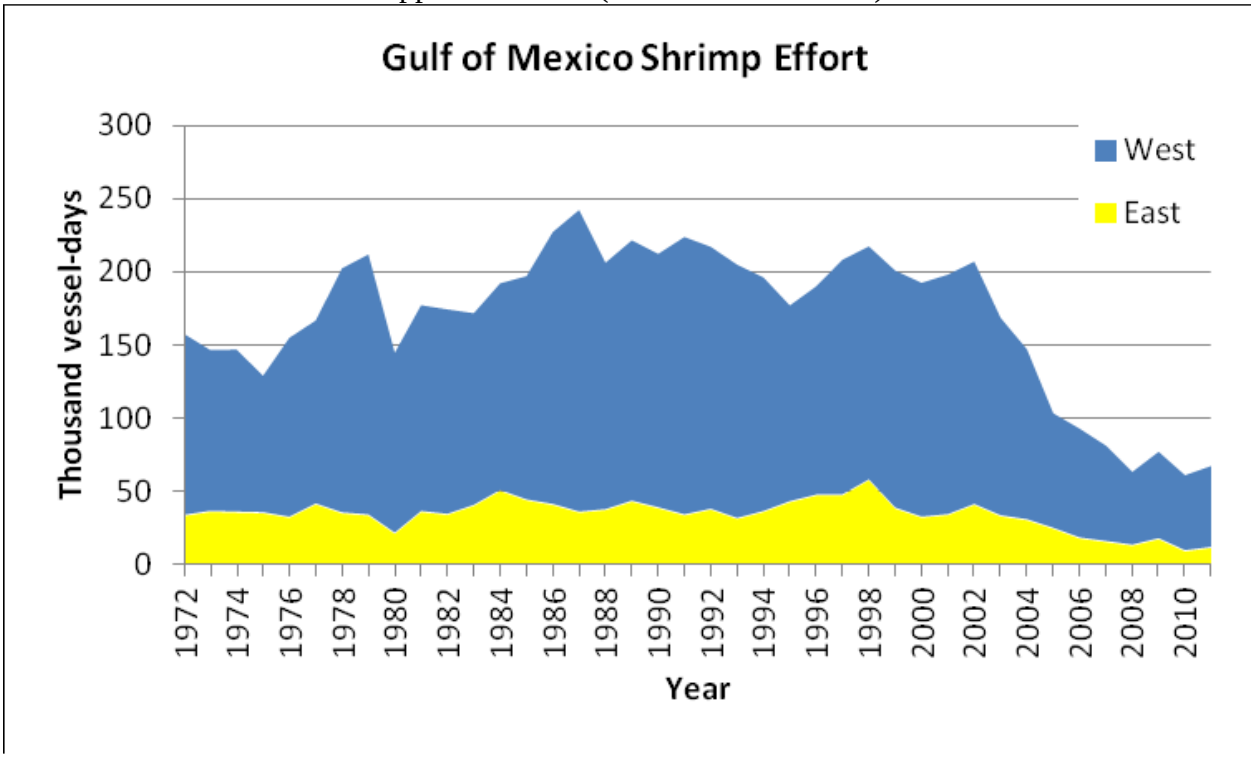

Figure 7.1. Gulf shrimp fishery effort (thousand vessel-days) provided by the National Marine Fisheries Service Galveston Lab. The reported effort does not include the average effort values used to fill empty cells. Source: Linton 2012b.

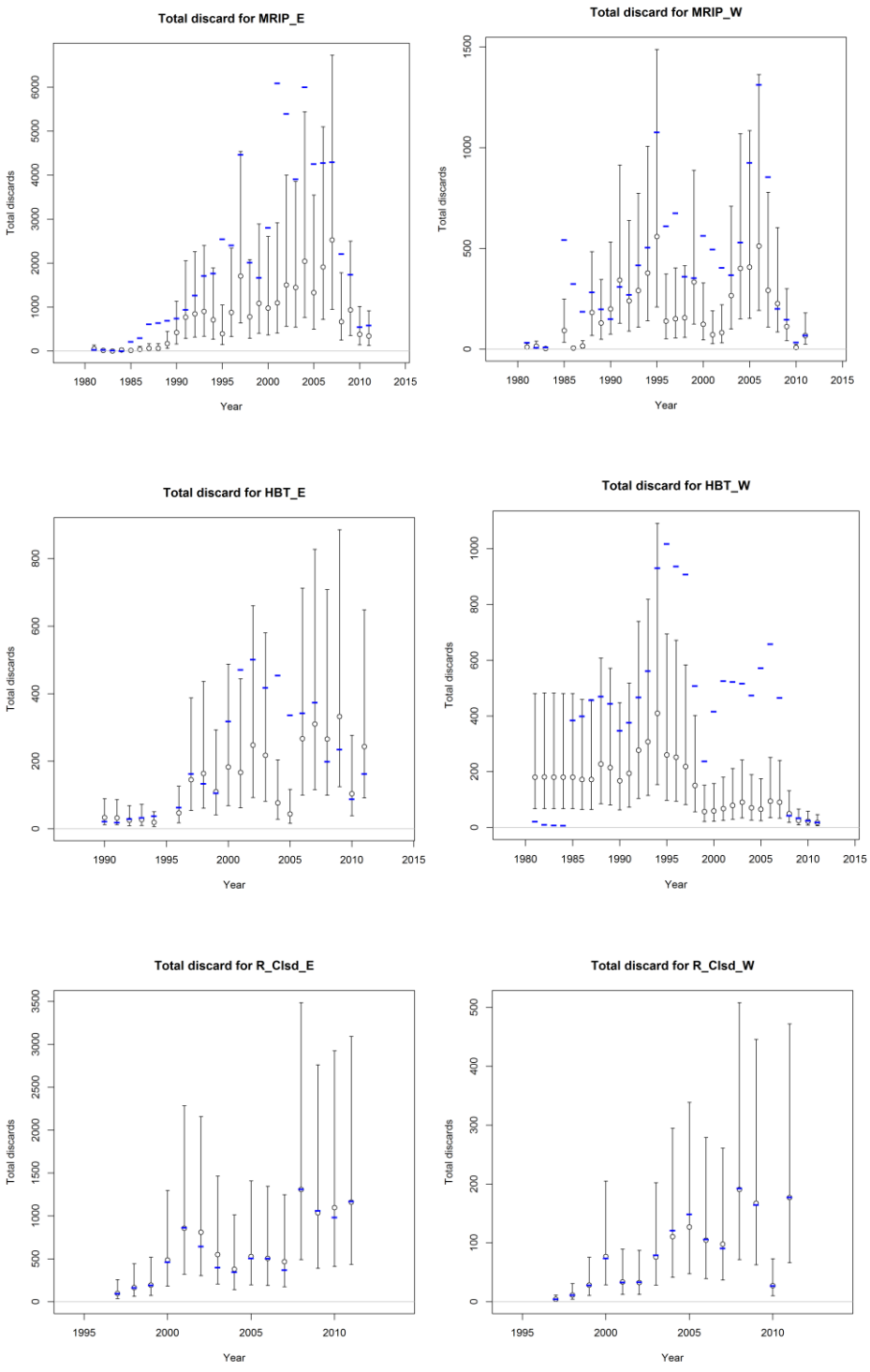

Figure 7.2. Observed (open circles) and predicted total discards (blue dashes) of red snapper from the private angler open season (top), headboat open season (middle), and recreational closed season in the eastern (left) and western (right) Gulf, 1997-2011. Source: SEDAR 31 2013.

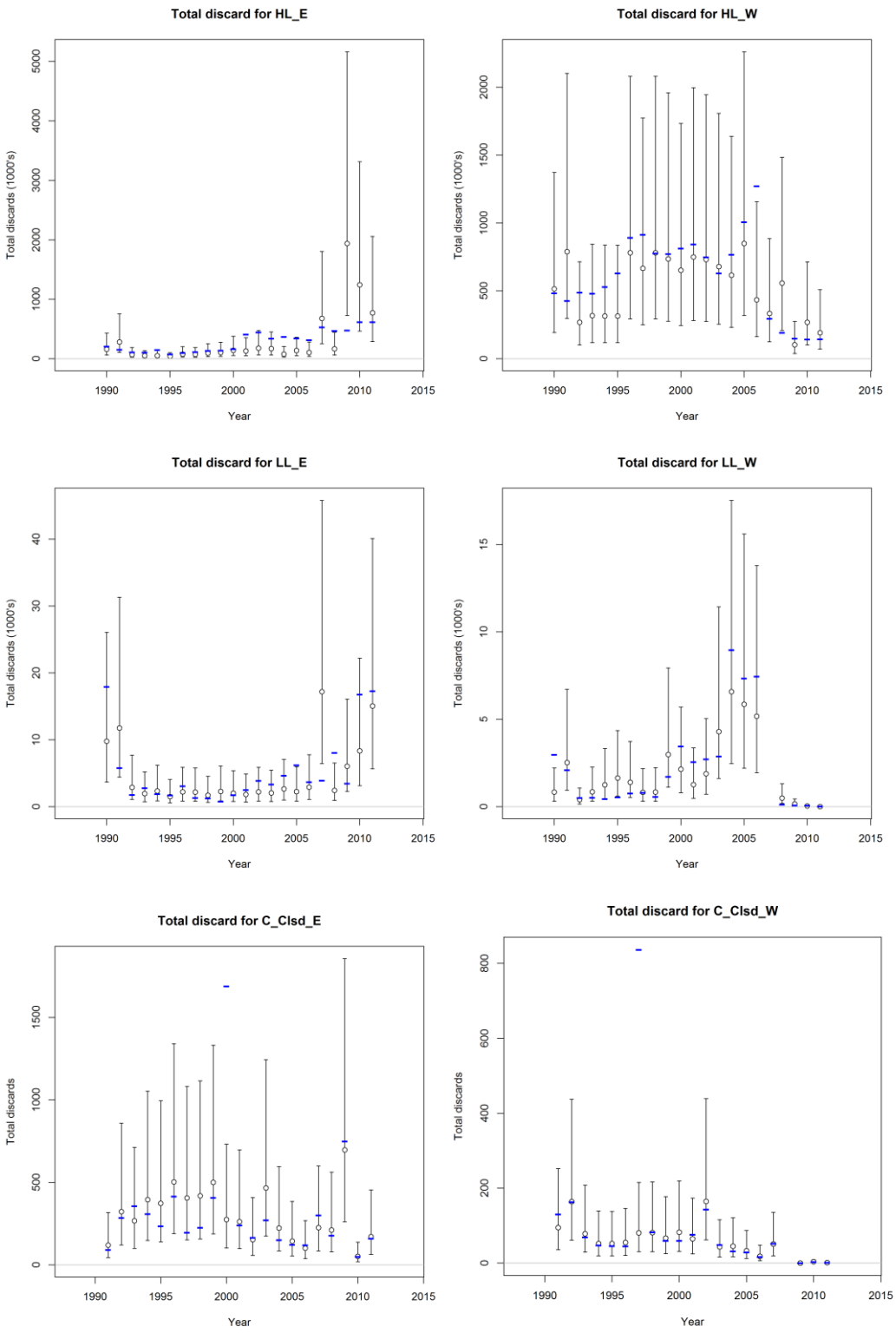

Figure 7.3. Observed (open circles) and predicted total discards (blue dashes) of red snapper from the commercial handline open season (top), longline open season (middle), and commercial

closed season in the eastern (left) and western (right) Gulf, 1997-2011. Source: SEDAR 31 2013.

Campbell et al. (2012) identified several causes of red snapper discard mortality in their review of release mortality in the directed reef fish fishery. These included hooking injuries, thermal stress, and barotrauma. Campbell et al. (2012) reviewed 11 studies that listed discard (release) mortality rates ranging from 0 to 79%. They reported that mortality tended to increase with capture depth, increasing water depth, or from some compounding effect of these two factors. Burns et al. (2004) and Burns and Froeschke (2012) examined the feeding behavior of red snapper and found red snapper quickly chew and swallow their prey. As a result, there is less time to set a hook while fishing, resulting in greater probability of hooking related injuries. Burns et al. (2004) concluded hook-related trauma accounted for a greater portion of release mortality than depth, despite catching red snapper at depths ranging from 90 to 140 feet.

Although Campbell et al. (2012) did not specifically address surface interval and predation, these factors were identified in GMFMC (2007) as contributing to release mortality. Burns et al. (2002) found survival of red snapper increased the faster red snapper were returned to the water, thus they considered any reductions in surface interval/handling time an important way to reduce release mortality. Several studies have documented predation on released red snapper. Dolphins and pelicans are the two most commonly observed predators and are known to pursue released fish, as well as fish before they are landed (SEDAR 7 2005). Several studies, which assessed release mortality through surface observations, accounted for predation when estimating release mortality (Patterson et al. 2001; Burns et al. 2004; Wilson et al. 2004).

A variety of release mortality rates have been used in different stock assessment. The 1999 red snapper stock assessment (Schirripa and Legault 1999) assumed release mortality rates of 33 percent for the commercial fishery and 20 percent for the recreational fishery. These release mortality rates were derived from the literature and were determined by the Council's Reef Fish Stock Assessment Panel to be the best available estimates at the time (RFSAP 1999). During development of the 2005 red snapper stock assessment, the SEDAR 7 data workshop panel (SEDAR 7 2005) reviewed available information on depth of fishing and release mortality by depth to produce fishery specific release mortality rates by region (eastern and western Gulf), season (open and closed), and by sector (commercial and recreational). Estimates of release mortality rates ranged 15% for recreationally caught and released red snapper in the eastern Gulf to 88% for commercially caught and released red snapper in the western Gulf caught during a season closure (Table 7.1).

Table 7.1. Mean/median depth of fishing and corresponding release mortality rates for red snapper by fishery, region, and season.

Fishery	Region	Season	Depth of Capture	Release Mortality
Commercial	East	Open	180 ft (55 m)	71%
	East	Closed	180 ft (55 m)	71%
	West	Open	190 ft (58 m)	82%
	West	Closed	272 ft (83 m)	88%
Recreational	East	Open	65-131 ft (20-40 m)	15%
	East	Closed	65-131 ft (20-40 m)	15%
	West	Open	131 ft (40 m)	40%
	West	Closed	131 ft (40 m)	40%

Source: SEDAR 7 2005.

In the most recent benchmark stock assessment (SEDAR 31, 2013), a meta-analysis was used to estimate red snapper release mortality using the 11 studies reviewed by Campbell et al. (2012). A venting/no venting component was added to account for the requirement to vent reef fish put in place through Amendment 27 (GMFMC 2007) as well as a gear component. For the commercial sector, average depths at which discards occurred for each gear (handline or long line), region (eastern or western Gulf), and season (open or closed) were calculated using commercial observer program data. Consistent with how commercial discards have been treated in other parts of the assessment, discards from trips with IFQ allocation were considered open season discards, while discards from trips with no IFQ allocation were considered closed season discards. For the recreational sector, average depths at which discards occurred for each region (eastern or western Gulf) and season (open or closed) were calculated using self-reported data from the iSnapper program. Estimated release mortality rates ranged from 10 to 95% with commercial release mortality rates greater than recreational release mortality rates (Tables 7.2 and 7.3).

SEDAR 31 (2013) estimated the total number of fish killed (landed and discarded dead) by the commercial and recreational sectors from 1983 to 2011 (Table 7.4). For the recreational sector, the percentage of dead discards to total fish killed has declined since a peak in 2001. However, it was not until 2007 that the number of dead discards was consistently less than the number of landed fish. For the commercial sector, the percentage of dead discards peaked in 2000, but it was not until 2010 that the number of dead discards declined less than 40% of the total fish killed.

Since 1996, more red snapper have been landed in the eastern Gulf than the western Gulf by the recreational sector (Table 7.5). A drop in the percentage of dead discards relative to the total number of fish killed occurred in both regions in 2008. The percentage of dead discards fell from 49.4% to 36.7% between 2007 and 2008 for the eastern Gulf and from 50.0% to 20.3% between 2007 and 2008 in the western Gulf. For the commercial sector, in the eastern Gulf the number of dead discards has generally been above 50% indicating that there are more discards were killed than landed (Table 7.5). In contrast, in the western Gulf there has been a falling off in the percentage of dead discards relative to the total number of killed fish since 2006 to well below 50%.

Table 7.2. Average depths and associated discard mortality rates for commercial discards of red snapper in the Gulf.

Gear	Handline				Longline			
Region	East		West		East		West	
Season	Closed	Open	Closed	Open	Closed	Open	Closed	Open
Average Depth (m)	24	45	84	53	66	62	132	104
Disc Mort - no venting	0.74	0.75	0.87	0.78	0.82	0.81	0.95	0.91
Disc Mort - venting	0.55	0.56	0.74	0.60	0.66	0.64	0.88	0.81

Source: SEDAR 31 2013.

Table 7.3. Average depths and associated discard mortality rates for recreational discards of red snapper in the Gulf.

Gear	Recreational			
Region	East		West	
Season	Open	Closed	Open	Closed
Average Depth (m)	33	34	36	35
Disc Mort - no venting	0.21	0.21	0.22	0.22
Disc Mort - venting	0.10	0.10	0.11	0.10

Source: SEDAR 31 2013.

Table 7.4. Estimates of the total number of red snapper landed, the number of dead discards, and percent dead discards for all killed fish for the recreational and commercial sectors by year in the Gulf.

	Recreational			Commercial		
Year	Landed	Dead Discards	Percent dead discards	Landed	Dead Discard	Percent dead discards
1983	3,314,185	8,599	0.3%	4,559,794	80,758	1.7%
1984	1,232,024	2,699	0.2%	2,775,042	33,579	1.2%
1985	1,427,026	255,716	15.2%	1,234,986	351,105	22.1%
1986	1,265,955	223,079	15.0%	875,494	304,026	25.8%
1987	1,022,844	271,426	21.0%	661,469	277,787	29.6%
1988	1,241,859	302,800	19.6%	950,904	366,876	27.8%
1989	1,060,456	289,201	21.4%	742,388	296,024	28.5%
1990	625,933	270,824	30.2%	703,020	549,250	43.9%
1991	1,060,610	353,327	25.0%	691,943	635,961	47.9%
1992	1,609,040	434,448	21.3%	995,013	817,581	45.1%
1993	2,202,931	581,455	20.9%	1,011,914	781,941	43.6%
1994	1,615,241	695,102	30.1%	869,075	796,390	47.8%
1995	1,384,049	1,008,873	42.2%	698,404	767,187	52.3%
1996	1,180,361	859,431	42.1%	1,011,328	1,120,205	52.6%
1997	1,547,317	1,342,121	46.4%	1,122,447	1,674,115	59.9%
1998	1,235,683	679,689	35.5%	1,167,877	949,481	44.8%
1999	1,031,284	549,708	34.8%	1,190,580	1,063,684	47.2%
2000	1,002,899	985,281	49.6%	1,088,667	2,065,579	65.5%
2001	1,075,115	1,792,155	62.5%	1,030,580	1,214,566	54.1%
2002	1,372,415	1,586,095	53.6%	1,145,169	1,171,069	50.6%
2003	1,224,547	1,204,754	49.6%	1,080,662	996,171	48.0%
2004	1,365,946	1,677,071	55.1%	1,036,860	1,027,510	49.8%
2005	1,024,641	1,433,508	58.3%	973,109	1,170,293	54.6%
2006	1,196,183	1,533,800	56.2%	1,193,134	1,343,644	53.0%
2007	1,397,237	1,370,519	49.5%	851,537	903,242	51.5%
2008	821,804	417,509	33.7%	671,979	481,599	41.7%
2009	979,945	339,988	25.8%	656,148	772,463	54.1%
2010	447,991	170,959	27.6%	833,253	472,930	36.2%
2011	670,910	220,515	24.7%	808,582	533,198	39.7%

Source: Recreational data is from MRIP; headboat and commercial data is from the logbook and SEDAR 31 2013; Jacob Tetzlaff, pers. comm. Southeast Fisheries Science Center, Miami, Florida.

