Socio-Economic Profile of the Snapper Grouper Commercial Fishery in the South Atlantic Region

Draft Report provided to the South Atlantic Fishery Management Council
March 2018
Jekyll Island, GA

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Summary

As part of the Vision Blueprint for the South Atlantic Snapper Grouper Fishery, the South Atlantic Fishery Management Council (South Atlantic Council) requested an in-depth characterization of the commercial component of the Snapper Grouper fishery. The project topics incorporated input from the South Atlantic Council and the Snapper Grouper Advisory Panel, and include qualitative fishing community descriptions; detailed information about permits, vessels and permit holders; participation and catch; and landings and revenue summaries for all species combined, by gear type, and by species/complex.

Data sources for the report include permits records provided by the Permit Office of the NOAA Fisheries Southeast Regional Office; the Southeast Coastal Fisheries Logbook, and the Southeast Fisheries Science Center Social Science Research Group (SSRG) Socioeconomic Panel data set. Analysis was conducted from October 2017 through February 2018. Key findings are summarized below.

Permits, Permit Holders, and Vessels
To participate in the commercial South Atlantic Snapper Grouper fishery, a vessel must have a federal Snapper Grouper Unlimited (SG1) or Limited (SG2) commercial permit, which have been limited entry permits since December 1998. The number of SG1 permits has decreased by about 45% since implementation of limited entry primarily due to a requirement to purchase two SG1 permits to obtain an SG1 permit. Two-thirds of SG2 permits have been retired since 1998 because these permits are only transferable to immediate family.

As of January 2018, there are 541 SG1 permits and 110 SG2 permits. A majority of the permits are associated with vessels with homeports in Florida (67% of SG1 permits; 80% of SG2 permits), with the largest concentration in the Florida Keys. The proportion of permits held by corporate entities has increased since 1998, but most permits are held by individuals or families. Vessels with SG1 or SG2 permits commonly also have other federal commercial permits for Atlantic Dolphin/Wahoo, Spanish Mackerel, and King Mackerel, or federal charter/headboat permits for Atlantic Dolphin/Wahoo, Atlantic Coastal Migratory Pelagics, or South Atlantic Snapper Grouper.

The estimated cost to enter the Snapper Grouper commercial fishery by obtaining an SG1 permit was found to be about $60,000 to $80,000, based on prices found online. The increase in advertised prices from about $40,000 in 2011 suggests that the cost to obtain an SG1 permit is increasing. Additionally, temporary use of an SG1 permit is common, with advertised prices for SG1 annual "leases" at $6,000 to $8,000 in recent posts.

Examination of permit holder history indicates that a majority (60%) of permit holders have had the same SG1 permit for more than ten years. About 30% of permit holders have the same SG1 permit since implementation of the limited entry program. Additionally, analysis of landings from vessels with SG1 and SG2 permits from 2012 through 2016 shows that less than 5% of the permits have zero Snapper Grouper landings ("inactive" permits), and that 45% of SG1 permits and 30% of SG2 permits have landings every year in the time period.

Vessels with commercial Snapper Grouper permits in North Carolina, South Carolina and Georgia are generally larger and newer than permitted vessels in Florida. Most vessels had similar horsepower (201-400), were made of fiberglass, and used ice for refrigeration.

Participation and Catch

A comparison of number of vessels, number of trips and days at sea indicated that participation in the Snapper Grouper commercial fishery has fairly consistent levels from 2012 through 2016. Comparing 2016 levels to 2001 levels, participation has decreased overall but has remained consistent or increased slightly in North and Central Florida. Participation is highest from May through August in Northern and Central North Carolina, when weather is more amenable. For Southern North Carolina, South Carolina, Georgia and North Florida, participation is generally highest January through August, but drops off in the last few months of the year. Participation levels in the southern areas of the South Atlantic (Central Florida, South Florida and the Florida Keys) is consistent all year.

Trips on vessels from Northern and Central North Carolina along with Florida typically last 1-2 days, and on average have 1 or 2 crew including the captain. For Southern North Carolina, South Carolina and Georgia, trips are longer (3-5 days) with a crew size of 2 or 3, including the captain.

Catch portfolios were analyzed by area (North Carolina, South Carolina and Georgia; Florida East Coast; Florida Keys) and season (3-5 month seasons, depending on area) using 2016 commercial logbook data, and including all species reported in the logbook for any trip with any Snapper Grouper landings. Primary and secondary species for each area and season were identified along with trip types based on catch combinations and top gear types for associated trips. In all area/season analyses, a trip type with multiple Snapper Grouper species but usually a few more dominant species ("driving species") was identified, and these were referred to as the "Core Snapper Grouper" trip for that area/season. Last, annual portfolios were qualitatively described if possible.

For North Carolina, South Carolina and Georgia, the primary trip types for Season 1 (January through April) included the black sea bass driven trip; the Core Snapper Grouper trip primarily driven by vermilion snapper, gray triggerfish, and/or jacks; and the less frequent deepwater trip including snowy grouper, blueline tilefish and golden tilefish. The dominant trip types in Season 2 (May through August) trip types were the Core Snapper Grouper trip driven by black sea bass, gag grouper, and/or red porgy; and the blueline tilefish trip. Another Season 2 trip was the deepwater trip driven by snowy grouper. Season 3 trip types included the Core Snapper Grouper trip primarily driven by gray triggerfish and/or red porgy, and black sea bass/ gag grouper trip.

The Florida East Coast has the most diverse trips and species. In Season 1 (January through April), trip types included Core Snapper Grouper trip driven by vermilion snapper, gray triggerfish, mutton snapper, gray snapper, greater amberjack and/or hogfish; the yellowtail snapper driven trip; golden tilefish (mostly longline) driven trip; jacks driven trip; and the king mackerel driven trip. Season 2 (May through August) included the greater amberjack driven trip,

yellowtail snapper driven trip, mutton snapper driven trip and the trips driven by non-Snapper Grouper species (usually king mackerel). Last, Season 3 (September through December) included the Core Snapper Grouper trip dominated by shallow-water species, the yellowtail snapper driven trip, the golden tilefish (hook and line or electric) trip, and trips driven by non-Snapper Grouper species, primarily Spanish mackerel.

For the Florida Keys, yellowtail snapper trips were the dominant trip type for trips landings Snapper Grouper species in all three seasons. In Season 1 (January through April), in addition to the yellowtail snapper trip, three other trip types were identified. These included the deepwater trip driven by snowy grouper, blueline tilefish, golden tilefish and yellowedge grouper; non-Snapper Grouper species driven ("other species", which can be state-managed species or shellfish such as spiny lobster); and the Core Snapper Grouper trip driven by mutton snapper, gray snapper, gray triggerfish and greater amberjack. For Season 2 (May through July, adjusted due to the spiny lobster season opening on August 6), trip types included the yellowtail snapper trip; greater amberjack driven trip; gray snapper driven trip, Core Snapper Grouper trip dominated by mutton snapper and shallow-water groupers; and the deepwater trip similar to Season 1. The trip types in Season 3 (August through December) include the most common yellowtail snapper trip; Core Snapper Grouper trip driven by shallow water species; and deepwater trips driven by blueline tilefish, golden tilefish and yellowedge grouper.

Landings and Revenue

Using information from the SEFSC-SSRG Socioeconomic Panel data set, landings and revenue since 1998 was provided for all Snapper Grouper species combined and by gear type for the South Atlantic region. Total landings and revenue (adjusted for inflation) did not change since 1998 as much as expected, with an 8% decrease in landings and a 1.5% decrease in revenue. Trips with electric or hook and line reported as the top gear make up the large majority of (>75%) of landings and revenue.

Additionally, landings and revenue for thirteen main Snapper Grouper species was provided. Several species have experienced considerable decline in landings and revenue, but several species have remained consistent or increased in landings and revenue. Last, information on landings and revenue by complex is provided.

Next Steps

This report used only existing data sources and did not address all questions and input from the South Atlantic Council and the Snapper Grouper Advisory Panel. The project could be expanded on through data collection via surveys and other sources.

Chapter 1. South Atlantic Snapper Grouper Communities

This chapter includes descriptions of Snapper Grouper communities in the South Atlantic. The region was divided into nine areas, which are used throughout this report. The areas were selected based on input from the South Atlantic Fishery Management Council and the South Atlantic Snapper Grouper Advisory Panel. The descriptions include the primary communities, important Snapper Grouper species for the area, and summary of fleet characteristics. Additional details about the characteristics of each area are summarized from subsequent chapters in this report.

North Carolina

Northern North Carolina

This area includes Currituck, Pasquotank, Dare, and Hyde counties of North Carolina. The key communities involved with the Snapper Grouper commercial fishery include Hatteras, Wanchese, Manteo, Kill Devil Hills and Kitty Hawk (**Figure 1-1**). This area is a popular tourism destination, specifically in the Outer Banks.

[Insert Figure]
Figure 1-1. Map of Northern North Carolina Snapper Grouper fishing communities

The number of Snapper Grouper commercial permits associated with vessels in this area is relatively small with most permits in Hatteras or Wanchese. Almost all vessels in this area with Snapper Grouper commercial permits also have other federal South Atlantic commercial permits for Dolphin/Wahoo, King Mackerel, and Spanish Mackerel. A little under 20% of the vessels have federal charter/headboat permits for South Atlantic Snapper Grouper, Atlantic Dolphin/Wahoo, and Atlantic Coastal Migratory Pelagics (CMP). Blueline tilefish and snowy grouper have been key species for this area since 1998 (**Table 1-1**). Most vessels use electric gear and trips are 1-2 days in length. Participation is highest in the summer months.

Table 1-1. Key Snapper Grouper species landed in Northern North Carolina for 1998-2001; 2002-2006; 2007-2011; and 2012-2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

1998-2001	2002-2006	2007-2011	2012-2016
Black Sea Bass	Snowy Grouper	Blueline Tilefish	Blueline Tilefish
Snowy Grouper	Blueline Tilefish	Snowy Grouper	Snowy Grouper
Blueline Tilefish	Black Sea Bass	Black Sea Bass	Greater Amberjack

Central North Carolina

This area includes the counties of Craven, Carteret, Onslow, Pender, Jones and New Hanover. The primary Snapper Grouper communities include New Bern, Harkers Island, Morehead City, Beaufort, Carteret, Swansboro, Topsail, Sneads Ferry, and Wilmington (**Figure 1-2**). About 10%

of all Snapper Grouper federal commercial permits are associated with vessels in this area, and a large majority of North Carolina Snapper Grouper federal commercial permits are on vessels with homeports in Central North Carolina. Slightly under 50% of the vessels in this area have other federal South Atlantic commercial finfish permits (Dolphin/Wahoo, King Mackerel and Spanish Mackerel), but about 30% of the vessels have the three federal charter/headboat permits (South Atlantic Snapper Grouper, Atlantic Dolphin/Wahoo, and Atlantic CMP).

[Insert Figure]
Figure 1-2. Map of Central North Carolina Snapper Grouper fishing communities

The number of key Snapper Grouper species for Central North Carolina are diverse but have remained mostly consistent since 1998 (**Table 1-2**). Black sea bass, vermilion snapper, gag grouper, red grouper and gray triggerfish are the primary species that make up a majority of the total Snapper Grouper landings for the area. Most vessels use electric gear and take multi-day trips.

Table 1-2. Key Snapper Grouper species landed in Central North Carolina for 1998-2001; 2002-2006; 2007-2011; and 2012-2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

1998-2001	2002-2006	2007-2011	2012-2016
Black Sea Bass	Black Sea Bass	Black Sea Bass	Black Sea Bass
Vermilion Snapper	Vermilion Snapper	Vermilion Snapper	Gag Grouper
Gag Grouper	Gag Grouper	Red Grouper	Vermilion Snapper
Red Grouper	Red Grouper	Gag Grouper	Gray Triggerfish
Snowy Grouper	Snowy Grouper	Gray Triggerfish	Red Grouper
Black Grouper	Black Grouper		
Red Porgy			

Southern North Carolina

This area includes Brunswick County, North Carolina, and the primary Snapper Grouper communities are Southport, Oak Island, Holden Beach, Shallotte, and Calabash (**Figure 1-3**). The number of Snapper Grouper permitted vessels with homeports in this area is lower than Central North Carolina, and about half of the vessels have other federal commercial Dolphin-Wahoo, King Mackerel and Spanish Mackerel permits. About 20% of the vessels have all three federal charter/headboat permits (South Atlantic Snapper Grouper, Atlantic Dolphin/Wahoo, and Atlantic CMP) as well.

[Insert Map]
Figure 1-3. Map of Central North Carolina Snapper Grouper fishing communities

Similar to Central North Carolina, the identified primary Snapper Grouper species in this area is diverse but have experienced minimal change since 1998 (**Table 1-3**). Vermilion, red grouper, black sea bass, gag grouper and gray triggerfish make up most of the commercial snapper grouper landings for Southern North Carolina. Most vessels use electric gear and take trips lasting about 3 days.

Table 1-3. Key Snapper Grouper species landed in Southern North Carolina for 1998-2001; 2002-2006; 2007-2011; and 2012-2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

1998-2001	2002-2006	2007-2011	2012-2016
Vermilion Snapper	Vermilion Snapper	Vermilion Snapper	Vermilion Snapper
Red Grouper	Red Grouper	Red Grouper	Gray Triggerfish
Black Sea Bass	Gag Grouper	Gag Grouper	Gag Grouper
Gag Grouper	Black Sea Bass	Gray Triggerfish	Black Sea Bass
Snowy Grouper		Black Sea Bass	

*Data for Gray Triggerfish is only available from the data source for years 2005 through 2016, but it is likely that Gray Triggerfish has been a key species since 1998.

South Carolina and Georgia

Northern South Carolina

This area includes the South Carolina counties of Horry and Georgetown. The key Snapper Grouper communities in this area include Little River, North Myrtle Beach and Murrells Inlet (**Figure 1-4**). Most (about 80%) South Carolina Snapper Grouper permits are associated with this area, and about 25% of the vessels have federal commercial Dolphin/Wahoo, King Mackerel and Spanish Mackerel permits. Myrtle Beach is a popular fishing destination for tourists, and about 35% of the vessels have federal charter/headboat permits for South Atlantic Snapper Grouper, Atlantic Dolphin/Wahoo, and Atlantic CMP.

[Insert Figure]
Figure 1-4. Map of Northern South Carolina Snapper Grouper communities

The key Snapper Grouper species targeted by vessels in this area have changed little since 1998 (**Table 1-4**), with vermilion snapper, gag grouper, black seabass and gray triggerfish as the key Snapper Grouper species for the area. Most vessels in this area use electric gear on trips that last 2 or 3 days.

Table 1-4. Key Snapper Grouper species landed in Northern South Carolina for 1998-2001; 2002-2006; 2007-2011; and 2012-2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

1998-2001	2002-2006	2007-2011	2012-2016
Vermilion Snapper	Vermilion Snapper	Vermilion Snapper	Vermilion Snapper
Gag Grouper	Gag Grouper	Gag Grouper	Gag Grouper
Golden Tilefish	Black Sea Bass	Red Grouper	Golden Tilefish
Black Sea Bass	Red Grouper	Black Sea Bass	Black Sea Bass
Snowy Grouper	Golden Tilefish	Black Grouper	Gray Triggerfish
	Snowy Grouper	Gray Triggerfish	Snowy Grouper
			Greater Amberjack

*Data for Gray Triggerfish is only available from the data source for years 2005 through 2016, but it is likely that Gray Triggerfish has been a key species since 1998.

Southern South Carolina and Georgia

For the analyses in this report, Southern South Carolina and Georgia were combined due to similarities and also to maintain confidentiality of data for a relatively small number of participants. This area includes the South Carolina counties of Charleston, Colleton and Beaufort and all coastal counties of Georgia. The key Snapper Grouper communities in this area include McClellanville (SC), Charleston (SC), and Townsend (GA) (**Figure 1-5**). About 20% of the Southern South Carolina vessels have federal commercial Dolphin/Wahoo, King Mackerel and Spanish Mackerel permits, and most Georgia vessels have the other federal commercial finfish permits. About 30% of the vessels have federal charter/headboat permits for South Atlantic Snapper Grouper, Atlantic Dolphin/Wahoo, and Atlantic CMP.

[Insert Figure]
Figure 1-5. Map of Southern South Carolina and Georgia Snapper Grouper communities

The key Snapper Grouper species in this area are similar to Northern South Carolina, with a majority of the commercial snapper grouper landings coming from vermilion snapper, gag grouper and black sea bass (**Table 1-5**). These species have been the fundamental species on Snapper Grouper trips throughout the time period. Most vessels in this area use electric gear, with longer trips of an average 5 days.

Table 1-5. Key Snapper Grouper species landed in Southern South Carolina and Georgia for 1998-2001; 2002-2006; 2007-2011; and 2012-2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

1998-2001	2002-2006	2007-2011	2012-2016
Vermilion Snapper	Vermilion Snapper	Vermilion Snapper	Vermilion Snapper
Gag Grouper	Gag Grouper	Gag Grouper	Black Sea Bass
Black Sea Bass	Snowy Grouper	Black Sea Bass	Gag Grouper
Red Snapper	Red Snapper	Red Snapper	Golden Tilefish
	Golden Tilefish		Greater Amberjack
	Black Sea Bass		Gray Triggerfish

Florida

North Florida

This area includes Nassau, Duval, St. Johns, and Volusia counties in Florida. The key Snapper Grouper communities in this area include Jacksonville, Mayport, St. Augustine, Daytona Beach, Port Orange and Ponce Inlet (**Figure 1-6**). There are approximately 60 Snapper Grouper permitted vessels in this area. More than 50% of the vessels also have federal commercial Dolphin/Wahoo, King Mackerel and Spanish Mackerel permits, and about 25% of the vessels have the federal charter/headboat permits for South Atlantic Snapper Grouper, Atlantic Dolphin/Wahoo, and Atlantic CMP.

[Insert Figure]
Figure 1-6. Map of North Florida Snapper Grouper communities

Similar to the key Snapper Grouper species in South Carolina and Georgia communities, a majority of the commercial Snapper Grouper landings are vermilion snapper, gag grouper, golden tilefish, greater amberjack, black sea bass and gray triggerfish (**Table 1-6**). Red snapper was a key species until the 2010 closure. There are more trips with hook and line in this area than in the Carolinas or Georgia, but almost 50% of trips use electric gear. Most vessels take day trips, with some vessels taking trips that last 2-3 days.

Table 1-6. Key Snapper Grouper species landed in North Florida for 1998-2001; 2002-2006; 2007-2011; and 2012-2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

1998-2001	2002-2006	2007-2011	2012-2016
Gag Grouper	Vermilion Snapper	Vermilion Snapper	Vermilion Snapper
Vermilion Snapper	Gag Grouper	Red Snapper	Golden Tilefish
Golden Tilefish	Red Snapper	Gag Grouper	Greater Amberjack
Greater Amberjack	Golden Tilefish	Golden Tilefish	Gag Grouper
Red Snapper	Greater Amberjack	Greater Amberjack	Gray Triggerfish
Snowy Grouper	Snowy Grouper	Black Sea Bass	Red Porgy
		Gray Triggerfish	Black Sea Bass

Central Florida

This area includes Brevard, Indian River, St. Lucie and Martin Counties in Florida. The key Snapper Grouper communities in this area include Titusville, Port Canaveral, Cocoa Beach, Sebastien, Vero Beach, Fort Pierce, Stuart, and Port Salerno (**Figure 1-7**). There are approximately 60 Snapper Grouper permitted vessels in this area and about two-thirds of the vessels also have federal commercial Dolphin/Wahoo, King Mackerel and Spanish Mackerel permits. Approximately 30% of the vessels also have federal charter/headboat permits for South Atlantic Snapper Grouper, Atlantic Dolphin/Wahoo, and Atlantic CMP.

[Insert Figure]
Figure 1-7. Map of Central Florida Snapper Grouper communities

Golden tilefish dominates Snapper Grouper landings in Central Florida, which is a primary are for the golden tilefish longline fishery, followed by gag grouper (**Table 1-7**). Red snapper was a key species until the 2010 closure. Electric, longline and hook and line gear are used by most vessels and most trips are 1-2 days.

Table 1-7. Key Snapper Grouper species landed in Central Florida for 1998-2001; 2002-2006; 2007-2011; and 2012-2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

1998-2001	2002-2006	2007-2011	2012-2016
Golden Tilefish	Golden Tilefish	Golden Tilefish	Golden Tilefish
Gag Grouper	Gag Grouper	Gag Grouper	Gag Grouper
Greater Amberjack	Greater Amberjack	Greater Amberjack	Greater Amberjack
Snowy Grouper	Red Snapper	Red Snapper	Snowy Grouper
Red Snapper	Snowy Grouper	Snowy Grouper	

South Florida

This area includes the Florida counties of Palm Beach, Broward and Miami-Dade. The key Snapper Grouper communities in this area include Miami/Hialeah, Jupiter, and Boynton Beach (**Figure 1-8**). There are a little over 100 Snapper Grouper permitted vessels in this area and about two-thirds of the vessels also have federal commercial Dolphin/Wahoo, King Mackerel and Spanish Mackerel permits. Approximately 15% of the vessels also have federal charter permits for Atlantic Snapper Grouper, Atlantic Dolphin/Wahoo, and Atlantic CMP.

[Insert Figure]
Figure 1-8. Map of South Florida Snapper Grouper communities

Yellowtail snapper makes up a majority of Snapper Grouper landings in South Florida, and the key snapper grouper species for this area have changed little since 1998 (**Table 1-8**). Hook and line is the most frequently used gear, but there are also trips with electric or trolling gear in this area. Most vessels take day trips.

Table 1-8. Key Snapper Grouper species landed in South Florida for 1998-2001; 2002-2006; 2007-2011; and 2012-2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017.

1998-2001	2002-2006	2007-2011	2012-2016
Yellowtail Snapper	Yellowtail Snapper	Yellowtail Snapper	Yellowtail Snapper
Greater Amberjack	Greater Amberjack	Greater Amberjack	Greater Amberjack
Gag Grouper	Gag Grouper	Gag Grouper	Gag Grouper
Golden Tilefish	Golden Tilefish	Golden Tilefish	Golden Tilefish
Black Grouper	Black Grouper	Black Grouper	Black Grouper
Snowy Grouper	Snowy Grouper	Snowy Grouper	Snowy Grouper
		Vermilion Snapper	Vermilion Snapper

Florida Keys

This area includes Monroe County, Florida, and the key communities are Key Largo, Tavernier, Islamorada, Big Pine Key, Marathon, Summerland Key, Stock Island and Key West, although commercial Snapper Grouper vessels are homeported in smaller communities throughout the Keys (**Figure 1-9**). The Florida Keys has the highest number of Snapper Grouper permits (over 40%) and Snapper Grouper landings in the South Atlantic region. A majority of the vessels also have at least one other federal commercial permit (Dolphin/Wahoo, King Mackerel and Spanish

Mackerel permits) and many participate in the Florida spiny lobster fishery. Approximately 15% of the vessels have federal charter/headboat permits for Atlantic Snapper Grouper, Atlantic Dolphin/Wahoo, and Atlantic CMP in addition to a commercial Snapper Grouper permit.

[Insert Figure]
Figure 1-9. Map of South Florida Snapper Grouper communities

Yellowtail snapper dominates landings in the Florida Keys, and greater amberjack, black grouper, snowy grouper and red grouper have been key species since 1998. Golden tilefish recently became a key species for this area (**Table 1-9**). Most vessels use hook and line gear on day trips.

Table 1-9. Key Snapper Grouper species landed in the Florida for 1998-2001; 2002-2006; 2007-2011; and 2012-2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017.

1998-2001	2002-2006	2007-2011	2012-2016
Yellowtail Snapper	Yellowtail Snapper	Yellowtail Snapper	Yellowtail Snapper
Greater Amberjack	Greater Amberjack	Greater Amberjack	Greater Amberjack
Black Grouper	Black Grouper	Black Grouper	Black Grouper
Snowy Grouper	Snowy Grouper	Snowy Grouper	Golden Tilefish
Red Grouper	Red Grouper	Red Grouper	Snowy Grouper
			Red Grouper

Chapter 2. Permits

To commercially harvest species in the South Atlantic Snapper Grouper management unit in federal waters, a vessel must obtain a federal South Atlantic Snapper Grouper Unlimited commercial permit (SG1) or a federal South Atlantic Snapper Grouper Limited commercial permit (SG2). Snapper Grouper Amendment 4 (SAFMC 1991) established the initial permit requirement for commercial harvest, with open access permits obtained from the NOAA Fisheries Service (NMFS) each year.

Snapper Grouper Amendment 8 (SAFMC 1997) established the current limited entry system to address concerns about excess capacity, and potential negative effects on the stock from growth in the commercial sector. The amendment specified that commercial permits would be issued to vessels with any Snapper Grouper landings in 1993, 1994, 1995 or 1996, and that had a valid commercial permit during the period of February 11, 1996, through February 11, 1997. The limited entry system became effective in December 1998.

Amendment 8 established two types of commercial Snapper Grouper permits: Unlimited (SG1) and Limited (SG2). Analysis of the proposed measures indicated that 1,075 vessels met the minimum of 1,000 lbs in any of the qualifying years and were expected to qualify for SG1 permits, and 448 vessels would be expected to be issued SG2 permits through the initial qualifications but not the 1,000-lb requirement.

SG1 and SG2 permits differ in harvest limits and transferability. A vessel with an SG1 permit can harvest to the full commercial trip limits for all Snapper Grouper species, and a vessel with an SG2 permit is limited to 225 lbs total of Snapper Grouper species per trip. SG1 permits are transferable but a new entrant must purchase two SG1 permits from other permit holders in order to be issued an SG1 for the new entrant's vessel, with exceptions for transfers between vessels under the same owner, to immediate family members, or from an individual to his/her corporation. Additionally, an SG1 permit held by a corporation is not subject to the two-for-one requirement if the corporation is sold with the SG1 permit to an immediate family member. SG2 permits are not transferable except to a different vessel under the same owner or to an immediate family member. Both types of permits are not reissued if revoked or not renewed within one year of the expiration date[1]. These transferability provisions were established to reduce the number of permits over time but still allow a way for new entrants to obtain permits.

Additionally, Amendment 15B (SAFMC 2008A) specified that an SG1 or SG2 permit could be transferred from an individual to an incorporated fishing business, as long as that individual or an immediate family member was listed on original documentation of incorporation of the fishing business. This allowed permit holders (or their immediate family members) to establish a corporation and transfer SG1 and SG2 permits to the corporation without needing to purchase an additional SG1 permit or to bypass the non-transferability of the SG2 permit. However, if the corporation with the permit is transferred to an individual who is not an immediate family member of the corporation's shareholder, this would be subject to the two-for-one requirement.

[1] Amendment 8 established the renewal grace period as 60 days after the expiration date, but Amendment 15B (SAFMC 2008) revised the grace period to be one year.

Overview of Permits

As of January 5, 2018, there are 541 valid or renewable Snapper Grouper Unlimited (SG1) commercial permits, and 110 valid or renewable Snapper Grouper Limited (SG2) commercial permits. **Table 2-1** shows the number of permits by area/state for data accessed on January 1, 2018 from the SERO website[2].

Table 2-1. Distribution of Snapper Grouper Unlimited (SG1) and Limited (SG2) permits as of January 2018.

Area	SG1 Permits	SG2 Permits
Mid-Atlantic	3	2
North Carolina	110	11
Northern NC	17	3
Central NC	65	6
Southern NC	28	2
South Carolina	52	1
Northern SC	40	
Southern SC	12	1
Georgia	7	
Florida – East Coast	166	57
Northern FLE	58	3
Central FLE	45	12
Southern FLE	63	42
Florida Keys	189	30
Florida – West Coast	11	9
Gulf (not including Florida West Coast)	3	
TOTAL	**541**	**110**

Following implementation of the limited entry program for federal commercial Snapper Grouper permits, the number of permits has followed the expected decrease over time (**Figure 2-1**). The SG1 permits have decreased approximately 40% when compared to the number of SG1 permits in 1999. The decrease is due primarily to the requirement to purchase two SG1 permits for new entrants, but some permits have been retired because they were not renewed in time (discussed in detail in the next section). Data indicate that the "dip" in SG1 permits in 2006 was associated with a lower number of permits being renewed in the Florida Keys for that year, although most of these permits were renewed in the following year.

[2] Permits records are available at: http://sero.nmfs.noaa.gov/operations_management_information_services/constituency_services_branch/freedom_of_information_act/common_foia/index.html

Because SG2 permits are non-transferable, the permits are retired as the permit holder exits the fishery unless the permit is transferred to a family member. The number of SG2 permits has decreased by about 60% since 1999, with almost all of the decrease (53%) occurring between 1999 and 2006.

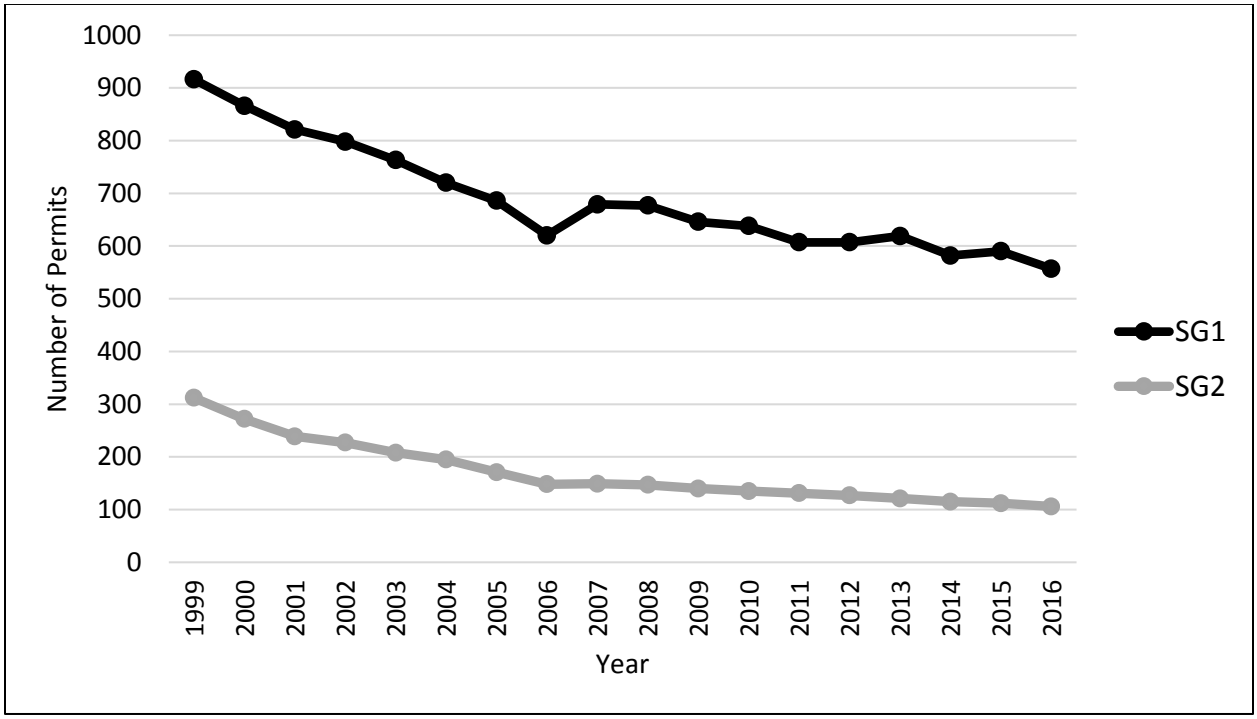

Figure 2-1. Number of valid or renewable Snapper Grouper Unlimited (SG1) and Snapper Grouper Limited (SG2) permits from 1999 through 2016.

Snapper Grouper Unlimited (SG1) Permits

This section provides detailed information on SG1 permits using permits records from 1998 through 2016, provided by the Permits Office at the NMFS Southeast Regional Office. **Figure 2-2** presents the geographic distribution of SG1 permits by area, based on the homeport state for the vessel associated with the permit. Due to the passive reduction of SG1 permits established by the limited entry program, each area has experienced a decrease in the number of permits over time. **Figure 2-3** displays the proportion of total SG1 permits by area. However, there has been minimal change in the overall proportion of permits by area (**Figure 2-3**). The largest proportion of permits has been associated with vessels in Florida throughout the time period, particularly with a large number in the Florida Keys.

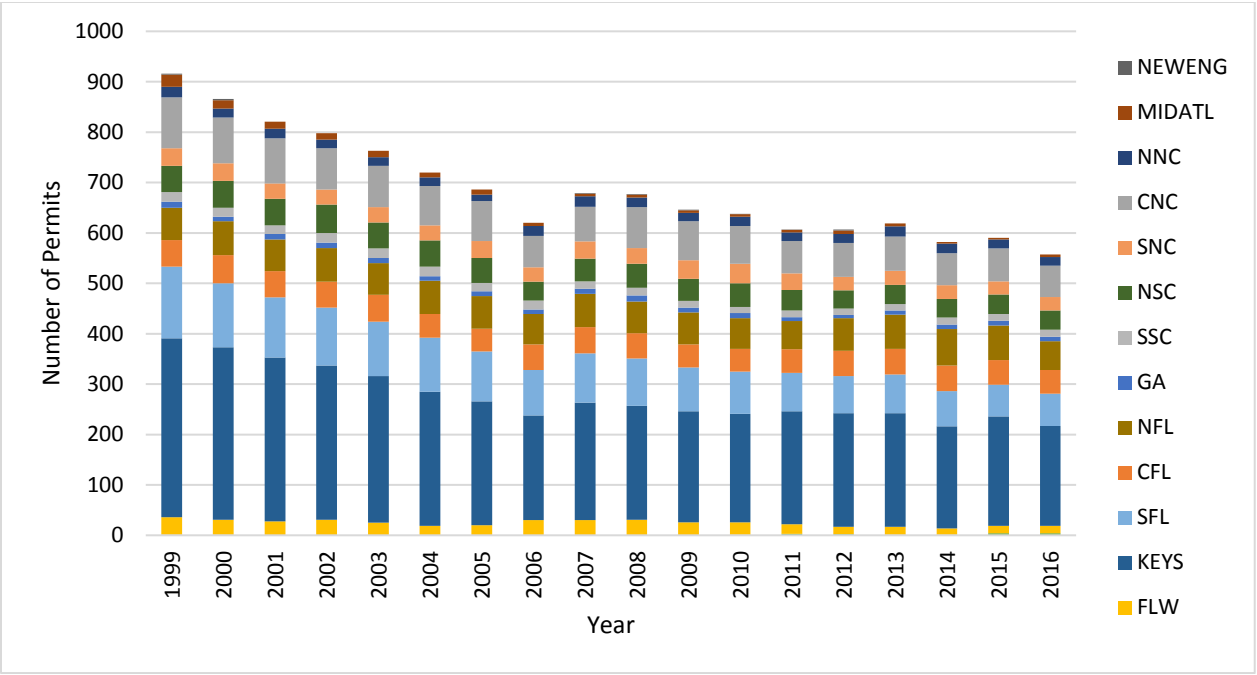

Figure 2-2. Snapper Grouper Unlimited (SG1) permits by homeport area/state from 1999 through 2016

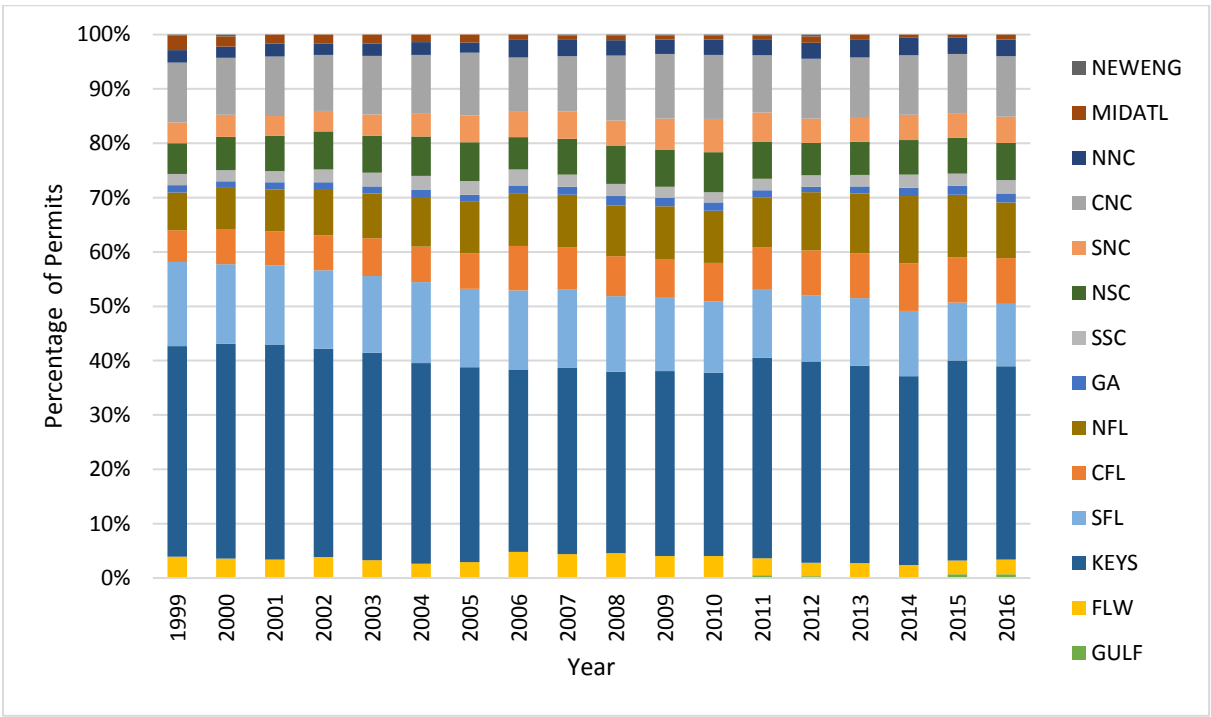

Figure 2-3. Proportion of total Snapper Grouper Unlimited (SG1) permits by homeport area/state from 1999 through 2016

The number of SG1 permits that are held by an incorporated entity has increased over time (**Figure 2-4; Table 2-2**). In 1999, less than 17% of SG1 permits were held by corporations. The proportion increased to almost 45% in 2016.

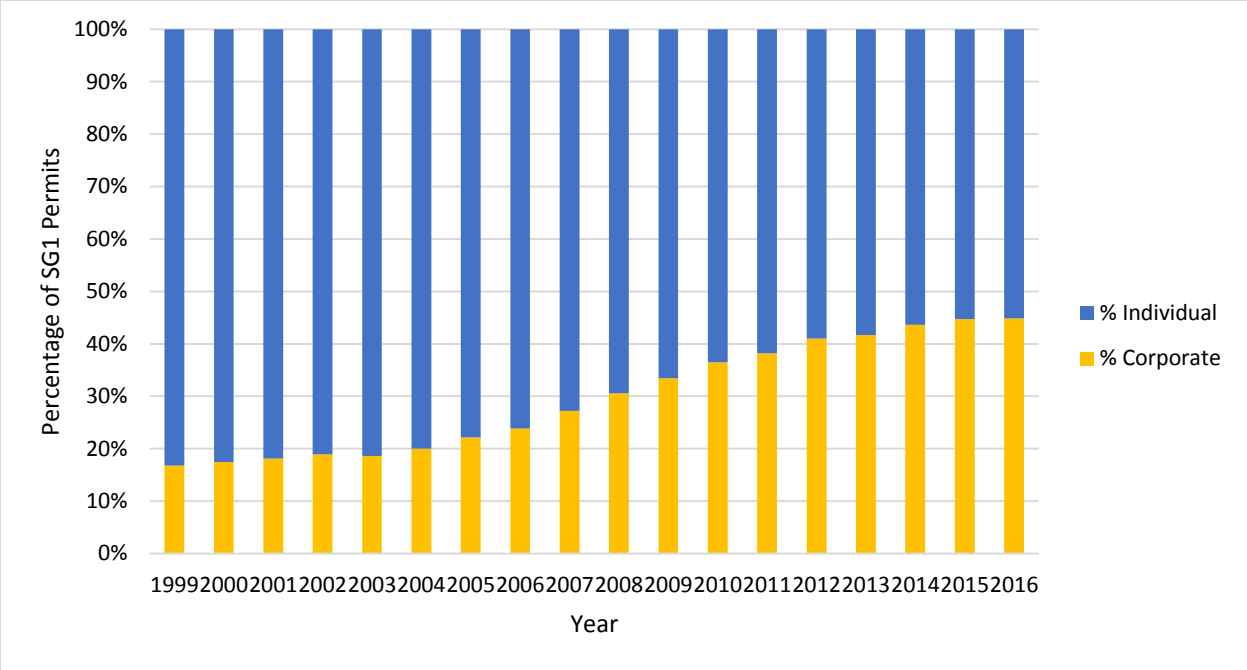

Figure 2-4. Proportions of total SG1 permits that are held by individuals and corporations 1998-2016

Table 2-2. Number of SG1 permits held by corporate and non-corporate entities from 1998-2016

Year	Corporate	Non-Corporate	TOTAL
1998	122	647	769
1999	129	701	830
2000	153	724	877
2001	130	633	763
2002	171	697	868
2003	154	640	794
2004	173	690	863
2005	150	505	655
2006	148	472	620
2007	186	495	681
2008	210	471	681
2009	218	430	648
2010	234	405	639
2011	235	375	610
2012	253	359	612
2013	260	362	622
2014	256	329	585
2015	267	327	594
2016	252	308	560

Snapper Grouper Limited (SG2) Permits

This section provides detailed information on SG2 permits using permits records from 1998 through 2016, provided by the Permits Office at the NMFS Southeast Regional Office. **Figure 2-5** shows the number of geographic distribution of SG2 permits over the last 18 years. Similar to SG1 permits, each area has experienced a decrease in permits as participants exited the fishery and the permits were retired.

