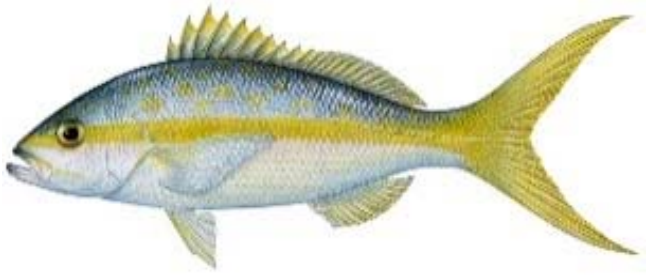
Tab B, No. 12(a)
3/21/16

Modification to Gear Requirements and Fishing Year for Yellowtail Snapper in the Gulf of Mexico



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

Including Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Analysis

April 2016

This is a publication of the Gulf of Mexico Fishery Management Council Pursuant to National Oceanic and Atmospheric Administration Award No. NA15NMF4410011.

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COVER SHEET

Name of Action

Draft Framework Action to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico to Modify Gear Restrictions and the Fishing Year for Yellowtail Snapper, including Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Analysis.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1. INTRODUCTION

1.1 Background

Currently, some fishing regulations differ between the Gulf of Mexico Fishery Management Council (Gulf Council), the South Atlantic Fishery Management Council (South Atlantic Council), and the State of Florida. This makes it burdensome for fishermen to abide by different regulations in the applicable areas, particularly in the areas where the jurisdictions are adjacent, and fishermen can fish in multiple jurisdictions on a single trip (Figure 1.1.1).

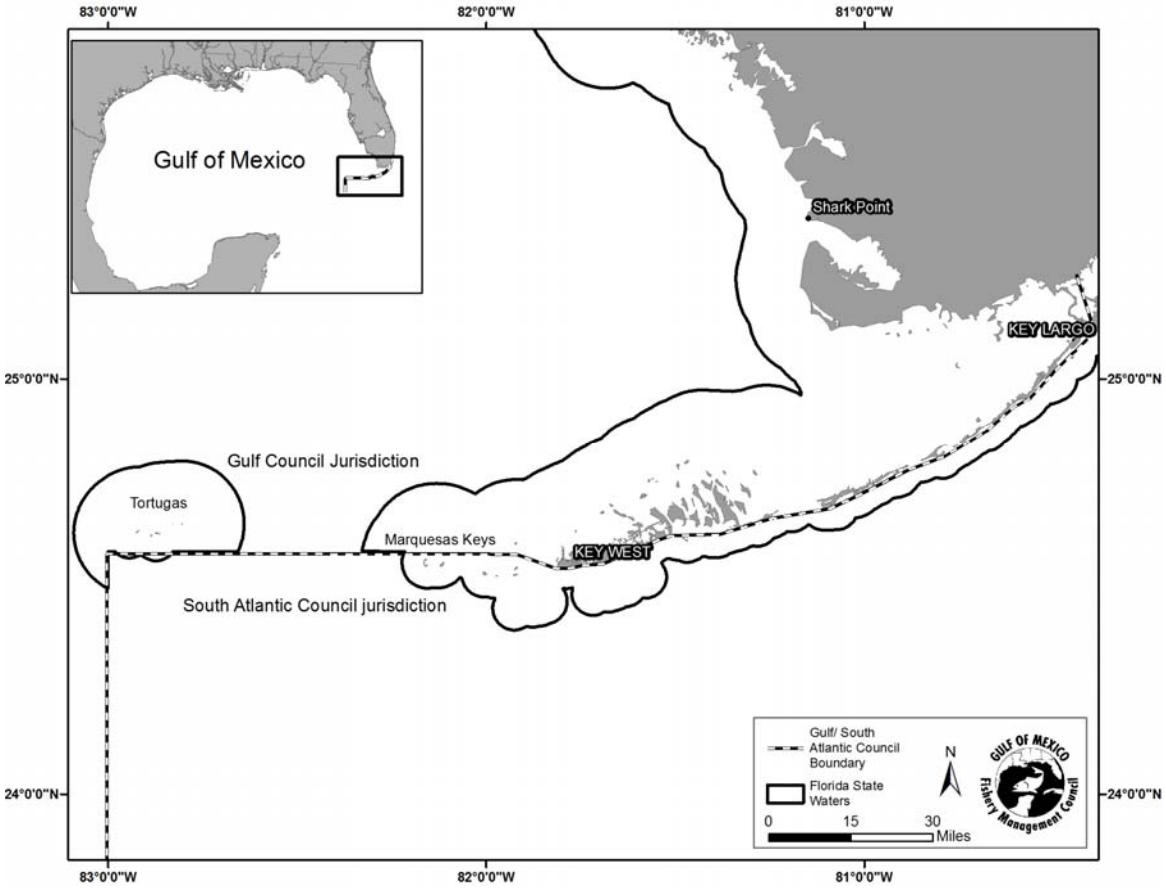


Figure 1.1.1. Inter-Council jurisdiction boundary in southern Florida, Florida Keys and Monroe County between the Gulf of Mexico and South Atlantic Councils. A full description of the inter-Council boundary can be found: 61 FR 32540, June 24, 1996, as amended at 63 FR 7075, February 12, 1998 or (CFR 600.105).

Commercial reef fish permit holders fishing for reef fish including yellowtail snapper in federal waters in the Gulf of Mexico (Gulf) are currently required to use circle hooks when fishing with natural bait (50 CFR 622.41). These regulations differ from those in the South Atlantic Council's jurisdiction, where snapper-grouper permit holders are not required to use circle hooks when fishing for any species within the snapper-grouper complex south of 28° 00' north latitude

(approximately south of Cape Canaveral on the Atlantic coast of Florida). Both the Fishery Management Plan (FMP) for Reef Fish Resources in the Gulf of Mexico ("Reef Fish FMP") and the Fishery Management Plan (FMP) for Snappers and Groupers in the South Atlantic ("Snapper-Grouper FMP") include yellowtail snapper, which are primarily caught around the southern half of Florida, with the majority of landings coming from the Florida Keys.

Commercial yellowtail snapper fishermen indicate that they use chum bags on the surface to attract yellowtail snapper to the stern of the fishing vessel, and then use natural bait on small hooks to catch and land the fish. These commercial fishermen also indicate that their release tools allow them to release yellowtail snapper which have been caught with J-hooks more easily than those caught with circle hooks, resulting in decreased handling times for fish which are to be discarded. Decreased handling times due to quicker dehooking methods for retained fish may result in an increase in the efficiency with which the yellowtail snapper component of the commercial reef fish fishery is prosecuted, and may also help reduce discard mortality rates. Further efficiency could be achieved by fishermen being able to use the same gears in both the Gulf and the South Atlantic, thereby reducing the burden of differing regulations on affected stakeholders.

The commercial yellowtail snapper season in the South Atlantic closed on October 31, 2015, due to the commercial sector reaching its annual catch limit (ACL). South Atlantic commercial fishermen stated that the closure during the winter months was more costly to them than if the closure had occurred during the summer months, partially due to the difference in the availability of alternative species to catch in the summer versus during the winter months. Further, the same fishermen remarked that they would prefer any closure due to the ACL being met occur during the summer, which corresponds to the peak of the yellowtail snapper spawning season (SEDAR 27 2012). In December of 2015, the South Atlantic Council approved a change to the fishing year from the current opening date of January 1st to August 1st. In keeping with the aforementioned goal of consistency in regulations between the Councils for south Florida species, the Gulf Council has decided to examine a similar change in its jurisdictional waters.

Yellowtail Snapper

Yellowtail snapper in the Gulf are managed with a stock ACL, meaning that there are not sector-specific (i.e., recreational and commercial) allocations. In the southeastern U.S., yellowtail snapper comprise a single stock. The South Atlantic and Gulf Council's jurisdictions are combined for stock assessment purposes. The Generic ACL and Accountability Measures Amendment (GMFMC 2011), established the jurisdictional apportionment of the yellowtail snapper acceptable biological catch (ABC) between the Gulf and South Atlantic Councils based on the Councils' jurisdictional boundary west of the Florida Keys (Monroe County) using 50% of the catch history from 1993-2008 and 50% of the catch history from 2006-2008. This formula resulted in a jurisdictional apportionment of yellowtail snapper, with 75% of the ABC delegated to the South Atlantic Council and 25% of the ABC delegated to the Gulf Council. This method places added emphasis on the more recent portion of the considered catch history.

In 2012, the Florida Fish and Wildlife Research Institute (FWRI) conducted a yellowtail snapper benchmark stock assessment (SEDAR 27 2012). Results from the assessment indicated that, as of 2010, the yellowtail snapper stock is neither overfished nor experiencing overfishing.

1.2 History of Management

Yellowtail snapper were included in the 33 species (15 snappers, 15 groupers, and 3 sea basses) that comprised the original fishery management unit for the Reef Fish FMP (GMFMC 1984). The first reef fish regulations, implemented in November 1984, included 1) prohibitions on the use of fish traps, roller trawls, and powerheads within an inshore stressed area; 2) construction requirements, maximum size, and numerical limits for fish traps; and 3) permit requirements for fish trap operators. In addition, reporting requirements were implemented for fish traps, commercial vessel owners and operators, and dealers and processors.

Amendment 1 (GMFMC 1989) to the Reef Fish FMP, implemented in 1990, implemented a 12-inch total length minimum size limit on yellowtail snapper. A 10 snapper aggregate recreational bag limit was also created, which included yellowtail snapper. The stressed area was expanded to run along the entire Gulf coastline, and a commercial vessel permit was established for the harvest and sale of reef fish. Amendment 1 also established an optimum yield goal for all reef fish of 20% spawning stock biomass per recruit (SSBR) relative to the SSBR that would occur with no fishing, and an overfished stock was defined as a stock biomass below 20% SSBR. Overfishing was defined, for a stock that is not overfished, as fishing at a rate that would not allow harvest of optimum yield on a continuing basis, and for a stock that is overfished, as fishing at a rate that is not consistent with rebuilding the stock to 20% SSBR. The spawning stock biomass per recruit terminology was later replaced with spawning potential ratio (SPR).

Amendment 5, implemented in February 1994, established a fish trap endorsement for vessel permits of permittees who had logbook landings of reef fish from fish traps in 1991 or 1992 through November 19, 1992, and established a three-year moratorium during which those endorsements would be non-transferable. The amendment also required that traps must be returned to shore at the end of each fishing trip; that each trap must be individually buoyed, or if fished in a trawl (several traps connected by a submerged line) a floating buoy is required at each end of the trawl; and prohibited the possession of magnesium pop-up devices. The amendment also created a special management zone with gear restrictions off the Alabama coast, created a framework procedure for establishing future special management zones, required that all finfish except for oceanic migratory species be landed with head and fins attached, and closed the region of Riley's Hump (near Dry Tortugas, Florida) to all fishing during May and June to protect mutton snapper spawning aggregations.

Amendment 11 (GMFMC 1995a) was partially approved by NMFS and implemented in January 1996. It established a permit requirement for reef fish charter vessels and headboats, and modified the transferability provisions of reef fish trap endorsements.

Amendment 12 (GMFMC 1995b) was implemented in January 1997. It established an exclusive economic zone (EEZ) aggregate recreational daily bag (possession) limit of 20-reef

fish per angler for all reef fish not having a bag limit. Yellowtail snapper remained in the separate 10-snapper aggregate bag limit for snappers other than red, lane and vermilion.

Amendment 14, implemented in March and April 1997, provided for a ten-year phase-out for the fish traps; allowed transfer of fish trap endorsements for the first two years and thereafter only upon death or disability of the endorsement holder, to another vessel owned by the same entity, or to any of the 56 individuals who were fishing traps after November 19, 1992 and were excluded by the moratorium; and prohibited the use of fish traps west of Cape San Blas, Florida. The amendment also provided the Regional Administrator of NMFS with authority to reopen a fishery prematurely closed before the allocation was reached, and modified the provisions for transfer of commercial reef fish vessel permits. In addition, the amendment prohibited the harvest or possession of Nassau grouper in the Gulf EEZ, consistent with similar prohibitions in Florida state waters, the south Atlantic EEZ, and the Caribbean EEZ.

Amendment 27 (GMFMC 2007b), implemented in June 2008, required the use of non-stainless steel circle hooks when using natural baits to fish for Gulf reef fish, and required the use of venting tools and dehooking devices when participating in the commercial or recreational reef fish fisheries.

The **Generic ACL/Accountability Measures Amendment** (GMFMC 2011a), implemented in January 2012, established ACLs, optional annual catch targets, and accountability measures for all stocks under Gulf Council management that required such parameters and did not already have them. For yellowtail snapper, the amendment established an apportionment of ABC, with 75% apportioned to the South Atlantic jurisdiction and 25% to the Gulf jurisdiction. For the Gulf apportionment, the amendment established a yellowtail snapper stock ACL of 0.725 million pounds whole weight, and a stock ACT of 0.645 million pounds whole weight.

A **framework action**, effective September 3, 2013, increased the Gulf yellowtail snapper ACL from 725,000 lbs whole weight to 901,125 lbs whole weight, and removed the requirement to have onboard and use venting tools when releasing reef fish.

1.3 Purpose and Need

The purpose is to address inconsistencies between Gulf and South Atlantic Councils' regulations for yellowtail snapper in Gulf waters, and to increase the operational efficiency of the yellowtail snapper component of the commercial reef fish fishery.

The need is to achieve optimum yield and to decrease the burden of compliance with differing regulations based on separate regulatory agencies across adjacent jurisdictions (i.e., Gulf, South Atlantic, and Florida waters).

CHAPTER 2. DRAFT MANAGEMENT ALTERNATIVES

2.1 Action 1 – Changes to Hook Requirements for Commercially Harvested Yellowtail Snapper in the Gulf of Mexico

Alternative 1: No Action. Do not change the current hook requirements for commercially harvested yellowtail snapper in the Gulf of Mexico. Circle hooks will continue to be required when fishing with natural bait for yellowtail snapper in the exclusive economic zone of the Gulf of Mexico.

Alternative 2: Remove the requirement to use circle hooks when commercial fishing with natural bait for yellowtail snapper throughout the exclusive economic zone of the Gulf of Mexico.

Alternative 3: Remove the requirement to use circle hooks when commercial fishing with natural bait for yellowtail snapper south of 28° 00' north latitude in the exclusive economic zone of the Gulf of Mexico (Clearwater Beach).

Alternative 4: Remove the requirement to use circle hooks when commercial fishing with natural bait for yellowtail snapper south of 25° 23' north latitude on the west coast of Monroe County, Florida ("Shark Point") south to the Gulf Council jurisdictional boundary.

Alternative 5: Remove the requirement to use circle hooks when commercial fishing with natural bait for yellowtail snapper south of 25° 09' north latitude on the west coast of Monroe County, Florida (Cape Sable) south to the Gulf Council jurisdictional boundary.

Discussion:

In 2008, the Gulf of Mexico Fishery Management Council (Gulf Council) adopted a preferred management alternative in Amendment 27 to the Fishery Management Plan for Reef Fish Resources of the Gulf of Mexico (Reef Fish FMP) (GMFMC 2008), which required anglers fishing in federal waters to use non–stainless steel circle hooks when catching reef fish with natural bait (50 CFR 622.30). Circle hooks are defined by regulation as "a fishing hook designed and manufactured so that the point is turned perpendicularly back to the shank to form a generally circular, or oval, shape." Florida matched federal regulations, with the added specification that a circle hook must have zero degrees of offset (Florida Administrative Code §68B-14.005), which means that the point of the hook must line up with the shank.

In 2010, the South Atlantic Fishery Management Council (South Atlantic Council) approved Amendment 17A to the Fishery Management Plan for Snapper and Grouper of the South Atlantic Region (Snapper-Grouper FMP) (SAFMC 2010a), which required recreational and commercial anglers fishing in federal waters to use non-stainless steel circle hooks (offset or non-offset)

when fishing for all species in the snapper-grouper complex when using hook-and-line-gear with natural baits in waters north of 28° 0' north latitude. The South Atlantic Council allows both recreational and commercial anglers to use J-hooks when fishing with natural bait for yellowtail snapper and other species in the snapper-grouper complex south of 28° 0' north latitude. This rule was effective in March 2011.

Multiple reef fish species managed by the Gulf Council occur in waters south of 28° 00' north latitude (approximately Clearwater Beach on the west coast of Florida). A recent stock assessment on red snapper recognized and incorporated reduced discard mortality as a result of the requirement to use circle hooks when fishing with natural bait (SEDAR 31 2013). Sauls and Ayala (2012) observed red snapper caught with circle hooks and J-hooks within the recreational sector and reported a 63.5% reduction in potentially lethal hooking injuries for red snapper caught with circle hooks (6.3% potentially lethal injuries, versus 17.1% with J-hooks) (SEDAR 31 2013). Conversely, SEDAR 33 (2014a, b) examined the effects of hook type on gag and greater amberjack and determined that the generally low level of recreational discard mortality for both species (both prior to and after the 2008 circle hook requirement) negated the realization of benefits from using circle hooks for those species (Sauls and Ayala 2012; Sauls and Cermak 2013; Murie and Parkyn 2013). Studies have described lower incidences of gut-hooking red grouper when using circle hooks as opposed to J-hooks (Bacheler and Buckel 2004; Cooke and Suski 2004; Burns and Froeschke 2012; SEDAR 42 2015).

Alternative 1 would retain the current circle hook requirements in the Gulf of Mexico (Gulf) exclusive economic zone (EEZ), requiring commercial anglers to use circle hooks when fishing for yellowtail snapper with natural bait. In general, fishing behavior may differ when fishermen use circle hooks compared to J-hooks. Anglers using a circle hook may wait for their fishing line to become taught, which is indicative of a fish taking the bait, and *then* reel in the fishing line, often hooking the fish in the mouth as the circle hook travels back up the fish's esophagus. Conversely, fishermen using J-hooks typically jerk the rod upward when they feel the fish take the bait to hook the fish, with the likelihood of gut-hooking the fish often being greater than when the angler uses circle hooks. Currently, no peer-reviewed literature is available with respect to the post-release mortality of yellowtail snapper when using circle hooks versus J-hooks.

Alternatives 2-5 would remove the requirement to use circle hooks when fishing commercially with natural bait for yellowtail snapper, and differ according to the spatial extent to which the requirement would be removed. Some commercial fishermen have informed resource managers of an increased propensity for gut-hooking yellowtail snapper when fishing with circle hooks due to the small size of hook needed to successfully hook yellowtail snapper. These fishermen indicate that the smaller circle hooks (especially those which feature a hook tip which is offset from the shank of the hook) are swallowed completely into the stomach, increasing the likelihood of the hook snagging somewhere in the fish's digestive tract. Circle hooks are designed to be swallowed by the fish, coming back up the fish's esophagus as the fish swims away, and finally hooking the fish in the mouth. This practice requires anglers to allow the fish to swim off with the bait to become hooked. Directed commercial yellowtail snapper fishing practices do not accommodate allowing a fish to swim off with the bait, thereby preventing circle hooks from being used as designed. If J-hooks are permitted for use, fishermen argue, they will

be able to hook yellowtail snapper in the mouth more frequently due to the morphology of the fish's mouth.

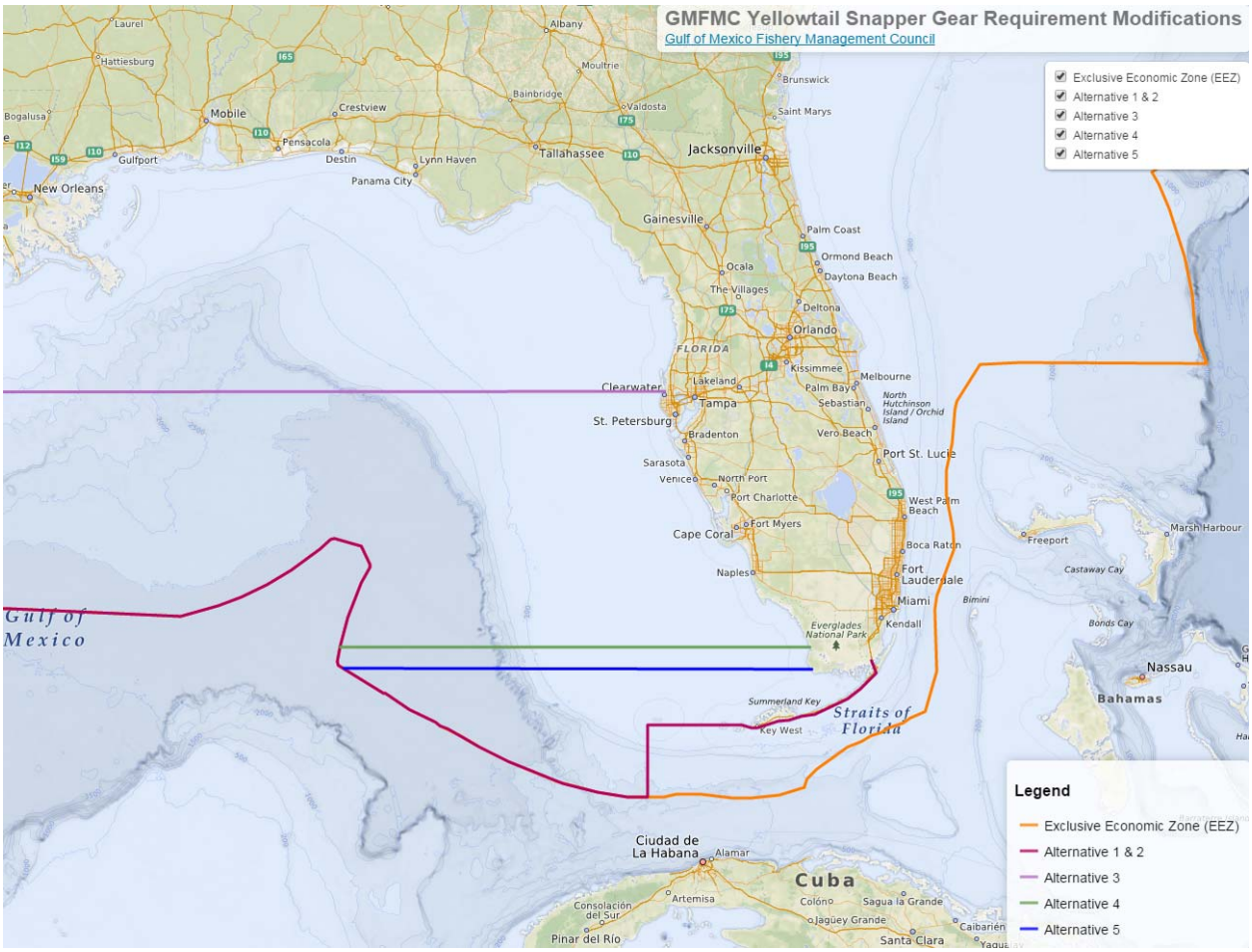


Figure 2.1.1. Spatial representation of the alternatives presented in Action 1. See: http://portal.gulfcouncil.org/YSGRM/YSGRM.html#7/26.711/-88.198

Alternative 2 would remove the requirement to use circle hooks when fishing commercially with natural bait for yellowtail snapper throughout the EEZ of the Gulf.[1]

Alternative 3 would remove the requirement to use circle hooks when fishing with natural bait for yellowtail snapper south of 28° 0' north latitude in the EEZ of the Gulf. This includes all areas of the west coast of Florida to just north of Tampa Bay. **Alternative 3** includes waters off both Florida and Texas which are not considered to be areas where commercial fishermen have been known to target yellowtail snapper. In this respect, **Alternative 3** is more similar to **Alternative 2** than it is to **Alternatives 4** and **5**.

