SAFMC Fishery Ecosystem Plan II: Managed Species Summaries and EcoSpecies Web-enabled Species Information System Development

Introduction: Species Review for SAFMC Fishery Ecosystem Plan II Development
In order to refine species information for FEP II, and in cooperation with SAFMC Scientific and Statistical Committee Chair and Vice-Chair, the following process was established as a method to both update snapper grouper and other managed species information while making that information more useful and accessible (e.g., during SEDAR Data Workshops, in EFH reviews and policy development and by regional partners). During last year's in-person Food Web and Connectivity workshop held at FWRI, we discussed an opportunity to operationalize and highlight the South Atlantic Ecospecies online species information system (http://saecospecies.azurewebsites.net/) we have, over the past years cooperatively developed with FWRI. Dave Reed, Alic Bandy and Kathleen OKeife (FWRI) are continuing to provide support in updating, maintaining and expanding the capabilities of the system as directed. In addition, Robin Grunwald (FWRI) was contracted to continue to search for and compile updated species specific EFH by life stage information (including species environmental vulnerabilities where available) for FEP II which is also being integrated into the Ecospecies system.

The Team facilitated creation of concise species summaries for FEP II and refining and updating the Ecospecies system to provide the vehicle to review and refine detailed South Atlantic species information. Participants in the meeting will be briefed on the latest structure and system functionality. In addition, FWRI staff provided guidance and example training to establish future editors. The meeting will be facilitated / documented with the help of Brett Boston and Brittany Boston with Group Solutions.

FEP II Managed Species Section Development Refinement of Ecospecies online system:

1) Provides species summaries for a concise Fishery Ecosystem Plan II.
2) Operationalizes the online system for use in linking to all aspects of South Atlantic managed species Essential Fish Habitat, species life history, status and assessment input parameters, catch and management, environmental limits and vulnerabilities.
3) Provides a direct link to species information for review during stock assessment process.
4) Establishes an Ecospecies editor pool for update and maintenance

SAFMC FEP II Managed Species Team/ Ecospecies System Development Participants- Meeting- November 17, 2016 FWRI *Team Meeting Scheduled May 23, 2017*	
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Note: Section summary team and editor pool membership was expanded subsequent to team meeting. Readily available detailed species information was included in the overall master document for use by editors in the EcoSpecies system. SEDAR documentation links were also compiled and provided to link to or draw on in updating refined EcoSpecies fields.

The SouthEast Data, Assessment, and Review (SEDAR) assessment projects follow one of three approaches approved by the Steering Committee: benchmark, standard and update. Each provides a peer reviewed stock assessment, they simply vary in the details of how the project is managed as well as the time and analyses required. SEDAR is operated as a Council process, with dedicated staff and administered through the South Atlantic Council. The basic SEDAR products are stock assessment reports prepared through SEDAR assessment projects. Specific Stock assessment projects focused on or including SAFMC managed species can be found through the following species specific links to the SEDAR site.

SEDAR Process Link http://sedarweb.org/
SAFMC Snapper Grouper FMP Species
SEDAR 50 Blueline Tilefish http://sedarweb.org/sedar-50
SEDAR 47 SE Goliath Grouper http://sedarweb.org/sedar-47
SEDAR 41 SA Red Snapper and Gray Triggerfish http://sedarweb.org/sedar-41

SEDAR 37 Southeastern Hogfish http://sedarweb.org/sedar-37
SEDAR 36 South Atlantic Snowy Grouper http://sedarweb.org/sedar-36
SEDAR 32 South Atlantic Blueline Tilefish and Gary Triggerfish http://sedarweb.org/sedar-32
SEDAR 27A Southeastern Yellowtail Snapper http://sedarweb.org/sedar-27a
SEDAR 25 South Atlantic Black Seabass and Tilefish http://sedarweb.org/sedar-25
SEDAR 24 South Atlantic Red Snapper http://sedarweb.org/sedar-24
SEDAR 23 South Atlantic and GOM Goliath Grouper http://sedarweb.org/sedar-23
SEDAR 19 South Atlantic and Gulf of Mexico Black Grouper
and South Atlantic Red Grouper http://sedarweb.org/sedar-19

SEDAR 17 South Atlantic Spanish Mackerel and Vermilion Snapper http://sedarweb.org/sedar-17
SEDAR 15A South Atlantic and Gulf of Mexico Mutton Snapper http://sedarweb.org/sedar-15a
SEDAR 15 South Atlantic Red Snapper and Greater Amberjack http://sedarweb.org/sedar-15
SEDAR 10 South Atlantic and Gulf of Mexico Gag Grouper http://sedarweb.org/sedar-10
SEDAR 06 Goliath Grouper and Hogfish http://sedarweb.org/sedar-6
SEDAR 08 Car. Yellowtail Snapper, Car. and Southeast US Spiny Lobster
http://sedarweb.org/sedar-8
SEDAR 04 South Atlantic Snowy Grouper and Tilefish http://sedarweb.org/sedar-4
SEDAR 03 South Atlantic and Gulf of Mexico Yellowtail Snapper,
Atlantic Menhaden and Atlantic Croaker http://sedarweb.org/sedar-3
SEDAR 02 South Atlantic Black Sea Bass and Vermilion Snapper http://sedarweb.org/sedar-2
SEDAR 01 South Atlantic Red Porgy http://sedarweb.org/sedar-1

