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**1/19/2020**

# Modification of the Gulf of Mexico Lane Snapper Catch Limits and Accountability Measures

## Framework Action
## to the Fishery Management Plan for
## Reef Fish of the Gulf of Mexico

## January 2021

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# ENVIRONMENTAL ASSESSMENT COVER SHEET

**Name of Action**

Modification of the Gulf of Mexico Lane Snapper Catch Limits and Accountability Measures: Framework Action to the Fishery Management Plan for Reef Fish Resources in the Gulf of Mexico.

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**Type of Action**

| | |
|---|---|
| ( ) Administrative | ( ) Legislative |
| (X) Draft | ( ) Final |

# ABBREVIATIONS USED IN THIS DOCUMENT

| | |
|---|---|
| ABC | acceptable biological catch |
| ACL | annual catch limit |
| ACT | annual catch target |
| ALS | Accumulated Landings System |
| AM | accountability measure |
| APAIS | Access Point Angler Intercept Survey |
| BEA | Bureau of Economic Analysis |
| BiOp | biological opinion |
| CFpA | cash flow per angler |
| CHTS | coastal household telephone survey |
| CI | confidence interval |
| Council | Gulf of Mexico Fishery Management Council |
| CPUE | catch per unit |
| CS | consumer surplus |
| DLMTool | Data-Limited Methods Toolkit |
| DPS | distinct population segment |
| EA | environmental assessment |
| EEZ | exclusive economic zone |
| EFH | essential fish habitat |
| EJ | Environmental Justice |
| E.O. | Executive Order |
| ESA | Endangered Species Act |
| FES | Fishing Effort Survey |
| FHS | For-Hire Survey |
| FL | fork length |
| FMP | Fishery Management Plan |
| GDP | Gross Domestic Product |
| Gulf | Gulf of Mexico |
| gw | gutted weight |
| HAB | harmful algal bloom |
| HAPC | habitat area of particular concern |
| IFQ | individual fishing quota |
| LA Creel | Louisiana Department of Wildlife and Fisheries creel survey |
| Magnuson-Stevens Act | Magnuson-Stevens Fishery Management Act |
| mp | million pounds |
| MRFSS | Marine Recreational Fisheries Statistics Survey |
| MRIP | Marine Recreational Information Program |
| MSST | minimum stock size threshold |
| MSY | maximum sustainable yield |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanic and Atmospheric Administration |
| OFL | overfishing limit |
| PDF | probability density function |
| PS | producer surplus |

| | |
|---|---|
| Reef Fish FMP | Fishery Management Plan for Reef Fish Resources in the Gulf of |
| RFFA | Mexico |
| RQ | regional quotient |
| Secretary | Secretary of Commerce |
| SEDAR | Southeast Data, Assessment, and Review process |
| SEFSC | Southeast Fisheries Science Center |
| SERO | Southeast Regional Office |
| SRHS | Southeast Region Headboat Survey |
| SSBR | spawning stock biomass |
| SSC | Scientific and Statistical Committee |
| TNR | trip net revenue |
| TPWD | Texas Parks and Wildlife |
| ww | whole weight |

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# CHAPTER 1. INTRODUCTION

## 1.1 Background

Gulf of Mexico (Gulf) lane snapper is managed under the Fishery Management Plan (FMP) for Reef Fish Resources in the Gulf of Mexico (Reef Fish FMP) and harvest is monitored as a single stock with no allocation between the commercial and recreational sectors. In 2012, the Generic Annual Catch Limits and Accountability Measures Amendment for the Gulf of Mexico (Generic ACL/AM Amendment; GMFMC 2011a) defined the catch limits for lane snapper including the overfishing limit (OFL), acceptable biological catch (ABC), and ACL. Additionally, the Generic ACL/AM Amendment established AMs for lane snapper by defining an annual catch target (ACT) and an in-season closure for the following fishing year should the ACL have been exceeded in the previous fishing year (GMFMC 2011a). A more detailed description of the establishment of catch limits and AMs specific to lane snapper as defined in the Generic ACL/AM Amendment (GMFMC 2011a) is outlined in the next two sections. This framework action evaluates modifications to the lane snapper catch limits, ACT, and fishing season closure AM in response to the latest stock assessment, changes to the collection of recreational data, and recent overharvest of the stock ACL.

*Establishment of lane snapper catch limits*

In the Generic ACL/AM Amendment, catch limits for lane snapper were defined using the Gulf of Mexico Fishery Management Council's (Council) ABC Control Rule, which employs a tiered approach in setting harvest thresholds for species based on factors such as stock status and scientific uncertainty (GMFMC 2011a). Tier 3a of this control rule was used to establish the OFL and ABC for lane snapper. Tier 3a is used for species when no stock assessment is available, but landings data exist, and the probability of exceeding the OFL in a given year can be approximated from the variance about the mean of recent landings. Using this control rule, the OFL for lane snapper was set at the mean of landings for a defined 10-year reference period (1999-2008) plus two standard deviations, which equaled 358,000 lbs whole weight (ww; Table 1.1.1). The ABC, which must be set at or below the OFL and accounts for scientific uncertainty, was set at the mean of landings for the reference period plus one standard deviation, equal to 301,000 lbs ww (Table 1.1.1). The ACL was set equal to the ABC (Table 1.1.1).

**Table 1.1.1.** Current catch limits and AMs for lane snapper as defined in the Generic ACL/AM Amendment. The 1999-2008 fishing seasons were used to compute the 10-year average. All values for catch limits and the ACT are in pounds whole weight.

| **Catch limits** | | |
|---|---|---|
| **Type** | **Value** | **Calculation method** |
| OFL | 358,000 | 10-year average + 2 standard deviations |
| ABC | 301,000 | 10-year average + 1 standard deviations |
| ACL | 301,000 | Set equal to ABC |
| **Accountability Measures** | | |
| ACT | Set at 259,000 lbs ww based on the Council's ACL/ACT Control Rule (A 14% reduction from the ACL) | |
| Fishing season closure | In the year following an overage of the ACL, an in-season closure will occur if harvest meets or is predicted to meet the ACL within that fishing year. | |

*Establishment of lane snapper AMs*

Generally, an ACT is calculated as a fraction of the ACL and provides a buffer to account for management uncertainty and reduces the probability of meeting or exceeding the ACL. For lane snapper, the ACT was set 14% below the ACL at 259,000 lbs ww (Table 1.1.1) and was calculated using the Council's ACL/ACT Control Rule (GMFMC 2011a; Appendix A). However, this ACT is not currently used to trigger the fishing season closure AM. Instead, the Generic ACL/AM Amendment (GMFMC 2011a) established a fishing season closure AM that states that if the ACL is exceeded in a given year, an in-season closure is triggered if the ACL is met or estimated to be met in the following year (Table 1.1.1).

*Recent lane snapper landings and fishing season closure implementation*

The lane snapper fishing season runs from January 1 – December 31. The ACL is based on the total catch and is not allocated between the commercial and recreational sectors. Lane snapper harvest is subject to an 8-inch total length minimum size limit (commercial and recreational), and is included within the 20-reef fish aggregate recreational bag limit. Lane snapper harvest exceeded the ACL each year from 2016 – 2019 (2019 data are preliminary; Table 1.1.2). In 2017, lane snapper harvest exceeded the ACL by 188%. In early 2019, the National Marine Fisheries Service (NMFS) notified the Council that landings in 2017 exceeded the OFL, resulting in overfishing. NMFS stated that preliminary 2018 data indicated that landings would not exceed the OFL in 2018, but likely exceeded the ACL, and that a closure in 2019 may be necessary[1]. In December 2019, NMFS closed fishing for lane snapper for the remainder of the

[1] Later in 2019, NMFS determined that 2018 landings had exceeded the OFL. However, the SEFSC then revised the 2018 recreational landings estimates to reflect more precise weight estimates within sample areas. This resulted in a decreased estimate of the recreational landings for Gulf lane snapper, and a subsequent determination that this stock was not subject to overfishing in 2018 (i.e., OFL was not exceeded).

fishing year based on a projection that the ACL would be met[2]. While 2019 landings data are preliminary, as of August 2020, lane snapper harvest for the 2019 fishing year was 382,398 lbs (127% of ACL).[3] Lane snapper recreational, commercial, and total landings for 1999 through 2019 are presented in Table 1.1.2. Recreational harvest data in Table 1.1.2 are presented in the Marine Recreational Fisheries Statistics Survey (MRFSS) units so that they are comparable to the current catch limit, against which harvest is monitored. A more detailed description on the recent changes to the collection of recreational data collection can be found in the "*Changes to the Recreational Data Collection Survey*" section.

**Table 1.1.2.** Lane snapper landings for the recreational (in MRFSS) and commercial sectors in pounds whole weight for the years 1999 through 2019.

| Year | Recreational Sector (MRFSS) | Commercial Sector | Total | Total ACL | % Total ACL |
|---|---|---|---|---|---|
| **1999** | 176,052 | 49,233 | 225,285 | | |
| **2000** | 122,287 | 47,684 | 169,971 | | |
| **2001** | 276,414 | 48,782 | 325,196 | | |
| **2002** | 166,543 | 52,970 | 219,513 | | |
| **2003** | 179,742 | 50,584 | 230,326 | | |
| **2004** | 283,281 | 50,772 | 334,053 | | |
| **2005** | 249,983 | 39,951 | 289,934 | | |
| **2006** | 184,446 | 49,340 | 233,786 | | |
| **2007** | 205,793 | 29,222 | 235,015 | | |
| **2008** | 179,013 | 25,475 | 204,488 | | |
| **2009** | 207,468 | 35,848 | 243,316 | | |
| **2010** | 94,697 | 17,262 | 111,959 | | |
| **2011** | 92,172 | 14,365 | 106,537 | | |
| **2012** | 154,787 | 28,928 | 183,715 | 301,000 | 61% |
| **2013** | 222,713 | 23,189 | 245,902 | 301,000 | 82% |
| **2014** | 246,996 | 30,249 | 277,245 | 301,000 | 92% |
| **2015** | 207,243 | 46,163 | 253,406 | 301,000 | 84% |
| **2016** | 272,247 | 34,913 | 307,160 | 301,000 | 102% |
| **2017** | 523,878 | 42,831 | 566,709 | 301,000 | 188% |
| **2018** | 312,882 | 26,600 | 339,482 | 301,000 | 113% |
| **2019*** | 382,398 | 23,716 | 358,682 | 301,000 | 127% |

*2019 data are preliminary (current as of August, 2020)
Source: SEFSC Commercial ACL data (Nov 2019) and SEFSC MRFSS Recreational ACL data (Apr 2020).

[2] https://www.fisheries.noaa.gov/bulletin/recreational-and-commercial-harvest-lane-snapper-federal-waters-gulf-mexico-will-close
[3] https://www.fisheries.noaa.gov/southeast/2018-2020-preliminary-gulf-mexico-stock-annual-catch-limit-landings

Currently, data used by NMFS to monitor private recreational landings of lane snapper are collected from the following fishery-dependent surveys: the Marine Recreational Information Program (MRIP) Fishing Effort Survey (FES), the MRIP Access Point Angler Intercept Survey (APAIS), the Southeast Region Headboat Survey (SRHS), Louisiana Department of Wildlife and Fisheries creel survey (LA Creel), and the Texas Parks and Wildlife Department creel survey (TPWD). Charter vessel landings estimates are generated through the For-Hire Survey (FHS) and APAIS. Headboat catch estimates are from the SRHS, which incorporates data from approximately 65 to 70 permitted headboats in the Gulf. Once landings are received by the Southeast Fisheries Science Center (SEFSC), they are checked for errors, any necessary weight estimates are generated, and the landings are combined into an ACL dataset for monitoring landings. The availability of recreational landings for monitoring is survey-dependent. For example, MRIP landings are generated in two-month waves, and are typically provided 45 days after a wave ends (e.g., May – June landings are usually provided by August 15). SRHS landings for species with in-season closures are typically available within one month of landing, and an annual summary of headboat landings for all stocks is available by March of the following year. However, NMFS recently published a final rule (85 FR 44005, effective Jan. 5, 2021) that requires trip-level electronic reporting for all federally permitted charter and headboats in the Gulf. This is expected to increase the accuracy and timeliness of data from the SRHS, but may take longer for landings for charter vessels to be used for management. TPWD provides landings twice a year: for low-use (November 21 – May 14) and high-use (May 15 – November 20) waves. TPWD low-use wave landings are available by fall (approximately October) and TPWD high-use wave landings are available in spring (approximately March). LA Creel landings are available approximately two weeks after landing.

*Stock Assessment*

In 2016, the Southeast Data, Assessment, and Review (SEDAR) process completed a stock assessment on Gulf lane snapper (SEDAR 49 2016). Lane snapper was assessed using the iTarget model from the National Oceanic and Atmospheric Association's (NOAA) Data-Limited Methods Toolkit (DLMtool).[4] The iTarget model is not specifically designed to provide a stock status determination; however, it can be used to infer stock condition based on historical data. The harvest data time series for the assessment encompassed the 1986 through 2014 fishing years. When reviewing SEDAR 49, the Council's Scientific and Statistical Committee (SSC) determined that the results of the model (OFL = 364,082 lbs, ABC = 355,501 lbs) represented the best scientific information available for lane snapper and were suitable for management advice. Because the 2016 SEDAR 49 results were similar to what had been established in the 2011 Generic ACL/AM Amendment, the Council determined that it was not necessary to implement the SSC recommendations and previous harvest thresholds established by the Generic ACL/AM Amendment remained in place (Table 1.1.1).

On June 6, 2019, in response to the notification from NMFS that lane snapper experienced overfishing in 2017 and exceeded the ACL in 2018, the Council requested that the SEFSC provide an update to the most recent lane snapper assessment to include the additional landings data from the 2015-2018 fishing years in the model. The SEFSC completed the update to

[4] DLMtool available at http://www.datalimitedtoolkit.org/.

SEDAR 49 and recreational landings data reported by participants in the SRHS from 1986-2018 were used to update an index of abundance for lane snapper (SEDAR 49 Update 2019) .[5]

At the September 2019 SSC meeting, the SEFSC presented the results of the SEDAR 49 update. The SSC determined that this update represented the best scientific information available. However, the recreational data included in the assessment update and presented to the SSC used APAIS-adjusted Coastal Household Telephone Survey (CHTS) values. The effort portion of the MRIP survey has since been replaced by the FES (see section below). The SSC requested that the recreational data used to calculate the estimated catch limits be converted to values directly comparable to those collected in the FES as recommended by NMFS (NOAA Fisheries 2019). At the January 2020 SSC meeting, the SEFSC presented the updated catch limits using the MRIP-FES converted recreational landings. However, the January 2020 update provided estimates of catch limits for total removals including dead discards, rather than landings that are used in quota monitoring. Thus, the SSC requested additional projections based on landings rather than total removals. The SEFSC provided updated catch limit projections in a March 2020 memo.[5] At the March 2020 SSC meeting, the SSC determined that the most recent methods used to generate catch limits for lane snapper represented the best scientific information available and were suitable for management advice. Since catch limit estimates were generated based on the March 2020 SEDAR 49 assessment update, the SSC recommended modifying the justification for setting lane snapper catch limits from the Tier 3a approach to the Tier 2 approach outlined in the Generic ACL/AM Amendment (GMFMC 2011a).

The Tier 2 approach for setting management thresholds is appropriate for species where a stock assessment exists but does not provide an estimate of maximum sustainable yield (MSY) or its proxy. Instead, the assessment provides a measure of OFL based on a probability density function (PDF) that can be calculated to estimate scientific uncertainty in the model-derived OFL measure. This PDF can be used to approximate the probability of exceeding the OFL, thus providing a buffer between the OFL and ABC (GMFMC 2011a). The SSC recommended establishing an ABC with a 30% probability of overfishing and an OFL with a 50% probability of overfishing for lane snapper.

*Changes to the Recreational Data Collection Survey*

MRFSS was started by NMFS in 1979. In the Gulf, MRFSS collected data on catch and effort in recreational fisheries, including lane snapper, and the first recreational estimates derived from the program were available in 1981. The program included the APAIS, which consists of on-site interviews at marinas and other points where recreational anglers fish, to determine catch. MRFSS also included the CHTS, which used random-digit dialing of homes in coastal counties to contact anglers to determine fishing effort. In 2000, the FHS was implemented to incorporate for-hire effort due to lack of coverage of charter boat anglers by the CHTS. The FHS used a directory of all known charter boats (i.e., for-hire vessels that do not participate in the SRHS) and a weekly telephone sample of the charter boat operators to obtain effort information.

[5] https://drive.google.com/open?id=1kXvp8ejSAxt1XKQLTv9YCrQt4UKPmrVj

In 2008, MRIP was established to replace MRFSS to meet increasing demand for more precise, accurate, and timely recreational catch estimates. After the National Academy of Sciences identified potential sources of bias in the sampling process (NRC 2006), catch survey protocols were revised. This led to a new design for the APAIS that was certified and subsequently implemented in 2013 to measure recreational catch on the Atlantic and Gulf coasts. This significantly improved how intercepts were conducted. This new design addressed concerns regarding the validity of the survey approach, specifically that trips recorded during a given time period were representative of trips for a full day (Foster et al. 2018). The more complete temporal coverage with the new survey design provided for consistent increases or decreases in APAIS angler catch rate statistics, which are used in stock assessments and management, for at least some species (NOAA Fisheries 2019).

MRIP is a more scientifically sound methodology for estimating catch because it reduces some sources of potential bias as compared to MRFSS resulting in more accurate catch estimates. Specifically, CHTS was improved to better estimate private angling effort. Instead of random telephone calls, MRIP-CHTS used targeted calls to anglers registered with a federal or state saltwater fishing registry. Subsequently, MRIP transitioned from the CHTS to a new mail-based FES beginning in 2015, and in 2018, replaced the CHTS. Both survey methods collect data needed to estimate marine recreational fishing effort (number of fishing trips) by shore and private/rental boat anglers on the Atlantic and Gulf coasts. The CHTS used random-digit dialing of homes in coastal counties to contact anglers. The new mail-based FES uses angler license and registration information as one way to identify and contact anglers (supplemented with data from the U.S. Postal Service, which includes virtually all U.S. households). Because of the survey differences between FES and CHTS, NMFS conducted side-by side testing of the two methods from 2015 to 2018 and developed calibration procedures to convert the historical catch estimates that were generated using prior methods (MRFSS, MRIP-CHTS, APAIS adjusted MRIP) into MRIP-FES. In general, landings estimates are higher using the MRIP-FES as compared to the prior methods. This is because the FES is designed to more accurately measure fishing activity than the CHTS, not because there was a sudden rise in fishing effort. NMFS developed a calibration model to adjust historic effort estimates so that they can be accurately compared to new estimates from the FES. The new effort estimates alone do not lead to definitive conclusions about stock size or status in the past or currently. NMFS determined that the MRIP-FES data, when fully calibrated to ensure comparability among years and across states, produced the best available data for use in stock assessments and management (NOAA Fisheries 2019). Table 1.1.3 reports lane snapper landings for the 1999 through 2018 fishing years using the MRIP-FES harvest data for the recreational sector.

**Table 1.1.3.** Lane snapper landings for the recreational (in MRIP-FES) and commercial sectors in pounds whole weight for the years 1999 through 2018.

| Year | Recreational Sector (MRIP-FES) | Commercial Sector | Total |
|---|---|---|---|
| **1999** | 476,545 | 48,782 | 525,327 |
| **2000** | 221,657 | 52,970 | 274,627 |
| **2001** | 829,636 | 48,782 | 878,418 |
| **2002** | 434,789 | 52,970 | 487,759 |
| **2003** | 501,227 | 50,584 | 551,811 |
| **2004** | 606,849 | 50,772 | 657,621 |
| **2005** | 509,985 | 39,951 | 549,936 |
| **2006** | 513,265 | 49,340 | 562,605 |
| **2007** | 531,427 | 29,222 | 560,649 |
| **2008** | 354,497 | 25,475 | 379,972 |
| **2009** | 535,177 | 35,848 | 571,025 |
| **2010** | 178,745 | 17,262 | 196,007 |
| **2011** | 151,383 | 14,365 | 165,748 |
| **2012** | 423,289 | 28,928 | 452,217 |
| **2013** | 456,629 | 23,189 | 479,818 |
| **2014** | 468,017 | 30,249 | 498,266 |
| **2015** | 400,237 | 46,163 | 446,400 |
| **2016** | 612,604 | 34,913 | 647,517 |
| **2017** | 1,272,225 | 42,831 | 1,315,056 |
| **2018** | 791,572 | 26,600 | 818,172 |

Source: SEFSC Commercial ACL data (Nov 2019), and SEFSC MRIP FES Recreational ACL data (Jan 2020).

*Summary of background and considerations for future lane snapper management*

In summary, changes to lane snapper management are being considered due to an increase in stock biomass as documented in the latest stock assessment, changes to the collection of recreational data, and recent overages of the stock OFL and ACL. The SSC has recommended an increase to catch limits based on the most recent assessment update. Additionally, the SSC recommended that catch limits be updated to account for changes in recreational data collection since MRIP-FES, and no longer MRFSS, is the survey used to estimate recreational fishing harvest. Action 1 considers updates to the lane snapper stock catch limits and ACT based on the SSC's recommendations (Table 1.1.4). Action 2 considers modifying the fishing closure AM, because of the recent overages of the ACL (Table 1.1.4).

**Table 1.1.4.** Actions considered in this framework action to update the catch limits and ACT of lane snapper along with potential considerations for modifying the fishing season closure AM.

| **Action 1 – Updating Catch Limits and ACT** | | | | | |
|---|---|---|---|---|---|
| **Alternative** | **OFL** | **ABC** | **ACL** | **ACT** | **Description** |
| **Alternative 1** | *358,000* | *301,000* | *301,000* | *259,000* | Retains current values. Does not account for stock assessment update or changes in recreational data collection |
| **Preferred Alternative 2** | 1,053,834 | 1,028,973 | 1,028,973 | Not set | Updates catch limits only (not ACT) to account for stock assessment and changes in recreational data collection |
| **Alternative 3** | 1,053,834 | 1,028,973 | 1,028,973 | 864,337 | Updates catch limits and ACT to account for stock assessment and changes in recreational data collection |

| **Action 2 – Modification of fishing season closure AM** | |
|---|---|
| **Alternative** | **Description** |
| **Alternative 1** | Retains current fishing season closure AM: In the year following a harvest exceeding the **ACL**, the stock is monitored to the **ACL** and an in-season closure will occur if harvest meets or is predicted to meet the **ACL** within that fishing year. |
| **Alternative 2** | Modifies fishing season closure AM: In the year following a harvest exceeding the **ACL**, the stock is monitored to the **ACT** and an in-season closure will occur if harvest meets or is projected to meet the ACT within that fishing year. |
| **Preferred Alternative 3: Option a** | Modifies fishing season closure AM to an in-season closure should the **ACL** be projected to be met or exceeded during the fishing year |
| **Alternative 3: Option b** | Modifies fishing season closure AM to an in-season closure should the **ACT** be projected to be met or exceeded during the fishing year |

Notes: Values for the catch limits and ACT are in pounds whole weight. Non-italicized values represent catch limits and the ACT calculated using recreational data in MRIP-FES. Italicized values represent catch limits and the ACT calculated using recreational data in MRFSS.

## 1.2 Purpose and Need

The purpose is to modify the OFL, ABC, and ACL based on recently updated yield projections for Gulf lane snapper and to consider updating the current AMs to account for management uncertainty.