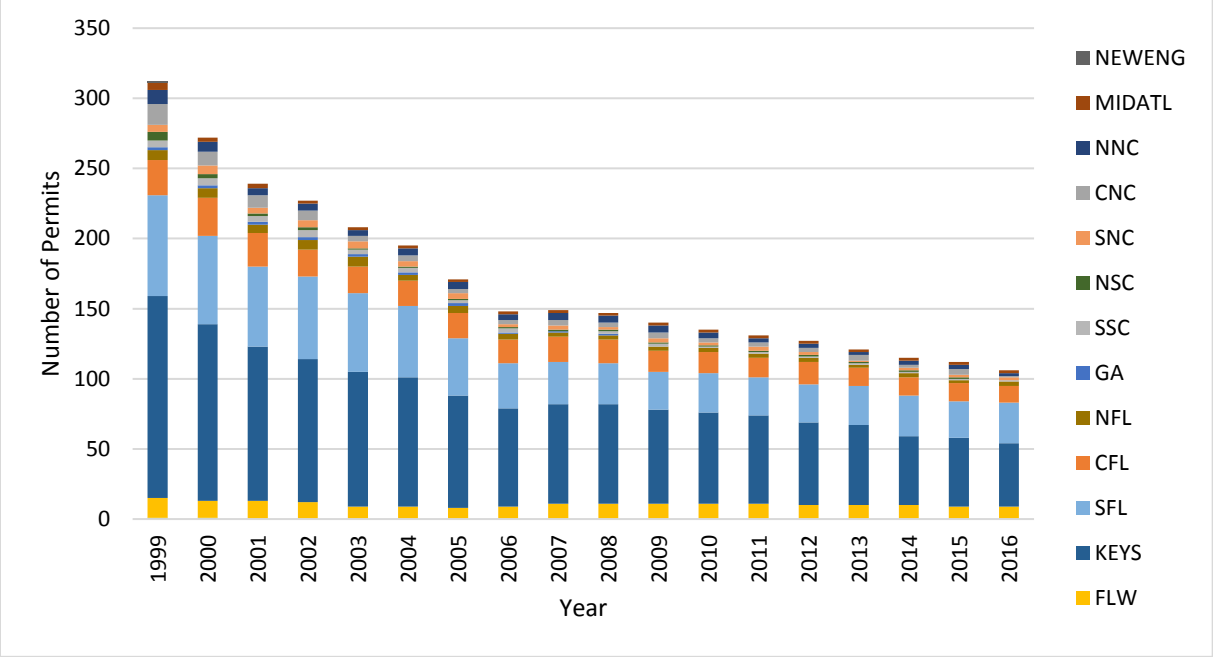

Figure 2-5. Snapper Grouper Limited (SG2) permits by homeport area/state from 1999 through 2016

For SG2 permits, the proportion held by corporations has not increased as much as corporate SG1 permits (**Figure 2-6**; **Table 2-3**). Since 1999, the proportion of corporate permits has increased from about 15% to almost 25% of all SG2 permits.

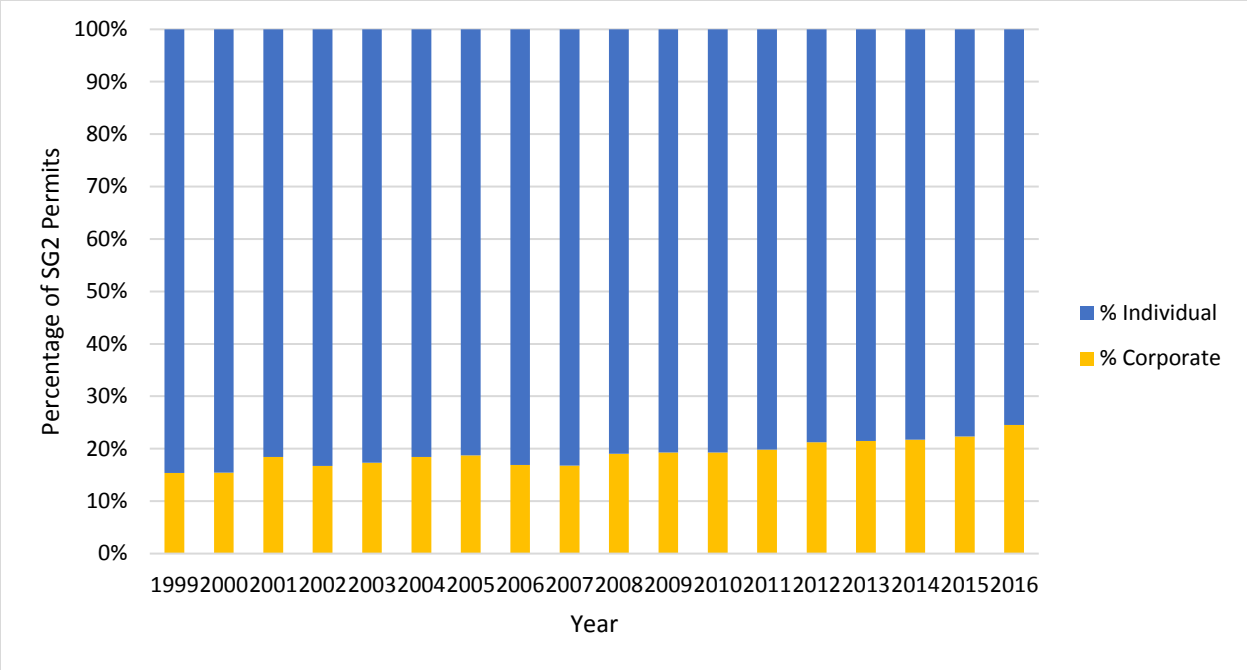

Figure 2-6. Proportions of total SG2 permits that are held by individuals and corporations 1998-2016.

Table 2-3. Number of SG2 permits held by corporate and non-corporate entities from 1998-2016

Year	Corporate	Individual	TOTAL
1998	41	231	272
1999	47	251	298
2000	44	239	283
2001	47	210	257
2002	50	211	261
2003	47	200	247
2004	41	204	245
2005	33	148	181
2006	25	123	148
2007	25	124	149
2008	28	119	147
2009	27	113	140
2010	26	109	135
2011	26	105	131
2012	27	100	127
2013	26	95	121
2014	25	90	115
2015	25	87	112
2016	26	80	106

Permit Portfolios

Snapper Grouper Unlimited (SG1) and Limited (SG2) permit holders commonly have several other permits associated with the vessel, which allows the vessel to harvest different species throughout the year or from year to year. This section provides detailed information on SG1 and SG2 permitted vessels using permits records from 1998 through 2016, provided by the Permits Office at the NMFS Southeast Regional Office. Information on Florida Spiny Lobster Endorsements was provided by the Florida Fish and Wildlife Conservation Commission (FWC) and included permit records from 2005 through 2016[3].

Analysis of the permit portfolios for South Atlantic SG1 and SG2 permitted vessels includes 27 other federal commercial and for-hire permits, including Gulf of Mexico, Caribbean, and Highly Migratory Species (HMS) permits (**Table 2-4**). There are additional federal permits that are not associated with any Snapper Grouper permitted vessels, including South Atlantic Rock Shrimp Limited Access (GA/FL exclusive economic zone (EEZ)), South Atlantic Golden Crab, Gulf Historical Captain Charter/Headboat for Coastal Migratory Pelagics (CMP) and Reef Fish, and Gulf Shrimp.

Table 2-4. Federal permits included in the permit portfolio analysis

Permit	Access
Atlantic/South Atlantic Commercial	
Snapper Grouper Unlimited (SG1)	Limited
South Atlantic 225-lb Limited (SG2)	Limited
Atlantic Dolphin/Wahoo (ADW)	Open
South Atlantic Rock Shrimp - GA and FL (RSLA)	Limited
South Atlantic Rock Shrimp – NC and SC (RSCZ)	Open
South Atlantic Penaeid Shrimp (SPA)	Open
South Atlantic Sea Bass Pot Endorsement (SBPE)	Limited
South Atlantic Golden Tilefish Longline Endorsement (GTFE)	Limited
South Atlantic Wreckfish (WF)	Open, requires WF ITQ
Atlantic/South Atlantic Charter and Headboat	
Atlantic Dolphin Wahoo (CDW)	Open
Atlantic Coastal Migratory Pelagics (CHS)	Open
South Atlantic Snapper Grouper (SC)	Open
Gulf of Mexico/Atlantic Commercial	
King Mackerel (KM)	Limited
King Mackerel Gillnet (GN)	Limited
Spanish Mackerel (SM)	Open
Florida Spiny Lobster	Open, requires Florida RS
Spiny Lobster (LC)- outside of FL EEZ	Open
Spiny Lobster Tailing (LT)	Open, requires LC/ FLSPL
Gulf of Mexico Commercial	
Gulf of Mexico Reef Fish (RR)	Limited
Eastern Gulf of Mexico Reef Fish Bottom Longline Endorsement (RRLE)	Limited

[3] Florida Spiny Lobster Endorsement records for only 2005 through 2016 were requested for the project, but as analysis progressed, additional years were added for permit portfolio analysis. Time restraints for this report did not allow another data request to FWC. An expanded analysis could incorporate the earlier Florida Spiny Lobster Endorsement information.

Table 2-4, continued

Gulf of Mexico Charter and Headboat	
Gulf Coastal Migratory Pelagics (CHG)	Limited
Gulf Reef Fish (RCG)	Limited
Highly Migratory Species (HMS) Commercial	
Atlantic Tuna Longline	Limited
Atlantic Swordfish Directed (SFD)	Limited
Atlantic Swordfish Handgear (SFH)	Limited
Atlantic Swordfish Incidental (SFI)	Limited
Atlantic Shark Directed (SKD)	Limited
Atlantic Shark Incidental (SKI)	Limited
Atlantic Smooth Hound Shark (SHS)	Open
Caribbean Small Boat (CCSB)	Open

Federal commercial and charter/headboat permits are required to harvest the species/complex in the EEZ in the management area. For spiny lobster harvested in the EEZ off Florida, an individual must hold a Florida Saltwater Products License, a Florida Restricted Species endorsement, and a Spiny Lobster "C" endorsement (for traps) or "CD" endorsement (for diving)[4].

This analysis examines permit portfolios using permit data from 2007, 2011 and 2016 including Florida spiny lobster trap and diving endorsements, provided by the NOAA Fisheries Southeast Regional Office and FWC. These years were selected because this set includes the most recent year of data in the permits data (2016), and years after major regulatory actions (2011 and 2007), and these years are included in the range of the permits data that incorporates Spiny Lobster endorsement information. Two-mode network analysis was used to identify the permit portfolios, and is explained in more detail in **Appendix A**.

2016- Snapper Grouper Unlimited (SG1)
The 2016 SG1 permit analysis included 556 vessels with 27 permits in addition to the SG1 permit. Most vessels had between 3-5 permits, including SG1. The most permits associated with a vessel was 14 permits (two vessels had this number). There was little variation by area or corporate versus non-corporate. About 4% of vessels had only the SG1 permit.

[4] Spiny lobster is the only species under a federal management plan in the southeast region that includes a state-issued license as an equivalent to a federal permit. Almost all of the annual spiny lobster landings are in Florida, and the state provides landings for annual catch limit (ACL) monitoring.

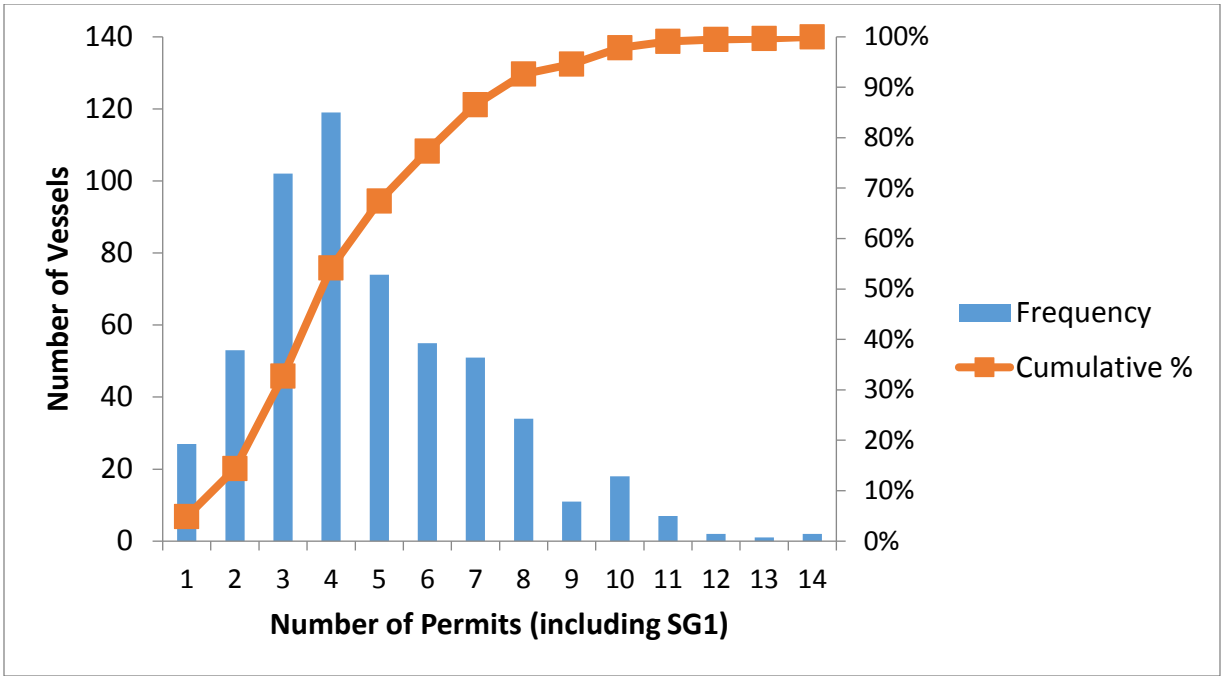

Figure 2-7. Frequency distribution of number of permits for SG1-permitted vessels in 2016.

A large majority of SG1 permitted vessels (81%) had a Commercial Dolphin/Wahoo permit, followed by Commercial Spanish Mackerel (66.2%) and Commercial King Mackerel (58.3%). It is likely that the relatively low cost along with open access contributes to the high percentage of commercial Dolphin/Wahoo and Spanish Mackerel permits on SG1 vessels. A little over 20% of vessels also had at least one of the federal charter/headboat permits for Atlantic Dolphin/Wahoo, Atlantic CMP, or South Atlantic Snapper Grouper (**Table 2-5**).

Table 2-5. Percentage of SG1 permitted vessels with other federal permits associated with the vessel in 2016

Permit Name	Percentage of SG1 vessels
Commercial South Atlantic Unlimited Snapper Grouper	100.0%
Commercial Atlantic Dolphin/Wahoo	88.1%
Commercial Spanish Mackerel	66.2%
Commercial King Mackerel	58.3%
Charter/Headboat Atlantic Dolphin Wahoo	21.8%
Charter/Headboat South Atlantic Snapper Grouper	21.8%
Charter/Headboat Atlantic Coastal Migratory Pelagics	21.2%
Commercial Florida Spiny Lobster (FL EEZ)	21.0%
Commercial Spiny Lobster Tailing	12.1%
Commercial Gulf of Mexico Reef Fish	11.0%
Commercial Spiny Lobster (Outside FL)	10.8%
Commercial HMS Shark Directed	7.6%
Commercial South Atlantic Sea Bass Pot Endorsement	6.1%
Commercial HMS Shark Incidental	6.1%
Commercial Golden Tile Longline Endorsement	4.1%
Charter/Headboat Gulf of Mexico Coastal Migratory Pelagics	3.6%

Table 2-5, continued	
Commercial South Atlantic Penaeid Shrimp	3.1%
Commercial HMS Atlantic Tuna Longline	2.5%
Charter/Headboat Gulf of Mexico Reef Fish	2.5%
Commercial HMS Smooth Hound Shark	2.0%
Commercial HMS Swordfish Handgear	1.6%
Commercial HMS Swordfish Directed	1.4%
Commercial Wreckfish	1.4%
Commercial HMS Swordfish Incidental	1.3%
Commercial HMS Caribbean Small Boat	0.9%
Commercial South Atlantic Rock Shrimp Carolinas Zone	0.9%
Commercial Eastern Gulf Reef Fish Bottom Longline Endorsement	0.7%
Commercial King Mackerel Gillnet	0.4%

The most prominent portfolio for SG1 permitted vessels included the commercial permits for Dolphin/Wahoo (ADW) and Spanish Mackerel (SM), with two-thirds of the vessels having the combination of SG1, ADW, and SM permits (**Table 2-6**). The next most common portfolio added the commercial King Mackerel (KM) permit (42.9%), followed by 20.5% with a permit combination with all three Atlantic/South Atlantic charter headboat permits for Dolphin/Wahoo (CDW), CMP (CHS), and Snapper Grouper (SC) or with the Florida Spiny Lobster Commercial Endorsement (21%). A majority of the vessels had 3-5 permits. The most common permits not included in the most common portfolios were the Commercial Spiny Lobster permit and Spiny Lobster Tailing permit, or the Gulf Reef Fish permit.

Table 2-6. Proportion of SG1-permitted vessels with the most common portfolios by area for 2016

	ADW/ SM	**ADW/ SM/ KM**	**CDW/ CHS/ CS**
TOTAL	63.7%	42.9%	20.5%
North Carolina			
North	88.2%	82.4%	17.6%
Central	48.4%	38.7%	29.0%
South	55.6%	44.4%	18.5%
South Carolina			
North	34.2%	23.7%	34.2%
South	21.4%	7.1%	28.6%
Georgia	77.8%	55.6%	11.1%
Florida			
North	58.9%	35.7%	26.8%
Central	72.3%	61.7%	29.8%
South	79.7%	64.1%	14.1%
Keys	71.7%	41.9%	13.1%
Other Regions	45.8%	20.8%	25.0%

Distribution of the common portfolios were not uniform across the region (**Table 2-6**). Northern North Carolina, Georgia, Central Florida, South Florida and the Florida Keys had the highest proportions of vessels with ADW/SM permits. Overall, the percentage of vessels with the ADW/SM/KM portfolio decreased in all areas except for Northern North Carolina. For the Charter/Headboat portfolio in addition to SG1 permits, the highest proportions of vessels were in Central North Carolina, South Carolina, and Northern and Central Florida areas. Only 15% of vessels had both the ADW/SM combination and CDW/CHS/CS combination, suggesting that vessels with the Charter/Headboat portfolio had minimal participation in commercial fisheries other than snapper grouper.

2016- Snapper Grouper Limited (SG2)

The 2016 SG2 permit analysis included 106 vessels and 20 permits in addition to the SG2 permit. Most vessels had four permits, including SG2 (**Figure 2-8**). The most permits associated with a vessel was 11 permits (one vessel). Similar to the analysis for SG -permitted vessels, there was little variation by area or corporate v non-corporate. About seven of the vessels had only the SG2 permit.

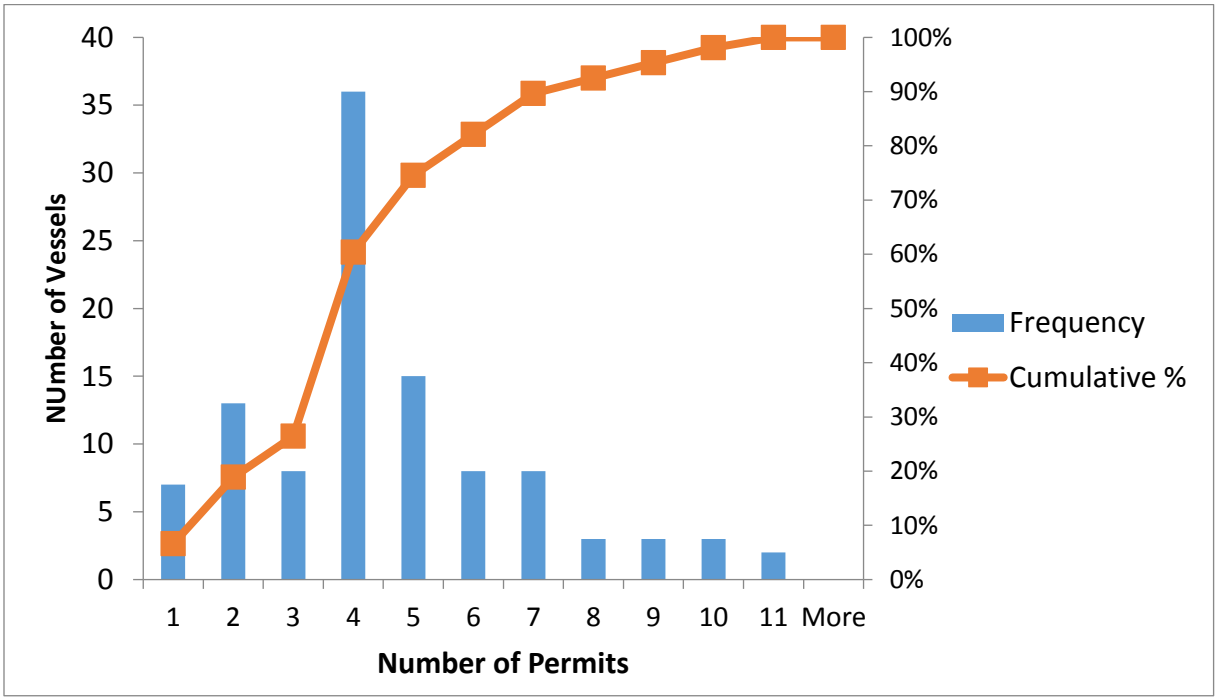

Figure 2-8. Frequency distribution of number of permits for SG2-permitted vessels in 2016

Similar to SG1 permitted vessels, a large majority of SG2 permitted vessels (80%) had a Commercial Dolphin/Wahoo permit, followed by Commercial Spanish Mackerel (70.8%) and Commercial King Mackerel (47.2%). Over 20% of vessels also had at least one of the Atlantic/South Atlantic charter/headboat permits (**Table 2-7**).

Table 2-7. Percentage of SG2-permitted vessels with other federal permits associated with the vessel in 2016

Permit Name	Percentage of SG2 vessels
Commercial Atlantic Dolphin/Wahoo	80.2%
Commercial Spanish Mackerel	70.8%
Commercial King Mackerel	47.2%
Commercial Florida Spiny Lobster (FL EEZ)	31.1%
Charter/Headboat Atlantic Dolphin Wahoo	23.6%
Charter/Headboat South Atlantic Snapper Grouper	23.6%
Charter/Headboat Atlantic Coastal Migratory Pelagics	22.6%
Commercial Spiny Lobster Tailing	10.4%
Commercial Spiny Lobster (Outside FL)	7.5%
Charter/Headboat Gulf of Mexico Coastal Migratory Pelagics	6.6%
Commercial HMS Shark Incidental	6.6%
Charter/Headboat Gulf of Mexico Reef Fish	5.7%
Commercial HMS Atlantic Tuna Longline	3.8%
Commercial Gulf of Mexico Reef Fish	3.8%
Commercial HMS Shark Directed	3.8%
Commercial HMS Swordfish Directed	3.8%
Commercial South Atlantic Penaeid Shrimp	2.8%
Commercial South Atlantic Rock Shrimp Carolinas Zone	0.9%
Commercial HMS Swordfish Incidental	0.9%
Commercial HMS Smooth Hound Shark	0.9%

The portfolios for SG2 permitted vessels were similar to SG1 permitted vessels. The most prominent portfolio included the commercial permits for Dolphin/Wahoo (ADW) and Spanish Mackerel (SM), with over 60% of the vessels having the combination of SG1, ADW, and SM permits (**Table 2-8**). The next most common portfolio added the commercial King Mackerel (KM) permit (40%), or included the Florida Spiny Lobster Commercial Endorsement (31%). Some SG2-permitted vessels also had a permit portfolio with the three Atlantic/South Atlantic charter headboat permits (CDW, CHS, SC) (22.6%) As noted above, a majority of the vessels had four permits. The most common permits not included in the top three portfolios were the Florida Spiny Lobster endorsement or one charter/headboat permit in the Atlantic or Gulf.

Table 2-8. Proportion of SG2 permitted vessels with the most common portfolios by area for 2016.

	ADW/ SM	ADW/ SM/ KM	CDW/ CHS/ CS
TOTAL	63.2%	40.6%	22.6%
Carolinas[1]	33%	33.3%	66.7%
Florida East Coast	81.8%	65.9%	15.9%
Florida Keys	46.7%	20%	22.2%
Other Regions	72.7%	27.3%	27.3%

[1]There are 12 SG2 permits in North Carolina and South Carolina, so these areas were combined. There are SG2 permits in Georgia.

Distribution of the common portfolios were not uniform across the region (**Table 2-8**). The Florida east coast had the highest proportions of vessels with ADW/SM permits. Overall, the area proportions of vessels with ADW/SM/KM combinations dropped, except for North Carolina and South Carolina. For the Charter/Headboat portfolio in addition to SG1 permits, the highest proportions of vessels were in North Carolina and South Carolina. Only 15% of vessels had both the ADW/SM combination and CDW/CHS/CS combination, suggesting that vessels with the Charter/Headboat portfolio had minimal participation in commercial fisheries other than snapper grouper.

Portfolio Changes

Permits held by SG1 permitted vessels during 1999, 2005, 2007, and 2011 were compared to permits in 2016. These years were selected because each followed a major regulatory change:

1999- Amendment 8 (Establishment of limited entry for commercial Snapper Grouper permits; SAFMC 1997)

2005- Amendment 13A (Prohibition on fishing for and possessing snapper grouper species within the *Oculina* Experimental Closed Area; SAFMC 2003)

2007- Amendment 13C (Ended overfishing of snowy grouper, vermilion snapper, black sea bass, and golden tilefish; SAFMC 2006)

2011- Amendments 17A and 17B (Annual catch limits for overfished species; closure for South Atlantic red snapper, SAFMC 2010A and 2010B)

Table 2-9 shows the comparison of permits held by SG1 permitted vessels in each year. The most substantial differences are for Commercial Dolphin/Wahoo and Commercial Spanish Mackerel, the two permits that are core to the primary permit portfolio. From 1999 to 2016, the percentage of SG1 permitted vessels with Commercial Dolphin/Wahoo permits increased from 65% to 88%. The proportion of vessels with Commercial Spanish Mackerel permits also increased from 1999 to 2016 from 50% to 66 percent. Commercial King Mackerel permits on SG1 permitted vessels has decreased since 1999 by about 10

percent. Overall, the change in proportions of other permits on SG1 permitted vessels has been minimal since 1999.

Table 2-9. Percentage of SG1 permitted vessels with other federal permits associated with the vessel in 2016, 2011, 2007, 2005 and 1999

Permit Name	2016	2011	2007	2005	1999
Commercial South Atlantic Unlimited Snapper Grouper	100%	100%	100%	83.5%	83.5%
Commercial South Atlantic Unlimited SG with Traps	--	--	--	16.5%	16.5%
Commercial Atlantic Dolphin/Wahoo	88.1%	84.6%	75.9%	65.5%	65.5%
Commercial Spanish Mackerel	66.2%	59.2%	51.3%	50.2%	50.2%
Commercial King Mackerel	58.3%	62.9%	67.6%	69.8%	69.8%
Charter/Headboat Atlantic Dolphin Wahoo	21.8%	21.3%	21.7%	19.0%	19.0%
Charter/Headboat South Atlantic Snapper Grouper	21.8%	23.8%	22.9%	22.8%	22.8%
Charter/Headboat Atlantic Coastal Migratory Pelagics	21.2%	22.3%	21.5%	21.7%	21.7%
Commercial Florida Spiny Lobster (FL EEZ)	21.0%	19.9%	24.1%	*	*
Commercial Spiny Lobster Tailing	12.1%	19.9%	15.7%	14.9%	14.9%
Commercial Gulf of Mexico Reef Fish	11.0%	10.6%	13.9%	16.5%	16.5%
Commercial Spiny Lobster (Outside FL)	10.8%	10.6%	7.9%	6.3%	6.3%
Commercial HMS Shark Directed	7.6%	8.3%	7.2%	7.2%	7.2%
Commercial South Atlantic Sea Bass Pot Endorsement	6.1%	--	--	--	--
Commercial HMS Shark Incidental	6.1%	8.6%	8.5%	7.6%	7.6%
Commercial Golden Tile Longline Endorsement	4.1%	--	--	--	--
Charter/Headboat Gulf Coastal Migratory Pelagics	3.6%	4.5%	4.7%	6.0%	6.0%
Commercial South Atlantic Penaeid Shrimp	3.1%	3.4%	1.4%	--	--
Commercial HMS Atlantic Tuna Longline	2.5%	4.0%	--	--	--
Charter/Headboat Gulf of Mexico Reef Fish	2.5%	3.0%	2.8%	4.1%	4.1%
Commercial HMS Smooth Hound Shark	2.0%	--	--	--	--
Commercial HMS Swordfish Handgear	1.6%	1.1%	1.6%	1.1%	1.1%
Commercial HMS Swordfish Directed	1.4%	2.3%	2.0%	2.3%	2.3%
Commercial Wreckfish	1.4%	2.5%	--	--	--
Commercial HMS Swordfish Incidental	1.3%	2.2%	2.4%	2.1%	2.1%
Commercial HMS Caribbean Small Boat	0.9%	--	--	--	--
Commercial South Atlantic Rock Shrimp Carolinas Zone	0.9%	1.7%	--	--	--
Commercial Eastern Gulf Reef Fish Bottom LL Endorsement	0.7%	0.6%	--	--	--
Commercial King Mackerel Gillnet	0.4%	1.2%	1.4%	1.5%	1.5%
Commercial Gulf Red Snapper License 2	--	--	--	3.9%	3.9%
Commercial Gulf of Mexico Shrimp	--	0.2%	0.3%	--	--
Commercial South Atlantic Rock Shrimp (before LA and CZ)	--	--	1.3%	--	0.7%
Commercial Gulf of Mexico Royal Red Shrimp	--	--	0.1%	--	--
Charter/Headboat Gulf CMP – Historic Captain	--	--	0.1%	0.1%	0.1%
Charter/Headboat Gulf Reef Fish – Historic Captain	--	--	0.1%	0.1%	0.1%

Changes since 1999 are similar for SG2 permitted vessels (**Table 2-10**). The most substantial changes were for Commercial Dolphin/Wahoo, which increased from 57.6% to 80%, and

Commercial Spanish Mackerel (58% to 71% of vessels). The percentage of SG2 permitted vessels with Commercial King Mackerel permits has decreased by about 10% since 1999. Overall, there were no other major differences over the years.

Table 2-10. Percentage of SG2 permitted vessels with other federal permits associated with the vessel in 2016, 2011, 2007, 2005 and 1999

Permit Name	2016	2011	2007	2005	1999
Commercial South Atlantic Unlimited Snapper Grouper	100%	100%	100%	97.7%	94.2%
Commercial South Atlantic Unlimited SG with Traps	--	--	--	2.3%	5.8%
Commercial Atlantic Dolphin/Wahoo	80.2%	76.6%	73.5%	57.6%	--
Commercial Spanish Mackerel	70.8%	63.5%	63.2%	57.6%	57.7%
Commercial King Mackerel	47.2%	46.7%	53.5%	56.4%	59.0%
Commercial Florida Spiny Lobster (FL EEZ)	31.1%	28.5%	34.2%	*	*
Charter/Headboat Atlantic Dolphin Wahoo	23.6%	21.2%	22.6%	19.2%	--
Charter/Headboat South Atlantic Snapper Grouper	23.6%	21.2%	21.3%	22.1%	17.9%
Charter/Headboat Atlantic Coastal Migratory Pelagics	22.6%	19.7%	21.3%	18.0%	--
Commercial Spiny Lobster Tailing	10.4%	11.7%	12.3%	9.3%	10.9%
Commercial Spiny Lobster (Outside FL)	7.5%	7.3%	7.1%	3.5%	9.3%
Charter/Headboat Gulf Coastal Migratory Pelagics	6.6%	7.3%	8.4%	9.3%	--
Commercial HMS Shark Incidental	6.6%	7.3%	5.2%	5.8%	--
Charter/Headboat Gulf of Mexico Reef Fish	5.7%	7.3%	7.1%	7.0%	7.4%
Commercial HMS Atlantic Tuna Longline	3.8%	2.9%	--	--	--
Commercial Gulf of Mexico Reef Fish	3.8%	7.3%	7.7%	12.2%	15.7%
Commercial HMS Shark Directed	3.8%	1.5%	2.6%	1.7%	--
Commercial HMS Swordfish Directed	3.8%	3.6%	1.3%	4.1%	--
Commercial South Atlantic Penaeid Shrimp	2.8%	2.2%	2.6%	--	--
Commercial South Atlantic Rock Shrimp Carolinas Zone	0.9%	1.5%	--	--	--
Commercial HMS Swordfish Incidental	0.9%	1.5%	0.6%	0.6%	--
Commercial HMS Smooth Hound Shark	0.9%	--	--	--	--
Commercial Eastern Gulf Reef Fish Bottom LL Endorsement	--	1.5%	--	--	--
Commercial South Atlantic Rock Shrimp (before LA and CZ)	--	--	1.3%	1.7%	2.6%
Commercial HMS Swordfish Handgear	--	--	1.3%	1.2%	--
Commercial King Mackerel Gillnet	--	--	0.6%	0.6%	0.6%
Commercial Gulf of Mexico Shrimp	--	--	0.6%	--	--
Commercial Gulf Red Snapper License Class 2 (old)	--	--	--	4.1%	3.5%
Commercial Gulf Red Snapper License Class 1 (old)	--	--	--	--	0.3%
Commercial Atlantic Shark (old)	--	--	--	--	19.2%
Commercial Atlantic Swordfish (old)					8.7%
Charter Headboat Coastal Migratory Pelagics (old)					16.3%

Chapter 3. Permit Holders and Permitted Vessel Characteristics

Background on Snapper Grouper Commercial Permits

Following implementation of the limited entry program, qualifying participants were issued Snapper Grouper Unlimited (SG1) or Snapper Grouper Limited (SG2) permits during initial allocation. For a new entrant to obtain an SG1 permit, the individual has to purchase two (non-corporate) permits to be assigned an SG1 permit from the NOAA Fisheries Southeast Regional Office. A new entrant can also buy a corporation that holds an SG1 permit as an asset. SG2 permits are non-transferable, with exceptions for immediate family members, and are not on the market for sale.

The price for an SG1 corporate or non-corporate permit is determined by the permit market. NMFS Southeast Regional Office provided price information collected from transfer applications, which show some increase in prices since 1998. However, the price information is self-reported and voluntary, and often is the price for a vessel and other permits along with the SG1 permit. An additional source of information on SG1 permit cost from North Carolina found that fishermen reported an average cost to enter the fishery at around $14,000, but as high as $60,000, in surveys conducted in 2008-09 (Crosson 2009). A subsequent survey of North Carolina commercial fishermen conducted in 2016 indicated that the average price for an SG1 permits is $31,946 (Personal communication, C. Wiegand, 2018).

Additional price information was collected from online sources. There are few SG1 permit sales advertised online (e.g., fishing forums or Craigslist) or in publications (newspapers, *National Fisherman*, etc.), and it is likely that most sales are initiated because the parties already know one another or are connected through someone else (i.e., word of mouth). An advertised price for a corporate permit in January 2016 was $57,000. Additional old posts were found with advertised prices for corporate permits at $30,000 (2011), $45,000 (2012), and $65,000 (2015). A post out of Jacksonville, Florida, for two non-corporate SG1 permits in October 2017 asked for $65,000 for the pair, and a more recent ad on Craigslist (posted across the region) in January 2018 offered two non-corporate SG1 permits for $40,000 each. Although the final price decided in each negotiation may be lower than the advertised price, the price information online indicates that prices are increasing for corporate and non-corporate SG1 permits. The current cost of obtaining a Snapper Grouper Unlimited (SG1) permit is estimated to be at least $60,000, and may cost up to $80,000. This would be in addition to the costs for a vessel, gear, and other needs and requirements to participate in the commercial fishery.

Additionally, a Craigslist Wilmington (NC) ad offered a corporate SG1 permit and Black Sea Bass pot endorsement for $125,000 in November 2017. Another post asking $47,500 for a Black Sea Bass pot endorsement was found in October 2017. There were no advertisements for Golden Tilefish Longline endorsements found online.

There is also a market for temporary SG1 permits, which involves a one-year assignment of the permit to another entity's vessel but with no changes to the permit holder. This is referred to

"leasing" in fishing communities. There were more advertised "leases" available online than permanent sales, but it is likely that available SG1 "leases" are found via word of mouth. Online posts indicate that an annual "lease" for an SG1 permit is about $6,000 to $8,000. Data are limited on how many permits are "leased" each year.

Permit Histories

Permit data ranging from initial allocation (December 1998) through December 2016 were used to examine how long current permit holders have held SG1 permits. Of the 995 SG1 permits that have existed, 440 permits have been retired due to non-renewal or as part of a two-for-one purchase by a new entrant (**Table 3-1**).

Table 3-1. Status of Snapper Grouper Unlimited (SG1) permits 1998 through 2016

Total Number of SG1 permits that have existed	995
Total Number of SG1 permits numbers retired	440
Total Number of SG1 permits existing in 2016	555

Of the 555 SG1 permits on record in 2016, 239 are assigned to corporate entities (**Table 3-2**). Almost 30% of these corporations have held the permit (as a corporation) since initial allocation. Another third of the corporations have held the incorporated permit for 11-18 years. About 27% of incorporated permits have been held by the same entity for 6-10 years, and about 10% holding the permit for only 1-5 years. It should be noted that it is likely that some permits were incorporated by the same individual or family holding the permit beforehand, but members of each corporation is not included in the permit data to verify this.

Table 3-2. Number of years that current corporate SG1 permit holders have held the permit

Number of years held by the current permit holder	**Number of permits**
All years (since initial allocation)	71
16-18 years	24
11-15 years	45
6-10 years	65
1-5 years	24
Total Number of SG1 corporate permits	**239**

There were 316 non-corporate permits in 2016 (**Table 3-3**). Of the non-corporate permits, 74% have been held by the individual or family to which the permit was initially assigned. About 20% have been held by the same permit holder for 11-18 years, followed by less than 5% for 6-10 years. Only one permit was listed under its current permit holder for five or less years.

Table 3-3. Number of years that current non-corporate SG1 permit holders have held the permit

Number of years held by the current permit holder	**Number of permits**
All years (since initial allocation)	234
16-18 years	30
11-15 years	36
6-10 years	15
1-5 years	1
Total Number of SG1 non-corporate permits	**316**

Permit records indicate that at least 37% were held by multiple family members, as determined by various permit holders listed on the permit in one year or multiple years (designated as 'family permits'). A large proportion (83%) of the family permits have been held by the same family since initial allocation. A majority (69%) of permits assigned to individuals were allocated at the start of the limited entry program.

Permit data ranging from initial allocation (December 1998) through December 2016 were also used to examine how long current permit holders have held SG2 permits. Of the 350 permits that have existed, 235 SG2 permits have been retired due to non-renewal (**Table 3-4**). Because SG2 permits cannot be transferred outside of immediate family members, there are no permits that have been held for shorter time periods by new entrants. Of the 116 SG2 permits in 2016, 23% were held by corporations, 57% by individuals, and about 20% by families.

Table 3-4. Status of Snapper Grouper Limited (SG2) permits 1998 through 2016

Total # SG2 permits that have existed	350
# SG2 permit numbers retired	235
# SG2 permits existing 2016	115
# SG2 permits held by corporations	27
# SG2 permits held by individuals	66
# SG2 permits held by multiple family members	22

Overall, the data indicate that permits are held by individuals or families for extended periods of time, and many of the initially allocated SG1 permits are still held by those individuals or transferred to family members.

Characteristics of Permitted Vessels

Vessel information from 2016 commercial logbook data were used to identify characteristics of vessels. Only vessels with homeports in the South Atlantic region were used for this analysis.

Table 3-5 shows the vessel length, year built, horsepower, hold capacity and fuel capacity for all vessels with snapper grouper landings in 2016 that are associated with a homeport in a South Atlantic state. The average vessel length is 31.3 feet, with the shortest vessel at 9 feet and the largest at 70 feet. The mode (most common) length is 75 feet. The average age of vessels is almost 30 years (built in 1989), with the oldest vessel in the data at almost 65 years old and the newest built just in 2017. Most vessels are about 40 years old (mode year built=1979).

Table 3-5. Features of all vessels with snapper grouper landings in 2016

	Vessel Length (ft)	Year Built	Horsepower	Hold Capacity (lbs)	Fuel Capacity (gal.)
Average	31.3	1989	374	2,851	292
Minimum	9	1954	25	96	5
Maximum	70	2017	1,470	25,000	2500
Mode	25	1979	300	2,000	300

Data source: NOAA Commercial Logbook

The average horsepower of South Atlantic vessels participating in the commercial snapper grouper fishery is 374 hp, with the minimum at 25 and the highest at 1,470 hp. The most common is 300 hp. Hold capacity varied greatly, with an average of 2,851 lbs but ranging from 96 lbs to 25,000 lbs. The mode is 2,000 lbs. Last, there was a large range of fuel capacity measures from 5 gallons to 2,500 gallons, with an average of 292 gallons and a mode of 300 gallons.

Vessel length, vessel age and horsepower were analyzed for variation throughout the region. **Figure 3-1** shows a comparison of lengths of Florida vessels (A) to vessels in Georgia, South Carolina and North Carolina (B). Florida vessels were generally of less length than GA/SC/NC vessels, which aligns with the differences in trip length for the areas (discussed in Chapter 4).