SAFMC Coastal Migratory Pelagics FMP Species
SEDAR 38 South Atlantic and GOM King Mackerel http://sedarweb.org/sedar-38
SEDAR 28 South Atlantic Spanish Mackerel and Cobia http://sedarweb.org/sedar-28
SEDAR 17 South Atlantic Spanish Mackerel and Vermilion Snapper http://sedarweb.org/sedar-17
SEDAR 16 South Atlantic and Gulf of Mexico King Mackerel http://sedarweb.org/sedar-16
SEDAR 05 South Atlantic and Gulf of Mexico King Mackerel http://sedarweb.org/sedar-5

SAFMC Spiny Lobster FMP Species
SEDAR 08 Car. Yellowtail Snapper, Car.and Southeast US Spiny Lobster
http://sedarweb.org/sedar-8

SAFMC Fishery Ecosystem Plan II: Managed Species – Example Species Summaries

Complete List of Latest Version of Managed Species Team FEP-II - Species Summaries

Managed Species Team FEP-II - Species Summaries Examples

Talking Points for Managed Species Authors

Dear Team Members:

Thanks for agreeing to assist in producing the Managed Species section for the Fisheries Ecosystem Plan II for the South Atlantic Fishery Management Council. We have divided the workload amongst many editors, based on species background and interest. The team met and developed a very short format for your use in writing your respective sections. This edit should take about 30 minutes per species, max.

Below is my guidance for editing the Google Doc:

If you are new to working with Google Docs, please contact Brittany Boston, our project manager, for any additional assistance at brittanyboston@groupsolutions.us, phone: 770-355-0269.

1. Before you delete any references listed, please add them to the list at the end of the Google Document or move them to a "comment (see instructions below), so we can add them into the online database that has been developed.

2. Each managed species summary should be limited to about ½ page and include the following aspects:

- **Common name, Sci. name,** other common names used widely in the region.
- **VERY brief morphology by sex if appropriate.** Include similar species. Examples are: yellowmouth and scamp groupers, black and gag grouper, etc..
- **Broad Geographic range, habitat in region** (by developmental stage if different e.g. gag) Grant suggested to use "warm-temperate"(gag, speckled hind), "temperate" (black seabass), and "tropical"(black and Nassau groupers) categories as they give more information (evolution, preferred climate, likely spawning and nursery range). Also consider using the term "established spawning populations". Since the greatest vulnerability and highest mortality for any fish is when it is within a spawning sites and at nursery sites, these geographic features should be emphasized and defined in this section. This may include habitat/microhabitat definition (coral vs rock vs artificial reefs; oysters vs seagrass) and even particular MPAs that have been designated due to the presence of recurring aggregations, spawning or critical nursery sites.
- **Max size, growth rate** (fast, slow, medium), max age. (by sex if sexually dimorph), Larval stage duration. No need to provide L50 or A50, or VB growth parameters.
- **Reproductive strategy** (e.g. gonogorist, hermaphroditism.). Size and age at maturity (and transition), sex ratio, spawning location(s) and season. Age at maturity, and sex transition
- **Management** (SAFMC/ASMFC/State in "FMP").
- **Target fishery (recreational and/or commercial) and primary gear.**
- **Other vulnerabilities and sources of mortality. (Vulnerability to "Non-fishery Mortality")** This category was added as several species depend on estuarine nursery sites or other areas for early development that are being heavily impacted by lower water quality and habitat loss.

Examples are goliath grouper (mangroves), gag and red grouper (seagrass and oysters), gray and Cubera snapper (seagrass, oysters, mangroves). Harmful Algal Blooms (HABs) have been occurring throughout the southeast and appear to be increasing in lethality and occurrence at specific locations.

- **A link to the on-line data base** indicating that "References and detailed information can be found at……..." will be added later during the final edits.
- **Do not worry too much about formatting.** We will consolidate the formatting after all text is complete.

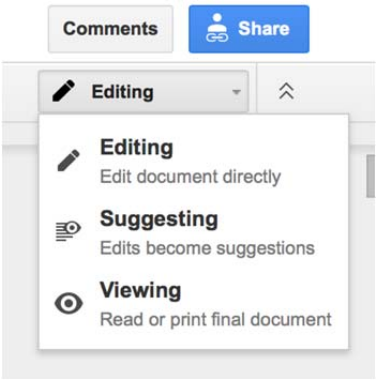
As an example of the format and length, review the final description for Black Sea Bass below.