Alternative 4 would remove the requirement to use circle hooks when fishing for yellowtail snapper south of 25° 23' north latitude on the west coast of Monroe County, Florida south to the

[1] Figure 2.1.1: http://portal.gulfcouncil.org/YSGRM/YSGRM.html#7/26.711/-88.198

Gulf Council jurisdictional boundary (Figure 2.1.1). This line of latitude corresponds to the Shark Point reference point in the Everglades on the west coast of Florida. It is 25 nautical miles (nm) south of the Monroe/Collier county line. According to information provided by Gulf Council members, fishing trips originating south of this boundary rarely travel north of the boundary, and trip originating north of the boundary rarely travel south. Therefore, this boundary serves as a natural demarcation for fishermen.

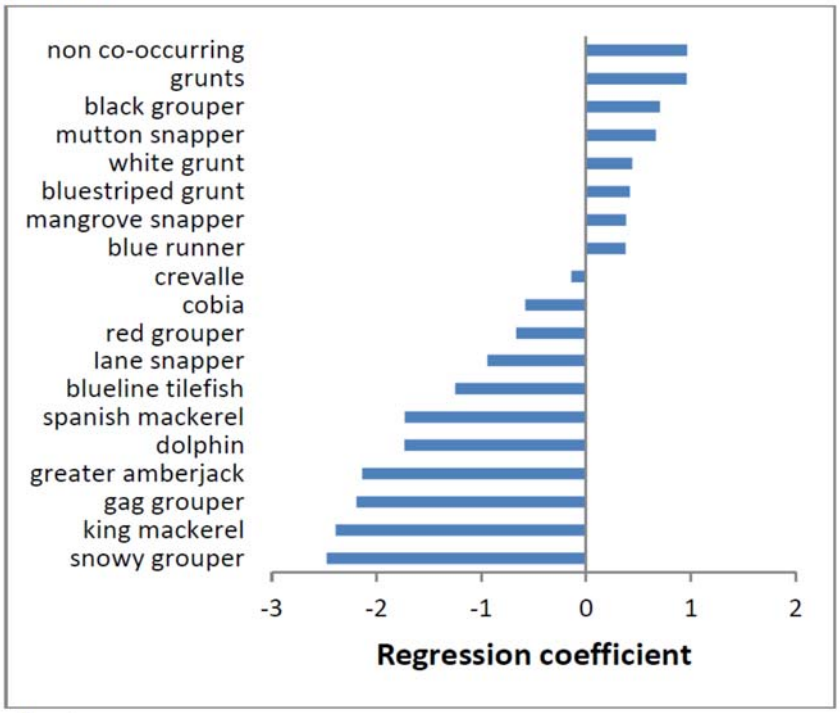
Alternative 5 would remove the requirement to use circle hooks when fishing for yellowtail snapper south of 25° 9' north latitude on the west coast of Monroe County, Florida south to the Gulf Council jurisdictional boundary (Figure 2.1.1). This line of latitude is just south of Cape Sable on the west coast of Florida. It is 38 nm south of the Monroe/Collier county line. This line is currently used by the Florida Fish and Wildlife Conservation Commission (FWC) as a regulatory boundary for state managed species such as permit. It is also considered by FWC to be far enough north of the Keys and far enough south of Naples and Marco Island so that regulatory issues are not simply shifted north to Collier County.

Alternatives 2, 3, 4 and 5 all remove the requirement to use circle hooks when fishing commercially for yellowtail snapper with natural bait compared to **Alternative 1**. Yellowtail snapper are concentrated in South Florida. Removing the requirement to use circle hooks for commercial fishermen targeting yellowtail snapper is expected to provide flexibility and improve operational efficiency, and to reduce regulatory burdens on fishermen who directly target yellowtail snapper in South Atlantic and Gulf Council jurisdictions. Due to the inherent multi-species nature of recreational fishing activities when yellowtail snapper are included, and no expressed need to increase operational efficiency and/or reduce a similar regulatory burden in the recreational fishing sector, modifications to recreational gear requirements are not currently being considered in this document.

An analysis was completed in SEDAR 27 (2012) on species which are landed along with yellowtail snapper on commercial fishing trips in the southeastern U.S. between 1986 and 2010. This analysis is included here to address concerns about bycatch of other species that could be impacted due to alternatives proposed in Action 1. Based on the methods proffered in Stephens and MacCall (2004), this analysis examines trip-level landings data to determine which species aside from the target species (yellowtail snapper), are likely to be landed on trips where the target species is also landed. This analysis does not inherently include every trip taken, thereby excluding some trips where yellowtail snapper were caught exclusively (see below) and including others where no yellowtail snapper were landed. However, it does illustrate the likelihood of a species being landed with the target species. A higher positive regression coefficient indicates that a species is more likely to occur in the landings on a trip where yellowtail snapper were also landed, while a negative regression coefficient indicates that a species is less likely to occur in the landings on a trip where yellowtail snapper were also landed. For example, a single-day trip during which gray snapper were landed may be indicative of a trip where yellowtail snapper were targeted/landed; a trip where snowy grouper were landed may indicate the opposite. This analysis, as provided in SEDAR 27 (2012), is shown in Figure 2.1.2. Panel (a) from Figure 2.1.2 shows the analysis from the South Florida region, and panel (b) shows the core area of commercial yellowtail snapper landings (>96.5%). Spatially, the area fished over which the south Florida index applies was limited to approximately Sarasota south to

the Florida Keys, then north to Palm Bay on Florida's east coast. The "core area" index was more restricted spatially from the Dry Tortugas eastward and northward to Jupiter Inlet on Florida's east coast, where catch rates of yellowtail snapper were higher in some years.

a) South Florida subset



b) "core area" subset

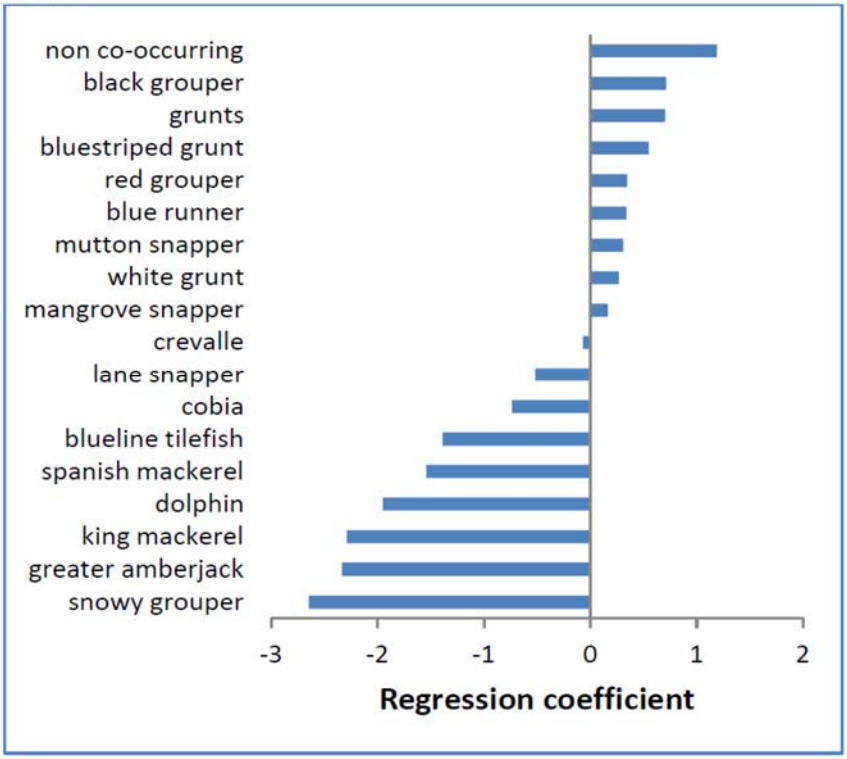


Figure 2.1.2. Stephens and MacCall analysis from SEDAR 27 (2012) from the south Florida (a) and "core area" (b) analyses. Positive coefficients mean that a species was more likely to occur in the landings on trips with yellowtail snapper, and negative coefficients mean that the species was less likely to occur. The "non co-occurring" is the intercept for the regression.

The Stephens and MacCall method of selecting trips was again applied to Gulf commercial logbook data for statistical area 2 for the 2010-2015 fishing years. These years were selected because they represent a more recent time period, and one during which both red snapper and all grouper species managed by the Gulf Council were under some form of individual fishing quota system. Landings were represented as the sum of the total pounds landed (both gutted and whole weight) by species across all trips. Landings were also constrained to statistical collection area 2 (Figure 2.1.3). Area 2 includes the area described in **Alternative 5**, and in which fishermen have indicated represents the area of the Gulf where the preponderance of yellowtail snapper fishing effort occurs. Landings were separated into single day trips (Figure 2.1.4) and multi-day trips (Figure 2.1.5). Landings were constrained to only those species occurring in the Reef Fish FMP, as fishermen are not required to use circle hooks for managed finfish species which are in other FMPs (e.g., coastal migratory pelagics like king mackerel). Lastly, landings were partitioned to show the sum of species landed across all trips, trips where at least 50% or 75% of the landed catch was yellowtail snapper.

The single day and multi-day analyses shown respectively in Figures 2.1.4 and 2.1.5 correspond well to the Stephens and MacCall analyses in the SEDAR 27 stock assessment (Figure 2.1.2). Approximately 40% of all single day trips selected by the Stephens and MacCall analysis landed only yellowtail snapper, while the same was shown for approximately 55% of the selected multi-day trips. These percentages indicate the presence of a directed commercial fishery for yellowtail snapper in the Gulf in area 2.

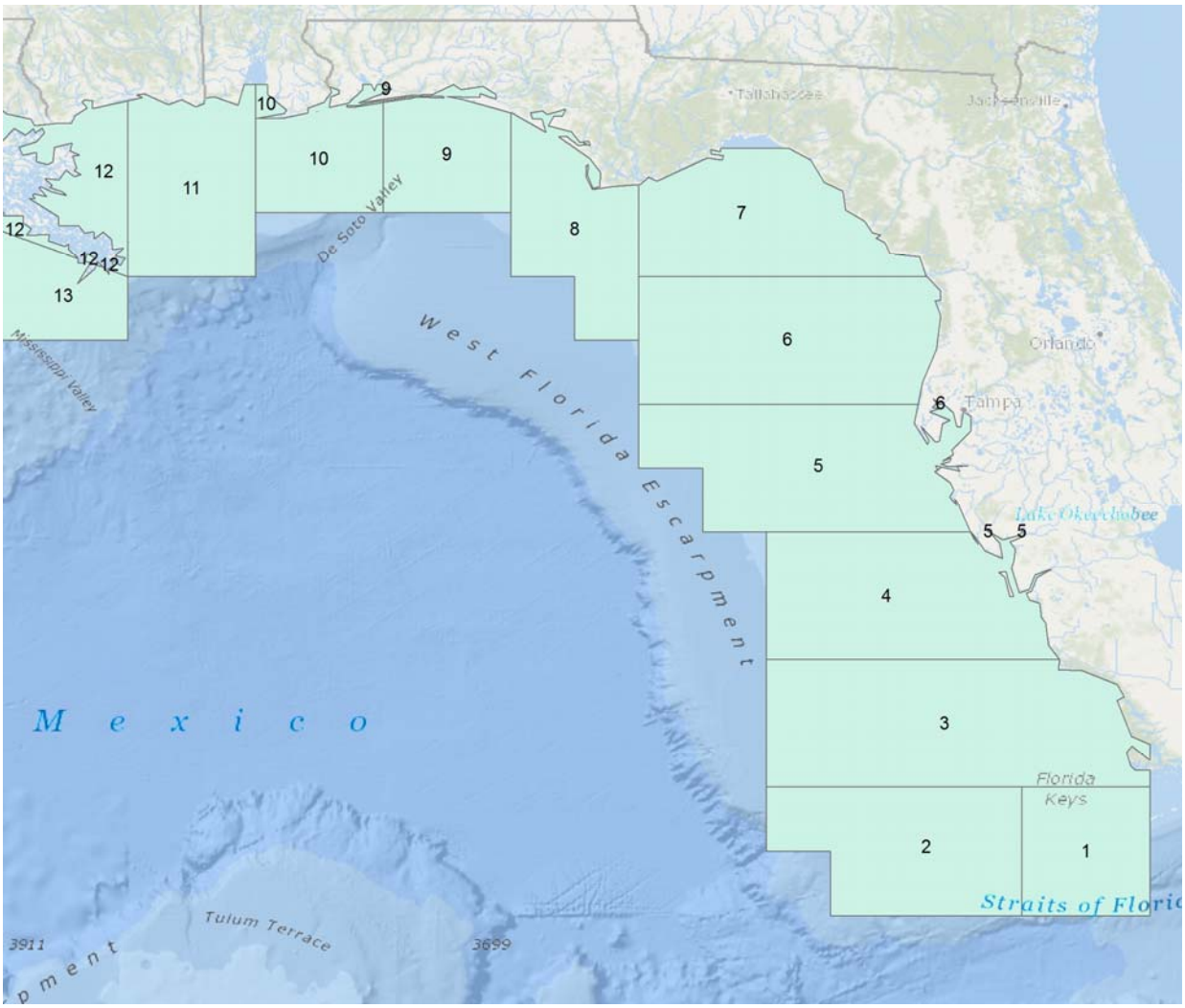


Figure 2.1.3. Map showing the shrimp statistical data collection grid for the eastern Gulf.

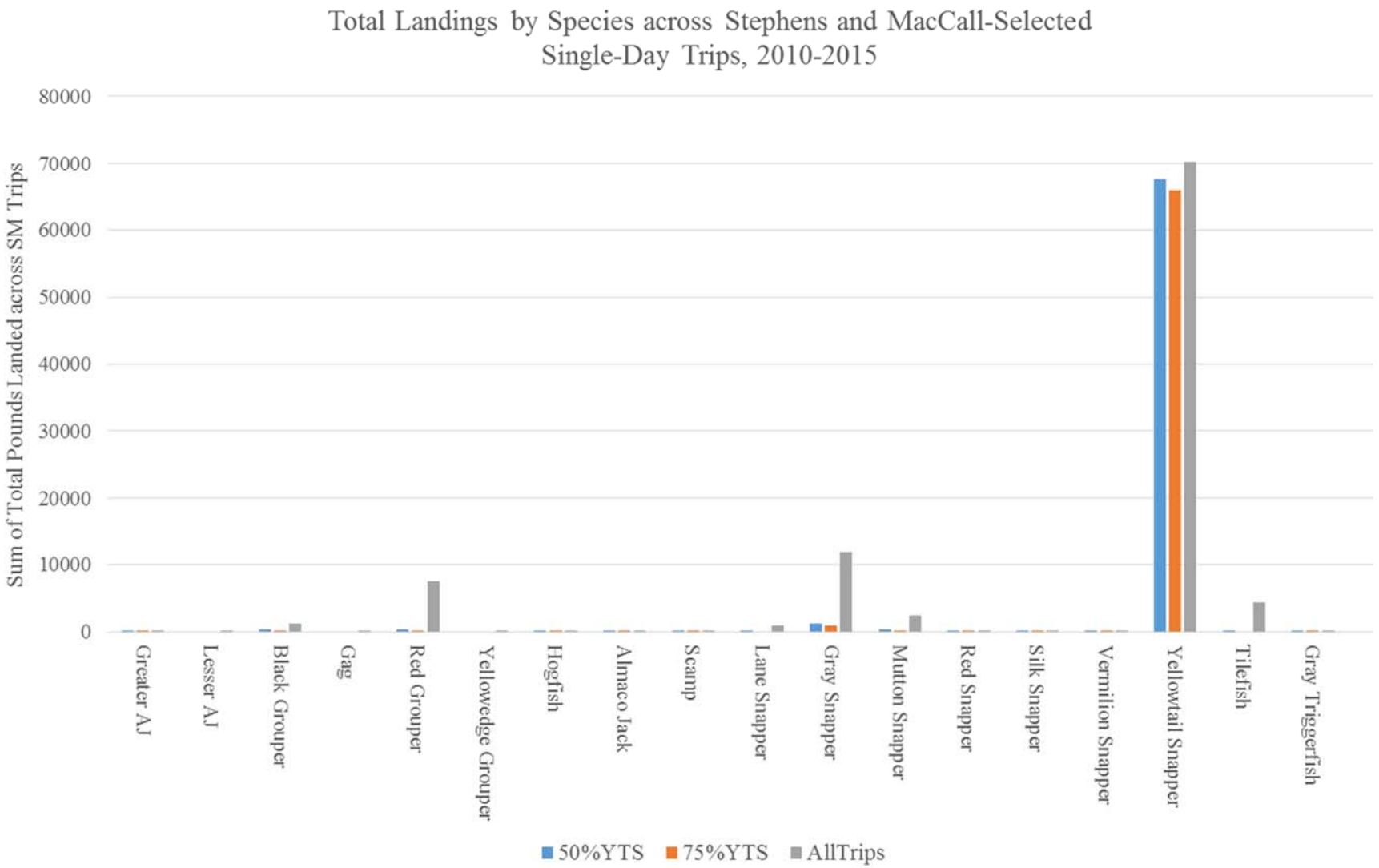


Figure 2.1.4. Sum of the total landed pounds, by species, across all single day commercial reef fish trips taken from 2010-2015 in Area 2 (see Figure 2.1.3).

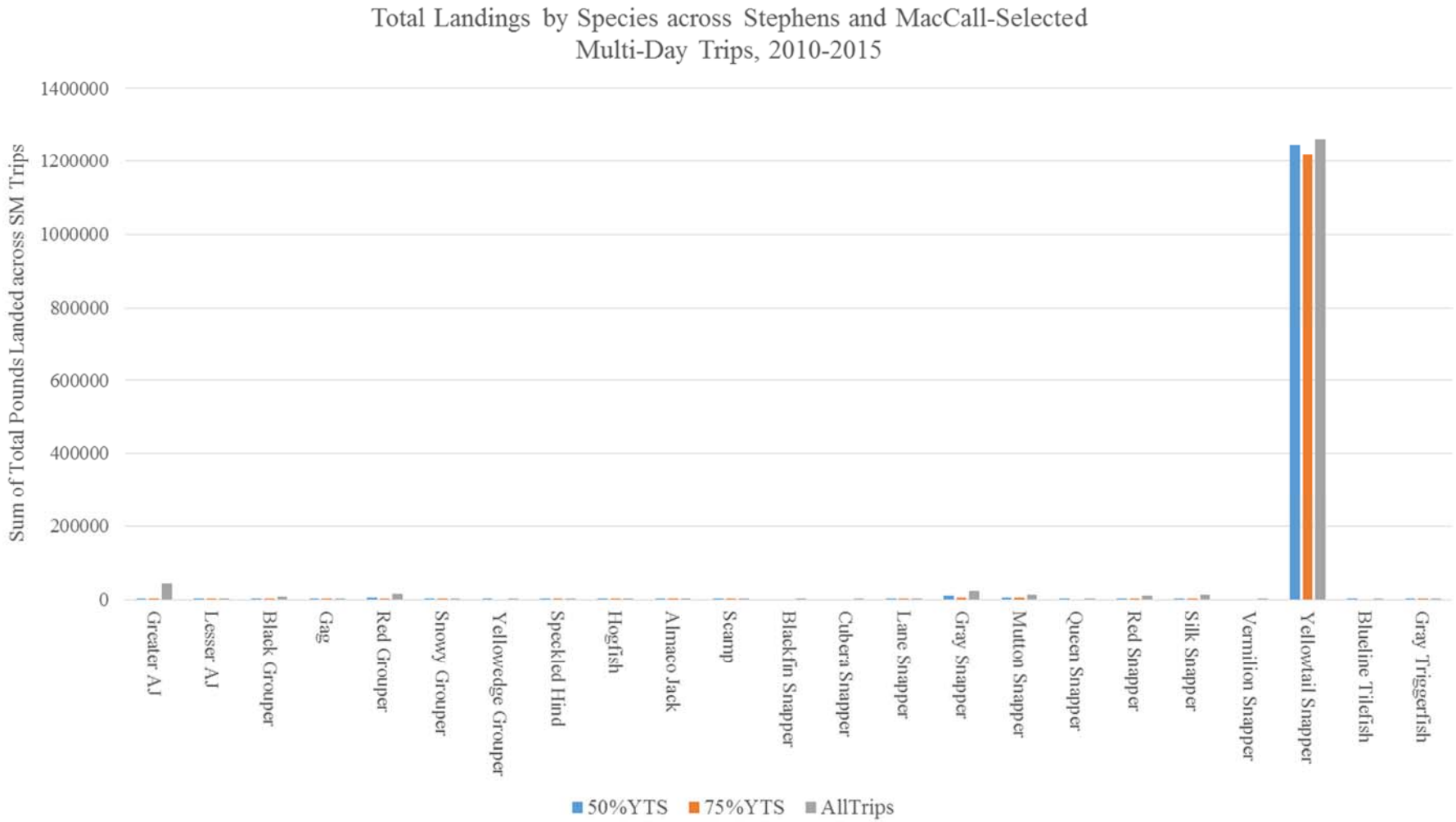


Figure 2.1.5. Sum of the total landed pounds, by species, across all multi-day commercial reef fish trips taken from 2010-2015 in Area 2 (see Figure 2.1.3).

2.2 Action 2 – Modify the Fishing Year for Gulf Yellowtail Snapper

Alternative 1: No Action. Do not modify the fishing year for yellowtail snapper. The fishing year (commercial and recreational) is the calendar year, January 1 through December 31.

Preferred Alternative 2: Modify the fishing year for the commercial sector for yellowtail snapper:

Option a: June 1 through May 30
Option b: July 1 through June 30
Preferred Option c: August 1 through July 31
Option d: September 1 to August 31

Preferred Alternative 3: Modify fishing year for the recreational sector for yellowtail snapper:

Option a: June 1 through May 30
Option b: July 1 through June 30
Preferred Option c: August 1 through July 31
Option d: September 1 to August 31

Discussion:

The fishing year for yellowtail snapper in the Gulf presently runs from January 1st to December 31st. The South Atlantic Council recently voted (December 2015) to change the fishing year for yellowtail snapper in their jurisdictional waters to open on August 1st and close on July 31st. The South Atlantic Council's rationale for this change was that if the yellowtail snapper fishing season is going to close in a given year, then the closure should correspond with the spawning season. Though spawning of yellowtail snapper in the southeastern US can occur year-round, the peak spawning period is from April to August (McClellan and Cummings 1998; SEDAR 27 2012). Commercial landings of yellowtail snapper from the South Atlantic typically peak in the late spring to early summer (Figure 2.2.1). The commercial harvest of yellowtail snapper in the South Atlantic was closed on October 31st of 2015 when the ACL was estimated to have been met.

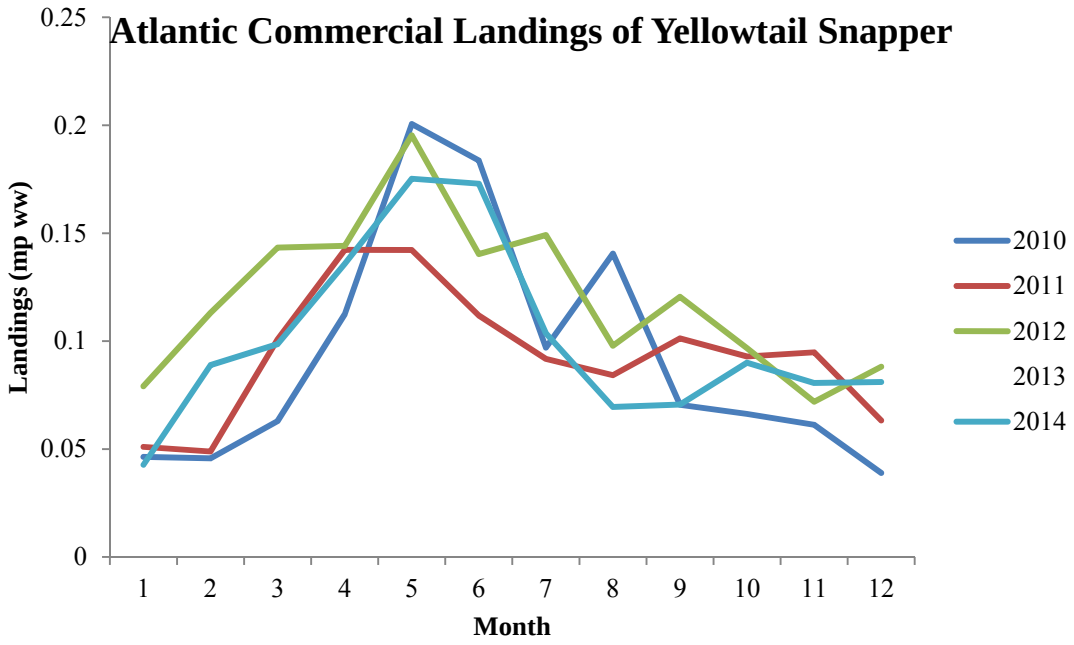


Figure 2.2.1. Distribution of South Atlantic yellowtail snapper commercial landings by month, 2010-2014. Source: SEFSC Commercial ACL Data (Oct 2, 2015).