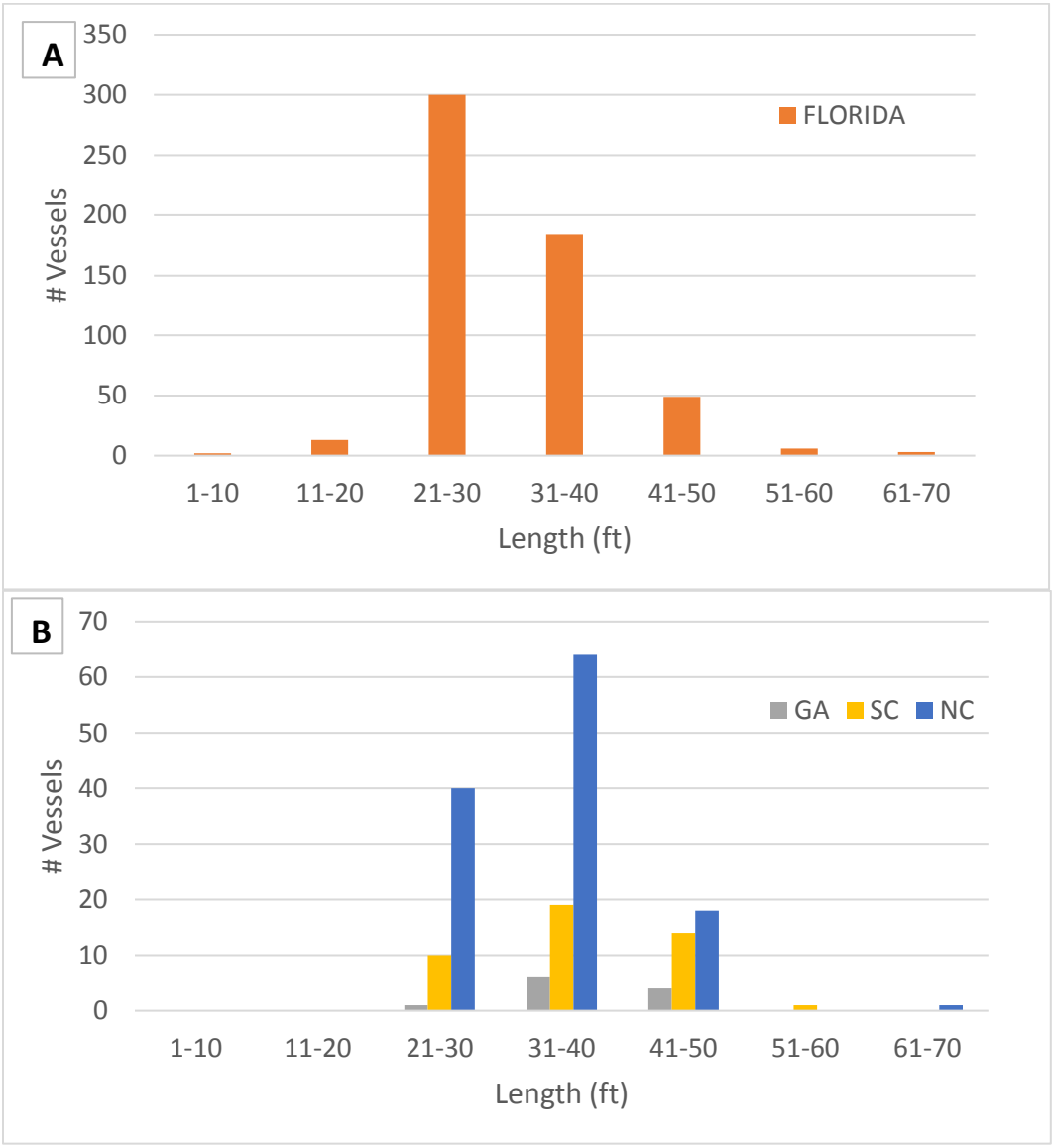

Figure 3-1. Comparison of vessel lengths from Florida (A) and Georgia/South Carolina/North Carolina (B).

Figure 3-2 shows the comparison of vessel ages in Florida (A) and Georgia/South Carolina/North Carolina (B). The data indicate that most Florida vessels were built in the 1970s or 1980s, with slightly fewer built in the 1990s and 2000s. Most Georgia and South Carolina vessels were built in the 1980s. For North Carolina vessels, although the data show that a large proportion were built in the 1980s and 1990s, the largest proportion of North Carolina vessels were built in the 2000s.

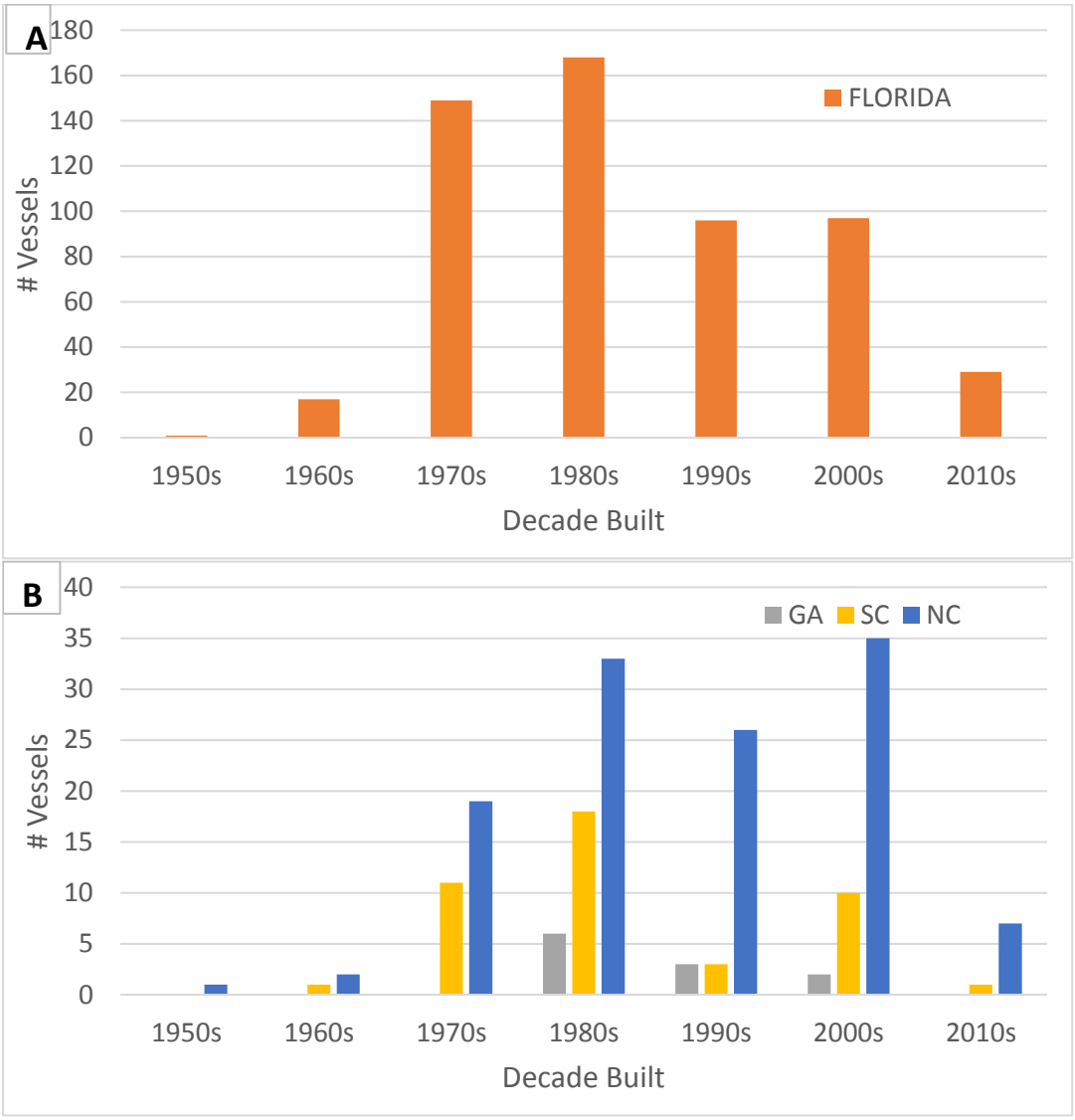

Figure 3-2. Comparison of vessel age for Florida (A) and Georgia/South Carolina/North Carolina (B).

Figure 3-3 provides the comparison of horsepower for vessels in Florida (A) and Georgia/South Carolina/North Carolina (B). Overall, there is little variation between Florida and GA/NC/SC vessels, with a majority of the vessels having 201-400 horsepower.

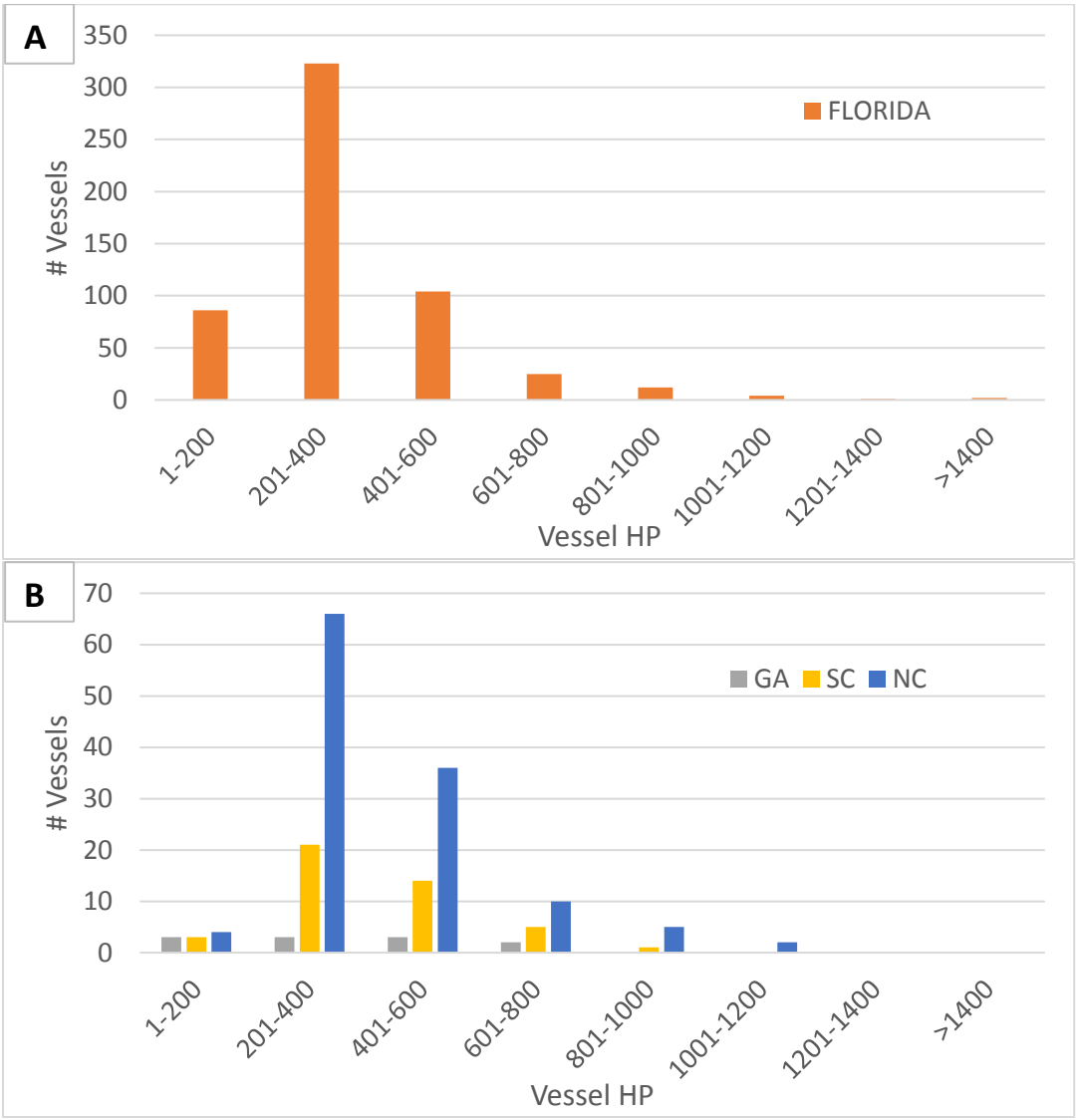

Figure 3-3. Comparison of vessel horsepower for Florida (A) and Georgia/South Carolina/North Carolina (B).

Vessel information was also used to determine the distribution of fuel types, material, refrigeration, and vessel classification (**Table 3-6**). For all vessels with homeports in South Atlantic states, diesel was the fuel type for 60% of the vessels, with gasoline used in about 40% of vessels. The hull type of almost all vessels (97%) was fiberglass. Most vessels (90%) used ice for refrigeration, but about 9% of vessels had a live well. Almost all vessels (92%) with commercial snapper grouper landings in 2016 were classified as commercial, with a small percentage (7%) as charter, and a minimal number as headboat.

Table 3-6. Distribution of features of all vessels with snapper grouper landings in 2016

Fuel Type		Material		Refrigeration		Vessel Classification	
Diesel	60%	Fiberglass	97%	Ice	90%	Commercial	92%
Gasoline	39.7%	Wood	2%	Live Well	9.3%	Charter	7%
NA	<%1	Steel	<1%	Freezer	<1%	Headboat	<1%
		Other/NA	<1%	NA	<1%	NA	<1%

Data source: NOAA Commercial Logbook

Landings on SG1 and SG2 Permits

There has been some discussion and concern raised about Snapper Grouper permits with no landings, referred to as "inactive" or "latent" permits. Southeast Coastal Fisheries Logbook (logbook) data from 2012 through 2016 were analyzed by linking vessel identification numbers with the number of active or renewable SG1 and SG2 permits in the permits database. Logbook data only encompass species that are included in federal management for species harvested in the South Atlantic, including king mackerel, Spanish mackerel, dolphin and wahoo.

Table 3-7 shows the percentage of valid or renewable SG1 permits with landings of species in the Snapper Grouper complex and landings of federally managed species, including coastal migratory pelagic species (CMP) and dolphin/wahoo (DW) for 2012 through 2016. State-managed species, Atlantic highly migratory species, and spiny lobster landings were not included in the analysis due to limitations of the Southeast Coastal Fisheries Logbook, but could be useful in future analyses.

Logbook data indicates that a large majority of SG1 permits have landings of federally managed South Atlantic Snapper Grouper species each year, with the exception of SG1 permits associated with vessels with a homeport in the Gulf of Mexico or Mid-Atlantic regions (listed as "Other Regions" in **Table 3-7**). In 2012, 2013 and 2014, a relatively lower proportion of SG1 permits associated with vessels with homeports in the Florida Keys reported landings of federally managed Snapper Grouper species or CMP/DW species. It is likely that Florida Keys vessels target other species not included in the logbook data, particularly spiny lobster, and that the number of SG1 permits associated with Florida Keys vessels have landings of other commercial species comparable to the percentages in other areas.

When snapper grouper landings from 2012 through 2016 are compared to the number of current permits, 531 permits have landings in at least one year between 2012 and 2016. This means that of the current SG1 permits, almost 97% of the SG1 permits have had at least one pound of Snapper Grouper species in the most recent five years of landings. Additionally, 45% of the permits have landings in all five years. Overall, the number SG1 permits with no landings is minimal.

Table 3-7. Percentage of valid SG1 permits by area each year with landings of species in the Snapper Grouper complex (SG spp) and with landings from the Snapper Grouper, CMP, and DW complexes (SG/CMP/DW spp) from 2012 through 2016

	2012	2013	2014	2015	2016
TOTAL					
SG spp	76.4%	71.9%	76.2%	78.6%	77.2%
SG/CMP/DW spp	78.5%	74.9%	78.6%	80.5%	78.4%
NC					
SG spp	85.2%	76.7%	89.1%	84.5%	90.6%
SG/CMP/DW spp	88.9%	76.7%	90%	87.3%	92.5%
SC and GA					
SG spp	87.7%	79.7%	81.7%	77.8%	73%
SG/CMP/DW spp	87.7%	83.1%	81.7%	79.4%	73.5%
FL East Coast					
SG spp	77%	70.1%	81.6%	87.2%	68%
SG/CMP/DW spp	81.1%	76.6%	86.2%	90.6%	85.8%
FL Keys					
SG spp	64.8%	59.6%	64.9%	73.1%	73%
SG/CMP/DW spp	66.5%	61.3%	66.8%	73.5%	73.5%
Other Regions					
SG spp	54.5%	34.8%	47.1%	36.4%	29.2%
SG/CMP/DW spp	54.5%	39.1%	47.1%	36.4%	45.8%

Table 3-8 provides a similar analysis of landings compared to SG2 permits, but does not separate the states and areas to maintain confidentiality. The largest proportion of SG2 permits with Snapper Grouper landings are associated with vessels homeported in areas on the Florida east coast. Overall, the proportion of SG2 permits with no landings of Snapper Grouper or CMP/DW species is substantially lower than for SG1 permits.

Table 3-8. Percentage of valid SG2 permits by area each year with landings of species in the Snapper Grouper complex (SG spp) and with landings from the Snapper Grouper, CMP, and DW complexes (SG/CMP/DW spp) from 2012 through 2016

	2012	2013	2014	2015	2016
SG spp	44.1%	42.1%	45.2%	38.4%	38.7%
SG/CMP/DW spp	50.4%	47.9%	51.3	46.4%	49.1%

When Snapper Grouper landings from 2012 through 2016 are compared to the number of current SG2 permits, 94% of SG2 permits have at least one pound of landings of Snapper Grouper species in at least one year between 2012 and 2016. About 29% of SG2 permits have landings in all five years. Overall, the number SG2 permits with no landings is minimal, similar to SG1 permits.

Chapter 4. Participation and Catch

This section includes information about participation levels and catch portfolios of Snapper Grouper vessels using Southeast Coastal Fisheries Logbook (logbook) data from 2001 through 2016. The logbook data used for the catch portfolio analysis include only federally managed Snapper Grouper species, Coastal Migratory Pelagic (CMP) species, dolphin, and wahoo. Wreckfish was not included because of confidentiality concerns due to the small number of participants. A review of the Wreckfish Individual Transferable Quota (ITQ) program is currently in development, and relevant information from the final review will be incorporated into the Snapper Grouper Socio-Economic Profile when it is available.

Participation

Table 4-1 shows the number of vessels, trips and days at sea for each area from 2012 through 2016. There has been an overall decrease that aligns with the decrease in available Snapper Grouper Unlimited (SG1) and Limited (SG2) permits, but participation in some areas has been relatively consistent over the last five years.

North Carolina has experienced minimal change in the number of vessels participating in the commercial Snapper Grouper fishery, but with an overall increase in the number of trips for each North Carolina area. Vessel numbers have declined slightly but trip numbers have increased for Northern North Carolina, with trip length average decreasing from 1.7 days to 1 day. In Central North Carolina, the number of vessels has dropped between 2012 and 2016, but number of trips has had little fluctuation. Average trip length has decreased from about 1.8 days in 2012 to about 1.4 days in 2016. Southern North Carolina participation shows fewer vessels over the time period but an increase in trips. Trip length is typically higher in this area than in the rest of North Carolina, around 3 days, and has been consistent over the last five years (**Table 4-1**).

South Carolina and Georgia has had minimal change in participation levels. Northern South Carolina vessel numbers fluctuate around about 42 vessels with a slight overall increase in the number of trips. Trips for these vessels are typically longer than in other areas but have decreased over the time period, with an average trip length of about 5 days in 2012 and about 4 days in 2016. For Southern South Carolina and Georgia (combined to maintain confidentiality), the number of trips and vessels has been stable over the last five years. Average trip length for this area has also been consistent, with the trip averages of 3.5 to 3.9 days throughout the time period (**Table 4-1**).

Table 4-1. Number of vessels, trips, and days at sea with Snapper Grouper landings by area by year for 2012 through 2016. Area is based on the area landed.

	2012		2013		2014		2015		2016	
	Vessels	**Trips/ Days**	**Vessels**	**Trips/ Days**	**Vessels**	**Trips/ Days**	**Vessels**	**Trips/ Days**	**Vessels**	**Trips/ Days**
North NC	27	276/ 468	28	269/ 420	27	245/ 319	22	252/ 302	24	421/ 437
Central NC	75	1,146/ 2,097	74	1,150/ 1,967	72	1,429/ 2,240	67	1,148/ 1,749	63	1,294/ 1,812
South NC	32	353/ 1,095	31	437/ 1,569	30	441/ 1,347	26	424/ 1,414	27	485/ 1,605
North SC	43	617/ 3,102	42	701/ 3,246	42	652/ 3,068	41	639/ 2,782	44	639/ 2,528
South SC + GA	19	230/ 889	21	283/ 983	21	281/ 1,001	20	251/ 975	20	220/ 858
North FL	53	792/ 1,701	58	825/ 1,904	61	1,166/ 2,465	70	966/ 2,369	76	805/ 2,104
Central FL	164	1,959/ 2,112	158	1,663/ 1,837	177	2,006/ 2,241	149	1,689/ 1,838	152	1,610/ 1,810
South FL	160	2,072/ 2,471	131	1,804/ 2,170	129	1,913/ 2,222	126	1,627/ 1,851	112	1,665/ 1,770
FL Keys	204	4,507/ 6,129	186	4,266/ 5,852	184	5,059/ 6,620	224	5,180/ 7,356	207	5,583/ 7,403
Other Regions**	20	80/ 175	17	36/ 116	12	29/ 137	9	21/ 122	8	15/ 37
TOTAL	**742**	**12,037/ 20,251**	**695**	**11,434/ 20,064**	**704**	**13,221/ 21,660**	**609**	**12,197/ 20,758**	**682**	**12,737/ 20,364**

* Number of vessels each year may be higher than the number of valid SG1/SG2 permits each year due to permit transfers that occur during the calendar year.
** Gulf of Mexico and Mid-Atlantic regions.

Participation in Florida has experienced the most variation in the region over the time period. The number of vessels in North Florida has risen since 2012, but the number of trips has experienced fluctuation. The average trip length for this area has increased slightly over the last five years, from 2.1 days to 2.6 days. Vessel number in Central Florida peaked in 2014 with 177 vessels but overall has decreased somewhat. Trip number is higher in years with more vessels, but the average trip length has remained constant at 1.1 days throughout the time period (**Table 4-1**).

South Florida has seen the most substantial decrease in participation, dropping about 30% for the number of vessels and 20% for number of trips. The average trip length has remained steady at about 1.1 to 1.2 days. Participation for the Florida Keys has stayed fairly consistent from 2012 through 2016, with a slight increase in trip number in 2015 and 2016. The average trip length for this area in 1.3 to 1.4 days (**Table 4-1**).

Trips landed in the Gulf of Mexico or Mid-Atlantic region ("Other Regions") have overall declined along with the number of vessels. Trip length depends on the proportion of trips landing in each area, with more trips with several (10+) days for the Gulf of Mexico, and shorter trips of 1-2 days for trips landed in the Mid-Atlantic (**Table 4-1**).

Table 4-2 compares participation over a longer time period, examining vessel number, trip number and days at sea in 2001, 2006, 2011 and 2016. Overall, participation decreased in alignment with the decrease in the number of available permits. Northern North Carolina experienced an increase in the number of trips (+28%), even though the number of participating vessels in that area dropped by 40 percent. Additionally, there were more vessels with trips landed in North Florida in 2016 than in 2011 (+8%) but the data indicate that there was a decrease in vessels between 2001 and 2011. Central Florida experienced a small decrease in the number of vessels (-4%), and both North and Central Florida had the least percentage decrease in trips (-17% and -14%, respectively). Southern South Carolina/ Georgia and the Florida Keys had the most substantial decrease in vessels (-46% and -45%, respectively). Data show that the other areas had about 25-40% fewer vessels and 23-46% fewer trips between 2001 and 2016.

Table 4-2. Number of vessels, trips, and days at sea with Snapper Grouper landings by area by year for 2012 through 2016. Area is based on the area landed.

	2001		**2006**		**2011**		**2016**	
	Vessels	**Trips/ Days**	**Vessels**	**Trips/ Days**	**Vessels**	**Trips/ Days**	**Vessels**	**Trips/ Days**
North NC	40	303/ 391	27	247/ 331	24	140/ 248	24	421/ 437
Central NC	102	2,413/ 3,687	92	1,738/ 2,720	77	1,192/ 2,312	63	1,294/ 1,812
South NC	43	634/ 1,645	47	587/ 1,756	33	372/ 1,192	27	485/ 1,605
North SC	59	1,008/ 5,006	53	732/ 4,742	48	631/ 3,580	44	639/ 2,528
South SC + GA	37	368/ 1,720	24	270/ 1,148	16	151/ 819	20	220/ 858
North FL	70	965/ 2,943	58	448/ 1,404	55	693/ 1,816	76	805/ 2,104
Central FL	158	1,872/ 2,397	130	1,129/ 1,327	153	1,839/ 1,952	152	1,610/ 1,810
South FL	187	2,561/ 2,919	180	1,719/ 1,873	172	2,007/ 2,263	112	1,665/ 1,770
FL Keys	374	7,479/ 9,861	264	5,027/ 6,480	202	4,390/ 6,033	207	5,583/ 7,403
Other Regions	10	15/ 141	8	21/ 29	3	5/ 80	8	15/ 37
TOTAL	**1,003**	**17,618/ 30,710**	**827**	**11,918/ 21,810**	**727**	**11,428/ 20,295**	**682**	**12,737/ 20,364**

* Number of vessels each year may be higher than the number of valid SG1/SG2 permits each year due to permit transfers that occur during the calendar year.

Trip length decreased in most areas in North Carolina, South Carolina and Georgia between 2001 and 2016, except for Southern North Carolina (2.6 days in 2001, 3.3 days in 2016). Trip length dropped for trips landed in South Carolina and Georgia by about 1 day, with the exception of a higher average trip length for Southern South Carolina/ Georgia in 2011 (5.4 days). Lengths for trips landed in Florida had minimal variation over the time period (**Table 4-2**).

Table 4-3 provides information about participation in 2016 by season for each area. The seasons are as follows:

Season 1
January through April: All areas

Season 2
May through August: All areas except Florida Keys
May through July: Florida Keys

Season 3
September through December: All areas except Florida Keys
August through December: Florida Keys

The seasons for the Florida Keys were selected based on participation of many vessels with Snapper Grouper permits in the Florida spiny lobster fishery, which opens annually on August 6.

In general, participation is highest in Season 2 for North Carolina, particularly in Northern and Central areas, which aligns with improved weather conditions in the late spring and opening of shallow water grouper and red porgy on May 1. There is less difference between participation in Season 1 and Season 2 for Southern North Carolina. Participation in Season 1 and Season 2 is similar for Northern South Carolina and Southern South Carolina/ Georgia, with lower participation in Season 3 for these areas (**Table 4-3**).

Table 4-3. Number of vessels, trips, and days at sea with Snapper Grouper landings by area by season in 2016. Area is based on the area landed.

	Season 1	Season 2	Season 3	All Year
North NC				
Vessels	10	21	10	24
Trips	50	347	24	421
Days at Sea	51	362	24	437
Central NC				
Vessels	43	54	46	63
Trips	326	602	366	1,294
Days at Sea	444	861	507	1,812
South NC				
Vessels	19	23	20	27
Trips	167	193	124	485
Days at Sea	574	610	421	1,605

Table 4-3, continued

	Season 1	Season 2	Season 3	All Year
North SC				
Vessels	33	35	28	44
Trips	232	250	157	639
Days at Sea	765	1,093	670	2,528
South SC + GA				
Vessels	14	14	13	20
Trips	83	83	54	220
Days at Sea	301	379	178	858
North FL				
Vessels	54	57	42	76
Trips	338	313	153	805
Days at Sea	938	804	362	2,104
Central FL				
Vessels	102	100	86	152
Trips	602	514	494	1,610
Days at Sea	755	555	500	1,810
South FL				
Vessels	85	83	70	112
Trips	574	596	486	1,665
Days at Sea	613	636	521	1,770
Florida Keys				
Vessels	147	155	143	207
Trips	2,227	1,753	1,588	5,583
Days at Sea	2,759	2,350	2,294	7,403

Overall for Florida, there was low variation in participation between Season 1 and Season 2 for all areas. Participation in areas on the Florida East Coast dropped in Season 3, especially in North Florida. This is likely due to switching target species to coastal migratory pelagics. In the Florida Keys, participation in the Snapper Grouper fishery is highest in Season 1 and lowest in Season 3, when spiny lobster season opens (**Table 4-3**).

Table 4-4 provides vessel and trip characteristics by area for participation in 2016, including the proportion of participating vessels with Snapper Grouper landings in all three seasons, the average and mode for trip length and crew size, top gear types, and the number of dealers purchasing snapper grouper species landed in that area.

Trips landing in North Carolina and South Carolina generally had high percentages of vessels that participated in all three seasons, except for Northern North Carolina. This is likely due to lower participation during the winter months in Season 1 and Season 3. The average trip length

varies for these areas, with longer trips occurring in the more southern areas. The average crew size differs among the areas but overall is about 2-3 crew per trip, including the captain. The most common gear listed as "top gear" in logbook records for trips landing in North Carolina and South Carolina is electric. Northern North Carolina also had many trips with longline as the top gear, and Central North Carolina had many hook and line trips. The number of dealers was similar for most North Carolina and South Carolina areas (11-14), except for Central North Carolina, which included over 30 dealers purchasing snapper grouper species from trips landed there (**Table 4-4**).

Table 4-4. Characteristics of vessels and trips with Snapper Grouper landings by area in 2016

	% Vessels in all 3 seasons	Avg / **Mode** Trip Length	Avg/ **Mode** Crew Size*	Top Gear Types	# Dealers
North NC	21%	1/ **1**	1.6/ **2**	Electric (55%) Longline (29%) Gillnet (13%)	11
Central NC	59%	1.4/ **1**	2.1/ **2**	Electric (49%) Hook&Line (33%) Trap (11%)	33
South NC	58%	3.3/ **3**	2.1/ **2**	Electric (89%)	11
North SC	52%	2.5/ **2**	4/ **3**	Electric (77%) Hook&Line (10%)	14
South SC + GA	50%	3.9/ **5**	2.4/ **3**	Electric (75%) Hook&Line (10%)	12
North FL	55%	2.6/ **1**	2.7/ **3**	Electric (44%) Hook&Line (26%) Spear/Powerhead (17%)	15
Central FL	57%	1.1/ **1**	1.7/ **2**	Hook&Line (49%) Trolling (20%) Electric (9%) Longline (7%) Spear/Powerhead (6%)	19
South FL	63%	1.1/ **1**	1.5/ **1**	Hook&Line (63%) Electric (21%) Trolling (10%)	47
FL Keys	63%	1.3/ **1**	1.9/ **2**	Hook&Line (79%) Electric (14%)	76

*Number of crew includes the captain.

A majority of vessels landing in Florida participated in all three seasons in 2016, and most trips were about 1 day, with a higher average trip length in North Florida of 2.6 days. Crew sizes in North Florida were similar to North Carolina, South Carolina and Georgia, but in general crew sizes in Central Florida, South Florida and the Florida Keys were less (1-2 crew). Electric was the top gear on a majority of trips landings in North Florida, along with hook and line and spear/powerhead. However, hook and line was the top gear for majority of trips landing in other Florida areas. Central Florida had a range of top gear types (**Table 4-4**).

Trip length has been discussed in the previous tables in this section, but **Table 4-5** provides information on the proportion of trips in 2016 with different trip lengths. For trips landing in North Carolina, South Carolina and Georgia, most trips in Seasons 1 and 3 are between 2 and 5 days, but in Season 2 a majority of trips are only one day. A large majority of trips landing in Florida areas are a single day in all seasons, although there are more trips of 2-5 days in Season 1 for the Florida East Coast than other seasons. Very few trips in the South Atlantic region are six or more days.

Table 4-5. Lengths of trips with snapper grouper landings by area and season in 2016

	% trips 1 day	% trips 2-5 days	% trips 6+ days
NC/SC/GA			
Season 1	42%	52%	6%
Season 2	59%	34%	7%
Season 3	46%	47%	7%
East Coast FL			
Season 1	78%	20%	2%
Season 2	85%	12%	3%
Season 3	91%	8%	1%
FL Keys			
Season 1	92%	7%	1%
Season 2	89%	9%	2%
Season 3	87%	11%	2%

Catch Portfolios

To describe catch portfolios, logbook data from 2016 were analyzed using network analysis. A two-mode network was generated for each area and season to identify that primary species and catch combinations from Snapper Grouper trips. The catch combinations were then analyzed as two-mode networks with the participating vessels to provide information about intra- and inter-annual catch portfolios. A detailed description of the methods along with network graphs are included in **Appendix A**.

The tables in this section provide information about the primary Snapper Grouper species, other Snapper Grouper species, and other species (coastal migratory pelagics, dolphin, wahoo and state species) caught on trips landed in the South Atlantic region. It is likely that there are Snapper Grouper trips that also included landings of highly migratory species (HMS; shark and swordfish) but those data are not included in the commercial logbook data provided by SEFSC, as those data are maintained by the NOAA Fisheries HMS Management Division. Additionally, logbook records include a field for "other species," which may include shellfish and state-managed species.

North Carolina, South Carolina and Georgia 2016 Portfolios

Trips landing in North Carolina, South Carolina and Georgia were analyzed together due to similarities identified in preliminary analysis, and included all trips with any landings of Snapper Grouper species. The first part of this section describes the primary, secondary and non-Snapper Grouper species for the area in each season. Next, the identified catch combinations (portfolios) are provided for each season.

Species

In Season 1 (January through April) of 2016, the primary species (in order of level of occurrence in logbook data) are black sea bass, vermilion, snowy grouper, 'other species', gray triggerfish and the jacks complex (**Table 4-6**); these are the main target species that drive a snapper grouper trip. Several other Snapper Grouper species were caught on trips, including various tilefish, grunts, snappers and groupers, but these are not main target species for most trips. Additionally, some trips included king and Spanish mackerel, dolphin, wahoo and sheepshead.

Table 4-6. Description of species caught on trips landed in North Carolina, South Carolina and Georgia in Season 1 of 2016

Primary Snapper Grouper Species	Secondary Snapper Grouper Species	Non-Snapper Grouper Species
Black sea bass	Grunts/Porgies	King mackerel
Vermilion	Blueline tilefish	Dolphin
Snowy grouper	White grunt Golden	Wahoo
Other species	tilefish	Sheepshead
Gray triggerfish	Greater amberjack	Spanish mackerel
Jacks/Amberjacks	Yellowedge grouper	
	Silk Snapper	
	Hogfish	
	Yellowtail snapper	
	Gray snapper	
	Queen snapper	
	Misty grouper	
	Mutton snapper	

Almost all (91.1%) trips had landings that were majority (over half) Snapper Grouper species, and about 52% of the trips in this season landed only Snapper Grouper species. Of the trips with majority Snapper Grouper landings, a large proportion (80%) reported the top gear as electric. Hook and line trips made up 16% of these trips, and a few trips reported the top gear as longline, trap, trolling, spear/powerhead, or buoy gear. For other trips, the main species were king mackerel or 'other species'.

The identified primary species for Season 2 (May through August) of 2016 in the area were more diverse than in the first season (**Table 4-7**), which aligns with the opening of shallow-water grouper and red porgy on May 1 along with increased participation in Season 2. The main target species that drive a Snapper Grouper trip in this season include black sea bass, blueline tilefish, 'other species', gag, red porgy, greater amberjack, greater amberjack, jacks complex, scamp,

snowy grouper, grunts/porgies, vermilion, and gray triggerfish (in order of level of occurrence). Secondary Snapper Grouper species caught on trips included multiple species of snappers and groupers. Dolphin was the most common non- Snapper Grouper species on Season 2 trips.

Table 4-7. Description of species caught on trips landed in North Carolina, South Carolina and Georgia in Season 2 of 2016

Primary Snapper Grouper Species	Secondary Snapper Grouper Species	Non-Snapper Grouper Species
Black sea bass	White grunt	Dolphin
Blueline tilefish	Red grouper	King mackerel
Other Species	Rock hind	Wahoo
Gag grouper	Silk snapper	Spanish mackerel
Red porgy	Black grouper	Sheepshead
Greater Amberjack	Yellowedge grouper	
Jacks/Amberjacks	Gray snapper	
Scamp	Mutton snapper	
Snowy grouper	Yellowtail snapper	
Grunts/Porgies	Yellowfin grouper	
Vermilion	Spadefish	
Gray triggerfish	Queen snapper	
	Yellowmouth grouper	

Similar to the first season, almost all (95%) trips in Season 2 had landings that were majority Snapper Grouper species, and 47% of trips landed only Snapper Grouper species. Top gear type is more diverse for Season 2, with 61% of trips reporting electric as the top gear, following by 15% hook and line, 10% trap, 9% longline, and a few trips with spear, trolling and buoy gear. Trips that did not land majority Snapper Grouper species reported 'other species' as the main landed species, with some trips driven by king mackerel, Spanish mackerel or dolphin.

The number of primary Snapper Grouper species on trips in Season 3 (September through December) of 2016 is lower than in the second season (**Table 4-8**), consistent with the level of participation in Season 3. The main target species in this season are black sea bass, gag, gray triggerfish, 'other species', red porgy, white grunt, vermilion, and grunts/porgies (in order of level of occurrence). Secondary Snapper Grouper species caught on trips include various snappers, groupers and tilefish. King mackerel was the most common non-snapper grouper species on Season 3 trips.

Table 4-8. Description of species caught on trips landed in North Carolina, South Carolina and Georgia in Season 3 of 2016

Primary Snapper Grouper Species	Secondary Snapper Grouper Species	Non-Snapper Grouper Species
Black sea bass	Scamp	King mackerel
Gag grouper	Greater amberjack	Dolphin
Gray triggerfish	Golden tilefish	Spanish mackerel
Other species	Hogfish	Wahoo
Red porgy	Rock hind	Sheepshead
White grunt	Red grouper	
Vermilion	Black grouper	
Grunts/Porgies	Silk snapper	
	Red hind	
	Jacks/Amberjacks	
	Mutton snapper	
	Yellowtail snapper	
	Gray snapper	
	Blueline tilefish	
	Snowy grouper	
	Yellowedge grouper	
	Yellowfin grouper	

As with the first two seasons, most trips in Season 3 (92%) reported a majority of landings as Snapper Grouper species, with 52% of trips reporting landings of only Snapper Grouper species. There were more hook and line trips (27%) in Season 3 than other season, but most trips reported top gear as electric (63%). There were a few trips with spear, trap, trolling and buoy gear as top gear type. Similar to Season 2, trips that did not land majority snapper grouper species reported 'other species' and king mackerel as the top species.

Catch Portfolios

A typology of trips for North Carolina, South Carolina and Georgia was developed by identifying species most commonly caught together on a trip, with gear type information incorporated. Network metrics were used to identify 'groups' based on catch combinations (methods described in detail in **Appendix A**). All trips do not fit perfectly into an identified 'group' but the trip types described in **Table 4-9** provide a generalized description of common catch combinations on trips for this area in each season.

The analysis identified three prominent 'groups' for Season 1 (**Table 4-9**). Trips identified as Black Sea Bass driven were primarily electric gear but there were some hook and line trips. These trips landed other species but were centered around black sea bass, indicating that this was the driving species. Another type of trip in this season is the Core Snapper Grouper trip, under which many trips were grouped, which suggests that this catch combination is common in this season for this area. The primary species on these trips included vermilion, gray triggerfish, species of the jacks complex, and grunts, and the main gear type was electric. Vermilion is the driving species for these trips. The third prominent group identified in the analysis was the

Deepwater trips, dominated by snowy grouper (driving species), 'other species, blueline tilefish, golden tilefish and yellowedge grouper. The main gear for this trip type is electric but there are some longline trips.

Analysis of Season 2 trips indicated that there were three main trip types based on species, but some differences in gear types for these trips (**Table 4-9**). The Core Snapper Grouper trip type included black sea bass, gag, red porgy, other species, vermilion, gray triggerfish, and greater amberjack as the main species, and these trips listed top gear as electric or hook and line. Black sea bass, gag and red porgy were identified as the driving species on these trips.

Another type of trip in this season is the Blueline tilefish trip, which the analysis indicates is the prominent species for this trip type. The main gears for this trip type are electric and longline. The third prominent group identified in the analysis was the Deepwater trips. Similar to Season 1, this trip type is primarily snowy grouper (driving species), golden tilefish and yellowedge grouper caught with electric gear.

Table 4-9. Trip typology for each season in 2016 for North Carolina, South Carolina and Georgia

Season 1	**Season 2**	**Season 3**
1 – **Black sea bass driven** Main sp: Black sea bass Main Gear: Electric, some H&L 2 – **Core Snapper Grouper** Main spp: Vermilion, Gray Triggerfish, Jacks Complex, Grunts Main Gear: Electric 3 - **Deepwater** Main spp: Snowy grouper, 'Other species', Blueline tilefish, Golden tilefish, Yellowedge grouper Main Gear: Electric, some longline	1 – **Core Snapper Grouper** Main spp: Black sea bass, Gag, Red porgy, 'Other Species', Vermilion, Gray triggerfish, Greater amberjack Main Gear: Mostly Electric, some H&L 2 - **Blueline tilefish driven** Main spp: Blueline tilefish, Main Gear: Electric and longline 3 – **Deepwater** Main sp: Snowy grouper Main Gear: Electric	1 – **Core Snapper Grouper** Main spp: Gray triggerfish, Red porgy, 'Other species' Main Gear: Mostly Electric 2 – **Black sea bass and gag driven** Main sp: Black sea bass Main Gear: Electric and H&L, some Trap

Analysis of trips in Season 3 for North Carolina, South Carolina and Florida generated a dense graph with many periphery species, which indicated that catch combinations were similar for most trips. Two groups were identified for prominent trip types. The Core Snapper Grouper type was driven by gray triggerfish, red porgy or 'other species', and the main gear type was electric. An additional prominent trip type was black sea bass and gag driven trips, which included primarily electric gear but also hook and line or trap (**Table 4-9**).

Due to the number of species and variation among trips and vessels, the annual portfolios for vessels landing in North Carolina, South Carolina and Georgia were analyzed qualitatively by reviewing the trip types for each season and the driving species (**Table 4-10**). Core Snapper Grouper trips, which included several snapper grouper species, were common for most vessels. Overall, Portfolio A vessels with Core Snapper Grouper trips that were driven by vermilion in Season 1 would continue with the Core Snapper Grouper trips in Season 2, except the driving species would be black sea bass, gag, and red porgy. In Season 3, Portfolio A vessels would have trips dominated by black sea bass and gag, or Core Snapper Grouper trips driven by gray triggerfish. Portfolio B vessels would target black sea bass in Season 1, followed by Core Snapper Grouper trips driven by black sea bass, gag and red porgy for Season 2. Most Portfolio B vessels would continue to target black sea bass and gag, or would commonly have Core Snapper Grouper trips driven by gray triggerfish.

Table 4-10. Common annual catch portfolios for North Carolina, South Carolina and Georgia in 2016

Portfolio	Season 1	Season 2	Season 3
A	**Core SG**- Vermilion	**Core SG**- Black sea bass/Gag/ Red porgy	**Black sea bass/ Gag** or **Core SG**- Gray triggerfish
B	**Black sea bass**	**Core SG**- Black sea bass/Gag/ Red porgy	**Black sea bass/ Gag** or **Core SG**- Gray triggerfish
C	**Deepwater**- Snowy grouper	**Core SG**- Black sea bass/Gag/ Red porgy or **Deepwater**- Snowy grouper	**Core SG**- Gray triggerfish
D	**Deepwater**- Snowy grouper (minimal)	**Blueline tilefish**	**Core SG**- Gray triggerfish or **None**

Portfolio C vessels would target snowy grouper on deepwater trips in Season 1, and continue with snowy grouper trips in Season 2 or switch to Core Snapper Grouper trips. Most Portfolio C vessels would switch to Core Snapper Grouper trips in Season 3, driven by gray triggerfish. Portfolio D focuses mostly on the blueline tilefish trips in Season 2, with some of these vessels targeting snowy grouper in Season 1 and Core Snapper Grouper in Season 3. However, several Portfolio D vessels did not have trips in Season 3 (**Table 4-10**).