3. Please check the species descriptions at http://www.safmc.net and review current descriptions for incorporating. Send Roger Pugliese or Amber VonHarten any major corrections or suggestions.

4. Authors should directly edit their work within the Google document. To edit in Google Docs:

XXXXXXXXXX

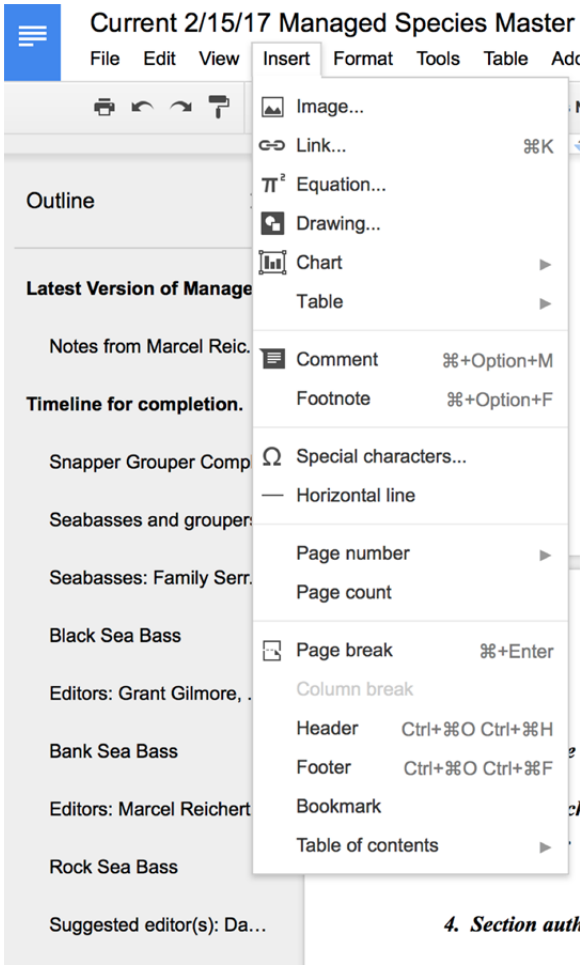
5. If you are not one of the listed authors for a particular section, please use commenting or suggest edit feature in Google Doc to **Suggesting** (Edits become suggestions) versus **Editing** directly.



6. You can list updated references in a comment box linked to your section. No need to add them at the end. Our overall section editor will format all references

in the final document.

7. You can find your specific species quickly by clicking on the Insert tab and selecting **Table of Contents** (at the bottom of the menu).



Timeline for completion-

Please complete edits and reviews by May 1.

Please let primary editor (first name in the list of editors) know when you have finished your edits so we can request that the reviewers can start their reviews! If you have reviewers in mind, please share the link with them and let Marcel know who is providing the review.

Reviews of complete FEP II and Interactive Executive Summary scheduled for June 2017 Committee Meeting.

Example

Black Sea Bass

Editors: Grant Gilmore, Marcel Reichert and Walter Bubley (suggested reviewer: Joey Ballenger)

(Edited by MR 2/13/2017, removed all references)

Centropristis striata - Black Sea Bass (Blackfish, Pinbass, Rock bass)

The larger black sea bass are black, while the smaller individuals are more of a dusky brown. The exposed parts of scales are paler than the margins, giving the fish the appearance of being barred with a series of longitudinal dots. The belly is only slightly lighter in color than the sides. The fins are dark, and the dorsal is marked with a series of white spots and bands. In larger fish, the upper portion of the caudal fin ends as a filament. During spawning, males may have a conspicuous blue nuchal hump.

Black Sea Bass can be distinguished from their closest relatives, the Rock Sea Bass, *C. philadelphica* and the Bank Sea Bass, *C. ocyurus*, by color and morphology, body depth, and gill raker and fin ray counts.

Black sea bass are opportunistic feeders eating whatever is available, preferring crabs, shrimp, worms, small fish and clams.

Black Sea Bass is a temperate species with permanent reproducing populations from Cape Cod, Massachusetts, to Cape Canaveral, Florida, in the north-eastern Gulf of Mexico. Larval Black Sea Bass settle in coastal and estuarine waters often near structure and migrate to inshore and mid-shelf reefs when they grow larger and mature. Once settled on (offshore) reefs, site fidelity is very high.

Black Sea Bass can reach a maximum age of about 11 yrs, but can live longer (up to 20 years) in others regions), and grow to 600mm (≈24 inches) or 6 pounds.

Black Sea Bass are protogynous hermaphrodites, transitioning from female to male at about 4 years of age, and a length of about 250 mm. Females mature can mature within their first year and around 150mm (larger elsewhere) in length. The spawning season extends from February through September, but peaks in the cooler months of February through April. Females spawn multiple times during the spawning season with the number of eggs produced during the spawning season ranging from 30,000 to 500,000 depending on fish size.