Yellowtail snapper in the Gulf are managed under a single annual catch limit (ACL); there is no recreational and commercial sector allocation. The commercial harvest of yellowtail snapper has not closed in the Gulf since the jurisdictional apportionment of the stock ACL was implemented through the Generic ACLs and Accountability Measures Amendment (GMFMC 2011). Some commercial fishermen fish for yellowtail snapper in both the Gulf and the South Atlantic. These fishermen have previously indicated that following the regulations would be less burdensome if those regulations were the same for both Councils' jurisdictions. Recreational landings of yellowtail snapper in the Gulf historically have accounted for only a small fraction of the total landings (Table 3.1.2.1).

Alternative 1 would not change the fishing year for yellowtail snapper in the Gulf from the current opening date of January 1st, closing on December 31st or when the ACL is reached. **Preferred Alternatives 2** and **3** would change the fishing season for Gulf yellowtail snapper for the commercial and recreational sectors, respectively. **Option a** would change the fishing season to open on June 1st and close on May 30th. **Option b** would change the fishing season to open on July 1st and close on June 30th. **Preferred Option c** would change the fishing season to open on August 1st and close on July 31st. **Option d** would change the fishing season to open on September 1st and close on August 31st. In the Gulf, landings of yellowtail snapper are generated primarily by the commercial sector (Tables 3.1.2.1 and 3.1.2.2). **Options a**, **b**, and **d** also would protect some portion of the spawning season if a closure were implemented; however, the Gulf and South Atlantic Councils have indicated that they thought **Preferred Option c** would protect the stock when spawning activity is most intense.

CHAPTER 3. AFFECTED ENVIRONMENT

3.1 Description of the Fishery

The Gulf of Mexico (Gulf) reef fish fishery is composed of 31 species: 11 snappers, 11 groupers, 4 jacks, 3 tilefishes, 1 triggerfish, and 1 wrasse. Commercial and recreational fishing for these species occur in state and federal waters off the Florida Keys to south Texas.

Yellowtail Snapper

Yellowtail snapper in the southeastern United States are harvested by both recreational and commercial fishermen, with landings coming almost exclusively from waters adjacent to Florida. The majority of yellowtail snapper landings in the Gulf are made by the commercial sector, which lands, on average, over 97% of the yellowtail snapper caught in the Gulf. To harvest yellowtail snapper in the Gulf, commercial fishermen must be in possession of a valid Gulf commercial reef fish permit. For-hire operators must be in possession of a valid Gulf charter-for-hire or headboat reef fish permit, as appropriate. More information on these permits is detailed in Section 3.3.

Commercial fishermen in the Gulf harvest yellowtail snapper almost exclusively off the southwestern coast of Florida and west and northwest of the Florida Keys (Figure 3.1.2.2). The most common fishing practice is hook-and-line fishing behind the vessel while using a chum slick (a large amount of natural chum drifting away from the stern of the fishing vessel). The chum slick draws the fish to the surface, where they feed directly behind the stern of the fishing vessel. Fishermen use small hooks with natural bait and cane poles (rods with ~15 feet of monofilament fishing line tied to the tip of the rod) or spinning reels to catch yellowtail snapper. Landed fish are then quickly dehooked using a purpose-built rig by pulling the fishing line across a horizontal bar, on which the hook catches (Figure 3.1.1), dropping the fish into a hold with ice. The operation is similar in the South Atlantic, where circle hooks are not required to land reef fish when using natural bait south of 28° 00’ north latitude. Fishermen in the South Atlantic use dehooking rigs similar to those in Figure 3.1.1 to quickly remove J-hooks from caught yellowtail snapper. Since a majority of the fishing occurs at the stern of the vessel in sight of the schooling fish, fishermen can proactively prevent unwanted fish (e.g., non-yellowtail snapper species) from taking a bait. Further, anecdotal observer information suggests that since the fish are feeding at the surface and are prevented from swimming away after being hooked, the probability of a fish being hooked anywhere besides the mouth is reduced.

Figure 3.1.1. An example of a purpose-built yellowtail snapper dehooking rig from a commercial yellowtail snapper vessel. The fish is lowered into the fish box, and the fishing line is then pulled over the crossbar. The hook catches on the crossbar, dehooking the fish, which then falls down into the fish box.

Recreational fishermen in the Gulf also harvest yellowtail snapper almost exclusively off the southwestern coast of Florida and in the Florida Keys (Figure 3.1.2.1). Common fishing practices include hook-and-line fishing with natural bait or jigs and, to a lesser extent, spearfishing. Gulf recreational fishermen are permitted to retain 10 yellowtail snapper per person per day, with a minimum size limit of 12 inches total length (TL). Contrary to commercial fishing practices, most recreational reef fish fishing trips target multiple species through similar fishing behaviors (e.g., bottom fishing). This results in the increased probability of a recreational angler catching and retaining species other than yellowtail snapper, which could have adverse effects on other species if hooks other than circle hooks are permitted for recreational use. Combined with the aforementioned bag limit, there is not a current need to address the efficiency of recreational fishing effort for yellowtail snapper.

3.1.1 Stock Status of Yellowtail Snapper

A benchmark assessment for yellowtail snapper was conducted in 2012 by the Florida Fish and Wildlife Research Institute (FWRI) (SEDAR 27 2012). This assessment was submitted to a joint meeting of the South Atlantic Council's Scientific and Statistical Committee (SSC) and the Gulf Council's Standing and Special Reef Fish SSC for review in October 2012. Whereas the

previous yellowtail snapper assessment in 2003 (SEDAR 3) used a release mortality estimate of 30%, this assessment used a lower bound for release mortality of 10% for the recreational sector, and 11.5% for the commercial sector, based on observer data. The assessment was conducted with a statistical catch-at-age model (ASAP2). Fishery-dependent data included commercial logbooks, the Marine Recreational Fisheries Statistics Survey (MRFSS), and the Southeast Region Headboat Survey (SRHS). Fishery-independent data came from the NMFS/University of Miami Reef Visual Census. Results from the assessment indicated that, as of 2010, the yellowtail snapper stock is neither overfished nor experiencing overfishing. Using the level of fishing mortality which would conserve 30% of the spawning biomass ($F_{30\% SPR}$) as a proxy for the level of fishing mortality at MSY (F_{MSY}), the ratio of the current level of fishing mortality (F_{2010}) / $F_{30\%SPR}$ = 0.153 (not overfishing), and the ratio of the current level of spawning biomass (SSB_{2010}) / $SSB_{F30\% SPR}$ = 3.357 (not overfished).

The yellowtail snapper stock straddles the jurisdictions of the Gulf and South Atlantic Councils. Therefore, the assessment was reviewed in October 2012 by a joint meeting of the South Atlantic Council's Scientific and Statistical Committee (SSC) and the Gulf Council's Standing and Special Reef Fish SSC. The SSCs thought that setting the overfishing limit (OFL) at the equilibrium yield level for F_{MSY} would be a sustainable and risk neutral approach because the stock biomass was well above the level needed to achieve maximum sustainable yield (MSY; 1.0). These levels fix the recommended catch at a constant amount over time, and account for interannual variability in landings. Consequently, the SSCs established OFL equal to 4.61 million pounds (mp) whole weight (ww) total removals (landings plus dead discards), or 4.51 mp ww in landings.

To set ABC, the Gulf and South Atlantic Councils have separate ABC control rules for establishing the appropriate P* (acceptable risk of overfishing). Using the South Atlantic ABC control rule resulted in a P* value of 0.40. Using Tier 1 of the Gulf Council's ABC control rule resulted in a P* of 0.416. Since the results were very close, the joint SSC agreed to use P* = 0.40 to set the ABC. When this P* was applied to a probability distribution function prepared by FWRI, the resulting ABC was 4.13 mp ww total removals, or 4.05 mp ww in landings. When apportioned between the South Atlantic and Gulf jurisdictions (75% and 25%, respectively), the resulting regional ABCs in terms of landings were 3.0375 mp ww to the South Atlantic Council, and 1.0125 mp ww to the Gulf Council.

3.1.2 Landings History for Yellowtail Snapper

Because the ABCs set for yellowtail snapper are based on equilibrium yields, they do not fluctuate from year to year, but remain constant until adjusted by a future assessment. In the Gulf, the ACL is set equal to the ABC, and there are no established sector allocations. Table 3.1.2.1 shows the annual landings of yellowtail snapper from 1986 – 2014 by Council and fishing sector. Table 3.1.2.2 shows the annual percentages of landings by sector for yellowtail snapper from 1986 – 2014 by Council. Table 3.1.2.3 shows yellowtail snapper landings by statistical collection zone for each Council by sector for 2008-2014. Commercial landings are assigned to sub-region (Gulf of Mexico or South Atlantic) based on fisher-reported catch area. For example, commercial landings reported north of U.S. Route 1 are considered to be within the Gulf Council's jurisdiction and south of U.S. Route 1 landings are considered to be within the

South Atlantic Council's jurisdiction. Headboats based from Texas to Gulf-based Monroe County are within the Gulf Council's jurisdiction, and headboats from North Carolina to the Florida Keys are within the South Atlantic Council's jurisdiction. The MRFSS data was post-stratified to break the Florida Keys out from the Gulf landings. The MRFSS landings from the Florida Keys were re-assigned to the South Atlantic Council's jurisdiction, because most legal-sized yellowtail snapper are likely caught in South Atlantic waters (GMFMC ACL/AM Amendment 2011).

Table 3.1.2.1. Yellowtail snapper landings from 1986 through 2015 in the Gulf of Mexico and South Atlantic in pounds whole weight.

	Gulf of Mexico			South Atlantic			
Year	Commercial	Recreational	Gulf Total	Commercial	Recreational	SA Total	Grand Total
1986	506,144	7,622	513,766	612,676	776,238	1,388,914	1,902,679
1987	1,275,194	14,314	1,289,508	88,876	955,012	1,043,888	2,333,396
1988	638,412	9,460	647,872	774,164	1,103,823	1,877,987	2,525,860
1989	1,020,640	10,581	1,031,221	830,896	1,691,611	2,522,507	3,553,728
1990	906,233	11,532	917,765	849,380	1,340,786	2,190,166	3,107,931
1991	787,663	13,180	800,843	1,073,979	2,299,126	3,373,105	4,173,948
1992	831,013	36,986	867,999	1,024,653	1,067,445	2,092,098	2,960,097
1993	1,067,452	51,015	1,118,467	1,311,367	1,189,637	2,501,004	3,619,471
1994	1,344,942	11,762	1,356,704	860,543	880,763	1,741,306	3,098,010
1995	591,074	3,434	594,508	1,265,856	660,235	1,926,091	2,520,599
1996	485,120	2,854	487,974	973,815	554,130	1,527,945	2,015,919
1997	218,384	2,008	220,392	1,455,496	702,850	2,158,346	2,378,737
1998	341,473	4,965	346,438	1,183,074	487,063	1,670,137	2,016,574
1999	601,027	39,260	640,287	1,245,345	288,951	1,534,296	2,174,583
2000	388,984	4,781	393,765	1,203,154	395,845	1,598,999	1,992,764
2001	246,849	7,045	253,894	1,174,008	328,458	1,502,466	1,756,360
2002	341,823	7,782	349,605	1,069,057	407,848	1,476,905	1,826,510
2003	463,743	11,472	475,215	948,886	510,314	1,459,200	1,934,414
2004	478,221	17,937	496,158	1,002,309	698,058	1,700,367	2,196,525
2005	510,437	31,176	541,613	814,899	576,247	1,391,146	1,932,760
2006	542,237	21,477	563,714	694,958	560,320	1,255,278	1,818,992
2007	350,079	19,726	369,805	628,608	786,399	1,415,007	1,784,813
2008	460,569	6,056	466,625	910,323	746,313	1,656,636	2,123,261
2009	891,925	19,250	911,175	1,085,281	348,536	1,433,817	2,344,993
2010	569,275	8,783	578,058	1,126,231	434,259	1,560,490	2,138,547
2011	769,729	25,560	795,289	1,125,220	390,998	1,516,218	2,311,506
2012	630,984	5,087	636,071	1,439,586	493,409	1,932,995	2,569,065
2013	734,112	6,991	741,103	1,328,931	666,026	1,994,957	2,736,061
2014	760,395	21,536	781,931	1,209,929	933,759	2,143,688	2,925,619
2015	416,360	71,593	487,953	1,620,510	701,252	2,321,762	2,809,715
Mean	**639,016**	**16,841**	**655,857**	**1,031,067**	**765,857**	**1,796,924**	**2,452,781**

Source: SEFSC Commercial (Dec 2015) and MRFSS-based Recreational ACL Databases (Jan 2015).
Note: Recreational landings reported to MRIP are post-stratified (Monroe County landings assigned to South Atlantic) and back-converted to MRFSS units to be consistent with most recent stock assessment inputs.
Note: 2015 landings are preliminary.

Table 3.1.2.2. Percentage of yellowtail snapper landings by sector from 1986 through 2015 in the Gulf of Mexico and South Atlantic.

	Gulf of Mexico		South Atlantic	
Year	% Comm	% Rec	% Comm	% Rec
1986	98.5%	1.5%	44.1%	55.9%
1987	98.9%	1.1%	8.5%	91.5%
1988	98.5%	1.5%	41.2%	58.8%
1989	99.0%	1.0%	32.9%	67.1%
1990	98.7%	1.3%	38.8%	61.2%
1991	98.4%	1.6%	31.8%	68.2%
1992	95.7%	4.3%	49.0%	51.0%
1993	95.4%	4.6%	52.4%	47.6%
1994	99.1%	0.9%	49.4%	50.6%
1995	99.4%	0.6%	65.7%	34.3%
1996	99.4%	0.6%	63.7%	36.3%
1997	99.1%	0.9%	67.4%	32.6%
1998	98.6%	1.4%	70.8%	29.2%
1999	93.9%	6.1%	81.2%	18.8%
2000	98.8%	1.2%	75.2%	24.8%
2001	97.2%	2.8%	78.1%	21.9%
2002	97.8%	2.2%	72.4%	27.6%
2003	97.6%	2.4%	65.0%	35.0%
2004	96.4%	3.6%	58.9%	41.1%
2005	94.2%	5.8%	58.6%	41.4%
2006	96.2%	3.8%	55.4%	44.6%
2007	94.7%	5.3%	44.4%	55.6%
2008	98.7%	1.3%	55.0%	45.0%
2009	97.9%	2.1%	75.7%	24.3%
2010	98.5%	1.5%	72.2%	27.8%
2011	96.8%	3.2%	74.2%	25.8%
2012	99.2%	0.8%	74.5%	25.5%
2013	99.1%	0.9%	66.6%	33.4%
2014	97.2%	2.8%	56.4%	43.6%
2015	85.3%	14.7%	69.8%	30.2%
Mean	97.3%	2.7%	58.3%	41.7%

Source: SEFSC Commercial (Dec 2015) and MRFSS-based Recreational ACL Databases (Jan 2015).
Note: Recreational landings reported to MRIP are post-stratified (Monroe County landings assigned to South Atlantic) and back-converted to MRFSS units to be consistent with most recent stock assessment inputs.
Note: 2015 landings are preliminary.

Table 3.1.2.3. Yellowtail snapper landings by statistical collection area for the Gulf of Mexico and South Atlantic Council jurisdictions for waters adjacent to the State of Florida. Landings are separated by sector and are displayed in pounds whole weight.

Recreational Sector										
Council	Region	2008	2009	2010	2011	2012	2013	2014	Mean	% of Mean
South Atlantic	NE	134	605	1,640	0	0	145	193	388	0.0%
	SE	581,279	520,470	333,846	210,358	286,013	623,573	356,127	415,952	31.2%
	K	1,583,584	570,257	623,266	497,448	623,304	2,017,435	460,654	910,850	68.2%
Gulf	WC	12,664	17,852	5,675	6,667	2,140	3,855	3,565	7,488	0.6%
	NW	0	0	0	0	0	0	0	0	0.0%
Commercial Sector										
Council	Region	2008	2009	2010	2011	2012	2013	2014	Mean	% of Mean
South Atlantic	East	26,245	28,879	30,135	91,858	28,423	25,065	26,655	36,751	1.96%
Both	South	1,341,755	1,942,968	1,662,667	1,797,833	2,066,160	1,998,411	2,005,003	1,830,685	97.63%
Gulf	West	1,326	3,157	1,116	3,811	12,642	20,708	11,397	7,737	0.41%

Note: Statistical collection zones for recreational landings as reported by the Florida Fish and Wildlife Conservation Commission (FWC) include the Northeast (Nassau to Brevard County), Southeast (Indian River to Dade County), the Florida Keys (Monroe County), Southwest (Collier to Levy County), and Northwest (Dixie to Escambia County). Statistical collection zones for commercial landings include the East (Nassau to Broward County), South (Dade and Monroe County), and West (Collier to Escambia County). Commercial data were aggregated in this way due to restrictions on data confidentiality.

Virtually all yellowtail snapper landed in the Gulf of Mexico are landed in Florida (> 99.9%, 2008-2013, SERO ALS and MRIP databases). Recreational and commercial landings by statistical collection zone are shown in Figures 3.1.2.1 and 3.1.2.2, respectively.

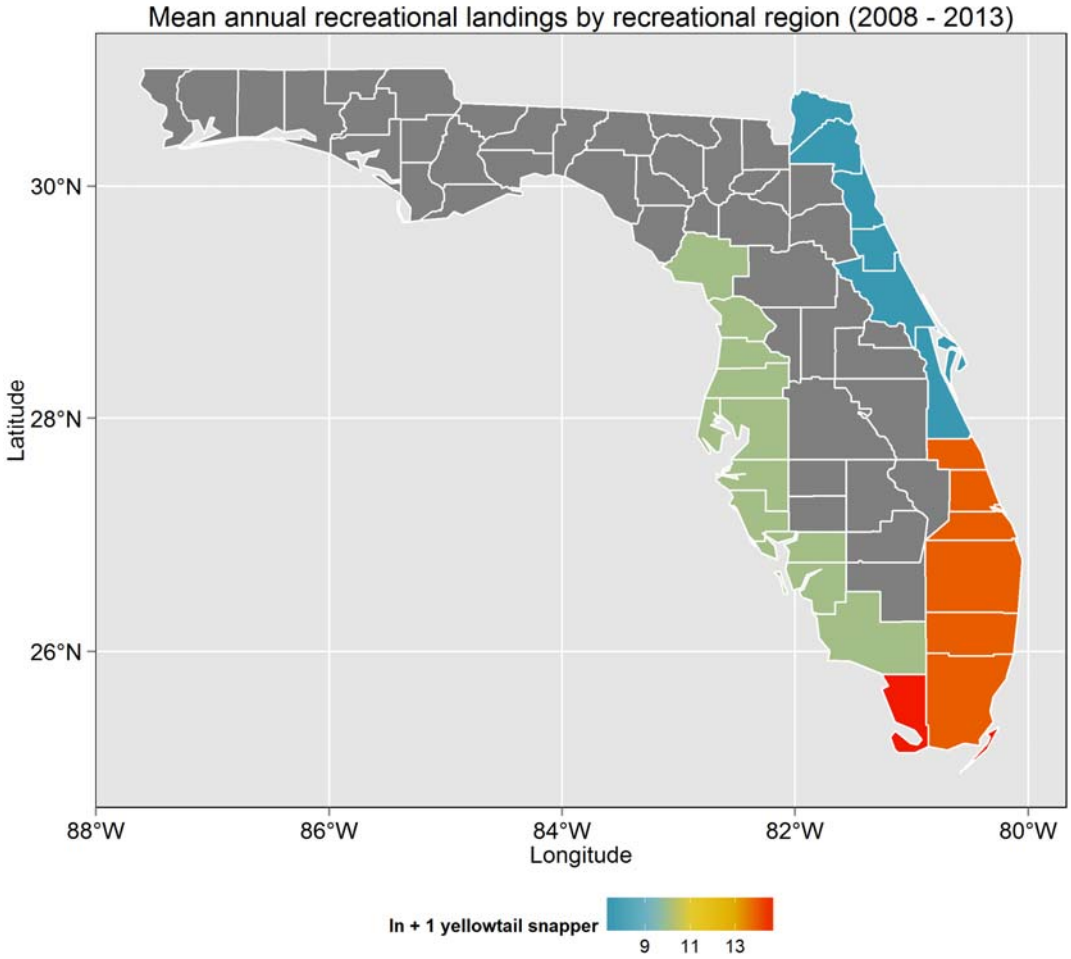


Figure 3.1.2.1. Mean annual recreational landings by statistical collection region for yellowtail snapper in Florida for 2008-2013. Landings are averaged across years and log-transformed for homogeneity. Blue colors indicate areas of low landings, red colors indicate areas with high landings, and counties shaded in gray have no landings.

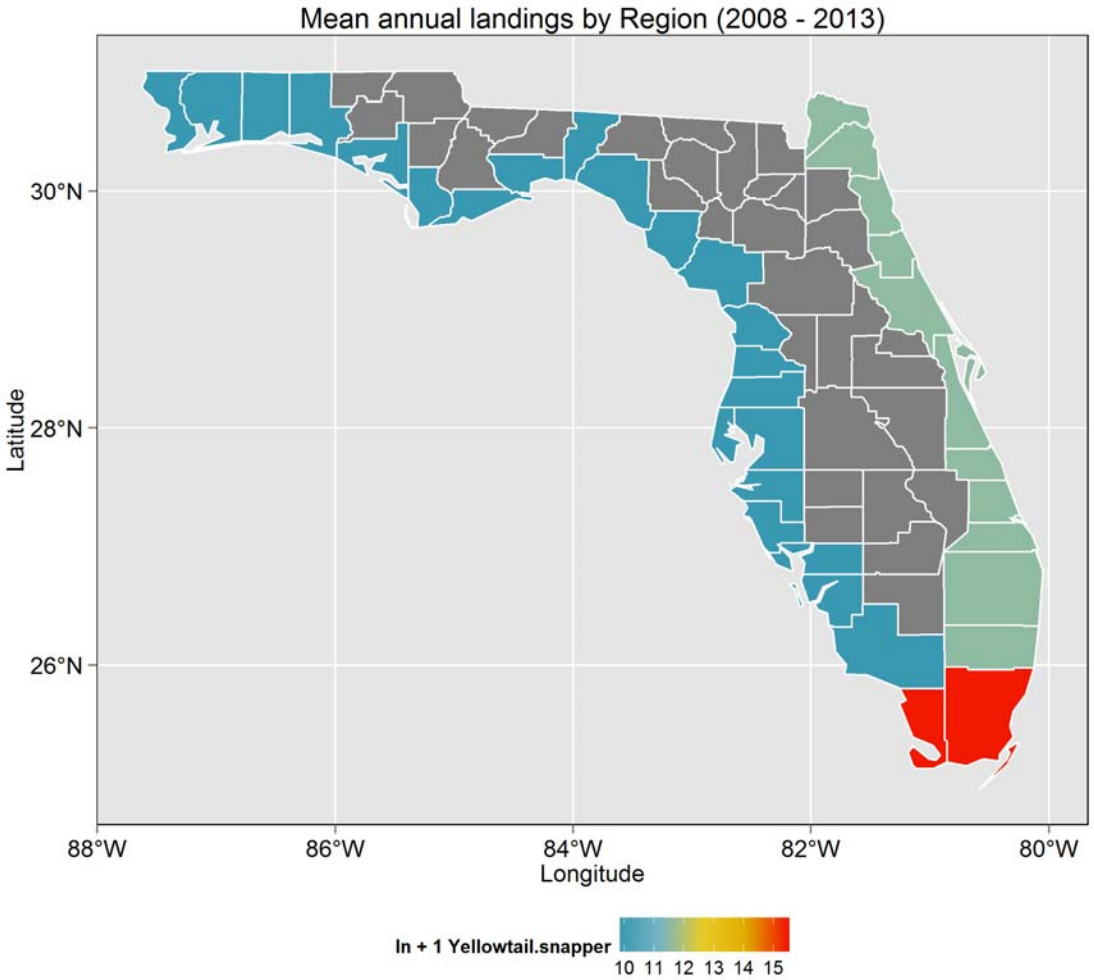


Figure 3.1.2.2. Mean annual commercial landings by region for yellowtail snapper in Florida for 2008-2013. Landings are averaged across years and log-transformed for homogeneity. Blue colors indicate areas of low landings, red colors indicate areas with high landings, and counties shaded in gray have no landings.