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

## 1.3 History of Management

The **Reef Fish FMP** was implemented November 8, 1984. The original list of species included in the management unit consisted of snappers, groupers, and sea basses. This summary focuses on management actions pertinent to the harvest of lane snapper. A complete history of management for the **Reef Fish FMP** is available on the Council's website.[6]

**Amendment 1** to the Reef Fish FMP was implemented February 21, 1990, and was a major revision of the original Reef Fish FMP. It set as a primary objective of the FMP the stabilization of long-term population levels of all reef fish species by establishing a survival rate of biomass into the stock of spawning age to achieve at least 20% spawning stock biomass per recruit (SSBR), relative to the SSBR that would occur with no fishing. The target date for achieving the 20% SSBR goal was set at January 1, 2000. Amendment 1 also set an 8-inch total length minimum size limit on lane snapper for both the commercial and recreational sectors.

**Amendment 12**, implemented in January 1997, created an aggregate bag limit of 20 reef fish for all reef fish species not having a bag limit (including lane snapper).

The **Generic ACL/AM Amendment** was implemented on January 30, 2012, and addressed a requirement in the Reauthorized Magnuson-Stevens Act of 2006 to establish ACLs and AMs for federally managed species. The amendment established an OFL of 358,000 lbs, and an ABC of 301,000 lbs for lane snapper based on Tier 3a of the Council's ABC Control Rule. The lane snapper ACL was set equal to the ABC. This action also established a control rule to set an ACT for several species including lane snapper.

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

# CHAPTER 2. MANAGEMENT ALTERNATIVES

## 2.1 Action 1 – Modify Catch Limits and Annual Catch Target for Lane Snapper

**Alternative 1:** No Action. The lane snapper overfishing limit (OFL), acceptable biological catch (ABC), annual catch limit (ACL), and annual catch target (ACT) will remain the same as implemented in 2012 by the Generic ACL and Accountability Measures (ACL/AM) Amendment.

| Year | OFL | ABC | ACL | ACT |
|---|---|---|---|---|
| **2021+** | 358,000 | 301,000 | 301,000 | 259,000 |

Note: Values presented in the Marine Recreational Fisheries Statistical Survey (MRFSS) in pounds whole weight.

**Preferred Alternative 2:** Modify the lane snapper OFL, ABC, and ACL based on the recommendation of the Scientific and Statistical Committee (SSC) for 2021 and subsequent years from the updated yield projections, as presented to the SSC in March 2020. Do not set an ACT.

| Year | OFL | ABC | ACL |
|---|---|---|---|
| **2021+ (MRIP-FES)** | 1,053,834 | 1,028,973 | 1,028,973 |
| **2021+ (MRFSS)** | 592,941 | 578,953 | 578,953 |

Note: Catch limit values in MRFSS are provided for comparison only.

**Alternative 3:** Modify the lane snapper OFL, ABC, and ACL based on the recommendation of the SSC for 2021 and subsequent years from the updated yield projections, as presented to the SSC in March 2020. Set an ACT using the Gulf of Mexico Fishery Management Council's (Council) ACL/ACT Control Rule, which would result in a 16% buffer between the ACL and the ACT.

| Year | OFL | ABC | ACL | ACT |
|---|---|---|---|---|
| **2021+ (MRIP-FES)** | 1,053,834 | 1,028,973 | 1,028,973 | 864,337 |
| **2021+ (MRFSS)** | 592,941 | 578,953 | 578,953 | 486,321 |

Note: Catch limit values in MRFSS are provided for comparison only.

**Discussion:**

Action 1 would update the catch limits (OFL, ABC, and ACL) and ACT for lane snapper based on the update to the March 2020 SEDAR 49 assessment update[7] and OFL and ABC recommendations from the SSC. Additionally, **Preferred Alternative 2** and **Alternative 3** would also update the catch limits to reflect that recreational catch and effort data are now provided by the Marine Recreational Information Program's Fishing Effort Survey (MRIP-FES) as opposed to Marine Recreational Fisheries Statistics Survey (MRFSS) (See Chapter 1).

**Alternative 1** (No Action) would maintain the current catch limits and ACT defined in the Generic ACL/AM Amendment (GMFMC 2011a). These catch limits were calculated using Tier 3a of the ABC Control Rule adopted by the Council in the Generic ACL/AM Amendment (GMFMC 2011a) using average landings from 1999 through 2008 (See Chapter 1). The catch limits in **Alternative 1** do not reflect the SSC's recent OFL and ABC recommendations. In addition, the current catch limits under **Alternative 1** were derived using recreational data from MRFSS, and recreational harvest data are now collected and monitored using MRIP-FES. Although there is an ACT set at 14% below the ACL under **Alternative 1**, it is not currently used for management purposes.

**Preferred Alternative 2** would modify catch limits for 2020 and subsequent years based on the recommendation of the Council's SSC from the updated yield projections. In comparison to **Alternative 1**, **Preferred Alternative 2** would increase the OFL, ABC, and ACL and would not set an ACT. The increase in catch limits in **Preferred Alternative 2** results from harvest projections generated by the March 2020 SEDAR 49 assessment update[7]. The recent stock assessment update relied on recreational landings data reported in the Southeast Region Headboat Survey (SRHS) through 2018. This index indicated an increase in stock abundance[5]. Therefore, the model projected that the stock could sustain higher catch levels.

The catch limits proposed in **Preferred Alternative 2** also differ from **Alternative 1** because of the recreational survey data used to generate those limits. In **Alternative 1**, the catch limits are calculated using recreational data from the MRFSS, while **Preferred Alternative 2** can be compared directly to the recreational data generated from the MRIP-FES. Conversions from MRFSS to MRIP-FES have generally resulted in higher recreational catch and effort values because MRIP-FES is accounting for more recreational fishing effort than previously estimated.[7] This pattern is similarly observed in the conversion of catch limits for lane snapper. The proposed lane snapper ACL in **Preferred Alternative 2** is 1,028,973 lbs ww when using MRIP-FES recreational data. Although the ACL proposed in **Preferred Alternative 2** is over three times higher than the current ACL, much of that increase is related to the adjustment in the recreational data collection from MRFSS to MRIP-FES. When comparing the alternatives in Action 1 using recreational data collected in MRFSS for reference, the difference is about double (See catch limit tables for **Alternative 1** and **Preferred Alternative 2**).

**Preferred Alternative 2** and **Alternative 3** differ based on the ACT. The ACT would be removed under **Preferred Alternative 2**, and would be modified under **Alternative 3**. The current ACT is set at 259,000 lbs ww (14% below the ACL), but it is not used directly for

[7] https://drive.google.com/open?id=1kXvp8ejSAxt1XKQLTv9YCrQt4UKPmrVj

management of lane snapper. The current fishing season closure AM for lane snapper is triggered if the ACL is exceeded in the previous year. If that occurs, National Marine Fisheries Service (NMFS) monitors landings the following year and closes the harvest of lane snapper when the ACL is projected to be met. **Alternative 3** would retain an ACT but modify it based on the Council's ACL/ACT Control Rule (Appendix A) applied to the proposed catch limits under **Alternative 3**. Applying the ACL/ACT Control Rule results in a 16% buffer between the ACL and the ACT in **Alternative 3**. Projections from the March 2020 SEDAR 49 update[8] and subsequent SSC recommendations suggested higher catch limits than those currently in place, including the ACL. Increasing the ACL (**Preferred Alternative 2** and **3)** may be substantial enough to allow current management and harvest patterns to continue without exceeding the ACL for the stock. The ACL for lane snapper was exceeded from 2016-2019 and an in-season closure was implemented in December 2019.[9] Because the ACT is not currently used for management and the fishing closure AM would remain in place, **Preferred Alternative 2** proposes to eliminate the ACT. However, retaining an ACT (**Alternatives 1** and **3**) and using it as a management target may provide a more conservative approach for harvest monitoring that would decrease the probability of exceeding the ACL (See Action 2).

[8] https://drive.google.com/open?id=1kXvp8ejSAxt1XKQLTv9YCrQt4UKPmrVj

[9] https://www.fisheries.noaa.gov/bulletin/recreational-and-commercial-harvest-lane-snapper-federal-waters-gulf-mexico-will-close

## 2.2 Action 2 – Modify the Fishing Season Closure AM for Lane Snapper

*Note: Alternative 2 and Alternative 3b are not valid if Alternative 2 is selected in Action 1.*

**Alternative 1:** No Action. If the ACL is exceeded in a given fishing year, National Marine Fisheries Service (NMFS) will prohibit harvest of lane snapper in the recreational and commercial sectors in the subsequent fishing year if landings meet or are projected to meet the stock ACL.

**Alternative 2:** Modify the closure AM such that an overage of the ACL in a fishing year would trigger a prohibition on the harvest of lane snapper by the recreational and commercial sectors in the following fishing year when the ACT is met or is projected to be met.

**Preferred Alternative 3:** Modify the closure AM such that if annual landings in a given year meet or are projected to meet the prescribed trigger, NMFS would prohibit harvest of lane snapper by the recreational and commercial sectors for the remainder of the fishing year.

**Preferred Option 3a:** Prescribed trigger is the ACL.
**Option 3b:** Prescribed trigger is the ACT.

**Discussion:**

Action 2 would modify the fishing season closure AM for lane snapper. **Alternative 2** and **Alternative 3 Option 3b** are only valid if an ACT is retained in Action 1 because these alternatives **would** establish the ACT as the AM trigger. In Action 1, an ACT is retained in Alternatives 1 and 3, but not in Alternative 2. Table 2.2.1 summarizes the relationship between the two action alternatives.

**Table 2.2.1.** Relationships between the alternatives in Action 1 and Action 2.

| Action 2 Alternatives Valid? | Action 1 Alternative 1: Retains ACT. | Action 1 Alternative 2: Drops ACT. | Action 1 Alternative 3: Modifies ACT. | Rationale |
|---|---|---|---|---|
| **Alternative 1** | Yes | Yes | Yes | Action 2 Alt. 1 retains ACL trigger |
| **Alternative 2** | Yes | No | Yes | Action 2 Alt. 2 requires setting ACT to modify trigger |
| **Preferred Alternative 3 Option a** | Yes | Yes | Yes | Action 2 Alt. 3 Option a retains ACL trigger |
| **Alternative 3 Option b** | Yes | No | Yes | Action 2 Alt. 3 Option b requires setting ACT to modify trigger |

NMFS generated projections of future catch (Appendix B) by analyzing recent lane snapper landings. Monthly commercial and recreational lane snapper landings were averaged from 2016 – 2018 to generate these estimates. All projected landings were then used to produce daily recreational and commercial landings estimates to determine if or when a catch limit is expected to be met for each alternative in Action 2 (Table 2.2.2). These estimates assumed that catch rates and effort levels in future years would be similar to that of 2016 - 2018. Additionally, this analysis included results from a range of possible catch per unit effort (CPUE) scenarios. For example, if CPUE in the future is lower than that observed from 2016 – 2018 (lower 95% confidence interval [CI]), then the timing of reaching or exceeding a catch limit would be later in the fishing year than if CPUE remained the same (prediction) or was greater than expected (upper 95% CI). If CPUE is lower than what was observed in 2016 – 2018, the forecasting analysis suggests that neither the ACL nor the ACT would be met for any alternatives (Table 2.2.2). However, if CPUE remains unchanged or increases relative to what was observed in 2016 – 2018, the ACL or ACT may be met before the end of the fishing year (Table 2.2.2).

**Table 2.2.2.** Results of forecasting analysis to determine if or when lane snapper harvest would meet or exceeded the trigger described for each alternative. All trigger values are in pounds whole weight.

| Action 1 Alternatives | Trigger | Recreational data collection survey | Value | Prediction | Upper 95% Confidence Interval | Lower 95% Confidence Interval |
|---|---|---|---|---|---|---|
| **Alternative 1** | ACL | MRFSS | 301,000 | Aug 19 | Jun 6 | No Closure (209,810) |
| **Preferred Alternative 2** | ACL | MRIP-FES | 1,028,973 | No Closure (926,915) | Sep 16 | No Closure (439,361) |
| **Alternative 3** | ACT | MRIP-FES | 864,337 | Dec 8 | Aug 2 | No Closure (439,361) |

Source: MRFSS SEFSC Recreational, MRIP FES SEFSC Recreational, and Commercial ACL dataset (January 2020; November 2019).

**Alternative 1** (No Action) would retain the current fishing season closure AM, which is triggered based on the ACL chosen in Action 1. NMFS projects that if catch rate and effort in future years are the same as 2016-2018, selecting Alternative 1 in Action 1 would result in harvest meeting the ACL on August 19. If future catch and/or effort is greater than from 2016-2018, then selecting Alternative 1 in Action 1 is projected to result in meeting the ACL by June 6. If Action 1 Alternative 3 is selected and future catch and effort remains the same as estimated, the ACL would be met on December 8, and if catch and/or effort is greater than estimated, the ACL is projected to be met on August 2. This would trigger the fishing season closure AM. **Alternative 1** is a less conservative approach to management than **Preferred Alternative 3**, as it only requires monitoring of landings in years after the ACL has been exceeded.

Like **Alternative 1**, the AM in **Alternative 2** would be triggered based on exceeding the ACL. However, in the year following an ACL overage, **Alternative 2** would restrict further harvest when the ACT (rather than the ACL) is met or projected to be met. **Alternative 2** is only valid if either Alternative 1 or Alternative 3 in Action 1 is selected as preferred because these alternatives retain the use of an ACT. Harvest projections indicate that the ACT would be met December 8 if future catch rate and/or effort remains the same, or August 2 if future catch rate and/or effort increases relative to 2016 – 2018 (Table 2.2.2).

The modification of the fishing season closure AM in **Alternative 2** is intended to reduce the likelihood that an ACL would be exceeded 2 years in a row. The ACT would be used to monitor landings and to trigger a closure in the year following a fishing year when the ACL is exceeded. An AM that triggers a closure in the year following an overage may be less suitable for stocks where there is a high likelihood of exceeding the ACL within a fishing year, which may include lane snapper, as ACLs have been exceeded each year since 2016. It is possible that this could result in an annual alternating of the fishing season closure, which could be confusing for the public. However, the proposed ACL for lane snapper presented in Action 1 is an increase from the current ACL, which may reduce the risk of an ACL overage. Nevertheless, in future years where this AM may be been triggered, **Alternative 2** would be expected to reduce the likelihood of exceeding the ACL and limit any ACL overages that do occur.

While **Alternatives 1** and **2** would result in a fishing season closure in the year following an ACL overage, **Preferred Alternative 3** would modify the fishing season closure AM to require NMFS monitor landings every year and implement an in-season closure when either the stock ACL (**Preferred Option 3a**) or the stock ACT (**Option 3b**) is met or projected to be met. Under **Preferred Option 3a**, NMFS projects that an in-season closure would only occur if future catch rates and/or effort increase relative to that observed from 2016 – 2018 (Table 2.2.2). For **Option 3b**, NMFS projects that an in-season closure would occur if future catch rates and/or effort remain the same or increased relative to 2016 – 2018 (Table 2.2.2). The results reflect the difference between the two options in **Preferred Alternative 3** with **Option 3b** using the stock ACT as the trigger, which is lower than the stock ACL. However, catch limits presented in Alternatives 2 and 3 in Action 1 are reflected in **Preferred Alternative 3**, and these values have increased from current catch limits (see Section 2.1). Even in a scenario when future catch rate and/or effort may increase (95% upper CI) relative to 2016 – 2018, NMFS projects that an in-season closure would not occur until August (**Preferred Option 3a)** or September (**Option 3b)** (Table 2.2.2). Likewise, if future catch rate and/or effort levels are similar to 2016 – 2018, NMFS projects that an in-season closure would not occur (**Preferred Option 3a**) or would not occur until December (**Option 3b**). It is possible that updating catch limits in Action 1 will provide an increase in the ACL substantial enough such that future harvest may not meet or exceed the AM trigger. However, the projections rely on assumptions about catch and effort, and these predictions are uncertain. Results from these analyses should be interpreted carefully.

**Option 3b** is predicted to result in a closure of lane snapper fishing in early December. If previous catch rates and effort remain the same, a December closure would impact both commercial and recreational fisheries. Monthly landings from recent years (see Appendix B) indicate that lane snapper landings in December have fluctuated. With the exception of 2017, December landings were at or below the yearly average, but were also higher in most years than landings from September through November. Estimates of lane snapper catch in December 2017 (Figure B2) were the highest of all months in the 2016-2018 time series, indicating that the fishery has the potential to land large quantities of lane snapper late in the year. Most of the increase in December landings from 2016 – 2018 is attributable to the recreational sector, as commercial landings accounted for less than 14% of December landings from 2016-2018 (compared to no more than 12% of landings for all months in the time period).

**Preferred Alternative 3** would require NMFS to monitor landings each fishing year and implement an in-season closure if warranted, and **Alternatives 1** and **2** would require monitoring in years following a year in which landings exceeded the ACL or ACT, respectively. Therefore, the timeliness of landings reporting is important. Ideally, the time between when a fish is caught and when estimates of the harvest can be made must be short enough so that fishery managers can put in place measures to prevent an overage of the ACL or ACT, as appropriate. Currently, there are lags between when fish are landed and when commercial and recreational landings data are available for use in quota monitoring. Regulations require that commercial fishermen report landings weekly, which allows for a more accurate and current accounting of commercial catch to be made. However, recreational data are not available for use in management until several months after the fish are landed (although charter vessels and headboats are required to submit electronic trip-level reports as of January 5, 2021; see Section 1.1). To mitigate for this lag, NMFS uses projections based on historical observations of landings and effort to inform fishing season length relative to a monitoring goal.

# CHAPTER 3. AFFECTED ENVIRONMENT

## 3.1 Description of the Fishery

Lane snapper is one of 31 stocks managed in the reef fish fishery. From 2012 through 2019, the stock annual catch limit (ACL) for lane snapper was 301,000 pounds (mp) whole weight (ww). Total landings (recreational and commercial) were in excess of the stock ACL each year from 2016 through 2019 (Table 1.1.1). There is no sector allocation for lane snapper. There is a post-season accountability measure (AM) for lane snapper that is triggered when total landings exceed the stock ACL in a year. Then, during the following fishing year, if the total landings reach or are projected to reach the stock ACL, the lane snapper season for both sectors is closed for the remainder of the fishing year. Over 93% of lane snapper landings in the Gulf of Mexico (Gulf) are made by the recreational sector, and the majority of lane snapper landings are in Florida (Table 1.1.2). Additional information on the reef fish fishery can be found in previous amendments, including the Generic ACL/AM Amendment (GMFMC 2011a), which can be found on the Gulf of Mexico Fishery Management Council's (Council) website.[10]

### 3.1.1 Recreational Sector

**Permits**

Anglers on privately owned or leased vessels do not need a federal permit to harvest reef fish in federal waters. However, anglers aboard these vessels must either be federally registered or licensed in states that have a system to provide complete information on the states' saltwater anglers to the national registry.

Any for-hire fishing vessel that takes anglers to harvest any species in the reef fish fishery from federal waters must have a charter/headboat permit for reef fish, which is a limited access permit specifically assigned to that vessel (1,280 as of 2017). Limited access permits may be renewed or transferred, but no additional permits may be issued. From 2012 through 2017, the number of vessels with the permit declined, in part due to the moratorium on the issuance of new permits since 2003. Table 3.1.1.1 provides the number of vessels with a charter/headboat permit for reef fish by state and year.

[10] http://gulfcouncil.org/fishery-management/implemented-plans/reef-fish/

**Table 3.1.1.1.** Number of vessels with charter/headboat permit for reef fish by homeport state of vessel, 2012-2017.

| Number of Vessels with Charter/Headboat Reef Fish Permit | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Year** | **AL** | **FL** | **LA** | **MS** | **TX** | **Gulf** | **Other** | **Total** | **% Gulf** |
| 2012 | 153 | 790 | 116 | 46 | 214 | 1,319 | 17 | 1,336 | 98.7% |
| 2013 | 155 | 782 | 113 | 45 | 213 | 1,308 | 15 | 1,323 | 98.9% |
| 2014 | 149 | 768 | 111 | 40 | 226 | 1,294 | 16 | 1,310 | 98.8% |
| 2015 | 138 | 761 | 115 | 36 | 228 | 1,278 | 16 | 1,294 | 98.8% |
| 2016 | 130 | 759 | 113 | 33 | 228 | 1,263 | 19 | 1,282 | 98.5% |
| 2017 | 137 | 773 | 112 | 31 | 210 | 1,263 | 17 | 1,280 | 98.7% |

Source: NMFS SERO.

The distribution of charter/headboat permits for reef fish by hailing port state changed little from 2012 through 2016 (Table 3.1.1.2). The largest relative change was an increase in Texas's share, which rose from 16.0% to 17.7%.

**Table 3.1.1.2.** Percentage of for-hire reef fish permits by state of hailing port of vessel, and the percent change in permits for each state relative to total number of permits.

| **Year** | **Percentage of Charter/Headboat Reef Fish Permits** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **2012** | **2013** | **2014** | **2015** | **2016** | ***Average*** | **Change 2012-2016** |
| AL | 11.4% | 11.7% | 11.4% | 10.8% | 10.2% | *11.1%* | -1.2% |
| FL | 58.9% | 58.9% | 58.5% | 58.6% | 59.1% | *58.8%* | 0.2% |
| LA | 8.9% | 8.8% | 8.7% | 9.1% | 9.1% | *8.9%* | 0.2% |
| MS | 3.5% | 3.5% | 3.1% | 2.9% | 2.7% | *3.1%* | -0.8% |
| TX | 16.0% | 16.1% | 17.1% | 17.5% | 17.7% | *16.9%* | 1.7% |
| *Gulf States* | *98.8%* | *98.9%* | *98.8%* | *98.8%* | *98.6%* | *98.8%* | *-0.2%* |
| Other | 1.2% | 1.1% | 1.2% | 1.2% | 1.4% | *1.2%* | 0.2% |
| **Total** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** | |

Source: NMFS SERO.

**Lane Snapper Landings**

From 2012 through 2018, recreational anglers landed approximately 95% of total landings (Table 1.1.2). The majority of lane snapper landings are by recreational anglers aboard privately owned and leased vessels. From 2012 through 2018, they accounted for an average of about 74% of annual recreational landings (Table 3.1.1.3). Almost all lane snapper is landed in Florida; on average approximately 97% of the landings occur there (Table 3.1.1.4).

**Table 3.1.1.3.** Percentage of recreational lane snapper landings by mode, 2013-2018.

| Year | Private Landings | Charter Landings | Headboat Landings | Total Landings (lbs ww) |
|---|---|---|---|---|
| **2012** | 69.1% | 22.1% | 8.8% | 423,289 |
| **2013** | 64.6% | 23.9% | 11.5% | 456,629 |
| **2014** | 70.7% | 17.7% | 11.6% | 468,017 |
| **2015** | 74.4% | 14.1% | 11.5% | 400,237 |
| **2016** | 80.3% | 10.2% | 9.6% | 612,604 |
| **2017** | 76.9% | 18.0% | 5.1% | 1,272,225 |
| **2018** | 81.3% | 14.0% | 4.8% | 791,572 |
| **Total** | 73.9% | 17.1% | 9.0% | 4,424,573 |

Source: SEFSC Recreational ACL Data (Jan. 2020)

**Table 3.1.1.4.** Recreational landings (lbs ww) of lane snapper by state, 2013-2018.

| Year | AL | FL | LA/MS | TX | Total | Percentage FL |
|---|---|---|---|---|---|---|
| **2013** | 5,103 | 448,288 | 829 | 2,408 | 456,629 | **98.2%** |
| **2014** | 4,308 | 455,907 | 5,317 | 2,485 | 468,017 | **97.4%** |
| **2015** | 15,547 | 382,331 | 316 | 2,044 | 400,237 | **95.5%** |
| **2016** | 10,767 | 594,906 | 5,265 | 1,665 | 612,604 | **97.1%** |
| **2017** | 30,714 | 1,235,746 | 2,367 | 3,398 | 1,272,225 | **97.1%** |
| **2018** | 6,539 | 779,252 | 3,297 | 2,484 | 791,572 | **98.4%** |
| **Average** | **72,978** | **3,896,431** | **17,391** | **14,484** | **4,001,284** | **97.4%** |

Source: SEFSC Recreational ACL Data (Jan, 2020)

The fishing season for lane snapper runs from January 1 through December 31. Lane snapper aggregates offshore during spring and summer months, but lane snapper landings are common throughout the year. From 2013 through 2018, approximately 29% of annual landings occurred during the May/June wave (Tables 3.1.1.5). Approximately 50% of annual landings occurred during two waves: from May/June through July/August.