Table 7.5. Estimates of the total number of red snapper landed the number of dead discards, and percent dead discards for all killed fish for the recreational and commercial sectors by year and region of the Gulf.

	Recreational						Commercial					
	East			West			East			West		
Year	Landed	Dead Discard	Percent dead discards	Landed	Dead Discard	Percent dead discards	Landed	Dead Discard	Percent dead discards	Landed	Dead Discard	Percent dead discards
1983	1,055,691	4,455	0.4%	2,258,494	4,144	0.2%	1,851,965	23,983	1.3%	2,707,829	56,775	2.1%
1984	192,098	332	0.2%	1,039,926	2,367	0.2%	1,077,487	5,872	0.5%	1,697,555	27,707	1.6%
1985	482,587	51,497	9.6%	944,439	204,219	17.8%	575,540	109,179	15.9%	659,446	241,926	26.8%
1986	574,495	63,839	10.0%	691,460	159,240	18.7%	237,499	31,193	11.6%	637,996	272,833	30.0%
1987	548,813	129,871	19.1%	474,031	141,555	23.0%	179,088	35,679	16.6%	482,381	242,108	33.4%
1988	524,591	137,182	20.7%	717,268	165,618	18.8%	197,784	72,004	26.7%	753,120	294,872	28.1%
1989	474,670	147,657	23.7%	585,786	141,544	19.5%	166,355	59,518	26.4%	576,033	236,506	29.1%
1990	314,036	161,286	33.9%	311,897	109,538	26.0%	208,799	169,101	44.7%	494,221	380,150	43.5%
1991	548,912	202,238	26.9%	511,698	151,089	22.8%	156,339	187,293	54.5%	535,604	448,669	45.6%
1992	886,594	272,181	23.5%	722,446	162,267	18.3%	155,044	294,315	65.5%	839,969	523,266	38.4%
1993	1,336,961	366,226	21.5%	865,970	215,229	19.9%	160,428	346,349	68.3%	851,486	435,592	33.8%
1994	819,900	379,092	31.6%	795,341	316,010	28.4%	161,842	341,927	67.9%	707,233	454,464	39.1%
1995	664,786	547,997	45.2%	719,263	460,876	39.1%	47,994	234,693	83.0%	650,411	532,493	45.0%
1996	608,817	519,005	46.0%	571,544	340,426	37.3%	66,458	384,466	85.3%	944,870	735,739	43.8%
1997	966,914	992,702	50.7%	580,403	349,419	37.6%	52,616	231,911	81.5%	1,069,832	1,442,204	57.4%
1998	814,811	485,790	37.4%	420,872	193,899	31.5%	112,125	271,377	70.8%	1,055,751	678,104	39.1%
1999	788,097	413,395	34.4%	243,187	136,313	35.9%	148,788	407,417	73.2%	1,041,792	656,267	38.6%
2000	741,378	753,560	50.4%	261,521	231,721	47.0%	169,886	1,375,667	89.0%	918,781	689,912	42.9%
2001	858,210	1,559,948	64.5%	216,905	232,208	51.7%	209,036	487,449	70.0%	821,544	727,118	47.0%
2002	1,137,262	1,374,869	54.7%	235,153	211,226	47.3%	300,706	459,631	60.5%	844,463	711,438	45.7%
2003	956,693	992,640	50.9%	267,854	212,113	44.2%	281,921	459,040	62.0%	798,741	537,130	40.2%
2004	1,128,710	1,429,531	55.9%	237,236	247,540	51.1%	251,425	392,841	61.0%	785,435	634,669	44.7%
2005	759,036	1,071,240	58.5%	265,605	362,268	57.7%	220,412	352,853	61.6%	752,697	817,440	52.1%
2006	839,855	1,076,677	56.2%	356,328	457,123	56.2%	212,766	329,879	60.8%	980,368	1,013,764	50.8%

2007	1,087,060	1,059,975	49.4%	310,177	310,544	50.0%		311,729	626,004	66.8%	539,808	277,238	33.9%
2008	642,570	371,930	36.7%	179,233	45,579	20.3%		284,937	366,341	56.2%	387,042	115,258	22.9%
2009	773,394	303,722	28.2%	206,551	36,266	14.9%		302,568	682,585	69.3%	353,579	89,878	20.3%
2010	360,404	162,119	31.0%	87,587	8,840	9.2%		413,808	384,519	48.2%	419,445	88,411	17.4%
2011	552,878	192,184	25.8%	118,032	28,331	19.4%		423,809	445,771	51.3%	384,773	87,427	18.5%

Source: Recreational data is from MRIP; headboat and commercial data is from the logbook and SEDAR 31 2013; Jacob Tetzlaff, pers. comm. Southeast Fisheries Science Center, Miami, Florida.

Other Bycatch

Species incidentally encountered by the directed red snapper fishery include sea turtles, sea birds, and reef fishes. The primary gears of the Gulf reef fish fishery (longline and vertical line) are classified in the proposed List of Fisheries for 2015 (79 FR 77919) as Category III gear. This classification indicates the annual mortality and serious injury of a marine mammal stock resulting from any fishery is less than or equal to one percent of the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock, while allowing that stock to reach or maintain its optimum sustainable population.

The most recent biological opinion for the Reef Fish Fishery Management Plan was completed on September 30, 2011 (NMFS 2011a). The opinion determined the continued authorization of the Gulf reef fish fishery managed under this fishery management plan is not likely to adversely affect Endangered Species Act-listed marine mammals or coral, and would not likely jeopardize the continued existence of sea turtles (loggerhead, Kemp's ridley, green, hawksbill, and leatherback), or smalltooth sawfish. However, in the past, actions have been taken by the Council and NMFS to increase the survival of incidentally caught sea turtle and smalltooth sawfish by the commercial and recreational sectors of the fishery. These include the requirements for permitted vessels to carry specific gear and protocols for the safe release in incidentally caught endangered sea turtle species and smalltooth sawfish (GMFMC 2005) as well as restrictions on the longline portion of the commercial sector. Restrictions for longlines in the reef fish fishery include a season-area closure, an endorsement to use longline gear, and a restriction on the total number of hooks that can be carried on a vessel (GMFMC 2009).

Three primary orders of seabirds are represented in the Gulf, Procellariiformes (petrels, albatrosses, and shearwaters), Pelecaniformes (pelicans, gannets and boobies, cormorants, tropic birds, and frigate birds), and Charadriiformes (phalaropes, gulls, terns, noddies, and skimmers) (Clapp et al., 1982; Harrison, 1983) and several species, including: piping plover, least tern, roseate tern, bald eagle, and brown pelican (the brown pelican is endangered in Mississippi and Louisiana and delisted in Florida and Alabama) are listed by the U.S. Fish and Wildlife Service as either endangered or threatened. Human disturbance of nesting colonies and mortalities from birds being caught on fishhooks and subsequently entangled in monofilament line are primary factors affecting sea birds. Oil or chemical spills, erosion, plant succession, hurricanes, storms, heavy tick infestations, and unpredictable food availability are other threats. There is no evidence that the directed red snapper fishery is adversely affecting seabirds. However, interactions, especially with brown pelicans consuming red snapper discards and fish before they are landed, are known to occur (SEDAR 7 2005).

Other species of reef fish are also incidentally caught when targeting red snapper. In the western Gulf, vermilion snapper and some deep-water groupers are incidentally caught as bycatch when harvesting red snapper. In the eastern Gulf, various species of shallow-water grouper and vermilion snapper are the primary species caught as bycatch when targeting red snapper. Vermilion snapper are not overfished or undergoing overfishing (SEDAR 9 Update 2011a) and bycatch is not expected to jeopardize the status of this stock. Deep-water groupers are caught both in the eastern and western Gulf primarily with longline gear (> 80 percent). The deep-water grouper fishery was managed with a 1.02 million pound quota. From 2004 until the

implementation of the grouper/tilefish IFQ program in 2010 (SERO 2012a), the fishery met their quota and closed no later than July 15 each year. Deep-water grouper closures during this time period may have resulted in some additional discards of grouper by longliners targeting red snapper. Since the IFQ program was implemented, deep-water grouper species are landed year-round by holders of IFQ allocation and the quota has not been exceeded. Longliners account for approximately 5% of the annual commercial red snapper landings since 2000 (SEDAR 31 2013). It is unknown how increases in closed season discards might have affected the status of deep-water grouper stocks or the change to an IFQ managed sector. An updated assessment for yellowedge grouper found the stock was not overfished or undergoing overfishing (SEDAR 22 2011a).

Red grouper and gag are the two most abundant shallow-water grouper species in the Gulf and primarily occur on the west Florida shelf. Gag was recently assessed (SEDAR 10 Update 2009) and determined to be overfished and undergoing overfishing. A rebuilding plan that takes into account gag dead discards was implemented through Amendment 32 (GMFMC 2011c). Red grouper were found not to be in an overfished condition and not undergoing overfishing (SEDAR 12 Update 2009). Within the reef fish fishery, discards represent a large and significant portion of mortality for gag and red grouper. In the past, these species were managed under a shallow-water grouper quota which was met prior to the end of the 2004 and 2005 fishing years. For the recreational sector, shallow-water grouper including gag and red grouper are managed with size limits, bag limits, and season and area closures. The recreational gag season begins July 1 and extends until the catch target is projected to be caught. Since 2010, the commercial harvest of gag, red grouper, and other shallow-water grouper are managed under an IFQ program and the commercial sector has not exceeded its quota under the program. Prior to the IFQ program, quota closures at the end of the year have likely resulted in some additional commercial discards when the red snapper fishery is open. However, most commercial landings of red snapper occur in the western Gulf where gag and red grouper are less abundant or infrequently caught.

Practicability of current management measures in the directed red snapper fishery relative to their impact on bycatch and bycatch mortality.

The bycatch practicability analysis in Amendment 27 (GMFMC 2007) indicated directed fishery bycatch was believed to have a greater effect on red snapper stock recovery than the shrimp fishery. Although shrimp bycatch still accounts for a majority of bycatch, bycatch from the directed fishery is now known to have a greater effect on stock recovery. A quota, 16-inch total length (TL) minimum size limit, 2-fish bag limit, closed season, and gear restrictions are presently used to manage the recreational fishery. The commercial fishery is managed with an IFQ program, a quota, a 13-inch TL minimum size limit, and gear restrictions. Prior to 2007 when the red snapper IFQ program was implemented, the commercial fishery was also managed with closed seasons and trip limits. The following discusses current and historic management measures with respect to their relative impacts on bycatch with particular reference to specific management measures considered in Action 4 - Regional Management Measures.

Closed Seasons

Prior to 1997, the recreational sector was able to fish for red snapper year round. To prevent the recreational quota from being exceeded, recreational fishing for red snapper was closed on November 27, 1997, September 30, 1998, and August 29, 1999. In 2000, an April 21 through October 31 red snapper season was established. This was modified to a June 1 through October 31 season in 2008 by Amendment 27 (GMFMC 2007). Currently, the recreational directed red snapper fishery is closed in the exclusive economic zone from January 1 through May 31 each year through a 2012 framework action. However, since 2008, the sector has been closed early when the quota is projected to be caught. In addition, since 2008, the length of time red snapper fishing has been open has become increasingly shorter such that for 2011, 2012, and 2013, the season length has shrunk to 48, 46, and 42 days, respectively. With these shorter seasons, the number of released fish has decreased during the open season, but the number of releases during the closed season has increased (Figure 2; SEDAR 31 2013). Reflected in this trend is that although the estimated number of dead discards has decreased during the fishing season, the number of dead discards has increased during the longer closed periods (Figure 4). For 2014, the season length was decreased to 9 days. This was in response to a decision by the U.S. District Court for the District of Columbia (Court) in Guindon v. Pritzker, 2014 WL 1274076 (D.D.C. Mar. 26, 2014). NMFS, at the request of the Council, took emergency action to implement an in-season accountability measure for the recreational harvest of red snapper in the Gulf. The action set an annual catch target (ACT) equal to 80% of the 5.390 mp quota (ACT = 4.312 mp). The resultant 9-day season was based on the ACT and has only a 15% probability of exceeding the quota.

With the implementation of the IFQ program, there is no closed season for the commercial sector. However, commercial vessels with little or no red snapper allocation cannot land red snapper on most or all their trips. Thus, they effectively operate under closed season conditions. SERO (2013b) indicated most discards were likely due to insufficient allocation, rather than the minimum size limit, especially in the longline fleet. Most of these discards were recorded as released alive.

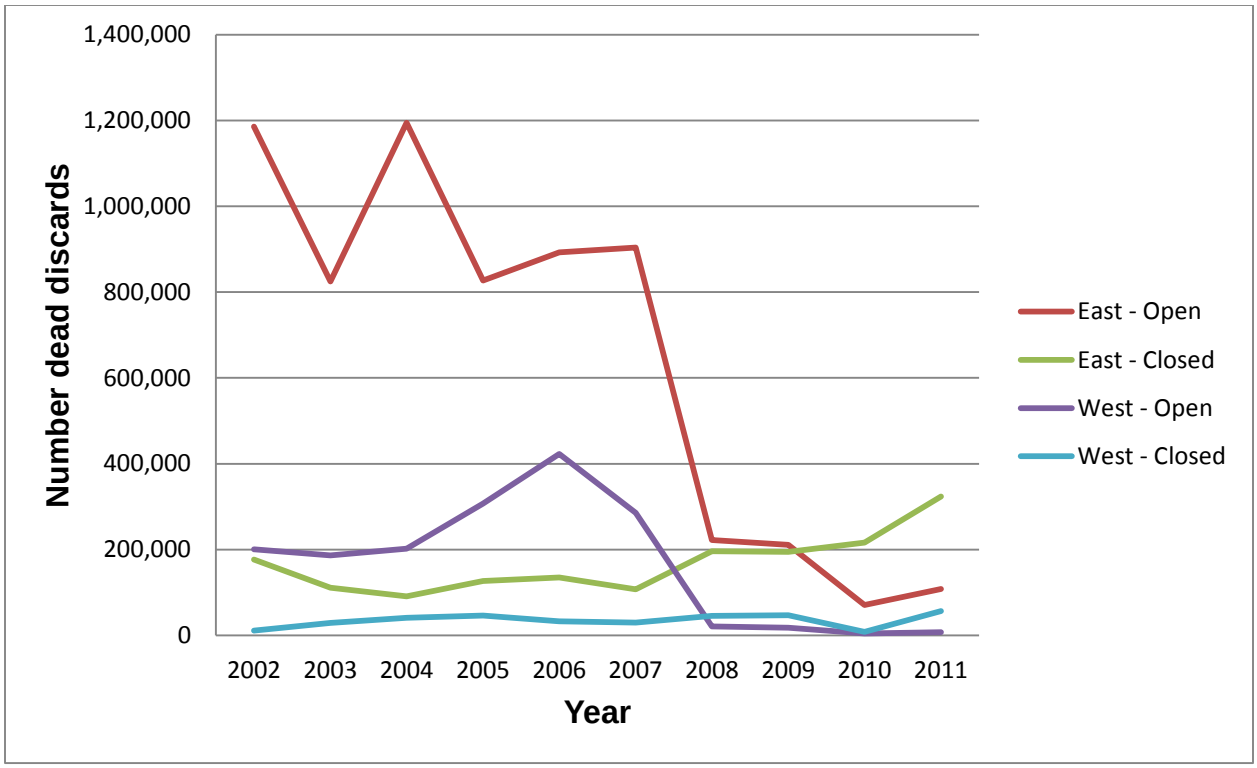

Figure 7.4. The number of Gulf red snapper dead discards from the recreational sector by year and by area. Source: Jakob Tetzlaff., pers. comm. Southeast Fisheries Science Center, Miami, Florida.

Bag Limits

The recreational fishery is regulated by a 2-red snapper daily bag limit per person. Red snapper discards while harvesting the daily bag limit are a result of incidental capture of undersized fish prior to reaching the bag limit and targeting of other reef fish residing in similar habitat as red snapper after bag limits have been reached. SERO (2012c) reported for-hire anglers, on average, landed 1.23 red snapper per trip and private anglers landed 1.58 red snapper per trip when the season is open. Based on average catch rates, the current two red snapper bag limit is not a limiting factor for many trips. Therefore, the release of undersized fish while harvesting the bag limit is still an important factor contributing to discards in addition to the release of legal-sized red snapper after the bag limit is reached.

Size limits

The 16-inch recreational and 13-inch commercial TL minimum size limits are important factors when considering bycatch in the directed fishery. Size limits are intended to protect immature fish and reduce fishing mortality. The recreational minimum size limit is above the size at 50% maturity and the commercial size limit is near the size at 50% maturity. Size-at-maturity varies by region, with 75% of eastern Gulf female red snapper mature by 12 inches TL and 50% of western Gulf red snapper mature by 13-14 inches TL (Fitzhugh et al. 2004).