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. 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). Mean annual sea surface temperatures ranged from 73 through 83º F (23-28º C) including bays and bayous (Figure 3.2.1) between 1982 and 2009, according to satellite-derived measurements (NODC 2012: http://accession.nodc.noaa.gov/0072888). In general, mean sea surface temperature increases from north to south with large seasonal variations in shallow waters.

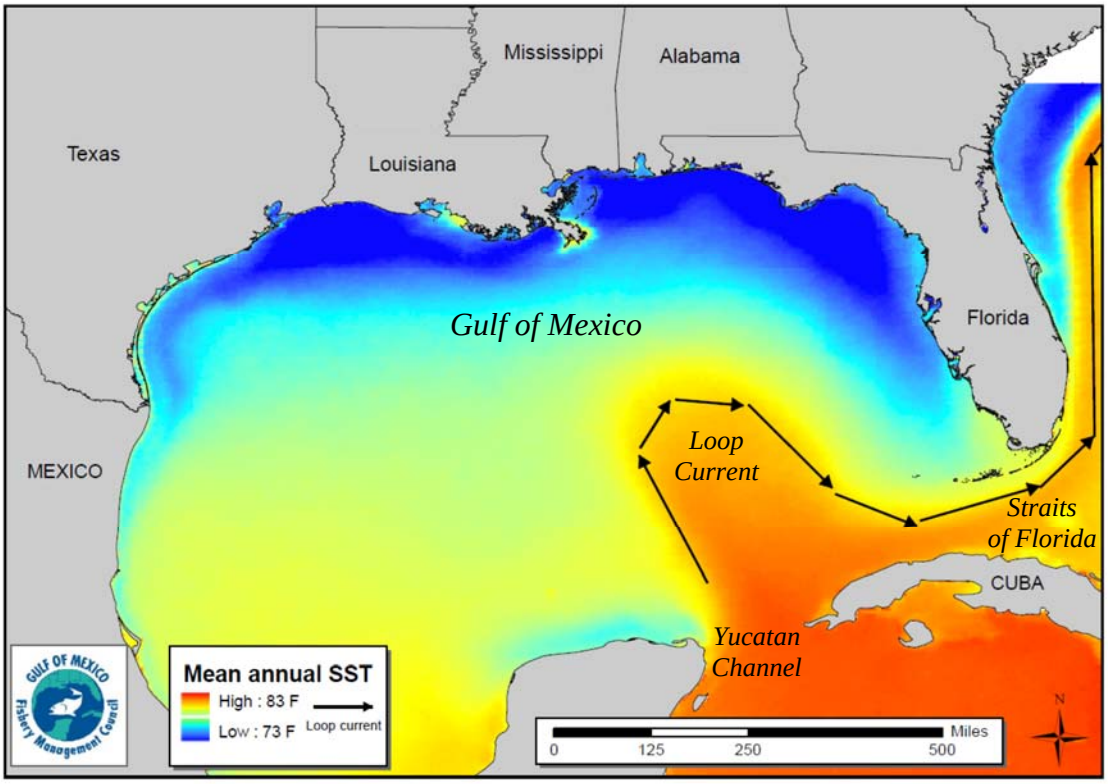


Figure 3.2.1. Mean annual sea surface temperature derived from the Advanced Very High Resolution Radiometer Pathfinder Version 5 sea surface temperature data set (http://pathfinder.nodc.noaa.gov).

The physical environment is detailed in the Environmental Impact Statement for the Generic Essential Fish Habitat (EFH) Amendment (GMFMC 2005) and the Generic ACLs/ Accountability Measures (AMs) Amendment[2] (GMFMC 2011) which are hereby incorporated by reference and updated below.

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

In the Gulf, the U.S.S. Hatteras, located in federal waters off Texas, is listed in the National Register of Historic Places. Fishing activity already occurs in the vicinity of this site, but the proposed action would have no additional adverse impacts on listed historic resources, nor would they alter any regulations intended to protect them. Historical research indicates that over 2,000 ships sank on the federal outer continental shelf between 1625 and 1951; thousands more sank closer to shore in state waters during the same period. Only a handful of these have been scientifically excavated by archaeologists for the benefit of generations to come. Further

[2] Final Generic Annual Catch Limits/Accountability Measures Amendment for the Gulf of Mexico Fishery Management Council's Red Drum, Reef Fish, Shrimp, Coral and Coral Reefs Fishery Management Plans.

information can be found at: http://www.boem.gov/Environmental-Stewardship/Archaeology/Shipwrecks.aspx

Habitat Areas of Particular Concern (HAPC)

Generic Amendment 3 (GMFMC 2005) for addressing EFH, HAPC, and adverse effects of fishing in the fishery management plans for Gulf Reef Fish, Red Drum, and CMP is hereby incorporated by reference.

Longline/Buoy Gear Area Closure – Permanent closure to use of these gears for reef fish harvest inshore of 20 fathoms (36.6 meters) off the Florida shelf and inshore of 50 fathoms (91.4 meters) for the remainder of the Gulf, and encompasses 72,300 square nautical miles (nm^2) or 133,344 km^2 (GMFMC 1989). Bottom longline gear is prohibited inshore of 35 fathoms (54.3 meters) during the months of June through August in the eastern Gulf (GMFMC 2009.

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

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

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

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

for the protection of coral reefs when using various fishing gears in coral reef areas for recreational and commercial fishermen was also developed.

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

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

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

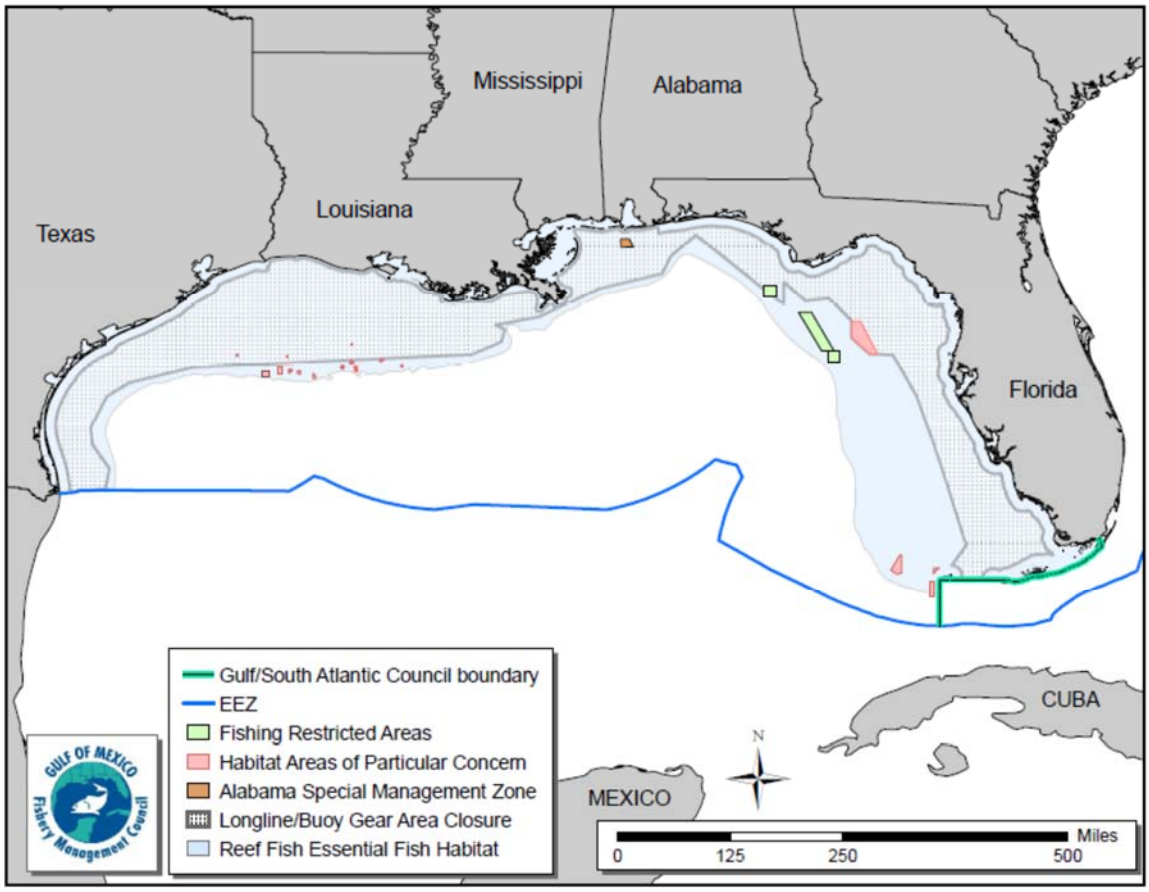


Figure 3.2.2. Map of most fishery management closed areas in the Gulf.

Deepwater Horizon MC252 Oil Spill Incident

Overview

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

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

In addition to the crude oil, over one million gallons of the dispersant, Corexit 9500A®, was applied to the ocean surface and an additional hundreds of thousands of gallons of dispersant was pumped to the mile-deep well head (National Commission 2010). No large-scale applications of dispersants in deep water had been conducted prior to the *Deepwater Horizon* MC252 oil spill.

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

General Impacts on Fishery Resources

The presence of PAHs in marine environments can have detrimental impacts on marine finfish, especially during the more vulnerable larval stage of development (Whitehead et al. 2011). When exposed to realistic yet toxic levels of PAHs (1–15 µg/L), greater amberjack (*Seriola dumerili*) larvae develop cardiac abnormalities and physiological defects (Incardona et al. 2014). The future reproductive success of long-lived species, including red drum (*Sciaenops ocellatus*) and many reef fish species, may be negatively affected by episodic events resulting in high-mortality years or low recruitment. These episodic events could leave gaps in the age structure

of the population, thereby affecting future reproductive output (Mendelssohn et al. 2012). Other studies have described the vulnerabilities of various marine finfish species, with morphological and/or life history characteristics similar to species found in the Gulf, to oil spills and dispersants (Hose et al. 1996; Carls et al. 1999; Heintz et al. 1999; Short 2003).

An increase in histopathological lesions were found in red snapper (*Lutjanus campechanus*) in the area affected by the oil, but Murawski et al. (2014) found that the incidence of lesions had declined between 2011 and 2012. The occurrence of such lesions in marine fish is not uncommon (Sindermann 1979; Haensly et al. 1982; Solangi and Overstreet 1982; Khan and Kiceniuk 1984, 1988; Kiceniuk and Khan 1987; Khan 1990). Red snapper diet was also affected after the spill. A decrease in zooplankton consumed, especially by adults (>400 mm TL) over natural and artificial substrates may have contributed to an increase in the consumption of fish and invertebrate prey- more so at artificial reefs than natural reefs (Tarnecki and Patterson 2015).

The effect of oil, dispersants, and the combination of oil and dispersants on fishes of the Gulf remains an area of concern. Marine fish species typically concentrate PAHs in the digestive tract, making stomach bile an appropriate testing medium. A study by Synder et al. (2015) assessed bile samples from golden tilefish (*Lopholatilus chamaeleonticeps*), king snake eel (*Ophichthus rex*), and red snapper for PAH accumulation over time, and reported concentrations were highest in golden tilefish during the same time period when compared to king snake eel and red snapper. These results suggest that the more highly associated an organism is with the sediment in an oil spill area, the higher the likelihood of toxic PAH accumulation. Twenty-first century dispersant applications are thought to be less harmful than their predecessors. However, the combination of oil and dispersants has proven to be more toxic to marine fishes than either dispersants or crude oil alone. Marine fish which are more active (e.g., a pelagic species versus a demersal species) appear to be more susceptible to negative effects from interactions with weathered oil/dispersant emulsions. These effects can include mobility impairment and inhibited respiration (Swedmark et al. 1973). Another study found that while Corexit 9500A® and oil are similar in their toxicity, when Corexit 9500A® and oil were mixed in lab tests, toxicity to microscopic rotifers increased up to 52-fold (Rico-Martínez et al. 2013). These studies suggest that the toxicity of the oil and dispersant combined may be greater than anticipated.

Climate change

Climate change projections show increases in sea-surface temperature and sea level; decreases in sea-ice cover; and changes in salinity, wave climate, and ocean circulation [Intergovernmental Panel on Climate Change (IPCC) http://www.ipcc.ch/]. These changes are likely to affect plankton biomass and fish larvae abundance that could adversely impact fish, marine mammals, seabirds, and ocean biodiversity. Kennedy et al. (2002) and Osgood (2008) have suggested global climate change could affect temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; change precipitation patterns and cause a rise in sea level which could change the water balance of coastal ecosystems; alter 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. NOAA's Climate Change Web Portal

(http://www.esrl.noaa.gov/psd/ipcc/ocn/) indicates the average sea surface temperature in the Gulf will increase by 1.2-1.4ºC for 2006-2055 compared to the average over the years 1956-2005. 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. Yellowtail snapper have not been used in the OceanAdapt model (http://oceanadapt.rutgers.edu/regional_data/) that shows trends in biomass distribution both in latitude and depth over the time period 1985-2013. For some reef fish species such as the smooth puffer, 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. Finally, for other reef 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 marine fisheries and dependent communities. Integrating the potential effects of climate change into fisheries assessments is currently difficult due to the time scale differences (Hollowed et al. 2013). Fisheries stock assessments rarely project through a time span that would include detectable climate change effects.

Greenhouse gases

The IPCC (http://www.ipcc.ch/) 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 (1.43% and 0.59%, 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 recreational vessels, and percent greenhouse gas emissions from commercial fishing and recreational vessels of the total emissions*.

Emission source	Greenhouse Gas CO_2	CH_4	N_2O	Total CO_{2e}**
Oil platform	11,882,029	271,355	167	17,632,106
Non-platform	22,703,695	2,029	2,698	23,582,684
Total	34,585,724	273,384	2,865	41,214,790
Commercial fishing	585,204	2	17	590,516
Recreational vessels	244,483	N/A	N/A	244,483
Percent commercial fishing	1.69	>0.01	0.59	1.43
Percent recreational vessels	0.71	NA	NA	0.59

*Compiled from Tables 7.9 and 7.10 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

Yellowtail Snapper Life History and Biology

Yellowtail snapper in the U.S. comprises a single stock, and the South Atlantic and Gulf regions are combined for the assessment. In continental U.S. waters, this species is primarily found associated with reefs and is commonly caught in the Florida Keys and southeastern Florida (McClellan and Cummings 1998; Acosta and Beaver 1998). Movement of adults between areas in the eastern Caribbean Sea and South Florida are limited, with the majority of larvae in each of these areas likely produced by adults occupying those areas (SEDAR 27 2012). Cowen et al. (2000, 2006) suggest that most recruitment occurs over distances of 10-100 km. Yellowtail snapper live to a maximum observed age of 23 years (Hoenig 1983). Approximately 50% of females are sexually mature at 9.1 inches (232 mm) total length and 1.7 years of age. Natural mortality (M) was estimated using the maximum age of 23 years at 0.194, and was derived in tandem with the age-specific M used in the stock assessment.

In the Florida Keys, sexually mature fish have been observed year-round (Collins and Finucane 1989). Spawning may occur in most months, but peaks from April to August (McClellan and Cummings 1998). During these months, large aggregations are believed to be spawning-related.

Spawning may occur in open water over high-relief hard bottom, including coral reefs, banks, and shelf areas, but is yet to be directly observed. Grimes (1987) described a male:female ratio of 1:1.04 in the Florida Keys. Larvae are planktonic for 21-28 days after spawning, and settle into seagrass habitats. Juveniles smaller than 150 mm fork length are found primarily in seagrasses, moving to shallow coral reef areas as they grow larger (Nagelkerken et al. 2000).

The previous yellowtail snapper assessment in 2003 (SEDAR 3) used a release mortality estimate of 30%. The SEDAR 27 assessment (2012) used a lower bound for release mortality of 10% for the recreational sector, and 11.5% for the commercial sector, based on observer data.

General Information on Reef Fish Species

Descriptions of habitat types and life history stages can be found in more detail in GMFMC (2004b and 2011b). In general, 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. Larvae feed on zooplankton and phytoplankton. Exceptions to these generalizations include the gray triggerfish that lay their eggs in depressions in the sandy bottom, and gray snapper whose larvae are found around submerged aquatic vegetation. Juvenile and adult reef fish are typically demersal, and are usually associated with bottom topographies on the continental shelf which have high relief, i.e., coral reefs, artificial reefs, rocky hard-bottom substrates, ledges and caves, sloping soft-bottom areas, and limestone outcroppings. However, several species are found over sand and soft-bottom substrates. Some juvenile snappers (e.g. mutton, gray, red, dog, lane, and yellowtail snappers) and groupers (e.g. Atlantic goliath, red, gag, and yellowfin groupers) have been documented in inshore seagrass beds, mangrove estuaries, lagoons, and larger bay systems (GMFMC 1981). More detail on hard bottom substrate and coral can be found in GMFMC and SAFMC (1982).

Status of Reef Fish Stocks

The NMFS Office of Sustainable Fisheries updates its Status of U.S. Fisheries Report to Congress on a quarterly basis utilizing the most current stock assessment information. The most recent update can be found at: http://www.nmfs.noaa.gov/sfa/fisheries_eco/status_of_fisheries/status_updates.html. Stock assessments and stock assessment reviews can be found on the Council (www.gulfcouncil.org) and SEDAR (http://sedarweb.org) websites. The status of both assessed and unassessed stocks as of the writing of this report is shown in Table 3.3.1.

Table 3.3.1. Species of the Reef Fish FMP grouped by family.

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

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

Protected Species

There are 40 species protected by federal law that may occur in the Gulf. Thirty-nine of these are under the jurisdiction of NMFS, while the West Indian manatee (*Trichechus manatus*) is managed by the U.S. Fish and Wildlife Service. Of the species under NMFS's jurisdiction, 27 are marine mammals that are protected under the Marine Mammal Protection Act (MMPA). The MMPA requires that each commercial fishery be classified by the number of marine mammals they seriously injure or kill. NMFS's List of Fisheries (LOF) classifies U.S. commercial fisheries into three categories based on the number of incidental mortality or serious injury they cause to marine mammals. More information about the LOF and the classification process can be found at: http://www.nmfs.noaa.gov/pr/interactions/lof/. Five of these marine mammal species are also listed as endangered under the Endangered Species Act (ESA) (i.e., sperm, sei, fin, blue, and humpback). In addition to those five marine mammals, five sea turtle species (Kemp's ridley, loggerhead, green, leatherback, and hawksbill), two fish species (Gulf sturgeon and smalltooth sawfish), and five coral species (elkhorn, staghorn, lobed star, mountainous star, and boulder star) are also protected under the ESA. Designated critical habitat for smalltooth sawfish, Gulf sturgeon, and the Northwest Atlantic Ocean distinct population segment of loggerhead sea turtles also occur within nearshore waters of the Gulf, though only loggerhead critical habitat occurs in federal waters.

NMFS has conducted specific analyses ("Section 7 consultations") to evaluate potential effects from the Gulf reef fish fishery on species and critical habitats protected under the ESA. On September 30, 2011, the Protected Resources Division released a biological opinion (Opinion), which concluded that the continued operation of the Gulf reef fish fishery is not likely to jeopardize the continued existence of sea turtles (loggerhead, Kemp's ridley, green, hawksbill, and leatherback) or smalltooth sawfish (NMFS 2011a). The Opinion also concluded that other ESA-listed species are not likely to be adversely affected by the FMP. An incidental take statement was issued specifying the amount and extent of anticipated take, along with reasonable and prudent measures and associated terms and conditions deemed necessary and appropriate to minimize the impact of these takes. The Council addressed further measures to reduce take in the reef fish fishery's longline component in Amendment 31 (GMFMC 2009).

Subsequent to the completion of the biological opinion, NMFS published final rules listing 20 new coral species (September 10, 2014), and designating critical habitat for the Northwest Atlantic Ocean distinct population segment of loggerhead sea turtles (July 10, 2014). NMFS addressed these changes in a series of consultation memoranda. In a consultation memorandum dated October 7, 2014, NMFS assessed the continued operation of the Gulf reef fish fishery's potential impact on the newly-listed coral species occurring in the Gulf (3 species of *Orbicella* and *Mycetophyllia ferox*) and concluded the fishery is not likely to adversely affect any of the protected coral species. Similarly, in a consultation memorandum dated September 16, 2014, NMFS assessed the continued authorization of South Atlantic and Gulf of Mexico fisheries' potential impacts on loggerhead critical habitat and concluded the Gulf reef fish fishery is not likely to adversely affect the newly designated critical habitat.

Marine Mammals
The gear used by the Gulf reef fish fishery is classified in the Marine Mammal Protection Act 2015 proposed List of Fisheries as a Category III fishery (79 FR 14418) and is unchanged from the 2014 list. This classification indicates the annual mortality and serious injury of a marine mammal stock resulting from any fishery is less than or equal to 1% of the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. Dolphins are the only species documented as interacting with these fisheries. Bottlenose dolphins prey upon on the bait, catch, and/or released discards of fish from the reef fish fishery. They are also a common predator around reef fish vessels, feeding on the discards. Marine Mammal Stock Assessment Reports and additional information are available on the NMFS Office of Protected Species website: http://www.nmfs.noaa.gov/pr/sspecies/.

Turtles
Green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles are all highly migratory and travel widely throughout the Gulf. The following sections are a brief overview of the general life history characteristics of the sea turtles found in the Gulf region. Several volumes exist that cover the biology and ecology of these species more thoroughly (i.e., Lutz and Musick (eds.) 1997, Lutz et al. (eds.) 2003).

Green sea turtle hatchlings are thought to occupy pelagic areas of the open ocean and are often associated with *Sargassum* rafts (Carr 1987, Walker 1994). Pelagic stage green sea turtles are thought to be carnivorous. Stomach samples of these animals found ctenophores and pelagic snails (Frick 1976, Hughes 1974). At approximately 20 to 25 cm carapace length, juveniles migrate from pelagic habitats to benthic foraging areas (Bjorndal 1997). As juveniles move into benthic foraging areas a diet shift towards herbivory occurs. They consume primarily seagrasses and algae, but are also know to consume jellyfish, salps, and sponges (Bjorndal 1980, 1997; Paredes 1969; Mortimer 1981, 1982). The diving abilities of all sea turtles species vary by their life stages. The maximum diving range of green sea turtles is estimated at 110 m (360 ft) (Frick 1976), but they are most frequently making dives of less than 20 m (65 ft.) (Walker 1994). The time of these dives also varies by life stage. The maximum dive length is estimated at 66 minutes with most dives lasting from 9 to 23 minutes (Walker 1994).