**Table 3.1.1.5.** Percentage of recreational lane snapper landings (lbs ww) by wave, 2013-2018.

| Year | Jan/Feb | Mar/Apr | May/Jun | Jul/Aug | Sep/Oct | Nov/Dec |
|---|---|---|---|---|---|---|
| **2013** | 2.6% | 15.0% | 23.2% | 23.6% | 22.7% | 12.9% |
| **2014** | 12.6% | 5.3% | 40.4% | 20.5% | 9.5% | 11.8% |
| **2015** | 9.8% | 14.0% | 32.5% | 24.1% | 10.4% | 9.3% |
| **2016** | 17.0% | 20.5% | 23.0% | 16.0% | 15.4% | 8.1% |
| **2017** | 16.8% | 7.1% | 23.5% | 20. 3% | 6.6% | 25.7% |
| **2018** | 12.7% | 19.7% | 29.8% | 25.0% | 1.6% | 11.2% |
| **Average** | **11.9%** | **13.6%** | **28.7%** | **21.6%** | **11.0%** | **13.2%** |

Source: SEFSC MRIP FES Recreational ACL Data (Jan 2020)

### 3.1.2 Commercial Sector

Commercial fishing for lane snapper represents about 5% of the lane snapper landed in the Gulf. The vast majority of Gulf commercial landings of lane snapper reported by dealers occur in Florida. From 2012 through 2018, an annual average of 94% of commercially harvested lane snapper were landed in Florida (SEFSC Commercial ACL Data, Nov 2019).

## 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 includes both temperate and tropical waters (McEachran and Fechhelm 2005). Gulf water temperatures range from 54º F to 84º F (12º C to 29º C) depending on time of year and depth of water. Mean annual sea surface temperatures ranged from 73º F through 83º F (23-28º C) including bays and bayous (Figure 3.2.1) between 1982 and 2009, according to satellite-derived measurements.[11] In general, mean sea surface temperature increases from north to south with large seasonal variations in shallow waters.

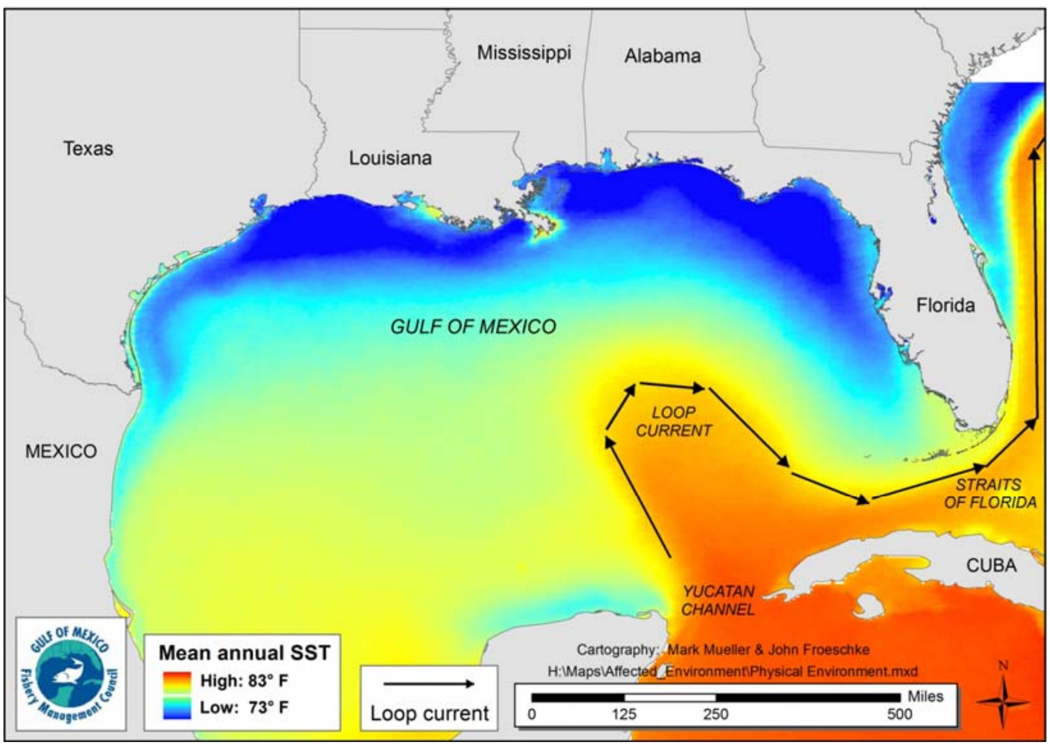


**Figure 3.2.1.** Physical environment of the Gulf including major feature names and mean annual sea surface temperature as derived from the Advanced Very High Resolution Radiometer Pathfinder Version 5 sea surface temperature data set (http://accession.nodc.noaa.gov/0072888).

[11] NODC 2012: http://accession.nodc.noaa.gov/0072888

The physical environment for Gulf reef fish, including lane snapper, is also detailed in the Generic EFH Amendment, the Generic ACL/AM Amendment, and Reef Fish Amendment 40 (GMFMC 2004a; GMFMC 2011a; GMFMC 2014, respectively), and is incorporated by reference and further summarized below. In general, reef fish are widely distributed in the Gulf, occupying both pelagic and benthic habitats during their life cycle. A planktonic larval stage lives in the water column and feeds on zooplankton and phytoplankton (GMFMC 2004a). Juvenile and adult reef fish are typically demersal and usually associated with bottom topographies on the continental shelf (less than 100 m) which have high relief, i.e., coral reefs, artificial reefs, rocky hard bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings.

Detailed information pertaining to the Gulf area closures and marine reserves is provided in Amendment 32 (GMFMC 2011b). There are environmental sites of special interest that are discussed in the Generic Essential Fish Habitat (EFH) Amendment (GMFMC 2004a) that are relevant to lane snapper management. These include the longline/buoy area closure, the Edges Marine Reserve, Tortugas North and South Marine Reserves, individual reef areas and bank habitat areas of particular concern (HAPC) of the northwestern Gulf, the Florida Middle Grounds HAPC, the Pulley Ridge HAPC, and Alabama Special Management Zone. These areas are managed with gear restrictions to protect habitat and specific reef fish species. These restrictions are detailed in the Generic EFH Amendment (GMFMC 2004a).

With respect to the National Register of Historic Places, there is one site listed in the Gulf. This is the wreck of the *U.S.S. Hatteras*, located in federal waters off Texas. Historical research indicates that over 2,000 ships sunk on the Federal Outer Continental Shelf between 1625 and 1951, and thousands more sunk closer to shore in state waters during the same period. Only a handful of these have been scientifically excavated for archeological benefit.[12]

**Northern Gulf of Mexico Hypoxic Zone**

Every summer in the northern Gulf, a large hypoxic zone forms. It is the result of allochthonous materials and runoff from agricultural lands by rivers to the Gulf, increasing nutrient inputs from the Mississippi River, and a seasonal layering of waters in the Gulf. The layering of the water is temperature and salinity dependent and prevents the mixing of higher oxygen content surface water with oxygen-poor bottom water. For 2018, the extent of the hypoxic area was estimated to be 2,720 square miles and fourth smallest area mapped since 1985.[13] The hypoxic conditions in the northern Gulf directly affect less mobile benthic macroinvertebrates (e.g., polychaetes) by influencing density, species richness, and community composition (Baustian and Rabalais 2009). However, more mobile macroinvertebrates and demersal fishes (e.g., lane snapper) are able to detect lower dissolved oxygen levels and move away from hypoxic conditions. Therefore, although not directly affected, these organisms are indirectly affected by limited prey availability and constrained available habitat (Baustian and Rabalais 2009; Craig 2012).

**Greenhouse Gases**

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[12] Further information can be found at http://www.boem.gov/Environmental-Stewardship/Archaeology/Shipwrecks.aspx.
[13] http://gulfhypoxia.net

The Intergovernmental Panel on Climate Change has indicated greenhouse gas emissions are one of the most important drivers of recent changes in climate. Wilson et al. (2014) inventoried the sources of greenhouse gases in the Gulf from sources associated with oil platforms and those associated with other activities such as fishing. A summary of the results of the inventory are shown in Table 3.2.1 with respect to total emissions and from fishing. Commercial fishing and recreational vessels make up a small percentage of the total estimated greenhouse gas emissions from the Gulf (2.04% and 1.67%, respectively).

**Table 3.2.1.** Total Gulf greenhouse gas emissions estimates (tons per year) from oil platform and non-oil platform sources, commercial fishing, and percent greenhouse gas emissions from commercial fishing vessels of the total emissions*. Data are for 2011 only.

| Emission source | $CO_2$ | Greenhouse $CH_4$ | Gas $N_2O$ | Total $CO_{2e}$** |
|---|---|---|---|---|
| Oil platform | 5,940,330 | 225,667 | 98 | 11,611,272 |
| Non-platform | 14,017,962 | 1,999 | 2,646 | 14,856,307 |
| **Total** | **19,958,292** | **227,665** | **2,743** | **26,467,578** |
| Commercial fishing | 531,190 | 3 | 25 | 538,842 |
| Recreational fishing | 435,327 | 3 | 21 | 441,559 |
| Percent commercial fishing | 2.66% | >0.01% | 0.91% | 2.04% |
| Percent recreational fishing | 2.18% | >0.01% | 0.77% | 1.67% |

*Compiled from Tables 6-11, 6-12, and 6-13 in Wilson et al. (2014). **The $CO_2$ equivalent ($CO_2e$) emission estimates represent the number of tons of $CO_2$ emissions with the same global warming potential as one ton of another greenhouse gas (e.g., $CH_4$ and $N_2O$). Conversion factors to $CO_{2e}$ are 21 for $CH_4$ and 310 for $N_2O$

## 3.3 Description of the Biological/Ecological Environment

The biological/ecological environment of the Gulf, including that of lane snapper, is described in detail in the final environmental impact statement for the Generic EFH Amendment (GMFMC 2004a) and is incorporated herein by reference.

### 3.3.1 Lane Snapper

**Life History and Biology**

***Distribution***
Lane snapper occurs off the east coast of the United States from North Carolina down to the southern coast of Brazil, and is found throughout the Caribbean and Gulf (Allen 1985). Lane snapper is common in a variety of habitats, ranging from coral reefs to brackish waters near shore. It typically frequents waters between 30 m and 120 m of depth (Thompson and Munro 1974). Juveniles are often found inshore near seagrass beds that they utilize as a nursery habitat. Adults utilize a variety of habitats including natural and artificial reefs both in coastal and offshore waters (Bortone and Williams 1986). Spawning occurs offshore from March through

September, with a peak in activity from June through August (Manooch and Mason 1984). Females typically produce up to about one million pelagic eggs (Rodriguez-Pino 1962). Larvae are planktonic, and peak abundance is seen in July through September when water temperatures are the highest (D'Alessandro et al. 2010). Post-larval stage fish move into estuarine habitat and are commonly found over seagrass beds.

***Age/Growth***
Aiken (2001) estimated a maximum age of at least 12 years for lane snapper. However, regional differences in size and age structure have been observed (SEDAR 49 2016), and further studies have documented individuals reaching ages up to 19 years. A growth curve, based on fractional ages and observed fork lengths (FL) at capture, was modeled using the von Bertalanffy growth model for the SEDAR 49 stock assessment.

***Reproduction***
Lane snapper spawns from March through September (D'Alessandro et al. 2010). Fifty percent of individuals are estimated to attain maturity by 268 mm FL (11 inches FL) for males and 221 mm FL (9 inches FL) for females (Aiken 2001).

***Natural Mortality***
The life history working group convened as part of the SEDAR 49 assessment recommended natural mortality estimate where M = 0.33.

**Status of the Lane Snapper Stock**
Lane snapper is managed as a single stock in the Gulf in Florida. A review of the stock identification and delineation was conducted as part of the stock assessment (SEDAR 49). There is evidence of two genetically distinct stocks in the northern Gulf based on microsatellite alleles: a western stock which includes individuals from the northwestern and northcentral Gulf and an eastern stock that includes individuals from the west coast of Florida, the Florida Keys, and the Atlantic coast of Florida (Karlsson et al. 2009). However, the authors observed no significant difference in stock structure for two closely related lutjanids, Gulf red snapper (*L. campechanus*) (Pruett et al. 2005; Saillant and Gold 2006) and gray snapper (*L. griseus*) (Gold et al. 2009), and found no further compelling evidence indicating that Gulf stocks should be managed separately. Results from the 2019 SEDAR 49 Update indicated that Gulf lane snapper is not overfished and is not undergoing overfishing

### 3.3.2 General Information on Reef Fish Species

The National Ocean Service collaborated with the National Marine Fisheries Service (NMFS) and the Council to develop distributions of reef fish (and other species) in the Gulf (SEA 1998). Reef fish are widely distributed in the Gulf, occupying both pelagic and benthic habitats during their life cycle. In general, both eggs and larval stages are planktonic. Larval fish feed on zooplankton and phytoplankton. Gray triggerfish are exceptions to this generalization as they lay their eggs in nests on the sandy bottom (Simmons and Szedlmayer 2012), and gray snapper whose larvae are found around submerged aquatic vegetation.

**Status of Reef Fish Stocks**

The Fishery Management Plan for Reef Fish Resources in the Gulf of Mexico (Reef Fish FMP) currently encompasses 31 species (Table 3.3.1). The NMFS Office of Sustainable Fisheries updates its Status of U.S. Fisheries Report to Congress[14] on a quarterly basis. Stock assessments and status determinations have been conducted and designated for many reef fish stocks and can be found on the Council[15] and the SEDAR[16] websites.

Of the stocks for which stock assessments have been conducted, the last quarter report of the 2020 Status of U.S. Fisheries classifies only one as overfished (greater amberjack), and two stocks as undergoing overfishing (cobia and lane snapper). Lane snapper underwent overfishing in each year from 2016 through 2019.

The status of both assessed and unassessed stocks, as of the most recent version of the Status of U.S. Fisheries Report, is provided in Table 3.3.2.1. Reef Fish Amendment 44 (GMFMC 2017), was implemented December 2017, and modified the minimum stock size threshold (MSST) for seven species in the Reef Fish FMP to 50% of $B_{MSY}$. Red snapper and gray triggerfish are now listed as not overfished but rebuilding, because the biomass for the stock is currently estimated to be greater than 50% of $B_{MSY}$, but below $B_{MSY}$.

A stock assessment was conducted for Atlantic goliath grouper (SEDAR 47 2016). The Council's Science and Statistical Committee (SSC) accepted the assessment's general findings that the stock was not overfished nor experiencing overfishing. Although the SSC determined Atlantic goliath grouper to not be experiencing overfishing, the SSC deemed the assessment not suitable for stock status determination and management advice.

Stock assessments were conducted for seven reef fish stocks (including lane snapper) using the Data Limited Methods Toolkit (DLMToolkit; SEDAR 49 2016). This method allows the setting of the overfishing limit (OFL) and acceptable biological catch (ABC) based on limited data and life history information, but does not provide assessment-based status determinations. Several stocks did not have enough information available to complete an assessment even using the DLMToolkit.

The remaining species within the Reef Fish FMP have not been assessed at this time. Therefore, their overfished status is unknown (Table 3.3.2.1). For those species that are listed as not undergoing overfishing, that determination has been made based on the annual harvest remaining below the OFL. No other unassessed species are scheduled for a stock assessment at this time.

[14] https://www.fisheries.noaa.gov/national/population-assessments/fishery-stock-status-updates
[15] www.gulfcouncil.org
[16] www.sedarweb.org

**Table 3.3.2.1.** Status of species in the Reef Fish FMP grouped by family.

| Common Name | Scientific Name | Stock Status | | Most recent assessment or SSC workshop |
|---|---|---|---|---|
| | | Overfishing | Overfished | |
| **Family Balistidae – Triggerfishes** | | | | |
| gray triggerfish | *Balistes capriscus* | N | N | SEDAR 43 2015 |
| **Family Carangidae – Jacks** | | | | |
| greater amberjack | *Seriola dumerili* | N | Y | SEDAR 70 2020 |
| lesser amberjack | *Seriola fasciata* | Y | Unknown | SEDAR 49 2016 |
| almaco jack | *Seriola rivoliana* | Y | Unknown | SEDAR 49 2016 |
| banded rudderfish | *Seriola zonata* | Y | Unknown | |
| **Family Labridae – Wrasses** | | | | |
| hogfish | *Lachnolaimus maximus* | N | N | SEDAR 37 2014 |
| **Family Malacanthidae – Tilefishes** | | | | |
| tilefish (golden) | *Lopholatilus chamaeleonticeps* | N | N | SEDAR 22 2011a |
| blueline tilefish | *Caulolatilus microps* | N | Unknown | |
| goldface tilefish | *Caulolatilus chrysops* | N | Unknown | |
| **Family Serranidae – Groupers** | | | | |
| gag | *Mycteroperca microlepis* | N | N | SEDAR 33 Update 2016b |
| red grouper | *Epinephelus morio* | N | N | SEDAR 42 2015 |
| Scamp | *Mycteroperca phenax* | Unknown | Unknown | |
| black grouper | *Mycteroperca bonaci* | N | N | SEDAR 19 2010 |
| yellowedge grouper | *Hyporthodus flavolimbatus* | N | N | SEDAR 22 2011b |
| snowy grouper | *Hyporthodus niveatus* | N | Unknown | SEDAR 49 2016 |
| speckled hind | *Epinephelus drummondhayi* | N | Unknown | SEDAR 49 2016 |
| yellowmouth grouper | *Mycteroperca interstitialis* | Unknown | Unknown | SEDAR 49 2016 |
| yellowfin grouper | *Mycteroperca venenosa* | Unknown | Unknown | |
| warsaw grouper | *Hyporthodus nigritus* | N | Unknown | |
| *Atlantic goliath grouper | *Epinephelus itajara* | N | Unknown | SEDAR 47 2016 |
| **Family Lutjanidae – Snappers** | | | | |
| queen snapper | *Etelis oculatus* | N | Unknown | |
| mutton snapper | *Lutjanus analis* | N | N | SEDAR 15A Update 2015 |
| blackfin snapper | *Lutjanus buccanella* | N | Unknown | |
| red snapper | *Lutjanus campechanus* | N | N | SEDAR 31 Update 2015 |
| cubera snapper | *Lutjanus cyanopterus* | N | Unknown | |
| gray snapper | *Lutjanus griseus* | N | N | |
| lane snapper | *Lutjanus synagris* | Y | Unknown | SEDAR 49 Update 2019 |
| silk snapper | *Lutjanus vivanus* | N | Unknown | |
| yellowtail snapper | *Ocyurus chrysurus* | N | N | SEDAR 27A 2012 |
| vermilion snapper | *Rhomboplites aurorubens* | N | N | SEDAR 45 2016 |
| wenchman | *Pristipomoides aquilonaris* | N | Unknown | SEDAR 49 2016 |

Note: *Atlantic goliath grouper is a protected grouper (i.e., ACL is set at zero) and benchmarks do not reflect appropriate stock dynamics. Species status based on the NOAA Quarter 4 2020 FSSI report.

### 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 (GMFMC 2004b, GMFMC 2007, GMFMC 2014, GMFMC 2015, and GMFMC 2016).

**Protected Species**

The Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) provide special protections to some species that occur in the Gulf, and more information is available on the NMFS Office of Protected Resources website.[17] All 22 species of marine mammals in the Gulf are protected under the MMPA (Waring et al. 2016). These marine mammals include one manatee, which is under U.S. Fish and Wildlife Service's jurisdiction, and 21 dolphins and whales, all under NMFS' jurisdiction. Six species (sperm, blue, Bryde's, sei, and fin whales, and manatees) are also protected under the ESA.

The MMPA requires that each commercial fishery be classified into one of three categories based on the level of incidental mortality or serious injury of marine mammals. NMFS classifies reef fish bottom longline/hook-and-line gear in the MMPA 2018 List of Fisheries as a Category III fishery (83 FR 5349). This classification indicates the fishery has a remote likelihood of, or no known incidental mortality or serious injury of marine mammals. There have been three observed takes of bottlenose dolphin from the continental shelf stock by this fishery.

Other species protected under the ESA include sea turtle species (Kemp's ridley, loggerhead (Northwest Atlantic Ocean distinct population segment [DPS]), green (North Atlantic and South Atlantic DPSs), leatherback, and hawksbill), fish species (Gulf sturgeon, smalltooth sawfish, Nassau grouper, oceanic whitetip shark, giant manta ray), and coral species (elkhorn, staghorn, pillar, lobed star, mountainous star, and boulder star). Critical habitat designated under the ESA for smalltooth sawfish, Gulf sturgeon, and the Northwest Atlantic Ocean DPS of loggerhead sea turtles also occur in the Gulf, though only loggerhead critical habitat occurs in federal waters.

NMFS has conducted consultations under section 7 of the ESA evaluating potential effects from the Gulf reef fish fishery on ESA-listed species and critical habitat. The most recent formal consultation or Biological Opinion (Bi Op) was finalized on September 30, 2011. It concluded that the continued authorization of the Gulf reef fish fishery is not likely to adversely affect listed whales or elkhorn or staghorn coral, and is not likely to jeopardize sea turtles (loggerhead, Kemp's ridley, green, hawksbill, and leatherback) or smalltooth sawfish (NMFS 2011). 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. Since issuing the 2011 Bi Op, in memoranda dated September 16, 2014, and October 7, 2014, NMFS concluded that the activities associated with the Reef Fish FMP will not adversely affect critical habitat for the Northwest Atlantic Ocean loggerhead sea turtle DPS or the additional four species of coral. On September 29, 2016, NMFS reinitiated formal consultation on the continued authorization of the Gulf reef fish fishery because new species (Nassau grouper and North Atlantic and South Atlantic green sea turtle DPSs) were listed under the ESA that may be affected by the fishery. On March 6, 2018, NMFS revised the request for reinitiation to include the newly listed oceanic whitetip

[17] http://www.nmfs.noaa.gov/pr/laws/

shark and the giant manta ray. NMFS also determined that the continued authorization of the fishery during the re-initiation period will not jeopardize the continued existence of these species.