In the SE, Black Sea Bass is managed by the SAFMC under the Snapper/Grouper FMP. Black Sea Bass have been under intense commercial and recreational fishing pressure at least since the late 1970s, being an important reef fish species targeted by both fisheries. It is caught in hook and line and trap fisheries.

Other vulnerabilities and sources of mortality include decline in estuarine water quality, harmful algal blooms, and predation by larger reef predators, groupers, and possibly invasive lionfish.

Start of Google Doc. for editing

Snapper Grouper Complex
Seabasses and groupers

Seabasses: Family Serranidae

Black Sea Bass

Editors: Grant Gilmore, Marcel Reichert and Walter Bubley
(Edited by MR 2/13/2017, removed all references)(Edited by WB 3/30/2017)

Centropristis striata - Black Sea Bass (Blackfish, Pinbass, Rock bass),

Larger Black Sea Bass are black, while the smaller individuals are more of a dusky brown, with both having a belly that is only slightly lighter in color than the sides. The fins are dark, and the dorsal is marked with a series of white spots and bands. In larger fish, the upper portion of the caudal fin ends as a filament. During spawning, males may have a conspicuous blue nuchal hump.Black Sea Bass can be separated from their closest relatives, the Rock Sea Bass, *C. philadelphica* and the Bank Sea Bass, *C. ocyurus*, by color and morphology, body depth, and gill raker and fin ray counts.

Black Sea Bass is a temperate species with permanent reproducing populations from Cape Cod, Massachusetts, to Cape Canaveral, Florida, and in the north-eastern Gulf of Mexico. Larval Black Sea Bass settle in coastal and estuarine waters often near structure and migrate to inshore and mid-shelf reefs when they grow larger and mature. Once settled on (offshore) reefs, site fidelity is very high.Black Sea Bass are opportunistic feeders eating whatever is available, preferring crabs, shrimp, worms, small fish and clams.

Black Sea Bass can reach a maximum age of about 11 years, but can live longer (up to 20 years) in others regions), and grow to 24 inches or 6 pounds.

Black Sea Bass are protogynous hermaphrodites, transitioning from female to male at about 4 years of age and a length of about 10 inches. Females can mature within their first year and around 6 inches in length (larger elsewhere). The spawning season extends from February through September, but peaks in the cooler months of February through April. Females spawn multiple times during the spawning season with the number of eggs produced during the spawning season ranging from 30,000 to 500,000 depending on fish size.

In the SE, Black Sea Bass is managed by the SAFMC under the Snapper/Grouper FMP. Black Sea Bass has been under intense commercial and recreational fishing pressure at least since the late 1970s, being an important reef fish species targeted by both fisheries. It is caught in hook and line and trap fisheries.

Other vulnerabilities and sources of mortality include decline in estuarine water quality, harmful algal blooms, and predation by larger reef predators, potentially including invasive lionfish.

Bank Sea Bass

Editors: Marcel Reichert and Walter Bubley (Ask: Paulette Mikell and Charlie Barans to review)
(Edited by MR 2-13-2017, references removed)(Edited by WB 3/30/2017)

Centropristis ocyurus - Bank sea bass (Rock squirrel, Rockfish (misnomer))

Bank Sea Bass is a warm temperate, small demersal serranid with a tapering yellow-brown body with tri-lobed caudal fin. There are black markings which consist of three longitudinal rows of blotches on the sides in addition to spots on the dorsal and caudal fins. The head, fins, and front portion of the body often have blue and yellow spots and stripes. Bank Sea Bass are similar in appearance to Rock Sea Bass, but can be distinguished by the lack of dermal flaps above the dorsal fin spines.

Bank Sea Bass occurs in reefs or rocky offshore habitats from Cape Lookout, North Carolina, to the Yucatan banks of the southern Gulf of Mexico. It is found in waters ranging from 50-500 feet and in the SE it is more common in shelf edge habitats than the Black Sea Bass, which is found more on inner- and mid-shelf reefs. Bank sea bass is an opportunistic carnivore consuming crustaceans, mollusks, fishes, and echinoderms.

Little is known about the life history of Bank Sea Bass. They can grow to about 15.5 inches and nearly 2 lbs, and live to a maximum age of 7 to 8 years. Bank Sea Bass are protogynous hermaphrodites and transition from female to male generally between 5 and 7 inches of length. Females mature when they are 2 or 3 years old and spawning occurs offshore between January and November, but peak spawning occurs from February through April. Female Bank Sea Bass can spawn multiple times during the spawning season and can spawn, depending on size, well over 30,000 eggs in a spawning season.