The **hawksbill's** pelagic stage lasts from the time they leave the nesting beach as hatchlings until they are approximately 22-25 cm in straight carapace length (Meylan 1988, Meylan and Donnelly 1999). The pelagic stage is followed by residency in developmental habitats (foraging areas where juveniles reside and grow) in coastal waters. Little is known about the diet of pelagic stage hawksbills. Adult foraging typically occurs over coral reefs, although other hard-bottom communities and mangrove-fringed areas are occupied occasionally. Hawksbills show fidelity to their foraging areas over several years (van Dam and Diéz 1998). The hawksbill's diet is highly specialized and consists primarily of sponges (Meylan 1988). Gravid females have been noted ingesting coralline substrate (Meylan 1984) and calcareous algae (Anderes Alvarez and Uchida 1994), which are believed to be possible sources of calcium to aid in eggshell production. The maximum diving depths of these animals are not known, but the maximum

length of dives is estimated at 73.5 minutes. More routinely, dives last about 56 minutes (Hughes 1974).

Kemp's ridley hatchlings are also pelagic during the early stages of life and feed in surface waters (Carr 1987, Ogren 1989). Once the juveniles reach approximately 20 cm carapace length they move to relatively shallow (less than 50m) benthic foraging habitat over unconsolidated substrates (Márquez-M. 1994). They have also been observed transiting long distances between foraging habitats (Ogren 1989). Kemp's ridleys feeding in these nearshore areas primarily prey on crabs, though they are also known to ingest mollusks, fish, marine vegetation, and shrimp (Shaver 1991). The fish and shrimp Kemp's ridleys ingest are not thought to be a primary prey item but instead may be scavenged opportunistically from bycatch discards or from discarded bait (Shaver 1991). Given their predilection for shallower water, Kemp's ridleys most routinely make dives of 50 m or less (Soma 1985, Byles 1988). Their maximum diving range is unknown. Depending on the life stage a Kemp's ridleys may be able to stay submerged anywhere from 167 minutes to 300 minutes, though dives of 12.7 minutes to 16.7 minutes are much more common (Soma 1985, Mendonca and Pritchard 1986, Byles 1988). Kemp's ridleys may also spend as much as 96% of their time underwater (Soma 1985, Byles 1988).

Leatherbacks are the most pelagic of all ESA-listed sea turtles and spend most of their time in the open ocean. Although they will enter coastal waters and are seen over the continental shelf on a seasonal basis to feed in areas where jellyfish are concentrated. Leatherbacks feed primarily on cnidarians (medusae, siphonophores) and tunicates. Unlike other sea turtles, leatherbacks' diets do not shift during their life cycles. Because leatherbacks' ability to capture and eat jellyfish is not constrained by size or age, they continue to feed on these species regardless of life stage (Bjorndal 1997). Leatherbacks are the deepest diving of all sea turtles. It is estimated that these species can dive in excess of 1000 m (Eckert et al. 1989) but more frequently dive to depths of 50 m to 84 m (Eckert et al. 1986). Dive times range from a maximum of 37 minutes to more routines dives of 4 to 14.5 minutes (Standora et al. 1984, Eckert et al. 1986, Eckert et al. 1989, Keinath and Musick 1993). Leatherbacks may spend 74% to 91% of their time submerged (Standora et al. 1984).

Loggerhead hatchlings forage in the open ocean and are often associated with *Sargassum* rafts (Hughes 1974, Carr 1987, Walker 1994, Bolten and Balazs 1995). The pelagic stage of these sea turtles are known to eat a wide range of things including salps, jellyfish, amphipods, crabs, syngnathid fish, squid, and pelagic snails (Brongersma 1972). Stranding records indicate that when pelagic immature loggerheads reach 40-60 cm straight-line carapace length they begin to live in coastal inshore and nearshore waters of the continental shelf throughout the U.S. Atlantic (Witzell 2002). Here they forage over hard- and soft-bottom habitats (Carr 1986). Benthic foraging loggerheads eat a variety of invertebrates with crabs and mollusks being an important prey source (Burke et al. 1993). Estimates of the maximum diving depths of loggerheads range from 211 m to 233 m (692-764ft.) (Thayer et al. 1984, Limpus and Nichols 1988). The lengths of loggerhead dives are frequently between 17 and 30 minutes (Thayer et al. 1984, Limpus and Nichols 1988, Limpus and Nichols 1994, Lanyon et al. 1989) and they may spend anywhere from 80 to 94% of their time submerged (Limpus and Nichols 1994, Lanyon et al. 1989).

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

Fish

Historically the **smalltooth sawfish** in the U.S. ranged from New York to the Mexico border. Their current range is poorly understood but believed to have contracted from these historical areas. In the South Atlantic region, they are most commonly found in Florida, primarily off the Florida Keys (Simpfendorfer and Wiley 2004). Only two smalltooth sawfish have been recorded north of Florida since 1963 (the first was captured off North Carolina in 1963 and the other off Georgia in 2002 (National Smalltooth Sawfish Database, Florida Museum of Natural History)). Historical accounts and recent encounter data suggest that immature individuals are most common in shallow coastal waters less than 25 meters (Bigelow and Schroeder 1953, Adams and Wilson 1995), while mature animals occur in waters in excess of 100 meters (Simpfendorfer pers. comm. 2006). Smalltooth sawfish feed primarily on fish. Mullet, jacks, and ladyfish are believed to be their primary food resources (Simpfendorfer 2001). Smalltooth sawfish also prey on crustaceans (mostly shrimp and crabs) by disturbing bottom sediment with their saw (Norman and Fraser 1938, Bigelow and Schroeder 1953).

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

3.4 Description of the Economic Environment

3.4.1 Commercial Sector

Vessel Activity

Tables 3.4.1.1 and 3.4.1.2 contain information on vessel performance for commercial vessels that harvested yellowtail snapper Gulf-wide in 2010-2014 and Tables 3.4.1.3 and 3.4.1.4 provide similar information for just Monroe County, Florida (FL). The tables contain vessel counts from the NMFS Southeast Fisheries Science Center (SEFSC) logbook (logbook) data (vessel count, trips, and landings). Dockside values were generated using landings information from logbook data and price information from the NMFS SEFSC Accumulated Landings System (ALS) data.

The data in Tables 3.4.1.1-4 cover all vessels that harvested yellowtail snapper anywhere in the Gulf, regardless of trip length or species target intent. Information on the co-harvest of other species on trips that harvest yellowtail snapper is provided in Section 2.1.

On average, 132 vessels per year landed yellowtail snapper (Table 3.4.1.1). These vessels, combined, averaged 900 trips per year in the Gulf on which yellowtail snapper was landed and 1,197 other trips (Table 3.4.1.1). The average annual total dockside revenue (2014 dollars) was approximately $1.70 million from yellowtail snapper, approximately $1.60 million from other species co-harvested with yellowtail snapper (on the same trips), and approximately $11.17 million from other trips by these vessels on which no yellowtail snapper were harvested or occurred in the South Atlantic (Table 3.4.1.2). Total average annual revenue from all species harvested by vessels harvesting yellowtail snapper in the Gulf was approximately $14.46 million, or approximately $107,000 per vessel (Table 3.4.1.2).

Table 3.4.1.1. Summary of vessel counts, trips, and logbook landings (pounds gutted weight (lbs gw)) or vessels landing at least one pound of yellowtail snapper, 2010-2014.

Year	Number of Vessels	Number of Gulf Trips that Caught Yellowtail Snapper	Yellowtail Snapper Landings (lbs gw)	"Other Species" Landings Jointly Caught with Yellowtail Snapper (lbs gw)	Number of Other Trips*	Landings on Other Trips (lbs gw)
2010	117	844	413,627	366,434	1,228	2,194,958
2011	133	914	466,022	454,258	1,660	3,298,577
2012	115	968	564,719	560,772	1,135	2,744,375
2013	130	892	563,798	461,778	1,597	3,199,916
2014	163	880	666,492	687,809	2,393	5,343,682
Average	132	900	534,932	506,210	1,197	3,356,302

Source: NMFS SEFSC Logbook data.
*Includes Gulf trips on which yellowtail snapper were not harvested as well as trips in the South Atlantic regardless of what species were harvested, including yellowtail snapper.

Table 3.4.1.2. Summary of vessel counts and revenue (2014 dollars) for vessels landing at least one pound of yellowtail snapper, 2010-2014.

Year	Number of Vessels	Dockside Revenue from Gulf Yellowtail Snapper	Dockside Revenue from "Other Species" Jointly Caught with Yellowtail Snapper	Dockside Revenue on Other Trips*	Total Dockside Revenue	Average Total Dockside Revenue per Vessel
2010	117	$1,265,373	$988,392	$6,171,348	$8,425,113	$72,010
2011	133	$1,495,674	$1,342,811	$9,878,082	$12,716,567	$95,613
2012	115	$1,800,243	$1,678,888	$8,932,188	$12,411,319	$107,925
2013	130	$1,730,665	$1,513,448	$11,486,485	$14,730,599	$113,312
2014	163	$2,196,717	$2,464,941	$19,365,265	$24,026,923	$147,404
Average	132	$1,697,734	$1,597,696	$11,166,673	$14,462,104	$107,253

Source: NMFS SEFSC Logbook and ALS data.

Table 3.4.1.3. Summary of vessel counts, trips, and logbook landings (pounds gutted weight (lbs gw)) or vessels landing at least one pound of yellowtail snapper, Monroe County, FL, 2010-2014.

Year	Number of Vessels	Number of Gulf Trips that Caught Yellowtail Snapper	Yellowtail Snapper Landings (lbs gw)	"Other Species" Landings Jointly Caught with Yellowtail Snapper (lbs gw)	Number of Other Trips*	Landings on Other Trips (lbs gw)
2010	74	765	400,187	103,190	260	189,198
2011	66	781	441,664	99,650	237	127,502
2012	67	837	542,165	141,299	228	131,424
2013	71	765	523,545	99,845	189	97,873
2014	73	685	635,487	100,815	412	285,600
Average	70	767	508,610	108,960	265	166,319

Source: NMFS SEFSC Logbook data.
*Includes Gulf trips on which yellowtail snapper were not harvested as well as trips in the South Atlantic regardless of what species were harvested, including yellowtail snapper.

Table 3.4.1.4. Summary of vessel counts and revenue* (2014 dollars) for vessels landing at least one pound of yellowtail snapper, Monroe County, FL 2010-2014.

Year	Number of Vessels	Dockside Revenue from Gulf Yellowtail Snapper	Dockside Revenue from "Other Species" Jointly Caught with Yellowtail Snapper	Dockside Revenue on Other Trips*	Total Dockside Revenue	Average Total Dockside Revenue per Vessel
2010	74					
2011	66					
2012	67					
2013	71					
2014	73					
Average	70					

*revenue information is not available at this time, but is expected to be available prior to final action on this amendment.
Source: NMFS SEFSC Logbook and ALS data.

Share, Allocation, and Ex-vessel Prices

The dockside or ex-vessel price is the price the vessel receives at the first sale of harvest. Over the period 2010-2014, the average annual ex-vessel price per lb for yellowtail snapper harvested in the Gulf was $3.17 (2014 dollars), and ranged from $3.06 in 2010 to $3.30 in 2014.

Commercial Sector Business Activity

Estimates of the business activity (economic impacts) in the U.S. associated with the Gulf yellowtail commercial harvests were derived using the model developed for and applied in NMFS (2015) and are provided in Table 3.4.1.5. Business activity for the commercial sector is characterized in the form of full-time equivalent (FTE) jobs, output (sales) impacts (gross business sales), income impacts (wages, salaries, and self-employed income), and value added impacts (difference between the sales price of a good and the cost of the goods and services needed to produce it). Income impacts should not be added to output (sales) impacts because this would result in double counting. The estimates of economic activity include the direct effects (effects in the sector where an expenditure is actually made), indirect effects (effects in sectors providing goods and services to directly affected sectors), and induced effects (effects induced by the personal consumption expenditures of employees in the direct and indirectly affected sectors).

Table 3.4.1.5. Average annual business activity (thousand 2014 dollars) associated with the harvests of vessels that harvested yellowtail snapper, 2010-2014.

Species	Average Annual Dockside Revenue	Jobs	Output (Sales) Impacts	Income Impacts	Value Added Impacts
Yellowtail Snapper	$1,698	232	$16,839	$6,184	$8,737
All species*	$14,462	1,980	$143,417	$52,668	$74,413

*Includes dockside revenues and economic activity associated with the average annual harvest of all species, including yellowtail snapper, harvested by vessels that harvested yellowtail snapper in the Gulf.
Source: revenue data from NMFS SEFSC Logbook and ALS data, economic impact results calculated by NMFS SERO using the model developed for NMFS (2015).

As discussed above, vessels that harvested yellowtail snapper also harvested other species on trips where yellowtail snapper were harvested, and some took other trips in the Gulf on which no yellowtail snapper were harvested, as well as trips in the South Atlantic. All revenues from all species harvested on all of these trips contributed towards making these vessels economically viable and contribute to the economic activity associated with these vessels. The average annual total ex-vessel revenues from all species harvested during this period (2010-2014) by vessels that harvested yellowtail snapper in the Gulf was approximately $14.46 million (2014 dollars). The business activity associated with this revenue is estimated to support 1,980 FTE jobs and is associated with approximately $143.42 million in output (sales) impacts, approximately $52.67 million in income impacts, and approximately $74.41 million in value added impacts.

Dealers

Commercial vessels landing yellowtail snapper can only sell their catch to federally permitted seafood dealers. On February 9, 2016, 411 dealers possessed the necessary federal dealer permit to receive yellowtail snapper harvested in the Gulf. However, in 2013 (the most recent year for which dealer location data is available), only 81 dealers in the Gulf received yellowtail snapper. There are no income or sales requirements to acquire a federal dealer permit. As a result, the total number of dealers can vary over the course of the year and from year to year.

Imports

Information on the imports of all snapper and grouper species, either fresh or frozen, are available at: http://www.st.nmfs.noaa.gov/st1/trade/cumulative_data/TradeDataProduct.html. Information on the imports of individual snapper or grouper species is not available. In 2012, imports of all snapper and grouper species (fresh and frozen) were approximately 44.51 million

pounds valued at approximately $128.20 million (2012 dollars). More recent data are not currently available. These amounts are contrasted with the domestic harvest of all snapper and grouper in the U.S. in 2012 of approximately 19.60 mp valued at approximately $60.53 million (2012 dollars; data available at: http://www.st.nmfs.noaa.gov/commercial-fisheries/publications/index). Although the levels of domestic production and imports are not totally comparable for several reasons, including considerations of different product form such as fresh versus frozen, and possible product mislabeling, the difference in the magnitude of imports relative to the amount of domestic harvest is indicative of the dominance of imports in the domestic market. Final comparable data for more recent years are not currently available.

3.4.2 Recreational Sector

Angler Effort

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

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

Other measures of effort are possible, such as directed trips (the number of individual angler trips that either targeted or caught a particular species). Estimates of the number of yellowtail snapper target trips and catch trips for the shore, charter, and private/rental boat modes in the Gulf for 2010-2014 are provided in Table 3.4.2.1 and Table 3.4.2.2. Over the period examined, yellowtail snapper were most commonly targeted by private/rental anglers and yellowtail snapper target effort averaged approximately 84,000 trips per year across all modes (Table 3.4.2.1). As shown in Table 3.4.2.2, considerably more trips caught yellowtail snapper, approximately 238,000 trips, than targeted yellowtail snapper, but the private/rental mode remains the dominant mode.

Table 3.4.2.1. Number of yellowtail snapper recreational target trips, by mode, Florida, 2010-2014*.

	Shore Mode	Charter Mode	Private/Rental Mode	All Modes
2010	nr	7,996	34,815	42,811
2011	nr	7,230	31,938	39,167

2012	6,550	22,291	18,781	47,622
2013	nr	17,447	92,355	109,802
2014	25,658	19,332	85,902	130,892
Average	16,104	14,859	52,758	83,721

*Florida was the only Gulf state with recorded target effort for yellowtail snapper. "nr" = none recorded. Averages based on positive entries; "nr" entries are not assumed equivalent to "0" trips. Source: MRIP database, NMFS, SERO.

Table 3.4.2.2. Number of yellowtail snapper recreational catch trips, by mode, Florida, 2010-2014*.

	Shore Mode	Charter Mode	Private/Rental Mode	All Modes
2010	1,001	39,745	105,418	146,165
2011	44,324	38,682	56,222	139,228
2012	20,776	59,288	106,110	186,174
2013	63,393	55,665	269,873	388,931
2014	55,886	68,835	206,026	330,747
Average	37,076	52,443	148,730	238,249

*Florida was the only Gulf state with recorded catch for yellowtail snapper.
Source: MRIP database, NMFS, SERO.

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 number of standardized 12-hour fishing days that account for the different half-, three-quarter-, and full-day fishing trips by headboats. The stationary "fishing for demersal (bottom-dwelling) species" nature of headboat fishing, as opposed to trolling, suggests that most, if not all, headboat trips and, hence, angler days, are demersal or reef fish trips by intent.

Estimates of headboat effort (angler days) are provided in Table 3.4.2.3. Headboat data is collected by the NMFS Southeast Region Headboat Survey (SRHS). Because yellowtail snapper target and catch effort for shore, private/rental, and charter anglers were only recorded in Florida, only estimates for headboat angler days from Florida are relevant to the analysis. Although Florida headboat data are partitioned, with north Florida headboat data combined with Alabama data for confidentiality purposes, yellowtail snapper is a south Florida species. As a result, the estimates of the headboat angler days in Florida provided in Table 3.4.2.3 exclude data from north Florida/Alabama.

Table 3.4.2.3. Headboat angler days, Florida 2010-2014*.

	Florida
2010	69,113

2011	78,317
2012	83,365
2013	94,752
2014	102,841
Average	85,678

*Southwest Florida through the Florida Middle Grounds.
Source: NMFS Southeast Region Headboat Survey (SRHS).

Permits

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

A federal charter/headboat (for-hire) vessel permit is required for fishing in federal waters for Gulf reef fish (RF). On February 17, 2016, there were 1,312 vessels with a valid (non-expired) or renewable Gulf for-hire RF permit (including historical captain permits). A renewable permit is an expired limited access permit that may not be actively fished, but is renewable for up to one year after expiration. The Gulf RF for-hire permits are limited access permits. Most for-hire vessels possess more than one for-hire permit.

Although the for-hire permit application collects information on the primary method of operation, the permit itself does not identify the permitted vessel as either a headboat or a charter vessel and vessels may operate in both capacities. However, if a vessel meets the selection criteria (see Section 1.2) used by the SRHS and is selected to report by the Science Research Director of the Southeast Fisheries Science Center, it is determined to operate primarily as a headboat and is required to submit harvest and effort information to the SRHS. As of February 2016, 69 Gulf headboats were registered in the SRHS (K. Fitzpatrick, NMFS SEFSC, pers. comm.).

Information on Gulf charter vessel and headboat operating characteristics is included in Savolainen et al. (2012) and is incorporated herein by reference. The average charter vessel operation took 46 full-day (9 hours) and 55 half-day (5 hours) trips per year, carried 4.8 and 4.6 passengers per trip type, respectively, targeted reef fish and pelagic species on 64% and 19% of all trips, respectively, and took 68% of all trips in the EEZ. The average headboat operation took 83 full-day (10 hours) and 37 half-day (6 hours) trips per year, carried 13.1 and 14.6 passengers per trip type, respectively, targeted reef fish and pelagic species on 84% and 6% of all trips, respectively, and took 81% of all trips in the EEZ.

There are no specific federal permitting requirements for recreational anglers to fish for or harvest reef fish. Instead, anglers are required to possess either a state recreational fishing permit

that authorizes saltwater fishing in general, or be registered in the federal National Saltwater Angler Registry system, subject to appropriate exemptions. For the for-hire sector, customers are authorized to fish under the charter or headboat vessel license and are not required to hold their own fishing licenses. As a result, it is not possible to identify with available data how many individual anglers would be expected to be affected by this proposed action.

Economic Value

Economic value for for-hire vessels can be measured by producer surplus (PS) per passenger trip (the amount of money that a vessel owner earns in excess of the cost of providing the trip). Estimates of the PS per for-hire passenger trip are not available. Instead, net operating revenue (NOR), which is the return used to pay all labor wages, returns to capital, and owner profits, is used as a proxy for PS. For vessels in the Gulf, the estimated NOR value is $153 (2014 dollars) per charter angler trip (Liese and Carter 2011). The estimated NOR value per headboat angler trip is $53 (2014 dollars) (C. Liese, NMFS SEFSC, pers. comm.).

Business Activity

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 yellowtail snapper were derived using average impact coefficients for recreational angling for all species, as derived from an add-on survey to the Marine Recreational Fisheries Statistics Survey (MRFSS) to collect economic expenditure information, as described and utilized in NMFS (2015). Estimates of the average expenditures by recreational anglers are also provided in NMFS (2015) and are incorporated herein by reference.

Recreational fishing generates business activity (economic impacts). Business activity for the recreational sector is characterized in the form of full-time equivalent jobs, output (sales) impacts (gross business sales), income impacts, and value-added impacts (difference between the value of goods and the cost of materials or supplies). Estimates of the average yellowtail snapper target effort (2010-2014) and associated business activity (2014 dollars) are provided in Table 3.4.2.4. Because yellowtail snapper directed effort during this time period was only recorded in Florida (see Table 3.4.2.1), estimates of business activity for the other Gulf States are not provided.

Estimates of the business activity in the U.S. associated with the recreational targeting of yellowtail snapper are provided in Table 3.4.2.4. The average annual target effort for yellowtail snapper over the period 2010-2014 supported an estimated 149 jobs, and generated

approximately $20.09 million in output (sales) impacts, $11.50 million in value added impacts, and $7.42 million in income impacts.

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

Permits

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

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Table 3.4.2.4. Summary of yellowtail snapper target trips (2010-2014 average) and associated business activity (thousand 2014 dollars). Output, value added, and income impacts are not additive.

	Impacts
	Shore Mode
Target Trips	16,104
Output Impact	$1,641
Value Added Impact	$913
Income Impact	$540
Jobs	12
	Private/Rental Mode
Target Trips	52,758
Output Impact	$5,219
Value Added Impact	$2,896
Income Impact	$1,676
Jobs	35
	Charter Mode
Target Trips	14,859
Output Impact	$13,229
Value Added Impact	$7,687
Income Impact	$5,199
Jobs	102
	All Modes
Target Trips	83,721
Output Impact	$20,089
Value Added Impact	$11,496
Income Impact	$7,415
Jobs	149

Source: Effort data from the MRIP, economic impact results calculated by NMFS SERO using the model developed for NMFS (2015).

3.5 Description of the Social Environment

This framework action affects commercial and recreational management of yellowtail snapper. This section provides the background for the proposed actions which will be evaluated in Chapter 4. Nearly all commercial and recreational yellowtail snapper landings occur in southern Florida (Figure 1.2.2.1-1.2.2.2). Descriptions of fishing communities, including the top communities involved in yellowtail snapper commercial fishing in the Gulf, are included. Top Florida recreational fishing communities based on recreational engagement and a location in

counties with recreational landings of yellowtail snapper are included. Community level data are presented to address the requirements of National Standard 8 of the Magnuson-Stevens Act. National Standard 8 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.

Landings by State

As described in Section 1.2, nearly all commercial and recreational yellowtail snapper landings come from waters adjacent to Florida and the majority of Gulf yellowtail snapper is landed by the commercial sector (over 97% on average). A small amount of commercial yellowtail snapper is landed in other Gulf States (Texas, Louisiana, and Alabama) and in other South Atlantic States (South Carolina and North Carolina).

A small proportion of Gulf yellowtail snapper is landed by the recreational sector. From 2005 to 2015, recreational landings have ranged from less than 1% to about 6% of total Gulf yellowtail snapper landings (Table 1.2.2.1). As described in Section 1.2, Gulf recreational fishermen harvest yellowtail snapper almost exclusively off the southwestern coast of Florida and in the Florida Keys. A very small amount of recreational yellowtail snapper is also landed in other Gulf States; in 2015, this totaled 46 lbs total for Texas, Louisiana, and Alabama (SEFSC Recreational ACL MRFSS based database, January 2016).