Several yield-per-recruit (YPR) analyses have previously been conducted to identify the size that balances the benefits of harvesting fish at larger sizes against losses due to natural mortality. Goodyear (1995) concluded YPR was maximized in the red snapper fishery between 18 and 21 inches TL, assuming 20 and 33% release mortality in the recreational and commercial red snapper fisheries, respectively. A subsequent yield per recruit (YPR) analysis by Schirripa and Legault (1997) indicated increasing the minimum size limit above 15 inches TL would result in no gains in yield. Analyses of minimum size limits run for Amendment 27 (GMFMC 2007) indicated red snapper projected recovery rates are slightly faster if the commercial minimum size limit is reduced or eliminated, but increasingly slowed by smaller recreational minimum size limits (Porch 2005). Decreasing the recreational and commercial minimum size limits was projected to increase stock recovery slightly over the short term, but stock recovery would be increasingly slowed if the recreational size limit were lowered over the long term (Porch 2005). However, as discussed in Amendment 27, changes in spawning potential and the rate of stock recovery were found to be negligible for recreational size limits ranging from 13 to 15 inches TL. An YPR analysis conducted by SERO (2006), using current fishery selectivities and release mortality rates from SEDAR 7 (2005) supported Porch's (2005) findings. SERO (2006) examined four commercial minimum size limits (12, 13, 14, and 15 inches TL) and five recreational minimum size limits (6, 13, 14, 15, and 16 inches TL). Based on the range of size limits analyzed, YPR was maximized at 16 inches TL in both the eastern and western Gulf recreational fisheries, 12-inches TL in the western Gulf commercial fishery, and 15-inches TL in the eastern Gulf commercial fishery. However, there was virtually no difference in maximum YPR (< 0.3 percent) for any of the eastern Gulf commercial size limits analyzed. In a study by Wilson et al. (2004) aboard commercial vessels using bandit rigs, 61% of red snapper released were greater than 13 inches and 86% were greater than 12 inches.

For this amendment, an YPR analysis was applied to the recreational sector (SERO 2013). This analysis indicates the Gulf-wide YPR is maximized at a recreational size limit of 15 inches TL. However, there was not much of a change in YPR between lengths of 13 and 18 inches TL. Thus, if the minimum size limit were changed from 16 to 15 inches TL, any gain in YPR would be minimal. SERO (2013) also showed than any increase in the minimum size limit would reduce the number of fish landed. This would probably result in more regulatory discards and an increase in the number of dead discards.

Given the above discussion, a larger recreational minimum size limit is considered to be more effective than a similar sized commercial minimum size limit because of lower release mortality rates in the recreational fishery (Tables 7.2 and 7.3). High release mortality rates in the commercial fishery provide little, if any, protection to the stock because the released fish mostly die rather than contribute to filling the quota. In contrast, the current 16-inch TL minimum recreational size limit was found to afford some protection to the stock, because a greater percentage of discarded fish will survive to spawn and later contribute to the quota as larger animals.

Area closures

Although the Council has not developed area closures specifically for red snapper, the Council has created areas to protect other species. For example, two restricted fishing areas were

developed to specifically protect spawning aggregations of gag in 2000 (GMFMC 1999). The Madison-Swanson and Steamboat Lumps marine restricted fishing areas are located in the northeastern Gulf at a depth of 40 to 60 fathoms. Both areas prohibit bottom fishing. Bottom fishing is also prohibited in the Tortugas North and South marine reserves in the southern Gulf near the Dry Tortugas. Marine reserves and time/area closures benefit fish residing within reserve boundaries by prohibiting their capture during part or all of the year. Within marine reserves, fish that are undersized potentially have an opportunity to grow to legal size and are no longer caught as bycatch. If these fish emigrate from the marine reserve (i.e., spillover effect), then they may be caught as legal fish outside the reserve, thereby reducing bycatch. However, anglers and commercial fishermen may redistribute their effort to areas surrounding the area closure. If fishing pressure in these areas is increased, then any benefits of reduced bycatch of fish in the marine reserve will likely be offset by increases in bycatch of fish residing outside the marine reserve. Within restricted fishing areas or time/area closures, fishing is allowed under restrictions that are intended to protect certain components of the populations within the area (e.g., prohibitions on bottom fishing gear), or to protect populations during a critical phase of their life history, such as during spawning.

The Council did develop a season area closure to reduce bycatch of sea turtles for the longline component of the commercial sector. The use of longlines had been prohibited from waters less than 20 fathoms east of Cape San Blas, Florida, and 50 fathoms west of Cape San Blas; however, due to higher estimates of sea turtles caught in longline gear, measures were put in place through Amendment 31 (GMFMC 2009) to reduce this bycatch. One of these measures was the prohibition of the use of bottom longline gear in the Gulf reef fish fishery, shoreward of a line approximating the 35-fathom contour east of Cape San Blas, Florida from June through August. Most sea turtle takes by longline occur during the summer months.

Allowable gear

Vertical hook-and-line gear (bandit rigs, manual handlines) is the primary gear used in the commercial fishery fishing for red snapper (> 96% of annual landings). Longlines, spears, and fish traps account for a small portion of the commercial harvest (< 5%). Longlines account for only a small fraction of red snapper dead discards as most of the landings come from handline-caught fish (Table 6). In addition, longlines are fished in deeper water, particularly in the west, and select for larger, legal-sized red snapper. Longline vessels east of Cape San Blas, Florida are also restricted to carrying 1,000 hooks onboard (only 750 rigged for fishing at any given time) as part of a suite of measures put in place through Amendment 31 (GMFMC 2009) to reduce sea turtle bycatch.

Rod-and-reel is the primary gear used in the recreational fishery. Recreational anglers also use spears to capture red snapper. Spearfishing does not affect discard mortality since all fish caught are killed. Only undersized red snapper mistakenly killed while spearfishing would contribute to discard mortality. During the red snapper recreational fishing season, discards are primarily due to the recreational size limit; however, allowable gears can affect discard mortality rates.

Fishermen in both the commercial and recreational sectors are required to use non-stainless steel circle hooks, if using natural baits, to reduce discard mortality. The size of circle hooks used in the fishery varies by manufacturer, gear type, and species targeted (i.e., if targeting vermilion snapper, smaller circle hooks may be used). Although circle hooks may not work as well to reduce red snapper discard mortality, they are effective in reducing mortality in other species such as red grouper (Burns and Froeschke 2012).

In addition to the circle hook requirement, Amendment 27 (GMFMC 2007) also put in place requirements for both commercial and recreational fishermen in the reef fish fishery to carry onboard dehooking devices. These gears are all intended to reduce bycatch and discard mortality. A dehooking device is a tool intended to remove a hook embedded in a fish. It reduces the handling time releasing a fish from a hook and allows a fish to be released with minimum damage.

IFQ program

The commercial sector was previously regulated by 2,000-lb and 200-lb trip limits. With the establishment of the red snapper IFQ program, red snapper discards after a trip limit was reached are no longer a factor. However, reef fish observer data since the IFQ program was implemented indicate a large proportion of legal-sized red snapper continue to be discarded by both the handline and longline fleets (GMFMC 2013). Discard rates do vary by gear. In 2011, 3.5 red snapper were landed for every fish released in the vertical line fleet compared to a 0.5 red snapper landed for each fish released in the longline fleet (SERO 2012b). Discard rates greatly varied by region. In 2011, 87% of observed red snapper caught in the Florida Panhandle were landed, compared to 79% off Louisiana and Texas, and 47% off the Florida Peninsula. There was also a noticeable difference in the size of red snapper caught, with red snapper along the Florida Peninsula (mostly19-24-inches TL) generally larger than fish caught in other areas of the Gulf (mostly 15-21-inches TL). Most discards were estimated to be released alive, regardless of gear type used. Discards were likely due to insufficient allocation, rather than the minimum size limit, especially in the longline fleet. In a study by Wilson et al. (2004) aboard commercial vessels using bandit rigs, 61% of red snapper released were greater than 13-inches TL, the minimum size limit.

Table 6. Commercial red snapper landings and dead discards in the Gulf by year and area.

	Eastern Gulf				Western Gulf			
	Landings		Dead discards		Landings		Dead discards	
Year	Handline	Longline	Handline	Longline	Handline	Longline	Handline	Longline
1983	1,646,550	205,415	1,587	1,237	2,698,740	9,089	56,690	85
1984	949,341	128,146	309	388	1,625,800	71,755	27,160	547
1985	550,063	25,477	79,906	2,239	608,624	50,822	233,753	8,173
1986	222,738	14,761	21,314	646	564,277	73,719	261,093	11,740
1987	168,788	10,300	20,091	743	412,668	69,713	229,400	12,708
1988	186,924	10,860	51,433	738	686,680	66,440	285,429	9,443
1989	156,071	10,284	32,961	1,714	531,066	44,967	230,318	6,188
1990	198,778	10,021	94,242	4,552	482,224	11,997	377,444	2,706
1991	152,971	3,368	79,800	1,647	527,667	7,937	332,927	1,905
1992	153,940	1,104	54,930	484	837,699	2,270	380,571	460
1993	157,367	3,061	57,447	843	849,065	2,421	375,085	471
1994	160,369	1,473	87,448	568	705,354	1,879	412,546	407
1995	46,528	1,466	54,453	658	648,399	2,012	491,941	501
1996	65,129	1,329	62,736	925	941,768	3,102	695,812	699
1997	51,767	849	79,005	515	1,066,360	3,472	713,290	729
1998	111,068	1,057	99,004	494	1,052,750	3,001	605,570	522
1999	147,499	1,289	102,825	340	1,032,070	9,722	602,380	1,564
2000	168,301	1,585	107,368	556	899,899	18,882	634,841	3,146
2001	207,257	1,779	278,236	894	809,218	12,326	658,252	2,334
2002	297,471	3,235	319,910	1,555	830,146	14,317	584,024	2,481
2003	279,295	2,626	235,502	1,190	782,006	16,735	492,094	2,618
2004	247,833	3,592	251,909	1,633	741,737	43,698	598,933	8,157
2005	216,596	3,816	230,654	2,081	725,819	26,878	785,721	6,686
2006	209,704	3,062	221,631	1,394	955,637	24,731	992,193	6,781
2007	308,237	3,492	949,770	14,520	521,931	17,877	231,164	443
2008	277,716	7,221	660,738	24,096	381,349	5,693	115,150	108
2009	299,480	3,088	748,261	10,548	347,913	5,666	89,641	68
2010	398,806	15,002	1,111,727	53,620	415,081	4,364	85,851	56
2011	408,346	15,463	1,274,735	60,252	382,630	2,143	86,460	18

Source: SEDAR 31 2013; Jacob Tetzlaff, pers. comm. Southeast Fisheries Science Center, Miami, Florida)

Alternatives being considered and bycatch minimization

The actions in this amendment can indirectly affect bycatch in the Gulf reef fish fishery. These actions are administrative and would develop regional management for red snapper recreational fishing. Action 1would give states or regions the ability to establish what types of measures could be used in regional management to constrain the recreational harvest to a region's allocation. Action 4 would evaluate different federal minimum size limits that would act as a default rather than the current 16-inch minimum size limit. Depending on how these measures are applied, as discussed above, they could either reduce or increase bycatch in the reef fish fishery. The impacts of changing these measures from status quo will need to be evaluated if changed.

Practicability Analysis

Criterion 1: Population effects for the bycatch species

This action establishes a red snapper regional management system for the recreational sector and so does not directly affect bycatch minimization. However, management measures that result from regional management are expected to affect bycatch. These include regional changes to fishing seasons, bag limits, size limits, and area closures. Longer fishing seasons, higher bag limits, smaller minimum size limits, and larger area closures can all minimize bycatch. However, constraining the harvest to a certain regional quota (allocation) could result in measures that work against each other in terms of reducing bycatch (e.g., a higher bag limit would require a shorter fishing season). Therefore, it is difficult to predict how regional management would affect bycatch.

As described above, the Council and NMFS have developed a variety of management measures to reduce red snapper bycatch and these measures are thought to benefit the status of the stock. These include bycatch reduction devices and effort targets in the shrimp fishery, size limit reductions and the IFQ program for the commercial sector, and gear requirements, such as dehooking devices and the use of circle hooks by the reef fish fishery. In addition, any increases in bycatch resulting from proposed management actions are accounted for when reducing directed fishing mortality. Any reductions in bycatch not achieved must be accounted for when setting the annual catch limits; the less bycatch is reduced, the more the annual catch limits must be reduced.

Criterion 2: Ecological effects due to changes in the bycatch of red snapper (effects on other species in the ecosystem)

The relationships among species in marine ecosystems are complex and poorly understood, making the nature and magnitude of ecological effects difficult to predict with any accuracy. The most recent red snapper stock assessment (SEDAR 31 2013) indicated the stock is rebuilding. Consequently, it is possible that forage species and competitor species could decrease in abundance in response to an increase in red snapper abundance. Changes in the bycatch of red snapper are not expected to directly affect other species in the ecosystem. Although birds,

dolphins, and other predators may feed on red snapper discards, there is no evidence that any of these species rely on red snapper discards for food.

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

Population and ecosystem effects resulting from changes in the bycatch of other species of fish and invertebrates are difficult to predict. As discussed in Amendment 27 (GMFMC 2007), groupers, snappers, greater amberjack, gray triggerfish and other reef fishes are commonly caught in association with red snapper. Many of these species are in rebuilding plans (gag, gray triggerfish, and greater amberjack) with the stocks improving. Regulatory discards significantly contribute to fishing mortality for all of these reef fish species, with the exceptions of gray triggerfish and vermilion snapper.

No measures are proposed in this amendment to directly reduce the bycatch of other reef fish species. Bycatch minimization measures implemented through Amendment 18A, Amendment 27, and Amendment 31 are expected to benefit reef fish stocks, sea turtles, and smalltooth sawfish. As mentioned, this action establishes a red snapper regional management system for the recreational sector and so would indirectly affect bycatch depending on which management measures are used in specific regions. For species with quotas (greater amberjack, gray triggerfish, red grouper, and gag, this could lead to a shift in fishing effort during red snapper season closures and negatively impact reef fish stocks not currently constrained by annual quotas or IFQ programs. The magnitude of this impact would depend on the size of the particular quota, the length of the closure, and the amount of effort shifting that occurs. Annual catch limits and accountability measures are now in effect for species not considered undergoing overfishing or overfished, thus potential for effort shifting and changes in bycatch may be lessened for these species.

Criterion 4: Effects on marine mammals and birds

The effects of current management measures on marine mammals and birds are described above. Bycatch minimization measures evaluated in this amendment are not expected to significantly affect marine mammals and birds. There is no information to indicate marine mammals and birds rely on red snapper for food, and measures in this amendment are not anticipated to alter the existing prosecution of the fishery, and thus interactions with marine mammals or birds.

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

The proposed management measures in this amendment would not be expected to result in any changes in fishing, processing, disposal, or marketing costs of commercially harvested red snapper because the measures only apply to the harvest of red snapper by the recreational sector. Red snapper that are harvested by the recreational sector in the Gulf may not be sold.

Criterion 6: Changes in fishing practices and behavior of fishermen

It is not possible to determine whether bycatch, including the amount of regulatory discards, will be affected following implementation of this action. The proposed measures of this amendment will enable each Gulf State or region to establish management measures for its assigned portion of the recreational red snapper quota. However, this action does not establish what those management measures will be, which remains unknown. Thus, it also remains unknown how the management measures that will be adopted by the regions will differ from the current regulations for red snapper and thus, how newly established regional regulations will differ from current fishing practices and affect fishermen behavior. It is possible that bycatch could be reduced if a region adopts a recreational red snapper season that is contemporaneous with periods of highest fishing activity. However, it is also likely that fishing activity will continue after the fishing season, and regulatory discards will occur. The amount of red snapper quota to be harvested by each State should theoretically approximate the catch that has been landed in that region, historically. Thus, it is possible that the amount of regulatory discards remains more or less the same.

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

Proposed management measures are not expected to significantly impact administrative costs at the federal level, but could increase costs at the regional level. Size limits, bag limits, quotas, and closed seasons are currently used to regulate the recreational sector harvesting red snapper. All of these measures will require additional research to determine the magnitude and extent of impacts to bycatch and bycatch mortality. None of the measures are expected to affect research, administration, or enforcement of the commercial sector.

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

The establishment of a regional management program is not expected to affect the economic, social, or cultural value of red snapper fishing. Red snapper is a highly desirable target species and the proposed measures are intended to support the adoption of fishing regulations that better satisfy the preferences of local constituents. This would be expected to improve fishing opportunities, thereby increasing the economic and social benefits for fishermen and associated coastal businesses and communities. No effects would be expected on the non-consumptive uses of the fishery resources.

Criterion 9: Changes in the distribution of benefits and costs

The net effects of the proposed management measures in this amendment on bycatch are unknown because the resultant management measures that will be enacted by the respective regions are unknown. The proposed management measures would not be expected to affect the amount of red snapper harvest normally harvested by anglers in each region as the allocation of the overall recreational quota should reflect regional harvests. However, the ability of each region to enact management measures that better match the preferences of local constituents would be expected to increase the benefits, and possibly decrease the costs, associated with the

recreational harvest of red snapper. Because the commercial sector is not affected by this action, there should be no change in the distribution of benefits and costs to this sector.

Criterion 10: Social effects

Bycatch is considered wasteful by fishermen and it reduces overall yield obtained from the fishery. Minimizing bycatch to the extent practicable will increase efficiency, reduce waste, and benefit stock recovery, thereby resulting in net social benefits for the recreational sector. It is assumed that if regions establish a red snapper fishing season to coincide with regionally preferred fishing times, the social effects will be positive.

Conclusion

Analysis of the ten bycatch practicability factors indicates there would be positive biological impacts associated with further reducing bycatch and bycatch mortality in the reef fish fishery. The main benefits of reducing red snapper bycatch are less waste and increased yield in the directed fishery. Reducing discards and discard mortality rates would result in less forgone yield.

When determining reductions associated with various management measures, release mortality is factored into the analyses to adjust the estimated reductions for losses due to dead discards. The increases in discards associated with each of these management measures varies and is contingent on assumptions about how fishermen's behavior and fishing practices will change. In this action, establishing a regional recreational red snapper management system would indirectly affect discards and bycatch. Discards and bycatch would be affected depending on the application of regional management measures allowed under Action 1.

The Council needed to consider the practicability of implementing the bycatch minimization measures discussed above with respect to the overall objectives of the Reef Fish Fishery Management Plan and Magnuson-Stevens Fishery Conservation and Management Act. Therefore, given actions in this amendment combined with previous actions, management measures, to the extent practicable, minimize bycatch and to the extent bycatch cannot be avoided, minimize the mortality of that bycatch.

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APPENDIX I. MRIP CALIBRATION WORKSHOP II – FINAL REPORT

SEDAR41-RD55
March 24, 2015
Available at:
http://sedarweb.org/docs/wsupp/S41_RD55_Carmichael%26VanVoorhees2015_MRIPCalibrationII.pdf

MRIP Calibration Workshop II – Final Report

John Carmichael and Dave Van Vorhees, Editors

SEDAR41-RD55

24 March 2015

MRIP Calibration Workshop II

September 8 – 10, 2014

North Charleston SC

Final Report

Hosted by

NOAA Fisheries, Office of Science and Technology, MRIP

and

SEDAR: Southeast Data, Assessment and Review

John Carmichael and Dave Van Vorhees, Editors

Introduction

The Second Marine Recreational Information Program (MRIP) Calibration workshop convened September 8 – 10, 2014, in North Charleston, SC to address potential impacts on catch resulting from changes in the Access Point Angler Intercept Survey (APAIS). Changes were implemented in the APAIS component of MRIP during 2013 and 2014 as the next step in ongoing efforts by the program to address issues raised by the 2006 National Research Council (NRC) review of recreational catch sampling.