Florida East Coast 2016 Portfolios

Trips with landings in all areas of the Florida east coast were analyzed together due to similarities identified during preliminary analysis. All trips with any landings of snapper grouper species were included. Primary, secondary and non-snapper grouper species each season are described first, followed by the trip typologies for each season.

Species

Primary species in order of level of occurrence in logbook data on trips in Season 1 (January through April) of 2016 are the 'other species', the jacks complex, golden tilefish, yellowtail snapper, and snowy grouper (**Table 4-11**); these are the main target species that drive a snapper grouper trip. Secondary Snapper Grouper species were diverse and included various snappers and groupers, greater amberjack, grunts, porgies and tilefish. There were many trips driven by king mackerel for the Florida east coast areas and Spanish mackerel, dolphin, wahoo and sheepshead were also caught on Season 1 trips.

Table 4-11. Description of species caught on trips landed in Florida east coast areas in Season 1 of 2016

Primary Snapper Grouper Species	Secondary Snapper Grouper Species	Non-Snapper Grouper Species
Other species	Vermilion	King mackerel
Jacks/Amberjacks	Mutton snapper	Dolphin
Golden tilefish	Greater amberjack	Spanish mackerel
Yellowtail snapper	Grunts/Porgies	Wahoo
Snowy grouper	Gray snapper	Sheepshead
	Gray triggerfish	
	Blueline tilefish	
	Black sea bass	
	Hogfish	
	Yellowedge grouper	
	Silk snapper	
	Lane snapper	
	Queen snapper	
	White grunt	
	Spadefish	

Unlike North Carolina, South Carolina and Georgia, only 53% of trips for the Florida east coast in Season 1 had landings that were majority Snapper Grouper species. Approximately one-third of the trips in this season landed only snapper grouper species. Of the trips with majority Snapper Grouper landings, most reported the top gear as electric (40%), hook and line (31%), and longline (23%). A few trips reported the top gear as gillnet, trolling, or spear/powerhead. For trips less than 50% of landings as Snapper Grouper species, the main species were king mackerel or 'other species', followed by Spanish mackerel.

Trips in Season 2 (May through August) included a larger number of primary species than in the first season (**Table 4-12**). The main target species that drive a Snapper Grouper trip in Season 2

include (in order of level of occurrence) grunts/porgies, golden tilefish, mutton snapper, greater amberjack, gag, white grunt, and blueline tilefish. Secondary Snapper Grouper species identified included several species of snappers and groupers along with red porgy and species in the jacks complex. King mackerel was the most common non- Snapper Grouper species on Season 2 trips and was a driving species over all Season 2 trips, as North Florida and Central Florida are major areas for the commercial king mackerel fishery.

Table 4-12. Description of species caught on trips landing in Florida east coast areas in Season 2 of 2016

Primary Snapper Grouper Species	Secondary Snapper Grouper Species	Non-Snapper Grouper Species
Grunts/Porgies	Black sea bass	King mackerel
Golden tilefish	Spadefish	Spanish mackerel
Mutton snapper	Lane snapper	Sheepshead
Greater amberjack	Red grouper	Dolphin
Gag grouper	Red porgy	Other species
White grunt	Gray snapper	Wahoo
Blueline tilefish	Snowy grouper	
	Scamp	
	Vermilion	
	Black grouper	
	Gray triggerfish	
	Rock hind	
	Hogfish	
	Red hind	
	Queen snapper	
	Silk snapper	
	Jacks/Amberjacks	

A larger proportion (64%) of trips in Season 2 had landings that were majority Snapper Grouper species than trips in Season 1, but data indicated that about one-third of Season 2 trips landed only snapper grouper species. There were slightly more trips with top gear reported as hook and line (47%) in Season 2, and electric gear was the top gear type on 34% of trips. Spear/powerhead made up 14% of trips and a few trips reported gillnet, longline, trap and trolling as the top gear type. Trips that did not land majority Snapper Grouper species reported ‘other species’ as the main landed species, with some trips driven by king mackerel.

The primary Snapper Grouper species in Season 3 for the Florida east coast are ‘other species’, jacks complex, yellowtail snapper, golden tilefish, greater amberjack and vermilion (in order of level of occurrence), which is fewer primary species than in the first two seasons. Secondary Snapper Grouper species caught on trips were diverse, and included various snappers, groupers, grunts, porgies and tilefish. Spanish and king mackerel were the most common non- Snapper Grouper species on Season 3 trips.

Table 4-13. Description of species caught on trips landing in Florida east coast areas in Season 3 of 2016

Primary Snapper Grouper Species	Secondary Snapper Grouper Species	Non-Snapper Grouper Species
Other species	Gray snapper	Spanish mackerel
Jacks complex	Gray triggerfish	King mackerel
Yellowtail snapper	Mutton snapper	Dolphin
Golden tilefish	Grunts/Porgies	Wahoo
Greater amberjack	Red porgy	Sheepshead
Vermilion	Gag grouper	
	Hogfish	
	Black sea bass	
	Black grouper	
	Silk snapper	
	Scamp	
	Red grouper	
	Lane snapper	
	Yellowedge grouper	
	Rock hind	
	Blueline Tilefish	
	Red hind	
	White grunt	
	Spadefish	
	Snowy grouper	
	Queen snapper	

A relatively lower proportion (35%) of Season 3 trips reported that the majority of landings were Snapper Grouper species, with just 19% of trips reporting landings of only s Snapper Grouper species. The top gear types were hook and line (46%) and electric (45%), with a small percentage of spear/powerhead trips. Trips that did not land majority Snapper Grouper species reported Spanish mackerel and king mackerel as the top species.

Catch Portfolios

A typology of trips for the Florida East Coast was developed by identifying species most commonly caught together on a trip, with gear type information incorporated and analysis to identify 'groups' (methods described in detail in **Appendix A**. All trips do not fit perfectly into an identified 'group' but the trip types described in **Table 4-14** provide a generalized description of common catch combinations on trips for this area in each season.

Overall, Florida East Coast trips included a diversity of species and catch combinations, which limited how many trips fit into the typology. There were four main groups in each season (**Table 4-14**). In Season 1, the Core Snapper Grouper type included several Snapper Grouper species but centered around vermilion, gray triggerfish, mutton snapper, gray snapper, greater amberjack and hogfish. There was no one species that could be identified as the driving species for these trips, which were primarily electric or hook and line. Another trip type was the yellowtail

snapper driven trip, which included other Snapper Grouper species as well and reported hook and line as the top gear. The golden tilefish driven type centered around longline golden tilefish trips, with some hook and line trips. The fourth trip type in Season 1 was the jacks trip, which included 'other species' as a dominant catch in addition to species in the jacks complex. There was also a trip type that centered around king mackerel, although Snapper Grouper species (most jacks) were also landed, with hook and line or trolling as the top gear.

Season 2 had a main group of greater amberjack driven trips, which were primarily electric or hook and line. Although greater amberjack was the central species for this trip type, species in the jacks complex and several other snapper grouper species were common. Season 2 also had a mutton snapper driven trip type that was primarily hook and line or trolling. The third trip type in Season 2 centered around 'other species' or king mackerel, with hook and line or trolling as the top gear for these trips. These trips included Snapper Grouper species, but non- Snapper Grouper species were the drivers for the trips (**Table 4-14**).

Table 4-14. Trip typology for each season in 2016 for Florida east coast areas

Season 1	**Season 2**	**Season 3**
1 – **Core Snapper Grouper** Main spp: Vermilion, Gray triggerfish, Mutton snapper, Gray snapper, Greater amberjack, Hogfish Main Gear: Electric or Hook and line 2 - **Yellowtail snapper driven** Main spp: Yellowtail snapper Main Gear: Hook and line 3 - **Golden tilefish driven** Main sp: Golden tilefish Main Gear: Longline, some Electric and Hook and line 4 - **Jacks** Main spp: Other species, Jacks complex Main Gear: Hook and line 5 – **King Mackerel driven** Main spp: King mackerel Main Gear: Hook and line or Trolling	1 – **Greater amberjack driven** Main spp: Greater amberjack, Jacks complex, gray snapper, core snapper grouper Main Gear: Electric or Hook and line 2 - **Mutton snapper driven** Main sp: Mutton snapper Main Gear: Hook and line or trolling 3 – **Non-Snapper grouper driven** Main sp: Other species, king mackerel Main Gear: Hook and line or trolling	1 – **Core Snapper Grouper** Main spp: Shallow water species, Vermilion, Gray triggerfish, Scamp Main Gear: Electric or Hook and line 2 - **Yellowtail snapper driven** Main sp: Yellowtail snapper Main Gear: Hook and line 3 - **Golden tilefish driven** Main sp: Golden tilefish Main Gear: Electric and some H&L 4 – **Non-Snapper grouper driven** Main sp: Other species, Spanish Mackerel, other jacks Main Gear: Hook and line or trolling

Trip types identified in Season 3 were similar to Season 1, with a Core Snapper Grouper type and a yellowtail snapper driven trip type. The golden tilefish driven trip type in Season 3 was primarily electric or hook and line gear. The catch combination on the fourth trip type was dominated by of 'other species' or Spanish mackerel although these trips did report snapper grouper landings as well, with trips typically using hook and line or trolling as the top gear (**Table 4-14**).

Trips landing in Florida East Coast areas had more variation in catch combinations and types of trips for each vessel, which did not allow for specific annual catch portfolios to be identified. A more detailed analysis by sub-area or county may be necessary to identify a pattern in annual catch portfolios. It was common for vessels to have trips falling under every identified trip type for that season and through the year.

The exceptions were some vessels with the golden tilefish longline trips in Season 1. About 25% of the vessels with golden tilefish longline trips did not have any additional trips of any type in Seasons 2 or 3. Vessels that did continue fishing after Season 1 followed similar patterns as other vessels and commonly had various trip types in Seasons 2 and 3.

Florida Keys 2016 Portfolios

The description of the Florida Keys catch portfolios follows portfolio descriptions for the other areas. All trips with any landings of Snapper Grouper species were included. Primary, secondary and non-snapper Snapper Grouper each season are described first, followed by the trip typologies for each season.

Species

Yellowtail snapper was the primary Snapper Grouper species on Florida Keys trips, followed to much lesser degree by 'other species', greater amberjack, snowy grouper, gray (mangrove) snapper, and mutton snapper (**Table 4-15**). Secondary Snapper Grouper species included various snappers and groupers, jacks, gray triggerfish, grunts and porgies. The dominant non-Snapper Grouper was king mackerel, and some snap Snapper Grouper trips also landed dolphin and wahoo.

Table 4-15. Description of species caught on trips landed in the Florida Keys in Season 1 of 2016

Primary Snapper Grouper Species	Secondary Snapper Grouper Species	Non-Snapper Grouper Species
Yellowtail snapper	Blueline tilefish	King mackerel
Other species	Hogfish	Dolphin
Greater amberjack	Golden tilefish	Wahoo
Snowy grouper	Grunts/Porgies	
Gray snapper	Vermilion	
Mutton snapper	Yellowedge grouper	
	Jacks/Amberjacks	
	Gray triggerfish	
	Lane snapper	
	Silk snapper	
	White grunt	
	Queen snapper	

Because a large proportion of trips were driven by yellowtail snapper, almost all (93%) of Season 1 trips had landings with majority Snapper Grouper. About two-thirds of trips in this season had only Snapper Grouper landings. Hook and line dominated as the top gear (82% of trips), which is expected with so many yellowtail snapper trips. About 16% of trips reported electric as top gear, and the remaining trips listed top gear as 'other' (most likely lobster or crab trap) or spear. For trips that did not have majority Snapper Grouper species, the main species were 'other species', which is likely to be spiny lobster or stone crab, or king mackerel.

Similar to Season 1, yellowtail snapper was the most prominent species for trips in Season 2 (May through July) (**Table 4-16**). Other identified driving Snapper Grouper species included gray snapper, 'other species', black grouper, greater amberjack, mutton snapper, and snowy grouper. Secondary Snapper Grouper species were more diverse than in other areas and included many species of snappers and groupers along with white grunt, tilefish, red porgy and species in the jacks complex. Dolphin was the main non- Snapper Grouper species for Season 2 trips.

Table 4-16. Description of species caught on trips landed in the Florida Keys in Season 2 of 2016

Primary Snapper Grouper Species	Secondary Snapper Grouper Species	Non-Snapper Grouper Species
Yellowtail snapper	Red grouper	Dolphin
Gray snapper	Blueline tilefish	King mackerel
Other species	Hogfish	Spanish mackerel
Black grouper	Jacks/Amberjacks	Wahoo
Greater amberjack	Grunts/Porgies	
Mutton snapper	Yellowedge grouper	
Snowy grouper	Gray triggerfish	
	Golden tilefish	
	Vermilion	
	Gag grouper	
	Scamp	
	Silk snapper	
	Red hind	
	Lane snapper	
	Rock hind	
	White grunt	
	Spadefish	
	Yellowmouth grouper	
	Yellowfin grouper	
	Red porgy	

Almost all (97%) trips in Season 2 had landings that were majority Snapper Grouper species, which is due to the large number of trips targeting yellowtail snapper. About 71% of trips landed only Snapper Grouper species. Top gear type is more diverse for Season 2, with 73% of trips reporting hook and line as the top gear, followed by 19% electric, 9% spear and a few trips with longline. Trips that did not land majority Snapper Grouper species reported 'other species', which is not spiny lobster or stone crab due to seasonal closures for these species.

Yellowtail snapper was again the most prominent species for trips in Season 3 (August through December), with other identified primary species including 'other species', mutton snapper, gray snapper and black grouper (**Table 4-17**). Secondary Snapper Grouper species caught on trips include various snappers, white grunt, tilefish, and jacks species. King mackerel was the most common non- Snapper Grouper species on Season 3 trips.

Table 4-17. Description of species caught on trips landed in the Florida Keys in Season 3 of 2016

Primary	Other Snapper Grouper	Non-Snapper Grouper
Yellowtail snapper	Hogfish	King mackerel
Other species	Greater amberjack	Dolphin
Mutton snapper	Red grouper	Spanish mackerel
Gray snapper	Grunts/Porgies	Wahoo
Black grouper	Golden tilefish	
	Yellowedge grouper	
	Vermilion	
	Blueline tilefish	
	Gray triggerfish	
	Red hind	
	Gag grouper	
	Lane snapper	
	Red porgy	
	White grunt	
	Silk snapper	
	Scamp	
	Jacks/Amberjacks	
	Rock hind	
	Queen snapper	

A slightly lower proportion of trips had landings with majority Snapper Grouper species in Season 3 than in other season (86%), which may be due to vessels targeting spiny lobster and stone crab during this season. A little over half of Season 3 trips reported landings of only Snapper Grouper species. A large percentage (88%) of trips listed hook and line as the top gear type, with some trips reporting top gear as electric, buoy gear, other, spear, or trolling.

Catch Portfolios

A typology of trips for the Florida Keys was developed by identifying species most commonly caught together on a trip, with gear type information incorporated and analysis to identify 'groups' (methods described in detail in **Appendix A**). All trips do not fit perfectly into an identified 'group' but the trip types described in **Table 4-18** provide a generalized description of common catch combinations on trips for this area in each season.

Overall, the primary Snapper Grouper trip type in each season was yellowtail snapper driven (**Table 4-18**). This trip type also caught other species, but yellowtail snapper was the main species. The primary gear for this trip type was hook and line. Season 1 also included a Core Snapper Grouper trip type that included mutton snapper, gray snapper, gray triggerfish, greater amberjack and several other species, but there was no identified driving species. The main gear was hook and line for this trip type. The third trip type in Season 1 included several deepwater species caught primarily with electric gear, but no specific species was identified as a driving species.

Season 2 (May through July) included the main group of yellowtail snapper hook and line trips, along with a trip type for greater amberjack driven trips, also primarily hook and line. Season 2 also had a gray snapper driven trip type that was primarily hook and line or trolling. Although other species were caught on these trips, gray snapper was the main species. The fourth trip type in Season 2 was the Core Snapper Grouper trip type, which used mostly hook and line gear and was driven by mutton snapper and shallow-water groupers (red grouper, black grouper and gag). There was also a deepwater trip type primarily using electric gear, but no one species was dominant for these trips (**Table 4-18**).

Table 4-18. Trip typology for each season in 2016 for the Florida Keys

Season 1	Season 2	Season 3
1 - **Yellowtail snapper driven** Main sp: Yellowtail snapper, Other species Main Gear: Hook and line 2 - **Deepwater** Main spp: Snowy grouper, Blueline tilefish, Golden tilefish, Yellowedge grouper Main Gear: Electric 3 - **Non-snapper grouper driven** Main spp: Other species, Yellowtail snapper Main Gear: Hook and line 4 – **Core Snapper Grouper** Main spp: Mutton snapper, Gray snapper, Gray triggerfish, Greater amberjack Main Gear: Hook and line	1 - **Yellowtail snapper driven** Main sp: Yellowtail snapper Main Gear: Hook and line 2 – **Greater amberjack driven** Main sp: Greater amberjack Main Gear: Hook and line 3 – **Gray snapper driven** Main sp: Gray snapper Main Gear: Hook and line or Trolling 4 – **Core Snapper Grouper** Main spp: Mutton snapper, Shallow-water groupers Main Gear: Hook and line 5 - **Deepwater** Main spp: Snowy grouper, Blueline tilefish, Golden tilefish, Yellowedge grouper Main Gear: Electric	1 - **Yellowtail snapper driven** Main sp: Yellowtail snapper Main Gear: Hook and line 2 –**Core Snapper Grouper** Main spp: Shallow water species, Hogfish, Mutton snapper, Gray Triggerfish, Other species Main Gear: Hook and line or Other 3 – **Deepwater** Main spp: Blueline tilefish, Golden tilefish, Yellowedge grouper Main Gear: Electric

Season 3 (August through December) also included the hook and line yellowtail snapper driven trip type. The Core Snapper Grouper trip type centered around shallow-water species, hogfish, mutton snapper, gray triggerfish, and other species. The main gear type was hook and line or other gear, which may indicate Snapper Grouper species caught on spiny lobster trips. The third trip type in this season was the deepwater trip, using electric gear and catching blueline tilefish, golden tilefish and yellowedge grouper.

Due to the number of species and variation among trips and vessels, the annual portfolios for vessels landing in the Florida Keys were analyzed qualitatively by reviewing the trip types for each season and the driving species (**Table 4-19**). In general, vessels with yellowtail snapper

trips in Season 1 (Portfolio A) continued with yellowtail snapper trips in Seasons 2 and 3. Portfolio B included trips driven by greater amberjack in Season 1 and Season 2, although some vessels switched to Core Snapper Grouper trips in Season 2 or Season 3. Vessels that fit into Portfolio C targeted deepwater species in Seasons 1 and 2, but either switched to Core Snapper Grouper trips in Season 3 or did not have snapper grouper trips in Season 3. It should be noted that many vessels in the Florida Keys may switch to spiny lobster or stone crab in Season 3.

Table 4-19. Common annual catch portfolios for the Florida Keys in 2016

Portfolio	Season 1	Season 2	Season 3
A	**Yellowtail Snapper**	**Yellowtail Snapper**	**Yellowtail Snapper**
B	**Greater Amberjack**	**Greater Amberjack** or **Core SG**- Mutton snapper, Shallow-water groupers	**Core SG**- Shallow-water species, Hogfish, Mutton snapper, Gray Triggerfish, Other species
C	**Deepwater**	**Deepwater**- Snowy grouper	**Core SG**- Shallow-water species, Hogfish, Mutton snapper, Gray Triggerfish, Other species or None

Chapter 5. Snapper Grouper Landings

This section provides an overview of snapper grouper landings and revenue for the region, by gear type, by species, and by complex. Each section includes information about the data sources used for the analysis.

South Atlantic Region Landings and Revenue

This information was obtained from the SEFSC Social Science Research Group (SSRG) Socioeconomic Panel data set (SEFSC-SSRG Socioeconomic Panel v.6 October 2017), which is compiled by the SEFSC SSRG from Federal Logbook System (FLS) data, supplemented by average prices calculated from the Accumulated Landings System (ALS). Wreckfish was not included because of confidentiality concerns due to the small number of participants. A review of the Wreckfish Individual Transferable Quota (ITQ) program is currently in development, and relevant information from the final review will be incorporated into the Snapper Grouper Socio-Economic Profile when it is available.

The South Atlantic region's total commercial landings of Snapper Grouper species and total revenue (adjusted for inflation using the US GDP deflator) from 1998 through 2016 are provided in **Figure 5-1** and **Table 5-1**. Overall, landings have ranged from 5.2 million pounds to almost 6.5 million pounds, while revenue ranged between $14,900,000 and $18,300,000. The trendlines (dotted) for total pounds and total revenue indicate a general decline in both, but less decline for revenue. There has been a decrease in total pounds over 2012 through 2016, but an increase or only slight decrease in revenue.

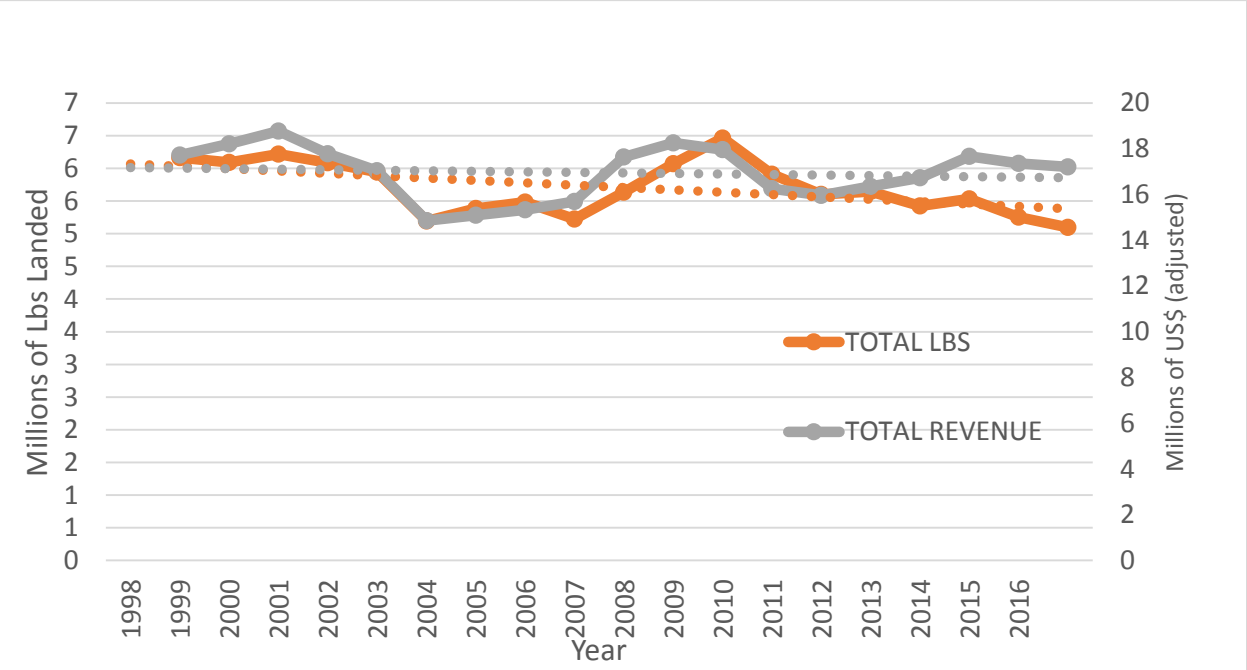

Figure 5-1. Total commercial landings of Snapper Grouper species and total revenue (adjusted for inflation) for the South Atlantic region from 1998 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Table 5-1. Total commercial landings of Snapper Grouper species and total revenue (adjusted) for the South Atlantic region from 1998 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Year	Total Landings (Lbs)	Total Revenue (US$, adjusted)
1998	6,164,399	17,727,615
1999	6,089,304	18,206,375
2000	6,215,827	18,778,030
2001	6,086,089	17,783,320
2002	5,944,165	17,039,683
2003	5,195,031	14,857,662
2004	5,384,294	15,085,249
2005	5,482,294	15,325,745
2006	5,222,757	15,697,894
2007	5,635,398	17,637,062
2008	6,072,014	18,256,439
2009	6,464,344	17,963,147
2010	5,908,932	16,255,682
2011	5,601,116	15,953,444
2012	5,642,615	16,351,605
2013	5,426,064	16,724,307
2014	5,532,248	17,672,785
2015	5,251,037	17,362,085
2016	5,096,481	17,202,331

Figure 5-2 and **Table 5-2** present the distribution of Snapper Grouper commercial landings by area from 1998 through 2016. There is some variation for each area's proportion of the total landings but the Florida Keys consistently produces the largest proportion of Snapper Grouper landings, and landings from the Florida areas make up 50% or more of total landings for the region.

The data indicate that there has been an increase in Florida's contribution to total landings in more recent years and that Florida areas make up a larger proportion of total landings than Georgia, South Carolina and North Carolina combined 2011 through 2016.

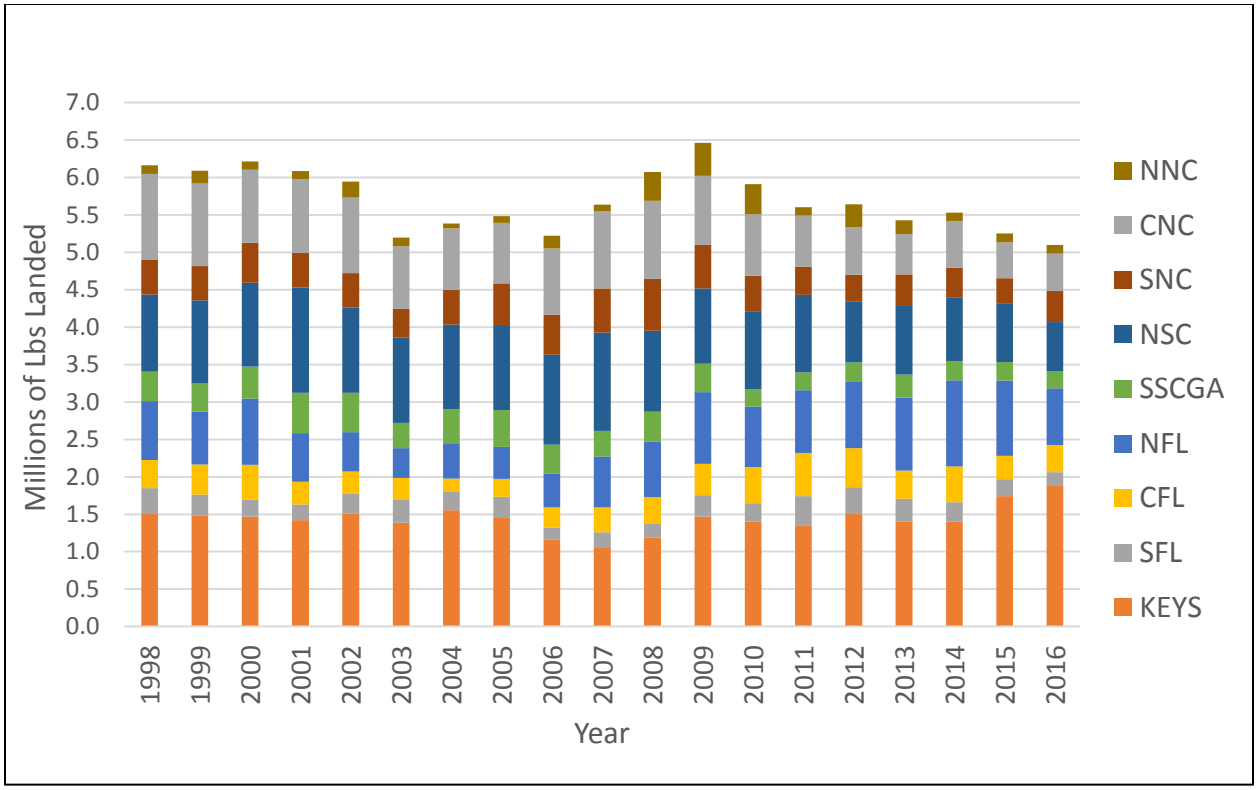

Figure 5-2. Landings of all Snapper Grouper species by area from 1998 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Table 5-2. Total landings (lbs) of Snapper Grouper species by area from 1998 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Year	KEYS	SFL	CFL	NFL	SSCGA	NSC	SNC	CNC	NNC	TOTAL
1998	1,501,309	349,360	372,199	788,466	394,353	1,030,383	462,567	1,147,412	118,350	6,164,399
1999	1,485,641	275,523	405,113	703,167	376,253	1,114,008	454,966	1,105,874	168,759	6,089,304
2000	1,468,377	228,216	462,301	885,870	426,935	1,120,368	536,479	974,548	112,733	6,215,827
2001	1,418,877	212,221	303,266	650,340	536,319	1,409,819	460,372	982,601	112,274	6,086,089
2002	1,508,768	261,152	301,621	524,055	525,434	1,140,016	459,893	1,010,842	212,384	5,944,165
2003	1,385,807	303,357	295,816	396,516	341,213	1,139,341	379,129	838,255	115,597	5,195,031
2004	1,554,205	249,923	174,607	459,485	467,862	1,129,461	465,511	818,384	64,856	5,384,294
2005	1,452,960	281,541	239,020	426,196	493,377	1,136,326	556,239	809,353	87,282	5,482,294
2006	1,164,872	154,385	273,752	450,379	385,326	1,203,098	534,051	884,051	172,843	5,222,757
2007	1,048,721	208,055	334,384	678,709	342,499	1,312,314	590,783	1,034,706	85,227	5,635,398
2008	1,190,316	180,797	356,536	745,745	398,696	1,080,464	694,164	1,039,876	385,420	6,072,014
2009	1,468,633	286,816	417,000	958,081	380,008	1,004,505	581,560	923,553	444,188	6,464,344
2010	1,404,483	242,713	484,018	809,356	228,993	1,036,664	483,803	820,019	398,883	5,908,932
2011	1,354,157	388,204	575,687	837,338	241,012	1,034,724	377,902	682,976	109,116	5,601,116
2012	1,502,524	359,143	521,560	894,566	252,585	813,871	354,455	636,256	307,655	5,642,615
2013	1,397,953	307,624	378,697	974,666	308,656	928,109	411,280	536,445	182,634	5,426,064
2014	1,404,146	256,900	479,554	1,151,154	251,457	850,574	401,277	624,987	112,199	5,532,248
2015	1,743,118	226,808	310,096	1,006,357	247,874	785,495	335,551	481,932	113,806	5,251,037
2016	1,876,536	184,378	363,698	757,774	230,026	656,182	413,464	500,321	114,102	5,096,481

Landings and Revenue by Gear

This information was obtained from the SEFSC Social Science Research Group (SSRG) Socioeconomic Panel data set (SEFSC-SSRG Socioeconomic Panel v.6 October 2017). **Figures 5-3** and **5-4** show the proportion of total landings and revenue for each gear type for the South Atlantic region for 2005 through 2016, based on the top gear reported in each snap Snapper Grouper trip. Overall, electric gear make up the largest proportion of landings and revenue, followed by hook and line gear. Trips with electric or hook and line reported as the top gear make up the large majority of (>75%) of landings and revenue.

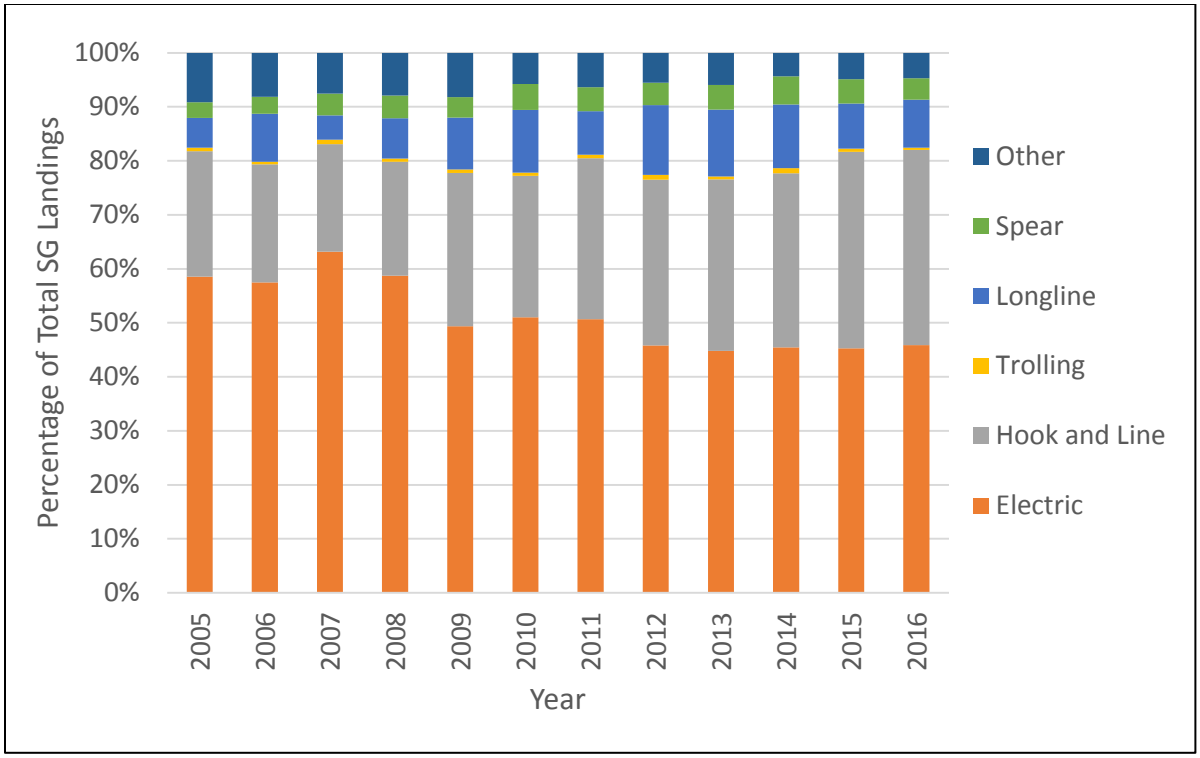

Figure 5-3. Distribution of Snapper Grouper commercial landings by top gear reported on trips for the South Atlantic region from 2005 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

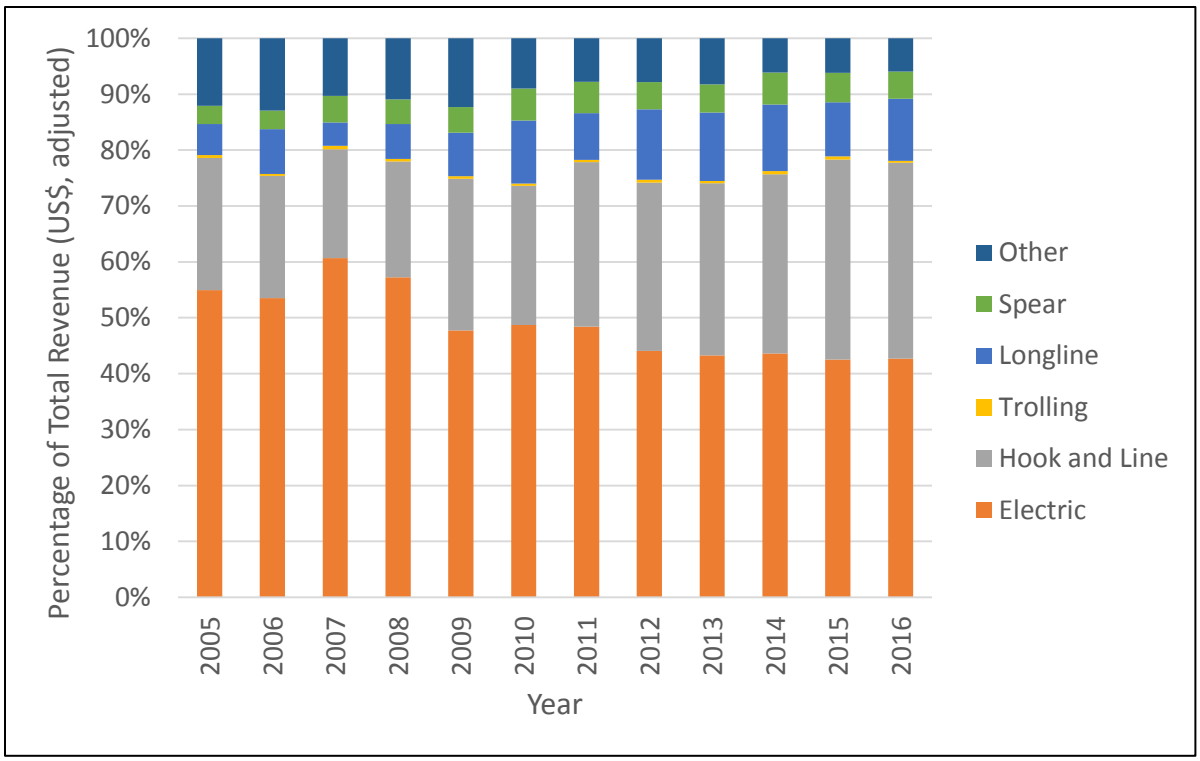

Figure 5-4. Distribution of Snapper Grouper commercial revenue (US$, adjusted for inflation) by top gear reported on trips for the South Atlantic region from 2005 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

For North Carolina, South Carolina and Georgia, a large majority of trips in most years from 2005 through 2016 report the top gear as electric, with a smaller proportion of trips reporting hook and line or longline as the top gear (**Figure 5-5**). Other gear includes spear, trolling, buoy and gillnet.

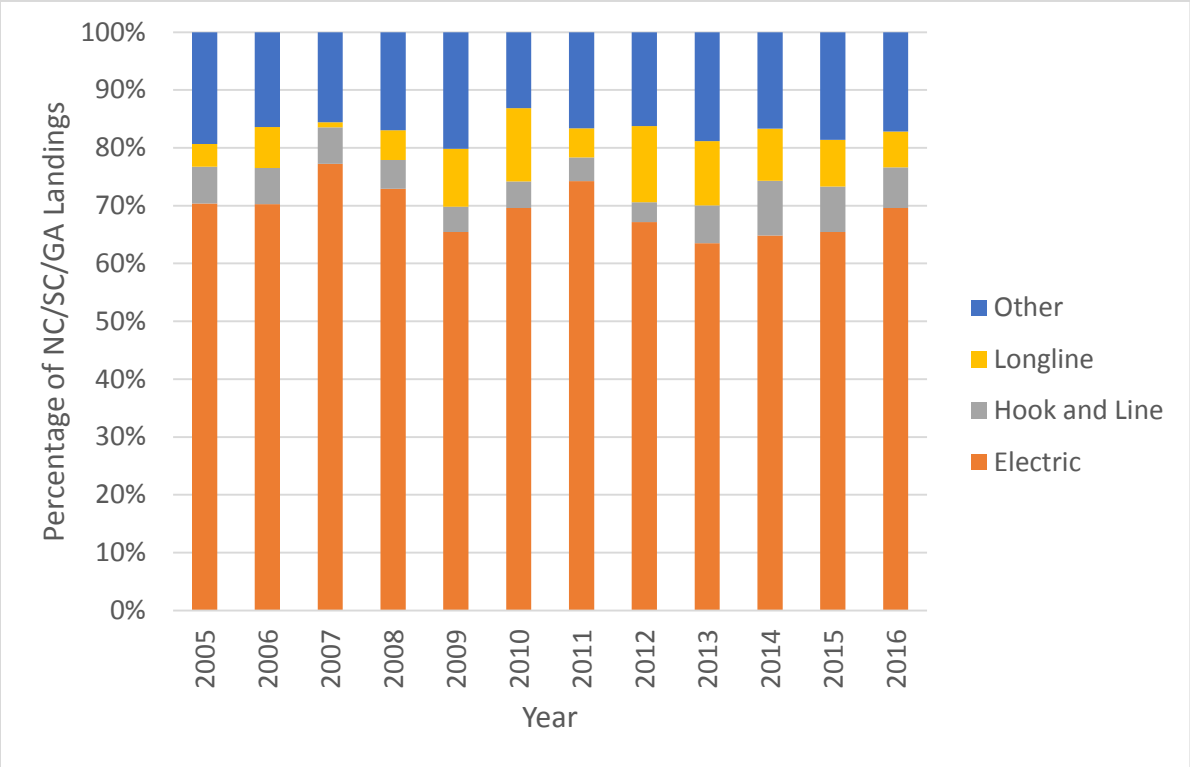

Figure 5-5. Distribution of Snapper Grouper commercial landings by top gear reported on trips for North Carolina, South Carolina and Georgia from 2005 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Table 5-3 provides comparison of the proportion of total landings and percentages of total revenue for Snapper Grouper trips landed in North Carolina, South Carolina and Georgia in recent years. In general, the proportion of total pounds aligns with the proportion of total revenue for this area, except for longline trips. This suggests that Snapper Grouper species caught on longline trips have a lower ex-vessel value than species caught on electric or hook and line trips. Trips reporting the top gear as spear, trolling, buoy gear, and gillnet ('Other Gear' in **Table 5-3**), make up a larger proportions of total revenue than proportion of total landings, which indicates that snapper grouper species caught on these trips have higher ex-vessel value than species caught on trips with another gear type.

Table 5-3. Comparison of percentage of total landings and percentage of total revenue by gear type for North Carolina, South Carolina and Georgia from 2005 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

	Electric		Hook and Line		Longline		Other Gear	
Year	Lbs	$	Lbs	$	Lbs	$	Lbs	$
2005	72.7%	69.8%	6.6%	6.5%	4.1%	3.7%	20.0%	20.1%
2006	72.0%	67.0%	6.4%	6.3%	7.2%	5.8%	16.8%	20.9%
2007	78.9%	75.8%	6.5%	6.3%	0.9%	0.6%	15.9%	17.3%
2008	74.8%	72.9%	5.1%	5.1%	5.3%	3.4%	17.4%	18.6%
2009	67.8%	64.9%	4.5%	4.6%	10.4%	6.7%	20.9%	23.9%
2010	70.7%	67.8%	4.7%	4.6%	12.9%	9.7%	13.3%	17.9%
2011	76.1%	72.7%	4.2%	4.6%	5.2%	4.4%	17.0%	18.3%
2012	68.8%	66.4%	3.5%	3.8%	13.5%	10.9%	16.6%	18.9%
2013	65.5%	63.3%	6.8%	6.8%	11.5%	9.9%	19.4%	20.1%
2014	66.4%	63.8%	9.7%	9.3%	9.2%	9.2%	17.1%	17.7%
2015	67.5%	63.5%	8.1%	8.2%	8.3%	9.5%	19.2%	18.8%
2016	71.4%	67.2%	7.2%	6.9%	6.4%	8.4%	17.6%	17.6%

For the Florida East Coast and the Florida Keys, a most trips from 2005 through 2016 report the top gear as hook and line, with a slightly lower percentage reporting electric as the top gear (**Figure 5-6**). Trips with these two gear types make up a large majority of Snapper Grouper trips, with a smaller proportion for longline, spear, and other gear (trolling, buoy and gillnet).