Fishing Communities

A description of the social environment, including analysis of communities engaged in yellowtail snapper fishing, was provided in a framework action for vermilion and yellowtail snapper (GMFMC 2013) and is incorporated herein by reference. The referenced description focuses on available geographic and demographic data to identify top commercial yellowtail snapper communities using 2011 ALS data. This section has been updated using 2014ALS data, the most recent year available. The referenced description also includes top Florida Keys communities by recreational fishing engagement, using a factor analysis based on charter permits, charter vessels, and recreational fishing infrastructure. This section has been updated to include a description of top Florida recreational communities based on indicators of recreational fishing engagement and reliance and compared to county level landings of recreational yellowtail snapper. These indicators are a more complex metric of recreational fishing, allowing for comparison among communities.

The descriptions of Gulf communities include information about the top communities based on a "regional quotient" (RQ) of commercial landings and value for yellowtail snapper. The 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 that could change the yellowtail snapper fishery and impact participants, associated businesses, and communities within the region. If a community is identified as a yellowtail snapper community based on the RQ, this does not necessarily mean that the community would experience significant impacts due to changes in the yellowtail

snapper fishery if a different species or number of species were also important to the local community and economy. Additional detailed information about communities with the highest RQs can be found for Gulf communities on the Southeast Regional Office's Community Snapshots website at http://sero.nmfs.noaa.gov/sustainable_fisheries/social/community_snapshot/.

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

Using a principal component and single solution factor analysis, each community receives a factor score for each index to compare to other communities. Factor scores of both engagement and reliance were plotted for the communities with the highest RQs. Two thresholds of one and one-half standard deviation above the mean are plotted to help determine a threshold for significance. The factor scores are standardized; therefore, a score above a value of 1 is also above one standard deviation. A score above one-half standard deviation is considered engaged or reliant with anything above one standard deviation to be very engaged or reliant.

The reliance index uses factor scores that are normalized. The factor score is similar to a z-score in that the mean is always zero, positive scores are above the mean, and negative scores are below the mean. Comparisons between scores are relative; however, like a z-score, the factor score puts the community on a point in the distribution. Objectively, that community will have a score related to the percent of communities with similar attributes. For example, a score of 2.0 means the community is two standard deviations above the mean and is among the 2.27% most vulnerable places in the study (normal distribution curve). Reliance score comparisons between communities are relative; however, if the community scores greater than two standard deviations above the mean, this indicates that the community is dependent on fishing. Examining the component variables on the reliance index and how they are weighted by factor score provides a measurement of commercial reliance. The reliance index provides a way to gauge change over time in these communities and also provides a comparison of one community with another.

Landings for the recreational sector are not available by species at the community level; therefore, it is not possible with available information to identify communities as dependent on recreational fishing for yellowtail snapper. However, Figure 1.2.2.1 shows the mean recreational landings by county for yellowtail snapper in Florida. 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. Florida communities including Gulf and Florida Keys communities were included in the analysis because the majority of recreational yellowtail snapper fishing occurs off the southwestern coast of Florida and in the Florida Keys. Communities were analyzed in ranked order by recreational fishing engagement. The top 20 recreational communities were compared to counties with recreational landings of yellowtail snapper in Figure 1.2.2.1. Top communities located in counties with recreational landings of yellowtail snapper are presented.

Commercial Fishing Communities

The majority of yellowtail snapper is landed in Florida in communities located in or around the Florida Keys and southwestern Florida. The following description includes a community-level analysis which contains commercial landings made by Gulf communities including the Florida Keys (Figure 3.5.1). These landings are included because most yellowtail snapper landings occur in the Florida Keys, which are located on the jurisdictional boundary between the Gulf and South Atlantic Councils. As explained in the Generic ACL/AM Amendment (GMFMC 2011), it is plausible that fishermen in the Florida Keys could fish both state and federal waters in one day, possibly on both coasts; however, only one "area fished" location is documented in logbooks. Gulf and South Atlantic yellowtail snapper landings for Florida Keys communities are included in this analysis in order to address this possibility. In addition, these communities include some of the most likely communities to be impacted by the actions proposed by this framework, as the actions propose to create consistent regulations between the two jurisdictional areas; however only positive effects are expected from the proposed actions.

All of the top yellowtail snapper communities are located in Florida (Figure 3.5.1). Eight of the top 10 communities are located in the Florida Keys and make up approximately 99% of landings in 2014. The top two communities alone (Key West and Marathon) make up approximately 88% of landings. In addition, two other communities along the southwestern coast of Florida are included.

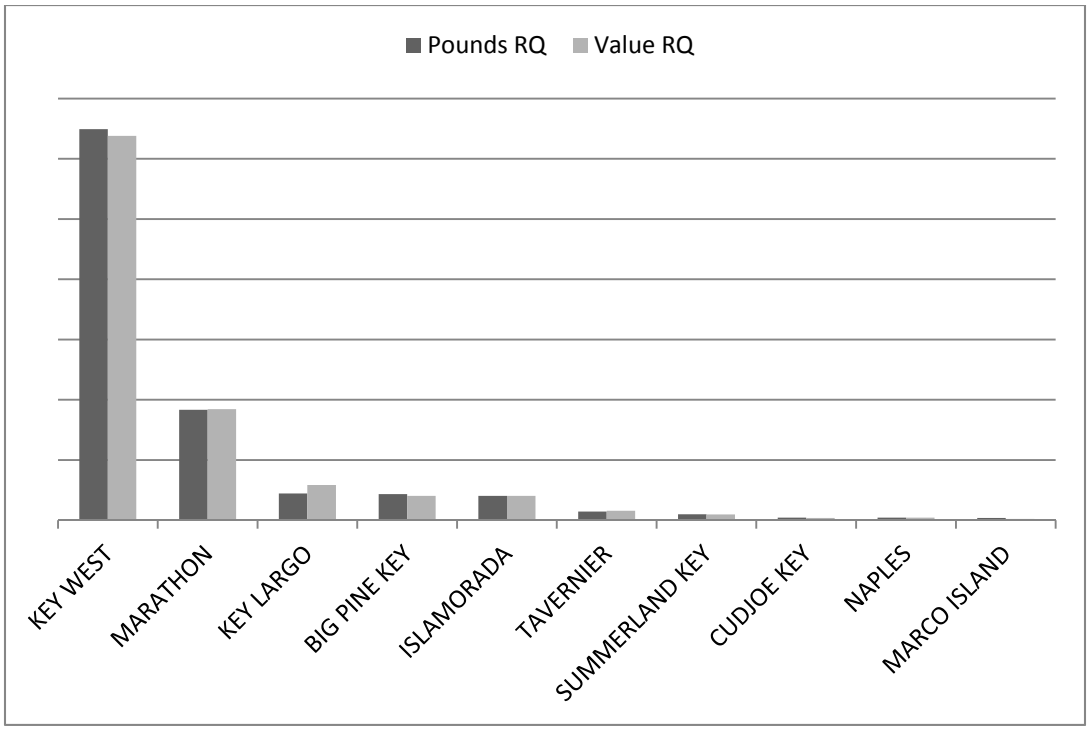

Figure 3.5.1. Top 10 Gulf communities ranked by pounds and value regional quotient (RQ) of yellowtail snapper. The actual RQ values (y-axis) are omitted from the figure to maintain confidentiality.
Source: SERO, Community ALS 2014.

The details of how these indices are generated are explained at the beginning of the Fishing Communities section. The primary communities that demonstrate high levels of commercial engagement and reliance include Key West, Marathon, Key Largo, Big Pine Key, Islamorada, and Naples, Florida (Figure 3.5.2). Communities with substantial commercial engagement and reliance include Tavernier and Cudjoe Key, Florida.

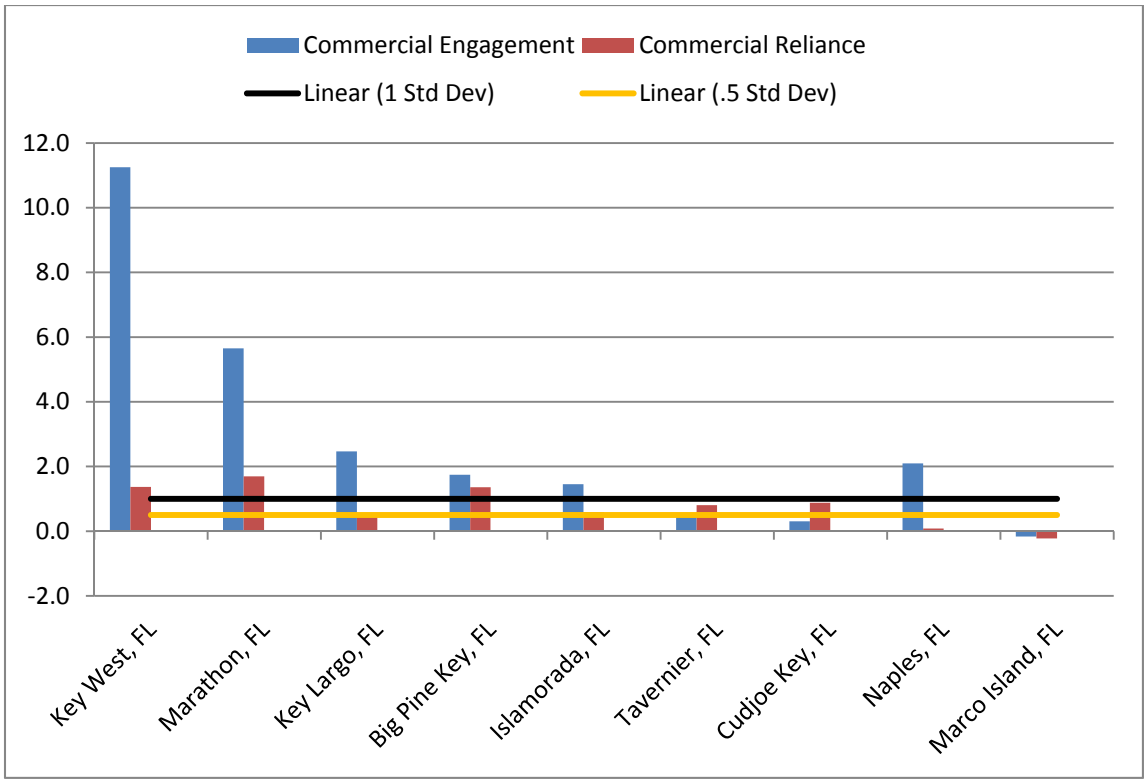

Figure 3.5.2. Top 10 Gulf yellowtail snapper communities' commercial engagement and reliance.

Recreational Fishing Communities

Figure 3.5.3 identifies the Florida communities that are the most engaged and reliant on recreational fishing and are located in counties with recreational landings of yellowtail snapper. 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 13 included communities demonstrate high levels of recreational engagement. Five communities (Key West, Marathon, Islamorada, Fort Myers Beach, and Big Pine Key) demonstrate high levels of recreational reliance.

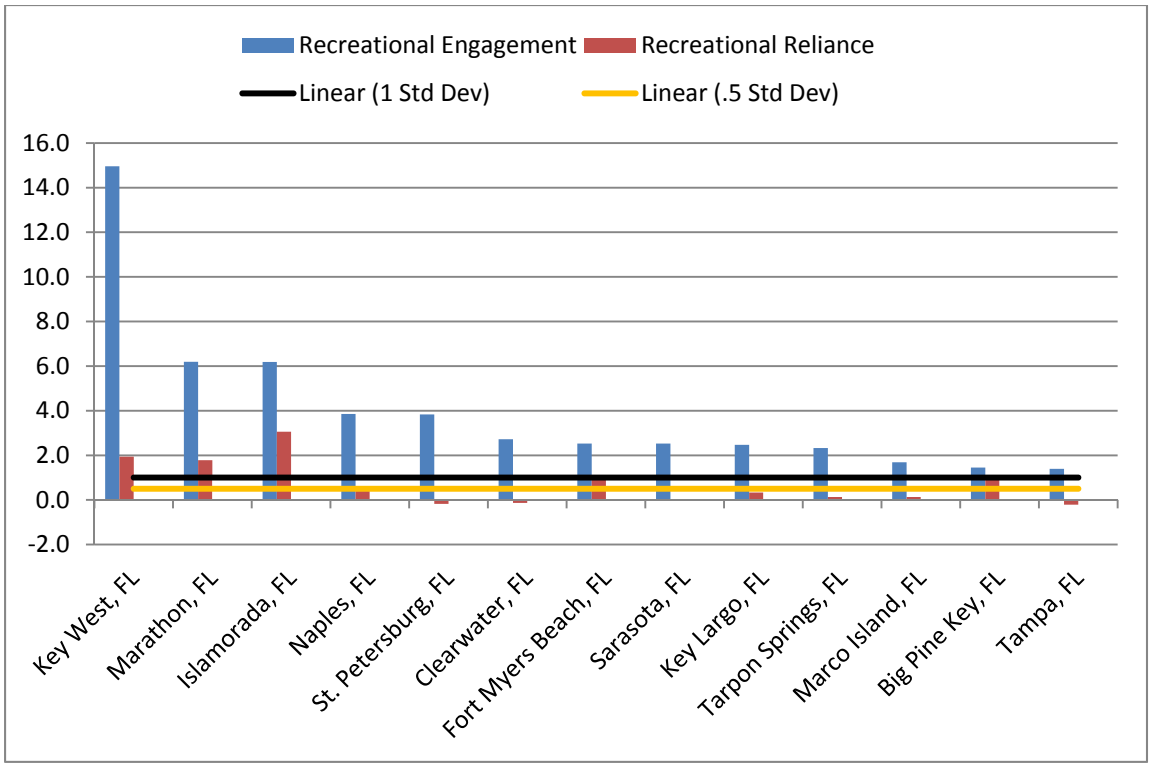

Figure 3.5.3. Recreational fishing communities' engagement and reliance.
Source: SERO, Social indicators database (2012).

Environmental Justice Considerations

Executive Order 12898 requires federal agencies conduct their programs, policies, and activities in a manner to ensure individuals or populations are not excluded from participation in, or denied benefits of, or subject to discrimination because of their race, color, or national origin. In addition, and specifically with respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. The main focus of Executive Order 12898 is to consider "the disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories…" This executive order is generally referred to as environmental justice (EJ).

The proposed actions could be expected to affect commercial and recreational fishermen and associated industries in communities primarily in the Florida Keys and southwestern Florida. However, any effects from the proposed actions are expected to be minimal and positive. Information on the race and income status for groups at different participation levels (individual fishermen, for-hire vessel owners, crew, employees of associated support industries, etc.) is not available. Although information is available concerning communities' overall status with regard

to minorities and poverty (e.g. census data), such information is not specific to fishermen and those involved in the industries and activities, themselves.

To help assess whether any environmental justice concerns may be present in Gulf coastal communities, a suite of indices were 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 are all signs of populations experiencing vulnerabilities. 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 3.5.4 provide the social vulnerability of the top commercial and recreational communities. No communities exceed the threshold of one standard deviation above the mean for any of the indices. One community exceeds the threshold of one half standard deviation above the mean for three of the indices (Tampa, Florida) and would be the community most likely to exhibit vulnerabilities to social or economic disruption due to regulatory change.

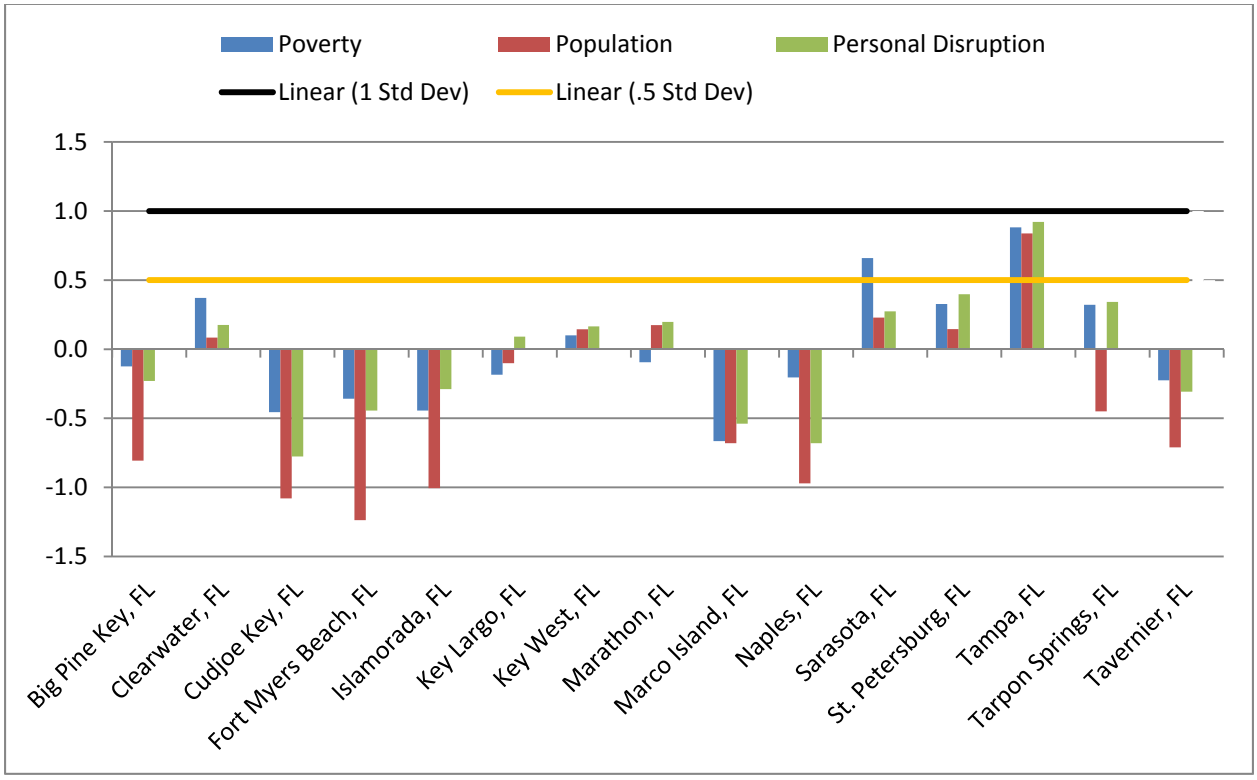

Figure 3.5.4. Social vulnerability indices for top commercial and recreational fishing communities.
Source: SERO, Social indicators database (2012).

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, no data are available on the race or income status for those involved in the local fishing industry (employment), or for their dependence on yellowtail snapper specifically (participation). There are no known claims for customary usage of yellowtail snapper by any Gulf of Mexico population including tribes or indigenous groups. Regarding subsistence, there is a possibility that subsistence consumption of yellowtail snapper occurs because some fishing for yellowtail snapper occurs on the shore (16.9% of recreational catch trips in 2014, Table 3.4.2.2). Subsistence includes fisheries that are not commercial and are not primarily recreational, but are intended for consumption by the fishermen, their families, and community (Berkes 1988); however in the Gulf, information about subsistence fishing is primarily available through recreational data. It cannot be assumed, however, that all recreational fishermen conduct yellowtail snapper fishing for subsistence purposes. In addition, there are no expected negative effects to subsistence fishers from either proposed action. 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 Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 *et seq.*), originally enacted in 1976 as the Fishery Conservation and Management Act. The Magnuson-Stevens Act claims sovereign rights and exclusive fishery management authority over most fishery resources within federal waters (the exclusive economic zone, or EEZ), an area extending 200 nautical miles from the seaward boundary of each of the coastal states, and authority over U.S. anadromous species and continental shelf resources that occur beyond federal waters.

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

The Gulf Council is responsible for fishery resources in federal waters of the Gulf of Mexico. These waters extend to 200 nautical miles offshore from the seaward boundaries of the Gulf states of Alabama, Florida, Louisiana, Mississippi, and Texas, as those boundaries have been defined by law, including the Congressional Omnibus Appropriations Bill signed into law on December 18, 2015, which will remain in place for one year unless Congress takes additional action. The length of the Gulf coastline is approximately 1,631 miles. Florida has the longest

coastline of 770 miles along its Gulf coast, followed by Louisiana (397 miles), Texas (361 miles), Alabama (53 miles), and Mississippi (44 miles).

The Gulf Council consists of 17 voting members: 11 public members appointed by the Secretary; one each from the fishery agencies of Texas, Louisiana, Mississippi, Alabama, and Florida; and one from NMFS. The public is also involved in the fishery management process through participation on advisory panels and through Council meetings that, with few exceptions for discussing personnel matters, national security, or litigation briefings, are open to the public. The regulatory process is also in accordance with the Administrative Procedures Act, in the form of "notice and comment" rulemaking, which provides extensive opportunity for public scrutiny and comment, and requires consideration of and response to those comments.

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

3.6.2 State Fishery Management

The purpose of state representation at the Council level is to ensure state participation in federal fishery management decision-making and to promote the development of compatible regulations in state and federal waters. The state governments of Texas, Louisiana, Mississippi, Alabama, and Florida have the authority to manage their respective state fisheries. Each of the five Gulf States exercises legislative and regulatory authority over their respective state's natural resources through discrete administrative units. Although each agency is the primary administrative body with respect to the State's natural resources, all States cooperate with numerous State and federal regulatory agencies when managing marine resources. A more detailed description of each State's primary regulatory agency for marine resources is provided in Amendment 22 to the Reef Fish FMP (GMFMC 2004b).

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

4.1 Action 1 – Changes to Hook Requirements for Commercially Harvested Yellowtail Snapper in the Gulf of Mexico

Alternative 1: No action – Do not change the current hook requirements for commercially harvested yellowtail snapper in the Gulf of Mexico. Circle hooks will continue to be required when fishing with natural bait for yellowtail snapper in the exclusive economic zone of the Gulf of Mexico.

Alternative 2: Remove the requirement to use circle hooks when commercial fishing with natural bait for yellowtail snapper throughout the exclusive economic zone of the Gulf of Mexico.

Alternative 3: Remove the requirement to use circle hooks when commercial fishing with natural bait for yellowtail snapper south of 28° 00' north latitude in the exclusive economic zone of the Gulf of Mexico (Clearwater Beach).

Alternative 4: Remove the requirement to use circle hooks when commercial fishing with natural bait for yellowtail snapper south of 25° 23' north latitude on the west coast of Monroe County, Florida ("Shark Point") south to the Gulf Council jurisdictional boundary.

Alternative 5: Remove the requirement to use circle hooks when commercial fishing with natural bait for yellowtail snapper south of 25° 09' north latitude on the west coast of Monroe County, Florida (Cape Sable) south to the Gulf Council jurisdictional boundary.

4.1.1 Direct and Indirect Effects on the Physical Environment

Direct and indirect effects on the physical environment when fishing for reef fish have been discussed in detail in Amendment 27 to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico (FMP) (GMFMC 2007b). This information is incorporated here by reference.

Commercial and recreational fishermen in the Gulf of Mexico (Gulf) harvest yellowtail snapper exclusively off the southwestern coast of Florida and west and northwest of the Florida Keys. The most common commercial fishing practice is hook-and-line fishing behind the vessel, using a chum slick (a large amount of natural chum drifting away from the stern of the fishing vessel). The chum slick draws the fish to the surface, where they feed directly behind the stern of the fishing vessel. Typically, vertical line gear has the potential to snag and entangle bottom structures. Each individual gear has a very small footprint, and thus only a small potential for impact, but the cumulative impact of the commercial and recreational fishing sector results in a

large amount of gear being placed in the water, increasing the potential for impact. The line and weights used by this gear type also can cause abrasions (Barnette 2001). However, the fishing practices specific to yellowtail snapper target the fish at or near the surface, reducing the interaction of the vertical line gear with the substrate.