### Climate Change

Climate change projections predict increases in sea-surface temperature and sea level; decreases in sea-ice cover; and changes in salinity, wave climate, and ocean circulation.[18] These changes are likely to affect plankton biomass and fish larvae abundance that could adversely affect fish, marine mammals, seabirds, and ocean biodiversity. Kennedy et al. (2002) and Osgood (2008) have suggested global climate change could affect temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions, change precipitation patterns and cause a rise in sea level. This could change the water balance of coastal ecosystems; altering patterns of wind and water circulation in the ocean environment; and influence the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs. The National Oceanic and Atmospheric Association (NOAA) Climate Change Web Portal[19] predicts the average sea surface temperature in the Gulf will increase by 1-3ºC for 2010-2070 compared to the average over the years 1950-2010. For reef fishes, 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. The smooth puffer and common snook are examples of species for which there has been a distributional trend to the north in the Gulf. For other species, such as red snapper and the dwarf sand perch, there has been a distributional trend towards deeper waters. For other fish species, such as the dwarf goatfish, there has been a distributional trend both to the north and to deeper waters. These changes in distributions have been hypothesized as a response to environmental factors, such as increases in temperature.

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. However, some stocks have shown increases in abundance in the northern Gulf (Fodrie et al. 2010) and Texas estuaries (Tolan and Fisher 2009) during the interval between 1979 and 2006. This may be a result of increasing water temperatures in coastal environments.

### *Deepwater Horizon* MC252 Oil Spill

The Deepwater Horizon oil spill occurred on April 20, 2010 and released large amounts of crude oil into the Gulf. Crude oil contains polycyclic aromatic hydrocarbons (PAH), which are highly toxic chemicals that tend to persist in the environment for long periods of time, in marine environments can have detrimental impacts on marine finfish, especially during the more

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[18] http://www.ipcc.ch/
[19] https://www.esrl.noaa.gov/psd/ipcc/

vulnerable larval stage of development (Whitehead et al. 2012). When exposed to realistic, yet toxic levels of PAHs (1–15 µg/L), greater amberjack larvae develop cardiac abnormalities and physiological defects (Incardona et al. 2014). The future reproductive success of long-lived species, including red drum 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).

Increases in histopathological lesions were found in red snapper 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 (greater than 400 mm total length) over 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).

In addition to the crude oil, over a million gallons of the dispersant, Corexit 9500A®, was applied to the ocean surface and an additional hundreds of thousands of gallons of dispersant was pumped to the mile-deep wellhead (National Commission 2010). No large-scale applications of dispersants in deep water had been conducted until the *Deepwater Horizon* MC252 oil spill. Thus, no data exist on the environmental fate of dispersants in deep water. The effect of oil, dispersants, and the combination of oil and dispersants on fishes of the Gulf remains an area of concern.

**Red Tide**

Red tide is a common name for harmful algal bloom (HAB) caused by species of dinoflagellates and other organisms that causes the water to appear to be red. Red tide blooms occur in the Gulf almost every year, generally in late summer or early fall. They are most common off the central and southwestern coasts of Florida between Clearwater and Sanibel Island but may occur anywhere in the Gulf. More than 50 HAB species occur in the Gulf, but one of the best-known species is *Karenia brevis*. This organism produces brevetoxins capable of killing fish, birds and other marine animals.[20]

The effects of red tide on fish stocks have been well established. In 2005, a severe red tide event occurred in the Gulf along with an associated large decline in multiple abundance indices for red grouper, gag, and other species thought to be susceptible to mortality from red tide events. It is unknown whether mortality occurs via absorption of toxins across gill membranes (Abbott et al. 1975; Baden 1988), ingestion of toxic biota (Landsberg 2002), or from some indirect effect of red tide such as hypoxia (Walter et al. 2013). In 2018, a severe red tide event occurred off the southwest coast of Florida from Monroe County to Sarasota County that persisted for more than

[20] http://myfwc.com/research/redtide/general/about/

10 months; the impacts on fish stocks will likely be considered in future stock assessments. Adult lane snapper are considered effected by red tide events (Sagarese et al. 2015).

## 3.4 Description of the Economic Environment

The following section describes the economic environment of the Gulf lane snapper portion of the reef fish fishery, broken down by sector. Inflation adjusted revenues and prices are reported in 2018 dollars using the annual, non-seasonally adjusted Gross Domestic Product (GDP) implicit price deflator provided by the U.S. Bureau of Economic Analysis (BEA).

### 3.4.1 Commercial Sector

**Permits**

Any fishing vessel that harvests and sells any of the reef fish species managed under the Reef Fish FMP from the Gulf exclusive economic zone (EEZ) must have a valid Gulf reef fish permit. As of February 26, 2020, there were 834 limited access valid or renewable reef fish permits, 62 of which had longline endorsements. Commercial harvest of Gulf lane snapper in the EEZ may only be sold to dealers with a federal dealer permit. As of February 26, 2020, there were 395 entities with a federal Gulf and South Atlantic Dealers permit.

**Total Landings and Dockside Revenue**

Gulf lane snapper is managed under a stock ACL that is specified and monitored in terms of pounds (lbs) whole weight (ww). Florida accounted for the vast majority of commercial lane snapper landings and revenue in the Gulf, both of which fluctuated from 2014 through 2018, ending in 5-year lows (Table 3.4.1.1). The average annual ex-vessel price for lane snapper from 2014 through 2018 was approximately $2.50 per lb ww (2018 dollars). There was no discernible seasonal pattern in Gulf lane snapper landings during this time period (Figure 3.4.1.1).

**Table 3.4.1.1.** Commercial Gulf lane snapper landings (lbs ww) and revenue (2018 dollars) by state.

| - | AL | FL | LA/MS* | TX | Total |
|---|---|---|---|---|---|
| | Landings (lbs ww) | | | | |
| 2014 | 118 | 29,352 | 623 | 156 | 30,249 |
| 2015 | 174 | 44,343 | 1,398 | 248 | 46,163 |
| 2016 | 228 | 32,829 | 1,357 | 499 | 34,913 |
| 2017 | 280 | 40,600 | 1,735 | 216 | 42,831 |
| 2018 | 56 | 25,666 | 758 | 120 | 26,600 |
| Average | 171 | 34,558 | 1,174 | 248 | 36,151 |
| | Dockside Revenue (2018 dollars) | | | | |
| 2014 | $ 315 | $ 69,861 | $ 1,663 | $ 486 | $ 72,325 |
| 2015 | $ 449 | $ 103,441 | $ 3,671 | $ 751 | $ 108,311 |
| 2016 | $ 609 | $ 80,293 | $ 3,362 | $ 1,683 | $ 85,947 |
| 2017 | $ 642 | $ 104,743 | $ 4,261 | $ 630 | $ 110,277 |
| 2018 | $ 170 | $ 69,625 | $ 1,934 | $ 360 | $ 72,089 |
| Average | $ 437 | $ 85,592 | $ 2,978 | $ 782 | $ 89,790 |

Source: Southeast Fisheries Science Center (SEFSC) Commercial ACL Dataset (November 2019)
*Louisiana and Mississippi are combined for confidentiality purposes.

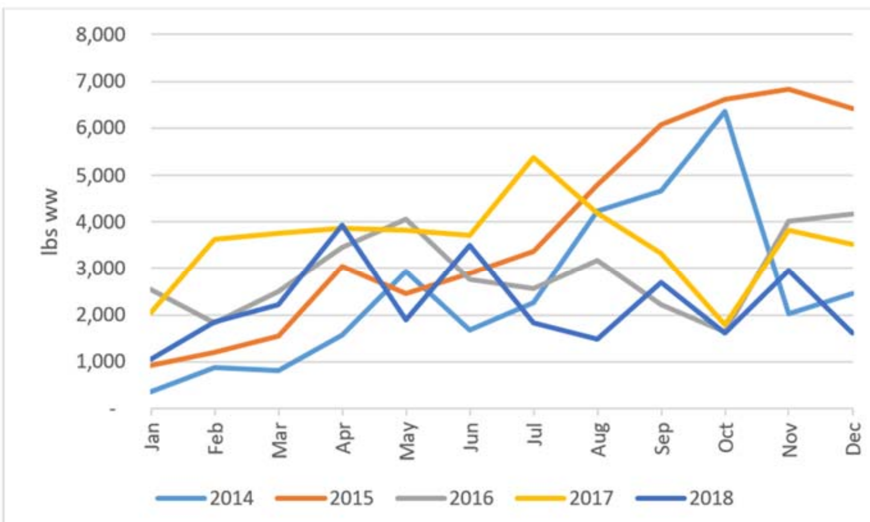


**Figure 3.4.1.1.** Monthly Gulf lane snapper landings (lbs ww), by year. Source: SEFSC Commercial ACL Dataset (November 2019).

**Vessels, Trips, Landings, and Dockside Revenue**

The following summaries of landings, revenue, and effort (Tables 3.4.1.2 and 3.4.1.3) are based on logbook information and the NMFS Accumulated Landings System (ALS) for prices.

Therefore, the values contained in this section may not match exactly with landings and revenue values presented elsewhere in this document that used ACL monitoring data. In addition, the landings are presented in gutted weight (gw) rather than in ww. Landings for all species in the SEFSC Social Science Research Group's (SEFSC-SSRG) Socioeconomic Panel data are expressed in gw to provide one unit for all species. This is because data summarizations, as presented in Tables 3.4.1.2 and 3.4.1.3 below, generally involve a multitude of species. It is also important to note that federally-permitted vessels that are required to submit logbooks generally report their harvest of most species regardless of whether the fish were caught in state or federal waters.

The number of federally permitted commercial vessels that harvested lane snapper in the Gulf increased steadily from 2014 through 2017 and then dropped noticeably in 2018 (Table 3.4.1.2). Lane snapper landings and ex-vessel revenue were at 5-year lows in 2018 (Tables 3.4.1.2 and 3.4.1.3). On average (2014 through 2018), vessels that landed lane snapper did so on approximately 38% of their Gulf trips, but lane snapper comprised less than 0.2% of their annual revenue from all species (Tables 3.4.1.2 and 3.4.1.3). Average annual revenue per vessel for all species harvested by these vessels increased in 2015 and then decreased steadily to a 5-year low in 2018 (Table 3.4.1.3). Estimates of net revenue specific to the vessels affected by this amendment are not readily available; however, it is assumed there is an overlap between these vessels and vessels that participate in the commercial Gulf reef fish fishery in general. According to Overstreet and Liese (2018), annual net revenue from operations for commercial vessels in the reef fish fishery was approximately 34% of their average annual gross revenue from 2014 through 2016.[21] Applying this percentage to the results provided in Table 3.4.1.3 would result in an estimated per vessel average annual net revenue from operations of $52,361 (2018 dollars) per year.

[21] The percentage estimates have been rounded to the closest full percentage point for current purposes based on guidance from the report's authors.

**Table 3.4.1.2.** Number of vessels, number of trips, and landings (lbs gw) by year for lane snapper.

| Year | # of vessels that caught lane snapper (> 0 lbs gw) | # of trips that caught lane snapper | lane snapper landings (lbs gw) | Other species' landings jointly caught w/ lane snapper (lbs gw) | # of Gulf trips that only caught other species | Other species' landings on Gulf trips w/o lane snapper (lbs gw) | All species landings on South Atlantic trips (lbs gw) |
|---|---|---|---|---|---|---|---|
| 2014 | 301 | 1,594 | 27,516 | 4,783,233 | 3,322 | 7,663,585 | 123,806 |
| 2015 | 311 | 1,996 | 40,999 | 5,662,522 | 3,042 | 7,038,032 | 148,785 |
| 2016 | 329 | 1,950 | 42,364 | 5,214,717 | 3,355 | 7,624,833 | 110,709 |
| 2017 | 333 | 2,141 | 37,879 | 5,029,049 | 3,018 | 6,388,038 | 157,200 |
| 2018 | 303 | 1,623 | 22,774 | 3,515,926 | 2,493 | 5,884,222 | 68,565 |
| Average | 315 | 1,861 | 34,306 | 4,841,089 | 3,046 | 6,919,742 | 121,813 |

Source: SEFSC-SSRG Socioeconomic Panel v.10 (March 2020)

**Table 3.4.1.3.** Number of vessels and ex-vessel revenues by year (2018 dollars) for lane snapper.

| Year | # of vessels that caught lane snapper (> 0 lbs gw) | Dockside revenue from lane snapper | Dockside revenue from 'other species' jointly caught w/ lane snapper | Dockside revenue from 'other species' caught on Gulf trips w/o lane snapper | Dockside revenue from 'all species' caught on South Atlantic trips | Total dockside revenue | Average total dockside revenue per vessel |
|---|---|---|---|---|---|---|---|
| 2014 | 301 | $73,206 | $19,014,030 | $29,839,858 | $409,892 | $49,336,986 | $163,910 |
| 2015 | 311 | $107,819 | $23,254,034 | $28,566,251 | $510,042 | $52,438,146 | $168,611 |
| 2016 | 329 | $125,644 | $21,457,768 | $31,008,184 | $294,044 | $52,885,640 | $160,747 |
| 2017 | 333 | $108,596 | $20,711,560 | $25,886,269 | $515,806 | $47,222,231 | $141,809 |
| 2018 | 303 | $69,425 | $15,278,450 | $25,276,330 | $261,428 | $40,885,633 | $134,936 |
| Average | 315 | $96,938 | $19,943,168 | $28,115,378 | $398,242 | $48,553,727 | $154,003 |

Source: SEFSC-SSRG Socioeconomic Panel v.10 (March 2020)

## Imports

Imports of seafood products compete in the domestic seafood market and have in fact dominated many segments of the seafood market. Imports affect the price for domestic seafood products and tend to set the price in the market segments in which they dominate. Seafood imports have downstream effects on the local fish market. At the harvest level for reef fish in general and lane snapper in particular, imports affect the returns to fishermen through the ex-vessel prices they receive for their landings. As substitutes to domestic production of reef fish, including lane snapper, imports tend to cushion the adverse economic effects on consumers resulting from a reduction in domestic landings. The following describes the imports of fish products which directly compete with domestic harvest of snappers, including lane snapper.

Imports[22] of fresh snapper increased steadily from 23.6 million pounds product weight (pw) in 2014 to 30.6 million pounds pw in 2016, then leveled off through 2018. Total revenue from fresh snapper imports increased from $76.9 million (2018 dollars[23]) in 2014 to a five-year high of $96.8 million in 2018. Imports of fresh snappers primarily originated in Mexico, Central America, or South America, and entered the U.S. through the port of Miami. Imports of fresh snapper were highest on average (2014 through 2018) during the months of March through August.

Imports of frozen snapper were substantially less than imports of fresh snapper from 2014 through 2018. During this time, frozen snapper imports ranged from 9.3 million pounds pw to 14.4 million pounds pw and the value of these imports ranged from $26 million (2018 dollars) to $39.5 million. Imports of frozen snapper primarily originated in South America (especially Brazil), Indonesia, and Mexico. The majority of frozen snapper imports entered the U.S. through the ports of Miami and New York. Imports of frozen snappers tended to be lowest during February through June when fresh snapper imports were strong.

**Business Activity**

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

Estimates of the U.S. average annual business activity associated with the commercial harvest of lane snapper in the Gulf were derived using the model developed for and applied in NMFS (2018) and are provided in Table 3.4.1.4.[24] This business activity is characterized as jobs (full- and part-time), output impacts (gross business sales), income impacts (wages, salaries, and self-employed income), and value-added impacts, which represent the contribution made to the U.S. GDP. These impacts should not be added together because this would result in double counting.

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[22] NOAA Fisheries Service purchases fisheries trade data from the Foreign Trade Division of the U.S. Census Bureau. Data are available for download at https://www.fisheries.noaa.gov/national/sustainable-fisheries/foreign-fishery-trade-data

[23] Converted to 2018 dollars using the annual, non-seasonally adjusted GDP implicit price deflator provided by the U.S. BEA.

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

It should be noted that the results provided should be interpreted with caution and demonstrate the limitations of these types of assessments. These results are based on average relationships developed through the analysis of many fishing operations that harvest many different species. Separate models to address individual species are not available. For example, the results provided here apply to a general "Reef Fish" category rather than just lane snapper, and a harvester job is "generated" for approximately every $33,000 (2018 dollars) in ex-vessel revenue. These results contrast with the number of harvesters (vessels) with recorded landings of lane snapper presented in Table 3.4.1.2 and Table 3.4.1.3.

**Table 3.4.1.4**. Average annual business activity (2014 through 2018) associated with the commercial harvest of lane snapper in the Gulf. All monetary estimates are in 2018 dollars.

| Species | Average Ex-vessel Value ($ thousands) | Total Jobs | Harvester Jobs | Output (Sales) Impacts ($ thousands) | Income Impacts ($ thousands) | Value Added ($ thousands) |
|---|---|---|---|---|---|---|
| Lane Snapper | $97 | 12 | 3 | $961 | $353 | $499 |

Source: Calculated by NMFS Southeast Regional Office (SERO) using the model developed for and applied in NMFS (2018).

### 3.4.2 Recreational Sector

The recreational sector is comprised of the private and for-hire modes. The private mode includes anglers fishing from shore (all land-based structures) and private/rental boats. The for-hire mode is composed of charter boats and headboats. Charter boats generally carry fewer passengers and charge a fee on an entire vessel basis, whereas headboats carry more passengers and payment is per person. The type of service, from a vessel- or passenger-size perspective, affects the flexibility to search different fishing locations during the course of a trip and target different species because larger concentrations of fish are required to satisfy larger groups of anglers.

**Landings**

Recreational landings of lane snapper fluctuated from 2014 through 2018, with a peak in 2017 (Figure 3.4.2.1). The majority of landings were from private/rental vessel trips, with most of the remaining landings coming from charter and headboat vessels (Figure 3.4.2.1). Only a small amount of landings were attributed to the shore mode during this time period (Figure 3.4.2.1). Although not shown in the figures, on average (2014 through 2018), approximately 97% of estimated recreational lane snapper landings were attributed to Florida. Seasonal landings fluctuated throughout each year and across years from 2014 through 2018, but on average, peak landings occurred in the Marine Recreational Information Program (MRIP) wave 3 (May/June) (Figure 3.4.2.2).

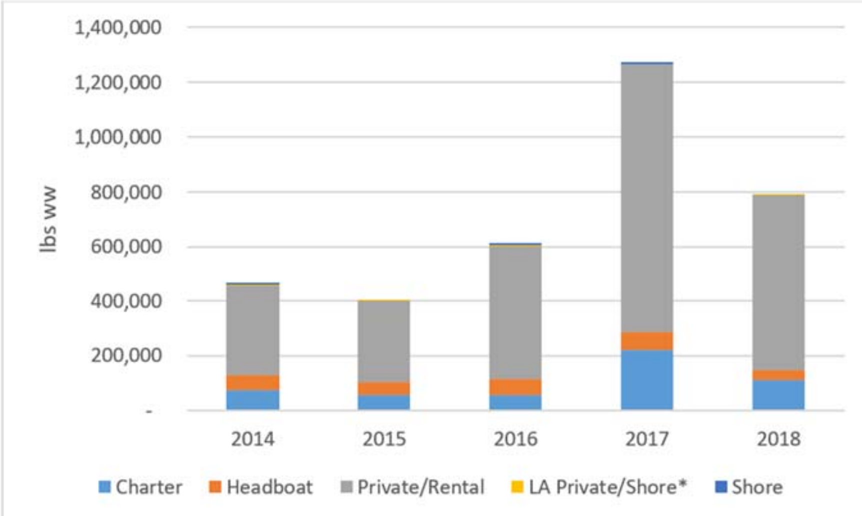


**Figure 3.4.2.1**. Recreational landings of Gulf lane snapper by mode.
Source: SEFSC MRIP Fishing Effort Survey (FES) Recreational ACL data (Feb 2020).
*The Louisiana Department of Wildlife and Fisheries does not differentiate between private and shore modes in their LA Creel data collection program.

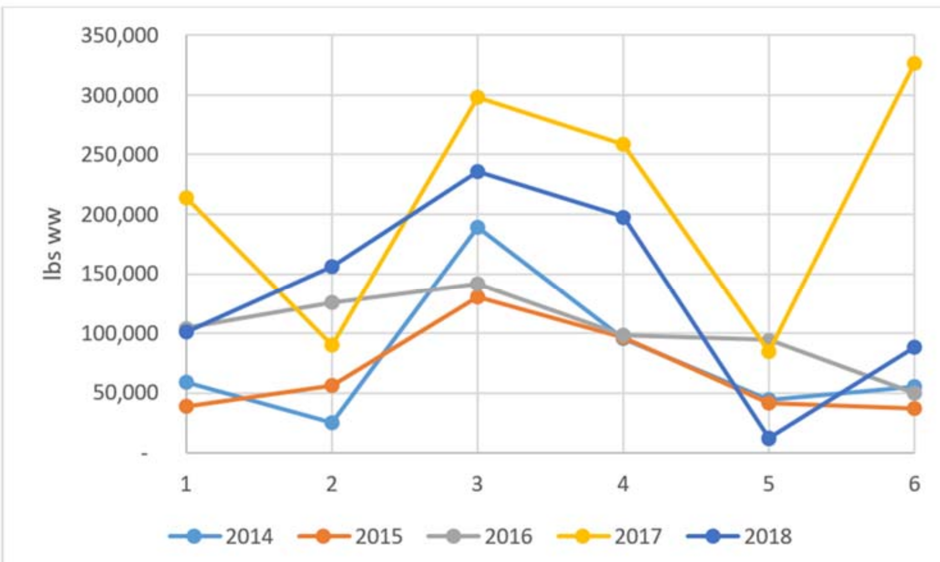


**Figure 3.4.2.2**. Recreational landings of Gulf lane snapper by MRIP wave.
Source: SEFSC MRIP Fishing Effort Survey (FES) Recreational ACL data (Feb 2020).

**Permits**

For-hire vessels are required to have a Gulf charter/headboat permit for reef fish (for-hire permit) to fish for or possess reef fish species in the Gulf EEZ. These are limited access permits. On February 26, 2020, there were 1,304 vessels with a valid (non-expired) or renewable[25] for-hire reef fish permit (including historical captain permits). Although the for-hire permit application

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

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 Fisheries Science Center (SEFSC) that the vessel primarily operates as a headboat.  As of February 8, 2020, 69 Gulf headboats were registered in the SRHS (K. Fitzpatrick, NMFS SEFSC, pers. comm.).  The majority of these headboats were located in Florida (39), followed by Texas (16), Alabama (9), and Mississippi/Louisiana (5).

Information on Gulf charter vessel 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 species, including lane snapper.  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.  As a result, it is not possible to identify with available data how many individual anglers would be expected to be affected by this action.

**Angler Effort**

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

A target trip may be considered an angler's revealed preference for a certain species, and thus may carry more relevant information when assessing the economic effects of regulations on the subject species than the other two measures of recreational effort.  Given the subject nature of this action, the following discussion focuses on target trips for lane snapper in the Gulf.

It is important to note that in 2018, MRIP transitioned from the old Coastal Household Telephone Survey (CHTS) to a new mail-based fishing effort survey (FES).  The estimates presented in Table 3.4.2.1 are calibrated to the FES and may be greater than estimates that are non-calibrated.  Nearly all of the estimated target trips for lane snapper in the Gulf from 2014 through 2018 were taken in Florida and the dominant mode of fishing was the private/rental mode (Table 3.4.2.1). Target trips for lane snapper increased rapidly from 2014 through 2016, but then fluctuated modestly through 2018 (Table 3.4.2.1).