While revised survey methods changes are believed to improve survey performance and reliability, implementing such changes results in survey outputs such as catch estimates that are now based on a different method than those same outputs from prior years. This creates a break in the time series of estimates that affects stocks assessments which rely up on long time series of data. It also creates an issue for management specifications and Accountability Measures (AMs) tied to catch levels, since the current catch estimates used to evaluate a fishery are based on a different survey method than the catch estimates used to develop those management specifications and AMs. Similar concerns were cited in the justification for the first Calibration workshop, held March 27 – 29, 2012, in Raleigh, NC, to address re-estimation 2004-2011 catch.

The goals of this workshop were to determine if changes made to the APAIS component of MRIP provide catch estimates that differ from prior values and how best to adjust survey estimates to maintain a valid time series of catch estimates.

Workshop outcomes include recommendations that calibration is necessary, that three alternative approaches should be considered and a list of steps to follow when dealing with future survey changes. Calibration alternatives are discussed in general in the workshop report, with detailed steps provided in Appendix 1. Because considerable time and effort will be required to fully develop and evaluate these alternatives, an interim approach was developed by a subset of workshop participants for application in assessments conducted while the 3 primary approaches are pursued. The interim methods is described in Appendix 2.

Table of Contents

Workshop Terms of Reference

1. Review the calibration approaches recommended by the MRFSS/MRIP Calibration Workshop held March 27-29, 2012, in Raleigh NC.

2. Review analyses performed to evaluate potential effects of the 2013 change in the APAIS sampling design on MRIP catch statistics.

3. Evaluate the feasibility of separating the effects of changes in the APAIS sampling design from the effects of changes in the fishery during the affected years.

    - Use red snapper as a case study and review evidence for major changes in the fishery that could account for observed changes in catch statistics.

4. Recommend appropriate calibration approaches to adjust the catch statistics (point estimates and variance) for the years prior to 2013. Discuss the key factors that the calibration approaches must take into account and how they should be modified as more years of APAIS data are collected with the new sampling design.

5. Discuss how future MRIP survey design changes should be evaluated with respect to possible needs for calibration and adjustments to past catch statistics, addressing how any APAIS design change calibration would best be integrated with any future calibrations.

6. Prepare a consensus report providing complete documentation of workshop activities and recommendations.

Proceedings and Recommendations

1. Review the calibration approaches recommended by the MRFSS/MRIP Calibration Workshop held March 27-29, 2012, in Raleigh NC.

The Workshop Panel received a presentation summarizing the approach and findings of the first Calibration workshop. The panel did not raise objections to the approaches recommended by the first calibration workshop. Discussion centered around regional implementation of recommended calibration approaches. Representatives of the Northeast and Southeast Fisheries Science Centers were asked to provide the following summaries of implementation activities in their respective areas.

Northeast Fisheries Science Center

(Bullets addressing calibration implementation: Paul/Jon)

Southeast Fisheries Science Center

(Bullets addressing calibration implementation: Steve/Vivian)

2. Review analyses performed to evaluate potential effects of the 2013 change in the APAIS sampling design on MRIP catch statistics

The second overview presentation addressed specific changes in the APAIS. Topics discussed included the need to change methods, findings of a pilot study conducted to evaluate method changes, and examples of how the change in methods may have impacted survey estimates. The panel recognized the need for a change in survey design and agreed that the updated methods are an improvement.

3. Evaluate the feasibility of separating the effects of changes in the APAIS sampling design from the effects of changes in the fishery during the affected years.

- **Use red snapper as a case study and review evidence for major changes in the fishery that could account for observed changes in catch statistics.**

Several workshop presentations addressed this Term of Reference. Collectively they provided a detailed evaluation of survey, evidence that survey changes affected catch estimates in 2013 and 2014, and alternatives for calibrating survey estimates in response to method changes. The third presentation addressed changes made in 2013, evaluation of those changes with regard to improving sampling productivity, and further changes made in 2014. This led into the fourth presentation, addressing MRIP staff efforts to describe how the changes in survey methods impacted survey estimates. These investigations centered around year effects and design change effects, with the goal

of determining whether there was evidence that design changes impacted survey estimates. Evidence that design changes have an impact on survey estimates or catch or effort provides justification to calibrate those estimates for periods prior to the design changes. The fifth workshop presentation provided information on the variation in survey change impacts on landings, details on observed changes in Gulf of Mexico red snapper estimates and introduced an approach for calibration.

Following these presentations, the Panel agreed there was evidence that survey estimates changed in response to changes in methods. Therefore, adjustment or calibration should be made to the survey estimates to ensure that estimates are comparable over time. Because the new survey methods are considered necessary and preferable to the prior survey methods, the panel agreed that calibration should be applied to the earlier estimates. There was also discussion of calibrating the more recent estimates to historical estimates to allow tracking of catches relative to ACLs established using prior survey methods, until such time that ACLs can be revised. The overall goal of calibration is to adjust the earlier values to be in line with what they would have been had the new survey methods been in place previously. If no calibration or adjustment is applied changes in catch estimates observed between years before and after method changes are applied, that are due to the survey changes, will be erroneously attributed to fishery, environmental or regulatory changes, and can lead to ACLs being met sooner or later depending on the directionality of change in landings estimates.

Recommendation: Calibration is required

- Discontinuity in time series of estimates is a concern for assessment and management efforts
- It is not appropriate to compare estimates based on the new survey design to management parameters such as Annual Catch Limits (ACL) based on old design.
- While there may be a need in the short-term to calibrate new estimates to align with existing estimates, this panel recommends that the appropriate long-term solution is to calibrate existing estimates to the new survey method estimates.
- Addressing existing management and assessment deadlines will require some interim calibrations. These should be based on the best insights and information available at the time required.

4. **Recommend appropriate calibration approaches to adjust the catch statistics (point estimates and variance) for the years prior to 2013. Discuss the key factors that the calibration approaches must take into account and how they should be modified as more years of APAIS data are collected with the new sampling design.**

Having reached agreement that survey method changes affected survey estimates, and that an adjustment in pre-change values is necessary to ensure valid comparison of results across time, the Panel began deliberations on appropriate calibration approaches. A single, most-appropriate calibration recommendation could not be reached during the workshop. Rather, the panel recognized and described three potential approaches: a simple ratio adjustment, a complex ratio adjustment, and a model-based approach. Each varies in data requirements and assumptions. In addition, while the ratio methods are fairly simple and may provide the most timely results, the model-based approach is more complex, time consuming, and may not work as theoretically envisioned. Therefore, the panel provided the following recommendations that address the methods proposed and provided guidance on their application, evaluation and final selection.

Recommendation: Pursue 3 alternative calibration approaches.

- The most appropriate calibration approach can only be determined following application and evaluation of the three proposed methods.
- The ratio methods should be applied in the short term, to address the most time sensitive management and assessment needs.
    - Apply the ratio methods to Gulf of Mexico red grouper and red snapper by October 15.
    - This is a preliminary, interim approach recommended to address the time constraints posed by upcoming assessments.
- The model based approach requires the most time and effort to implement, and is therefore unlikely to be ready in the short term for immediate management or assessment use. This option will also benefit from including additional (future) years of data in the analysis.
- All of the proposed methods key on temporal changes in survey coverage, which is considered potentially the most influential change in methods.
- Consider simulations to evaluate temporal change and sample cap effects and give some insight into the effects of each change.
- The complex ratio adjustment considers more detail of the temporal design than the simple ratio adjustment. Ratio methods vary in assumptions, and may vary by region or other factors. All assumptions for any adjustment must be checked and verified.
- Regional assistance, ideally obtained through a subset of this workshop panel, will be needed to develop and evaluate these calibration approaches.

Recommendation: Thoroughly evaluate the 3 methods before selecting the most appropriate.

- Criteria to consider when evaluating the most appropriate calibration method should be identified in advance, and include measures of variance and ability to meet assumptions.
- Calibration methods should be applied to data from the NC Pilot Study to test their performance.
- Full application of all three methods should be completed by early 2015 so that calibrated values are available for stock assessment and management use.

Recommendation: Include this workshop panel in final selection

- This workshop panel, with its broad regional representation and varied expertise, should be involved in evaluating the calibration approaches and making final recommendations.

5. Discuss how future MRIP survey design changes should be evaluated with respect to possible needs for calibration and adjustments to past catch statistics, addressing how any APAIS design change calibration would best be integrated with any future calibrations.

The workshop panel considered lessons learned through the first calibration workshop, the NC pilot study of recent APAIS changes, and the situation described in the presentations of this workshop to develop recommendations for managing future survey changes. These recommendations are offered as a series of sequential events to apply to future changes.

1. Consider calibration needs when designing survey changes.

- Ideally, apply existing and new methods side-by-side for an appropriate period of time.
  - If full side by side comparisons are not feasible due to time or budget constraints, conduct representative side by side comparisons that measure the scale and magnitude of potential biases and enables evaluating each method change before full implementation or replacement of existing methods.
  - Pilot studies should be distributed according to a valid statistical design to address known variation in survey estimates, rather than applied to a single area or year that may not be representative of the fishery
  - Use simulations (sample new data to simulate old method) to develop understanding of potential impacts from method changes.
- Consider interactions with previous changes and maintain access to original estimates, to avoid “calibrating calibrations”.

- Consider impacts on stock assessment, monitoring and management activities prior to implementing changes in survey methods.

- Consider the trade-offs between making incremental changes, with increased opportunities to ascribe changes in results to changes in methods and responds to new ideas and approaches, and clustered changes, which will reduce overall calibration burdens and provide more points of consistency in survey methods.
- Preserve the ability to calculate estimates consistent with "old" survey methods until calibration and adjustment methods are developed, peer reviewed and approved to address changes in estimates due to "new" survey methods.

2. Conduct outreach and education throughout the development, implementation and evaluation of survey changes and subsequent calibration of estimates.

3. Continue reporting survey estimates based on existing methods while developing and evaluating calibration and adjustment criteria for new methods, and securing peer review of new estimates. Design new methods with sufficient components to replicate status quo methods, and maintain the ability to replicate status quo methods as long as necessary to conduct the steps described here.

4. Conduct a peer review of calibration methods and applications.

5. Finally, revise time series of survey estimates and make them available to update stock assessments and management parameters.

    - Provide both sets of estimates until all managed species have updated catch limits and assessments

6. Prepare a consensus report providing complete documentation of workshop activities and recommendations.

This report documents the workshop proceedings and panel recommendations. It also includes, through several appendices, the result of efforts following the workshop to fully document the 3 proposed calibration methods as well as the interim approach offered for short-term assessment needs.

Further development and evaluation of the proposed calibration methods will be documented through subsequent reports, thereby allowing the work of this workshop panel to conclude.

Documents and Presentations

Supporting Documents

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Workshop Presentations

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2. Van Vorhees, D. A New Design for the Access Point Angler Intercept Survey. 2010 North Carolina Pilot Study.
3. Foster, J. APAIS 2013/2014 Design Changes.
4. Foster, J. Evaluation of APAIS 2013 Design Changes. Descriptive Analysis Part 1: Methods and Results for Temporal Distributions and Effort Components.
5. Foster, J. Evaluation of APAIS 2013 Design Changes. Descriptive Analysis Part 2: Results for Catch Rates, Quasi Design-based Approach for Calibration.

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Appendix 1. Detailed Implementation Steps for the Calibration Methods Proposed During the Workshop.

Summary Report: NOAA Calibration Methods Workshop - Charleston, SC
September 8-10, 2014
Lynne Stokes, Ken Pollock, Ginny Lesser
December 18, 2014

The new MRIP Access point survey has replaced the original MRFSS Access Point Survey. A variety of design changes have been made. One major consequence is that the new survey covers the fishing day more effectively than the original MRFSS Access Point Survey. Because the time series of recreational catch rate estimates form the basis of so many important fisheries stock assessments, there is the need to develop methods which "calibrate" the original time series of MRFSS estimates to the new time series of MRIP estimates. This is a difficult statistical estimation and prediction issue because both surveys were not run in parallel in any years (except for one pilot test in NC). The new estimates can be very different from the old estimates causing an abrupt change in the time series.

The purpose of this document is to outline the steps involved in implementing several model dependent calibration approaches to re-estimate catch that were discussed at the Charleston workshop. In addition, we discuss their assumptions. The first two methods use ideas of ratio estimation and assume that the major changes between the two surveys are due to a better temporal coverage of the fishing day in the new MRIP survey. The third method is a regression prediction modeling approach that will take longer to develop. None of these methods incorporate any analysis of spatial patterns or include time series methods, which might improve estimates. This would be worth exploring to determine if time series or small area estimation techniques for this short time series might provide improved estimates.

1. Direct Catch Ratio Adjustment
    - Steps in approach (for each subregion, state, mode, species.):
        i. Define peak period for each of the domains (excluding species). Peak period is defined using two criteria: 1) the contiguous range of hours during which weighted hourly proportions of total trips in the MRFSS years (prior to 2013) were greater than or equal to the corresponding weighted hourly proportions of total trips in 2013, and 2) the peak period accounted for at least 75% of the intercept data (trips) in the MRFSS years.
        ii. Estimate peak and total catch using the 2013 data based on the MRIP survey method where both the peak and total fishing periods were sampled adequately. Denote these by $c_{p,2013}$ and $c_{total,2013}$, respectively.

iii. Calculate the ratio $R_{2013} = c_{total,w2013}/c_{p,2013}$. This estimate and its large sample variance, based on standard Taylor series methods, can be calculated from survey sampling software packages such as SAS.

iv. Denote the estimator of catch based on the MRFSS method during the peak period in earlier year *y* (e.g., *y* = 2012, 2011, etc.) by $c_{p,y}$. Then the estimator of adjusted total catch for year *y* (i.e., a prediction of what would have been obtained if MRIP had been run) will be calculated as the product of the ratio from year 2013 and the catch for the peak period in year y; i.e.,

$$c_{tot,y} = R_{2013} * c_{p,y}.$$

iv. The variance of the adjusted catch $c_{tot,y}$ can be calculated using the expression for the variance of a product of two independent random variables introduced by Goodman (1960): .

$$var(c_{tot,y}) = var(R_{2013})(c_{p,y})^2 + var(c_{p,y})(R_{2013})^2 - var(R_{2013})var(c_{p,y})$$

By substituting estimates for each of the components in this equation, the variance can be estimated.

- Assumptions:
  i. Relative distribution of catch throughout day (i.e., between peak and total) is constant between 2013 and the year that is being adjusted for each domain

- Advantages:
  i. Simple to apply.

- Disadvantages:
  i. Information that is available for non-peak hours are not used.

- Two variations of this approach:
  i. Keep a fixed peak time the same (note this will vary by state and mode)
  ii. Use different peak times (allow this to vary by state, mode and year since this was allowed to vary in these groups)

2. Complex Ratio Method Based on Fishing Effort Distributions

- Steps in approach (for each subregion, state, mode, species etc.):
  i. The 2013 daily relative distribution of total fishing effort is obtained and also the relative distribution of total fishing effort data for the year to be compared to (for example, for y = 2012, 2011, etc.). Total fishing effort is estimated as the fishing effort estimate from separate telephone surveys (CHTS, FHS) that is subsequently expanded by coverage correction factors estimated from APAIS.

ii. The 2013 sampling weights are then adjusted (up or down weighted) so that the 2013 relative distribution matches the year y relative distribution. This is to be done by using discrete temporal bins with the exact bin widths yet to be determined.

The adjustments made to the 2013 sample weights are a ratio style adjustment of the form:

$$w_{dti|y} = w_{dti} * \frac{\hat{p}_{dt,y}}{\hat{p}_{dt,2013}}$$

where w_{dti} is the unadjusted 2013 sample weight for angler-trip *i* in time bin *t* in subregion, state, mode domain *d*,

$\hat{p}_{dt,2013}$ is the original 2013 weighted proportion for time bin *t* of total trips in domain *d*,

$\hat{p}_{dt,y}$ is the year *y* weighted proportion for time bin *t* of total trips in domain *d*, and

$w_{dti|y}$ is the 2013 sample weight for angler-trip *i* in time bin *t* in domain *d* adjusted to year *y*.

From initial evaluations of bin width, it appears that a 3-hour bin is the smallest bin that results in no data gaps or mismatches in 2013 (data present in a bin in a prior year but not in 2013) for all state by mode domains. However, additional work could be done to fine tune bin widths for each domain cell.

iii. Use the MRIP survey method to estimate catch for the complete 2013 data and denote it by c_{2013}. Also calculate catch for the 2013 data weighted to match the truncated distribution of effort for year y data (step ii above), and denote this estimator by $c_{tr,2013}$

iv. Calculate the ratio of 2013 complete to truncated catch based on the MRIP survey; i.e., $R_{c/tr,2013} = c_{2013}/c_{tr,2013}$.

v. Multiply this ratio by the year y estimate of catch c_y to obtain the adjusted year y catch estimate (i.e. what would have been obtained if MRIP survey had been run) $c_{y,adj} = R_{c/tr,2013} * c_y$.

vi. A similar approach can be used to adjust all other years one by one or alternately down weight 2013 compared to the pooled temporal distribution of all other years and get one overall ratio which can be used to adjust all the years.

vii. Explore computation of the variances of the calibrated estimates by either using a bootstrap or delta method.

- Assumptions:

i. Assumptions for this approach, such as constant relative distribution of trip/catch characteristics between years in the comparison/adjustment, must be investigated to determine if assumptions are met and will lead to consistent estimators.

- Advantages:
    i. Information that is available for non-peak hours are used unlike in the previous method.

- Disadvantages:
    i. Information from non-peak hours will be limited and may be highly variable or impacted by incomplete coverage compared to information from peak hours.
    ii. The assumptions under which this estimator will be consistent (that is, will provide an unbiased estimate for a sufficiently large sample size) are unknown at this time. For example, if the (strong) assumption needed for Method 1 is assumed, the estimator will still not necessarily be consistent.

- Other ideas to consider as variations of above
    i. Recalculate catch after effort has been readjusted. Therefore, both catch and effort are readjusted. The calibration methods make use of the MRIP public-use or micro datasets. The records included in these datasets come from APAIS. However, the sample weights in these datasets include a post-stratification adjustment such that the sum of the sample weights equals the MRIP estimate of total effort in domain cells defined by year, subregion, state, wave, mode, and area. To more fully approximate the effect of temporal coverage changes on catch, the MRIP estimates of total effort must be recalculated since they also include coverage correction factors estimated from APAIS. Once total effort has been recalculated, sample weights may be post-stratified to the new effort totals, and then revised catch estimates may be calculated as weighted sums using sample weights that have been adjusted to both a prior year daily distribution of effort as well as the resultant new effort total.
    ii. Apply temporal distribution either year-by-year or as an average across a range of years (say 2004-2012). Then multiply this ratio by MRFSS estimates of catch in previous years. NOTE: If use each year separately, then there is no assumption that the relative distribution of catch is constant throughout the day across years, only the two years that are compared. So if only one year violates this assumption, then conducting an aggregate analysis could bias the estimator for the other years, while if it was done separately, only it would be biased by that assumption violation. Conversely, using a multi-year average distribution may work to smooth results in cases where annual level distributions may be more variable.