Additionally, vertical line vessels often anchor when fishing, adding to the potential damage of the bottom at fishing locations. Bottom longlines have the potential to break or move hard structures on the sea floor, including rocks, corals, sponges, other invertebrates, and algae, when the line sweeps the bottom (Barnette 2001). If vertical and longline gear are not removed, long-term indirect effects to habitat may occur if the line becomes overgrown with algae or marine life becomes entangled (Hamilton 2000; Barnette 2001).

The effects on the physical environment for circle hooks versus J-hooks were analyzed in detail in Amendment 27 to the FMP (GMFMC 2007b). While the analysis concluded that non-stainless steel circle hooks would have less negative impacts on the physical environment, it focused mainly on examples of hooking reef fish near the substrate and did not consider the different fishing practice specific to yellowtail snapper.

Alternative 1 (No Action) would have no change in effects on the physical environment. While the direct effects on the physical environment should be geographically limited to the relatively small area in south Florida targeting yellowtail snapper, **Alternatives 2-5** consider allowing the use of J-hooks for the harvest of yellowtail snapper in various areas of the Gulf. Allowing fishermen to use J-hooks to harvest yellowtail snapper throughout a larger spatial area could cause negative effects on the physical environment if those fishermen attempt to fish on reef substrate. **Alternative 2** would allow the use of J-hooks throughout the entire Gulf exclusive economic zone (EEZ), and would potentially have the greatest impact on the physical environment, followed by **Alternative 3**. **Alternatives 4** and **5** would likely have similar effects, as the difference in area specified in the alternatives is minimal, thereby restricting the use of J-hooks to the primary area in which yellowtail snapper are landed in the Gulf. Under any of these alternatives, the effect on the physical environment from vessels anchoring is likely to remain similar to status quo unless fishing effort increases. Any effects on the physical environment would be further constrained by the limited area used for the harvest of yellowtail snapper which is heavily concentrated around the Dry Tortugas.

This action is not expected to change the manner in which the yellowtail snapper component of the commercial reef fish fishery is conducted, except to allow J-hooks in a limited area while targeting yellowtail snapper. Thus, this action is not likely to increase the overall effects to the physical environment. For the same reasons discussed above, this action, considered in the context of the fishery as a whole, would not be expected to have an adverse impact on essential fish habitat (EFH).

4.1.2 Direct and Indirect Effects on the Biological and Ecological Environments

For some reef fish species, circle hooks reduce hooking mortality rates more than J- hooks. Hooking depth, anatomical hooking location, amount of bleeding, and ease of hook removal

have been identified as major contributors to mortality, and are thought to be reduced when using circle hooks. This reduction in release mortality associated with circle hooks results primarily from the tendency of circle hooks to hook fish in the jaw after the fish consumes the natural bait and turns to swim away. Concurrently, ease of hook removal is a major contributor to release survival (Cooke and Suski 2004).

Commercial harvest of Gulf yellowtail snapper occurs almost exclusively off the southwestern coast of Florida and west and northwest of the Florida Keys (Figure 3.1.2.2). Hook-and-line fishing behind the commercial vessel is common, using a chum slick to attract the fish to the surface. Yellowtail snapper then feed close to the stern of the commercial vessel, while fishermen use small hooks with natural bait and "cane poles" (rods with ~15' of monofilament fishing line tied to the tip) or spinning reels to catch the fish. Landed yellowtail snapper are then quickly dehooked on a special rig and drop into the hold. The operation is similar in the South Atlantic, where circle hooks are not required to land reef fish when using natural bait south of 28° 00' north latitude. Fishermen can proactively prevent other fish species from taking a bait at the surface, largely due to the close proximity of the fisherman to the bait, which facilitates a direct view of feeding activity. Further, anecdotal information suggests that since the fish are feeding at the surface and cannot take any line after being hooked, the probability of a fish being hooked anywhere besides the mouth is minimal.

Alternative 1 would not change the current hook requirements for commercially harvested yellowtail snapper in the Gulf. Circle hooks would continue to be required when fishing with natural bait for yellowtail snapper in the Gulf EEZ. No studies examining the direct effect of hook type on post-release mortality of yellowtail snapper are currently known, and as such, it is difficult to postulate the effect of different hook types on this species. Some reef fish in the Gulf have demonstrated decreased discard mortality rates as a result of the use of circle hooks (red snapper: SEDAR 31 2013; red grouper: SEDAR 42 2015), while others have not (gag and greater amberjack: SEDAR 33 2014). Regardless, the use of circle hooks has not been shown to detrimentally affect discard mortality rates of reef fish in the Gulf (one exception to this is Burns and Froeschke [2012] with respect to red snapper; however, this research was not accepted for use in the most recent red snapper benchmark stock assessment [SEDAR 31 2013] due to errors in experimental design). **Alternative 1** would not result in any change to current fishing practices in the Gulf, and would therefore not result in any changes in the direct or indirect effects to the biological or ecological environments.

Other species in the directed reef fish fishery include red snapper, gray snapper, vermilion snapper, hogfish, gag, red grouper, black grouper, gray triggerfish, and greater amberjack. Some of these species inhabit similar habitats and consume similar prey as yellowtail snapper; however, yellowtail snapper tend to have a smaller mouth gape to body-size ratio compared to other lutjanids (Bester 2016; Fluech 2016). The continuation of the current requirement to use circle hooks when fishing with natural bait would continue to offer protection against additional discard mortality for these other snappers. Decreasing the discard mortality of species, especially those under rebuilding plans (like red snapper), has the potential to alleviate overall mortality on these stocks, and can result in shorter rebuilding periods.

Alternatives 2-5 all discuss the removal of the requirement to use circle hooks when commercial fishing with natural bait for yellowtail snapper, albeit over different spatial scales. Generally speaking, the effects to the biological and ecological environments of removing the current gear requirement would be less over more constrained spatial scales, thereby reducing the likelihood of adverse effects due to a change in allowable fishing gear.

Alternative 2 would remove the requirement to use circle hooks when commercial fishing with natural bait for yellowtail snapper throughout the EEZ of the Gulf. Since 1999, the Council has encouraged the use of circle hooks for red snapper and other reef fish in order to reduce fishing mortality. Circle hooks typically hook fish around the maxilla for red snapper (SEDAR 7 2005; SEDAR 31 2013), and are less likely to be swallowed. Additionally, circle hooks were found less likely to result in bleeding than J-hooks, which tend to hook fish deeper in the digestive tract at a higher frequency (Cooke and Suski 2004). Removal of deeply ingested hooks often results in mortality (Warner 1979; Muoneke and Childress 1994), with vital organs being damaged from penetration into the pericardium or body cavity (Diggles and Ernst 1997). Further, Burns et al. (2002) found more red snapper caught with rod-and-reel gear died from hook mortality than all other causes combined, including depth, stress, and handling, even in otherwise healthy fish.

Over 99% of yellowtail snapper landings in the Gulf (commercial and recreational) are attributed to waters adjacent to the state of Florida (see Section 1.2). Removing the requirement to use circle hooks when commercial fishing with natural bait for yellowtail snapper throughout the EEZ of the Gulf may have adverse indirect effects on species with a demonstrated vulnerability to J-hooks, such as red snapper (SEDAR 31 2013) and red grouper (SEDAR 42 2015). Though the previously described fishing practice for yellowtail snapper is well-established in waters adjacent to Florida, the same cannot be said about the small quantities of yellowtail snapper landed in the other four Gulf States (Table 3.4.1). Fishermen claiming to be fishing for yellowtail snapper with J-hooks could inadvertently subject other reef fish to more severe hooking injuries, thereby increasing discard mortality of those other species. Since the primary fishing area for yellowtail snapper only occurs off the southwestern coast of Florida and west and northwest of the Florida Keys, the paucity of landings data from the other four Gulf States renders the ability to defensibly quantify the impacts of this gear exemption for yellowtail snapper impossible over such a large area.

Alternative 3 would remove the requirement to use circle hooks when commercial fishing with natural bait for yellowtail snapper south of 28° 00’ north latitude in the EEZ of the Gulf. The potentially negative effects described for **Alternative 2** are also germane for **Alternative 3**; however, the area for which these effects may be relevant is greatly reduced (see Figure 2.1.1 and the corresponding interactive map at the link provided).

Alternatives 4 and **5** both further constrain the area for which the removal of the requirement to use circle hooks when commercial fishing with natural bait for yellowtail snapper would apply, thereby limiting the spatial extent for any possible negative effects further still. These alternatives limit this gear exemption to the primary area in which commercial yellowtail snapper fishing occurs in the Gulf. The line of latitude in **Alternative 4** was proffered as a boundary around which little fishing activity occurs, while the same in **Alternative 5** coincides with a boundary line used by the State of Florida in the management of pompano. The Gulf

Council's Reef Fish Advisory Panel generally supported the gear exemption discussed in Action 1, but noted that it should apply over the smallest reasonable area and should focus on the fishery adjacent to the Florida Keys.

Finfish species likely to be caught while commercially targeting yellowtail snapper are characterized in Section 2.1, specifically in Figures 2.1.2, 2.1.4, and 2.1.5. Because of the general method by which directed commercial yellowtail snapper fishing occurs, it is generally unlikely that this component of the commercial reef fish fishery would interact with protected species (finfish, turtles, or marine mammals) in a detrimental manner. Additionally, lost fishing gear may result in fouling of bottom habitat and, by association, coral communities. (Barnette 2001). However, directed fishing for yellowtail snapper target the fish at or near the surface, reducing the interaction of vertical line gear with the substrate.

4.1.3 Direct and Indirect Effects on the Economic Environment

Alternative 1 (No Action) would not modify the hook requirements for commercially harvested yellowtail snapper. **Alternative 1** would continue to mandate that commercial fishermen use circle hooks when fishing with natural bait for yellowtail snapper in the Gulf of Mexico EEZ. **Alternative 1** would therefore not be expected to result in direct economic effects because it would not affect commercial harvests or other customary uses of yellowtail snapper. However, as explained below and elsewhere in this proposed amendment, although the use of circle hooks may be appropriate for other reef fish species, they may be less so for yellowtail snapper and may adversely affect the efficiency with which yellowtail snapper are harvested, resulting in lost economic benefits. These losses would be expected to be greatest for fishermen able to selectively target yellowtail snapper at the exclusion of other reef fish species. Thus, **Alternative 1** would result in the continuation of these losses. Alternatively, **Alternative 1** would to continue to preserve the economic benefits associated with the protection the use of circle hooks affords other reef fish species for which the use of circle hooks may be more appropriate.

Alternatives 2-5 would remove the requirement to use circle hooks when commercial fishing with natural bait for yellowtail snapper over varying portions of the Gulf EEZ. The economic effects that would be expected to result would depend on several factors. First, the removal of the circle hook requirement for commercial fishermen would be expected to afford more flexibility and improve the operational efficiency of commercial operations targeting yellowtail snapper. It is expected that added flexibility and improved efficiency would result in economic benefits, especially for multi-day trips, which tend to target yellowtail snapper more heavily. Second, a decrease in the likelihood to gut-hook yellowtail snapper would be expected to result from lifting the circle hook requirement, thereby improving the odds of survival for discarded yellowtail snapper. Positive economic effects would be expected to be associated with biological benefits that would stem from improved survival of released yellowtail snapper. Third, reef fish species other than yellowtail snapper would also be expected to be incidentally caught using J-hooks once the circle hook requirement is removed in the respective areas snapper, resulting in negative biological effects, due to increased mortality of released fish, and associated economic effects. Finally, the enforcement of the prohibition to using J-hooks when fishing for other reef fish (excluding yellowtail snapper) would become more challenging; essentially, the only way to

effectively allow the use of J-hooks may be to not allow other reef fish on board as, otherwise, it may not be possible to prove that the different species were harvested with the appropriate hooks. This, however, may be a problem because, as shown in Section 2.1, substantial amounts of other reef fish species are co-harvested on trips that land yellowtail snapper, regardless of whether the trips are single or multi-day trips, accounting for more than half of the total harvest, by weight, for the average trip, over the period 2010-2015.

Thus, lifting the circle hook requirement would be expected to induce both positive and negative economic effects. Whether the net economic effects would be positive or negative, at either the individual or aggregate level, would depend, if the possession of other reef fish species is not allowed, on the extent to which fishermen are able to target yellowtail snapper to the exclusion of other reef fish species, the amount of other reef fish species, typically harvested in conjunction with (on the same trip) yellowtail snapper, and relative economic importance of yellowtail snapper compared to the other reef fish species on the same trip or overall to the fishing operation. If the possession of other reef fish species is allowed, potentially reduced effectiveness of the circle hook requirement for these species could substantially reduce the economic benefits associated with more efficient yellowtail snapper harvest.

In the aggregate, the magnitude of these effects would be expected to increase/decrease the larger/smaller the area encompassed by the proposed alternative. Where yellowtail snapper are the dominant harvest species and fewer other species are harvested, the greater the likelihood that the net effect will be a gain in economic benefits. As the size of the area increases, however, the greater the likelihood that problems associated with other reef fish species may arise. Thus, the removal of the circle hook requirement for yellowtail snapper would be expected to result in net positive economic effects if it is limited to smaller portions of the Gulf where yellowtail snapper harvests are concentrated because the adverse effects on other reef fish species and the enforcement challenges would be minimized. Therefore, positive economic effects are more likely expected to result, and be greater, from **Alternatives 4** and **5**. Conversely, **Alternatives 2** and **3** would be expected to result in smaller economic benefits, and may be a net loss, effects compared to **Alternatives 4** or **5**. Effectively, based on the assumption of that ranking would be based on size of the affected area and that effective yellowtail snapper targeting is possible regardless of where fishing occurs (i.e., even in the northern range of the proposed areas if the harvest of other reef fish species is not affectively allowed, yellowtail snapper exclusive trips may be economically feasible), **Alternative 5** may be expected to result in the most economic benefits, followed by **Alternative 4**, **Alternative 3**, **Alternative 2**, and **Alternative 1**.

4.1.4 Direct and Indirect Effects on the Social Environment

The commercial sector harvests on average 97% of yellowtail snapper landed in the Gulf (Table 3.1.2.2), and these landings occur almost entirely in southern Florida (Figure 3.1.2.2). In both the Gulf and South Atlantic, most commercially caught yellowtail snapper comes from the waters surrounding Monroe and Miami-Dade Counties at the southern end of Florida (Figure 3.1.2.2). This area represents the southern-most area and the border between the Gulf and South Atlantic Councils' jurisdictions (Figure 3.2.1). However, commercial regulations regarding permissible fishing gear for yellowtail snapper differs between the two Councils' in this area. Additional effects would not be expected from retaining **Alternative 1**, which would continue to

require commercial fishermen to use circle hooks for yellowtail snapper while fishing in the Gulf Council's jurisdiction of south Florida. However, this alternative is inconsistent with the South Atlantic Council's regulations in south Florida for the commercial harvest of yellowtail snapper, which allows the use of J-hooks with natural bait. Thus, **Alternative 1** would allow the inconsistent regulations to continue, which negatively affects commercial fishermen targeting yellowtail snapper in Gulf waters.

Compared to **Alternative 1**, direct positive effects would be expected from **Alternatives 2 – 5** as commercial fishermen would be allowed to use J-hooks rather than circle hooks while fishing for yellowtail snapper with live bait in Gulf waters. J-hooks are preferred by commercial fishermen targeting yellowtail snapper, as discussed in Section 2.1. The effects among **Alternatives 2 – 5** vary according to the overlap between the area in which the requirement to use circle hooks for commercially caught yellowtail snapper would be removed and where commercial fishermen are targeting yellowtail snapper.

Because nearly all commercial landings of yellowtail snapper in the Gulf occur off Monroe County (Figure 3.1.2.2), removing the requirement to use circle hooks for commercially caught yellowtail snapper for the area which closest approximates where yellowtail fishermen are active would provide the greatest benefits to the fishermen, while avoiding potential negative indirect effects on enforcement. **Alternatives 4** and **5** would modify the gear requirement for the area that most closely overlaps with where commercial fishermen target yellowtail snapper, thereby providing the greatest benefits to fishermen while avoiding potential impacts from enforcement. Removing the circle hook requirement for commercially caught yellowtail snapper across the entire EEZ (**Alternative 2**), or south of Clearwater Beach area off west Florida (**Alternative 3**) would not provide any additional benefits to commercial yellowtail snapper fishermen compared to **Alternatives 4** and **5**, but could allow for enforcement issues to develop, as circle hooks would no longer be required consistently for commercial reef fish fishing outside of the southern Florida area. The potential for greater compliance and enforcement concerns would be more likely under **Alternative 2** than **Alternative 3**, as **Alternative 2** would modify the gear requirement for the largest area of the Gulf.

The boundary lines which would be established under **Alternatives 4** and **5** both fall south of the Monroe/Collier County line and are 13 nm apart. Thus, the effects between the alternatives would likely be minimal. The line which would be established under **Alternative 5** is also used by Florida Fish and Wildlife Conservation Commission for some state managed species such as permit, and may thus be familiar to fishermen. This is also the Gulf Council's current preferred alternative for establishing the boundary between the west Florida shelf stock and east Florida/Florida Keys stocks of hogfish[3]. Management measures for hogfish are expected to differ on either side of this line following implementation of a hogfish rebuilding plan by the South Atlantic Council for both the commercial and recreational sectors.

At 13 nm to the north, the line that would be established under **Alternative 4** would allow fishermen to target yellowtail snapper with J-hooks over a slightly larger area than **Alternative 5**. In contrast to **Alternative 5**, the line that would be established under **Alternative 4** is rarely

[3] Reef Fish Amendment 43 is currently under development by the Gulf Council.

crossed by fishermen during trips; trips that originate south of the line rarely travel north, and trips that originate north of the line, rarely travel south. Thus, adopting **Alternative 5** would result in the same line being used as the demarcation of different commercial regulations for both yellowtail snapper and hogfish, while adopting **Alternative 4** would be less likely to result in potential enforcement issues, as fishermen rarely travel across the line in a single fishing trip.

4.1.5 Direct and Indirect Effects on the Administrative Environment

Regulations modifying allowable gear types in a fishery would place a burden on the National Marine Fisheries Service (NMFS) and enforcement personnel. **Alternative 1** is not expected to have a direct effect on the administrative environment as it maintains existing gear with no modifications. **Alternatives 2-5** would have a direct effect on the administrative environment pertaining to enforcement of new regulations. The extent of the effects would decrease with the spatial extent of allowing J-hooks for the harvest of yellowtail snapper. Thus, the greatest effect would be from **Alternative 2**, followed by **Alternative 3, Alternative 4,** and then **Alternative 5**. If any amount of other managed species would be allowed onboard the vessel, then it would be increasingly difficult for enforcement to determine if the other species were legally harvested with circle hooks or illegally harvested with J-hooks.

4.2 Action 2 – Modify the Fishing Year for Gulf Yellowtail Snapper

Alternative 1 (No Action). Do not modify the fishing year for yellowtail snapper. The fishing year (commercial and recreational) is the calendar year, January 1 through December 31.

Preferred Alternative 2: Modify the fishing year for the commercial sector for yellowtail snapper:

Option a: June 1 through May 30
Option b: July 1 through June 30
Preferred Option c: August 1 through July 31
Option d: September 1 to August 31

Preferred Alternative 3: Modify fishing year for the recreational sector for yellowtail snapper:

Option a: June 1 through May 30
Option b: July 1 through June 30
Preferred Option c: August 1 through July 31
Option d: September 1 to August 31

4.2.1 Direct and Indirect Effects on the Physical Environment

Direct and indirect effects on the physical environment when fishing for reef fish have been discussed in detail in Amendment 27 to the Fishery Management Plan for the Reef Fish Resources of the Gulf of Mexico (FMP) (GMFMC 2007b), and previously in Section 4.1.1. Modifying the fishing year for the commercial and/or recreational harvest of yellowtail snapper is not likely to affect the physical environment. Overall fishing effort for yellowtail snapper is constrained by the annual catch limit (ACL). The Gulf landings of yellowtail snapper have not exceeded the Gulf ACL of 1.0125 mp since its institution in 2011 (see Table 3.1.2.1). **Alternative 1** would not change the fishing season or the effects to the physical environment. **Preferred Alternative 2** would apply to the commercial sector and **Preferred Alternative 3** would apply to the recreational sector. The subsequent options (**Options a, b, d,** and **Preferred Option c**) would not likely effect the physical environment as fishing effort would still be constrained to the ACL.

4.2.2 Direct and Indirect Effects on the Biological and Ecological Environments

The current fishing year for yellowtail snapper in the Gulf opens on January 1st and closes on December 31st (**Alternative 1**). Yellowtail snapper in the Gulf are managed using a stock ACL. Over the last five fishing years, the Gulf has not landed its allocation of yellowtail snapper (Table 4.2.2.1).

Table 4.2.2.1. Landings for Gulf yellowtail snapper from 2011 to 2015. Landings are in pounds.

Year	Commercial Landings	Recreational Landings*	Total Landings	Total ACL	Remaining ACL (lbs)	Remaining ACL (%)
2011	769,730	25,560	795,290	1,012,500	217,210	21.45%
2012	630,984	5,087	636,071	1,012,500	376,429	37.18%
2013	728,387	6,991	735,378	901,125	165,747	18.39%
2014	760,395	21,536	781,931	901,125	119,194	13.23%
2015**	416,360	71,593	487,953	901,125	413,172	45.85%

* Recreational landings exclude Monroe County (attributed to the South Atlantic Council).
** Landings for 2015 are preliminary. Recreational landings for November and December of 2015 were not available at time of publishing.

Preferred Alternatives 2 and **3** would modify the fishing year for Gulf yellowtail snapper for the commercial and/or recreational fishing sector(s), respectively. Options for modifying the fishing year are identical in both **Preferred Alternatives 2** and **3**. **Option a** would change the fishing year to open on June 1st and close on May 30th. **Option b** would change the fishing year to open on July 1st and close on June 30th. **Preferred Option c** would change the fishing year to open on August 1st and close on July 31st. **Option d** would change the fishing year to open on September 1st and close on July 31st.

Regardless of which of these options is chosen as preferred, it is unlikely that the biological or ecological effects for Gulf yellowtail snapper would be measurably different from those in **Alternative 1**. This is largely because the Gulf ACL for yellowtail snapper has not been landed over the last five years (Table 4.2.2.1). It is possible, however, that fishermen in the South Atlantic (which selected **Preferred Option c** in **Alternatives 2** and **3**, and submitted that measure to the Secretary of Commerce for implementation in December of 2015) who also hold a valid Gulf Reef Fish permit could redirect their fishing efforts to the Gulf in the event of a closure in the South Atlantic. Even still, the National Marine Fisheries Service monitors regional landings and would close the Gulf harvest of yellowtail snapper in the event the ACL was met, thereby limiting the likelihood of exceeding the ACL.

4.2.3 Direct and Indirect Effects on the Economic Environment

This action considers changes to the fishing year for Gulf yellowtail snapper. **Alternative 1** (No Action) would maintain the January 1st through December 31st fishing year and would therefore not affect commercial or recreational harvests and other customary uses for yellowtail snapper in the Gulf of Mexico. Therefore, **Alternative 1** would not be expected to result in any direct economic effects. However, under **Alternative 1**, commercial and recreational fishing seasons in the Gulf would not be consistent with the seasons established by the South Atlantic region, which are August 1st through July 31st (pending Secretarial approval). Therefore, **Alternative 1** may result in indirect adverse economic effects because the lack of consistency may be detrimental to Gulf commercial fishermen and recreational anglers who fish under both jurisdictions. For **Preferred Alternatives 2** and **3, Preferred Option c** would establish consistent fishing seasons between the South Atlantic and the Gulf. Fishermen and anglers harvesting yellowtail snapper in the South Atlantic and Gulf would be expected to benefit from

the ease and flexibility afforded by consistent seasons, thereby generating economic benefits. Although positive, these economic effects are expected to be small because aggregate recreational and commercial harvests in the Gulf are below the Gulf yellowtail snapper ACL. Similar to **Alternative 1**, **Options a**, **b**, and **d** under **Preferred Alternatives 2** and **3** would not establish consistent yellowtail snapper seasons. Although the resultant seasons would be closer to those in effect in the South Atlantic and, therefore, an improvement over **Alternative 1**, regulatory inconsistency would continue and, therefore, be expected to result in minor adverse economic effects.