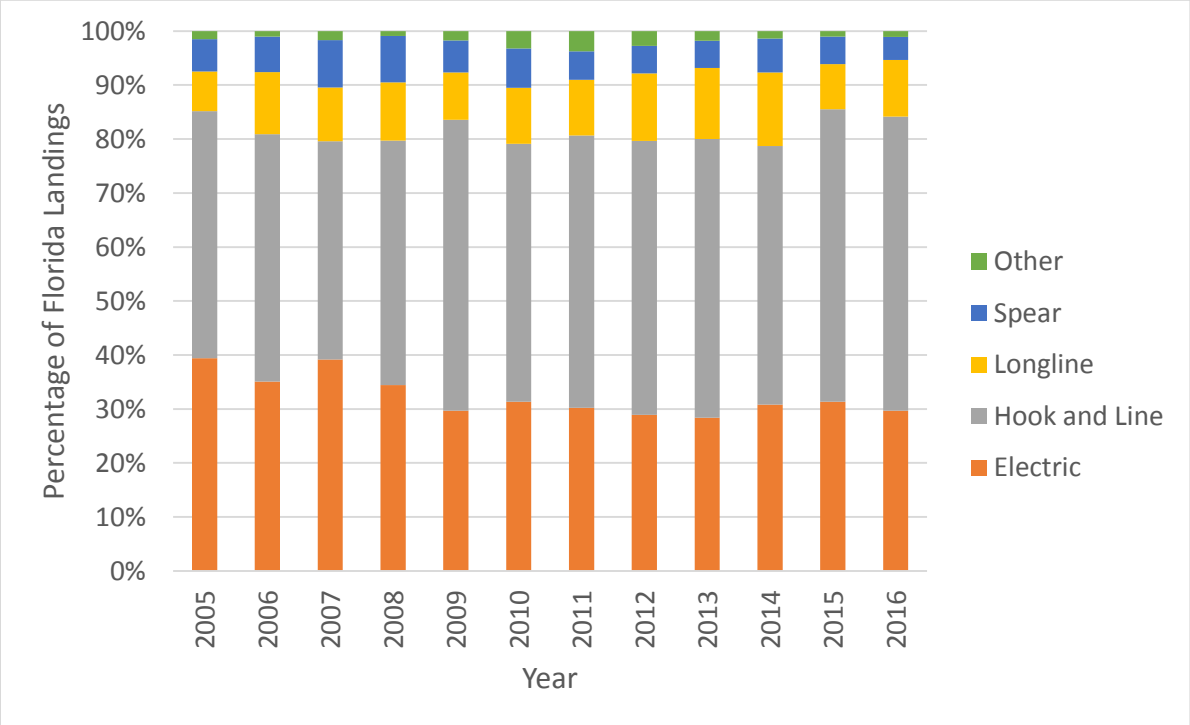

Figure 5-6. Distribution of Snapper Grouper commercial landings by top gear reported on trips for Florida from 2005 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Table 5-4 provides comparison of the proportion of total landings and percentages of total revenue for Snapper Grouper trips landed in Florida from 2005 through 2016. Overall, the proportion of total pounds aligns with the proportion of total revenue. Florida hook and line or longline trips make up a larger proportion of total revenue than the proportion of pounds for each respective gear, indicating that Snapper Grouper species caught on these trips have a higher ex-vessel value than species from trips with other gear types, specifically trips with electric gear.

Table 5-4. Comparison of percentage of total landings and percentage of total revenue by gear type for Florida from 2005 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

	Electric		Hook and Line		Longline		Spear		Other Gear	
Year	Lbs	$	Lbs	$	Lbs	$	Lbs	$	Lbs	$
2005	39.4%	29.7%	45.8%	52.8%	7.3%	8.8%	5.9%	7.4%	1.5%	1.3%
2006	35.0%	28.1%	45.9%	51.0%	11.5%	12.2%	6.6%	7.7%	1.0%	1.0%
2007	39.2%	32.9%	40.4%	43.6%	10.0%	10.7%	8.7%	11.3%	1.7%	1.4%
2008	34.4%	29.1%	45.3%	48.8%	10.8%	11.3%	8.5%	9.9%	0.9%	0.9%
2009	29.7%	25.8%	53.9%	56.0%	8.8%	9.1%	5.9%	7.5%	1.8%	1.6%
2010	31.4%	25.2%	47.7%	49.9%	10.4%	13.3%	7.3%	9.0%	3.3%	2.5%
2011	30.2%	23.3%	50.4%	55.2%	10.3%	12.4%	5.3%	6.7%	3.9%	2.4%
2012	28.9%	24.0%	50.8%	53.7%	12.5%	14.1%	5.1%	6.1%	2.8%	2.0%
2013	28.4%	23.5%	51.6%	54.5%	13.2%	14.6%	5.1%	5.9%	1.8%	1.4%
2014	30.8%	27.0%	47.9%	50.8%	13.6%	14.1%	6.3%	7.0%	1.4%	1.1%
2015	31.4%	27.3%	54.1%	55.8%	8.4%	9.8%	5.1%	6.2%	1.0%	0.9%
2016	29.7%	23.9%	54.5%	56.7%	10.5%	13.1%	4.3%	5.2%	1.1%	1.0%

Landings and Revenue by Species

This section provides information about commercial landings and revenue for 13 main species, including black grouper, black sea bass, blueline tilefish, gag grouper, golden tilefish, gray triggerfish, greater amberjack, red grouper, red porgy, red snapper, snowy grouper, vermilion snapper and yellowtail snapper. Data sources include Accumulated Landings System (ALS), Southeast Commercial Logbook, and the SEFSC Social Science Research Group (SSRG) Socioeconomic Panel data set (SEFSC-SSRG Socioeconomic Panel v.6 October 2017). Figures showing the landings and revenue are shown for the calendar year for each species. Figures showing distribution of landings for North Carolina/South Carolina/Georgia, East Coast Florida and the Florida Keys are based on the fishing year. A brief description of regulatory changes that affected commercial harvest is provided for each species.

For figures showing the distribution of landings by area, some areas have been combined to maintain confidentiality. Additional qualitative information is provided, which is based on the quantitative data, to provide further details without compromising confidentiality for areas with no or low landings.

Black Grouper

Amendment 16 (SAFMC 2009) established the January through April spawning season that included black grouper, along with the closure of commercial harvest of black grouper, red grouper and the shallow water grouper complex when the gag grouper directed quota is met. Black grouper was managed under an aggregate annual catch limit (ACL) with gag and red grouper (Amendment 17B; SAFMC 2010B) until a separate ACL for black grouper was established in the Comprehensive ACL Amendment (SAFMC 2011A). The commercial ACL was set at 90,575 lbs ww for 2012 and with two annual increases to 96,844 lbs ww for 2014 and subsequent years. The collective closure when the gag landings reach the gag directed quota were removed in Regulatory Amendment 15 (SAFMC 2013A).

Regulatory actions restricting access to fishing areas for black grouper include the fishing prohibition in the *Oculina* Experimental Closed Area (Amendment 13A; SAFMC 2003) and several marine protected areas with fishing prohibitions that were established in 2009 (Amendment 14; SAFMC 2007A).

Landings and revenue for black grouper peaked around 2004-2006, followed by a decline till 2012 and a slight increase in recent years (**Figure 5-7**). Overall, the revenue line (gray) tracks the landings line (orange), suggesting that the price per pound has experienced minimal change when adjusted for inflation. North Carolina, South Carolina and Georgia combined had higher landings in earlier years of the time period but most landings are consistently from Florida, specifically the Florida Keys (**Figure 5-8**). Most landings in the NC/SC/GA area are in Central North Carolina and Northern South Carolina.

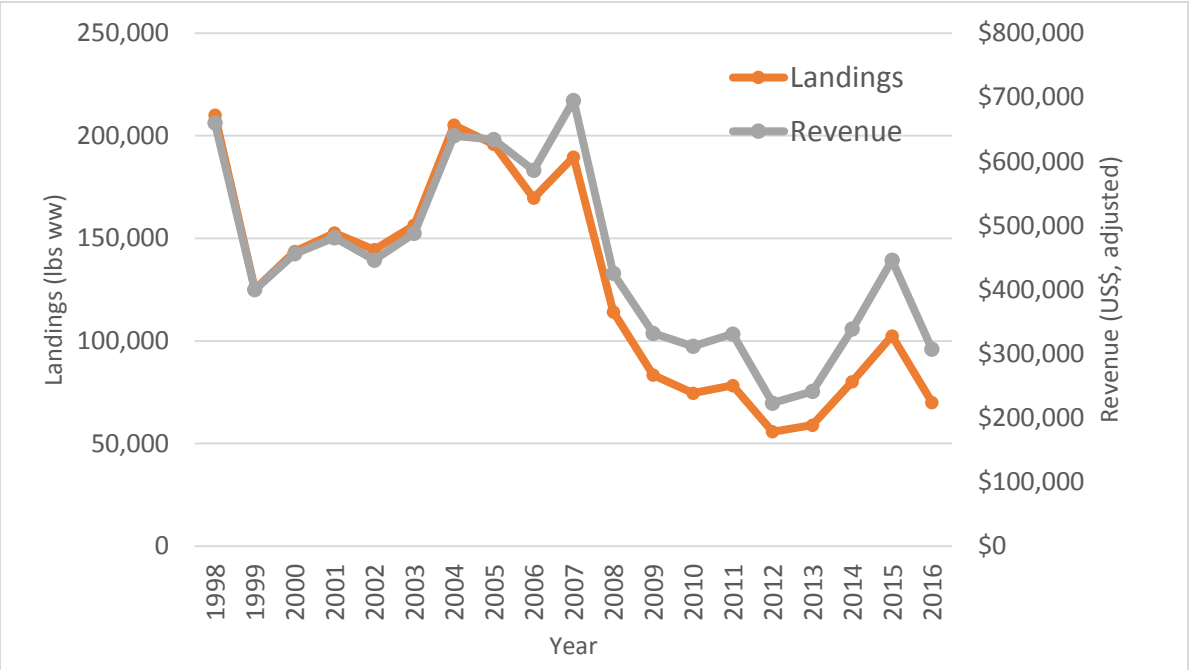

Figure 5-7. Total commercial landings (lbs ww) and revenue of black grouper from 1998 through 2016. Landings were converted from gutted weight to whole weight based on conversion factor of 1.18 lb ww to 1 lb gw. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

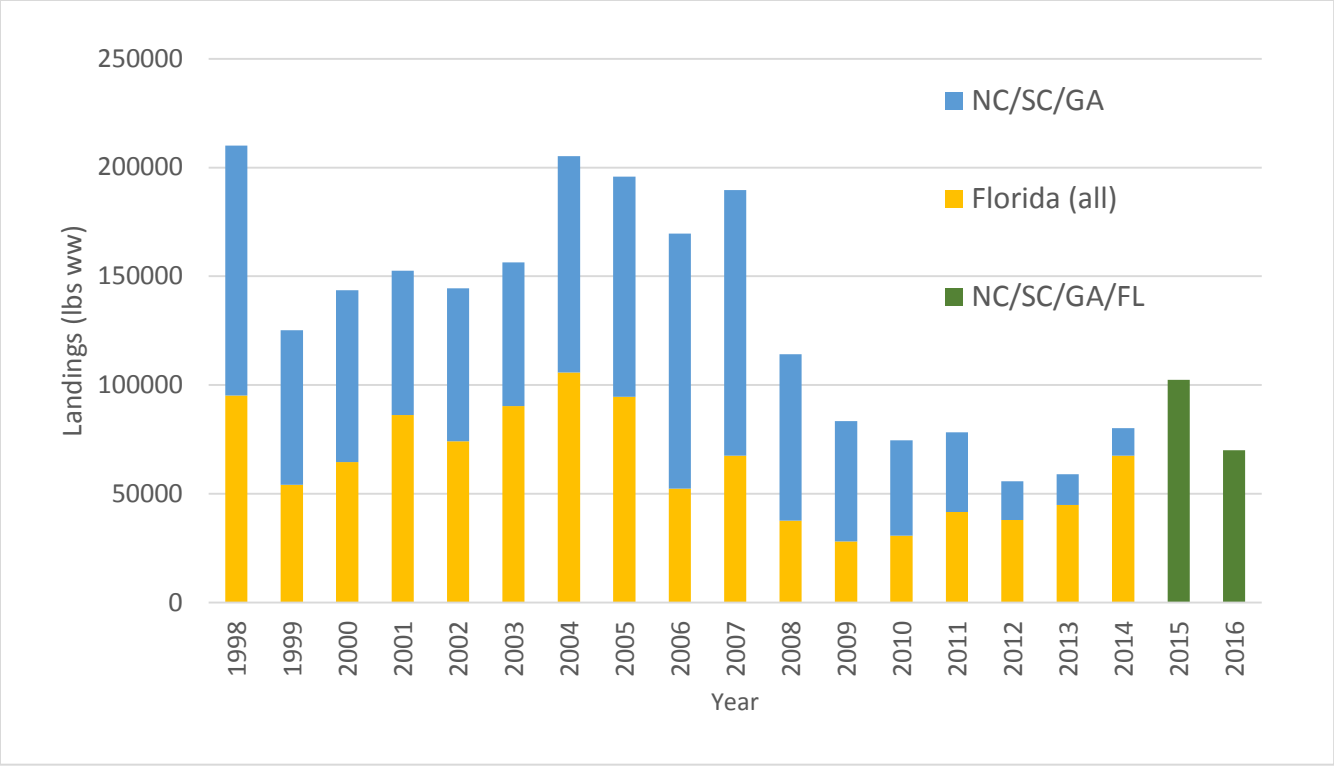

Figure 5-8. Commercial landings (lbs ww) of black grouper by area from 1998 through 2016. Landings were converted from gutted weight to whole weight based on conversion factor of 1.18 lb ww to 1 lb gw. To maintain confidentiality, landings from Florida are combined for all years, and landings from all areas are combined for 2015 and 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Black Sea Bass

A commercial quota for black sea bass was implemented through Snapper Grouper Amendment 13C in 2006 (SAFMC 2006), set at 477,000 lbs gutted weight (gw) and decreasing over the next three years to 309,000 lbs gw. Implementation of the limited entry black sea bass pot endorsement through Amendment 18A (SAFMC 2011B) restricted the number of participants in the pot component of the black sea bass fishery. In 2013, a stock assessment update resulted in a recommendation for an increased ACL over a three-year period to 640,063 lbs gw (Regulatory Amendment 19; SAFMC 2013B).

In general there is an overall downward trend in landings and revenue of black sea bass (**Figure 5-9**). Most landings are in North Carolina, South Carolina and Georgia (**Figure 5-10**), with a majority of landings coming from Central North Carolina, followed by landings in Northern South Carolina. Landings are very low for Florida, with no landings in the Florida Keys. ALS and logbook data indicate sale of just one or two fish from most Florida trips. Most Florida landings are from North Florida, which has seen an increase landings since about 2009.

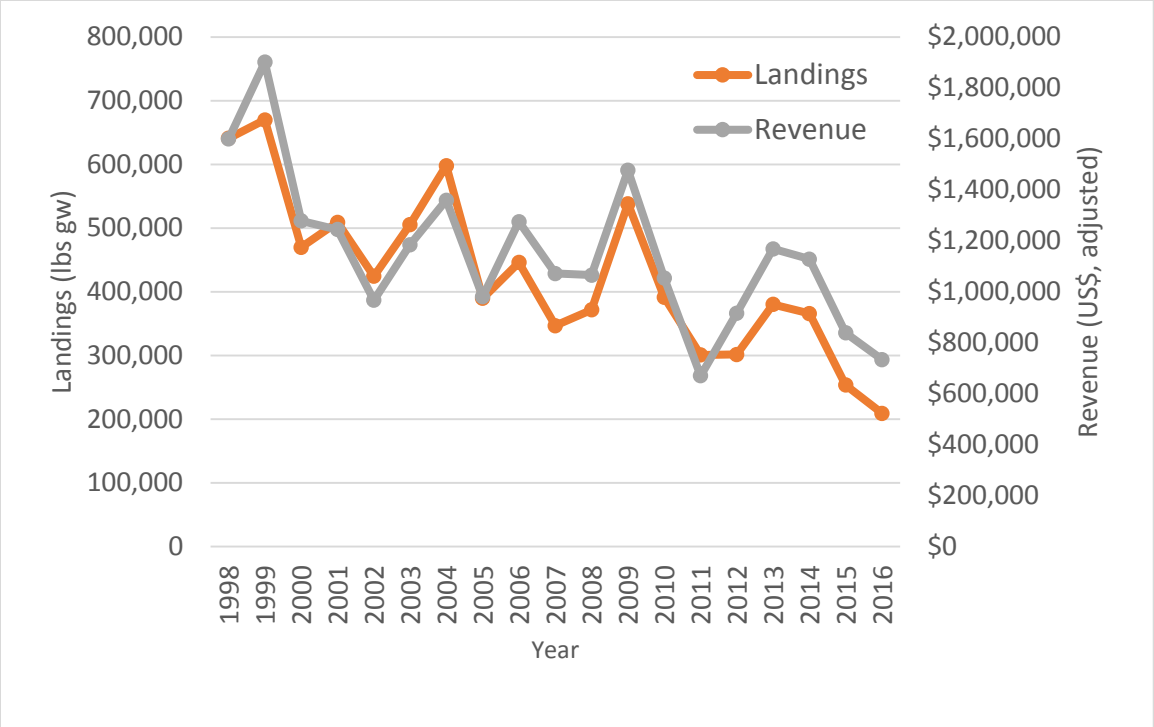

Figure 5-9. Total commercial landings (lbs gw) and revenue of black sea bass from 1998 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

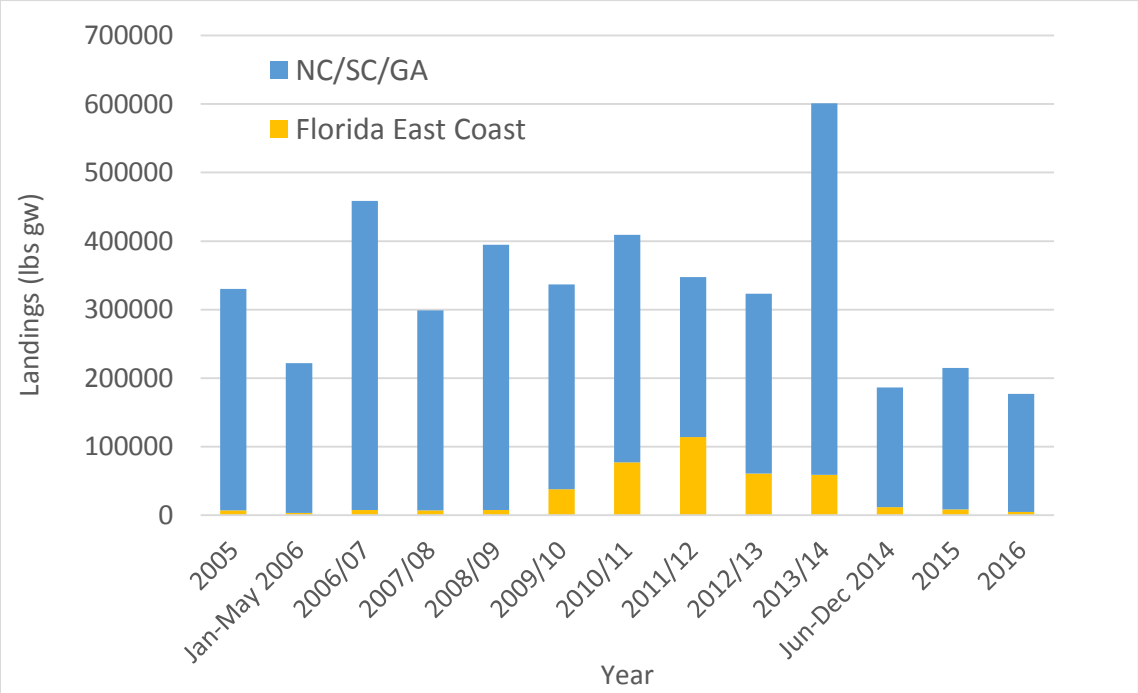

Figure 5-10. Commercial landings (lbs gw) of black sea bass by area from 1998 through 2016. To maintain confidentiality, landings from Florida are combined for all years. Data source: Accumulated Landings System (ALS)

Blueline Tilefish

Several regulatory actions have affected commercial harvest of blueline tilefish. The first ACL for blueline tilefish was an aggregate ACL established in the Comprehensive ACL Amendment, in which blueline tilefish was included in the deepwater complex (SAFMC 2011A). A stock assessment reviewed in 2013 indicated that the stock was overfished and that overfishing was occurring, and an ACL of 17,841 lbs ww for blueline tilefish (no longer part of the deepwater complex ACL) was implemented in 2015 through Amendment 32 (SAFMC 2014A). Following a new recommendation, the ACL was updated to 87,521 lbs ww in 2016 (Regulatory Amendment 25; SAFMC 2016).

Commercial harvest of blueline tilefish closed early in 2014 (late June); 2015 (early April); 2016 (early June with a 6-week reopening in July/August); and 2017 (mid-July with a one-week reopening in October).

Commercial landings of blueline tilefish increased sharply in 2008 through 2010, followed by a steep decline in 2011 (**Figure 5-11**). Although landings increased again in 2012, the subsequent decline continued through 2016 following in-season closures in 2014, 2015 and 2016. Overall, revenue follows a similar pattern as landings, suggesting that the price per pound has changed minimally when adjusted for inflation. The majority of blueline tilefish landings are in the NC/SC/GA area (**Figure 5-12**). From 2007 through 2013, Northern North Carolina had at least 75% of total landings of blueline tilefish. In more recent years, Northern South Carolina has landed the majority of the landings.

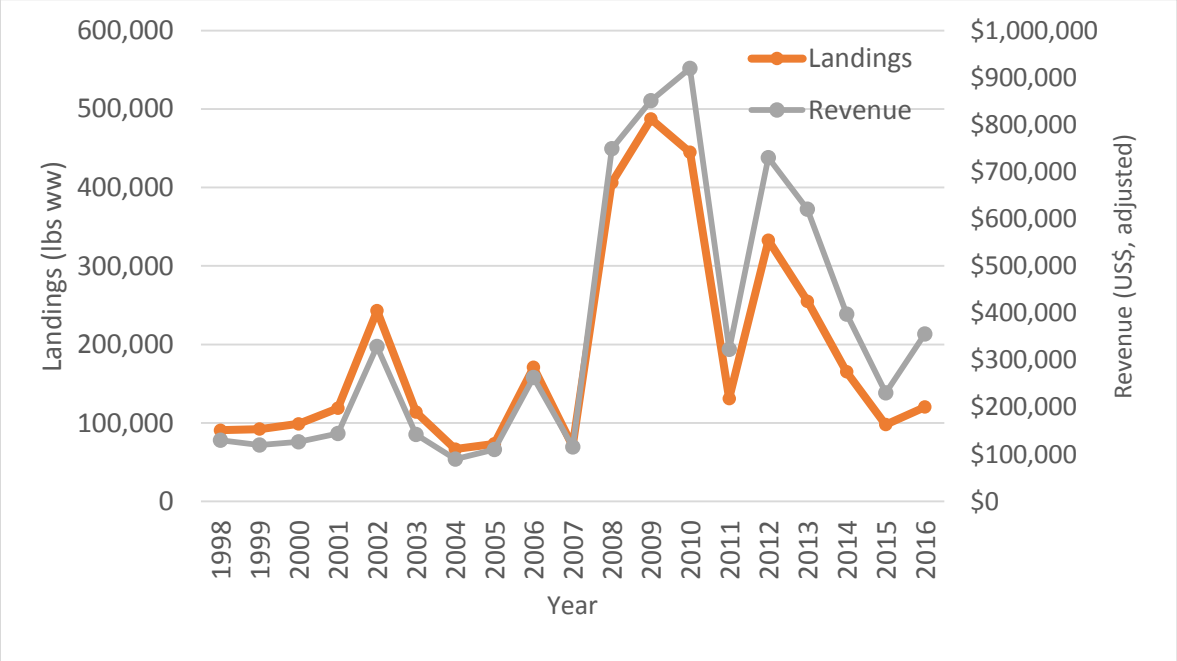

Figure 5-11. Total commercial landings and revenue of blueline tilefish from 1998 through 2016. Landings were converted from gutted weight to whole weight based on conversion factor of 1.12 lb ww to 1 lb gw. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

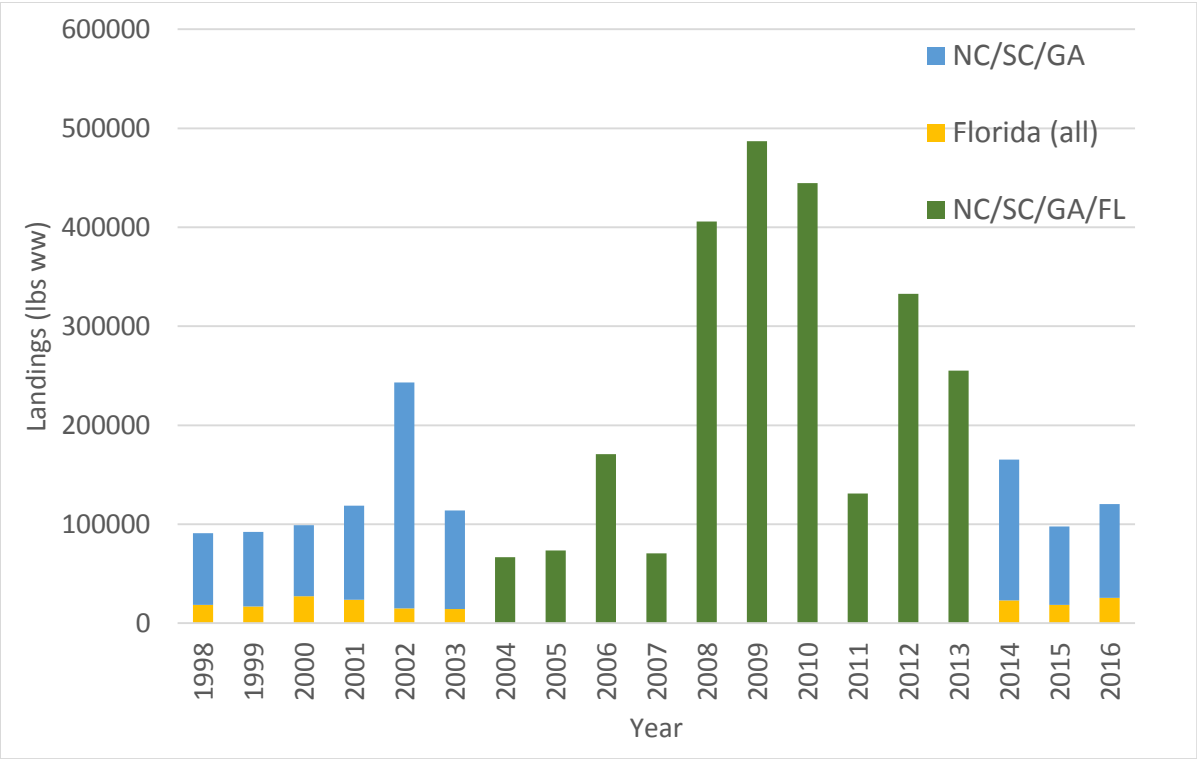

Figure 5-12. Commercial landings of blueline tilefish by area from 1998 through 2016. Landings were converted from gutted weight to whole weight based on conversion factor of 1.12 lb ww to 1 lb gw. To maintain confidentiality, landings from Florida are combined for all years, and landings from all areas are combined for 2004 through 2013. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Gag Grouper

A stock assessment in 2006 indicated that gag grouper was overfished and that overfishing was occurring. A commercial quota of 353,940 lbs gw was implemented in July 2009, along with a commercial directed quota of 352,940 lbs gw that when reached, all commercial harvest of gag, black grouper, red grouper and the shallow water grouper complex would end for the year in an effort to reduce bycatch of gag (Amendment 16; SAFMC 2009). The collective closure was removed in 2013 (Regulatory Amendment 15; SAFMC 2013A).

An assessment update in 2014 indicated that the gag stock was no longer overfished but overfishing continued. The commercial directed quota for gag was set at 295,459 lbs gw in 2015 and 297,882 lbs gw in 2016 (with annual increases through 2019) (Regulatory Amendment 22; SAFMC 2015A).

Changes in access to fishing areas for gag grouper were also affected by the fishing prohibition in the *Oculina* Experimental Closed Area (Amendment 13A; SAFMC 2003) and the 2009 establishment of several marine protected areas with fishing prohibitions (Amendment 14; SAFMC 2007A).

There has been a decline in landings and revenue since 1998 (**Figure 5-13)**. Most landings are in NC/SC/GA (**Figure 5-14**). Florida landings are primarily in Central and North Florida, with

almost no landings of gag in the Florida Keys. All areas of NC/SC/GA have landings of gag grouper except for Northern North Carolina, which has minimal landings.

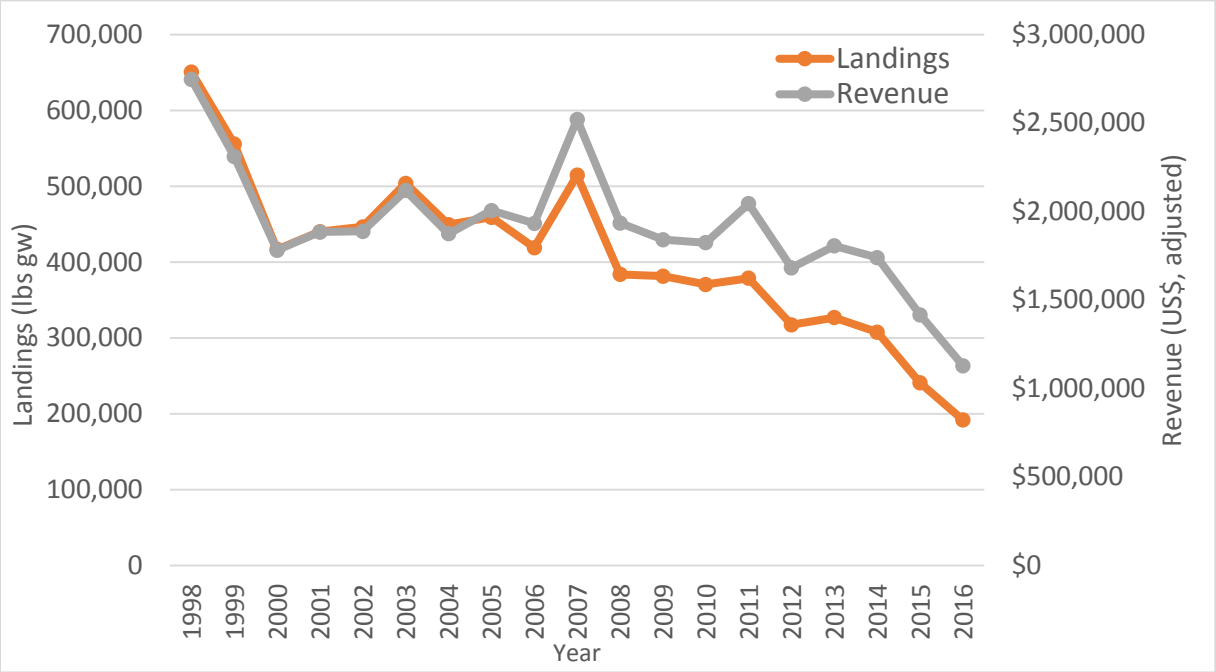

Figure 5-13. Total commercial landings and revenue of gag grouper from 1998 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

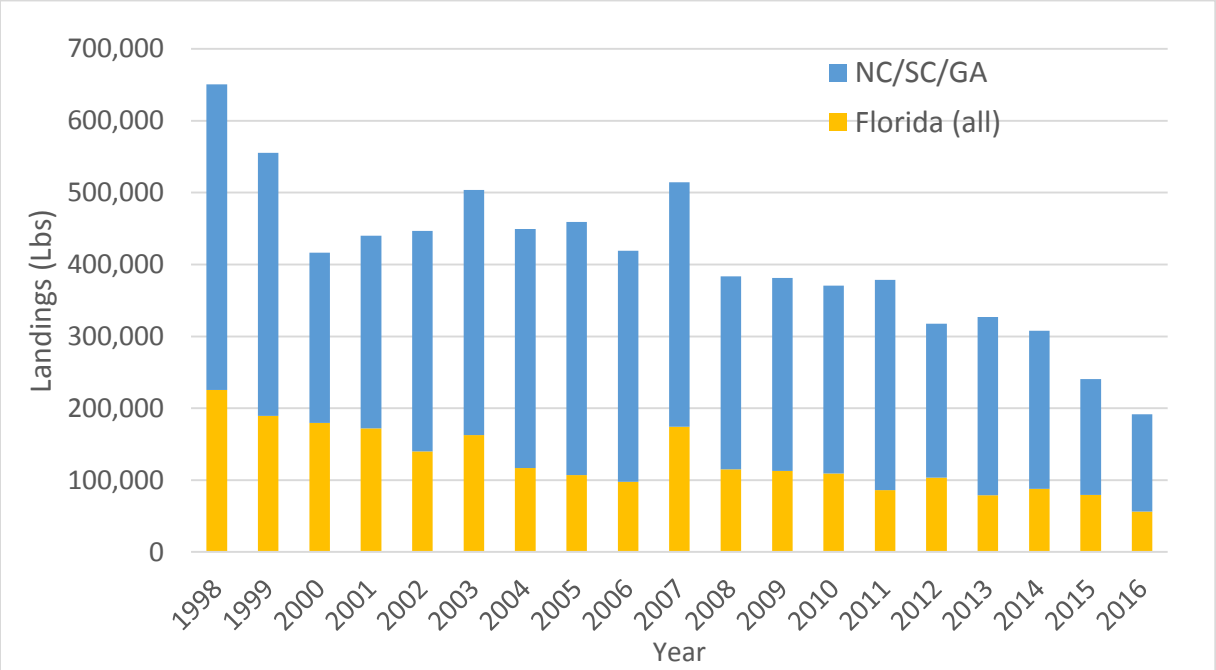

Figure 5-14. Commercial landings of gag grouper by area from 1998 through 2016. Landings from Florida are combined to maintain confidentiality. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Golden Tilefish

In earlier years of golden tilefish management (before 1998), the commercial quota was specified as 1,001,663 lbs gw (Amendment 6; SAFMC 1993). To end overfishing of golden tilefish, Amendment 13C (SAFMC 2006) revised the commercial quota to 295,000 lbs gw. Amendment 17B (SAFMC 2010B) established the total ACL and commercial/recreational allocations, with the commercial ACL set at 282,819 lbs gw. Following a stock assessment for golden tilefish, the commercial ACL was revised to 541,295 lbs gw starting in 2012 (Regulatory Amendment 12; SAFMC 2012). Amendment 18B (SAFMC 2013C) established gear allocations for longline and hook and line.

There were also regulatory actions that affected access to golden tilefish. Longline harvest has been prohibited south of St Lucie inlet since 1995 (Amendment 7; SAFMC 1994B), and several marine protected areas in which golden tilefish harvest is prohibited were established in 2009 (Amendment 14; SAFMC 2007A). Amendment 17B (SAFMC 2010B) established a closure for harvest of deepwater species including golden tilefish at depths over 240 feet starting in January 2011 to reduce bycatch of Warsaw grouper and speckled hind. The closure was removed in May 2012 (Regulatory Amendment 11; SAFMC 2011C).

Landings and revenue for golden tilefish have been increasing since about 2004, with a small dip in 2015 (**Figure 5-15**). In most years, a majority of landings were in Florida (**Figure 5-16**), specifically Central Florida. Northern South Carolina makes up most of the landings in NC/SC/GA.

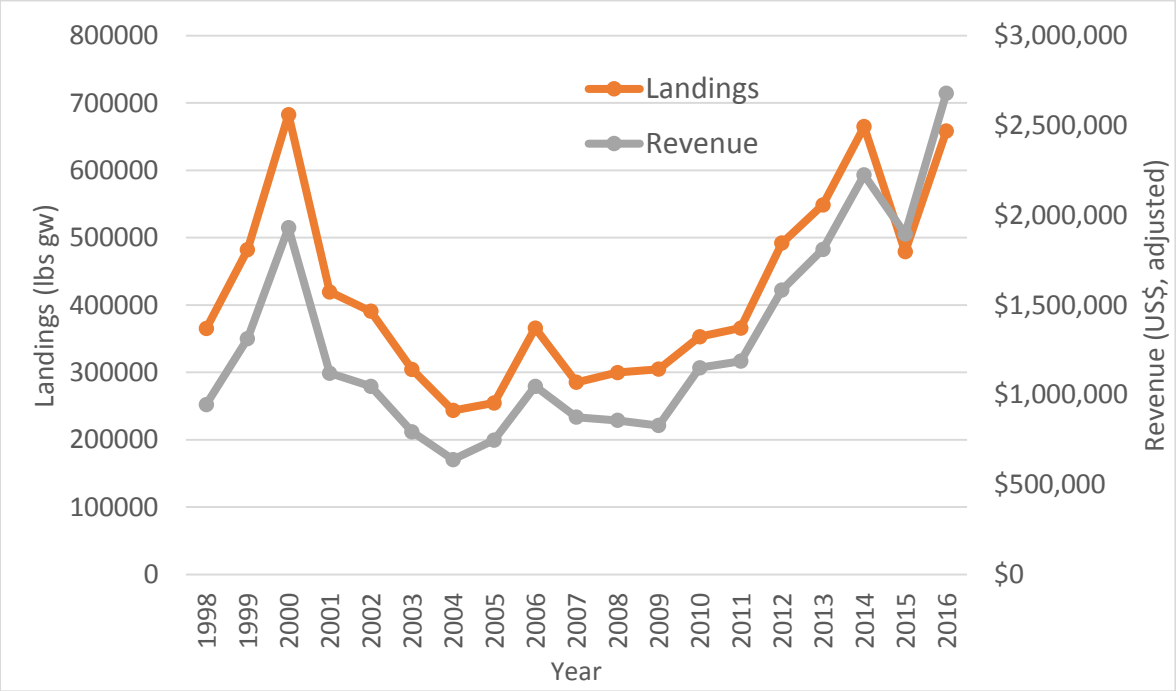

Figure 5-15. Total commercial landings and revenue of golden tilefish from 1998 through 2016

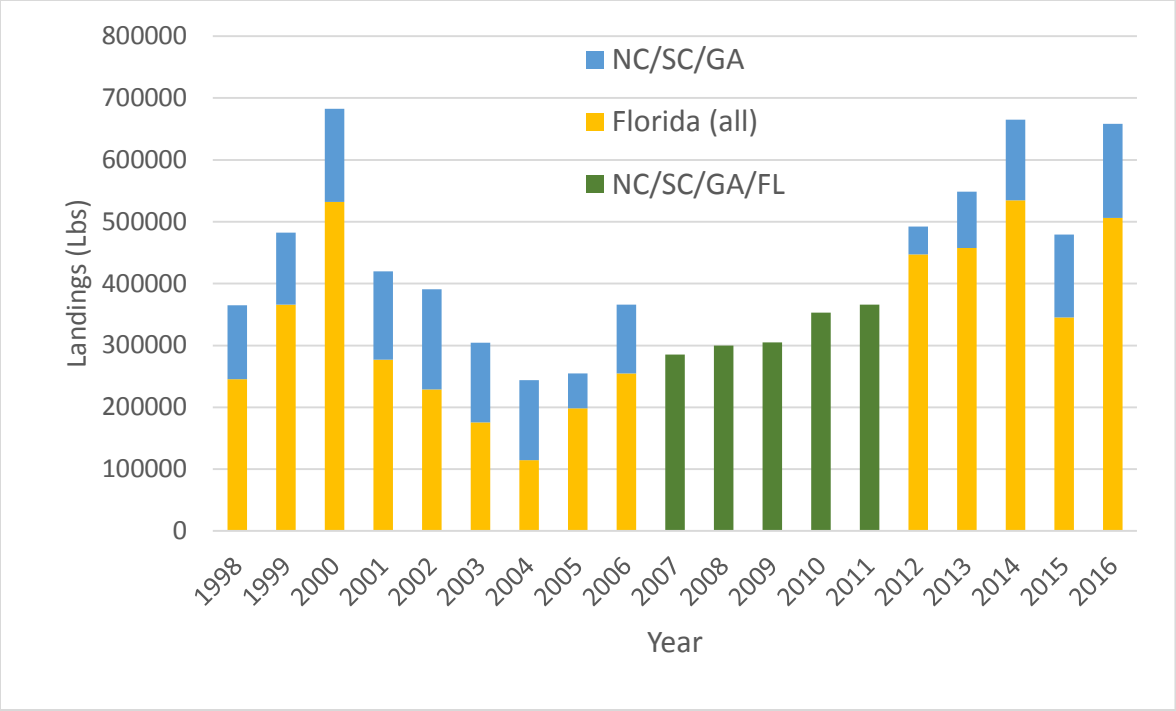

Figure 5-16. Commercial landings of golden tilefish by area from 1998 through 2016. To maintain confidentiality, landings from Florida are combined for all years, and landings from all areas are combined for 2007 through 2011. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Gray Triggerfish

The Comprehensive ACL Amendment established the gray triggerfish commercial ACL in 2012, set at 305,262 lbs ww (SAFMC 2011A). The commercial ACL was updated to 272,880 lbs ww in 2013 (Regulatory Amendment 13; SAFMC 2013D) following updated recreational landings. Minimum size limits, a split season and a revised commercial ACL of 312,325 lbs ww was established in July 2015 through Amendment 29 (SAFMC 2015B).