In the SE, Bank Sea Bass is managed by the SAFMC under the Snapper/Grouper FMP. Bank Sea Bass is of limited direct economic value and is captured incidentally by anglers and commercial fishermen.

Rock Sea Bass

Suggested editor(s): David Wyanski and Fritz Rhode
(Edited by MR 2-13-2017, references removed)

Centropristis philadelphica - Rock sea bass

Rock sea bass is small demersal serranid with a tri-lobed caudal fin, and an overall brown/greenish color with 5-7 darker bars (saddles) along the dorsal area. The fins have diffuse light and darker brown bands. It can be confused with Bank sea bass which is similar in size and appearance. Black sea bass can grow larger and is black in color.

Rock sea bass occurs in the Western Atlantic from North Carolina to Palm Beach, Florida as well as the northern Gulf of Mexico. It prefers hard bottom, rocks, jetties, and ledges. Its maximum reported size is 300 mm (11.9 inches). Rock sea bass is an opportunistic bottom feeder with a diet mostly consisting of crustaceans, small fish and mollusks.

In the SE, Rock Sea Bass is managed by the SAFMC under the Snapper/Grouper FMP. Rock sea bass is of limited direct economic interest and is captured incidentally by anglers and commercial fishermen.

Gag Grouper

Editors: Grant Gilmore, Marcel Reichert, and Walter Bubley
(Edited by MR 2-13-2017, references removed; edited by JCM 3-17-17)(Edited by WB 4/3/2017)

Mycteroperca microlepis - Gag, Gag grouper (Gray grouper, Charcoal belly (large males))

Gag is a large (145 cm) grouper with a compressed body. Coloration is highly variable and changes with the size of the fish but has some variation of a distinct reticulate body color pattern. Large gag are dark brownish-gray above and paler below, with traces of dark wavy markings on the sides. Smaller fish are much lighter and have numerous dark brown or charcoal reticulate marks along the sides. Large males sometimes display a "blackbelly" and "black-back" phase that is mostly pale grey, with a network of faint dark markings below the soft dorsal fin; the belly and ventral part of the body above anal fin are black in this phase, as are edge of the soft dorsal fin, central rear part of the tail fin and rear margins of pectoral and pelvic fin. Gag resembles Black grouper, Scamp, and Yellowmouth grouper, but can de distinguished by its distinct reticulate body color pattern and caudal fin shape. The deeply notched preopercle further distinguish them from the most similar Black grouper.

Gag is a warm temperate species, from the Yucatan Peninsula throughout the Gulf of Mexico, around the Florida peninsula northward to Cape Hatteras, North Carolina. They are usually found shallower than 115 m on sponge-coral habitat and rock ledges. Larvae and/or juveniles migrate to specific estuarine seagrass and oyster reef habitats at depths less than 3 feet and leave for shallow coastal shelf reefs in the fall and winter of their first year. They prey on crabs, shrimp, lobster, octopus, squid and fish that live close to reefs.

Gag can grow to over 5 feet in length and live over 30 years. Gag are protogynous, transitioning from females to male at an age of about 10 yrs and a length of about 39 inches. Female Gag mature at an age of 3-4 yrs, when they are about 28-31 inches long. The sex ratio may have been changed from historical levels as a result of overfishing, skewing towards more females. Spawning occurs from December through May, with a peak between February and April, at which time they may make annual spawning migrations to specific locations where they may form spawning aggregations. Adult spawning aggregations have been reported on shelf edge reefs at depths of 240 – 300 ft.

In the southeast, Gag is managed by the South Atlantic Fishery Management Council under the Snapper-Grouper Fishery Management Plan and is subject to annual catch limits, size and bag limits, trip limits, gear restrictions, and a spawning season closure. Gag is a popular target by commercial and recreational fishermen using a variety of hook and line gear, including electric and snapper reels, power heads, and spear-guns.

Because Gag post-larvae and juveniles depend on specific estuarine micro-habitats, seagrass and oyster reefs, non-fishery mortality can be high with the loss of these habitats due to anthropogenic causes.

Red Grouper

Editors: Marcel Reichert and Walter Bubley (ask Ted Switzer and Ed Matheson to review)
(Edited by MR 2-13-2017, references removed) (Edited by WB 4/3/2017)

Epinephelus morio - The Red Grouper

The Red Grouper is a protogynous serranid that is associated with reef habitat, especially the adults, in the Western Atlantic from Massachusetts through the Gulf of Mexico and south to Brazil with a disjunct distribution off the Atlantic coast. They are commonly caught off NC, northern SC and southern FL, but are rare from southern SC to northern FL. Red Grouper are reported to occur at depths of 80-400 ft. Red Grouper inhabits ledges, crevices, and caverns of rocky limestone reefs, and also lower-profile, live-bottom areas.