**Table 3.4.2.1**. Gulf lane snapper recreational target trips, by mode and state, 2014-2018.*

| | Alabama | Florida | Mississippi | Total |
|---|---|---|---|---|
| | **Shore Mode** | | | |
| 2014 | 0 | 0 | 0 | 0 |
| 2015 | 0 | 0 | 0 | 0 |
| 2016 | 0 | 0 | 0 | 0 |
| 2017 | 0 | 8,196 | 0 | 8,196 |
| 2018 | 0 | 0 | 0 | 0 |
| Average | 0 | 1,639 | 0 | 1,639 |
| | **Charter Mode** | | | |
| 2014 | 0 | 4,513 | 0 | 4,513 |
| 2015 | 0 | 4,174 | 0 | 4,174 |
| 2016 | 0 | 0 | 0 | 0 |
| 2017 | 0 | 600 | 0 | 600 |
| 2018 | 0 | 0 | 0 | 0 |
| Average | 0 | 1,857 | 0 | 1,857 |
| | **Private/Rental Mode** | | | |
| 2014 | 0 | 3,667 | 0 | 3,667 |
| 2015 | 0 | 6,358 | 0 | 6,358 |
| 2016 | 1,289 | 41,326 | 0 | 42,615 |
| 2017 | 0 | 27,683 | 0 | 27,683 |
| 2018 | 0 | 39,628 | 0 | 39,628 |
| Average | 258 | 23,732 | 0 | 23,990 |
| | **All Modes** | | | |
| 2014 | 0 | 8,181 | 0 | 8,181 |
| 2015 | 0 | 10,532 | 0 | 10,532 |
| 2016 | 1,289 | 41,326 | 0 | 42,615 |
| 2017 | 0 | 36,479 | 0 | 36,479 |
| 2018 | 0 | 39,628 | 0 | 39,628 |
| Average | 258 | 27,229 | 0 | 27,487 |

Source: MRIP database, SERO, NMFS.
*These estimates are based on the MRIP FES. Directed effort estimates that are calibrated to the new MRIP mail-based FES may be greater than non-calibrated estimates presented elsewhere.
Note 1: MRIP estimates for Louisiana are not available after 2013. The Louisiana Department of Wildlife and Fisheries did collect target effort data beginning in 2016; however, that data is not currently calibrated with the MRIP data and therefore is not useful for direct comparison. As seen

in the neighboring state of Mississippi, NMFS expects there would be few if any target trips for lane snapper in that part of the Gulf.
Note 2: Texas and headboat information is unavailable.

Similar analysis of recreational effort is not possible for the headboat mode because headboat data are not collected at the angler level. Estimates of effort by the headboat mode are provided in terms of angler days, or the total number of standardized full-day angler trips.[26] Headboat angler days were fairly stable across the Gulf states from 2014 through 2018 (Table 3.4.2.2). There was, however, a noticeable peak in reported angler days in Florida in 2016 and modest fluctuations elsewhere. On average (2014 through 2018), Florida accounted for the majority of headboat angler days reported, followed by Texas and Alabama; whereas, Mississippi and Louisiana combined accounted for only a small percentage (Table 3.4.2.2). Headboat effort in terms of angler days for the entire Gulf was concentrated most heavily during the summer months of June through August on average (2014 through 2018) (Table 3.4.2.3).

**Table 3.4.2.2**. Gulf headboat angler days and percent distribution by state (2014 through 2018).

| | Angler Days | | | | Percent Distribution | | | |
|---|---|---|---|---|---|---|---|---|
| | **FL** | **AL** | **MS-LA*** | **TX** | **FL** | **AL** | **MS-LA** | **TX** |
| **2014** | 174,599 | 16,766 | 3,257 | 51,231 | 71.0% | 6.8% | 1.3% | 20.8% |
| **2015** | 176,375 | 18,008 | 3,587 | 55,135 | 69.7% | 7.1% | 1.4% | 21.8% |
| **2016** | 183,147 | 16,831 | 2,955 | 54,083 | 71.3% | 6.5% | 1.1% | 21.0% |
| **2017** | 178,816 | 17,841 | 3,189 | 51,575 | 71.1% | 7.1% | 1.3% | 20.5% |
| **2018** | 171,996 | 19,851 | 3,235 | 52,160 | 69.6% | 8.0% | 1.3% | 21.1% |
| **Average** | 176,987 | 17,859 | 3,245 | 52,837 | 70.5% | 7.1% | 1.3% | 21.1% |

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

[26] Headboat trip categories include half-, three-quarter-, full-, and 2-day trips. A full-day trip equals one angler day, a half-day trip equals .5 angler days, etc. Angler days are not standardized to an hourly measure of effort and actual trip durations may vary within each category.

**Table 3.4.2.3**. Gulf headboat angler days and percent distribution by month (2014 – 2018).

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Headboat Angler Days** | | | | | | | | | | | |
| **2014** | 7,069 | 12,402 | 18,626 | 18,733 | 21,345 | 44,342 | 46,246 | 30,893 | 12,089 | 17,395 | 7,557 | 9,156 |
| **2015** | 9,444 | 10,594 | 22,827 | 20,684 | 20,973 | 44,731 | 45,192 | 26,637 | 15,114 | 17,246 | 9,757 | 9,906 |
| **2016** | 7,954 | 13,233 | 21,829 | 18,691 | 21,693 | 50,333 | 49,881 | 21,775 | 13,596 | 15,827 | 11,823 | 10,381 |
| **2017** | 8,998 | 14,007 | 21,032 | 19,383 | 19,186 | 47,673 | 54,028 | 22,984 | 10,289 | 11,054 | 11,299 | 11,488 |
| **2018** | 5,524 | 13,694 | 20,762 | 17,584 | 16,876 | 54,251 | 53,304 | 24,819 | 13,235 | 10,633 | 8,183 | 8,377 |
| **Avg** | 7,798 | 12,786 | 21,015 | 19,015 | 20,015 | 48,266 | 49,730 | 25,422 | 12,865 | 14,431 | 9,724 | 9,862 |
| | **Percent Distribution** | | | | | | | | | | | |
| **2014** | 2.9% | 5.0% | 7.6% | 7.6% | 8.7% | 18.0% | 18.8% | 12.6% | 4.9% | 7.1% | 3.1% | 3.7% |
| **2015** | 3.7% | 4.2% | 9.0% | 8.2% | 8.3% | 17.7% | 17.9% | 10.5% | 6.0% | 6.8% | 3.9% | 3.9% |
| **2016** | 3.1% | 5.1% | 8.5% | 7.3% | 8.4% | 19.6% | 19.4% | 8.5% | 5.3% | 6.2% | 4.6% | 4.0% |
| **2017** | 3.6% | 5.6% | 8.4% | 7.7% | 7.6% | 19.0% | 21.5% | 9.1% | 4.1% | 4.4% | 4.5% | 4.6% |
| **2018** | 2.2% | 5.5% | 8.4% | 7.1% | 6.8% | 21.9% | 21.6% | 10.0% | 5.4% | 4.3% | 3.3% | 3.4% |
| **Avg** | 3.1% | 5.1% | 8.4% | 7.6% | 8.0% | 19.2% | 19.8% | 10.1% | 5.1% | 5.7% | 3.9% | 3.9% |

Source: NMFS SRHS.

### Economic Value

Participation, effort, and harvest are indicators of the value of saltwater recreational fishing. However, a more specific indicator of value is the satisfaction that anglers experience over and above their costs of fishing. The monetary value of this satisfaction is referred to as consumer surplus (CS). The value or benefit derived from the recreational experience is dependent on several quality determinants, which include fish size, catch success rate, and the number of fish kept. These variables help determine the value of a fishing trip and influence total demand for recreational fishing trips.

Haab et al. (2012) estimated the CS for catching and keeping one additional snapper in the Southeastern U.S. using four separate econometric modeling techniques. Of the four models, the finite mixture model, which takes into account variation in the preferences of anglers, produced the lowest root mean square error. The CS estimate for snapper from the finite mixture model was $12.72 (2018 dollars); however, the other logit-based models from the study produced CS estimates for snapper that ranged from $12.72 (2018 dollars) to $35.35. [27]

The foregoing estimates of economic value should not be confused with economic impacts associated with recreational fishing expenditures. Although expenditures for a specific good or service may represent a proxy or lower bound of value (a person would not logically pay more for something than it was worth to them), they do not represent the net value (benefits minus cost), nor the change in value associated with a change in the fishing experience.

[27] Excludes red snapper which Haab et al. (2012) modeled separately and which had an estimated willingness to pay of $45.32 to $142.92 (2018 dollars).

With regard 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, trip net revenue (TNR), which is the return used to pay all labor wages, returns to capital, and owner profits, is used as a proxy for PS. When TNR is divided by the number of anglers on a trip, it represents cash flow per angler (CFpA). The estimated CFpA value for an average Gulf charter angler trip is $162 (2018 dollars) and the estimated CFpA value for an average Gulf headboat angler trip is $53 (Souza and Liese 2019). Estimates of CFpA for a lane snapper target trip are not available.

According to Savolainen et al. (2012), the average charter vessel operating in the Gulf is estimated to receive approximately $88,000 (2018 dollars) in gross revenue and $26,000 in net income (gross revenue minus variable and fixed costs) annually. The average headboat is estimated to receive approximately $267,000 (2018 dollars) in gross revenue and $78,000 in net income annually.

**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 lane snapper in the Gulf were calculated using average trip-level impact coefficients derived from the 2016 Fisheries Economics of the U.S. report (NMFS 2018) and underlying data provided by NOAA's Office of Science and Technology. Economic impact estimates in 2016 dollars were adjusted to 2018 dollars using the annual, not seasonally adjusted GDP implicit price deflator provided by the U.S. Bureau of Economic Analysis.

Business activity (economic impacts) for the recreational sector is characterized in the form of jobs (full- and part-time), income impacts (wages, salaries, and self-employed income), output impacts (gross business sales), and value-added impacts (contribution to the GDP in a state or region). Estimates of the average annual economic impacts (2014-2018) resulting from Gulf lane snapper target trips are provided in Table 3.4.2.4. The average impact coefficients, or multipliers, used in the model are invariant to the "type" of effort and can therefore be directly used to measure the impact of other effort measures such as lane snapper catch trips. To calculate the multipliers from Table 3.4.2.4, simply divide the desired impact measure (sales impact, value-added impact, income impact or employment) associated with a given state and mode by the number of target trips for that state and mode.

The estimates provided in Table 3.4.2.4 only apply at the state-level. Addition of the state-level estimates to produce a regional (or national) total may underestimate the actual amount of total business activity, because state-level impact multipliers do not account for interstate and interregional trading. It is also important to note that these economic impacts estimates are based on trip expenditures only and do not account for durable expenditures. Durable expenditures cannot be reasonably apportioned to individual species. As such, the estimates provided in Table 3.4.2.4 may be considered a lower bound on the economic activity associated with those trips that targeted lane snapper.

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

**Table 3.4.2.4**. Estimated annual average economic impacts (2014-2018) from recreational trips that targeted Gulf lane snapper, by state and mode, using state-level multipliers. All monetary estimates are in 2018 dollars in thousands.

| | FL | AL | MS |
|---|---|---|---|
| | **Charter Mode** | | |
| Target Trips | 1,857 | 0 | 0 |
| Value Added Impacts | $630 | $0 | $0 |
| Sales Impacts | $1,058 | $0 | $0 |
| Income Impacts | $368 | $0 | $0 |
| Employment (Jobs) | 10 | 0 | 0 |
| | **Private/Rental Mode** | | |
| Target Trips | 23,732 | 258 | 0 |
| Value Added Impacts | $829 | $11 | $0 |
| Sales Impacts | $1,286 | $17 | $0 |
| Income Impacts | $435 | $4 | $0 |
| Employment (Jobs) | 12 | 0 | 0 |
| | **Shore** | | |
| Target Trips | 1,639 | 0 | 0 |
| Value Added Impacts | $58 | $0 | $0 |
| Sales Impacts | $91 | $0 | $0 |
| Income Impacts | $31 | $0 | $0 |
| Employment (Jobs) | 1 | 0 | 0 |
| | **All Modes** | | |
| Target Trips | 27,229 | 258 | 0 |
| Value Added Impacts | $1,518 | $11 | $0 |
| Sales Impacts | $2,435 | $17 | $0 |
| Income Impacts | $834 | $4 | $0 |
| Employment (Jobs) | 23 | 0 | 0 |

Source: Effort data from MRIP; economic impact results calculated by NMFS SERO using NMFS (2018) and underlying data provided by the NOAA Office of Science and Technology.
Note 1: MRIP estimates for Louisiana are not available after 2013. The Louisiana Department of Wildlife and Fisheries did collect target effort data beginning in 2016; however, that data is not currently calibrated with the MRIP data and therefore is not useful for direct comparison. As seen in the neighboring state of Mississippi, NMFS expects there would be few if any target trips for lane snapper in that part of the Gulf.
Note 2: Texas and headboat information is unavailable.

## 3.5 Description of the Social Environment

This framework action affects commercial and recreational management of lane snapper in the Gulf. A description of the permits and endorsements related to the commercial and recreational reef fish fishing is included by state in order to provide a geographic distribution of fishing involvement. Top communities based on the number of permits and endorsements are presented.

Commercial and recreational landings by state are included to provide information on the geographic distribution of fishing involvement. Descriptions of the top communities involved in commercial lane snapper are included as well as the top recreational fishing communities based on recreational engagement. Community level data are presented in order to meet the requirements of National Standard 8 of the Magnuson-Stevens Fishery Management Act (Magnuson-Stevens Act), which requires the consideration of the importance of fishery resources to human communities when changes to fishing regulations are considered. Lastly, social vulnerability data are presented to assess the potential for environmental justice concerns.

Additional detailed information about communities in the following analysis can be found on the SERO's Community Snapshots website.[28]

### 3.5.1 Commercial Sector

**Permits**

Gulf reef fish permits are issued to individuals in Florida (80% of Gulf reef fish vessels), Texas (8.2%), Alabama (4.6%), Louisiana (4.1%), and Mississippi (1%, SERO permit office, December 21, 2020). Residents of other states (Arkansas, Georgia, Illinois, Maryland, Missouri, North Carolina, New York, Oklahoma, and South Carolina) also hold commercial reef fish permits, but these states represent a smaller percentage of the total number of issued permits.

Gulf reef fish permits are held by individuals with mailing addresses in 230 communities (SERO permit office, December 21, 2020). Communities with the most commercial reef fish permits are located in Florida and Texas (Table 3.5.1.1). The communities with the most reef fish permits are Panama City, Florida (8.3% of reef fish permits), Key West, Florida (4.6%), and St. Petersburg, Florida (3.2%).

[28] https://www.fisheries.noaa.gov/southeast/socioeconomics/snapshots-human-communities-and-fisheries-gulf-mexico-and-south-atlantic

**Table 3.5.1.1.** Top communities by number of Gulf reef fish permits and Eastern Gulf reef fish bottom longline endorsements.

| State | Community | Reef Fish Permits (RR) | State | Community | Eastern Gulf Reef Fish Bottom Longline Endorsements (RRLE) |
|---|---|---|---|---|---|
| FL | Panama City | 69 | FL | Cortez | 9 |
| FL | Key West | 38 | FL | Largo | 7 |
| FL | St. Petersburg | 27 | FL | Madeira Beach | 6 |
| FL | Largo | 24 | FL | Seminole | 5 |
| FL | Destin | 22 | FL | Lecanto | 4 |
| TX | Galveston | 22 | FL | Palm Harbor | 4 |
| FL | Pensacola | 20 | FL | St. Petersburg | 4 |
| FL | Cortez | 18 | FL | Clearwater | 3 |
| FL | Seminole | 18 | FL | Indian Shores | 3 |
| FL | Clearwater | 17 | FL | Panama City | 3 |
| FL | Tampa | 15 | | | |
| FL | Naples | 13 | | | |
| FL | Winter Springs | 13 | | | |
| FL | Fort Walton Beach | 11 | | | |
| FL | Tarpon Springs | 11 | | | |
| FL | Lecanto | 10 | | | |
| TX | Houston | 10 | | | |
| FL | Apalachicola | 9 | | | |
| FL | Hudson | 9 | | | |
| FL | Lynn Haven | 9 | | | |
| FL | Palm Harbor | 9 | | | |
| FL | Steinhatchee | 9 | | | |

Source: SERO permit office, December 21, 2020.

A valid Gulf reef fish permit is required for a commercial Eastern Gulf reef fish bottom longline endorsement. Nearly all Eastern Gulf reef fish bottom longline endorsements are issued to individuals in Florida, with one endorsement issued to an individual in Texas. Longline endorsements are held by individuals with mailing addresses in 21 communities, and a large portion of these communities are located in the greater Tampa Bay area in Pinellas, Manatee, Pasco, and Sarasota Counties (approximately 81% of communities with bottom longline endorsements, Southeast Regional Office (SERO) permit office, December 21, 2020). The communities with the most longline endorsements are Cortez, Florida (14.5% of longline endorsements), followed by Largo (11.3%), and Madeira Beach (9.7%, Table 3.5.1.1).

## Landings

As described in Section 3.1, commercial fishing accounts for about 5% of total lane snapper landings and the majority of commercial landings of lane snapper are from waters adjacent to Florida (average of 94% from 2012-2018, SEFSC Commercial ACL Data). A small proportion of the total commercial lane snapper catch is landed in other Gulf States.

The regional quotient (RQ) is the proportion of landings and value out of the total landings and value of that species for that region, and is a relative measure. These communities would be most likely to experience the effects of the proposed actions. If a community is identified as a lane snapper community based on the RQ, this does not necessarily mean that the community would experience significant impacts due to changes in the fishery if a different species or number of species were also important to the local community and economy.

The top lane snapper communities are located in Florida (Figure 3.5.1.1). About 11% of lane snapper is landed in the top community of Madeira Beach, representing 10.1% of Gulf-wide ex-vessel value for the species. Matlacha, Florida ranks second in terms of pounds RQ for lane snapper, but first in terms of value.

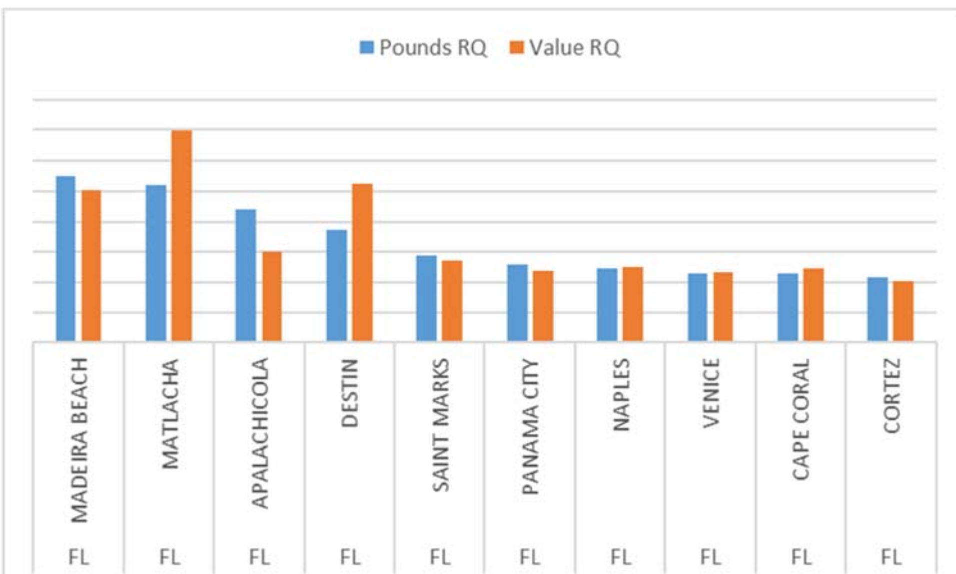


**Figure 3.5.1.1.** Top 10 Gulf communities ranked by pounds and value RQ for lane snapper. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.
Source: SERO, Community ALS 2018.

As described in Section 3.4, vertical gear accounted for the majority of lane snapper commercial landings (approximately 84%); followed by longline gear (approximately 15%); and other gear types including spear, trolling, buoy, and powerhead (SEFSC-SSRG Socioeconomic Panel v. 10, March 2020). Therefore, the commercial fishermen that may be the most affected by the actions in this framework are those using vertical gear and to a lesser extent, longline gear and are located in communities described in Table 3.5.1.1 and Figure 3.5.1.1.

## 3.5.2 Recreational Sector

**Permits**

Charter/headboat for reef fish permits are issued to individuals in Florida (59.7% of charter/headboat for reef fish vessels), Texas (15.8%), Alabama (10%), Louisiana (7.7%), and Mississippi (2.9%, SERO permit office, December 21, 2020). Residents of other states (Alaska, Arkansas, California, Connecticut, Georgia, Illinois, Indiana, Kansas, Michigan, Montana, North Carolina, New Jersey, New York, Ohio, Oklahoma, Tennessee, Virginia, and Wisconsin) also hold charter/headboat permits, but these states represent a smaller percentage of the total number of issued permits.

Charter/headboat for reef fish permits are held by individuals with mailing addresses in 339 communities (SERO permit office, December 21, 2020). Communities with the most charter/headboat for reef fish permits are located in Florida, Alabama, and Texas (Table 3.5.2.1). The communities with the most charter/headboat permits are Destin, Florida (4.9% of charter/headboat permits), Panama City, Florida (4.4%), and Naples, Florida (3.7%).

**Table 3.5.2.1.** Top communities by number of Gulf charter/headboat for reef fish permits.

| State | Community | Charter/Headboat for Reef Fish Permits (RCG) |
|---|---|---|
| FL | Destin | 63 |
| FL | Panama City | 57 |
| FL | Naples | 47 |
| AL | Orange Beach | 45 |
| FL | Key West | 37 |
| FL | Pensacola | 28 |
| TX | Galveston | 21 |
| FL | Panama City Beach | 20 |
| FL | Sarasota | 20 |
| FL | St. Petersburg | 19 |
| FL | Clearwater | 17 |
| FL | Cape Coral | 16 |
| TX | Corpus Christi | 16 |
| FL | Fort Myers | 14 |
| FL | Gulf Breeze | 14 |

Source: SERO permit office, December 21, 2020.

Historical captain charter/headboat permits are issued to individuals in Florida (48% of historical captain charter/headboat vessels), Louisiana (20%), Alabama (16%), Texas (12%), and Mississippi (4%, SERO permit office, December 21, 2020).

Historical captain charter/headboat for reef fish permits are held by individuals with mailing addresses in 19 communities (SERO permit office, December 21, 2020). Communities with the most historical captain permits are located in Alabama, Florida, and Louisiana (Table 3.5.2.2).

**Table 3.5.2.2.** Top communities by historical captain Gulf charter/headboat for reef fish permits.

| State | Community |
|---|---|
| AL | Orange Beach |
| FL | Destin |
| FL | Naples |
| FL | Port St. Joe |
| LA | Houma |
| LA | Metairie |

Source: SERO permit office, December 21, 2020.

### Landings

As described in Section 3.1.1, the majority of lane snapper is landed by recreational anglers (approximately 95% of total landings of lane snapper from 2012-2018, SEFSC Commercial ACL Data and SEFSC MRFSS Recreational ACL Data). The majority of recreational landings of lane snapper are from waters adjacent to Florida (average of 97.4% from 2013-2018), followed by Alabama (1.8%), Louisiana and Mississippi (0.4%), and Texas (0.4%, Table 3.1.1.4).

### Engagement and Reliance Indicators

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

Figure 3.5.2.1 identifies the top Gulf communities that are engaged and reliant upon recreational fishing in general. Two thresholds of one and one-half standard deviation above the mean were plotted to help determine a threshold for significance. Communities are presented in ranked order by fishing engagement and all 20 included communities demonstrate high levels of recreational engagement, although this is not specific to fishing for lane snapper. Because the analysis used discrete geo-political boundaries, Panama City and Panama City Beach had separate values for the associated variables. Calculated independently, each still ranked high enough to appear in the top 20 list suggesting a greater importance for recreational fishing in that area.