3. Regression Model-Based Approach
    - Steps in approach:
        i. Develop a regression model using 2013 intercept data (perhaps other years as well) to predict and classify trips into either morning, peak, or evening as predicted from

their characteristics, such as type of catch and other demographic and behavior characteristics of the anglers that are available from the intercept questionnaire. Cross-validation could be used to check the model. For example, one could use approximately 75% of the data to develop the model. Then Bayes' Information Criterion (or other model fit statistic) could be used to develop the best fitting model. Once the model is built, the remaining 25% of the data could be used to predict the response variable. A statistic, such as the Press statistic, could be calculated to document how well the model is predicting the response categories. A replication approach might also be considered to look at model robustness or stability.

ii. Use the model to predict Morning, Peak and Evening trips for 2012, 2011, etc. These classifications won't be "true" morning, peak, and evening categories, since they won't be aiming to identify when the trip took place. Rather, they will be trying to predict when a trip is similar, based on catch and demographic and behavior characteristics of anglers, to trips in 2013 in those categories.

iii. Determine the proportion of Morning, Peak, and Evening trips in 2013. Adjust the 2012, 2011, data so that the Morning, Peak, Evening proportions are identical to the 2013 data. These are adjusted proportions. In addition to 2013 data, control proportions for prior years may be developed using trip time data from the CHTS and FHS effort surveys, which would be available for a range of years prior to 2013.

iv. This new weight, the inverse of the 'adjusted proportions', is multiplied by the existing weights for 2012, 2011, etc. to create the adjusted weight.

v. Data are now analyzed using the adjusted weights.

vi. A bootstrap method could be used to calculate variances.

- Assumptions:
  i. Reasonable predictive model can be developed using 2013 data to reasonably predict catch period type (i.e., Morning, Peak, and Evening).
  ii. The demographic characteristics of the angler/catch predict the characteristics of the catch through a "label" we are assigning about time of day.
  iii. Assumes that true time and latent time are identical in 2013 (see below for definition of latent.)

- Disadvantages:
  i. More work is required to develop the prediction model.
  The model is not designed to predict the observable characteristic (time of day), but is rather predicting whether the trip "resembles" a trip made during that time of day, which is a latent variable. Because of this, the model checking done on the 2013 data to see how well the model works is not like the target years, since we can't observe the latent variable even for 2013. It may be that some of the trips

made in the morning in 2013 do not resemble morning trips, and yet the model will be examined for its accuracy in predicting true time. If we were really interested in predicting true time, we would simply use the true time as a predictor in previous years!

- Advantages
    i. A number of important explanatory variables can be incorporated in the model to better predict trips.
    ii. Approach incorporates the calibration into the sample weights, which maintains the current usability of MRIP public-use datasets for analysts.

- Other comments:
    i. As more data is collected using the MRIP design, the model development should be repeated to improve prediction.

Catch can also be added to model, but need to be careful of applying 2013 year affects to previous years.

References:
Goodman, Leo A., "On the exact variance of products," *Journal of the American Statistical Association*, December 1960, 708–713.

Appendix 2. Recommended Interim Calibration Approach, suggested for use in Assessments Conducted in Winter 2014/15.

October 30, 2014
Summary Report: Recommended NOAA Calibration Method
Lynne Stokes, Ken Pollock, Ginny Lesser

Introduction

The new MRIP Access Point Angler Intercept Survey (APAIS) has replaced the original MRFSS Access Point Survey. A variety of design changes have been made. One major consequence is that the new survey covers the fishing day more effectively than the original MRFSS Access Point Survey. Because the time series of recreational catch rate estimates form the basis of so many important fisheries stock assessments, there is the need to develop methods which "calibrate" the original time series of MRFSS estimates to the new time series of MRIP estimates. This is a difficult statistical estimation and prediction issue because the two surveys were not run in parallel in any years (except for one pilot test in NC). The new estimates can be very different from the old estimates causing an abrupt change in the time series. Three methods of producing a calibration were suggested at the workshop in Charleston, SC held in September. Since that time, the statistical consultants have worked on investigating the properties of the three methods, and John Foster has implemented two of the three methods for some areas/species, in order to see how they perform. The purpose of this document is to describe our recommended method and to explain our choice.

Our recommendation

Our recommendation at this time is to use the method that was referred to as "Method 1" at the workshop. Our decision is based on two main factors. One is that the method is the easiest to explain and to understand of the three methods. It is based on an assumption that the ratio of catch in the peak period to total catch is stable over time. The method referred to as "Method 2" at the workshop is also a ratio method, but it is more complex (a negative feature) and uses the data from prior years more fully (a positive feature). Our reluctance to recommend Method 2 at this time is that we have not yet been able to determine the assumptions under which this estimator is consistent. For example, the strong assumptions required for consistency of the method 1 estimator are not sufficient to ensure consistency

of the method 2 estimator. It is also clear that the method 2 estimator requires estimation of more parameters than Method 1. As a result, we are not confident that the one year of new MRIP APAIS estimates available at this time will be sufficient. Finally, Method 3 considered at the conference is a regression prediction modeling approach that will take longer to develop and also need more data. (It is the one method not yet applied to any of the data by John Foster.)

Description of the method

Here we describe the basic assumption used to justify Method 1, and then outline the steps required for implementation. First, the justification of the method requires the assumption that in years previous to 2013, there is a period of the day that can be considered to have been fully covered by the MRFSS survey, and that the bias in its estimates occurs due to undercoverage in the non-peak periods. This is a very strong, but necessary assumption for this method. Second, the method requires the assumption that the ratio of peak catch to total catch stays constant across years for subregion, state, mode, and species. So for each of these domains, the calibrated total catch for year *y* is made as

$$\hat{C}_{tot,y} = \hat{R}_{2013}\hat{C}_{p,y} \qquad (1)$$

where $\hat{C}_{p,y}$ is the estimated peak-period catch for year *y* calculated from reweighted MRFSS data and $\hat{R}_{2013} = \hat{C}_{tot,2013} / \hat{C}_{p,2013}$ is the ratio of the total to peak catch for year 2013, which is calculated from MRIP data. $C_{tot,y}$ is thus our estimate of the catch total for the domain that would have been estimated if MRIP

had been conducted in year *y*.

The steps in producing this estimate are outlined below.

Step 1. Define peak period for each of the domains (subregion, state, mode). In the pilot implementation by John Foster, peak period was defined using two criteria: 1) the contiguous range of hours during which weighted hourly proportions of total trips in the MRFSS years (prior to 2013) were greater than or equal to the corresponding weighted hourly proportions of total trips in 2013, and 2) the peak period accounted for at least 75% of the intercept data (trips) in the MRFSS years.

Step 2. Calculate $\hat{C}_{p,y}$, the catch in the peak period for all years *y* < 2013 for which calibration is needed. Step 3. Estimate peak and total catch using the 2013 data based on the MRIP survey method where both the peak and total fishing periods were sampled adequately. Calculate its ratio $\hat{R}_{2013}$.

Step 4. Calculate the estimator $\hat{C}_{tot,y}$ shown in (1).

The variance of this estimator can be calculated using standard statistical methods.

Discussion

There are at least three substantial criticisms possible for this method. First is that the method uses none of the data collected outside the peak period in years prior to 2013. The second is that the method requires an assumption that the ratio of catch in the peak period to total catch is constant across years. We are not sure if this is defensible from a scientific point of view. Third, the method assumes that the estimate of total catch for the peak period made from the reweighted MRFSS data in years prior to 2013 is unbiased. On the other hand, some type of unverifiable assumption will be necessary in order to carry out any calibration because of the lack of side-by-side data collection for the MRIP and MRFSS APAIS sampling designs.

Some variations on Method 1 are possible. For example, the choice of how the peak period is defined will affect the estimates. Peak can be determined individually for each year or based on

an aggregation of years and/or domains. We believe that this definition will be difficult to specify in advance, and must be based on characteristics of the data.

We recommend that investigation continue on the remaining two methods. It is possible that one of them will be determined to be better at some future date.

APPENDIX J. 2015 GULF OF MEXICO RED SNAPPER RECREATIONAL SEASON LENGTH ESTIMATES

SERO-LAPP-2015-4
April 20, 2015
Available at:
http://sero.nmfs.noaa.gov/sustainable_fisheries/lapp_dm/documents/pdfs/2015/rs_2015_rec_quota_projection.pdf

2015 Gulf of Mexico Red Snapper Recreational Season Length Estimates
NOAA Fisheries, Southeast Regional Office

Executive Summary

The Gulf of Mexico (Gulf) red snapper recreational fishing season in federal waters opens each year on June 1 and closes when the recreational quota is met or projected to be reached. Prior to June 1 each year, NOAA Fisheries projects the season closing date based on previous years of data, and notifies the public of the closing date for the upcoming season. On April 1, 2015, NOAA Fisheries published a letter seeking comments on changes to the red snapper quota in response to an updated stock assessment. If this quota increase is implemented, the recreational annual catch target (ACT) in 2015 would be 5.608 mp ww. On April 10, 2015, the Secretary of Commerce approved Amendment 40 to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico (RF-40). RF-40 allocates 2,372,184 lb ww (42.3%) of the recreational ACT to the for-hire sector and 3,235,816 lb ww (57.7%) to the private sector (including state-licensed charter vessels). The purpose of this report is to project the 2015 federal fishing season length based on the proposed 2015 recreational ACTs with and without the implementation of RF-40's sector-specific sub-quotas, and with and without compatible fishing seasons in Gulf state waters. In 2014, with incompatible state seasons and a 9-day federal season, approximately 3.853 mp ww of red snapper were recreationally landed in the Gulf (89% of the 2014 ACT). For 2015 projections, a similar approach was followed. The analysis projected Eastern and Western Gulf catch rates and average weights by mode of fishing using the previous year's landings, the mean of the past two years, and regression modeling incorporating uncertainty in landings estimates from the various recreational fishing surveys used to provide information on harvest of Gulf red snapper during the federal season. A range of projection scenarios were used to encompass uncertainty in catch rates due to uncertainty in recreational catch estimates, potential reductions in the rate of average weight increase, changes in state seasons and catch rates. For 2015, projections showed that states adopting incompatible seasons could reduce the federal season length by 22-30% in the absence of RF-40, and by 29-45% for private and state-licensed charter vessels if RF-40 is implemented. In the absence of RF-40, the federal season in 2015 was projected to be between 9-21 days (up to 2.3

times longer than 2014). The implementation of RF-40 allows a much longer federal season for federally-permitted for-hire vessels (40-67 days; median = 46 days), with private seasons between 5-16 days, depending on catch rates and state compatibility. Several issues emerged during the regression modeling process incorporating the 2004-2014 data, including poor or insignificant model fits and potentially unrealistic trends. To address this uncertainty, projections scenarios were developed using only 2013-2014 data. Mean season lengths for projections based on recent data only, assuming RF-40 is implemented and state seasons are incompatible, were 44 days for for-hire and 10 days for private vessels.

Introduction

Red snapper are managed in Gulf of Mexico (Gulf) federal waters from the west coast of Florida to Texas by the Gulf of Mexico Fishery Management Council (Council). On October 1, 2013, NOAA Fisheries published a final rule (78 FR 57314) implementing an 11 million pound whole weight (mp ww) total allowable catch for Gulf red snapper. On April 20, 2015, a final rule (80 FR 06294) will establish a red snapper recreational annual catch target (ACT) by applying a buffer to the recreational quota, which is based on the Council's annual catch limit (ACL)/ACT control rule developed in the Generic ACL Amendment (76 FR 82044). The ACL/ACT control rule used to determine the appropriate target catch levels that account for management uncertainty to maintain catches at or below the ACL (quota).

For the recreational sector, the control rule specifies a 20% buffer to constrain landings below the quota. In 3 of the last 4 years landings have exceeded the recreational quota. This final rule (80 FR 06294) also revises the procedure for determining the recreational season length (closure date). The red snapper recreational season closure date will be based on when the recreational ACT will be met or projected to be reached instead of when the recreational quota will be met. Using the ACT to set the season length serves as an in-season accountability measure (AM) and reduces the probability of exceeding the recreational quota during a fishing year from 50 percent to 15 percent. This final rule also revises the recreational AMs to include a quota overage adjustment (payback). If red snapper are overfished and the recreational quota is exceeded, then in the year following the overage, the recreational quota will be reduced by the amount of the recreational quota overage in the prior fishing year, unless the best scientific information available determines that a greater, lesser, or no overage adjustment is necessary. If the quota is adjusted, the recreational ACT will also be reduced to maintain the 20-percent buffer between the ACT and the adjusted quota.

The red snapper recreational fishing season opens each year on June 1 and closes when the recreational quota is met or projected to be reached. Prior to June 1 each year, NOAA Fisheries projects the season closing date based on previous years of data, and notifies the public of the closing date for the upcoming season. If subsequent data indicate that the quota has not been reached, NOAA Fisheries may re-open the season. In 2014, the red snapper ACL was 5.390 mp ww, and the ACT was 4.312 mp ww. The federal season was open for 9 days, from June 1-June

9 (SERO-LAPP-2014-04). Additionally, the state of Texas had a year round (365 day) state waters season with a 4-fish bag limit and 15-inch minimum size limit (MSL). The state of Louisiana had 286-day state water season (3-day weekends Feb 21-Apr 13, all days Apr 14-Dec 31). The state of Florida had a 52-day state water season (May 24-July 15). The state of Alabama had a 21-day state water season (June 1-9; 3-day weekends in July). The state of Mississippi had a 36-day state water season (June 1-9; 3-day weekends in July and Oct-Nov 2). Alabama, Florida, Mississippi, and Louisiana also had a 2-fish bag limit and a 16-inch MSL.

On April 1, 2015, NOAA Fisheries published a letter seeking comments on changes to the red snapper quota (FB15-025) in response to an updated stock assessment (SEDAR-31 Update 2014). The proposed quota would increase to 14.30 mp ww, the highest ever for Gulf red snapper, and would be allocated 51% (7.293 mp ww) to the commercial sector and 49% (7.007 mp ww) to the recreational sector. If this quota increase is implemented, the recreational ACT in 2015 would be 5.608 mp ww. On April 10, 2015, the Secretary of Commerce approved Amendment 40 to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico (RF-40; FB15-006). This rulemaking provides a basis for increased flexibility in future management of the recreational sector, and reduce the chance for recreational quota overruns, which could jeopardize the rebuilding of the red snapper stock. The rule would establish sub- quotas for federally permitted for-hire vessels and private anglers who fish for red snapper for a three-year period beginning in 2015. The federal for-hire component would be comprised of all for-hire operators with a valid or renewable federal reef fish charter vessel/headboat permit. The private angling component would be comprised of private recreational anglers and other for-hire operators who do not have a federal reef fish charter vessel/headboat permit. The rule would implement sub-quotas using RF-40's allocation of 42.3% to the federal for-hire component and 57.7% to the private angling component. RF-40 allocates 2,372,184 lb ww (42.3%) to the for-hire sector and 3,235,816 lb ww (57.7%) to the private sector (including state-licensed charter vessels). The purpose of this report is to project the 2015 recreational red snapper federal fishing season length based on the proposed 2015 recreational ACTs with and without the implementation of RF-40's sector-specific sub-quotas, and with and without compatible fishing seasons in Gulf of Mexico state waters.

State Regulations

In 2015, as in previous years, Texas will have a 365-day state waters red snapper season with 4-fish bag limit and a 15-inch total length MSL. Louisiana will have a 287-day season from March 20 through December 31. The Florida Fish and Wildlife Commission has approved a 70-day state waters fishing season beginning Memorial Day weekend (May 23) and ending on July 12 with Labor Day weekend (Sept 5-7) and two-day weekends in Sept-Oct open as well. Mississippi has yet to specify their season length. Analyses herein presume Mississippi will have a similar season as they did in 2014.. This analysis assumes Alabama will implement regulations consistent with the federal season implemented by NOAA Fisheries, and seasons, bag limits, and size limits for other Gulf states will be consistent with those summarized in **Table 1** below.

Table 1. Potential Gulf state water recreational red snapper regulations for 2015. Cells highlighted in gray indicate regulations incompatible with 2015 federal regulations.

State	Size Limit	Bag Limit	Season	Days Open
Florida	16" TL	2-fish	Open May 23 - July 12, resume Sept. 5-7 and finish with Saturdays and Sundays throughout Sept.-Oct., closes Nov. 1.	70
Alabama*	16" TL	2-fish	Same as federal season	Same as federal season
Mississippi*	16" TL	2-fish	Open federal season, 3-day weekends July, Oct	Federal season plus ~24 days
Louisiana	16" TL	2-fish	Opens March 20	287
Texas	15" TL	4-fish	Jan 1-Dec 31	365

**Not finalized*

Data Sources

Recreational red snapper landings were obtained from four data sources (**Table 2**):

1. Marine Recreational Information Program (MRIP), including the For-hire charter survey.
2. Southeast Region Headboat survey (SRHS).
3. Louisiana Department of Wildlife and Fisheries (LDWF) creel survey.
4. Texas Parks and Wildlife Department (TPWD) charter and private/rental creel survey.

MRIP and for-hire red snapper landings are estimated using a combination of dockside intercepts (landings data) and phone surveys (effort data). Landings are estimated in both numbers and whole weight (lbs) by two-month wave (e.g., Wave 1 = Jan/Feb, …, Wave 6 = Nov/Dec), area fished (inland, state, and federal waters), mode of fishing (charter, private/rental, shore), and state (west Florida, Alabama, Mississippi, and Louisiana). Uncertainty in MRIP mean estimates in average weights, numbers of fish landed, and pounds of fish landed are expressed as percent standard error (PSE). MRIP has replaced the Marine Recreational Fisheries Statistics Survey program as the primary methodology for collecting and estimating recreational catches in the Gulf. In 2013, MRIP implemented changes to the Access Point Angler Intercept Survey (APAIS). These changes to APAIS required a recalibration of historical landings to account for biases in sampling time period; these re-calibrated landings were incorporated into the SEDAR-31 Update (2014) stock assessment and were used to generate the inputs for the 2015 season length projections in this report. These recalibrated landings were distributed to waves using proportions from MRIP data in the Southeast Fisheries Science Center (SEFSC) Recreational Data (accessed Feb 2015). MRIP data for 2014 were obtained both for Wave 3 and for June 1-9 (federal season only).