Red Grouper are easily recognized by their deep brownish-red color and by the sloped, straight line of their spiny dorsal fin. The fin has a long second spine and an unnotched interspine membrane, while other Epinephelus groupers have a notched dorsal spine membrane and a third spine longer than the second. The body has occasional white spots on the sides. The Red Grouper is most closely related to the Nassau Grouper, which has several vertical bars and blotches, and is found more commonly on coral reefs in the West Indies.

Red grouper can live to over 25 years, with older fish reaching a size of 32.5 inches and 25 pounds. Red grouper are protogynous hermaphrodites transitioning from female to male at an age of about 8 years and a length of about 28 in. Female Red Grouper mature at an age of about 3 years, when they are about 20 in. Red Grouper spawning season is from February through June, with a peak in April. Females can spawn multiple times during the spawning season and can release over 1.5 million pelagic eggs in a season. The eggs remain at the surface for 30-40 days before the larvae settle to the bottom.

In the SE, Red Grouper is managed by the SAFMC under the Snapper/Grouper FMP and is subject to annual catch limits, size and bag limits, trip limits, gear restrictions, and a spawning season closure. It is targeted by recreational and commercial fishers using a variety of hook and line gear, including snapper reels, and spear guns.

Scamp

Editors: Marcel Reichert and Wally Bubley (Dave Wyanski to review)
(Edited by MR 2-13-2017, references removed)(Edited by WB 4/3/2017)

Mycteroperca phenax - Scamp (Broomtail)

Scamp is a small to medium sized slender-bodied grouper. They are identified by their pronounced anal and soft dorsal ray extensions, a more concave profile of the head, and by their color. Scamp have a tan to grayish-brown body covered with sharply defined, well-separated dark spots, which are approximately an eighth of an inch in diameter. Yellowmouth Grouper can have a very similar appearance, but generally live in deeper waters.

Scamp can be found along the Atlantic Coast of the US from North Carolina to Key West, FL, in the Gulf of Mexico, and along the southern shores of the Caribbean. Scamp inhabit low-profile live-bottom areas, areas of living *Oculina* coral (off Florida east coast), and over ledges and high-relief rocky bottoms in waters between 75 to 300 feet deep. Scamp can be an aggressive ambush predators preying on crabs, shrimp, and fish.

Scamp can live up to 30 years and reach lengths to over 40 inches and weighing more than 35 pounds. Scamp are protogynous hermaphrodites transitioning from female to male at the age of 5 to 9 when they are 20 to 30 inches long. Female Scamp mature at an age of 1-2 yrs, when they are about 14 inches long. Scamp spawn from February to August with a peak in March and April.

In the SE, Scamp is managed by the SAFMC under the Snapper/Grouper FMP and is subject to annual catch limits, size and bag limits, trip limits, gear restrictions, and a spawning season closure. Scamp is highly prized and has been targeted by commercial and recreational fisheries. Scamp is caught using various hook and line gear, including snapper reels, and spearguns.

Snowy Grouper

Editors: Marcel Reichert, Wally Bubley, and George Sedberry (Ask Jennifer Potts, Byron White and Charlie Barans to review)
(Edited by MR 2-13-2017, references removed. GRS 6Mar17; 29Mar17.)(Edited by WB 4/3/2017)

Hyporthodus niveatus - Snowy Grouper (chocolate grouper)

Snowy Grouper is a large deepwater reef-associated species. Although coloration varies with the size, smaller fish are dark brown overall, punctuated with pearly white spots on the sides that are not always visible on larger fish. A distinctive black, saddle occurs on the upper caudal peduncle and extends down below the lateral line. Larger Snowy Grouper usually lose the white spots and caudal saddle and become dark brown with a slight coppery tint. The spiny portion of the dorsal fin has a black margin. It is rarely confused with other species.

Snowy Grouper occurs in the western Atlantic from Massachusetts to Brazil, including Bermuda, Cuba, the Bahamas, and the Gulf of Mexico. Off the southeastern US, Snowy Grouper can be found on the outer continental shelf and upper slope at depths greater than 150 feet in habitats characterized by ridges, terraces and precipitous cliffs; or on wrecks and artificial reefs. Snowy Grouper is a bottom fish that ambushes bottom-dwelling prey. The most common diet items are deepwater crabs, but finfish are eaten also.

Snowy Grouper is relatively long-lived and may reach a maximum age of 35 years and a weight of 70 pounds. Like many groupers, it is a protogynous hermaphrodite transitioning from female to male at the age of 10-17 when they are about three feet long. Female Snowy grouper mature at an age of 5-6 yrs, when they are about 24 inches long. The spawning season is from April to September, with a peak in May to August

In the Atlantic waters of the southeast U.S., Snowy Grouper is managed by the SAFMC under the Snapper/Grouper FMP and is subject to annual catch limits, bag limits, trip limits, gear restrictions, and a seasonal closures. Snowy Grouper landings occur primarily in commercial fisheries using snapper reels, but some recreational hook and line catch occurs, particularly at the shallow end of the depth range (160-200 feet).