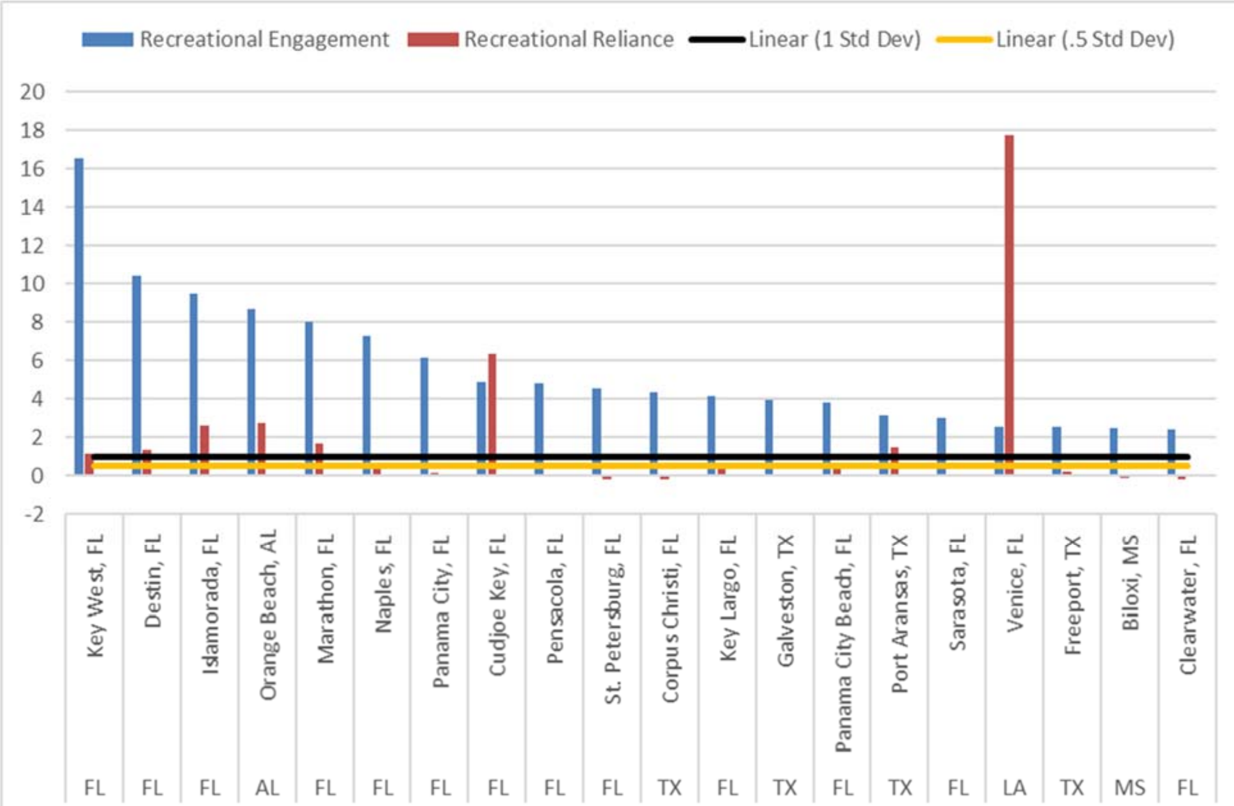


**Figure 3.5.2.1.** Top 20 recreational fishing communities' engagement and reliance.
Source: SERO, Community Social Vulnerability Indicators Database 2018.

### 3.5.3 Environmental Justice

Executive Order (E.O.) 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 E.O. 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 E.O. is generally referred to as environmental justice (EJ).

Information is available concerning communities overall status with regard to minorities and poverty (e.g., census data). To help assess whether any EJ concerns may be present within regional communities, a suite of indices was created to examine the social vulnerability of coastal communities. 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 and 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. Again, for those communities that exceed the threshold it would be expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change.

Figures 3.5.3.1 and 3.5.3.2 provide the social vulnerability of the top commercial and recreational reef fish and lane snapper communities. One community exceeds the threshold of one standard deviation above the mean for all three indices, Freeport, Texas. Several other communities exceed the threshold of one standard deviation above the mean for any of the indices (Houma, Louisiana and Houston, Texas). These communities would be the most likely to exhibit vulnerabilities to social or economic disruption due to regulatory change.

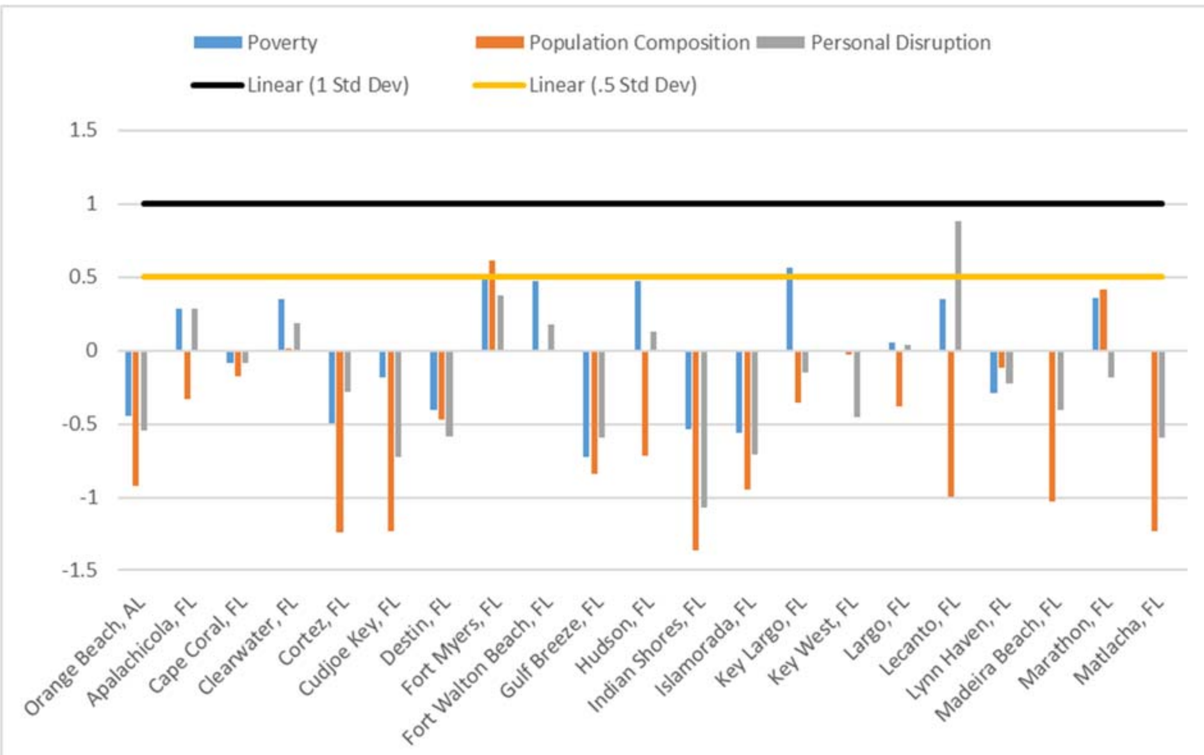


**Figure 3.5.3.1.** Social vulnerability indices for top commercial and recreational reef fish and lane snapper communities.
Source: SERO, Community Social Vulnerability Indicators Database 2018.

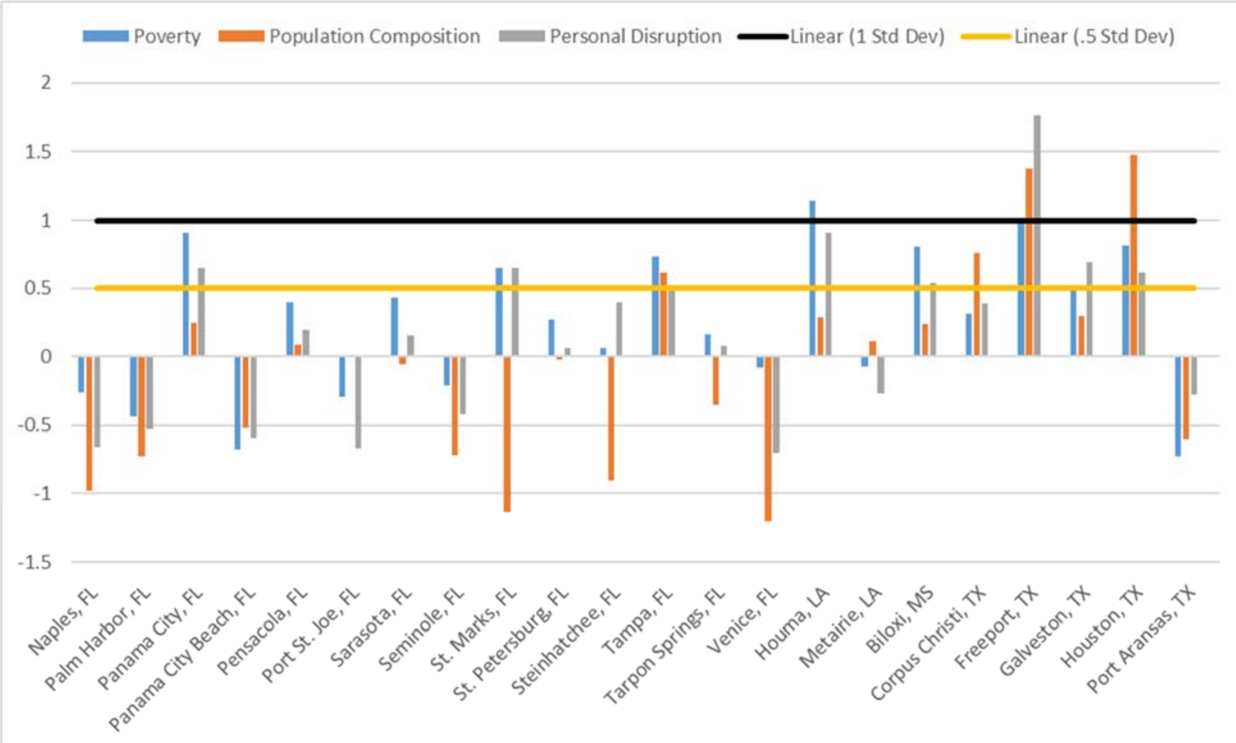


**Figure 3.5.3.2.** Social vulnerability indices for top commercial and recreational reef fish and lane snapper communities continued.
Source: SERO, Community Social Vulnerability Indicators Database 2018.

People in these communities may be affected by fishing regulations in two ways: participation and employment. Although these communities may have the greatest potential for EJ concerns, complete data are not available on the race and income status for those involved in the local fishing industry (employment), or for their dependence on lane snapper specifically (participation). Although no EJ issues have been identified, the absence of potential EJ concerns cannot be assumed.

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

Responsibility for federal fishery management decision-making is divided between 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 C. In most cases, the Secretary has delegated this authority to NMFS.

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

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

### 3.6.2 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 states' natural resources through discrete administrative units. Although each agency is the primary administrative body with respect to the states' natural resources, all states cooperate with numerous state and federal regulatory agencies when managing marine resources. Descriptions of individual state management and data collection programs can be found at the Web Pages shown in Table 3.6.2.1.

**Table 3.6.2.1.** Gulf state marine resource agencies and web pages.

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

# CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

## 4.1 Action 1 – Modify Catch Limits and ACT

### 4.1.1 Direct and Indirect Effects on the Physical Environment

The alternatives in this action would modify the catch limits for lane snapper: overfishing limit (OFL), acceptable biological catch (ABC), the annual catch limit (ACL), and the annual catch target (ACT). While this action would not directly affect the physical environment, catch levels that allow for more or less harvest may change fishing activity, which could indirectly affect this environment. Any effects from this action are not expected to be significant, as this action is not expected to change how the reef fish fishery is prosecuted overall because it is a multi-species fishery targeting many species. This action would only affect the portion of the fishery targeting lane snapper.

Participants in the commercial sector of the reef fish fishery primarily use vertical lines (i.e., electric reel, bandit rig, hook-and-line, and trolling) and longlines. However, on average (from 1999 through 2019) approximately 14% of lane snapper is landed by the commercial sector (Table 1.1.2). Participants in the recreational sector (headboat, charter, and private modes) primarily use vertical line gear (hook-and-line). Bottom longline gear is deployed over hard bottom habitats using weights to keep the gear in direct contact with the bottom. The potential for this gear to adversely impact the bottom depends on the type of habitat it is set on, the presence or absence of currents and the behavior of fish after being hooked. In addition, this gear, upon retrieval, can abrade, snag, and dislodge smaller rocks, corals, and sessile invertebrates (Hamilton 2000; Barnette 2001). Direct underwater observations of longline gear in the Pacific halibut fishery by High (1998) noted that the gear could sweep across the bottom. A study that directly observed deployed longline gear (Atlantic tilefish fishery) found no evidence that the gear shifted significantly, even when set in currents (Grimes et al. 1982). A lack of gear shifting, even in strong currents, was attributed to setting anchors at either end of the longline to prevent movement, which is the standard in the longline component of the commercial sector of the reef fish fishery. Based on direct observations, it is logical to assume that bottom longline gear would have a minor impact on sandy or muddy habitat areas. However, due to the vertical relief that hard bottom and coral reef habitats provide, it would be expected that bottom longline gear may become entangled, resulting in potential negative effects to habitat (Barnette 2001). Concentrations of many managed reef fish species are higher on hard bottom areas than on sand or mud bottoms, thus vertical line gear fishing generally occurs over hard bottom areas (GMFMC 2004a). Vertical lines include multi-hook lines known as bandit gear, handlines, and rod-and-reels. Vertical line gear is less likely to contact the bottom than longlines, but still has the potential to snag and entangle bottom structures and cause attached organisms, such as soft corals and sponges, to tear off or be abraded (Barnette 2001). In using bandit gear, a weighted line is lowered to the bottom, and then the weighted line is raised slightly off the bottom (Siebenaler and Brady 1952). The gear is in direct contact with the bottom for only a short period of time. Barnette (2001) suggested that physical impacts may include entanglement and minor degradation of benthic species from line abrasion and the use of weights (sinkers). Anchor damage is also associated with vertical line fishing vessels, particularly by the recreational sector, where anglers may repeatedly visit well-marked or known fishing locations. Hamilton (2000) pointed out that “favorite” fishing areas such as reefs are targeted and revisited multiple times, particularly with the advent of GPS technology. The cumulative effects of repeated anchoring could damage the hard bottom areas where reef fish fishing occurs, as well as repeated drops of weighted fishing rigs onto the reef. Recreational and commercial vessels that use vertical line gear are typically known to anchor more frequently over the reef sites. Spears are used by both the recreational and commercial sector to harvest reef fish, but represent a relatively minor component of both. Barnette (2001) summarized a previous study that concluded spearfishing on reef habitat might result in some coral breakage. In addition, there could be some impacts from divers touching coral with their hands or from re-suspension of sediment by fins (Barnette 2001).

**Alternative 1** (No Action) would maintain the current catch limits and ACT. Under **Alternative 1**, fishing effort and effects on the physical environment would be similar to what has been experienced in recent years (2012-2019). Landings would still be limited as the stock is managed under the ACL. Both **Preferred Alternative 2** and **Alternative 3** would increase the catch limits for lane snapper based on results from the SEDAR 49 stock assessment update and conversion of recreational landings to the Marine Recreation Information Program’s Fishing Effort Survey (MRIP-FES). Higher catch limits may increase fishing effort resulting in increased adverse effects on the physical environment relative to **Alternative 1**. **Preferred Alternative 2** removes the ACT, so harvest could not be constrained using this accountability measure (AM) under Action 2. Instead, harvest would continue to be constrained to the ACL. **Alternative 3** would update the ACT for lane snapper, and allow the Council to select an alternative in Action 2 that used the ACT to constrain harvest. Since the ACT is set below the ACL, using the ACT is a more conservative approach that would trigger a fishing closure sooner than monitoring to the ACL, resulting in less fishing effort and adverse effects on the physical environment. Since **Alternative 3** retains the ACT, it could result in decreased fishing effort relative to **Preferred Alternative 2**. However, since the buffer between the ACL and the ACT is only 16% it is possible that any difference in the adverse effects on the physical environment between **Preferred Alternative 2** and **Alternative 3** may be negligible.

### 4.1.2 Direct and Indirect Effects on the Biological Environment

Direct and indirect effects from fishery management actions have been discussed in detail for a variety of reef fish species in past Reef Fish FMP Amendments (e.g., GMFMC 2004b, 2007, 2008a, 2008b, 2008c, 2009, 2011b, 2012a, 2012b, 2015, 2016, 2017b) and are incorporated here by reference. Management actions that affect the biological and ecological environment mostly relate to the impacts of fishing on a species’ population size, life history, and the role of the species within its habitat. Removal of fish from the population through fishing reduces the overall population size. Fishing gears have different selectivity patterns that refer to a fishing method’s ability to target and capture organisms by size and species. This would include the number of discards, which are expected to be mostly sublegal fish or fish caught during seasonal closures, and the mortality associated with releasing these fish. Fishing can affect life history characteristics of reef fish such as growth and maturation rates. For example, Fischer et al. (2004) and Nieland et al. (2007) found that the average size-at-age of red snapper had declined and associated this trend with fishing pressure. Woods (2003) found that the size at maturity for

Gulf red snapper had declined and speculated this change may also have been due to increases in fishing effort. Lombardi-Carlson et al. (2006) found that the mean size of gag at age was larger pre-1990 than in post-1990 years, and suggested this change was also due to fishing. Bycatch does occur within the reef fish fishery. If fish are released due to catch limits, seasons, or other regulatory measures, these fish are considered bycatch. Bycatch practicability analyses have been completed for red snapper (GMFMC 2004, GMFMC 2007, GMFMC 2014 GMFMC 2015), grouper (GMFMC 2008a, GMFMC 2009, GMFMC 2011b, GMFMC 2012a), vermilion snapper (GMFMC 2004b, GMGMC 2017a), greater amberjack (GMFMC 2008b, GMFMC 2012b), gray triggerfish (GMFMC 2012c), and hogfish (GMFMC 2016). In general, these analyses have 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. Some management measures can increase bycatch through regulatory discards such as increased minimum sizes and closed seasons. However, these measures are implemented in situations where the biological benefit to the managed species outweighs any increases in discards. For this action, any effects on bycatch are likely to be negligible because the action is not expected to change how the reef fish fishery is prosecuted.

Fishing for species in the reef fish fishery can also affect species outside the reef fish complex. For example, sea turtles have been observed to be directly affected by the bottom longline component of the Gulf reef fish fishery. These effects occur when sea turtles interact with fishing gear and result in an incidental capture injury or mortality and are summarized in GMFMC (2009) and NMFS (2011). However, as described in Section 3.3, the reef fish fishery is not likely to jeopardize the continued existence of any endangered species and has a remote likelihood of, or no known incidental mortality or serious injury of, marine mammal species. Modifying the catch levels through this action is not expected change how the reef fish fishery is prosecuted or result in any impacts beyond those described in Section 3.3.

**Alternative 1** (No Action) would maintain the current catch limits and ACT. Under **Alternative 1**, fishing effort and effects on the biological/ecological environment would be similar to what has been experienced in recent years (2012-2019). Landings would still be limited as the stock is managed under the ACL. However, **Alternative 1** does not represent the best scientific information available, especially as it relates to the estimation of fishing effort. Therefore, **Alternative 1** may be underestimating fishing effort, and therefore may not allow fishery managers to best account for that fishing effort on lane snapper. Both **Preferred Alternative 2** and **Alternative 3** would increase the catch limits for lane snapper based both on results from the SEDAR 49 stock assessment update and conversion of recreational landings to MRIP-FES. An increase in catch limits resulting from the estimated increase in biomass (SEDAR 49 Update) is likely to increase fishing effort. However, so long as the prescribed catch limits in **Preferred Alternative 2** and **Alternative 3** are not exceeded, no long-term negative effects on the lane snapper stock are expected, as these harvest levels are projected to be sustainable. Further, because **Preferred Alternative 2** and **Alternative 3** would facilitate the monitoring of recreational catch and effort using the best scientific information available, they are expected to be more accurate at measuring both compared to **Alternative 1**, thereby reducing the potential for negative effects compared to **Alternative 1**. **Preferred Alternative 2** removes the ACT, so harvest could not be constrained using this AM under Action 2. Instead, harvest would continue to be constrained to the ACL. **Alternative 3** would update the ACT for lane snapper, and allow the Council to select an alternative in Action 2 that used the ACT to constrain landings. Since the ACT is set below the ACL, using the ACT is a more conservative approach that would trigger a fishing closure sooner than monitoring to the ACL, resulting in less fishing effort and a lower probability of negative effects on the biological/ecological environment. Since **Alternative 3** retains the ACT, it could result in decreased fishing effort relative to **Preferred Alternative 2**. Any difference in the adverse effects on the biological/ecological environment between **Preferred Alternative 2** and **Alternative 3** would be expected to be proportional to the buffer between the ACL and the ACT in **Alternative 3** (16%). In addition, any effects resulting from the change to the catch levels are not expected to be significant because this action is not expected to change how the reef fish fishery is prosecuted overall, because it is a multi-species fishery targeting many species.

### 4.1.3 Direct and Indirect Effects on the Economic Environment

**Alternative 1** (No Action) would not modify the current reference points, catch limits and, catch targets. Therefore, **Alternative 1** would not be expected to affect fishing practices or harvests of lane snapper and would not be expected to result in economic effects. However, **Alternative 1** would not be compatible with SSC's recommendations because it would continue to rely on outdated Marine Recreational Fisheries Statistic Survey (MRFSS) units to estimate lane snapper recreational effort and catch. The continued reliance of outdated measurement units could result in misguided management measures which in turn could adversely impact the lane snapper stock and result in negative economic effects. The size of these potential adverse economic effects cannot be quantified at this time because it would be determined by the discrepancy between management measures that would have been proposed based on MRIP-FES catch and effort estimates and those that would result from the reliance of outdated units of measurement (MRFSS).

Relative to **Alternative 1**, **Preferred Alternative 2** would set reference points and catch limits based on the result of SEDAR 49, which used different recreational survey data, and SSC recommendations. Estimates generated in **Alternative 1** rely on MRFSS while those proposed in **Preferred Alternative 2** are based on MRIP-FES. The higher reference points and catch limits proposed in **Preferred Alternative 2** are attributed to the combination of the recalibration of recreational data and the SEDAR 49 projections. **Preferred Alternative 2** and **Alternative 3** would set the same OFL, ABC, and ACL. and **Alternative 3** differs from **Preferred Alternative 2** because it would retain the ACT.

For recreational anglers, economic effects expected to result from **Preferred Alternative 2** and **Alternative 3** would typically be based on estimated changes in economic value relative to **Alternative 1** (No Action). Changes in economic value are generally estimated by first computing the expected changes in the recreational ACL or ACT, or the portion of the stock ACL/ACT expected to be harvested by the recreational sector when there are no sector allocations. In other words, the differences between the portion of the baseline ACL or ACT likely to be harvested by the recreational sector from **Alternative 1** and the corresponding portion of the proposed ACL or ACT for each proposed alternative are used to compute changes in consumer surplus (CS) to anglers. To compute CS changes, an estimated change in landings in pounds is converted into number of fish and multiplied by a CS estimate per fish. For the for-hire sector, assuming that the baseline (**Alternative 1**) and **Preferred Alternative 2** and **Alternative 3** are expressed in the same measurement units**,** changes in economic value are usually estimated by multiplying the expected difference in trips by an estimated trip net revenue (TNR). CS per fish and TNR estimates are provided in Section 3.4.2. However, because in this action reference points and catch limits in **Alternative 1** are based on MRFSS and are not readily convertible into MRIP-FES units, it is not possible to compute expected differences in recreational landings (or in number of trips) between **Alternative 1** and **Preferred Alternative 2** or **Alternative 3.** A MRFSS equivalent ACL and ACT are provided under **Preferred Alternative 2** and **Alternative 3**, so we know that the overall stock ACL and ACT are almost 100% greater than under **Alternative 1** when ignoring the influence of the adjustment in the recreational data collection from MRFSS to MRIP-FES. However, the specific increase in expected landings for the recreational sector in MRIP-FES units is not quantifiable. Therefore, a qualitative evaluation of expected economic effects to the recreational sector is provided in this section. Table 4.1.3.1 provides predicted lane snapper closure dates for the alternatives considered.