Headboat landings are collected through logbooks completed by headboat operators and submitted to the SRHS. Landings (lbs ww) are reported by vessel, day/month, and statistical reporting area (i.e., area 18 = Dry Tortugas off west coast of Florida, …, area 27 = Southeast Texas). Landings from vessels participating in the 2015 Headboat Collaborative Exempted Fishing Permit (http://gulfheadboat.com/) were deducted from the projection inputs, and their harvest was also deducted from the recreational for-hire sub-quota (http://sero.nmfs.noaa.gov/sustainable_fisheries/gulf_fisheries/reef_fish/2013/headboat_efp/).

No estimates of uncertainty are generated by the SRHS. Headboat landings were obtained through 2013 from the SEFSC Recreational ACL Dataset (accessed Feb 2015) and 2014 landings were obtained directly from SRHS staff.

Louisiana's quota monitoring survey was designed to estimate the number of red snapper landed in Louisiana during the 2014 recreational season. Dockside interviews were conducted by state personnel at sites commonly reporting offshore species. To estimate fishing effort of private anglers, LDWF personnel contacted a random portion of those anglers holding a Louisiana Recreational Offshore Landing Permit by phone and/or email on a weekly basis. Permit holders were asked if they fished offshore, how many trips were taken the previous week, if they landed at a public site, what time they returned to the dock, and whether they fished on a paid charter. The randomly selected permit holders were notified by e-mail each Wednesday of their selection to be surveyed. Those selected permit holders had the option to answer the effort survey questions by reply e-mail. If an e-mail was not received, they were contacted by phone. Charter captains holding a Louisiana Recreational Offshore Landing Permit were also contacted by LDWF weekly to collect information on the total number of red snapper caught the previous week. Charter captains had the option to respond via e-mail prior to LDWF personnel contacting them via phone. Estimated landings were produced based on observed catch rates, average weights, and estimated fishing effort (as adjusted for persons not possessing an offshore landing permit). Weekly estimates of uncertainty in LDWF survey average weights, numbers of fish landed, and pounds of fish landed are expressed as PSE. There was no MRIP sampling in Louisiana in 2014.

The TPWD creel survey generates estimates of landings in numbers for private/rental boats and charter vessels fishing off Texas. Landings are reported in numbers by high (May 15-November 20) and low-use time periods (November 21-May 14), area fished (state versus federal waters), and mode of fishing (private versus charter). To convert TPWD landings in numbers to landings in pounds, red snapper average lengths by mode, wave, and area fished are converted to weights using a length-weight conversion formula. High- and low-use estimates of uncertainty in TPWD numbers of fish landed are expressed as PSE and were obtained from TPWD staff for this analysis. TPWD landings were not available for the high-use period in 2014; 2013 high-use data were used as a proxy.

Table 2. Data inputs used in projections.

Source	Time Period	Details
Marine Recreational Information Program (MRIP)	2004-2014	Landings and PSE by wave, recalibrated for changes in angler intercept survey
Texas Parks and Wildlife Department (TPWD)	2004-2014	Landings by wave from SEFSC Recreational ACL dataset, with 2013 used as a proxy for May-Dec 2014; CVs (define)from TPWD staff
Louisiana Department of Wildlife and Fisheries (LDWF)	2013-2014	Weekly landings and error estimates from LDWF staff
Southeast Region Headboat Survey (SRHS)	2004-2014	Monthly landings through 2013 from SEFSC Recreational ACL Data (Feb 2015) and 2014 landings from SRHS staff
SEFSC Recreational ACL Dataset	2004-2014	Average weights by year and mode of fishing

Methods

2014 Landings and Retrospective

Landings from 2014 were obtained from the various data sources described in **Table 2**. Federal in-season catch rates were determined using MRIP, LDWF, SRHS, and TPWD estimates. These were compared to federal season catch rates projected in SERO-LAPP-2014-04.

2015 Projections: Average Weights and Catch Rates

A tiered projection approach was taken for forecasting recreational red snapper average weight and in-season catch rates in the Gulf of Mexico for 2015. Average weights and in-season catch rates were computed using the same methodology as 2013 projections (see SERO-LAPP-2013-02 Addendum). Since 2007, the recreational fishing season has decreased from 194 days to 9 days (2014 season length). Because federal waters were only open in June 2014, only federal in-season catch rates, expressed as landings per open day, from June 2004-2014 were used as regression inputs. Because the Eastern and Western Gulf states have differing data collection programs, average weights and catch rates were projected separately for the Eastern and Western Gulf. Different projections were done for Headboat, Charter, and Private modes to account for differences in the effort dynamics of these modes, the potential implementation of RF-40, and the availability and completeness of data.

Generalized linear regression models were implemented using R (R Core Team 2014). The best-fitting models for each of the model scenarios in SERO-LAPP-2013-10 were identified based on significance of parameter terms, adjusted Akaike information criterion (AICc; Burnham & Anderson 2002), and Bayesian information criterion (Schwarz 1978). Parametric bootstrapping

techniques were applied, where the mean and variance per year were used to define a distribution of possible values at each observed point. This extension allowed different variance estimates at each point, directly incorporating variance estimates from the surveys (e.g., MRIP, LDWF, and TPWD) into the projection framework. Because catch rates and average weights for many region-mode combinations appeared stabilized over the 2013-2014 period, additional sensitivity runs were performed using the mean of 2013-2014, 2014 (June 1-9 only), and 2014 (Wave 3) catch rates and average weights.

To generate a mean estimate with variance for 2015 Eastern and Western Gulf average weights for the Private and Charter modes, 1,000 bootstrapped time series were generated around the mean in-season average weights for the Eastern and Western Gulf, by mode of fishing. These bootstrapped time series incorporated uncertainty using weighted mean percent standard error (PSE) for red snapper average weights from the Eastern and Western Gulf. State- and mode-specific average weight PSE estimates were obtained from the MRIP website (www.countmyfish.noaa.gov), LDWF, and TPWD staff. PSE estimates were weighted by landings in pounds when aggregated to the region-mode level. Generalized linear model regressions with a Gaussian distribution were fit to each of the 1,000 bootstrapped time series and forecast to 2015. Residual diagnostics were used to verify goodness-of-fit. Each time series considered multiple input streams (e.g., 2004-2014, 2007-2014) with AIC and significance of parameter estimates used to guide selection of the appropriate input time series.

To generate a mean estimate with variance for 2015 Eastern and Western Gulf red snapper catch rates in numbers of fish for the Private and Charter modes, 1,000 bootstrapped time series were generated around the mean in-season catch rates in numbers for the Eastern and Western Gulf. These bootstrapped time series incorporated uncertainty using weighted mean Eastern Gulf MRIP and Western Gulf MRIP/LDWF/TPWD PSEs. For the Eastern Gulf, state-specific PSE estimates for landings (in numbers) were obtained from the MRIP website (www.countmyfish.noaa.gov) and weighted by landings in numbers. For the Western Gulf, MRIP (2004-2012), LDWF (2013-2014) and TPWD (2004-2013) survey estimates of landed (numbers of fish) PSE were weighted by landings in numbers. Generalized linear model regressions with a log-linked negative binomial distribution were fit to each of the 1,000 bootstrapped time series and forecast to 2015. Predictive covariates considered were model-estimated and model-projected spawning stock biomass (from the SEDAR-31 Update stock assessment), annual mean fuel prices (http://www.eia.gov/petroleum/data.cfm#prices), and annual per capita Gross Domestic Product (GDP; http://data.worldbank.org/country/united-states). Trends in these covariates are shown in **Figure 1**. Spawning stock biomass (SSB) was included to potentially account for changes in stock size (and corresponding availability) as the population rebuilds. Mean fuel prices were included because they are believed to have an influence on the ability of recreational fishermen to fish offshore where higher catch rates of red snapper are possible. Per Capita GDP was included because it is an indicator of the economic status of the United States overall, which may predict the ability of recreational anglers to afford to take trips for red snapper. For simplicity, 2015 projections assumed fuel prices and per capita GDP would remain stable at 2014 levels. Residual diagnostics were used

to verify goodness of fit. Each time series considered multiple input streams (e.g., 2004-2014, 2007-2014) with AIC and significance of parameter estimates used to guide selection of the appropriate input time series and inclusion of covariates.

Mean and variance estimates for 2015 Eastern/Western Gulf catch per day (in pounds per day), by mode, were computed by running summary statistics on the product of the 1,000 bootstrapped forecasts for 2015 average weight and the 1,000 bootstrapped forecasts for 2015 catch rate in numbers for both the Eastern and Western Gulf.

Uncertainty estimates are not generated for headboat survey catches. Due to differences in observed trends, it was still useful to project the changes in average weight and catch rate in numbers separately, then combine them for a forecast of catch rate in pounds. To generate a mean estimate with variance for 2015 Eastern/Western Gulf headboat average weights, a generalized linear regression model with a Gaussian distribution was fit to input data for 2007-2014 and forecast to 2015 for both regions. To generate a mean estimate with variance for 2015 Eastern/Western Gulf headboat catch rate in numbers, a generalized linear regression model with a Gaussian distribution was fit to input data for 2007-2014 and forecast to 2015 for both regions. Landings from Headboat Collaborative vessels were excluded from input data before fitting regression models. To appropriately express the combined uncertainty in the projected average weight and catch rate in numbers to generate a catch rate in pounds per day, 1,000 bootstrapped time series were generated around the mean projected 2015 average weight and catch rate in numbers for the Eastern and Western Gulf. These bootstrapped time series incorporated uncertainty using the standard error in the forecast from the regression model.

Mean and variance estimates for 2015 Eastern/Western Gulf headboat catch per day (in pounds per day) were computed by running summary statistics on the product of the 1,000 bootstrapped forecasts for 2015 average weight and the 1,000 bootstrapped forecasts for 2015 catch rate in numbers for both the Eastern and Western Gulf.

Because several Gulf states had adopted or suggested they might have fishing seasons for red snapper in state waters that would be incompatible with the federal season, separate out-of-season catch rates were computed for each state and mode using the most recent available data. For Alabama, Florida, and Mississippi, catch rates during Waves 2 and 4-5 in 2014 were used as proxies for catch rates in those waves in 2015. For Wave 3, catch rates from June 10-30, 2014, were used as proxies for out-of-season catch rates in Wave 3 of 2015. None of these states are anticipated to have openings in Waves 1 or 6 of 2015. For Louisiana, LDWF weekly catch rates from 2014 were used as proxies for out-of-season catch rates in 2015. For Texas, TPWD catch rates reported for Waves 1-2 2014 and Waves 4-6 of 2013 were used as proxies for those Waves in 2015, and state waters catch rates from Wave 3 2013 were used as a proxy for out-of-season landings that might take place outside the federal season during Wave 3 2015.

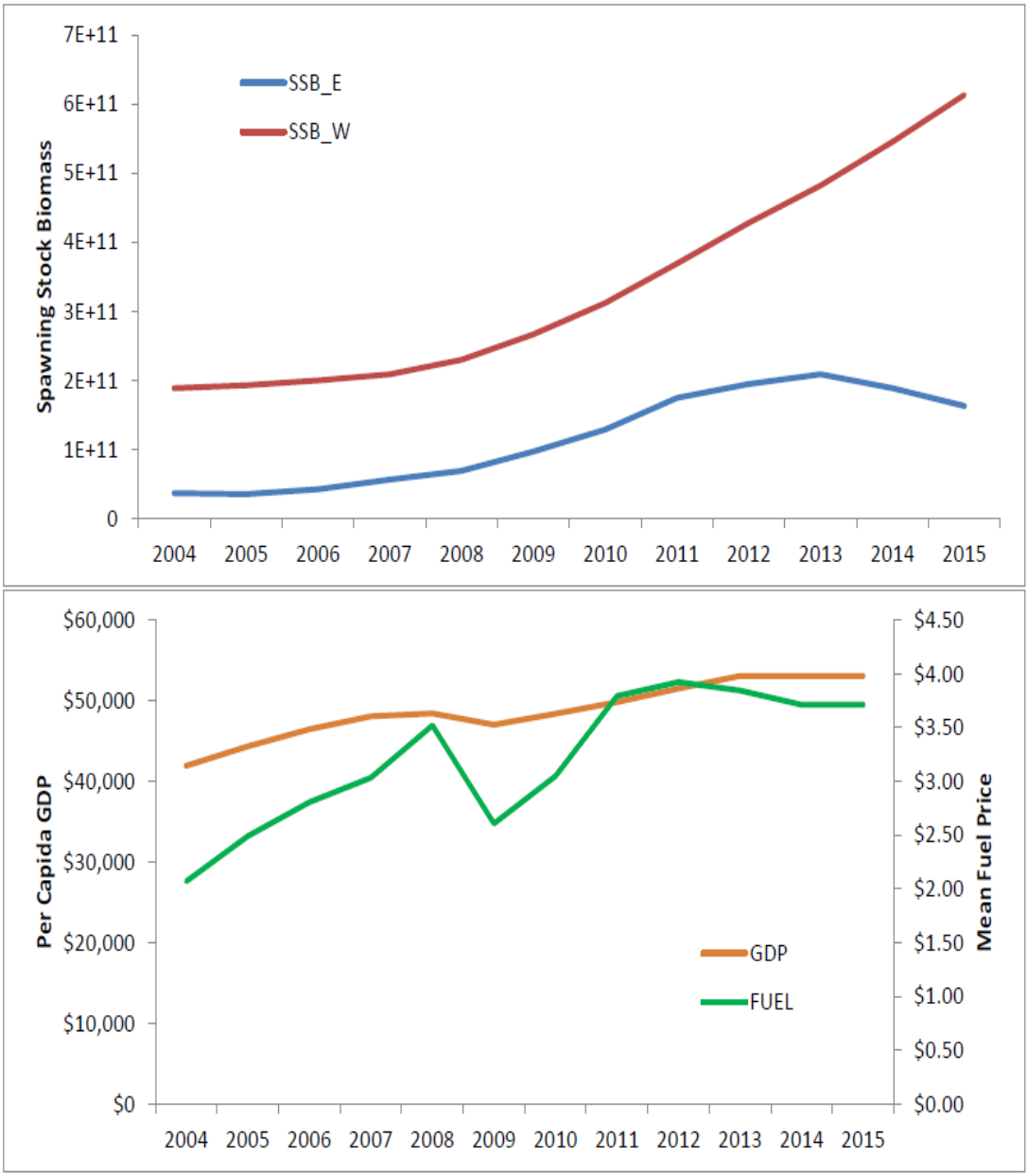

Figure 1. *Projection covariates.* Top: Spawning stock biomass (SSB) estimates, in billions of eggs, from SEDAR-31 Update (2014) stock assessment model for Eastern (blue) and Western (red) Gulf of Mexico red snapper stock, Bottom: U.S. Gross Domestic Product (orange) and mean unleaded fuel price (green).

Additionally, in 2014 NOAA Fisheries approved the Gulf Headboat Collaborative exempted fishing permit (EFP). In 2015, this EFP authorizes participating vessels to harvest 279,657 lb ww of the red snapper quotaHeadboats participating in the program could harvest red snapper beginning January 1. NOAA Fisheries is actively tracking landings (in numbers) in near real time and landings are being converted to pounds based on dockside sampling estimates. Projections accounted for the red snapper to be landed by the Headboat Collaborative. When estimating 2015 catch rates and average weights for headboats, historical landings by Collaborative vessels were removed from catch per day and average weight computations.

2015 Projections: Season Length

Forecasts of catch rates and average weights from best-fitting models were incorporated, along with their variance, into an Excel-based season length projection model to determine the federal season length under each scenario. This model accounted for out-of-season catch rates and state incompatibility with federal season length as described previously. Scenarios evaluated are presented in **Table 3**.

Table 3. Season length projection scenarios (A-F) evaluated. 'PRJ' denotes projected.

	Mode	A	B	C	D	E	F
Catch Rate	Charter	2014	2014	2014	Avg. 2013-14	PRJ (June 1-9)	PRJ (Wave 3)
	Private	2014	2014	2014	Avg. 2013-14	PRJ (June 1-9)	PRJ (Wave 3)
	HB	2014	2014	2014	Avg. 2013-14	PRJ	PRJ
Avg. Weight	Charter	PRJ	PRJ	2014	PRJ	PRJ (June 1-9)	PRJ (Wave 3)
	Private	2014	PRJ	2014	Avg. 2013-14	PRJ (June 1-9)	PRJ (Wave 3)
	HB	2014	PRJ	2014	Avg. 2013-14	PRJ	PRJ

Note: "June 1-9" denotes use of MRIP June 1-9 2014 federal season data, "Wave 3" denotes use of all Wave 3 data from 2014 to as input for MRIP 2014 catch rates and average weights.

Results

2014 Landings and Retrospective

Approximately 3.853 mp ww of red snapper were recreationally landed in the Gulf in 2014 (**Table 3**). These landings represented approximately 89% of the ACT and 71% of the ACL. The mean projected federal catch rate in 2014 was 226,011.4 lb ww per federal day. The observed federal catch rate in 2014 was 233,958.3 lb ww (a 3.5% overestimate). This level of forecasting precision was well within the uncertainty in observed federal catch rates.

Table 3. 2014 preliminary totals for Gulf recreational red snapper landings (pounds whole weight), by wave (1-6) and sector/mode.

Source	Sector	1	2	3	4	5	6	Total
MRIP	Private	0	14,173	2,017,009	320,215	5,034	0	2,356,431
	For-Hire	0	0	190,239	63,927	0	0	254,166
LA-DWF Creel	Private	0	58,995	280,491	90,665	71,611	26,467	528,229
	For-Hire	17,266	0	70,342	3,674	799	1,043	93,124
TPWD Creel	Private	5,089	3,562	*100,385*	*48,521*	*24,270*	*21,267*	203,094
	For-Hire	644	854	*15,157*	*7,418*	*8,253*	*3,073*	35,399
HBS	For-Hire	39,180	46,230	189,127	93,887	8,425	5,444	382,293
Total	Private	5,089	76,730	2,397,885	459,400	100,916	47,734	3,087,754
	For-Hire	57,090	47,084	464,865	168,905	17,477	9,560	764,982
	All Modes	**62,179**	**123,814**	**2,862,750**	**628,306**	**118,393**	**57,294**	**3,852,736**

MRIP: Marine Recreational Information Program (from Feb 2015 SEFSC ACL Dataset); LA-DWF Creel: Louisiana Department of Wildlife and Fisheries Creel Survey; TPWD Creel: Texas Parks and Wildlife Department Creel Survey.
Note: TPWD landings for Waves 3-6 2014 were not available at the time this report was prepared; 2013 used as proxy.

2015 Projections: Average Weights and Catch Rates

The bootstrapped distribution of average weights input into the projection model is shown in **Figure 2**. Generalized linear regression model fits to mean average weights, by mode and region, are shown in **Figure 3**.