Landings peaked in 2011 prior to establishment of the ACL in 2012, and have remained between 250,000 and 300,000 lbs ww since 2012 (**Figure 5-17**). Revenue has increased, which indicates that value of gray triggerfish has increased even if landings have not. Most landings are in NC/SC/GA (**Figure 5-18**), specifically Northern South Carolina, Southern North Carolina, and Central North Carolina. There has been an increase in landings in Florida in recent years.

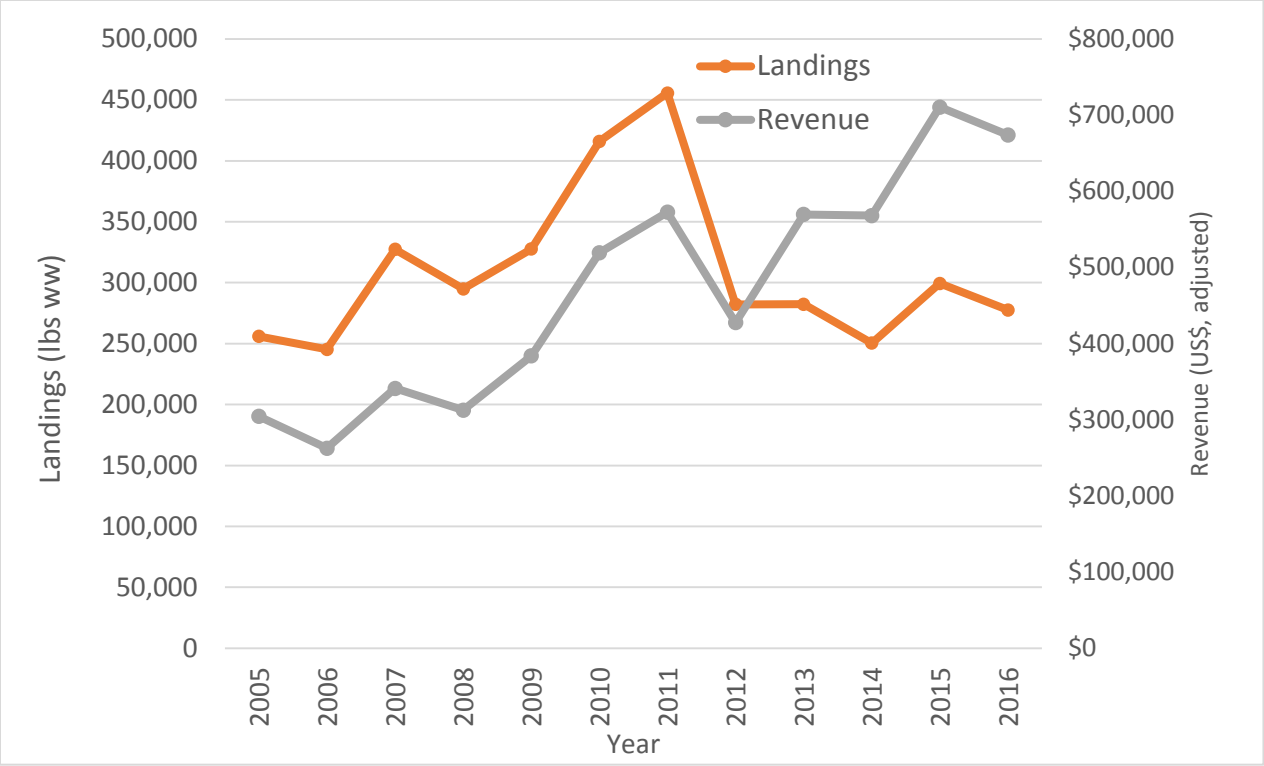

Figure 5-17. Total commercial landings and revenue of gray triggerfish from 2005 through 2016. Landings were converted from gutted weight to whole weight based on conversion factor of 1.04 lb ww to 1 lb gw. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

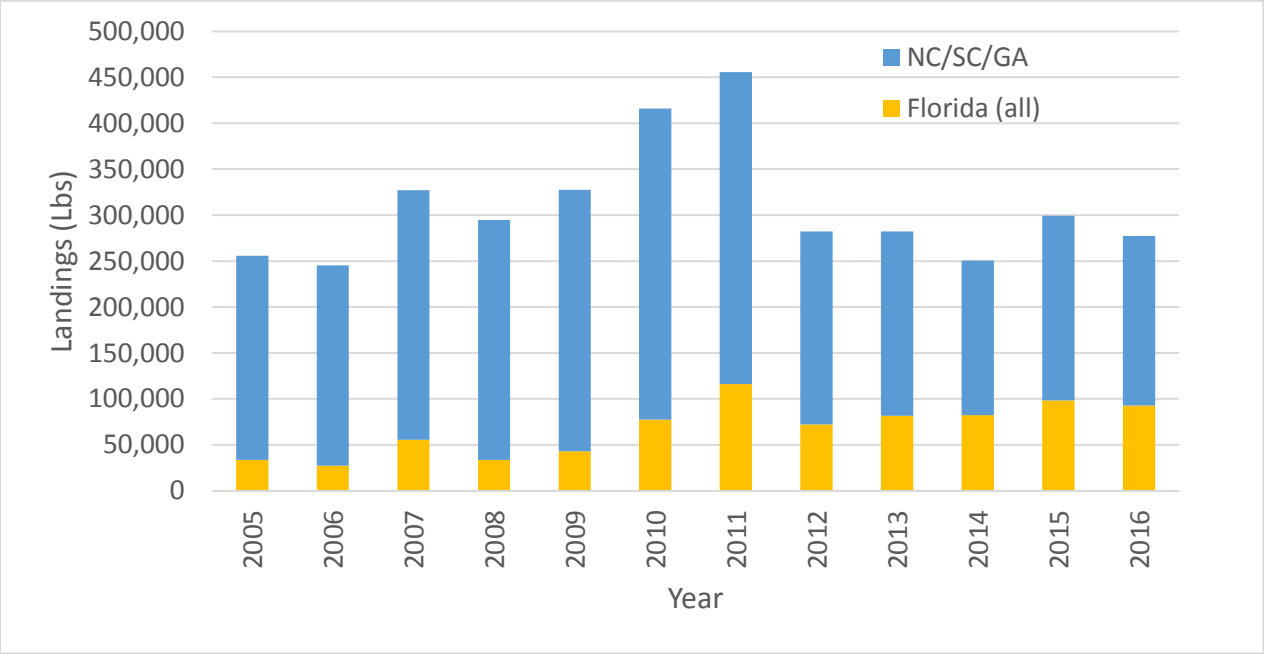

Figure 5-18. Commercial landings of gray triggerfish by area from 2005 through 2016. Landings were converted from gutted weight to whole weight based on conversion factor of 1.04 lb ww to 1 lb gw. To maintain confidentiality, landings from Florida are combined for all year. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Greater Amberjack

Greater amberjack was managed under a commercial/recreational quota of 1,169,931 lbs ww starting in 1999 (Amendment 9; SAFMC 1998). The commercial ACL was established in 2011 through the Comprehensive ACL Amendment (SAFMC 2011A) and set at 769,388 lbs gw. Regulatory Amendment 9 (SAFMC 2011) increased the trip limit from 1,000 lbs to 1,200 lbs gw, and the start date of the fishing year was changed in 2014 from March 1 to May 1 through Regulatory Amendment 14 (SAFMC 2014B). Commercial harvest is closed for the month of April for the spawning season (Amendment 9; SAFMC 1998).

Landings and revenue for greater amberjack have increased overall, with a small decline in 2015 and 2016 (**Figure 5-19**). Most landings are in Florida are from Northern and Central Florida. For NC/SC/GA, South Carolina makes up the greatest proportion of landings (**Figure 5-20**).

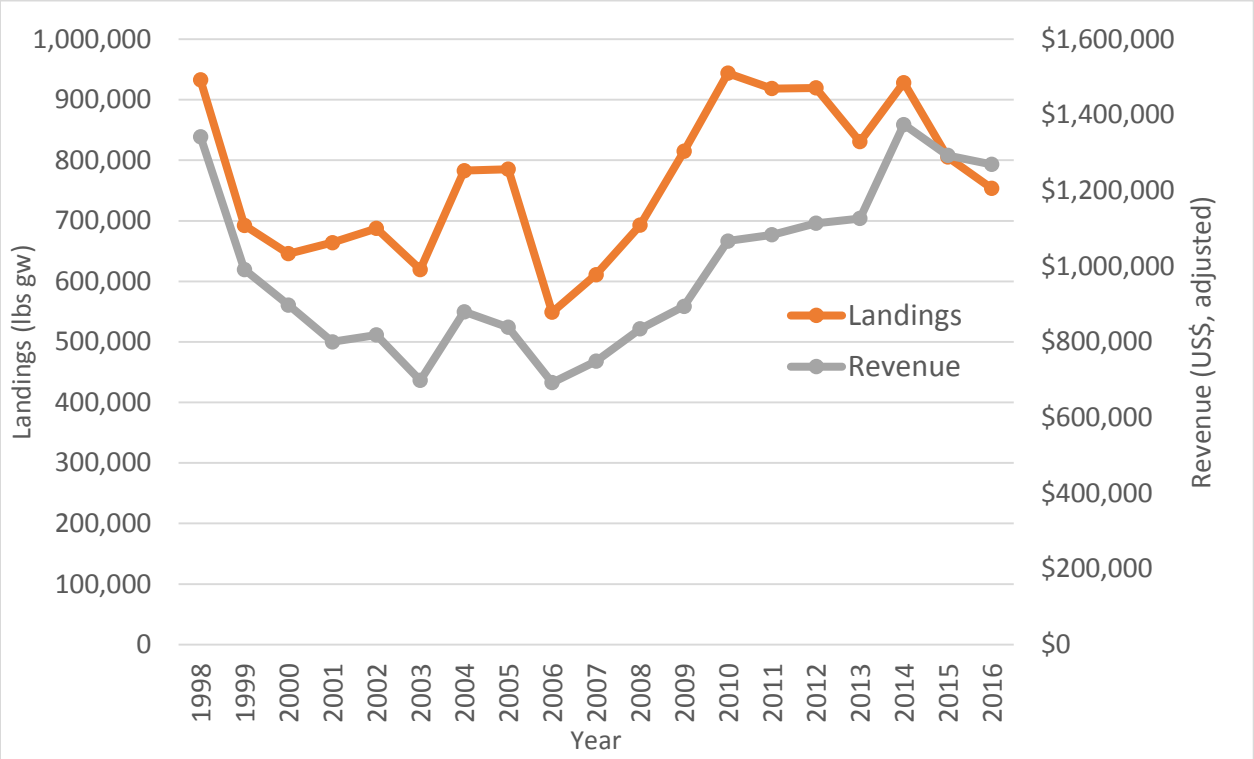

Figure 5-19. Total commercial landings and revenue of greater amberjack from 1998 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

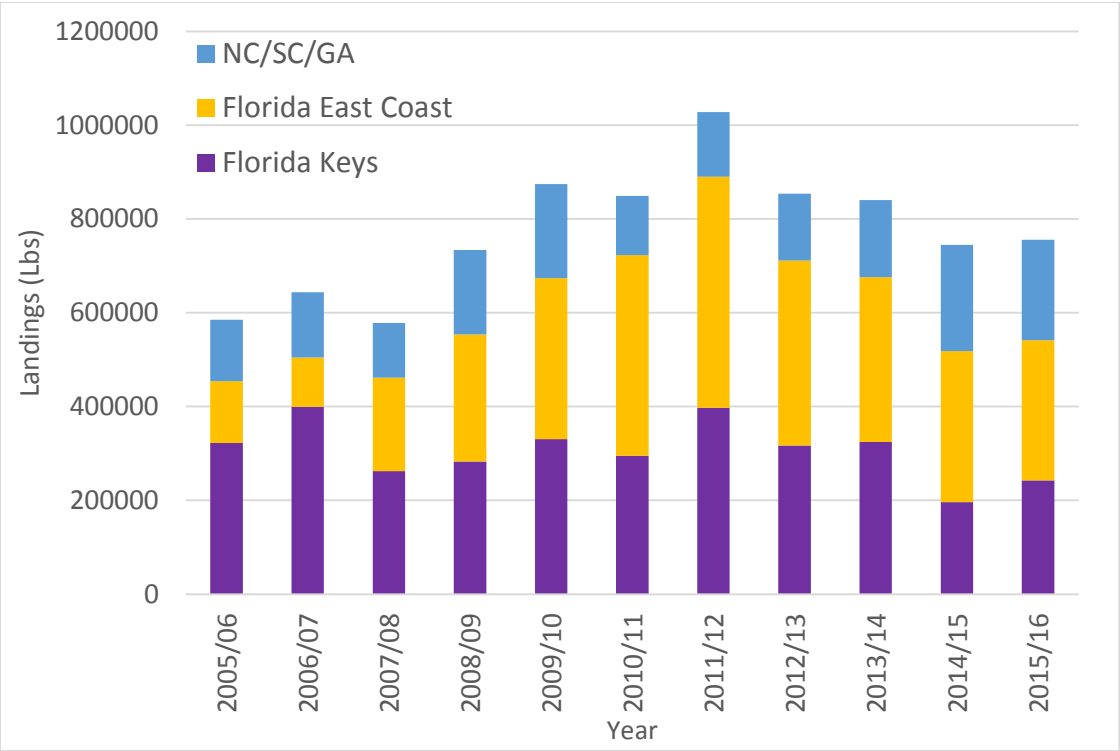

Figure 5-20. Commercial landings of greater amberjack by area from 1998 through 2016. Fishing years for 2005/06 through 2013/14 is May 1 - April 30; for 2014/15 is May 1 - February 28; and 2015/16 is March 1 – February 28. Data source: SEFSC Commercial Logbook

Red Grouper

Harvest of red grouper is closed January through April for the spawning season established in Amendment 16 (SAFMC 2009). This amendment also implemented a closure of commercial harvest of black grouper, red grouper and the shallow water grouper complex when the gag grouper directed quota is met, but the collective closure was removed in Regulatory Amendment 15 (SAFMC 2013A). Catch limits for red grouper were first established in Amendment 17B (SAFMC 2010B) as part of the aggregate ACL of 662,403 lbs gw for gag, black grouper and red grouper. Following a stock assessment, red grouper was removed from the aggregate ACL and a rebuilding plan was implemented (Amendment 24; SAFMC 2011D). The red grouper commercial ACL was set at 284,680 lbs ww for 2012; 315,920 lbs ww for 2013; and 343,200 lbs ww for 2014 and subsequent years. Red grouper was also affected by the fishing prohibition implemented for the *Oculina* Experimental Closed Area (Amendment 13A; SAFMC 2003) and the 2009 establishment of several marine protected areas with fishing prohibitions (Amendment 14; SAFMC 2007A).

Landings and revenue sharply increased in 2007 and 2008 then experienced a drastic decline that has continued into recent years (**Figure 5-21**). Most landings are from NC/SC/GA (**Figure 5-22**), with Northern South Carolina, Southern North Carolina and Central North Carolina making up a majority of landings for all years. Most Florida landings in earlier years of the time period were from the Florida Keys.

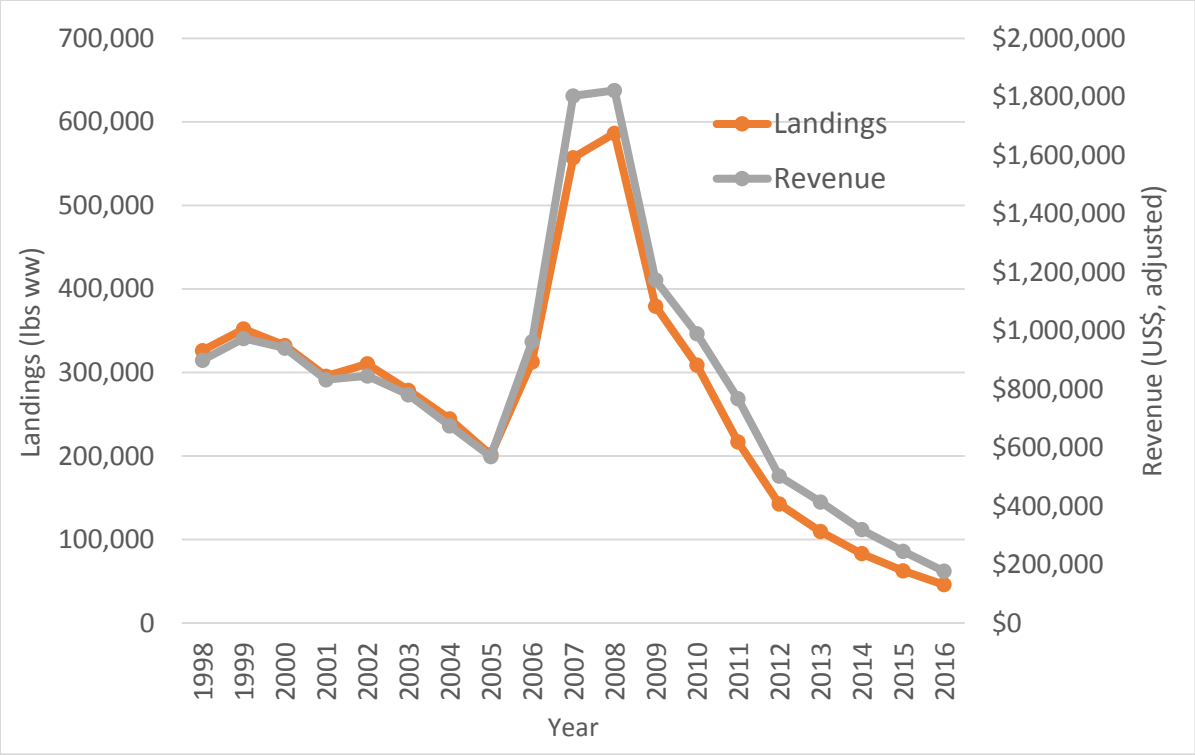

Figure 5-21. Total commercial landings and revenue of red grouper from 1998 through 2016. Landings were converted from gutted weight to whole weight based on conversion factor of 1.18 lb ww to 1 lb gw. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

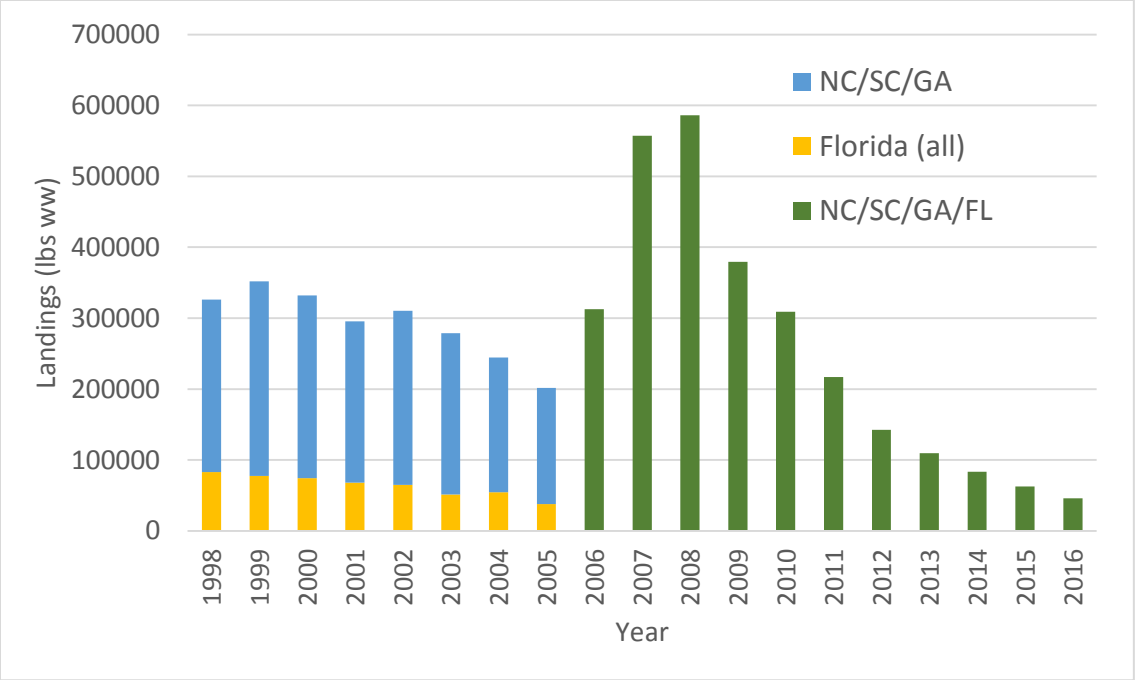

Figure 5-22. Commercial landings of red grouper by area from 1998 through 2016. Landings were converted from gutted weight to whole weight based on conversion factor of 1.18 lb ww to 1 lb gw. To maintain confidentiality, landings from Florida are combined for all years, and landings from all areas are combined for 2007 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Red Porgy

Red porgy was recognized as overfished in 1998 and a rebuilding plan was established through Amendment 9 (SAFMC 1998) but an update in the assessment indicated that the stock was at a higher level of overfished than previous information had indicated. An emergency actions closed red porgy harvest in September 1999 through August 2000. A spawning season closure from January through April was implemented along with a 50-lb trip limit (Amendment 12; SAFMC 2000). Following a stock assessment for red porgy, Amendment 13C (SAFMC 2006) established a commercial quota of 127,000 lbs gw. A rebuilding plan was implemented for red porgy in Amendment 15A (SAFMC 2007B), with a commercial ACL of 190,050 lbs gw. The ACL was revised in 2013 after an assessment update, with a commercial ACL set at 147,115 lbs gw for 2013, 148,558 lbs gw for 2014, and 157,602 lbs gw for 2015 and subsequent years (Regulatory Amendment 18; SAFMC 2013E).

Landings and revenue have mostly increasing since the interim closure in 1999/2000 until about 2008, when landings and revenue have been somewhat consistent (**Figure 5-23**). Landings have mostly been in NC/SC/GA **(Figure 5-24**), with landings from Northern South Carolina making up the largest proportion. The increase in Florida landings starting in 2007 is mainly due to landings in North Florida.

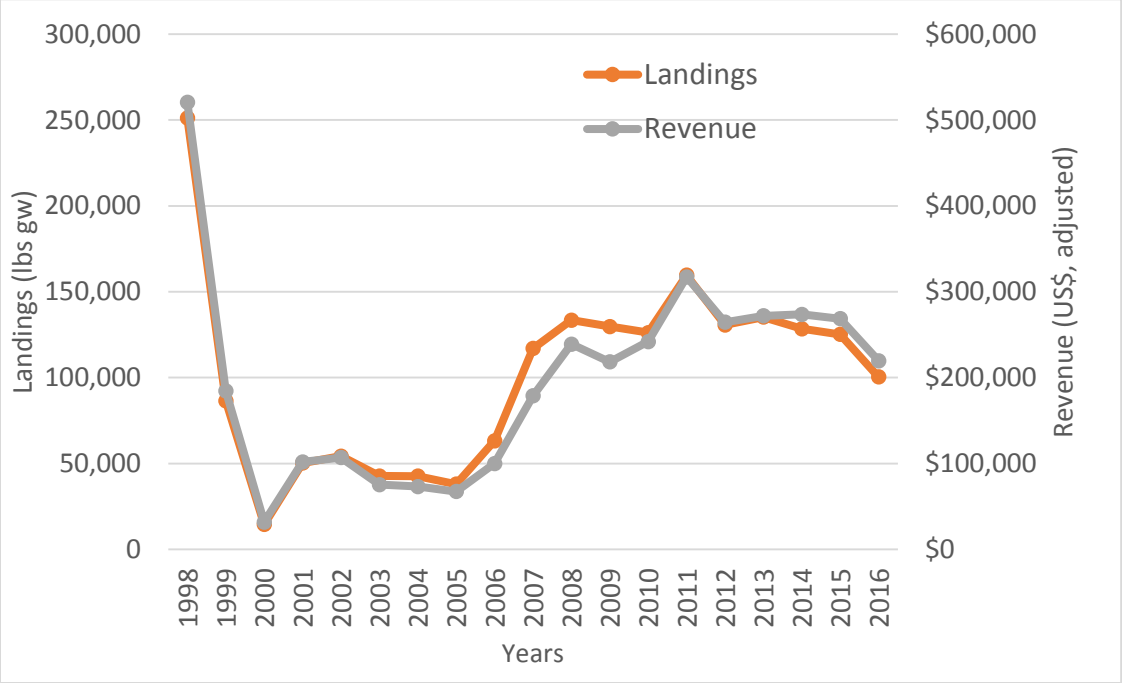

Figure 5-23. Total commercial landings and revenue of red porgy from 1998 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

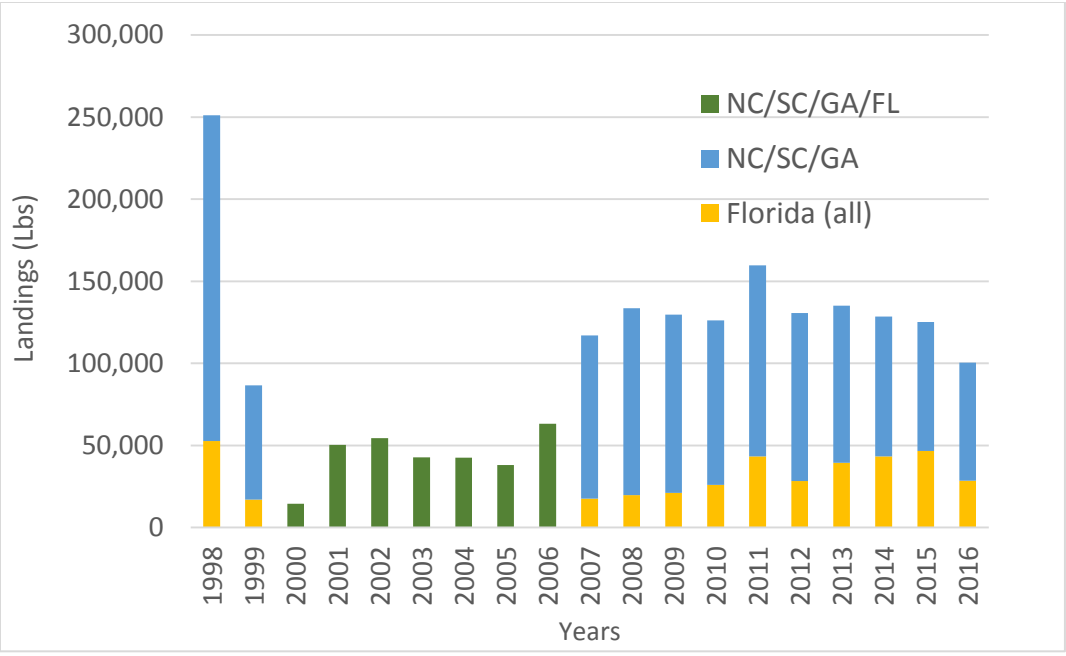

Figure 5-24. Commercial landings of red porgy by area from 1998 through 2016. To maintain confidentiality, landings from Florida are combined for all years, and landings from all areas are combined for 2000 through 2006. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Red Snapper

Following an assessment indicating that red snapper was overfished and experiencing overfishing, an interim rule closed all red snapper harvest starting in January 2010. Amendment 17A (SAFMC 2010A) established the ACL at zero for red snapper. In 2012, emergency action opened a one-week commercial season with a 50-lb trip limit and a commercial ACL of 20,818 lbs gw. Amendment 28 (SAFMC 2013F) specified the procedure to set ACLs and seasons for red snapper, and in 2013 commercial harvest was open for about six weeks with a 50-lb trip limit. Commercial harvest was also allowed in 2014 for about eight weeks. Commercial harvest did not open in 2015 and 2016.

Other regulatory actions affecting red snapper include the fishing prohibition in the *Oculina* Experimental Closed Area (Amendment 13A; SAFMC 2003) and establishment of marine protected areas with fishing restrictions in 2009 (Amendment 14; SAFMC 2007A).

Landings and revenue had a sharp increase from 2006 to 2009 (**Figure 5-25**), immediately before the January 2010 closure. There have only been three seasons since 2010, with landings and revenue low during those brief openings. In 2008 and 2009, Florida made up a majority of landings (**Figure 5-26**), with most landings coming from North Florida. For NC/SC/GA, most landings are in South Carolina.

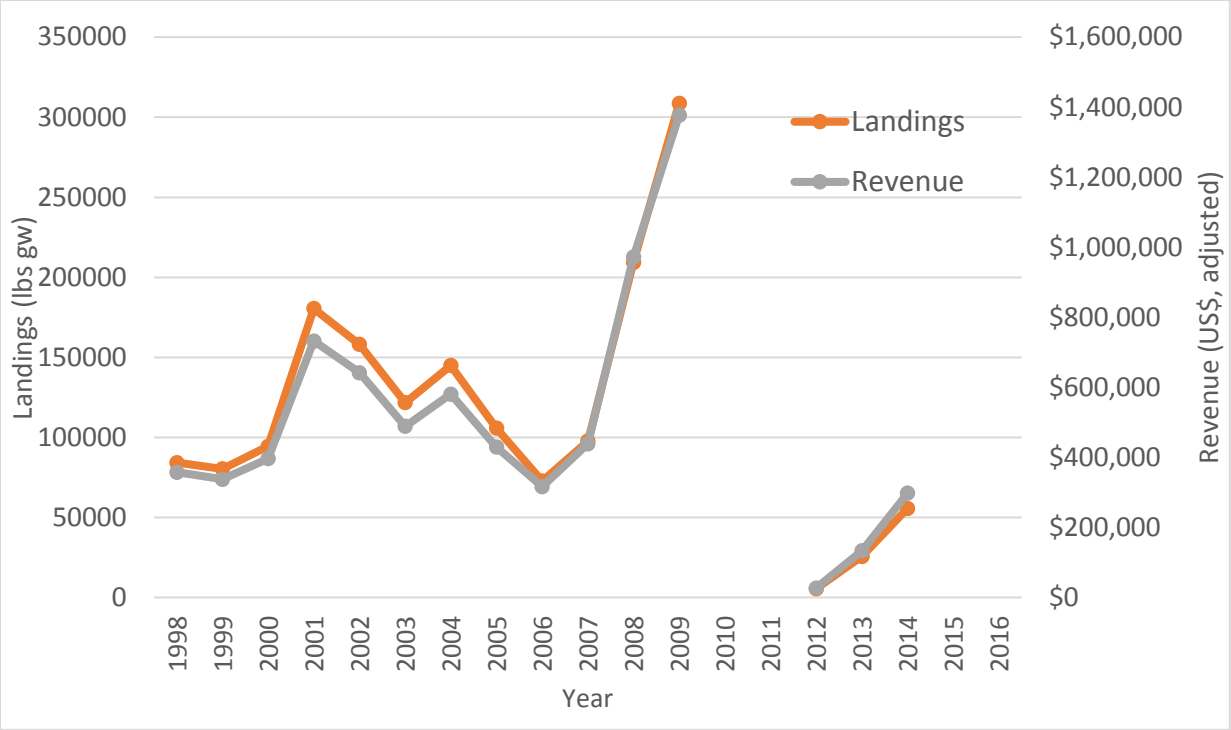

Figure 5-25. Total commercial landings and revenue of red snapper from 1998 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

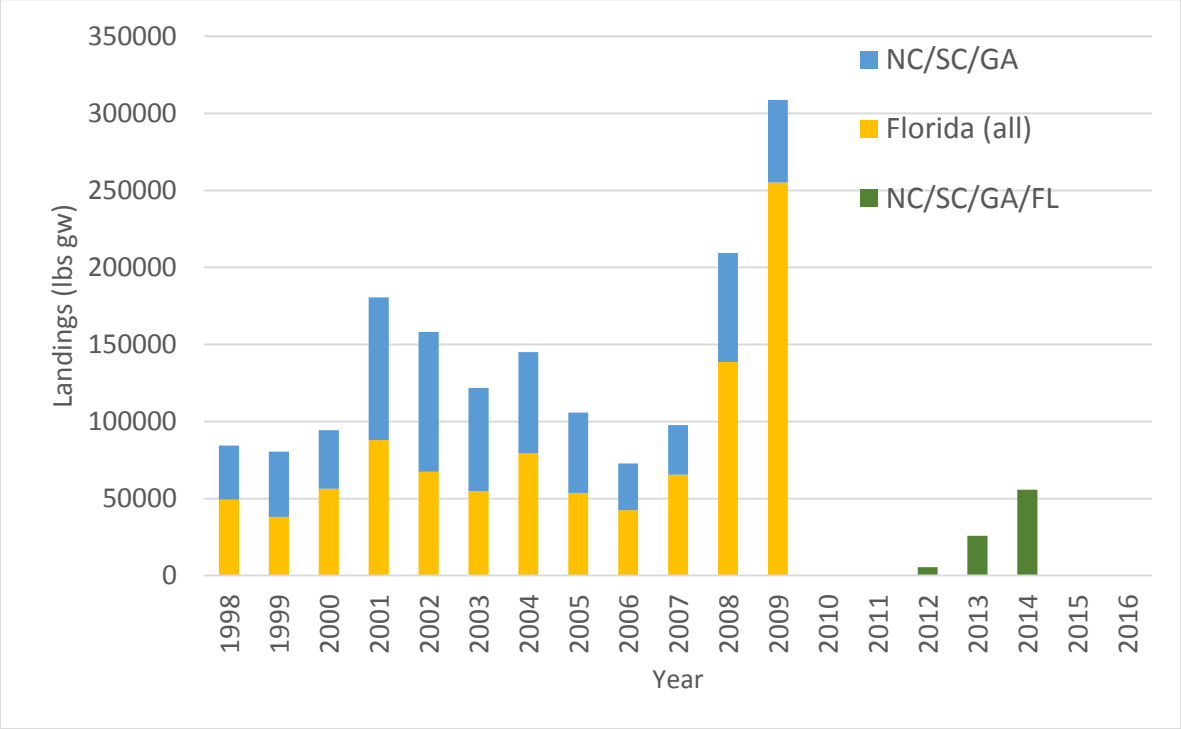

Figure 5-26. Commercial landings of red snapper by area from 1998 through 2016. To maintain confidentiality, landings from Florida are combined for all years, and landings from all areas are combined for 2012 through 2014. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Snowy Grouper

The catch limit for snowy grouper was 344,508 lbs gw since 1996 (Amendment 6; SAFMC 1993), but was revised in 2006 under a rebuilding plan implemented through Amendment 13C (SAFMC 2006). The 2006 catch limit was 151,000 lbs gw and decreased annually over two years to 84,000 lbs gw. The biological reference points were updated through Amendment 15A (SAFMC 2007) and the catch limit was set at 82,900 lbs gw. Following the 2013 stock assessment, the ACL was increased to 115,451 lbs gw for 2015 and 125,760 lbs gw for 2016 (Regulatory Amendment 20; SAFMC 2014C).

Access to snowy grouper was also affected by the area restrictions for the *Oculina* Experimental Closed Area (Amendment 13A; SAFMC 2003) and marine protected areas in Amendment 14 (SAFMC 2007A).

Landings and revenue of snowy grouper were in decline from about 1999 through 2011, but have been increasing since 2012 (**Figure 5-27**). In most years, a majority of the landings were from NC/SC/GA (**Figure 5-28**), primarily Northern South Carolina along with Central/Northern North Carolina. Most Florida landings come from North Florida, but in recent years there has been an increase in landings from Central Florida.

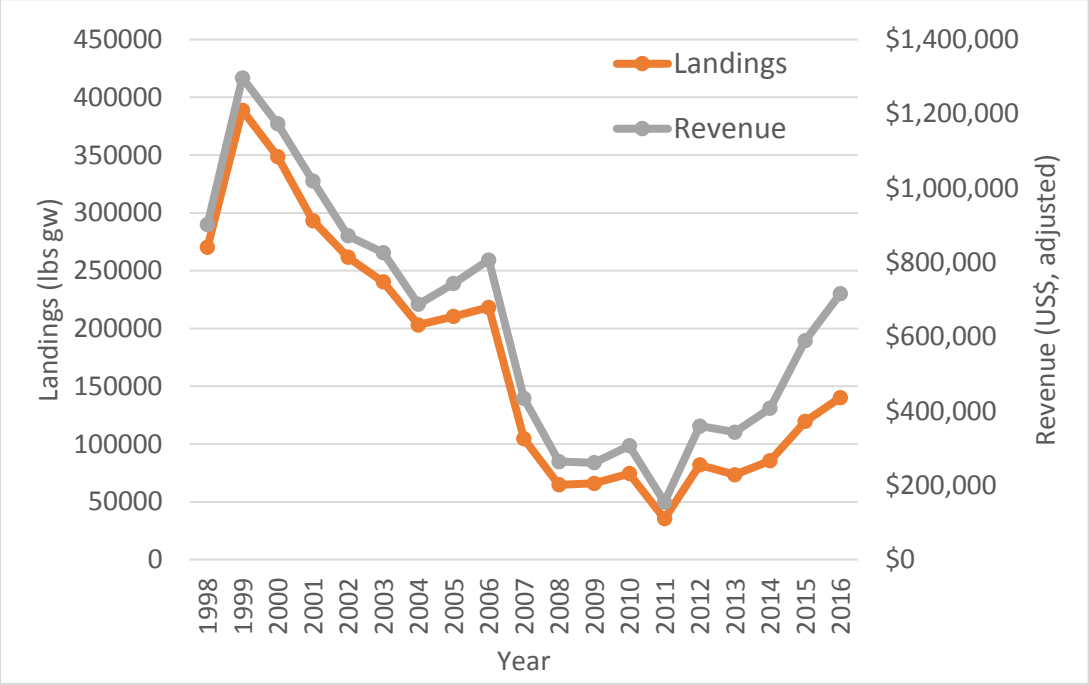

Figure 5-27. Total commercial landings and revenue of snowy grouper from 1998 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

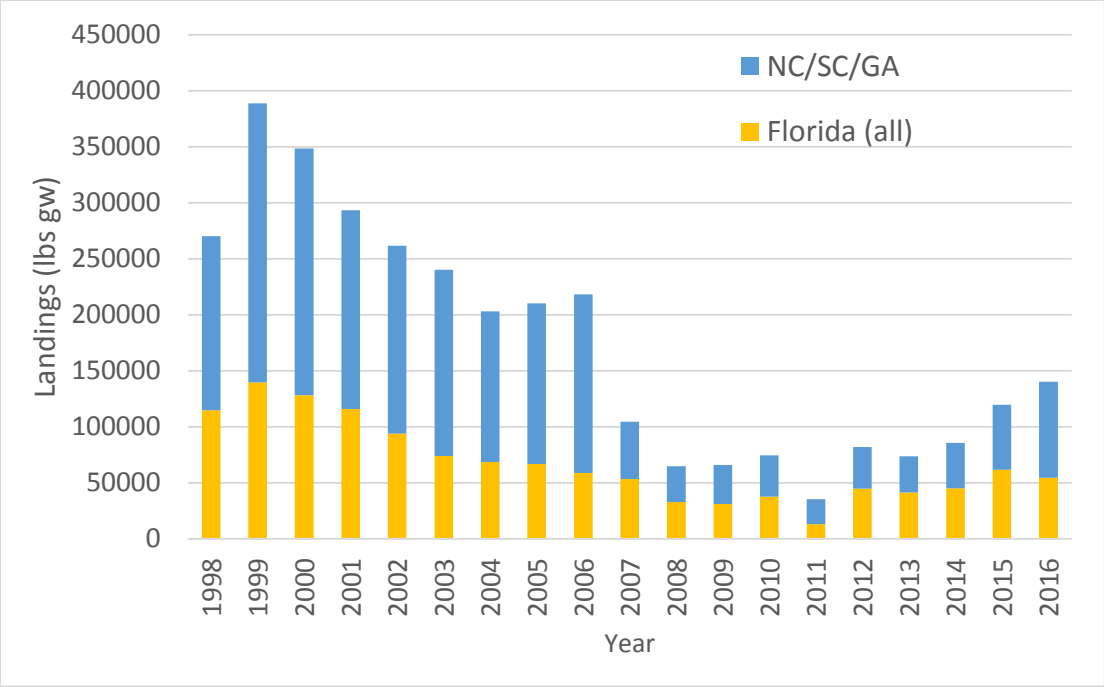

Figure 5-28. Commercial landings of snowy grouper by area from 1998 through 2016. To maintain confidentiality, landings from Florida are combined for all years. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Vermilion Snapper

Amendment 13C (SAFMC 2006) established the commercial quota for vermilion at 1,100,000 lbs gw. The total allowable catch was updated to 618,046 lbs gw in Amendment 16 (SAFMC 2009) and a 50-50 commercial split season for vermilion was established. Following an assessment update, Regulatory Amendment 18 (SAFMC 2013E) revised the commercial ACL to be 420,252 lbs gw in 2013 with annual decreases over four years, with the commercial ACL set at 388,703 lbs gw for 2016 and subsequent years. Vermilion snapper harvest may also affected have been affected by the fishing prohibition for the *Oculina* Experimental Closed Area (Amendment 13A; SAFMC 2003).

Landings and revenue for vermilion snapper peaked around 2001, and since about 2009 landings and revenue have been relatively consistent, reaching the ACL each year (**Figure 5-29**). A majority of landings come from NC/SC/GA, with most landings in Northern South Carolina and Southern/Central North Carolina (**Figure 5-30**). Most of the Florida landings are from North Florida.