Speckled Hind

Editors: Grant Gilmore, Marcel Reichert, Walter Bubley, and George Sedberry
(Edited by MR 2-13-2017, references removed; GRS 29Mar17)(Edited by WB 4/3/2017)

Epinephelus drummondhayi - Speckled Hind (Kitty Mitchell, strawberry grouper)

Speckled Hind is a distinctive grouper with a laterally-compressed body densely covered with small pearly white spots on a dark reddish-purple to brown background. Some juveniles undergo a "xanthic phase", where white spots cover a light yellow background.

Speckled Hind is a warm-temperate species, occurring from the Yucatan Peninsula throughout the Gulf of Mexico, around the Florida peninsula northward to Cape Hatteras, North Carolina and Bermuda. It is absent from the tropical continental and insular Caribbean Sea and Bahama Islands. They commonly inhabit mid-shelf to upper continental slope reef habitats at depths ranging from 65 to 600 feet. Speckled Hind is usually found inshore of more typical deepwater reef fish such as Tilefish, and Snowy, Warsaw and Yellowedge groupers. Yellow (xanthic) phase juvenile Speckled Hind have been observed on shelf-edge *Oculina* coral reefs off east central Florida, and on shelf-edge hard-bottom reefs off South Carolina.Speckled Hind is considered piscivorous and generally engulf their prey whole.

Speckled Hind can reach a maximum age of 35 yrs, and can weigh over 50 pounds (the world record is 64-pound caught off North Carolina). Speckled Hind are protogynous hermaphrodites spawning over a prolonged period from April to October with a peak in May to August. Females transition to male at 6 years of age or older and at a length of 1.5-2.0 feet. Female Speckled Hind mature at an age of 4-6 yrs, when they are about 1.5 feet long.

In the Atlantic waters of the southeast U.S., Speckled Hind is managed by the SAFMC under the Snapper/Grouper FMP. Speckled Hind are caught on shelf edge and continental slope reefs using hook-and-line gear including electric reels and bottom longlines.

Predation by larger groupers and snappers is highly likely in early developmental stages, and invasive lionfish have been documented to feed on juvenile *Epinehelus* groupers.

Black Grouper

Editors: Jack McGovern and George Sedberry
(Edited by JCM 3-21-17, references removed; GRS 29Mar17)

Mycteroperca bonaci - Black grouper

Black Grouper is a large reef fish that is grayish or dark brown, with irregular coppery spots (some spots join to form chain-like streaks). The pectoral fins are dusky brown, gradually becoming orange at the edge; the soft dorsal and anal fins and leading edges of pelvic fins have a dark margin. The preopercle (cheek) bone is evenly rounded, without a notch or projecting bony lobe at the corner. Black Grouper is often confused with Gag; however, the most noticeable color difference is the coppery spots on Black Grouper that do not occur on Gag. The tail of Gag is slightly concave, whereas the tail of a Black Grouper is squared off.

Black Grouper occur off North Carolina to Florida, around Bermuda, and in the Gulf of Mexico, West Indies, and from Central America to southern Brazil. Adults are found over hard bottom such as coral reefs and rocky ledges. Black Grouper occur at depths of 30-100 ft. Juveniles sometimes occur in estuarine seagrass and oyster habitat, or on shallow patch reefs.

Black Grouper live for at least 33 years and attain sizes as great as five feet. Black Grouper change sex from female to male, and approximately 50% of females are sexually mature by 2.7 ft. and 5.2 years of age. At a length of 4 ft. and an age of 15.5 years, approximately 50% of the females have become males. Black grouper are in spawning condition throughout the year; however, peak spawning of females occurs from January to March.

In the southeast, Black Grouper are managed by the South Atlantic Fishery Management Council under the Snapper-Grouper Fishery Management Plan and are subject to annual catch limits, size and bag limits, trip limits, gear restrictions, and a spawning season closure. Most of the landings are in the Florida Keys.

Rock Hind

Editors: George Sedberry and Grant Gilmore (ask Jennifer Potts to review)
(Text from original FEP)
GRS edits 29-30Mar17, JCM 1 May 2017

Epinephelus adcensionis - Rock Hind

Rock Hind is a medium-sized grouper that is generally yellow-brown or pale greenish. The body is covered with reddish-brown spots and scattered pale blotches; there is usually 3-5 dark brown blotches (groups of dark spots) at the base of the dorsal fin and a blackish brown blotch on top of of the caudal peduncle. The maximum length is about 24 inches. Rock Hind occurs on rocky reefs in depths of 6-350 ft. It feeds mainly on crabs and fishes. Females mature at 12 in. (2 years old); ripe females (14-17 in.) were noted from January to June at the Florida Middle Grounds.