4.2.4 Direct and Indirect Effects on the Social Environment

This action is primarily intended to make Gulf regulations for yellowtail snapper consistent with the South Atlantic regulations for yellowtail snapper in south Florida. The South Atlantic Council changed the fishing year for yellowtail snapper to avoid a quota closure occurring in the winter months. In contrast, the yellowtail snapper ACL in the Gulf has not been met or exceeded, and an in-season closure is not likely to occur under current fishing practices. While there were benefits to fishermen in the south Atlantic that resulted from changing the fishing year, no direct benefits would be expected for fishermen in the Gulf, as the change in fishing year will not change the ability of commercial or recreational fishermen to access the resource, or increase the likelihood of a fishing season closure. Thus, there is no difference in direct effects among **Alternatives 1 – 3** and the corresponding options.

Some indirect benefits may result by aligning the fishing season for yellowtail snapper across the Gulf and South Atlantic Councils' jurisdictions. South Florida is subject to regulations promulgated by several government agencies at the state and federal level, and some regulations vary across the region. Complying with the prevailing regulations in a given area can be confusing for the angling public, and complicate enforcement for both commercial and recreational fishermen. Reducing such differences in regulations can be expected to provide some indirect benefits to the social environment, although these effects would be minimal. Compared to **Alternative 1** and **Options a, b**, and **d**, these benefits would be realized under **Preferred Alternatives 2** and **3**, **Preferred Options c**, as the fishing year would become consistent with the South Atlantic Council's season.

4.2.5 Direct and Indirect Effects on the Administrative Environment

None of the alternatives in Action 2 should result in significant direct or indirect effects to the administrative environment. **Alternative 1** would not change the fishing season or the effects to the administrative environment. **Preferred Alternative 2** would only apply to the commercial sector and **Preferred Alternative 3** would only apply to the recreational sector. The subsequent options (**Options a, b, d,** and **Preferred Option c**) would not likely affect the administrative environment, since the Gulf ACL is not currently being landed and responsibility for monitoring that ACL still belongs to the NMFS. Indirectly, a fishing year which is similar to that in the South Atlantic may reduce regulatory burdens on fishermen.

4.3 Cumulative Effects Analysis

The cumulative effects to the reef fish fishery have been analyzed in Reef Fish Amendments 32 (GMFMC 2011c) and 40 (GMFMC 2014), and are summarized herein by reference. The effects of modifying the gear and fishing year in this framework action are similar to those described in Amendment 27 to the FMP (GMFMC 2007).

The analysis in Sections 4.1 and 4.2 concluded that the direct and indirect effects of these actions would be minimal.

This framework action is not likely to result in significant effects when considered in combination with other relevant past, present, and reasonably foreseeable actions because it will not substantially alter the manner in which the yellowtail snapper component of the commercial reef fish fishery is prosecuted. Pertinent past actions are summarized in the History of Management in Section 1.2. The cumulative impacts of the actions cannot be foreseen at this time, and will be addressed fully in the environmental analyses for this framework action.

Additional considerations for cumulative effects may include the impacts of the *Deepwater Horizon* MC252 oil spill and potential climate change issues. It is unknown whether the impacts of the *Deepwater Horizon* MC252 oil spill affected south Florida where yellowtail snapper are mainly harvested. Although not reported in the primary yellowtail snapper area, there have been reports of increased incidences of diseased fish by some scientists that may be related to the spill; however, others have argued there is no baseline from which to judge the prevalence of disease, so no correlation can be conclusively determined. Studies are continuing to investigate whether diseased fish suffer from immune system and fertility problems (Tampa Bay Times 2012). In a recent study, Weisberg et al. (2014) suggested the hydrocarbons associated with the *Deepwater Horizon* MC252 oil spill did transit onto the Florida shelf and may be associated with the occurrences of reef fish with lesions and other deformities. The overall impact of the oil spill may not be realized for quite some time and studies are just now being published.

There is a large and growing body of literature on past, present, and future impacts of global climate change induced by human activities. Some of the likely effects commonly mentioned are sea level rise, increased frequency of severe weather events, and change in air and water temperatures. The Environmental Protection Agency's climate change webpage (http://www.epa.gov/climatechange/) provides basic background information on these and other measured or anticipated effects. In addition, the Intergovernmental Panel on Climate Change's Fourth Assessment Report (IPCC 2007) contains a compilation of scientific information on climate change and is incorporated herein by reference (http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml). Global climate change could have significant effects on Gulf fisheries; however, the extent of these effects cannot be quantified at this time.

Possible impacts, outlined in the Generic ACL/AM amendment (GMFMC 2011b) and Amendment 32 to the FMP (GMFMC 2011c), include temperature changes in coastal and marine ecosystems that can influence organism metabolism and alter ecological processes such as productivity and species interactions; changes in precipitation patterns and a rise in sea level

which could change the water balance of coastal ecosystems; altering patterns of wind and water circulation in the ocean environment; and influencing the productivity of critical coastal ecosystems such as wetlands, estuaries, and coral reefs (Kennedy et al. 2002). It is unclear how climate change would affect reef fishes, and likely would affect species differently. Climate change can affect factors such as migration, range, larval and juvenile survival, prey availability, and susceptibility to predators. In addition, the distribution of native and exotic species may change with increased water temperature, along with 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 marine fisheries and dependent communities. Integrating the potential effects of climate change into fisheries stock assessment is currently difficult due to differences in time scales (Hollowed et al. 2013). Fisheries stock assessments rarely project across a time period that would include detectable climate change effects. While climate change may significantly impact Gulf of Mexico reef fish species in the future, the level of impacts cannot be quantified at this time, and the time frame during which these impacts would occur are unknown. The proposed actions are not expected to significantly contribute to climate change through the increase or decrease in the carbon footprint from fishing as these actions should not change how the fishery is prosecuted. As described in Section 3.2, the contribution to greenhouse gas emissions from fishing is minor compared to the total from other emission sources.

The effects of the proposed action are, and will continue to be, monitored through collection of landings data by the NMFS for the commercial and recreational sectors, stock assessments, life history studies, economic and social analyses, and other scientific observations.

CHAPTER 5. REGULATORY IMPACT REVIEW

CHAPTER 6. REGULATORY FLEXIBILITY ANALYSIS

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

Preparers:

Name	Expertise	Responsibility
Ryan Rindone, GMFMC	Fishery Biologist	Co-Team Lead – amendment development, introduction, biological and ecological impacts
Cynthia Meyer, NMFS/SF	Fishery Biologist	Co-Team Lead – amendment development, introduction, physical, administrative and cumulative impacts
Assane Diagne, GMFMC	Economist	Economic impacts, Regulatory Impact Review
Ava Lasseter, GMFMC	Anthropologist	Social impacts
Stephen Holiman, NMFS/SF	Economist	Economic environment and impacts, Regulatory Flexibility Act analysis
Christina Package, NMFS/SF	Anthropologist	Social environment
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Reviewers:

Name	Discipline/Expertise	Role in EA Preparation
Mara Levy, NOAA GC	Attorney	Legal review
Noah Silverman, NMFS	Natural Resource Management Specialist	NEPA review
David Dale, NMFS/HC	EFH Specialist	Habitat review
Jennifer Lee, NMFS/PR	Protected Resources Specialist	Protected resources review
Christopher Liese	Economist	Social/economic review

GMFMC = Gulf of Mexico Fishery Management Council, SAFMC = South Atlantic Fishery Management Council, NMFS = National Marine Fisheries Service, SF = Sustainable Fisheries Division, PR = Protected Resources Division, HC = Habitat Conservation Division, GC = General Counsel

The following have or will be consulted:

National Marine Fisheries Service

- Southeast Fisheries Science Center
- Southeast Regional Office

- Protected Resources
- Habitat Conservation
- Sustainable Fisheries

NOAA General Counsel
Environmental Protection Agency
United States Coast Guard
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
Georgia Department of Natural Resources
South Carolina Department of Natural Resources
North Carolina Division of Marine Fisheries

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APPENDIX A. SUMMARY OF PUBLIC COMMENTS RECEIVED

Public Hearing Summary
Framework Action: Yellowtail Snapper Hook Requirements and Fishing Season

Key West, Florida
March 1, 2016

Council/Staff
John Sanchez
Ryan Rindone
Emily Muehlstein

2 members of the public attended.

Bill Kelly- Florida Keys Commercial Fishing Association

For Action 1, he supports Alternative 5. Bill knows J-hooks increase efficiency and productivity for the commercial yellowtail snapper fishery. Release mortality is decreased with the use of J-hooks because the time fish are handled is decreased. Bill refers to a quick study done by his association that shows how much more successful J-hooks are with reducing discard mortality in this directed fishery. There are two on-the-water NOAA law enforcement officers and 55 FWC officers in the area. FWC should be included in any law enforcement discussions regarding yellowtail snapper regulation changes to ensure the transition is efficient. Regarding Action 2, he questions how the fishing year is shifted without losing quota. He supports Alternative 2c because consistency with the South Atlantic Council is ideal.

Manny Herrera- Commercial Fisherman

Manny took Martha Bademan, the Gulf Council representative from FWC to experiment with a circle hook on the pluck rod they use to target yellowtail snapper. The first fish on the circle hook was gut hooked. The fishery off Key West is very different from the rest of the Gulf. It's a subtropical climate and the only area that does directed yellowtail snapper fishing in the Gulf. The method of fishing is so different; they're fishing with tiny hooks and light line so they don't have any issue with bycatch of other reef fish. Additionally, most of the Keys fishermen that target yellowtail snapper in the Gulf jurisdiction don't have Gulf quota for the other reef fish so they're not even targeting the other species that could be a concern when it comes to the circle hook requirement. He supports Action 1, Alternative 5. This alternative is easiest for law enforcement because it's a small area and yellowtail snapper fisherman don't fish more than about 20 miles north of the Tortugas. He spends more hours in the Tortugas than anyone. The area that is actually productive for commercial fishermen is very small in the Gulf. When the South Atlantic closure happened last year everyone with a Gulf permit shifted effort to fish in the Gulf near the Tortugas. The area can sustain the effort. He would like to know how many boats

fishing for yellowtail snapper in the Keys have a Gulf Reef fish permit. For Action 2, the Council should keep the fishing the year the same as the South Atlantic (Alternative 2c).

A public hearing was also held in Sarasota, Florida on March 2, 2016 but, there were no attendees.

APPENDIX B. ALTERNATIVES CONSIDERED BUT REJECTED

No alternatives have been removed as of this printing.

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 fishery management in federal waters of the exclusive economic zone (EEZ). However, fishery management decision-making is also affected by a number of other federal statutes designed to protect the biological and human components of U.S. fisheries, as well as the ecosystems that support those fisheries. Major laws affecting federal fishery management decision-making are summarized below.

Administrative Procedures Act

Federal rulemaking is governed under the Administrative Procedure Act (APA) (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public input in the rulemaking process. Under the APA, the National Marine Fisheries Service (NMFS) is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider, and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day waiting period from the time a final rule is published until it takes effect.

Coastal Zone Management Act

Section 307(c)(1) of the federal Coastal Zone Management Act of 1972 (CZMA), as amended, requires federal activities that affect any land or water use or natural resource of a State's coastal zone be conducted in a manner consistent, to the maximum extent practicable, with approved state coastal management programs. The requirements for such a consistency determination are set forth in NMFS regulations at 15 C.F.R. part 930, subpart C. According to these regulations and CZMA Section 307(c)(1), when taking an action that affects any land or water use or natural resource of a state's coastal zone, NMFS is required to provide a consistency determination to the relevant state agency at least 90 days before taking final action.

Upon submission to the Secretary, NMFS will determine if this plan amendment is consistent with the Coastal Zone Management programs of the States of Alabama, Florida, Louisiana, Mississippi, and Texas to the maximum extent possible. Their determination will then be submitted to the responsible state agencies under Section 307 of the CZMA administering approved Coastal Zone Management programs for these States.

Data Quality Act

The Data Quality Act (DQA) (Public Law 106-443), effective October 1, 2002, requires the government to set standards for the quality of scientific information and statistics used and disseminated by federal agencies. Information includes any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, cartographic, narrative, or audiovisual forms (includes web dissemination, but not hyperlinks to information that others disseminate; does not include clearly stated opinions).

Specifically, the DQA directs the Office of Management and Budget (OMB) 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 OMB 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 DQA, FMPs and amendments must be based on the best information available. They should also properly reference all supporting materials and data, and be reviewed by technically competent individuals. With respect to original data generated for FMPs and amendments, it is important to ensure that the data are collected according to documented procedures or in a manner that reflects standard practices accepted by the relevant scientific and technical communities. Data will also undergo quality control prior to being used by the agency and a pre-dissemination review.

Endangered Species Act

The Endangered Species Act (ESA) of 1973, as amended, (16 U.S.C. Section 1531 et seq.) requires federal agencies use their authorities to conserve endangered and threatened species. The ESA requires NMFS, when proposing a fishery action that "may affect" critical habitat or endangered or threatened species, to consult with the appropriate administrative agency (itself for most marine species, the U.S. Fish and Wildlife Service (FWS) for all remaining species) to determine the potential impacts of the proposed action. Consultations are concluded informally when proposed actions may affect but are "not likely to adversely affect" endangered or threatened species or designated critical habitat. Formal consultations, including a biological opinion, are required when proposed actions may affect and are "likely to adversely affect" endangered or threatened species or adversely modify designated critical habitat. If jeopardy or adverse modification is found, the consulting agency is required to suggest reasonable and prudent alternatives.

On September 30, 2011, the Protected Resources Division released a biological opinion which, after analyzing best available data, the current status of the species, environmental baseline (including the impacts of the recent *Deepwater Horizon* MC 252 oil release event in the northern Gulf of Mexico [Gulf]), effects of the proposed action, and cumulative effects, concluded that the continued operation of the Gulf reef fish fishery is also not likely to jeopardize the continued existence of green, hawksbill, Kemp's ridley, leatherback, or loggerhead sea turtles, nor the continued existence of smalltooth sawfish (NMFS 2011a).

On July 10, 2014, NMFS published a final rule designating 38 occupied marine areas within the Atlantic Ocean and the Gulf as critical habitat for the Northwest Atlantic Ocean loggerhead sea turtle distinct population segment (79 FR 39856). The NMFS concluded in September 16, 2014, memos that activities associated with the subject FMP will not adversely affect any of the aforementioned critical habitat units. On September 10, 2014, NMFS published a final rule (79 FR 53852) listing 20 new coral species under the ESA. Four of those new species are threatened

and occur in federal waters in the Gulf (*Mycetophyllia ferox, Orbicella annularis, O. faveolata, and O. franksi*). In memos dated September 16, 2014, and October 7, 2014, NMFS determined that activities associated with the subject FMP will not adversely affect any of the newly listed coral species. In the October 7, 2014, memo NMFS also determined that although the September 10, 2014, Final Listing Rule provided some new information on the threats facing *Acropora*, none of the information suggested that the previous determinations were no longer valid.

Fish and Wildlife Coordination Act

Fish and Wildlife Coordination Act of 1934 (16 U.S.C. 661-667e) provides the basic authority for the U.S. FWS'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 U.S. FWS (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 are not likely to affect wildlife resources pertaining to water resource development as the EEZ is from the state water boundary extending to 200 nautical miles (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 U.S. Section 106 of the NHPA requires federal agencies to evaluate the impact of all federally funded or permitted projects for sites on listed on, or eligible for listing on, the National Register of Historic Places (NRHP) and aims to minimize damage to such places.

Typically, fishery management actions in the Gulf 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 NRHP. The proposed actions are not likely to increase fishing activity above previous years. Thus, no additional impacts to the *U.S.S. Hatteras* would be expected.

Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas, and on the importing of marine mammals and marine mammal products into the U.S. Under the MMPA, the Secretary of Commerce (authority delegated to NMFS) is responsible for the conservation and management of cetaceans and pinnipeds (other than walruses). The Secretary of the Interior is responsible for walruses, sea and marine otters, polar bears, manatees, and dugongs.

Part of the responsibility that NMFS has under the MMPA involves monitoring populations of marine mammals to make sure that they stay at optimum levels. If a population falls below its optimum level, it is designated as "depleted," and a conservation plan is developed to guide research and management actions to restore the population to healthy levels.

In 1994, Congress amended the MMPA, to govern the taking of marine mammals incidental to commercial fishing operations. This amendment required the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction, development and implementation of take-reduction plans for stocks that may be reduced or are being maintained below their optimum sustainable population levels due to interactions with commercial fisheries, and studies of pinniped-fishery interactions.

Under Section 118 of the MMPA, NMFS must publish, at least annually, a List of Fisheries that places all U.S. commercial fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals occurring in each fishery. The categorization of a fishery in the List of Fisheries determines whether participants in that fishery may be required to comply with certain provisions of the MMPA, such as registration, observer coverage, and take reduction plan requirements. The primary gears used in the Gulf reef fish fishery are classified in the updated 2012 MMPA List of Fisheries as Category III fishery (74 FR 73912).

Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (PRA) (44 U.S.C. 3501 et seq.) regulates the collection of public information by federal agencies to ensure the public is not overburdened with information requests, information collection procedures are efficient, and federal agencies adhere to appropriate rules governing the confidentiality of information. The PRA requires NMFS to obtain approval from OMB before requesting most types of fishery information from the public.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (16 U.S.C. 703) protects migratory birds. The responsibilities of federal agencies to protect migratory birds are set forth in Executive Order 13186. U.S. FWS is the lead agency for migratory birds. The birds protected under this statute include many common species, as well as birds listed as threatened or endangered. A memorandum of understanding (MOU) between NMFS and U.S. FWS, as required by Executive Order 13186 (66 FR 3853, January 17, 2001), is to promote the conservation of migratory bird populations. This MOU focuses on avoiding, or where impacts cannot be avoided, minimizing to the extent practicable, adverse impacts on migratory birds and strengthening migratory bird conservation through enhanced collaboration between NMFS and U.S. FWS by identifying general responsibilities of both agencies and specific areas of cooperation. Given NMFS' focus on marine resources and ecosystems, this MOU places an emphasis on seabirds, but does not exclude other taxonomic groups of migratory birds.

Typically, fishery management actions in the Gulf are not likely to affect migratory birds. The proposed actions are not likely to change the way in which the fishery is prosecuted. Thus, no additional impacts are reasonably expected.

Prime Farmlands Protection and Policy Act

The Farmland Protection and Policy Act of 1981 (7 U.S.C. 4201) was enacted to minimize the loss of prime farmland and unique farmlands as a result of federal actions by converting these

lands to nonagricultural uses. It assures that federal programs are compatible with state and local governments, and private programs and policies to protect farmland.

The fishery management actions in the Gulf are not likely to affect farmlands as the EEZ is from the state water boundary extending to 200 nm from shore.

National Wild and Scenic Rivers System

The National Wild and Scenic Rivers System of 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) preserves certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. This Act safeguards the special character of these rivers, while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection.

The fishery management actions in the Gulf are not likely to affect wetland habitats as the EEZ is from the state water boundary extending to 200 nm from shore.

North American Wetlands Conservation Act

The North American Wetlands Conservation Act of 1989 (Public Law 101-233) established a wetlands habitat program, administered by the U.S. FWS, to protect and manage wetland habitats for migratory birds and other wetland wildlife in the United States, Mexico, and Canada.

The fishery management actions in the Gulf are not likely to affect wetland habitats as the EEZ is from the state water boundary extending to 200 nm from shore.

Executive Orders

E.O. 12630: Takings

The Executive Order on Government Actions and Interference with Constitutionally Protected Property Rights that became effective March 18, 1988, requires each federal agency prepare a Takings Implication Assessment for any of its administrative, regulatory, and legislative policies and actions that affect, or may affect, the use of any real or personal property. Clearance of a regulatory action must include a takings statement and, if appropriate, a Takings Implication Assessment. The National Oceanic and Atmospheric Administration Office of General Counsel will determine whether a Taking Implication Assessment is necessary for this amendment.

E.O. 12866: Regulatory Planning and Review

Signed in 1993, this Executive Order requires federal agencies to assess the costs and benefits of their proposed regulations, including distributional impacts, and to select alternatives that maximize net benefits to society. To comply with E.O. 12866, NMFS prepares a Regulatory Impact Review (RIR) for all fishery regulatory actions that either implement a new fishery management plan or significantly amend an existing plan (See Chapter 5). RIRs provide a

comprehensive analysis of the costs and benefits to society of proposed regulatory actions, problems and policy objectives prompting the regulatory proposals, and the major alternatives that could be used to solve the problems. The RIRs also serve as the basis for the agency's determinations as to whether proposed regulations are a "significant regulatory action" under the criteria provided in E.O. 12866 and whether proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with the Regulatory Flexibility Analysis. A regulation is significant if it a) has an annual effect on the economy of $100 million or more or adversely affects in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments and communities; b) creates a serious inconsistency or otherwise interferes with an action taken or planned by another agency; c) materially alters the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or d) raises novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

E.O. 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations

This Executive Order mandates that each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the U.S. and its territories and possessions. The Executive Order is described in more detail relative to fisheries actions in Section 3.5.

E.O. 12962: Recreational Fisheries

This Executive Order requires federal agencies, cooperating 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: developing joint partnerships; promoting restoration of recreational fishing areas 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. It also establishes a seven-member National Recreational Fisheries Coordination Council (Council) responsible for ensuring that social and economic values of healthy aquatic systems supporting recreational fisheries are considered by federal agencies in the course of their actions, sharing the latest resource information and management technologies, and reducing duplicative and cost-inefficient programs among federal agencies involved in conserving or managing recreational fisheries. The Council, cooperating with federal agencies, States and tribes, develops a Recreational Fishery Resource Conservation Plan including a five-year agenda. Finally, the Order requires NMFS and the U.S. FWS to develop a joint agency policy for administering the ESA.

E.O. 13132: Federalism

The Executive Order on Federalism requires agencies in formulating and implementing policies, to be guided by the fundamental Federalism principles. The Order serves to guarantee the

division of governmental responsibilities between the national government and the States that was intended by the framers of the Constitution. Federalism is rooted in the belief that issues not national in scope or significance are most appropriately addressed by the level of government closest to the people. This Order is relevant to FMPs and amendments given the overlapping authorities of NMFS, the States, and local authorities in managing coastal resources, including fisheries, and the need for a clear definition of responsibilities. It is important to recognize those components of the ecosystem over which fishery managers have no direct control and to develop strategies to address them in conjunction with appropriate State, tribes, and local entities.

E.O. 13158: Marine Protected Areas

This Executive Order requires federal agencies to consider whether their proposed action(s) will affect any area of the marine environment that has been reserved by federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural or cultural resource within the protected area. There are several marine protected areas, habitat areas of particular concern, and gear-restricted areas in the eastern and northwestern Gulf.

Essential Fish Habitat

The amended Magnuson-Stevens Act included a new habitat conservation provision known as essential fish habitat (EFH) that requires each existing and any new FMPs to describe and identify EFH for each federally managed species, minimize to the extent practicable impacts from fishing activities on EFH that are more than minimal and not temporary in nature, and identify other actions to encourage the conservation and enhancement of that EFH. To address these requirements the Council has, under separate action, approved an Environmental Impact Statement (GMFMC 2004) to address the new EFH requirements contained within the Magnuson-Stevens Act. Section 305(b)(2) requires federal agencies to obtain a consultation for any action that may adversely affect EFH.

These actions are not expected to change the way in which the fisheries are conducted in regard to the impact of the fisheries on the environment. The actions, considered in the context of the fisheries as a whole, will not have an adverse impact on EFH; therefore, an EFH consultation is not required.