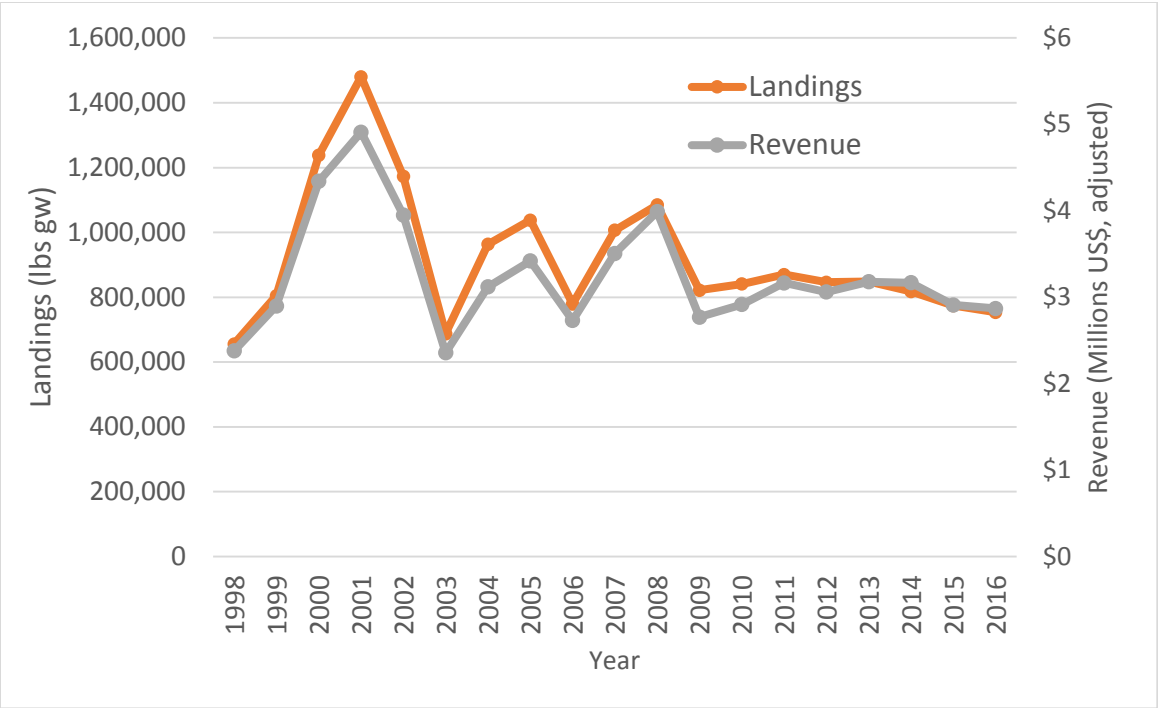

Figure 5-29. Total commercial landings and revenue of vermilion snapper from 1998 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

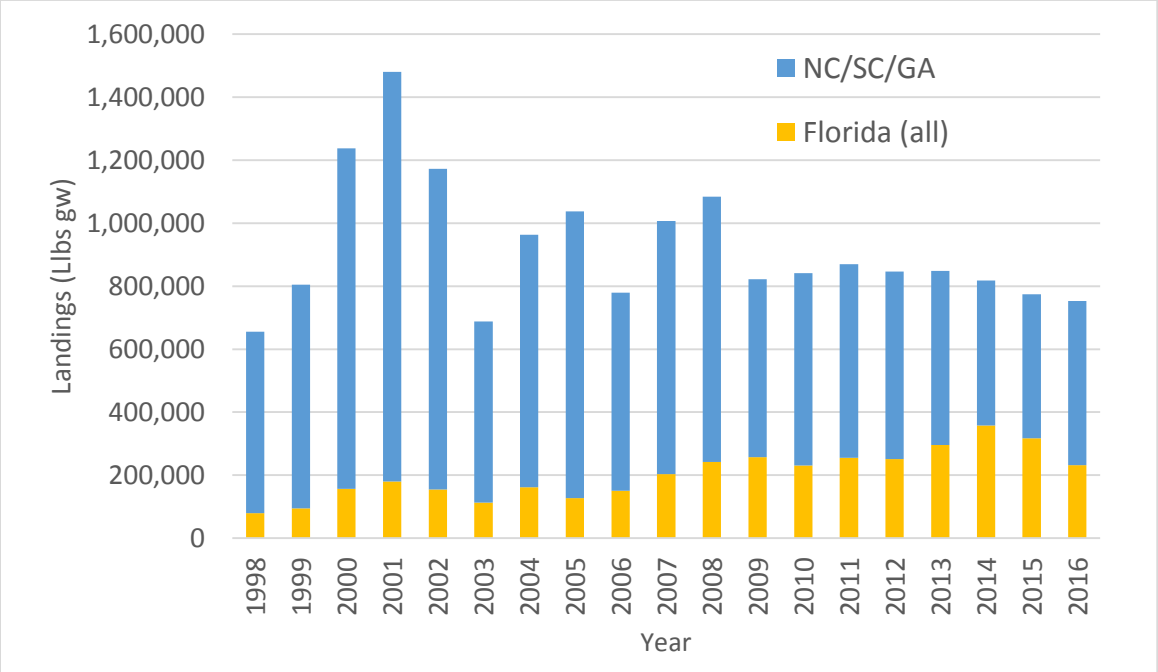

Figure 5-30. Commercial landings of vermilion snapper by area from 1998 through 2016. To maintain confidentiality, landings from Florida are combined for all years. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Yellowtail Snapper

The Comprehensive ACL Amendment (SAFMC 2011A) established the commercial ACL for yellowtail snapper at 1,596,510 lbs ww. In 2016, the fishing year changed from the calendar year to August 1 through July 31 (Regulatory Amendment 25; SAFMC 2016).

Landings and revenue for yellowtail snapper have been increasing since around 2007 (**Figure 5-31**). Almost all landings are from the Florida Keys, with some landings from South Florida (**Figure 5-32**). Landings in North Carolina, South Carolina and Georgia are minimal, and are not included in **Figure 5-32**.

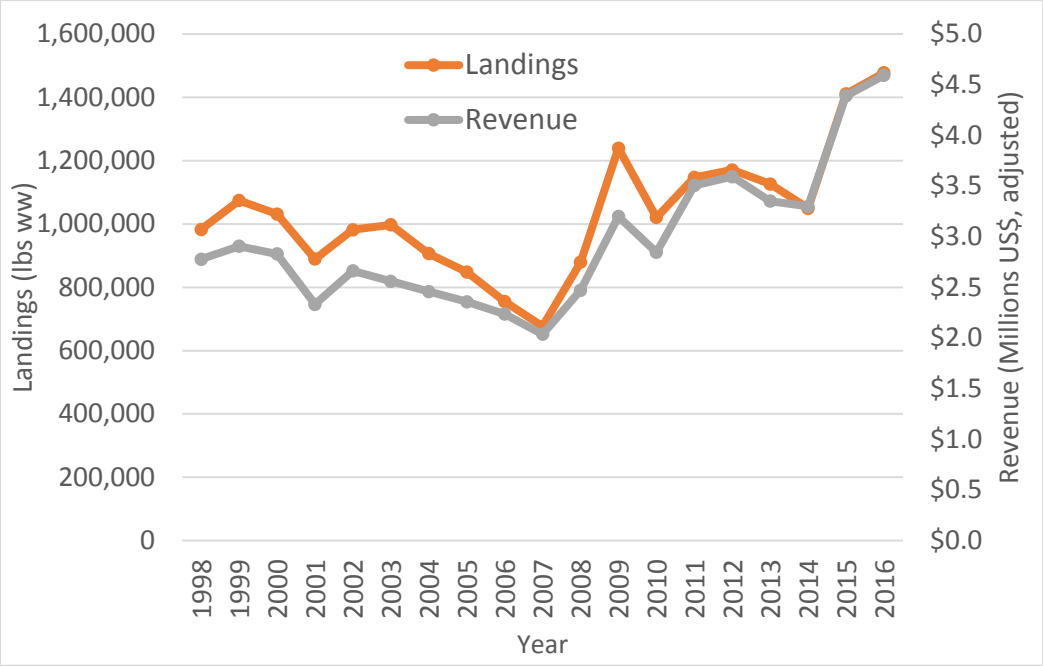

Figure 5-31. Total commercial landings and revenue of yellowtail snapper from 1998 through 2016. Landings were converted from gutted weight to whole weight based on conversion factor of 1.11 lb ww to 1 lb gw. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

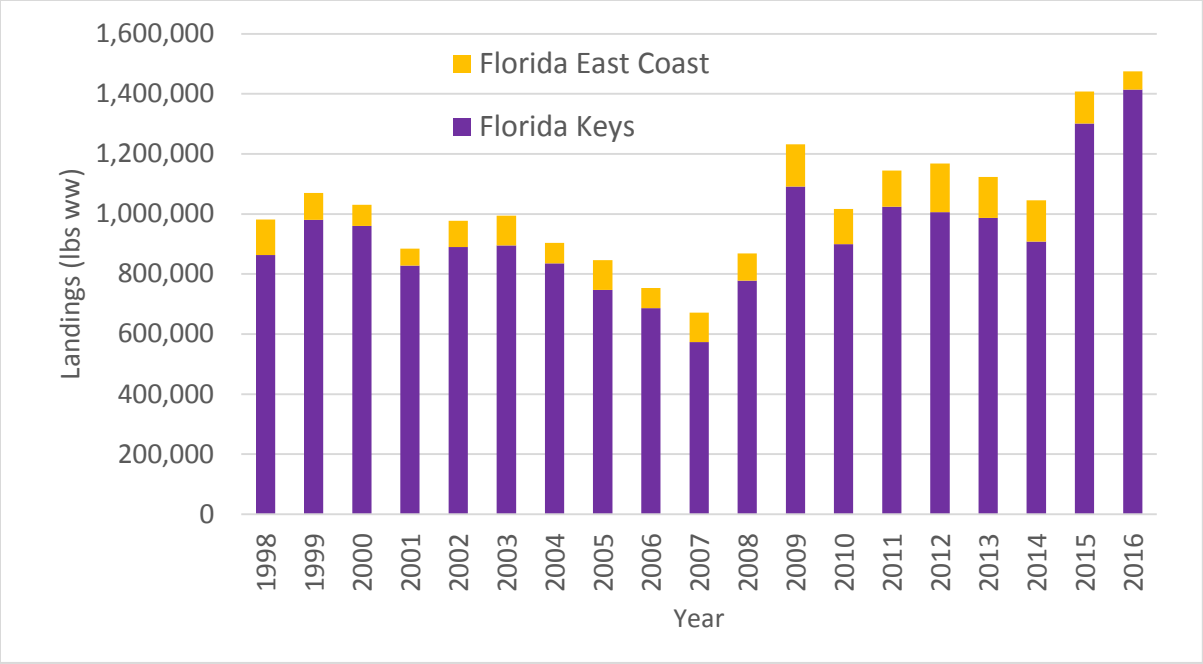

Figure 5-32. Commercial landings of yellowtail snapper by area from 1998 through 2016. Landings were converted from gutted weight to whole weight based on conversion factor of 1.11 lb ww to 1 lb gw. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Landings and Revenue by Complex

This section provides information about commercial landings and revenue for Snapper Grouper species by complex. Species in each group are provided, and the species from the previous section are included in the groups. Data was obtained from the SEFSC Social Science Research Group (SSRG) Socioeconomic Panel data set (SEFSC-SSRG Socioeconomic Panel v.6 October 2017). Figures are shown for the calendar year for each species.

For figures showing the distribution of landings by area, some areas have been combined to maintain confidentiality. Additional qualitative information is provided, which is based on the quantitative data, to provide further details without compromising confidentiality for areas with no or low landings.

Deepwater Species

This section includes landings and revenue information for the Deepwater Complex (yellowedge grouper, misty grouper, sand tilefish, silk snapper, queen snapper, and blackfin snapper), snowy grouper, golden tilefish and blueline tilefish. Landings and revenue vary, with an increase in revenue in later years of the time period without a similar increase in landings (**Figure 5-33**), which indicates that value is increasing for these species. As discussed in the previous section, blueline tilefish has experienced a decrease in landings and revenue while golden tilefish and snowy grouper have increased landings and revenue in recent years. Landings of species in the Deepwater Complex have decreased over recent years as well (SERO ACL Page 2017). Landings of these species are mostly in Florida, except in recent years in which most landings are in the NC/SC/GA area (**Figure 5-34**).

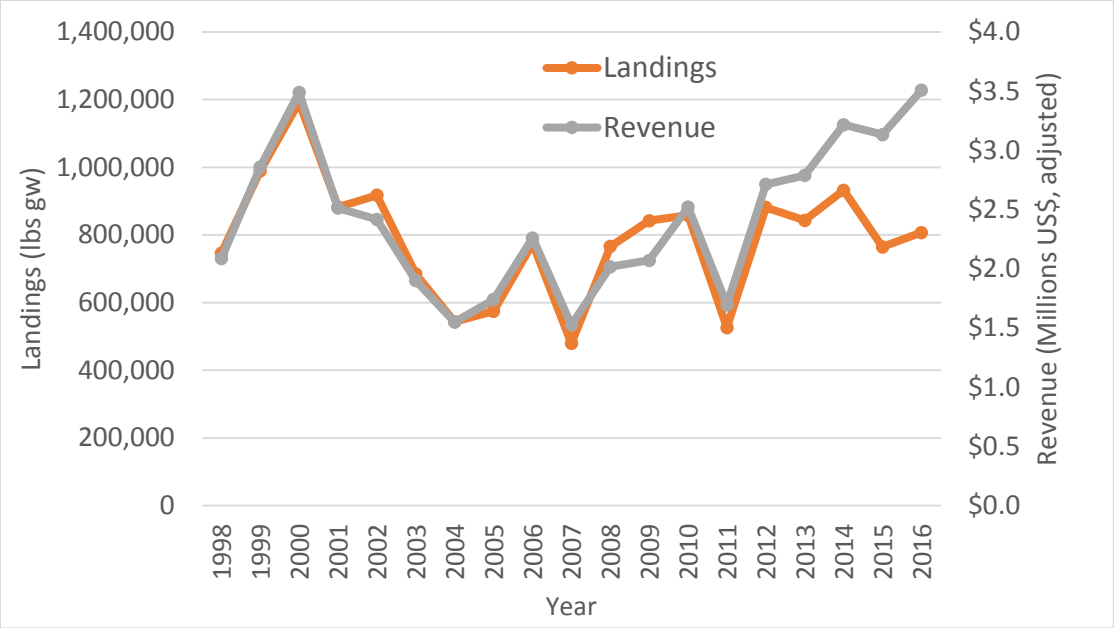

Figure 5-33. Total commercial landings and revenue of deepwater species from 1998 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

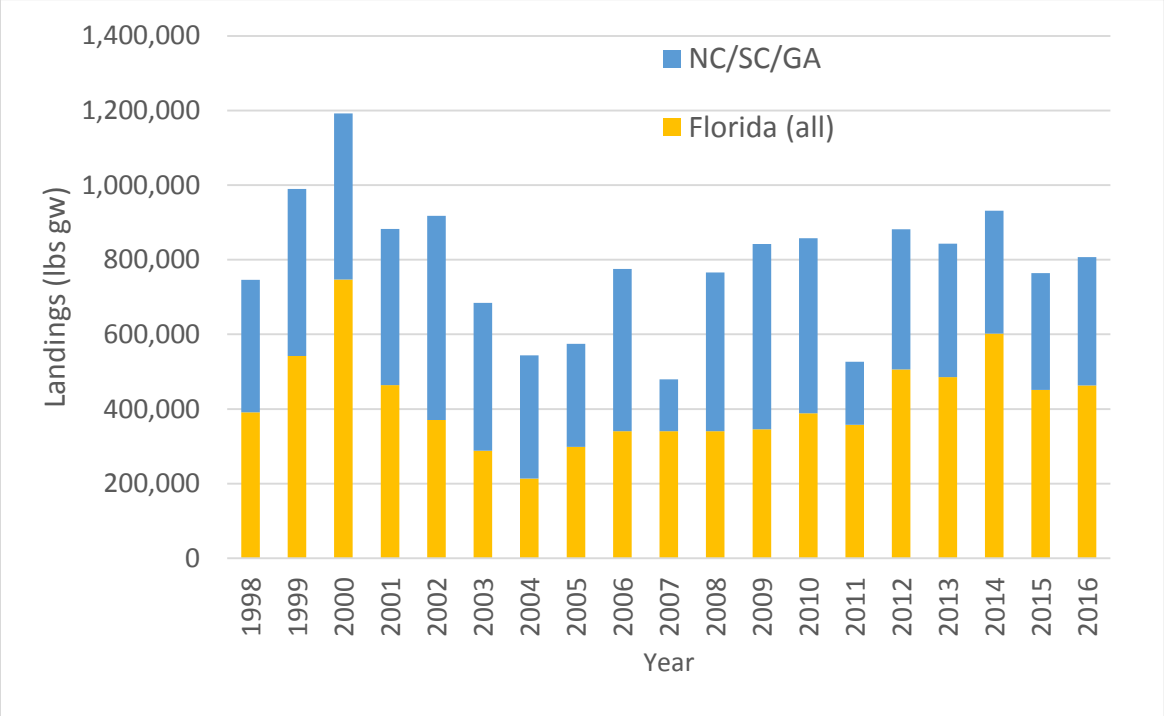

Figure 5-34. Commercial landings of deepwater species by area from 1998 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Grunts and Porgies

This group includes red porgy, the Porgies Complex (jolthead, knobbed, saucereye, whitebone, scup) and the Grunts complex (white, tomtate, margate, sailors choice). Landings and revenue have been fairly consistent since about 2008, with some decrease in the past few years (**Figure**

5-35). The Grunts and Porgies Complexes have had decreased landings over the past few years (SERO ACL Page 2017), but red porgy landings have been consistent (see Red Porgy section above). Most landings are from NC/SC/GA (**Figure 5-36**), with most landings from Northern South Carolina and Southern/Central North Carolina. Most Florida landings are from the Florida Keys.

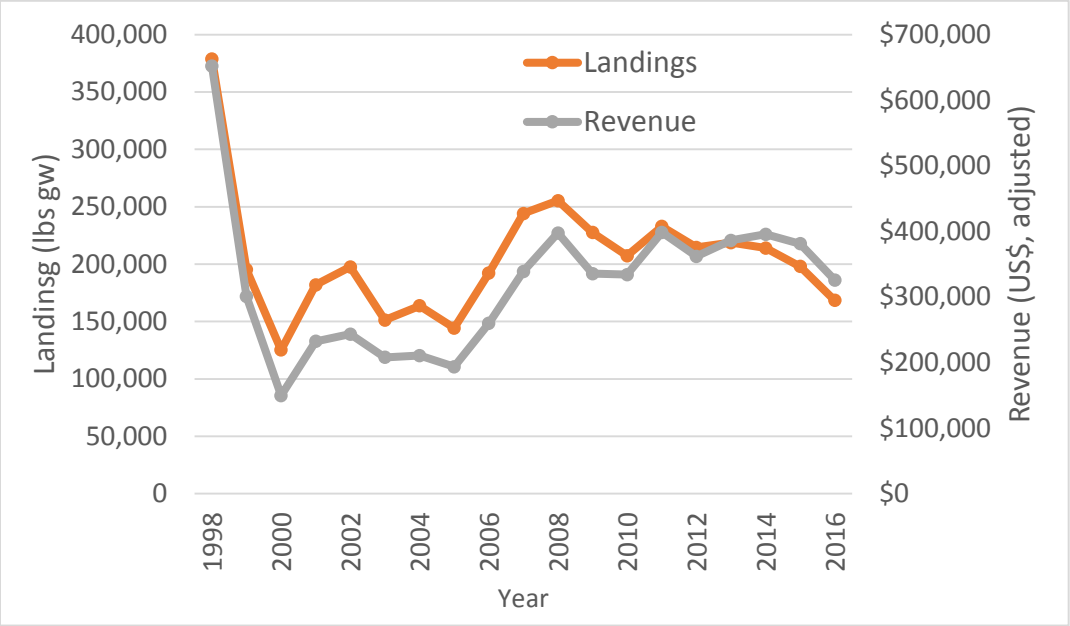

Figure 5-35. Total commercial landings and revenue of grunts and porgies from 1998 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

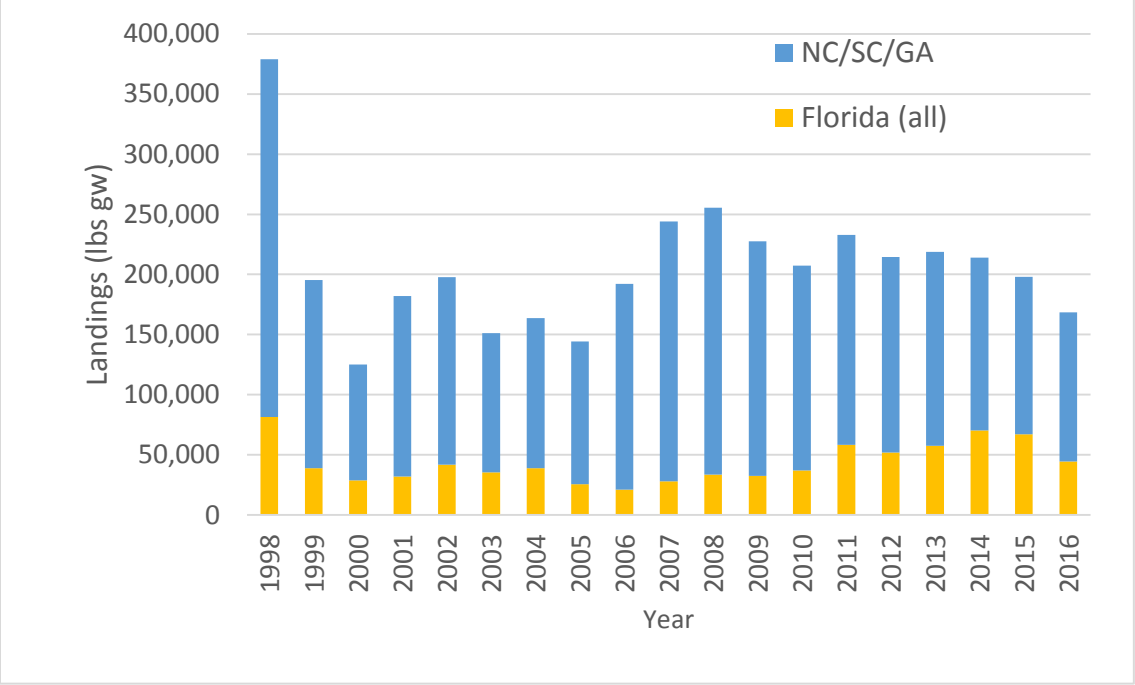

Figure 5-36. Commercial landings of grunts and porgies by area from 1998 through 2016. Data source: SEFSC-SSRG Socioeconomic Panel v.6 October 2017

Jacks

This group includes greater amberjack, bar jack, and the Jacks Complex (lesser amberjack, almaco jack and banded rudderfish). Overall, landings and revenue have increased since about 2006 (**Figure 5-37**), similar to patterns for greater amberjack discussed in the last section. Landings for the Jacks Complex have been fairly consistent (SERO ACL Page 2017), and bar jack landings are minimal. Most landings for this group are in Florida but landings in NC/SC/GA are consistent for most of the time period ((**Figure 5-38**).

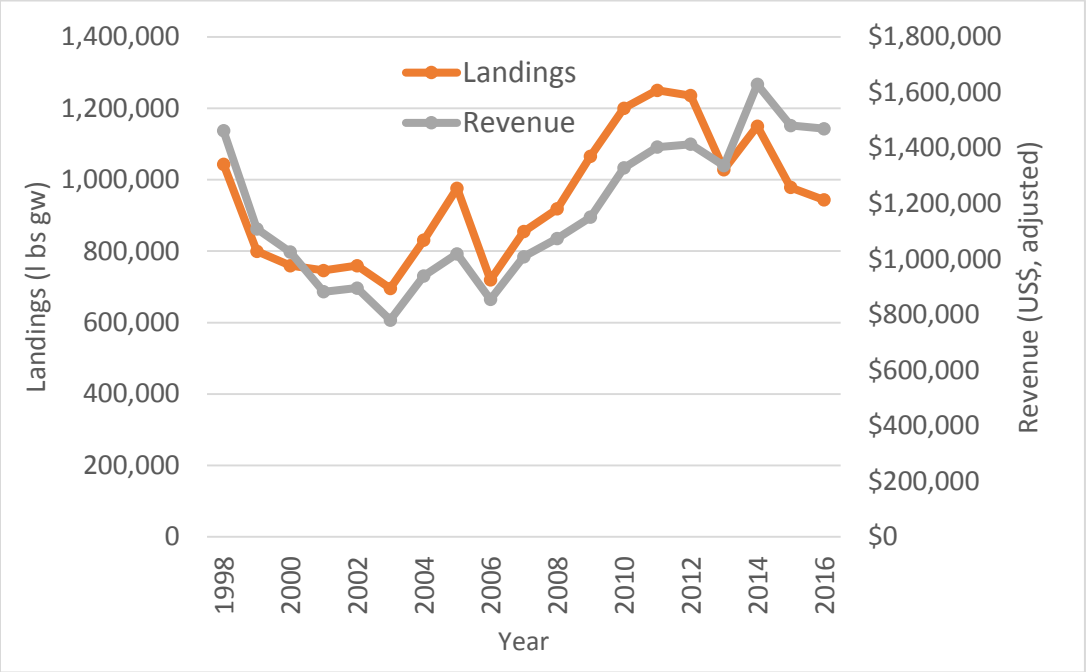

Figure 5-37. Total commercial landings and revenue of jacks from 1998 through 2016

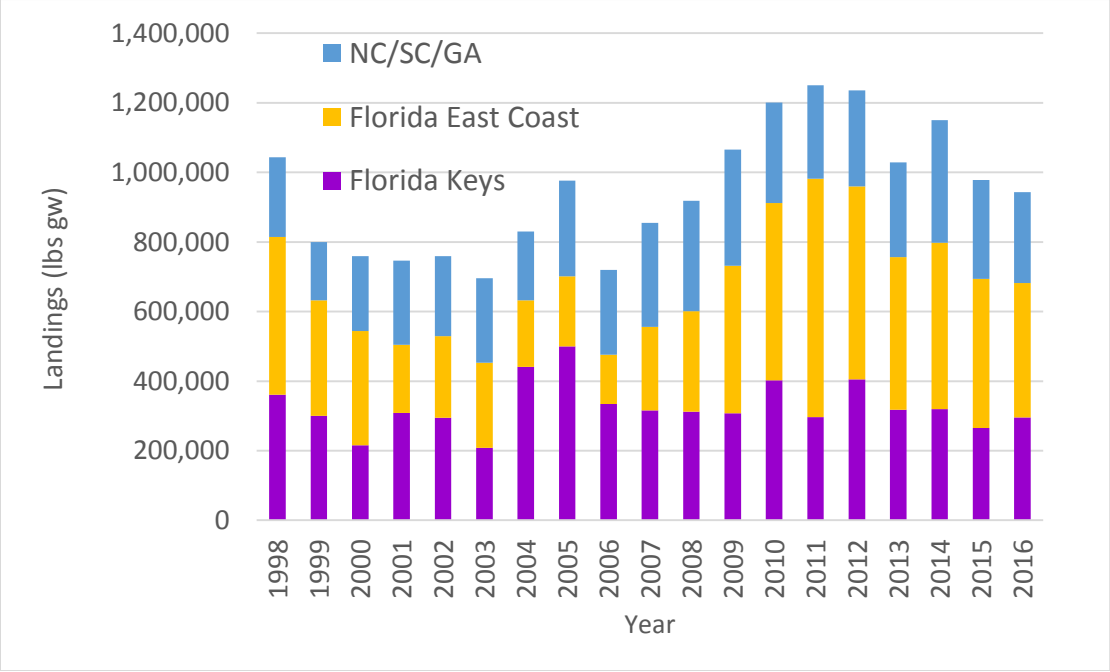

Figure 5-38. Commercial landings of jacks by area from 1998 through 2016

Shallow-water Groupers

This group includes black grouper, red grouper, gag grouper, scamp, and the Shallow-water Grouper Complex (red hind, rock hind, yellowfin grouper, yellowmouth grouper, coney and graysby). Overall, landings and revenue have decreased for this group (**Figure 5-39**), which tracks landings and revenue for black grouper, red grouper and gag grouper discussed in the previous section. Most landings come from NC/SC/GA (**Figure 5-40**), primarily all areas except for Northern North Carolina.

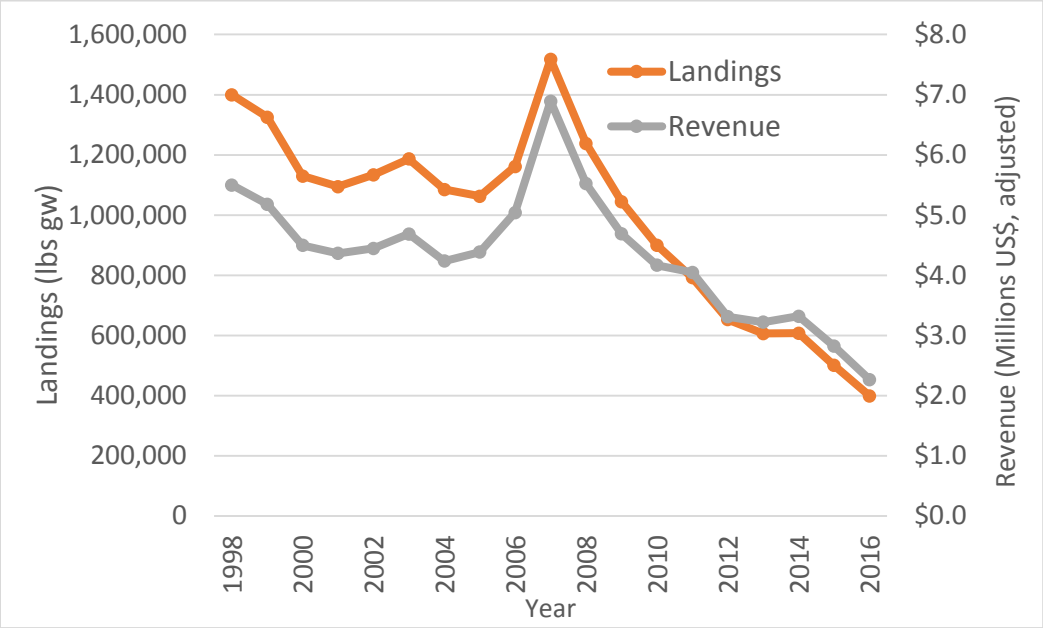

Figure 5-39. Total commercial landings and revenue of shallow-water groupers from 1998 through 2016

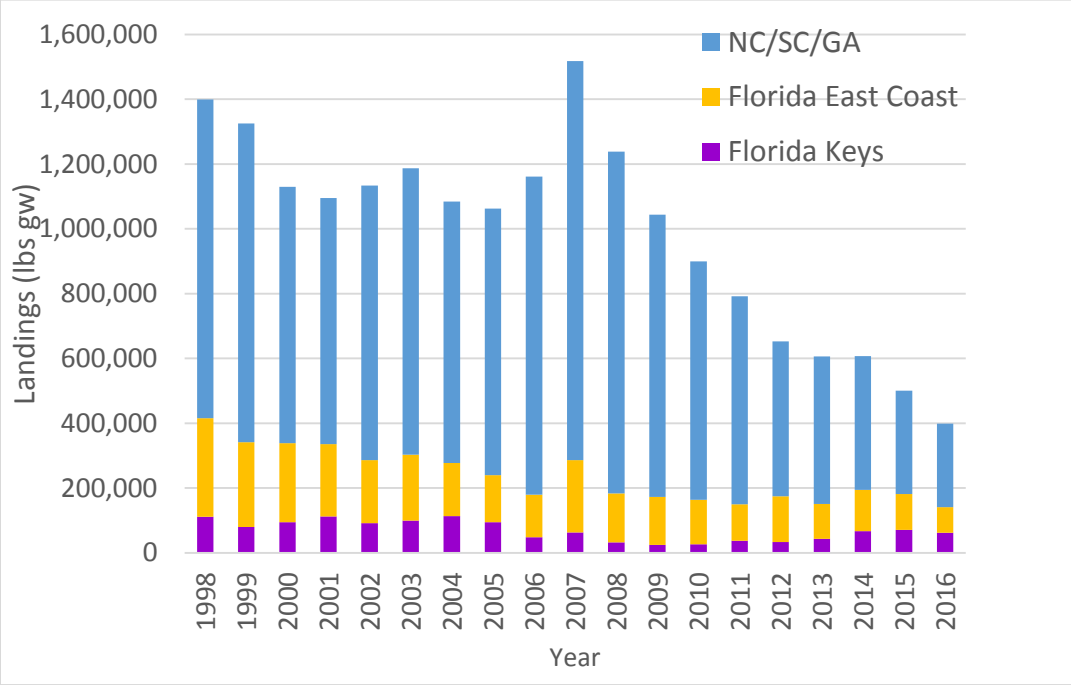

Figure 5-40. Commercial landings of jacks by shallow-water groupers from 1998 through 2016

Shallow-water Snappers

This group includes mutton snapper, red snapper, vermilion snapper, yellowtail snapper, and the Snappers Complex (gray snapper, lane snapper, and cubera snapper). Landings and revenue have been consistent since about 2009, with some increase in more recent years in the time period (**Figure 5-41**). Most landings are in Florida, specifically the Florida Keys (**Figure 5-42**), which is mostly attributed to yellowtail snapper.

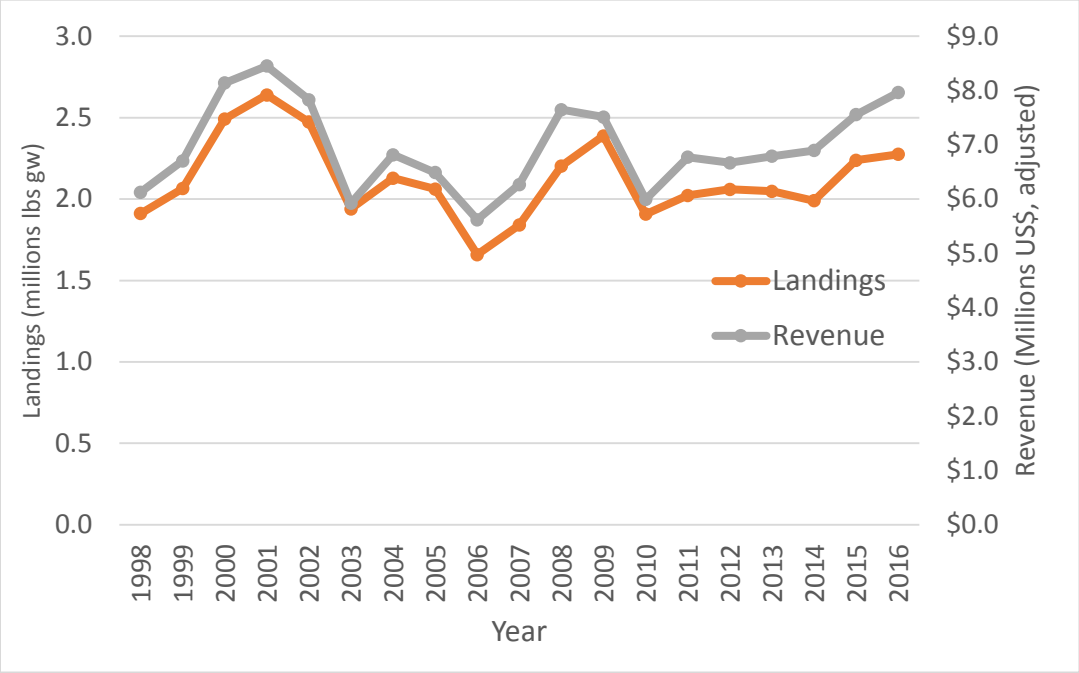

Figure 5-41. Total commercial landings and revenue of shallow-water snappers from 1998 through 2016

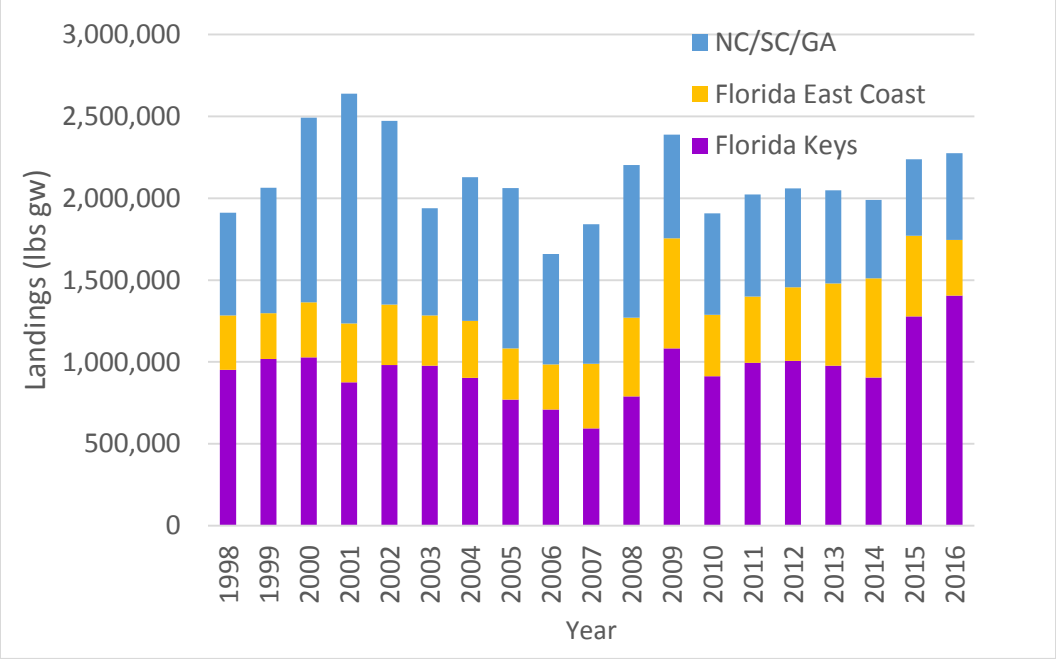

Figure 5-42. Commercial landings of jacks by shallow-water snappers from 1998 through 2016

Next Steps

This report attempts to address all questions and input provided by the South Atlantic Fishery Management Council and the Snapper Grouper Advisory Panel, but was limited by time and data constraints. Additional research can expand on the information provided in this report, along with periodic updates to the datasets. Last, this report used only existing data sources, which allows for substantial expansion through additional data collection.

Research topics generated from input from the Council and Advisory Panel that could be added to the Snapper Grouper Socio-Economic Profile (Profile) include additional qualitative information about fishing communities, including fishing history, sociocultural features, and broader issues for coastal communities that are not related to fishing (e.g., working waterfronts, infrastructure changes and development, tourism, and other issues).

Demographic data on permit holders may become available through additional information collected on permit applications, or could be collected from permit holders through a survey. This information would expand on demographic information of fishery participants provided in an earlier socio-demographic report (Rhodes et al. 1997) and allow an assessment of changes in participants since implementation of the limited entry Snapper Grouper commercial permits.

Surveys could also provide more information about how new participants enter the fishery and about obstacles to participating in the Snapper Grouper fishery. A profile of new entrants would offer a better understanding of ages of participants, and an outlook on the future of the fleet.

This report uses logbook data that encompasses only federally managed species, but many participants also target state-managed species and Highly Migratory Species (HMS). Catch data from these fisheries could be incorporated to provide all species that are a part of fishermen's catch portfolio and annual business plan.

More detailed information about dealers should be added to the Profile in future research. More available data from dealer reports could help evaluate the role of dealers and fish houses. Dealer surveys would also allow a more complete description of the Snapper Grouper commercial fishery and how the market affects fishing behavior and decisions.

Last, landings and revenue data could be analyzed to provide more details on the economic impacts at the local and regional level, along with growth potential analysis. This information would be helpful for long-term management decisions, and for planning by fishing businesses.

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Acknowledgements

Jeannette Dudley at the Permits Office of the Southeast Regional Office provided permits data along with guidance and patience in answering questions during the permits analysis. The Southeast Fisheries Science Center provided the Commercial Logbook data and the query tool (SEFSC-SSRG Socioeconomic data set) for landings and revenue. Input and recommendations from the South Atlantic Council, the Snapper Grouper Advisory Panel and the Socio-Economic Panel during development of the project goals were much appreciated. Special thank you to the South Atlantic Council staff, but especially to John Hadley for his extensive help throughout the project and his contributions to this report.

Appendix A. Data and Methods for Portfolio Analysis

Data

For analysis of the permit portfolios, permit records from 1998 through 2016 were provided by NOAA Fisheries Southeast Regional Office Permits Division. Data included the permit type and number, start and end dates, vessel identification number, vessel homeport city and state, and permit holder information (name and address). Information on Florida Spiny Lobster Endorsements was provided by the Florida Fish and Wildlife Conservation Commission (FWC) and included permit records from 2005 through 2016[5]. Permits data are not considered confidential information.

Catch portfolio analysis incorporated data from the Southeast Coastal Fisheries Logbook (logbook) data from 2001 through 2016. The logbook data used for the catch portfolio analysis include only federally managed Snapper Grouper species, Coastal Migratory Pelagic (CMP) species, dolphin, and wahoo. Wreckfish was not included because of confidentiality concerns due to the small number of participants. A review of the Wreckfish Individual Transferable Quota (ITQ) program is currently in development, and relevant information from the final review will be incorporated into the Snapper Grouper Socio-Economic Profile when it is available. All confidential data were aggregated with other areas, or not presented in this report.

Network Analysis

Most of the analysis for this report included processing the records to generate descriptive statistics on permits, permit holders, vessel characteristics, and landings. Analysis of the permit portfolios and catch portfolios were conducted using UCINET, a social network analysis software (Borgatti et al., 2002). Network analysis is a method to assess linkages among people, events, characteristics, or any other feature, that associates one with the other. By examining data as a network, patterns can be identified that provide information on relationships among the subjects of study and how these intersect. Any relationship can be defined as a tie and analyzed as a network.

In fishery social science studies, the typical type of network analysis is called one-mode analysis, which creates an adjacency matrix based on the presence or absence of a tie between two people. This project analyzes the permit data and logbook data as two-mode networks, also known as affiliation networks. Two-mode network analysis differs from one-mode analysis in that there are two sets of entities, each with ties to each other and with ties to the other set of entities, which allows analysis of pairs of entities and the relationships between them (Borgatti and Everett 1997). In two-mode network analysis, relationships among individuals can create the structures in the network but the structures can also constrain and define the individuals' ties (Breiger 1974).

[5] Florida Spiny Lobster Endorsement records for only 2005 through 2016 were requested for the project, but as analysis progressed, additional years were added for permit portfolio analysis. Time restraints for this report did not allow another data request to FWC. An expanded analysis could incorporate the earlier Florida Spiny Lobster Endorsement information.

Two-mode network analysis was selected for the permit and catch portfolio analyses because it would provide quantitative and visual information about permits that are commonly held collectively by vessels (permit portfolios) or similar catch combinations from trips (catch portfolios). Two-mode network analysis is somewhat similar to cluster analysis or multi-dimensional scaling, and these methods could be used to find part of the same outcome. The difference with two-mode network analysis is that it not only shows the common permit combinations but also the vessels that have those combinations and the vessels that have similar permit combinations. For the catch portfolios, two-mode network analysis provided information about species commonly caught together on a trip, the trips that caught those catch combinations, and the trips with similar catch combinations. Attributes can be added for more detailed analysis. Overall, this method provides a broad overview of the whole system, along with the associations between the permits and the vessels, or between the species and the trips. Additionally, network metrics are available to quantitatively examine the portfolios.