In 2014, average weights for private, charter, and headboat in the Eastern Gulf were 7.50, 8.50, and 4.90 lb ww, respectively. Projected average weights for 2015 for private, charter, and headboat in the Eastern Gulf were 9.08, 8.85, and 5.48 lb ww, respectively (**Figure 3**: Top). In 2014, average weights for private, charter, and headboat in the Western Gulf were 6.98, 10.0, and 5.40 lb ww, respectively. Projected average weights for 2015 for private, charter, and headboat in the Western Gulf were 8.61, 10.56, and 6.98 lb ww, respectively (**Figure 3**: Bottom). Both Eastern and Western Gulf private and headboat model fits to 2014 data were overestimated, suggesting projected private and headboat 2015 average weights might be overestimates.

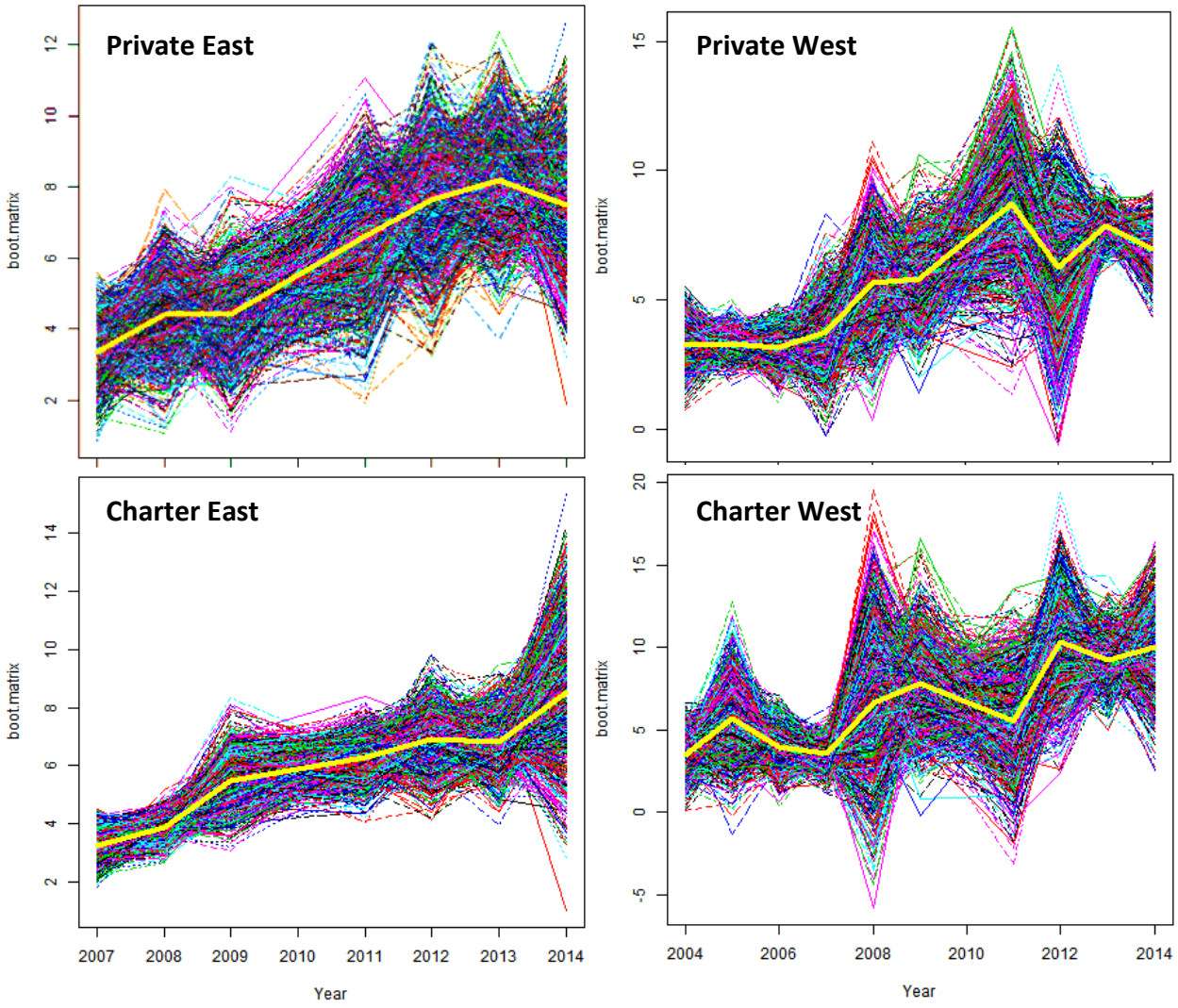

Figure 2. *Average weight uncertainty.* Bootstrapped distribution of average weights for recreational red snapper sampled by MRIP/LA Creel/TPWD in the Eastern and Western Gulf, with mean (yellow line) and time series generated using PSE (other colors).

The 2004-2014 observed private, charter, and headboat catch rates are shown in **Figure 4**. Not surprisingly, dividing Wave 3 landings by 9 open days resulted in higher catch rate estimates (**Figure 4**: red circles) for 2014 than doing the same to landings estimates from just June 1-9, 2014 (**Figure 4**: blue circles). The bootstrapped distribution of private and charter catch per day (in numbers) input into the projection model is shown in **Figure 5**. Uncertainty was high for private Eastern Gulf 2014 catch rates. Charter Eastern Gulf catch rates in 2014 were much lower than observed in 2013. Generalized linear regression model fits to mean catch per day (in numbers), by region, are shown in **Figure 6**.

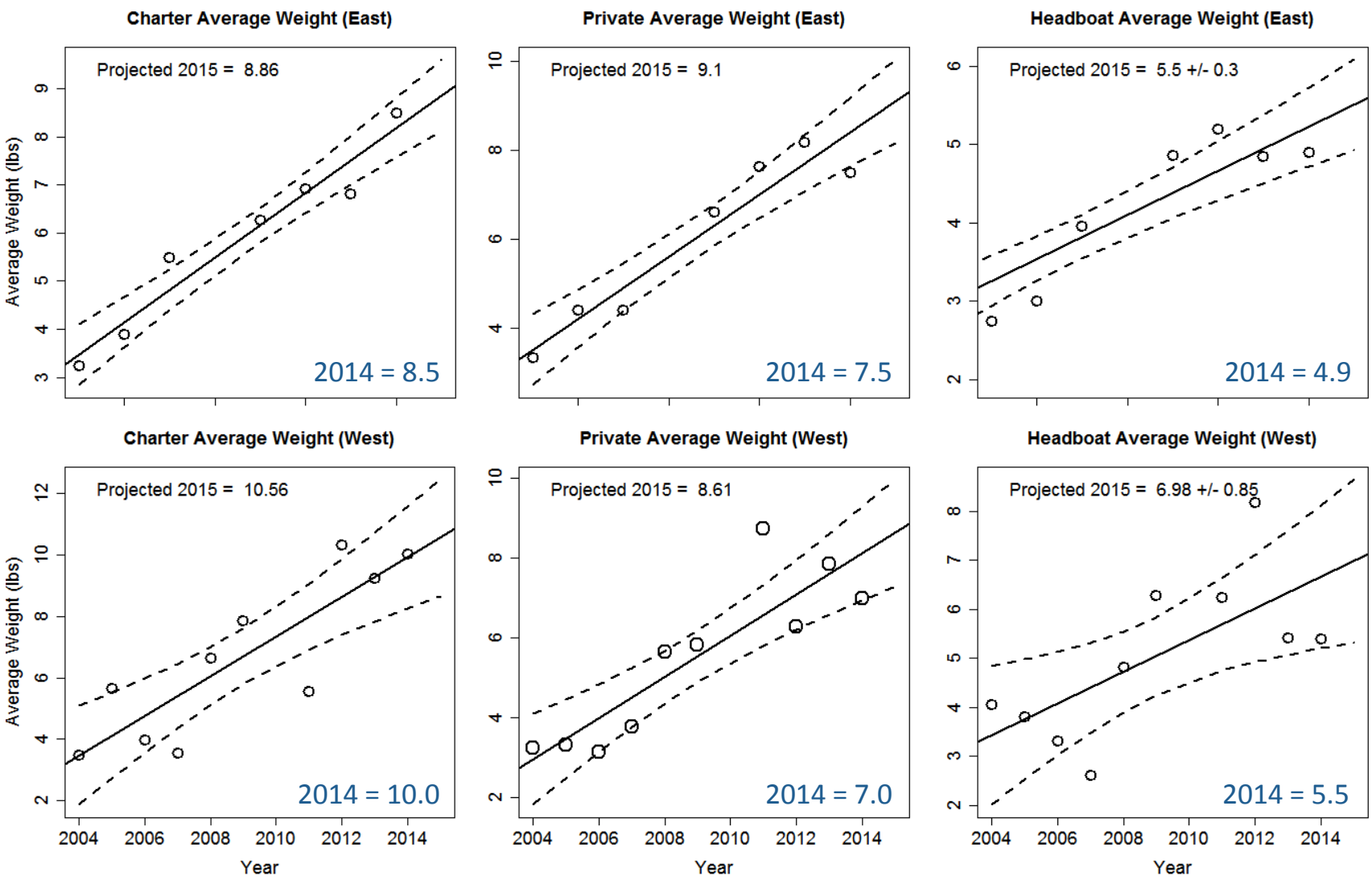

Figure 3. *Average weight projections.* Generalized linear regression fits to mean average weights for recreational red snapper sampled by MRIP/LA Creel/TPWD in the Eastern and Western Gulf. Dashed lines denote 95% confidence limits.

In 2014, in-season catch per federal day (in numbers) for private, charter, and headboat in the Eastern Gulf were 24,673, 1,848, and 1,120 fish/day, respectively, using June 1-9 post-stratified MRIP data. Using Wave 3 2014 MRIP data, the private catch rate increased to 31,581 fish/day, and the charter catch rate increased to 3,178 fish/day. Using June 1-9 post stratified MRIP input data for 2014, projected 2015 catch (in numbers) per day for Eastern Gulf private, charter, and headboats were 38,176, 945 and 1,268 fish/day, respectively (**Figure 6**). Eastern Gulf private catch rate projections included mean fuel prices as a significant predictor explaining 49.9% of the marginal deviance. This regression showed a dramatic increase. Eastern Gulf charter catch rate projections included SSB and GDP as significant predictors, explaining 47.9% and 37.4% of the marginal deviance, respectively. This regression showed a very steep decline. Eastern Gulf headboat catch rate regressions had no significant predictors, and the model fits were above the observed values in the final three years of the regression. In 2014, catch rates for private, charter, and headboats in the Western Gulf were 2,073, 483 and 1,574 fish/day, respectively. Projected 2015 catch (in numbers) per day for Western Gulf private was 2,503 fish/day (**Figure 6**). Western Gulf private catch rate model fits were above observed values in the final two years of the time series. No statistically significant regressions could be fit to Western Gulf charter or headboat catch rates.

The product of the bootstrapped distributions for average weights and catch (in numbers) per day yielded a distribution of projected catch (in pounds) per day. The distribution of projected 2015 catch (in pounds) per day for the private/charter sector in the Eastern and Western Gulf is shown in **Figure 7**. **Table 4** summarizes mean estimates of federal season catches per day from bootstrapped projections, by region and mode for the scenarios presented in **Table 2**. Estimated federal season lengths under different catch rate and average weight scenarios (A-F) and regulatory assumptions (with and without RF-40 implementation, with and without compatible state seasons) are presented in **Table 5**. In the absence of RF-40, the federal season in 2015 was projected to be between 9-21 days (up to 2.3 times longer than 2014). The median season length in the absence of RF-40 was projected at 13 days with states adopting incompatible seasons; 44% longer than the 2014 season. The implementation of RF-40 allows a much longer federal season for federally-permitted for-hire vessels (40-67 days; **Figure 8: top**), with private seasons between 5-16 days, depending on catch rates and state compatibility. Under RF-40, states adopting compatible seasons would gain 2-5 days of fishing in federal waters for private and state-licensed charter vessels, extending the federal season by 29-45% (**Table 5**, **Figure 8: middle**). In the absence of RF-40, states adopting compatible seasons would gain 2-4 days of fishing in federal waters for all vessels, extending the federal season by 22-30% (**Table 5**, **Figure 8: bottom**).

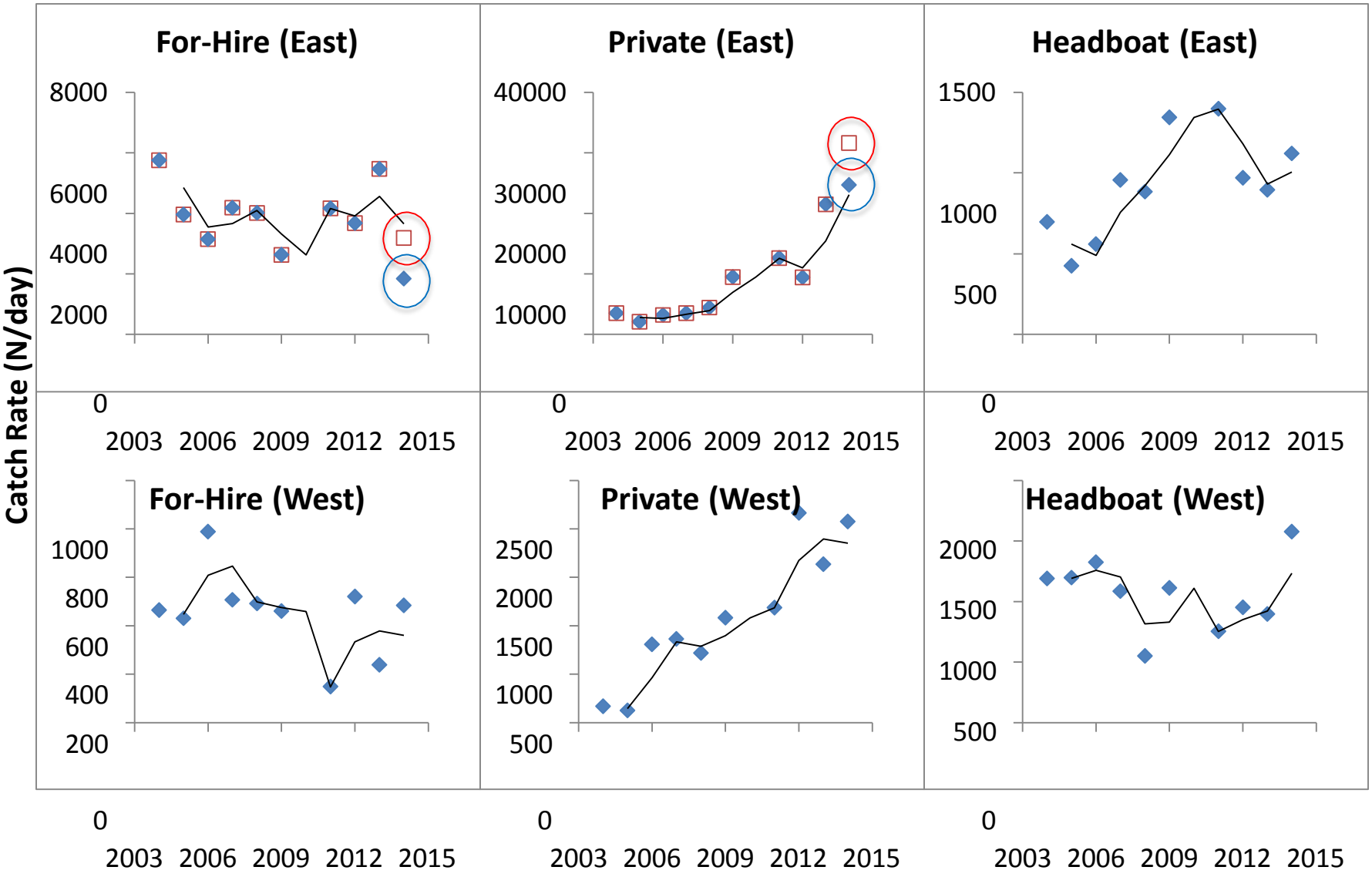

Figure 4. *Observed catch federal season catch rates.* Catch rates (catch in numbers per open federal day) from June 2004-2014 by mode and region are shown, with emphasis on differences between MRIP Wave 3 (red circles) and MRIP June 1-9 (blue circles).

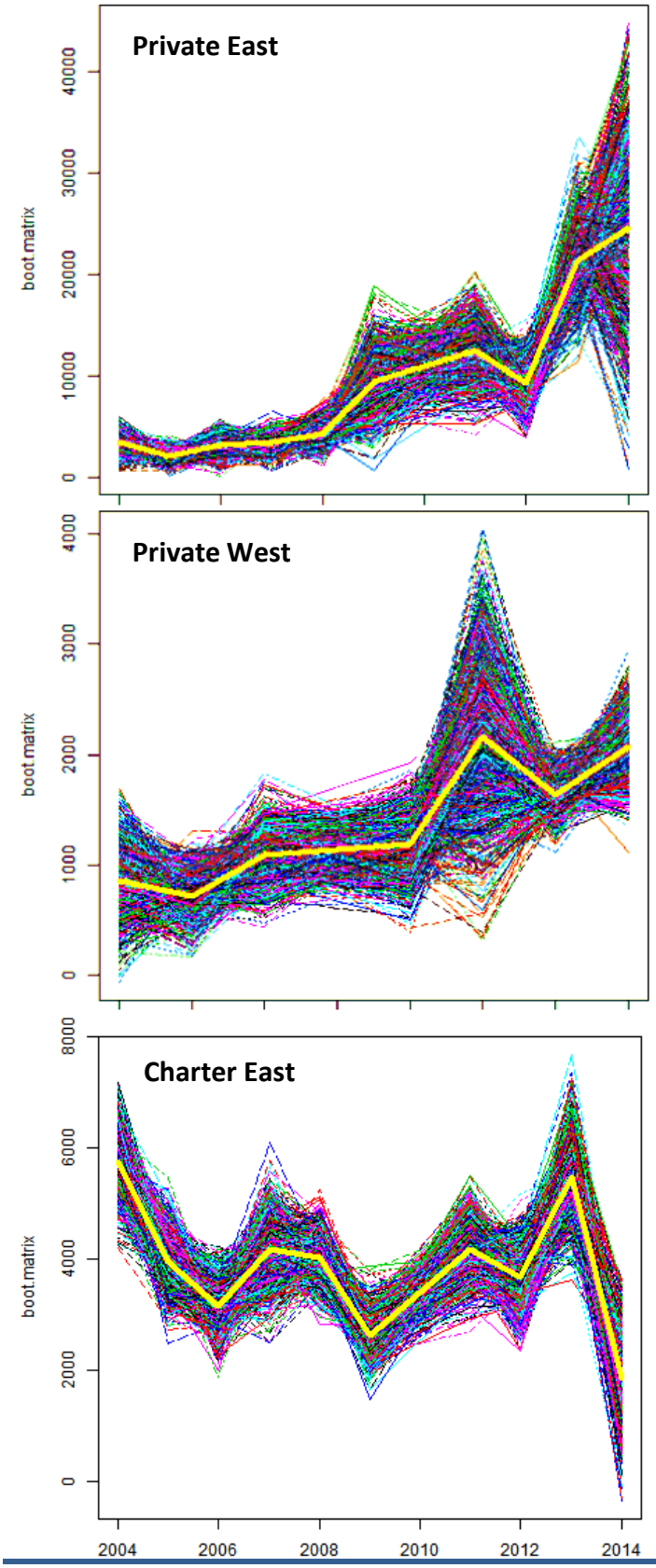

Figure 5. *Uncertainty in catch rates.* Bootstrapped distribution of catch (in numbers) per day, for recreational red snapper sampled by MRIP/LA Survey/TPWD in the Eastern and Western Gulf, with mean (yellow line) and time series generated using PSE (other colors). Note no significant regression fits were possible for Charter West.