**Table 4.1.3.1.** Predicted lane snapper closure date by alternative.

| Alternatives | Predicted Closure Date |
|---|---|
| **Alternative 1** | Aug 19 |
| **Preferred Alternative 2** | No Closure |
| **Alternative 3** | Dec 8 |

Source: See Appendix B

Relative to **Alternative 1** which predict the closure of lane snapper fishing on August 19, both **Preferred Alternative 2** and **Alternative 3** would extend the lane snapper fishing season for recreational anglers. Therefore, relative to **Alternative 1**, both **Preferred Alternative 2** and **Alternative 3** would be expected to result in greater economic benefits because they would provide additional fishing opportunities. Compared to **Alternative 3**, **Preferred Alternative 2** would offer a longer season because its predicted season length is based on the lane snapper ACL while the season under **Alternative 3** is estimated using the ACT. **Preferred Alternative 2** would provide a year-round season while **Alternative 3** would close the lane snapper fishing season on December 8 (if the ACT is in effect). Compared to **Alternative 3**, **Preferred Alternative 2** is therefore expected to provide greater fishing opportunities and greater associated economic benefits. It is also noted that additional fishing opportunities to the recreational sector would also translate into increased economic benefits to for-hire operators.

Relative to **Alternative 1**, potential economic benefits to the commercial sector could be approximated by the change in ex-vessel value attributable to **Preferred Alternative 2** or **Alternative 3**. Because commercial data were not subject to a change in measurement units, it can be assumed that commercial effort and landings patterns would remain similar between this action's alternatives. Therefore, based on the estimated closure dates and baseline 2016-2018 average landings figures, commercial landings were estimated for each of the alternatives. For **Preferred Alternative 2** and **Alternative** 3, Table 4.3.2 provides predicted closures dates, estimated commercial landings at closure, and differences in landings and ex-vessel values relative to **Alternative 1**. Ex-vessel values were based on an average ex vessel price of $2.48 per lb of lane snapper. Expressed in $2018, the average ex-vessel price was derived from Table 3.4.1.1 which provides commercial lane snapper landings and revenue.

**Table 4.1.3.2.** Predicted Closure dates and changes in commercial landings and ex-vessel values (dollar values in $2018).

| Alternatives | Predicted Closure Date | Commercial Landings at Closure | Difference in Landings relative to Alternative 1 | Difference in Ex-Vessel Value relative to Alternative 1 |
|---|---|---|---|---|
| **Alternative 1** | 19-Aug | 22,419 | | |
| **Preferred Alternative 2** | No Closure | 34,781 | 12,362 | $30,658 |
| **Alternative 3** | 8-Dec | 32,383 | 9,964 | $24,711 |

Source: NMFS SERO

**Preferred Alternative 2**, which would afford commercial fishermen a year-round fishing season and thus more fishing opportunities, would be expected to result in greater economic benefits compared to **Alternative 3 (**with the ACT in effect**)**. **Alternative 3** would allow commercial lane snapper fishing until December 8. Relative to **Alternative 1**, **Preferred Alternative 2** is expected to allow commercial fishermen to harvest 12,362 additional lbs of lane snapper and generated economic benefits valued at $30,658 per year. **Alternative 3** is expected to result in additional lane snapper harvests estimated at 9,964 with a value of $24,711.

### 4.1.4 Direct and Indirect Effects on the Social Environment

Depending on the alternative selected, this action would do three related things: increase the catch levels for lane snapper; convert the units used for the recreational sector from MRFSS to MRIP-FES; and consider whether to retain the ACT.

**Preferred Alternative 2** and **Alternative 3** provide the same catch levels for the OFL, ABC, and ACL; thus, the effects of each alternative would be the same compared to **Alternative 1** (No Action). The current ACL (**Alternative 1**) has been exceeded each year since 2016 (Table 1.1.2), and the fishing season for lane snapper was closed for the first time in 2019 on December 13, which negatively affected both sectors. **Preferred Alternative 2** and **Alternative 3** would increase the catch levels compared to **Alternative 1**. Although it cannot be assumed that effort and landings would remain stable compared with recent years, comparing the ACLs in MRFSS units, the ACL under **Preferred Alternative 2** and **Alternative 3** would represent a 52% increase compared to **Alternative 1**. This is greater than the highest year of landings (2017, when landings totaled 188% of the ACL). Thus, under **Preferred Alternative 2** and **Alternative 3**, it is less likely that the ACL would be exceeded compared to **Alternative 1**, and less likely to potentially trigger an in-season closure if the ACL is met for a second year in a row, resulting in positive effects for the social environment.

This action would also modify the units used for the recreational sector from MRFSS to MRIP-FES; no changes would be made to how landings are monitored for the commercial sector. In theory, there should be no direct effects as the change is a conversion, such that the proposed ACL of 1,028,973 lbs ww in MRIP-FES should be equivalent to an ACL that is 52% greater than the ACL currently set and monitored for both sectors (**Preferred Alternative 2** and **Alternative 3**).

**Preferred Alternative 2** and **Alternative 3** differ in that there would no longer be an ACT set under **Preferred Alternative 2**, while **Alternative 3** would revise the ACT in relation to the new ACL. Because the ACT is not currently used as an AM (**Alternative 1**), no effects would be expected from either removing the ACT (**Preferred Alternative 2**) or setting a new ACT (**Alternative 3**) compared to **Alternative 1**. However, Action 2 considers modifying the post-season accountability measure (AM) such that the ACT may be used for management. Thus, the effects of setting or removing the ACT are analyzed in Section 4.2.4.

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

Modifying catch limits, including the OFL, ABC, ACL and the ACT, does not typically result in substantial direct or indirect administrative effects. Both **Preferred Alternative 2** and **Alternative 3** would increase the catch limits for lane snapper based on results from the SEDAR 49 stock assessment update and conversion of recreational landings to MRIP-FES. **Alternative 3** would retain the ACT, which could be used to constrain lane snapper harvest and account for management uncertainty, which can reduce the administrative burden associated with exceeding the ACL or OFL. However, closures may be more likely to occur under an ACT, which is constrains catch to lower levels. Under an ACT, increased administrative burden associated with more frequent fishing season closures may result. Regardless, the administrative burden of monitoring to various catch limits or the ACT would not be significant because monitoring to these limits is routine for the Southeast Regional Office (SERO). Once these catch limits are implemented, the type of regulations needed to manage the lane snapper fishery would remain unchanged regardless of the choice of harvest levels. SERO monitors both the recreational and commercial landings in cooperation with the Southeast Fisheries Science Center (SEFSC) and Gulf states to determine if landings are meeting or exceeding the specified catch limits. Some administrative burden is anticipated with respect to outreach as it relates to notifying stakeholders of the changes to harvest levels.

## 4.2 Action 2 – Modify the Fishing Season Closure AM for Lane Snapper

### 4.2.1 Direct and Indirect Effects on the Physical Environment

Direct and indirect effects of reef fish fishing are discussed in detail in Section 4.1.1. This action does not affect the gear used and therefore has no direct effect on the physical environment. However, changes to the fishing closure AM could affect the fishing season length and therefore fishing effort. Alternatives that allow for annual monitoring of landings and in-season closures, and conservative AM triggers are expected to decrease adverse effects on the physical environment relative to other alternatives.

**Alternative 1** (no action) would leave the current fishing closure AM in place with the fishery subject to an in-season closure if the ACL in the previous fishing year is exceeded. **Alternative 2** would keep this same procedure but would require that NMFS use the ACT to constrain landings in a year after the ACL is exceeded. Both **Alternatives 1** and **2** may not require in-season monitoring every year. Therefore, **Alternatives 1** and **2** could have a greater adverse effect on the physical environment than **Preferred Alternative 3** if excess fishing effort continues. **Preferred Alternative 3** would require annual monitoring to a prescribed trigger and the fishery would be subject to a closure if that trigger is met is projected to be met, which could reduce fishing effort and its associated adverse effects to the physical environment. Using the ACT to constrain harvest (**Option 3b**) is more conservative than using the ACL (**Preferred Option 3a**). Any difference in the adverse effects on the physical environment as a result of choosing **Preferred Option 3a** or **Option 3b** would be proportional to the buffer between the ACL and the ACT (16%). Further, any effects from this action are expected to be minor, as this action is not expected to change how the reef fish fishery is prosecuted overall, because it is a multi-species fishery targeting many species.

### 4.2.2 Direct and Indirect Effects on the Biological/Ecological Environment

Direct and indirect effects of reef fish fishing are discussed in Section 4.1.2 in detail. Modification to the seasonal AM could affect the fishing season length and therefore fishing effort. Alternatives that allow for possible annual monitoring for in-season closures and AM triggers would have a decreased negative effect on the biological/ecological environment relative to other alternatives. However changing fishing effort on one stock generally does not change overall fishing effort within the reef fish fishery, particularly for stocks less subject to directed effort within the fishery such as lane snapper. Thus, any effects from this action are not expected to be significant.

**Alternative 1** (no action) would leave the current fishing season closure AM in place with the fishery subject to an in-season closure in the following year if the ACL in the previous fishing year is exceeded. Similarly, **Alternative 2** would follow the same mechanism, but would constrain the fishery to the ACT in the subsequent year when the ACL was met or exceeded. Both **Alternatives 1** and **2** would not restrict catch in fishing years that are not subject to an in-season closure. Therefore, **Alternatives 1** and **2** are likely to have a greater adverse effect on the biological/ecological environment than **Preferred Alternative 3** when the ACL in a fishing year is exceeded. **Preferred Alternative 3** would require annual monitoring to a prescribed AM trigger, which would reduce fishing effort and adverse effects to the biological/ecological environment should a closure be implemented. Setting the fishing season AM trigger to the ACT (**Option 3b**) is more conservative than setting the trigger to the ACL (**Preferred Option 3a**). Any difference in the adverse effects on the physical environment as a result of choosing **Preferred Option 3a** or **Option 3b** would be proportional to the buffer between the ACL and the ACT (16%).

### 4.2.3 Direct and Indirect Effects on the Economic Environment

**Alternative 1** (No Action) would not modify the fishing season closure AM for lane snapper. Therefore, **Alternative 1** would not be expected to affect fishing practices or harvests of lane snapper and would not be expected to result in economic effects.

**Alternative 2**, which would require that the ACT be retained in Action 1, would modify the lane snapper AM. Under **Alternative 2**, if the lane snapper ACL is exceeded in a given year, lane snapper harvests during the subsequent year will stop when the ACT is met or is projected to be met**.** **Alternative 2** would be more restrictive than **Alternative 1** because, it would close the fishery in the subsequent year based on the ACT rather than based on the ACL. Expected closure dates, conditional on the use of an ACL or an ACT, are provided in Tables 4.1.3.1 and 4.1.3.2. Therefore, compared to **Alternative 1**, **Alternative 2** would close the fishery sooner and grant fewer fishing opportunities. From this perspective, **Alternative 2** would be expected to result in more adverse economic effects than **Alternative 1**. However, by closing the fishery sooner, **Alternative 2** may afford more protection to the lane snapper stock when needed. Thus, **Alternative 2** would be expected to result in greater potential economic benefits over time stemming from increased protection to the lane snapper stock, compared to **Alternative 1**.

**Preferred Alternative 3** differs from **Alternatives 1** and **2** because it would prohibit lane snapper harvests as soon as the landings meet or are projected to meet the prescribed trigger within the fishing year. **Preferred Option 3a** and **Option 3b** would use the lane snapper ACL and ACT as the prescribed trigger, respectively. Because **Alternatives 1** and **2** would only consider closures in the subsequent year, **Preferred Alternative 3** would close the lane snapper fishery in a timelier manner once the trigger is met or projected to be met. Therefore, **Preferred Alternative 3 Preferred Option 3a** and **Preferred Alternative 3 Option 3b** would limit the likelihood of overharvesting lane snapper, thereby affording more protection to the stock when needed. This additional protection would be expected to result in potential economic benefits in the long-run. However, the prohibition of lane snapper harvests during the year in which the prescribed trigger is met or projected to be met would deny fishing opportunities to recreational anglers and commercial fishermen. **Preferred Alternative 3 Preferred Option 3a**, which uses the lane snapper stock ACL as the prescribed trigger, would be less restrictive than **Preferred Alternative 3 Option 3b** and would therefore correspond to smaller adverse economic effects due to forgone fishing opportunities compared to **Preferred Alternative 3 Option 3b**.

### 4.2.4 Direct and Indirect Effects on the Social Environment

An in-season closure is generally associated with short-term, direct negative effects as further retention of lane snapper would be prohibited for the duration of the year. These negative effects may be offset if the closure provides protection for the stock by ensuring sustainable catch levels over the long term. Negative effects would be greater the earlier in the year a closure goes into effect and the more frequently an in-season closure occurs. For lane snapper, there are no sector allocations; harvest is closed for both sectors when the respective catch level is projected to be reached. Although the catch levels are proposed to increase through Action 1, the conversion of the units used to manage the recreational sector coupled with total annual landings that have varied from year to year makes it difficult to predict when the new catch levels may be reached in the future.

Additional effects would not be expected under **Alternative 1**, and the post-season AM would remain based on the ACL, closing the fishing season for the duration of the year when the ACL is projected to be met in a year following one in which the ACL was exceeded. If the ACL is increased through Action 1 (Alternatives 2 or 3), it would be least likely for an in-season closure to occur in the future under **Alternative 1** compared to **Alternative 2** and **Preferred Alternative 3**. Thus, negative effects would be less likely to occur under **Alternative 1**.

Modifying the post-season AM such that it is triggered when the ACT is projected to be met in a year following one in which the ACL was exceeded (**Alternative 2**) could be expected to result in negative effects that are greater than **Alternative 1**, as the in-season closure would be triggered by a lower threshold, thus being more likely to occur, or occurring earlier in the year. However, these effects would be less than under **Preferred Alternative 3**, as any in-season closure under **Alternative 2** would only occur in a year following one in which the ACL had already been exceeded.

Modifying the in-season closure to occur in any year that the ACL (**Preferred Option 3a**) or ACT (**Option 3b**) is projected to be met could result in greater negative effects than **Alternatives 1** or **2**, as an in-season closure could occur in the first year of adopting this in-season closure. Because the ACT is set lower than the ACL, the closure would be more likely to occur, or would occur earlier in the year, under **Option 3b** compared to **Preferred Option 3a**. Thus, the greatest negative effects could occur under **Option 3b** compared to the other alternatives.

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

**Alternatives 1** (no action) and **2** would maintain current mechanism of monitoring for an in-season closure should the ACL be exceeded in the previous fishing year. However, **Alternative 2** would require an in-season closure be implemented should the ACT be projected to be met during the monitored fishing year. Defining the fishing closure AM triggered as the ACT (**Alternative 2** and **Preferred Alternative 3, Option 3b**) would likely result in increased frequency of fishing season closures relative to the other alternatives because the ACT constrains harvest at a lower level than the ACL. This increase in fishing season closures would result in an increased administrative burden. Fishing season closures are routine for SERO; however, there is an expected increase in frequency of in-season closures for lane snapper under **Preferred Alternative 3** relative to **Alternatives 1** and **2**, as catch would be constrained to a prescribed trigger annually. **Preferred Option 3a** would require the National Marine Fisheries Service (NMFS) issue a closure if the ACL is projected to be met, while **Option 3b** would require NMFS to issue a closure if the ACT is projected to be met. SERO monitors both the recreational and commercial landings in cooperation with the SEFSC and Gulf states to determine if landings are meeting or exceeding the specified ACLs and ACTs. While, the administrative burden between **Preferred Option 3a** and **Option 3b** is similar, setting the prescribed trigger to the ACL (**Preferred Option 3a**) would likely results in less frequent fishing season closures relative to setting the trigger to the ACT (**Option 3b**).

## 4.3 Cumulative Effects Analysis

Federal agencies preparing an environmental assessment (EA) must also consider cumulative effects of a proposed action and other actions, which are those effects that result from incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions (RFFA), regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative effects can result from individually minor but collectively significant actions that take place over a period of time (40 C.F.R. 1508.7). Below is a five-step cumulative effects analysis that identifies criteria that Bass et al. (2001) suggests be considered in an EA based on a legal opinion.

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

2. *The impacts that are expected in that area from the proposed action* - The proposed action would modify the catch limits and accountability measures for lane snapper. The environmental consequences of the proposed action are analyzed in detail in Sections 4.1-4.2. The lane snapper catch level should have very little effect on the physical and biological/ecological environment because the actions are not expected to alter the manner in which the fishery is prosecuted. This action would affect the social and economic environments, but effects would likely be minor for the near future as described in Sections 4.1-4.2. The reef fish fishery is a multispecies fishery where fishermen can target other species on trip. Thus, changing fishing practices due to management changes for one stock like lane snapper does not generally change how the fishery is prosecuted.

3. *Other Past, Present and RFFAs that have or are expected to have impacts in the area*

*<u>Other Fishery related actions</u>* - The cumulative effects relative to reef fish management have been analyzed in the EISs for Amendments 22 (GMFMC 2004c, 26 (GMFMC 2006), and 27/14 (GMFMC 2007), Amendments 29 (GMFMC 2008a), Amendment 30A (GMFMC 2008b), Amendments 30B (GMFMC 2008c), 31 (GMFMC 2009), 40 (GMFMC 2014), and 28 (GMFMC (2015). These cumulative effects analyses are incorporated here by reference. Other past actions

are summarized in the history of management (Section 1.3). Currently, there are several RFFAs that are being considered by the Council for the Reef Fish FMP, which could affect reef fish stocks. These include: framework actions to change red grouper ACLs and ACTs, gray triggerfish ACLs, vermilion snapper ACLs, revise gray triggerfish seasons and the vermilion snapper bag limit, and calibrate state red snapper private angling component ACLs; Amendments 36B and 36C, which would further revise the red snapper and grouper-tilefish commercial individual fishing quota (IFQ) programs; Amendment 48, which would establish status determination criteria for many reef fish stocks; and other plan amendments to address red snapper allocation, the carryover of unharvested quota, and ABC control rule revisions and framework procedures. In addition, there are several framework actions are being developed to address reef fish. Descriptions of these actions can be found on the Council's web page[29].

*Non-fishery related actions* - Actions affecting the reef fish fishery have been described in previous cumulative effect analyses (e.g., Amendment 40). Four important events include impacts of the *Deepwater Horizon* MC252 oil spill, the Northern Gulf Hypoxic Zone, red tide, and climate change.

*4. The impacts or expected impacts from these other actions* - The cumulative effects from managing the reef fish fishery have been analyzed in other actions as listed in part three of this section. They include detailed analysis of the reef fish fishery, cumulative effects on non-target species, protected species, and habitats in the Gulf. In general, the effects of these actions are positive as they ultimately act to restore/maintain the stocks at a level that will allow the maximum benefits in yield and recreational fishing opportunities to be achieved. However, some short-term negative impacts on the fisheries' socioeconomic environment may occur due to the need to limit directed harvest and reduce bycatch mortality. These negative impacts can be minimized by using combinations of management measures that provide the least disruption to the fishery while holding harvest to sustainable levels.

With respect to non-fishery related actions, these may affect lane snapper. Reef fish species are mobile and are able to avoid hypoxic and red tide conditions, so any effects from the Northern Gulf Hypoxic Zone or red tide on reef fish species are likely minimal regardless of this action. However, with red tide, some localized red tide events in coastal and estuarine areas may adversely affect reef fish species like lane snapper that inhabit these areas. Impacts from the Deepwater Horizon MC252 oil spill are still being examined; however, as indicated in Section 3.2, the oil spill had some adverse effects on fish species.

There is a large and growing body of literature on past, present, and future impacts of global climate change induced by human activities. Some of the likely effects commonly mentioned are sea level rise, increased frequency of severe weather events, and change in air and water temperatures. The Intergovernmental Panel on Climate Change has numerous reports addressing their assessments of climate change. Global climate changes could affect the Gulf fisheries as discussed in Section 3.3. However, the extent of these effects cannot be quantified at this time. The proposed action is not expected to significantly contribute to climate change through the increase or decrease in the carbon footprint from fishing as these actions should not change how

[29] http://gulfcouncil.org/

the fishery is prosecuted. As described in Section 3.3, the contribution to greenhouse gas emissions from fishing is minor compared to other emission sources (e.g., oil platforms).

5. *The overall impact that can be expected if the individual impacts are allowed to accumulate:* This action, combined with past actions and RFFAs, is not expected to have significant beneficial or adverse effects on the physical and biological/ecological environments because this action will only minimally affect current fishing practices (physical and biological/ecological effects descriptions in Sections 4.1-4.2). Each of the alternatives in action 1 and action 2 may result in increased harvest, which would have positive impacts on the social and economic environments, and could result in economic gain to fishing communities (economic and social effects descriptions in Sections 4.1-4.2). The cumulative effects of this action are likely minimal as the proposed action, along with past and RFFAs, are not expected to alter the manner in which the fishery is prosecuted. Because it is unlikely there would be any changes in how the fishery is prosecuted, this action, combined with past actions and RFFAs, is not expected to have significant adverse effects on public health or safety.

*6. Summary:* The proposed action, when combined with other past, present, and RFFAs is not expected to have individual significant effects to the biological, physical, or socio-economic environments. Any effects of the proposed action would 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 are through surveys that are discussed in detail in Chapter 1. Commercial data are collected through trip ticket programs, port samplers, and logbook programs, as well as dealer reporting through the IFQ program.

# CHAPTER 5. LIST OF AGENCIES CONSULTED

National Marine Fisheries Service
- Southeast Fisheries Science Center
- Southeast Regional Office
- Office for Law Enforcement

National Oceanic Atmospheric Administration General Counsel

Environmental Protection Agency
United States Coast Guard
United States Fish and Wildlife Services
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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# APPENDIX A. ACL/ACT CONRTROL RULE FOR LANE SNAPPER

The Gulf of Mexico Fishery Management Council's (Council) Annual Catch Limit/Annual Catch Target (ACL/ACT) Control Rule applies a buffer to the ACL to account for management error (GMFMC 2011a). To calculate the buffer, a tabulation spreadsheet uses a point system and series of components to represent various aspects of management uncertainty to derive a percent buffer between the ACL and ACT. The Council determines the minimum and maximum buffer (usually between 0 and 25) and points are adjusted to the appropriate values between those limits. A weighted buffer is calculated using:

$$Weighted\ buffer = \left[\left(\frac{\text{sum of points}}{\max possible\ points} * range\ between \min and \max buffer\right) + \min buffer\right] * (1 + weighting\ factor)$$

The Control Rule table consists of several additive components representing management uncertainty with a weighting factor. Most of the components are simple yes/no-type evaluations with either 0 or 1 point assigned. The components were selected to represent proxies for various sources of management uncertainty.