The permit portfolio analysis was less complex that the catch portfolio analysis. Following input of the permit and vessel data, a network graph (visualization) was generated. Visualizations are useful in preliminary phases of analysis to get a generalized, birds-eye view of the possible patterns among permits and permitted vessels. Visualizations use algorithms to calculate distances and placement of the nodes, and are a useful way to present information about the networks in early stages of research (Freeman 2000; Perer and Shneiderman 2006).

An example of a visualization of a two-mode network with permit and permitted vessels is provided in Figure A-1. In the visualization, every node represents a permitted vessel (circle) or a permit (square). Every line between an indicates that the vessel has the specific permit (circle-square); a vessel has the same permit as another vessel (circle-circle), or that a permit is held in combination with another permit (square-square). The closer the nodes, the more often those permits are held in combination (portfolios) and the more often the vessels have the same permit combination. The colors indicate the homeport of the vessel, but because there was no obvious patterns, this attribute was not used in any further analysis for this part. The size of the nodes indicates the value of a network matric called degree centrality, which simply measures the number of ties for each node.

In Figure A-1, the network is dense around the four permits (SG1, ADW, KM, and SM) in the middle of the graph with a high level of connectedness (Sparrowe et al. 2001). Additionally the degree centrality for these permits is high (larger nodes) which suggests that this is the prominent permit portfolio for this year. All degree centrality measures were used to identify the two main portfolios of commercial finfish permits and the charter/headboat permits (ADW/KM/SM and CDW/CHS/CS). This process was repeated for each year and SG1/SG2 permit type in the permit portfolio analysis, with similar results in the visualizations.

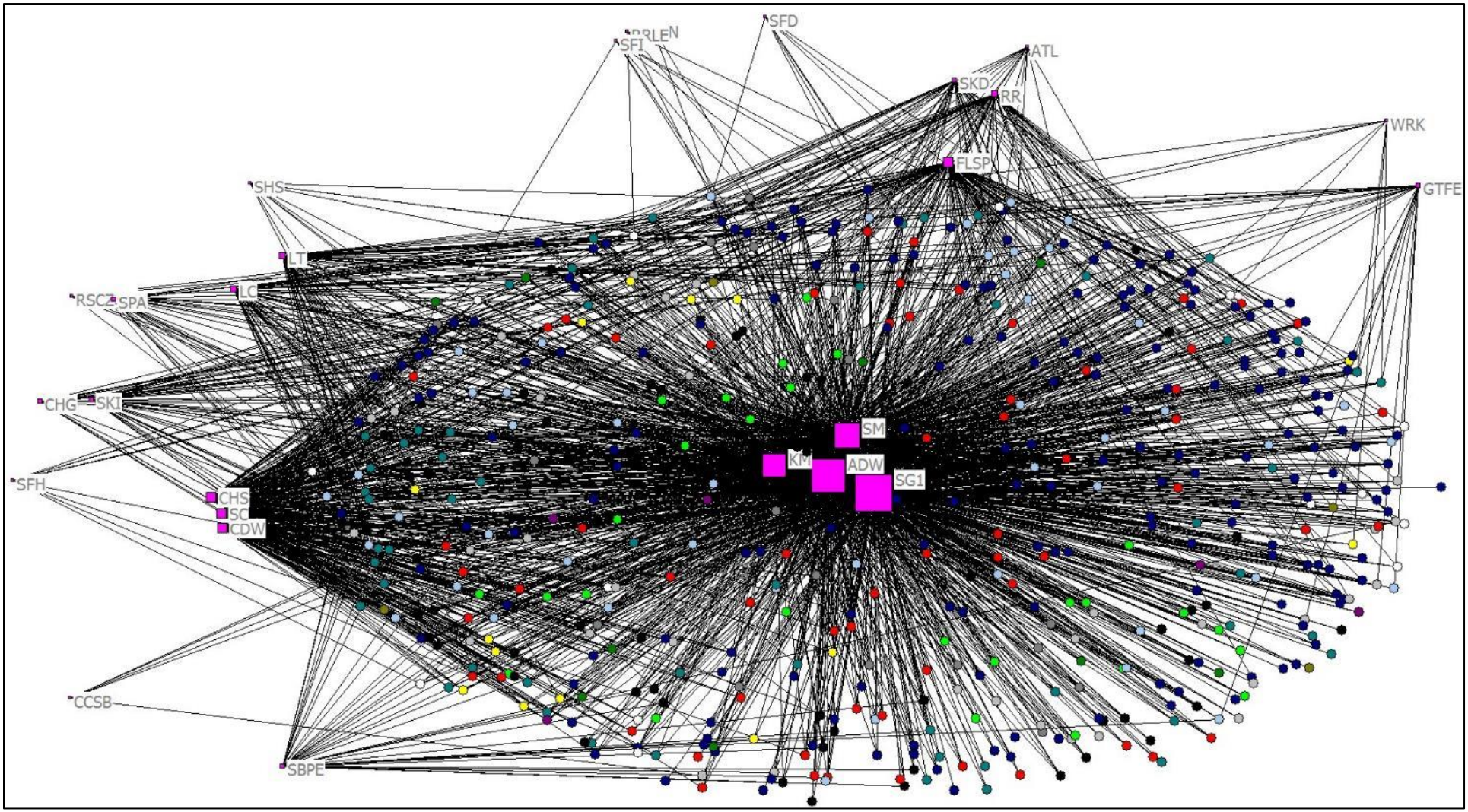

Figure A-1. Network graph (visualization) of permits (squares) and SG1-permitted vessels (circles), using 2016 permit data.

The analysis of catch portfolios and identification of trip types used several steps in the network analysis. First, a network graph of the species and trip data was generated, similar to the permits portfolios. Next, a network metric called 'betweenness centrality' was calculated for each node. The betweenness measure is a complex calculation of ties and distance between nodes within that network (Freeman 1977) – overall, it represents the number of ties to other nodes and the position of the node relative to other nodes in the network. Betweenness centrality was selected for the catch portfolios because this metric provides a quantitative value of the node's position within the network (Faust 1997), identifies nodes that if removed would substantially alter the network. The betweenness value was expected to be a good way to identify key species in the catch portfolios.

Next, a network metric called factions was used. Factions are groupings that are more connected (higher density) within the group and less connected to other groups (Everett and Borgatti 2005). This metric provided support to identification of the visual groups in the network graph. It should be noted that the species and trips did not fit perfectly into the factions due to the diversity in the catch combinations. However, it was a useful tool for preliminary identification of catch combinations and the associated trips.

The network visualizations for the catch portfolios are provided in Figures A-2 through A-10. In each visualization, every node represents a fishing trip (circle) or a species (square). Every line between an indicates that the trip included catch of that species(circle-square); a trip has the same species as another trip (circle-circle), or that a species is caught with another species on one trip (square-square). The closer the nodes, the more often those species are caught in combination (portfolios) and the more often the trips have the same or similar catch combination. The colors indicate the factions that the nodes are grouped into, and the size of the nodes indicates the value of the betweenness centrality. The trip types described in Chapter 4 were developed using each of the visualizations and the network metrics, along with trip attributes for gear type.

Two-mode network analysis may not be the best method for identifying catch portfolios, but it is a first step to use visual and quantitative data to identify the common catch combinations and associated trip attributes. Additional development of the methodology will be useful in the next steps of catch portfolio analysis.

[Network graphs (Figures A-2 through A-10) start on the page following the References section]

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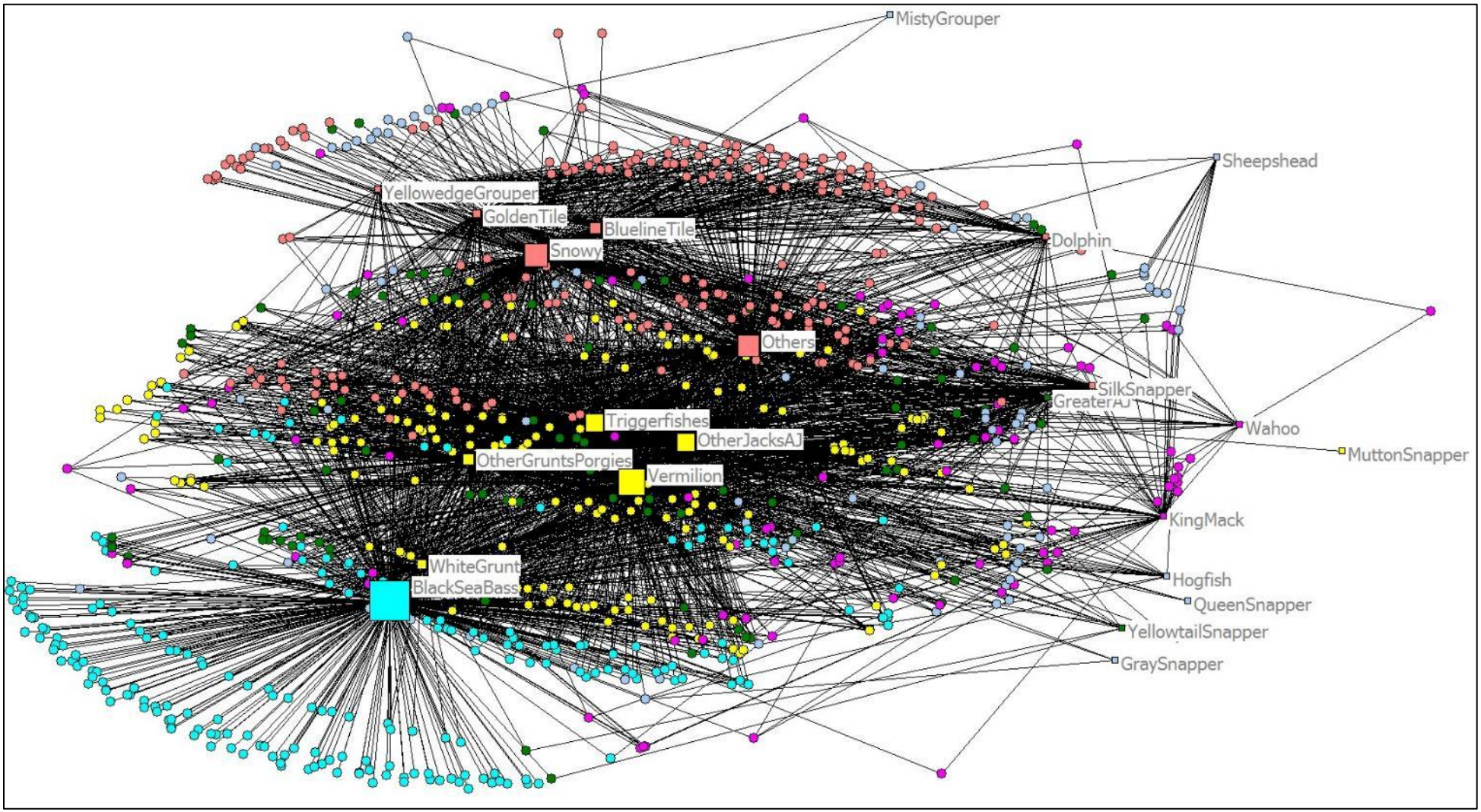

Figure A-2.Network graph (visualization) of Season 1 (January-April) of 2016 for North Carolina, South Carolina and Georgia.

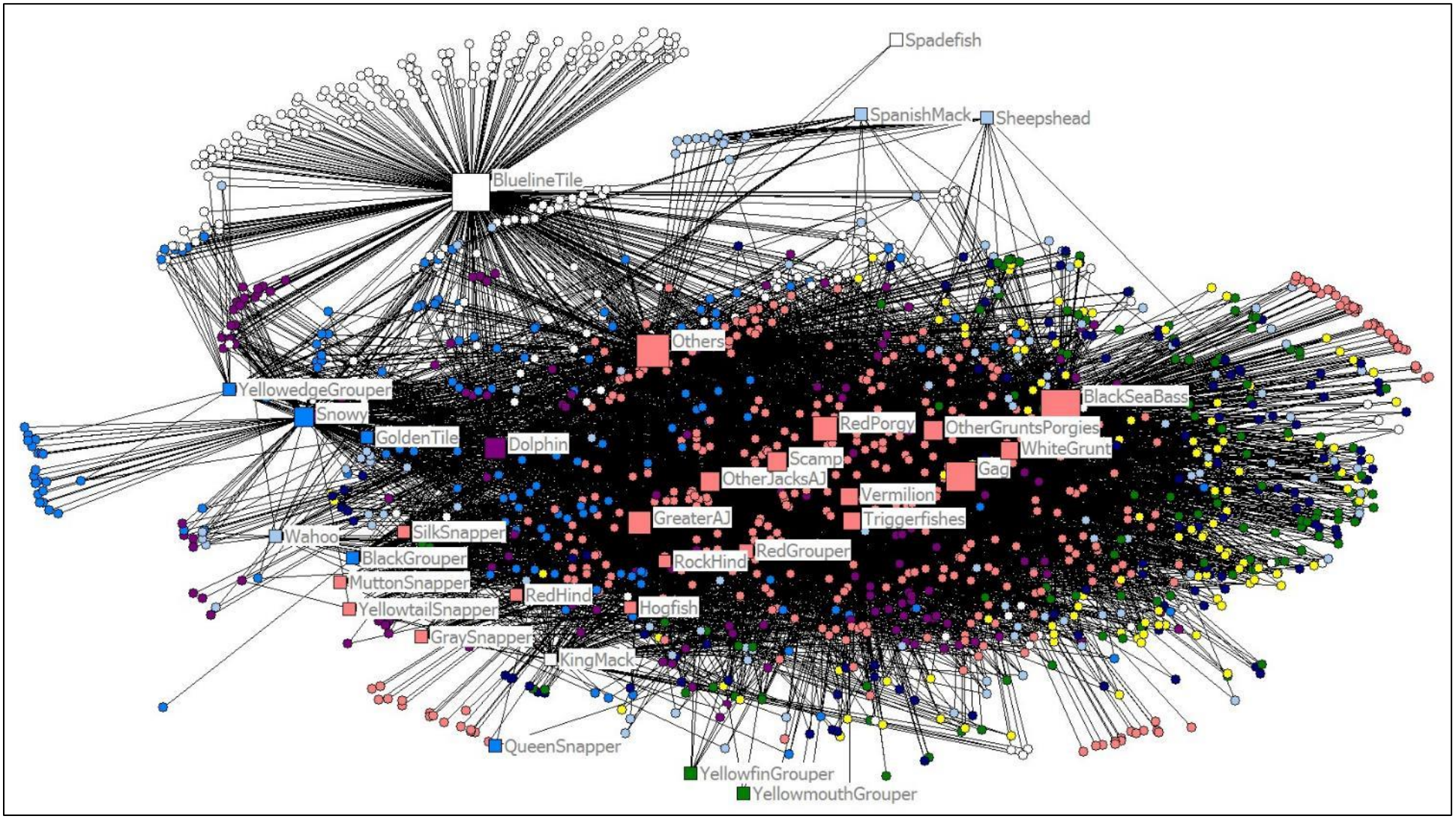

Figure A-3.Network graph (visualization) of Season 2 (May-August) of 2016 for North Carolina, South Carolina and Georgia

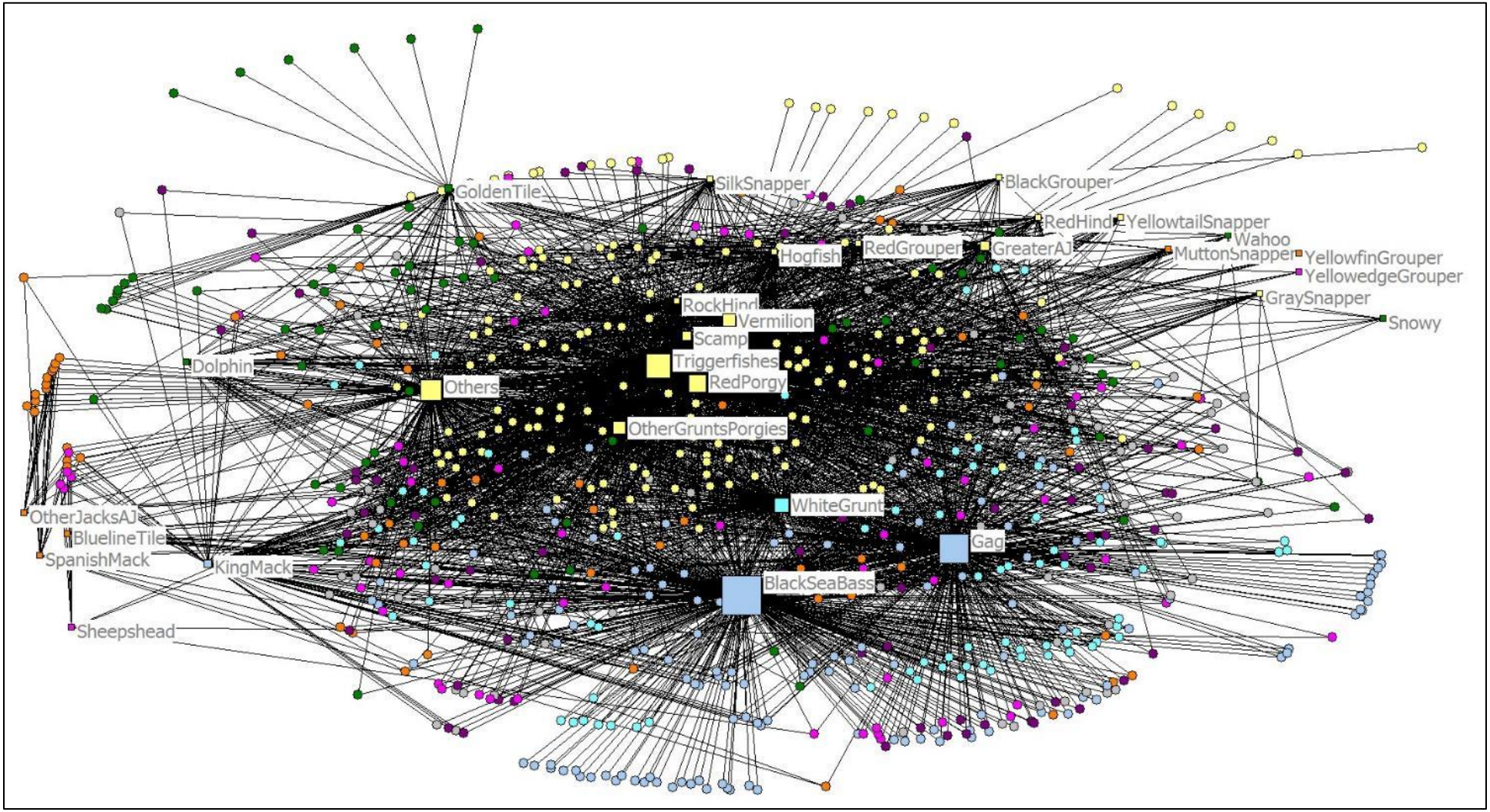

Figure A-4.Network graph (visualization) of Season 3 (September-December) of 2016 for North Carolina, South Carolina and Georgia

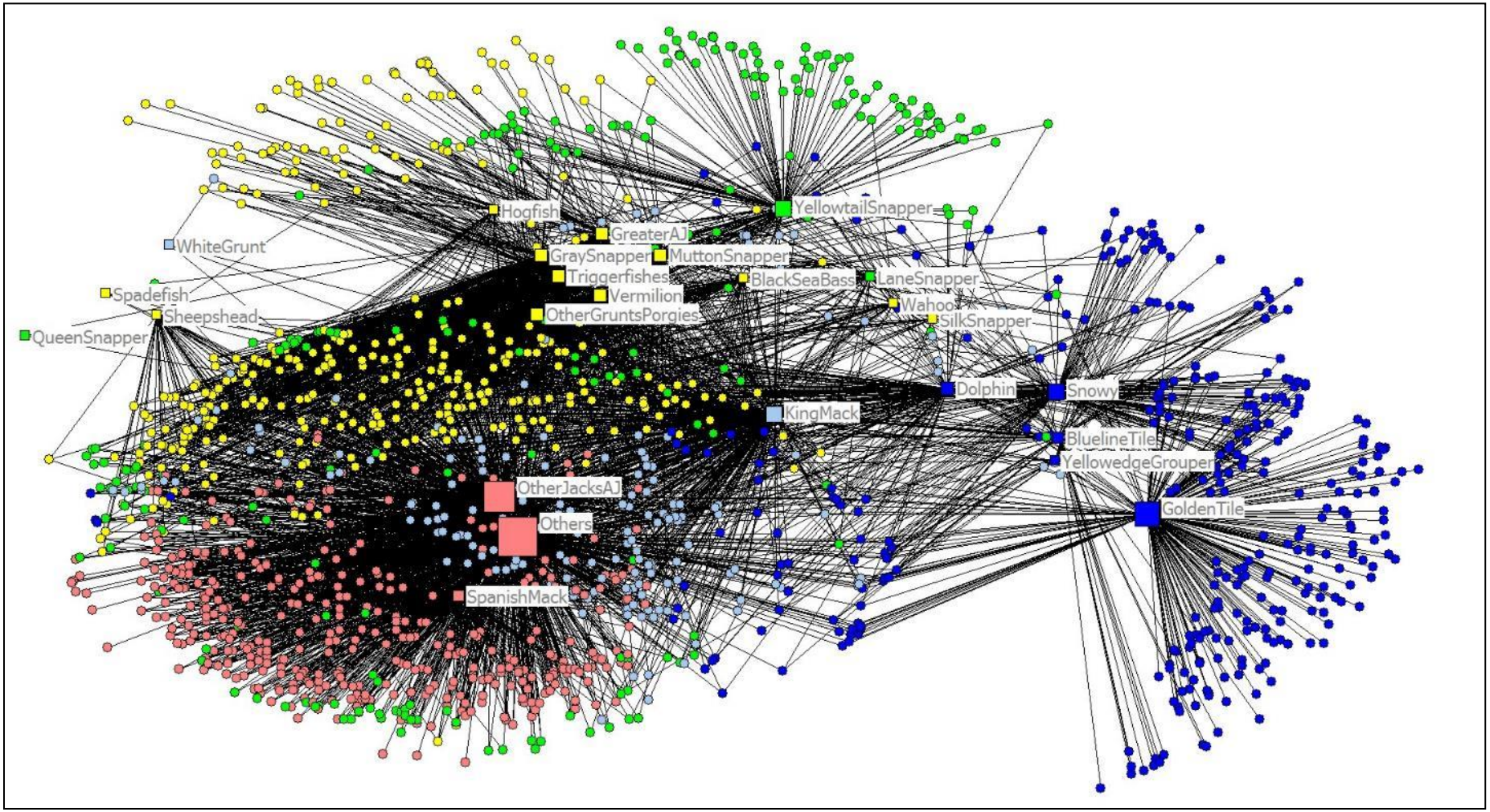

Figure A-5.Network graph (visualization) of Season 1 (January-April) of 2016 for the Florida East Coast.

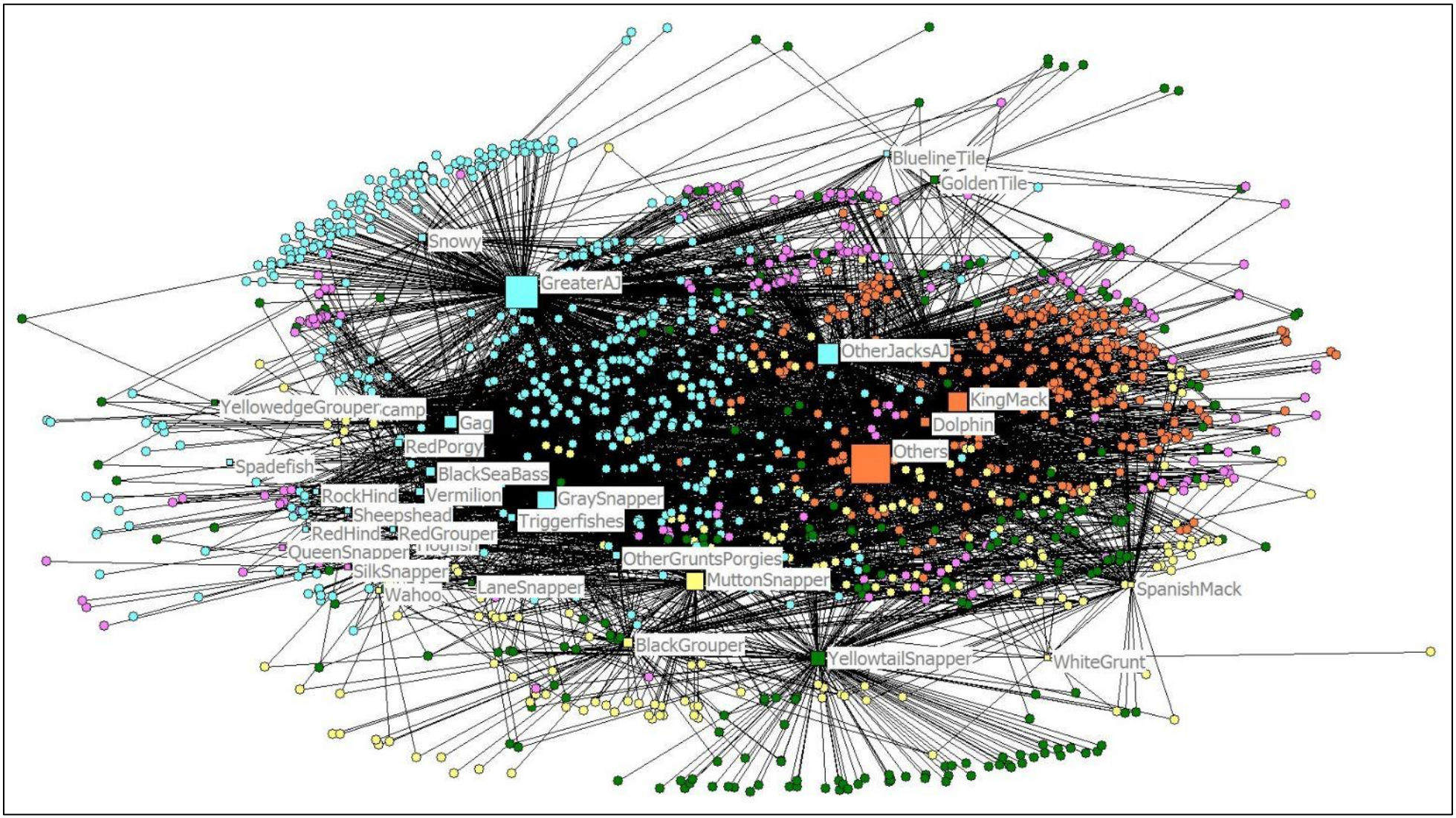

Figure A-6.Network graph (visualization) of Season 2 (May-August) of 2016 for the Florida East Coast.

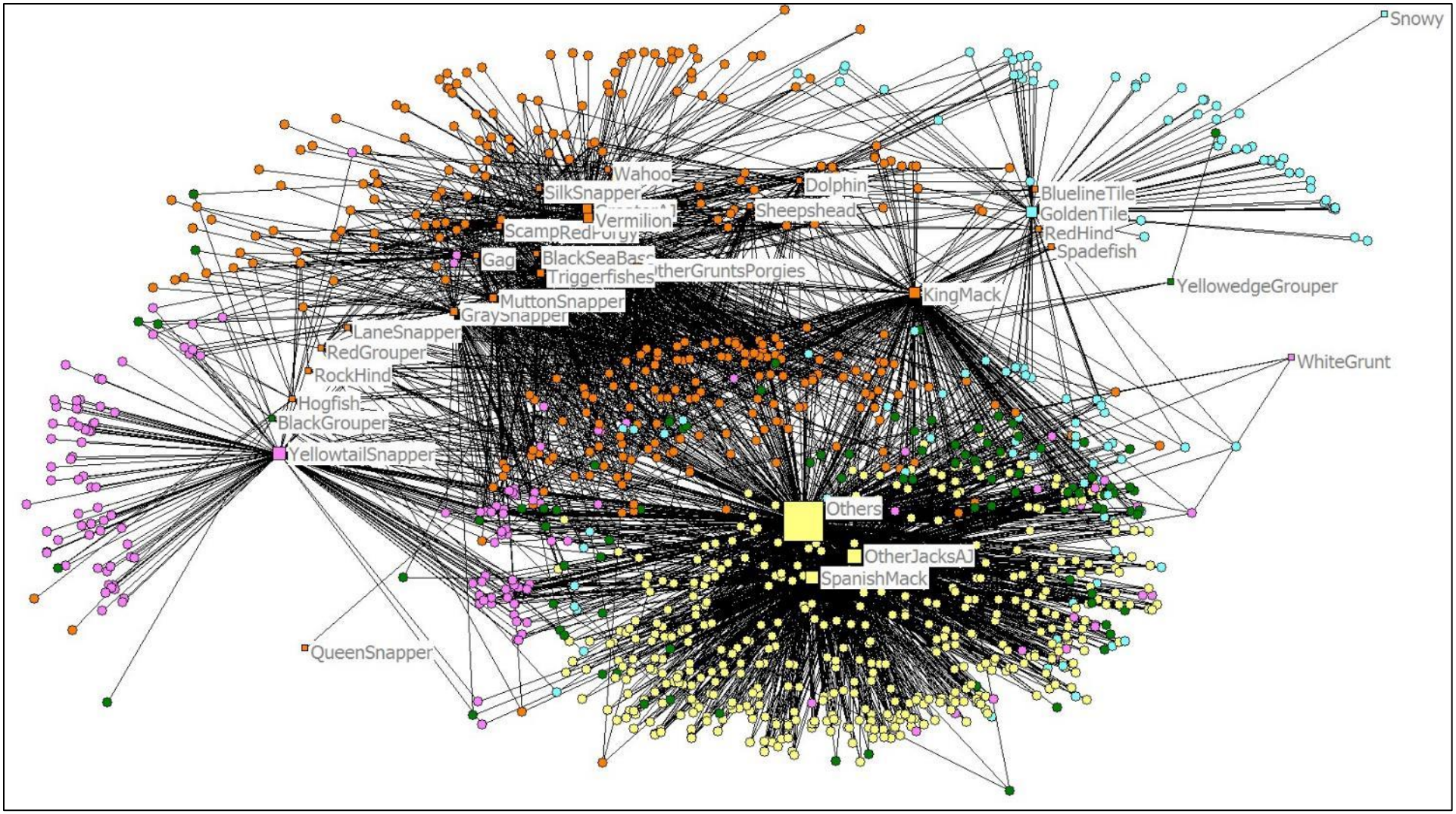

Figure A-7.Network graph (visualization) of Season 3 (September-December) of 2016 for the Florida East Coast.

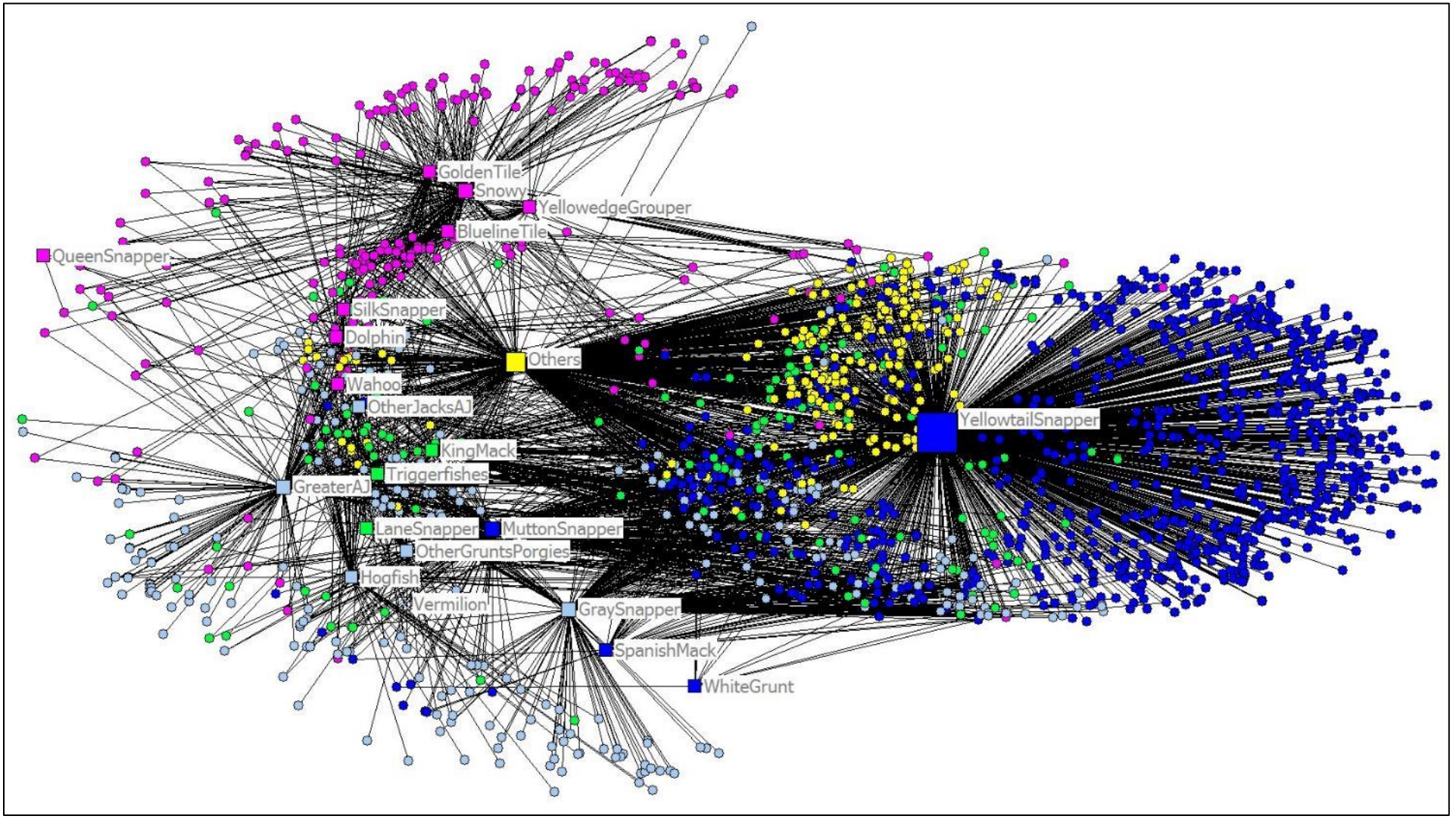

Figure A-8.Network graph (visualization) of Season 1 (January-April) of 2016 for the Florida Keys.

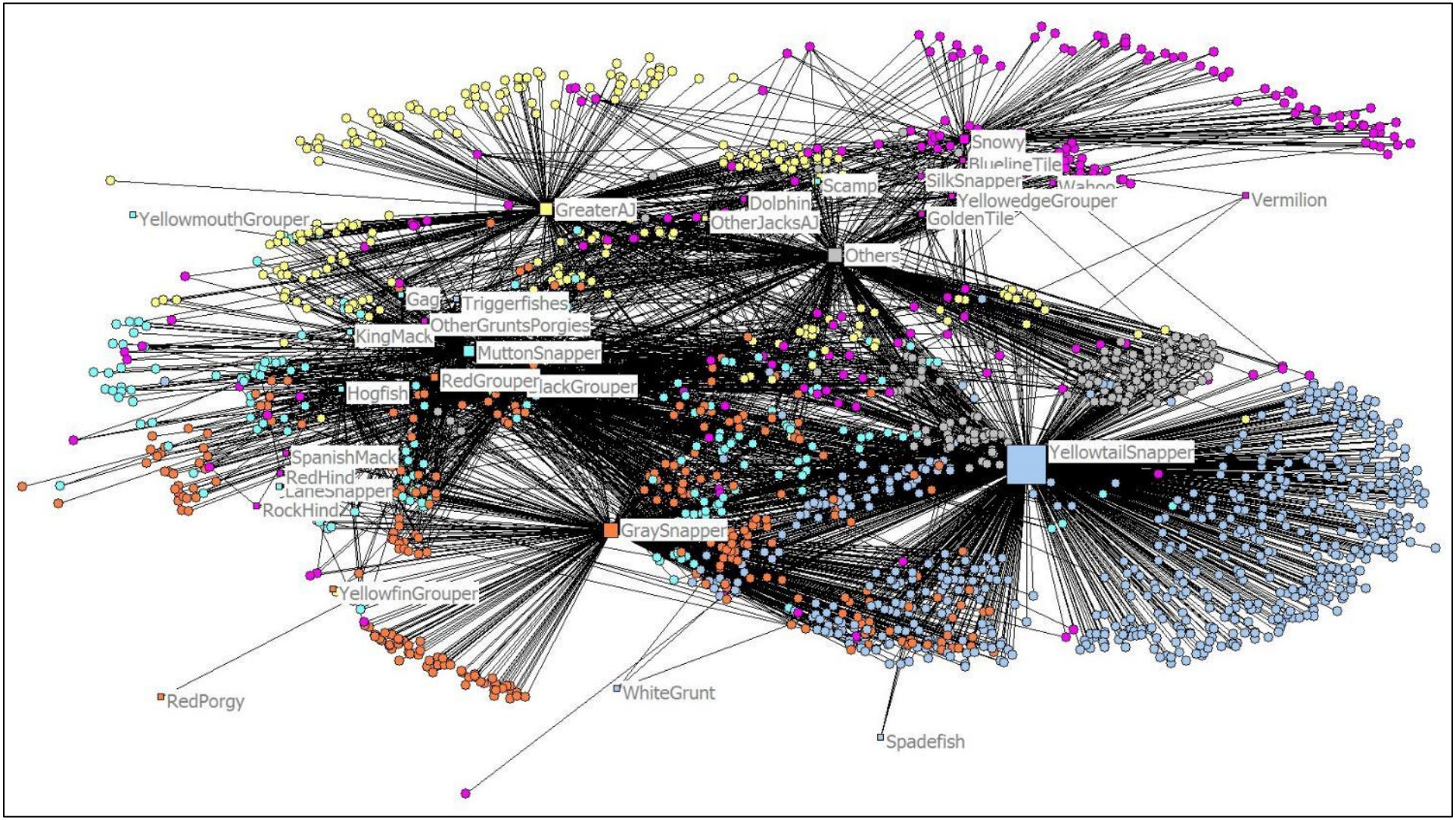

Figure A-9.Network graph (visualization) of Season 2 (May-July) of 2016 for the Florida Keys.

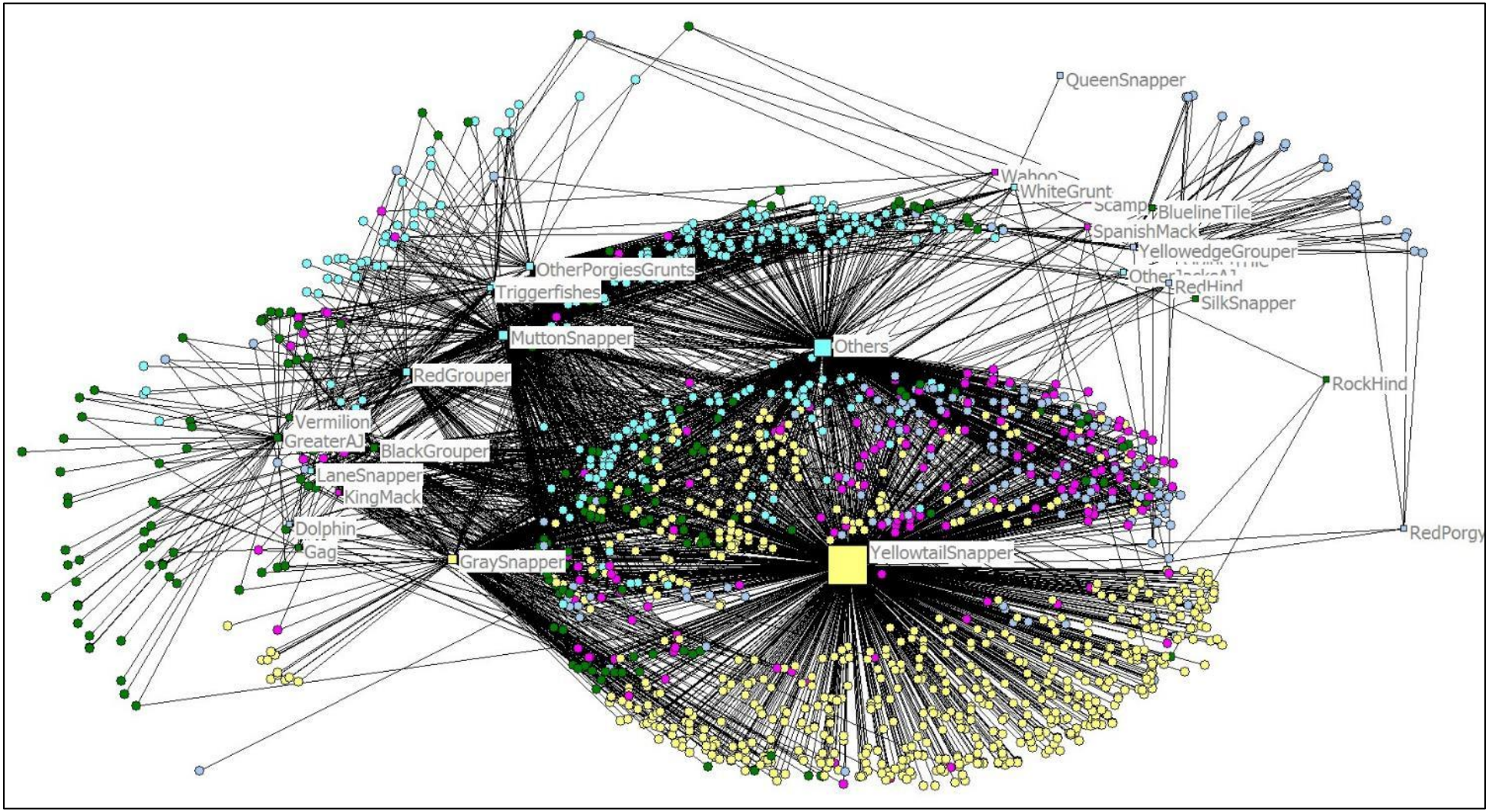

Figure A-10.Network graph (visualization) of Season 3 (August-December) of 2016 for the Florida Keys