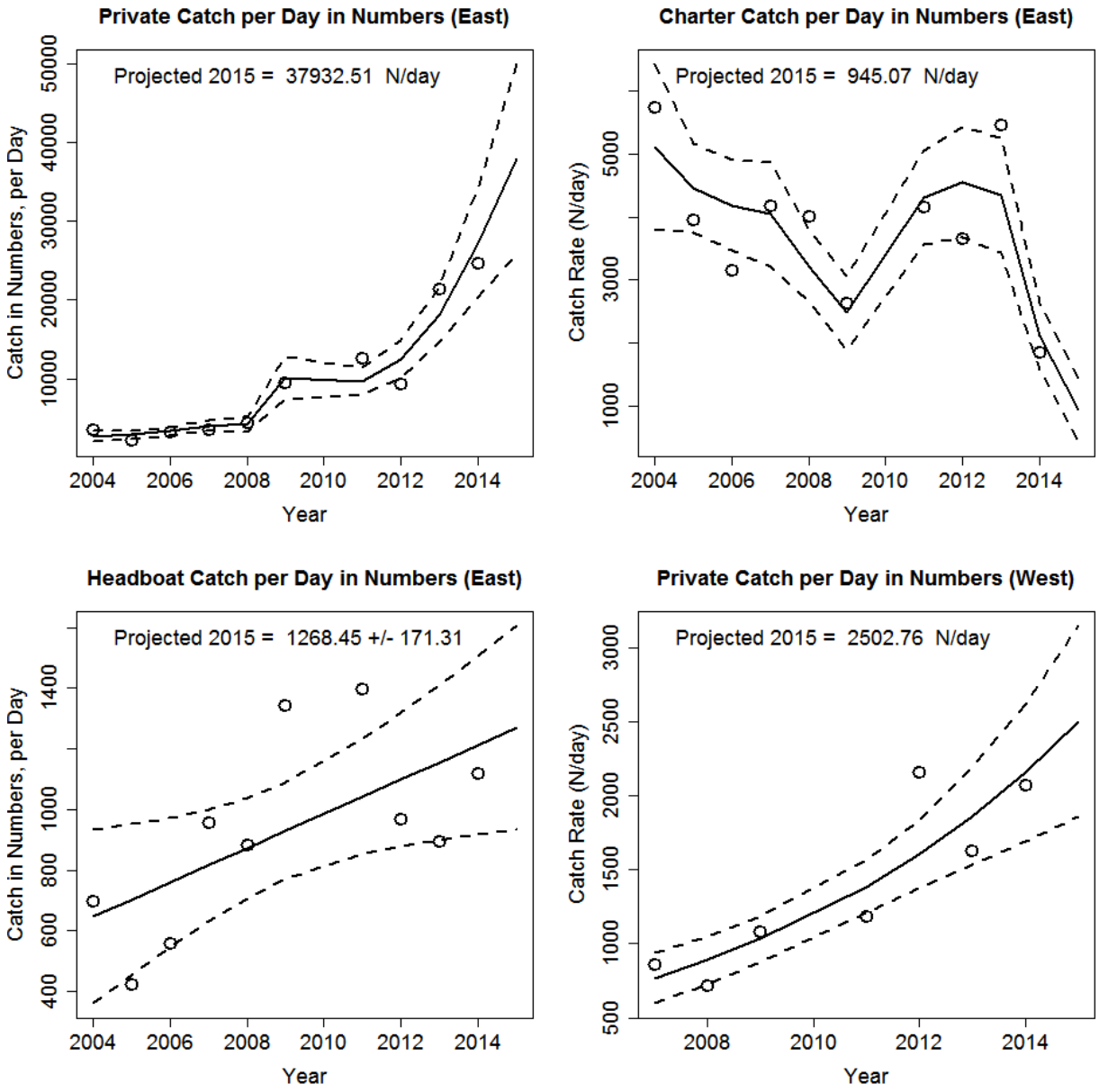

Figure 6. *Catch rate projections.* Generalized linear regression fits to mean catch (in numbers) per day for recreational red snapper sampled by MRIP/LA Creel/TPWD in the Eastern and Western Gulf. Note that headboat regressions incorporate spawning stock biomass as a predictive covariate. Dashed lines denote 95% confidence limits.

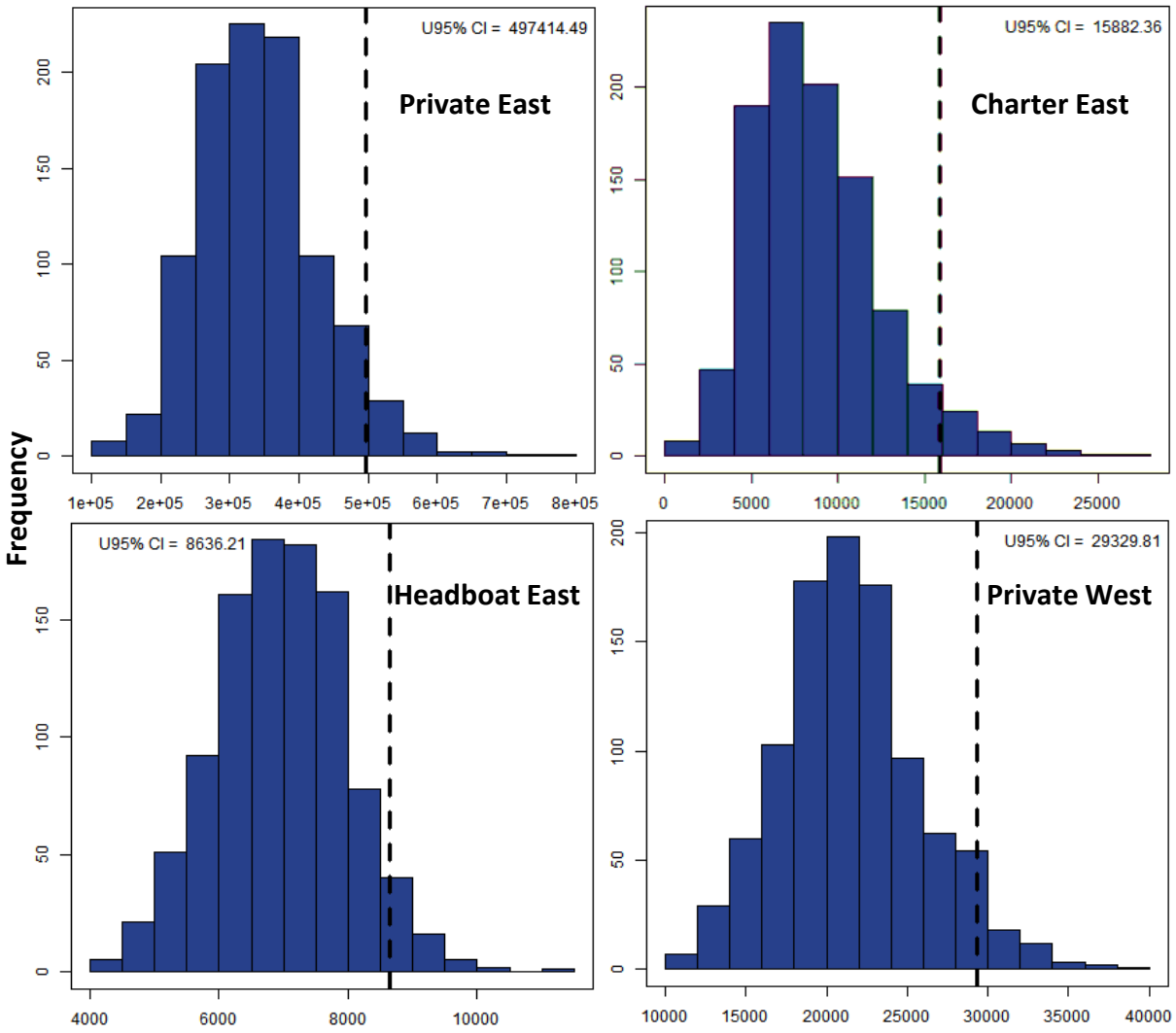

Figure 7. *Projected catch (in pounds) per federal day.* Projected catch rates from generalized linear regression fits to 1,000 bootstrapped distributions of average weight and catch (in numbers) per day for recreational red snapper in the Eastern and Western Gulf, by mode. Dashed lines denote 95% confidence limits. Note there were no significant regression fits for charter or headboat catch rates in the Western Gulf.

Table 4. Projected average weights (lb/fish) and catch rates (in numbers and lb ww) under different projection scenarios, by mode and region.

EAST	Mode	A	B	C	D	E	F
Catch (N/day)	Charter	3,178	3,178	3,178	4,319	1,003	1,767
	Private	24,673	31,581	31,581	23,070	38,176	43,738
Avg. Weight	Charter	8.85	8.85	8.50	8.85	8.85	8.85
	Private	7.50	9.08	7.50	7.84	9.08	9.08
Catch (lb ww/day)	Charter	28,124	28,124	27,007	38,215	8,879	15,636
	Private	184,951	286,896	236,740	180,876	346,803	397,339
	HB	5,486	5,486	5,486	4,905	6,959	6,957

WEST	Mode	A	B	C	D	E	F
Catch (N/day)	Charter	483	483	483	360	483	483
	Private	2,073	2,073	2,073	1,853	2,509	2,509
Avg. Weight	Charter	10.56	10.56	10.04	10.56	10.56	10.56
	Private	6.98	8.61	6.98	7.41	8.61	8.61
Catch (lb ww/day)	Charter	5,102	5,102	4,852	3,804	5,102	5,102
	Private	14,466	17,845	14,466	13,736	21,601	21,601
	HB	8,504	8,504	8,504	6,677	10,987	10,987

Table 5. Projected Gulf red snapper recreational season lengths (days) under different catch and average weight scenarios (A-F) and different assumptions regarding the implementation of Amendment 40 to the Reef Fish Fishery Management Plan (RF-40: "Sector Separation") and the compatibility of state seasons with the federal season in 2015.

State Seasons	RF-40	Sector	A	B	C	D	E	F	Mean	Median	Mode
Compatible	Implemented	For-Hire	45	45	46	40	67	55	50	46	45
		Private	16	9	12	16	8	7	11	11	16
Compatible	Not implemented	All	21	15	18	21	13	11	17	17	21
Incompatible	Implemented	For-Hire	45	45	46	40	67	55	50	46	45
		Private	11	7	9	11	6	5	8	8	11
Incompatible	Not implemented	All	17	12	14	17	10	9	13	13	17

Note: "Incompatible" state seasons assumes states implement seasons presented in Table 1.

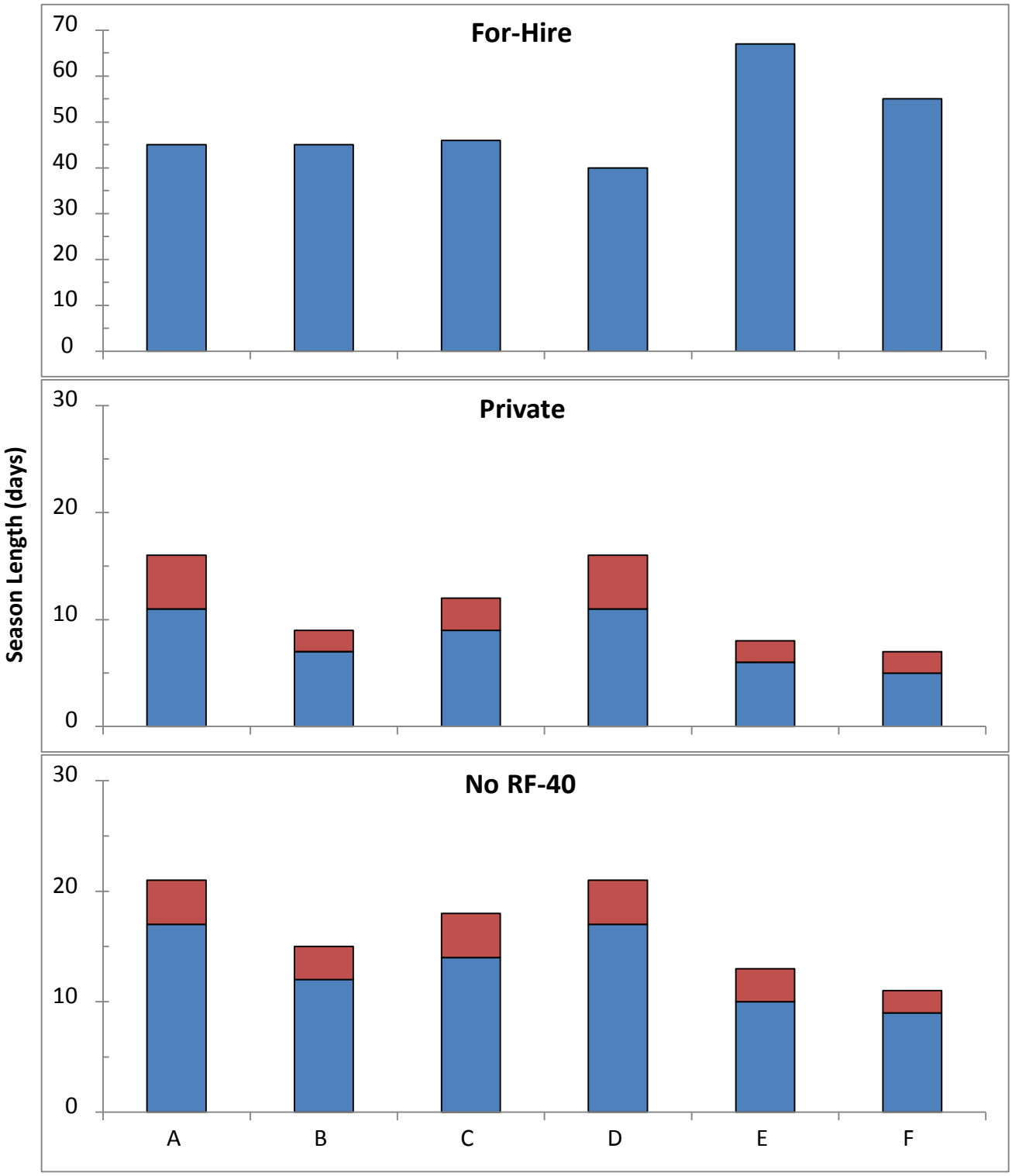
For-Hire
Private
No RF-40
Season Length (days)
70
60
50
40
30
20
10
0
30
20
10
0
30
20
10
0
A
B
C
D
E
F

Figure 8. Projected Gulf red snapper recreational season lengths (days), by sector, under different catch and average weight scenarios (A-F) without (blue) and with (red) compatible seasons from the Gulf states. Bottom figure shows season lengths without implementation of Reef Fish Amendment 40. Note vertical axis scale is different in top figure.

Discussion

In previous years, the Gulf recreational red snapper quota has been exceeded for a variety of reasons, including challenges with predicting angler behavior and landing rates, inconsistent state regulations, and rapidly increasing fish sizes. Projection assumptions have been refined to better account for increases in landings per day and changes in average weights. These refinements have led to increasingly more accurate predictions as described in SERO-LAPP-2013-10, SERO-LAPP-2014-04, and this document's retrospective analysis. Additionally, the implementation of a 20% buffer between the ACL and ACT has accounted for management uncertainty inherent in a protracted fishing season where the majority of landings are estimated by surveys.

There is considerable uncertainty in 2015 out-of-season state waters catch rates for the season length projection scenarios presented. Limited data exist to inform this uncertainty, so the
most recent data (2014: FL-LA, 2013/14: TX) were used as a proxy for anticipated 2015 out-of-season catch rates. If daily out-of-season catches in state waters are higher in 2015 than in previous years, the season lengths presented in Table 6 may be overestimates. This could happen if more anglers participate in state seasons or if red snapper population rebuilding results in higher catch rates in state waters. States adopting incompatible seasons could reduce the federal season length by 22-30% (2-4 days) in the absence of RF-40, and by 29-45% (2-5 days) for private and state-licensed charter vessels if RF-40 is implemented. RF-40 would result in a much longer federal fishing season for federally-permitted for-hire vessels (median = 46 days), with a median private season length of 11 days if states adopt compatible seasons and 8 days if states adopt the seasons presented in **Table 2**.

As with any projection model, the approaches discussed herein are dependent upon assumptions that historical data are accurately estimated and that historical trends are representative of future dynamics. Previous evaluations of Gulf recreational red snapper catch rates have indicated that effort compression (i.e., fishing pressure intensifies during open days as the season shortens) is occurring in the fishery (SERO-LAPP-2012-01). These dynamics are implicitly incorporated into the generalized linear regression approaches described by this document. Regression modeling approaches for the 2014 season (SERO-LAPP-2014-04) generated a catch rate estimate that was within 3.5% of the observed 2014 federal catch rate.

Although regression models for red snapper catch rates have provided compelling results in previous reports, several issues emerged during the regression modeling process incorporating the 2014 data. Western Gulf charter and headboat catch rate models failed to provide significant regression fits. The Western Gulf private catch rate model overestimated the final two years in the time series. The Eastern Gulf headboat catch rate model had no significant predictors and overestimated the final three years in the time series. The Eastern Gulf private catch rate model predicted catch rates in 2015 would be nearly double those in 2014, and the Eastern Gulf charter catch rate model predicted a dramatic decline. For these reasons, Scenarios E-F were considered potentially unreliable estimators for the 2015 season.

Several sensitivity runs used 2013 and 2014 data as predictors for 2015 (i.e., Scenarios A-D). Visual inspection of the catch rates presented in **Figure 4** suggested some stabilization in catch rates between the 2013-2014 seasons. This may be due to trends in red snapper recruitment to the recreational sector, reductions in the Eastern Gulf population (see **Figure 2**), or possible saturation in effort compression in the 2014 season, which was only 9 days long. Additionally, state seasons in 2013 and 2014 were longer than the federal season, which may have decelerated effort compression in the federal season. In general, season lengths based on regression models were longer for for-hire and shorter for private modes than those based on
2013-2014 data. For Scenarios A-D, under RF-40 and assuming states implement the seasons presented in **Table 2**, mean season lengths were 44 days for for-hire and 10 days for private.

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