**Component: Stock Assemblage**

The ACL or ACT can be applied to either a single stock or to an assemblage of stocks (including an indicator species used to represent an assemblage). When an ACL/ACT applies to an assemblage of stocks, there is an implicit assumption that the stocks in the assemblage have similar biological characteristics and selectivities. It is unlikely, however, that the stocks have exactly the same characteristics and selectivities. Since it is likely that not all stocks in an assemblage will react to management actions in the same way, an assemblage of stocks has more management uncertainty than a single stock.

**Component: Ability to Constrain Catch**

This component evaluates past management success as an indicator of uncertainty of future success. Both frequency and magnitude of past overages relative to catch limits are examined. The National Standard 1 guidelines recommend that the system of ACLs and accountability measures be reviewed if catch limits are exceeded more than once in the past four years. Based on this guidance, the frequency of overages is divided into two levels, 1 or less times, or 2 or more times. In addition, if there have been any overages, an additional 0.5 points are added for each 10 percentage points (rounded up to the nearest 10%) above the catch limit for the year with the greatest overage of the past four years. If there were no catch limits during any of the past four years, a "not applicable" selection can be made which removes this component from the calculations.

**Component: Precision of Landings Data - Recreational**

If a stock has sector allocations, and an ACT is being considered for each sector, then one iteration of the ACL/ACT Control Rule should be performed for each sector. The sector not being included in a particular iteration should have "not applicable" marked for that sector. If an ACT is being considered for a stock that does not have sector allocations, select the appropriate setting for each sector. For recreational fisheries, although there is not currently an absolute method of counting recreational catches, the spreadsheet allows for one to potentially exist in the future, and to keep the point system for recreational precision comparable to the point system for commercial precision. Otherwise, the proportional standard error (PSE) calculated by the Marine Recreational Information Program (MRIP) is used as a proxy to represent overall precision of the recreational harvest estimates. A PSE of 20 is used as the transition point between good and poor precision, since this is used by several other stock assessments and studies (e.g., Vaughan and Carmichael 2000). An average of the most recent 3 years is used to avoid transient spikes in the data. Note: If the for-hire sector is separated out and the MRIP For-hire Survey was used to estimate non-headboat for-hire landings, then this section will be applicable to the for-hire sector.

**Component: Precision of Landings Data - Commercial**

For commercial fisheries, the method used to monitor catches represents the level of precision for the commercial harvest estimates. Individual fishing quota (IFQ) systems monitor all commercial landings and are considered the most precise form of quota monitoring. Non-IFQ systems are monitored through dealer reporting, but not all dealers are surveyed. The National Marine Fisheries Service (NMFS) attempts to survey dealers who account for 95% of the landings (personal communication, NMFS Southeast Regional Office staff). Therefore, this form of monitoring is less precise than IFQ systems. Finally, if some other method of monitoring commercial landings is used (e.g., self-reported logbook records), the lowest level of precision is assigned. Note: If the for-hire component of the recreational sector is separated out and placed under an IFQ system, then this section will be applicable to the for-hire component of the recreational sector.

**Component: Timeliness**

This component is related to the ability of management to respond to changes in fishing pressure. This is partly a function of how timely the landings are reported, and partly a function of how quickly changes in management measures can be implemented. Both of these components are implicitly incorporated in the decision whether or not to use in-season accountability measures. Therefore, the use or non-use of in-season accountability measures is used as a proxy for timeliness. Since IFQ fisheries report landings almost real-time, they are considered to have a high level of timeliness and are ranked with in-season accountability measures.

**Weighting Factor: Stock Status**

Stock status is not included in the initial calculation of the buffer, but is applied to the final result to adjust the buffer. The status of the stock is a function of the stock assessment's outputs relative to management benchmarks. A stock that is in relatively poor condition may require a more precautionary approach in the form of a larger buffer between ACL and ACT (or between ABC and ACL). If a stock biomass is at or above its optimum yield ($B_{OY}$) level, then no adjustment is needed for the unweighted buffer. For stocks at lower biomass levels, a weighting adjustment is made to the buffer to account for the stock status. For example, a stock that is below $B_{OY}$ but above the biomass at maximum sustainable yield ($B_{MSY}$) will have the buffer increased by 10%.

**ACL/ACT Control Rule Calculation for Lane Snapper**

Calculation of the ACL/ACT Control Rule for lane snapper resulted in an additional buffer of 16% between the ACL and the ACT using recreational landings collected in the Marine Recreational Fisheries Statistics Survey (MRFSS) for 2015 – 2018 as the reference period (Table A1).

**Table A1.** Lane snapper recreational landings (collected from the MRFSS) for the reference period of 2015-2018 used to inform the ACT/ACL Control Rule.

| Year | Recreational Sector (MRFSS) | Commercial Sector | Overall Total | Total ACL | % Total ACL |
|---|---|---|---|---|---|
| **2015** | 207,243 | 46,163 | 253,406 | 301,000 | 84% |
| **2016** | 272,247 | 34,913 | 307,160 | 301,000 | 102% |
| **2017** | 523,878 | 42,831 | 566,709 | 301,000 | 188% |
| **2018** | 312,882 | 26,600 | 339,482 | 301,000 | 113% |

Source: SEFSC MRFSS Recreational ACL data (Jan 2020).

Lane snapper is assessed as a single stock, so the stock assemblage element score is 0. Harvest of the stock exceeded the ACL in 2016 through 2018, with a maximum overage of 88% in 2017. As a result, the Ability to Constrain Catch element was set at 4.5 (88% rounded up to 90%, divided by 10, and multiplied by 0.5). The PSE of recreational landings was either equal to or less than 20 for the reference period, resulting in a value of 1 for the Precision of Landings Data – Recreational. Commercial landings for lane snapper are collected based on dealer reporting, resulting in a value of 1 for the Precision of Landings Data – Commercial. The lane snapper fishery is subject to in-season closures if harvest exceeds the ACL, so the Timeliness element was set to 0. Lastly, since the stock status criteria is unknown for lane snapper, the Weighting Factor element was set to 0.3 (Figure A1).

| | | | | | |
|---|---|---|---|---|---|
| As of 02/11/2020 | | | | Lane Snapper | |
| **ACL/ACT Buffer Spreadsheet** | | | version 4.1 - April 2011 | **Sector: Combined** | |
| sum of points | 7.5 | | | **Years: 2015-2018** | |
| max points | 11.5 | | Buffer between ACL and ACT (or ABC and ACL) | Unweighted | 13 |
| **Min. Buffer** | 0 | **min. buffer** | User adjustable | Weighted | **16** |
| Max Unw.Buff | 19 | max unwt. Buff | | | |
| **Max Wtd Buff** | 25 | **max wtd. buffe** | User adjustable | | |
| | Component | Element score | Element | Selection | Element result |
| | Stock assemblag | 0 | This ACL/ACT is for a single stock. | x | 0 |
| | | 1 | This ACL/ACT is for a stock assemblage, or an indicator species for a stock assemblage | | |
| | Ability to | 0 | Catch limit has been exceeded 0 or 1 times in last 4 years | | 5.5 |
| | Constrain Catch | 1 | Catch limit has been exceeded 2 or more times in last 4 years | x | |
| | | | For the year with max. overage, add 0.5 pts. For every 10 percentage points (rounded up) above ACL | 4.5 | |
| | | | Not applicable (there is no catch limit) | | |
| | | | Apply this component to recreational fisheries, not commercial or IFQ fisheries | | |
| | | 0 | Method of absolute counting | | 1 |
| | Precision of | 1 | MRIP proportional standard error (PSE) <= 20 | x | |
| | Landings Data | 2 | MRIP proportional standard error (PSE) > 20 | | |
| | Recreational | | Not applicable (will not be included in buffer calculation) | | |
| | | | Apply this component to commercial fisheries or any fishery under an IFQ program | | |
| | Precision of | 0 | Landings from IFQ program | | 1 |
| | | 1 | Landings based on dealer reporting | x | |
| | Landings Data | 2 | Landings based on other | | |
| | Commercial | | Not applicable (will not be included in buffer calculation) | | |
| | Timeliness | 0 | In-season accountability measures used or fishery is under an IFQ | x | 0 |
| | | 1 | In-season accountability measures not used | | |
| | | | | Sum | 7.5 |
| | **Weighting factor** | | | | |
| | | Element weight | Element | Selection | Weighting |
| | Overfished statu | 0 | 1. Stock biomass is at or above $B_{OY}$ (or proxy). | | 0.3 |
| | | 0.1 | 2. Stock biomass is below $B_{OY}$ (or proxy) but at or above $B_{MSY}$ (or proxy). | | |
| | | 0.2 | 3. Stock biomass is below $B_{MSY}$ (or proxy) but at or above minimum stock size threshold (MSST). | | |
| | | 0.3 | 4. Stock is overfished, below MSST. | | |
| | | 0.3 | 5. Status criterion is unknown. | x | |

**Figure A1.** Using the Council's ACL/ACT Control Rule for lane snapper results in a 16% buffer between the ACL and the ACT.

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# APPENDIX B. GULF OF MEXICO LANE SNAPPER FISHERY SEASON PROHIBITION ANALYSIS

Gulf of Mexico (Gulf) lane snapper are managed in federal waters under the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico (Reef Fish FMP). In 2011, the Generic Annual Catch Limits/Accountability Measures Amendment to the Reef Fish FMP established a stock (combined recreational and commercial) annual catch limit (ACL) for lane snapper. The stock ACL was set at 301,000 pounds (lbs) whole weight (ww) using Marine Recreational Fisheries Statistics Survey (MRFSS) data and established the current ACL.

This Framework Action to the Reef Fish FMP, which addresses lane snapper in the Gulf, proposes to modify the ACL consistent with the best scientific information available for Gulf lane snapper using Marine Recreational Information Program's (MRIP) Access Point Angler Intercept Survey and recreational effort data from the MRIP Fishing Effort Survey (FES; Table B1). The analyses investigate whether the stock ACL and the annual catch target (ACT) can be expected to be reached or exceeded using the most recent three years of observed landings (Table B2) from 2016 through 2018 to predict future landings.

**Table B1.** Gulf lane snapper stock ACL alternatives.

| Action Alternatives: | Stock ACL/ACT |
|---|---|
| **Alternative 1: MRFSS data** | 301,000 lbs ww (ACL) |
| **Alternative 2: MRIP-FES data** | 1,028,841 lbs ww (ACL) |
| **Alternative 3: MRIP-FES data** | 864,337 lbs ww (ACT) |

**Table B2.** Annual recreational and commercial Gulf lane snapper landings from 2016 -2018.

| Year | MRFSS Rec. Landings (lbs ww) | MRIP FES Rec. Landings (lbs ww) | Com. Landings (lbs ww) |
|---|---|---|---|
| 2016 | 272,247 | 612,604 | 34,913 |
| 2017 | 523,878 | 1,272,225 | 42,831 |
| 2018 | 312,882 | 791,572 | 26,600 |

Source: SEFSC Recreational and Commercial ACL dataset [January 2, 2020; November 15, 2019].

Final commercial landings were provided from the Southeast Fisheries Science Center (SEFSC) on November 15, 2019. Recreational data were provided from the SEFSC on January 2, 2020 and included Texas Parks and Wildlife Department recreational creel survey (TPWD), Louisiana Department of Wildlife and Fisheries creel survey (LA Creel), Southeast Region Headboat Survey (SRHS), MRFSS, and MRIP-FES. Monthly commercial and recreational Gulf lane snapper landings were averaged from 2016 through 2018 to project future landings (Figures B1 and B2). All projected landings were then used to produce daily recreational and commercial landing estimates to determine if the ACL would be met for each alternative. Cumulative landings for the fishing year were compared against the current ACL using MRFSS recreational ACL data and the proposed ACL using MRIP-FES recreational ACL data to project a closure date.

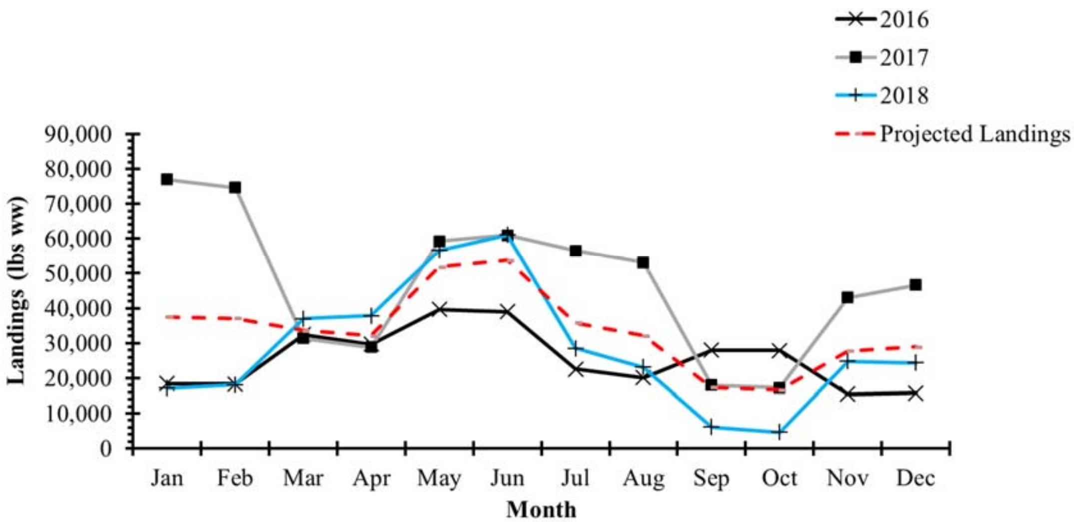


**Figure B1.** Observed projected monthly commercial and recreational Gulf lane snapper landings. Source: SEFSC Commercial and MRFSS Recreational ACL data (November 15, 2019; January 2, 2020).

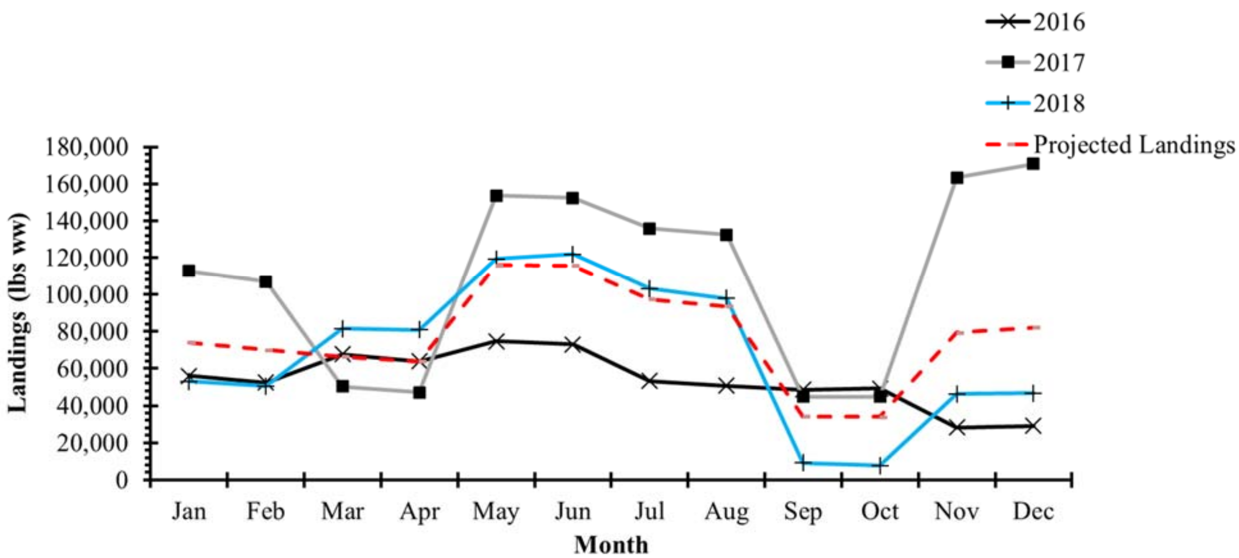


**Figure B2.** Observed and projected monthly commercial and recreational Gulf lane snapper landings. Source: SEFSC Commercial and MRIP FES Recreational ACL data (November 15, 2019; January 2, 2020).

Landings in recent fishing years (2016 through 2018) have exceeded the ACL (Figure B3). Similar landings are predicted for future fishing years. The predicted closure date for Alternative 1 in Action 2 is August 19 (Table B3). There is no closure date predicted for Alternative 2, which uses MRIP-FES recreational ACL data, but landings are expected to exceed the ACT set by Alternative 3, on December 8. However, there is considerable uncertainty evident by the wide confidence interval that spans from a closure on June 6 to no closure if the stock ACL is modified, or if the season is set to close on the ACT.

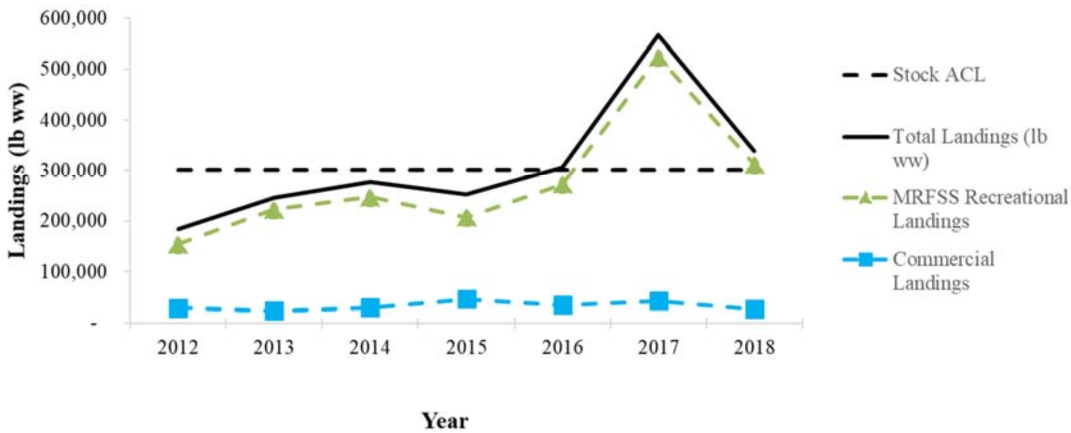


**Figure B3.** Annual commercial and recreational Gulf lane snapper landings. Source: SEFSC Commercial ACL Database (November 15, 2019) and MRFSS SEFSC Recreational ACL Dataset (January 2, 2020).

**Table B3.** The predicted closure dates with 95% confidence interval for each stock ACL (lbs ww).

| Action Alternatives | Trigger | Recreation al data collection survey | Value | Prediction | Upper 95% Confidence Interval | Lower 95% Confidence Interval |
|---|---|---|---|---|---|---|
| **Alternative 1** | ACL | MRFSS | 301,000 | Aug 19 | Jun 6 | No Closure (209,810) |
| **Alternative 2** | ACT | MRIP-FES | 864,337 | Dec 8 | Aug 2 | No Closure (439,361) |
| **Alternative 3a** | ACL | MRIP-FES | 1,028,973 | No Closure (926,91) | Sep 16 | No Closure (439,361) |
| **Alternative 3b** | ACT | MRIP-FES | 864,337 | Dec 8 | Aug 2 | No Closure (439,361) |

Source: MRFSS SEFSC Recreational, MRIP FES SEFSC Recreational, and Commercial ACL dataset (January 2, 2020; November15, 2019).

As with most predictions, the reliability of the results is dependent upon the accuracy of the underlying data and input assumptions. A realistic baseline has been created as a foundation for comparisons, under the assumption that projected future landings will accurately reflect actual future landings. Uncertainty exists in this projection, as economic conditions, weather events, changes in catch-per-unit effort, fisher response to management regulations, and a variety of other factors may cause departures from this assumption.

# APPENDIX C. 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 management of stocks included in fishery management plans in federal waters of the exclusive economic zone. However, 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 include the Endangered Species Act and Marine Mammals Protection Act (Section 3.3), E.O. 12866 (Regulatory Planning and Review, Chapter 5) and E.O. 12898 (Environmental Justice, Section 3.5.2). Other applicable laws are summarized below.

**Administrative Procedure Act**

All federal rulemaking is governed under the provisions of the Administrative Procedure Act (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the Act, 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 Act 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 NOAA regulations at 15 CFR 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 of Commerce, 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 (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 Act 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.

## Fish and Wildlife Coordination Act

Fish and Wildlife Coordination Act of 1934 (16 U.S.C. 661-667e) provides the basic authority for the USFWS's involvement in evaluating impacts to fish and wildlife from proposed water resource development projects. It also requires federal agencies that construct, license or permit water resource development projects to first consult with the Service (and NMFS in some instances) and State fish and wildlife agency regarding the impacts on fish and wildlife resources and measures to mitigate these impacts.

The fishery management actions in the Gulf of Mexico are not likely to affect wildlife resources pertaining to water resource development as the economic exclusive zone is from the state water boundary extending to 200 nm from shore.

## National Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966, (Public Law 89-665; 16 U.S.C. 470 *et seq.*) is intended to preserve historical and archaeological sites in the United States of America. Section 106 of the NHPA requires federal agencies to evaluate the impact of all federally funded or permitted projects for sites listed on, or eligible for listing on, the National Register of Historic Places and aims to minimize damage to such places.

Typically, fishery management actions in the Gulf of Mexico are not likely to affect historic places with exception of the *U.S.S. Hatteras*, located in federal waters off Texas, which is listed in the National Register of Historic Places. Lane snapper fishing does occur off Texas; therefore, the proposed actions are a part of the normal fishing activities that occur at this site. Thus, no additional impacts to the *U.S.S. Hatteras* would be expected.

**<u>Executive Orders (E.O.)</u>**

### E.O. 12630: Takings

The E.O. 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 NOAA Office of General Counsel will determine whether a Taking Implication Assessment is necessary for this amendment.

### E.O. 12962: Recreational Fisheries

This E.O. 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 (NRFCC) 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 NRFCC 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 E.O. requires NMFS and the USFWS to develop a joint agency policy for administering the ESA.

### E.O. 13089: Coral Reef Protection

The E.O. on Coral Reef Protection requires federal agencies whose actions may affect U.S. coral reef ecosystems to identify those actions, utilize their programs and authorities to protect and enhance the conditions of such ecosystems, and, to the extent permitted by law, ensure actions that they authorize, fund, or carry out do not degrade the condition of that ecosystem. By definition, a U.S. coral reef ecosystem means those species, habitats, and other national resources associated with coral reefs in all maritime areas and zones subject to the jurisdiction or control of the United States (e.g., federal, state, territorial, or commonwealth waters).

Regulations are already in place to limit or reduce habitat impacts within the Flower Garden Banks National Marine Sanctuary. Additionally, NMFS approved and implemented Generic Amendment 3 for Essential Fish Habitat (GMFMC 2005), which established additional habitat areas of particular concern (HAPCs) and gear restrictions to protect corals throughout the Gulf of Mexico. There are no implications to coral reefs by the actions proposed in this amendment.

### E.O. 13132: Federalism

The E.O. on Federalism requires agencies in formulating and implementing policies, to be guided by the fundamental Federalism principles. The E.O. 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 E.O. 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).

No Federalism issues were identified relative to the action to modify the management of lane snapper. Therefore, consultation with state officials under Executive Order 12612 was not necessary.

### E.O. 13158: Marine Protected Areas

This E.O. 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, HAPCs, and gear-restricted areas in the eastern and northwestern Gulf of Mexico. The existing areas are entirely within federal waters of the Gulf of Mexico. They do not affect any areas reserved by federal, state, territorial, tribal or local jurisdictions.