Rock Hind has a large range and is known from both sides of the Atlantic Ocean and some of its islands. In the region, Rock Hind occurs in Bermuda and from North Carolina to Florida, the Gulf of Mexico, and in the Caribbean to southern Brazil.

Rock Hind has been observed to spawn in aggregations near insular shelf edges in depths of 66-98 ft., January through March. Off South Carolina, females in spawning condition have been collected during May through August. Rock Hind are reported to be protogynous. Crabs compose the majority of their diet, but Rock Hind have also been observed to feed on fishes and young sea turtles.

Rock Hind is of minor importance to commercial and sport fisheries in the region, as it is less abundant than other groupers. Rock Hind are managed by the South Atlantic Council. It is caught with hook-and-line and spears.

Red Hind

Editors: Jack McGovern (ask Jennifer Potts to review)
(Edited by JCM 3-21-17,references removed)

Epinephelus guttatus - Red hind

Red hind and Rock hind (*Epinephelus adscensionis*) are characterized by numerous dark spots on a lighter background. This color feature alone distinguishes the two species from Speckled hind. Red hind have pale pink bodies with uniform red spots. The back and the sides of Red hind lack the large black blotches or saddles that are seen on Rock hind, and the soft-rayed portions of the dorsal and anal fins as well as caudal fin of Red hind are margined in black.

The species is found in tropical and subtropical waters as deep as 400 feet, from North Carolina to Brazil, including the southern part of the Gulf of Mexico and the Caribbean. It is most abundant off Bermuda and in the West Indies.

The species may live up to 17 years or longer. Maximum reported size is 76.0 cm TL (male) and 25.0 kg. Red hind is protogynous. Spawning occurs from March to July off the Southeast U.S., and females release an average of 90 thousand to 3 million pelagic eggs. Annual spawning aggregations occur during the full moon in January and February off the southwest coast of Puerto Rico and during the summer in Bermuda with no relation to lunar periodicity.

Red hind is managed by the South Atlantic Council. Commercial and recreational landings are small.

Graysby

Editors: George Sedberry and Ed Matheson
(GRS 30-31Mar17)

Cephalopholis cruentata - Graysby

The Graysby is a smaller species of grouper that varies in color from pale gray to dark brown. It has many darker orangish to red-brown spots on its body, fins, and chin, and 3-5 pale or dark spots that run along the base of the dorsal fin. A white line runs between the eyes from the nape to the lower lip. The tail is more rounded than in similar species.

Graysby occur from North Carolina to south Florida and in the Gulf of Mexico, Caribbean and Bermuda. The Graysby inhabits seagrass beds and coral reefs, and is found as deep as 557 ft. It is sedentary, solitary, and secretive, usually hiding during the day, and feeding at night.

Maximum reported size is 17 in. and 2.4 lbs. In the Caribbean, individuals in spawning condition have been observed in March, and from May to July, and spawning there occurs from July through October. Female Graysby approaching spawning condition have been found during summer off the Southeastern United States. Size and age at first maturity are estimated as 5.5 in. TL and 3.5 years. Sexual transition occurs at sizes ranging from 5.5-10.3 in. Tl with most transitional individuals occurring between the sizes of 7.9-9.1 in. TL and ages 4-5. Maximum reported age is 13 years and maximum size is 16 in. TL.

Juveniles feed on shrimp, while adults eat primarily fishes. Adult Graysby eat bony fish, shrimp, stomatopods, crabs, and gastropods.

Yellowfin Grouper

Editors: Walter Bubley and Grant Gilmore.
(Edited by MR 2/13/2017, removed all references)(Edited by WB 4/3/2017)

Mycteroperca venenosa - Yellowfin grouper (Fireback)

Yellowfin Grouper is a large grouper with a highly greenish olive or bright red color with longitudinal rows or darker black blotches over its entire body. The outer one-third of pectoral fins are bright yellow, while the lower parts of larger fish have small bright red spots. In shape, Scamp and Yellowmouth Grouper are similar, but the Yellowfin Grouper's coloration is distinctive enough to avoid misidentification.

Yellowfin Grouper occurs in the Western Atlantic, ranging from Bermuda to Brazil and the Guianas, including the Gulf of Mexico and Caribbean Sea at depths of 7-449 ft. Off the southeastern US, it is mostly found offshore on reefs off southern portions of Florida. The juveniles are commonly found in shallow seagrass beds, while adults occur over rocky areas and coral reefs. Yellowfin Grouper is primarily a piscivore, but includes squid in its diet.

Yellowfin Grouper can grow to 40 inches TL and 40 lbs, while reaching ages of 15 years. They are protogynous hermaphrodites, but data on maturity and transition from female to male is largely lacking. Spawning occurs from February to August, but off Florida most spawning activity is seen in May. Yellowfin Grouper seem to aggregate for spawning at some of the same sites utilized by Tiger Grouper, Nassau Grouper, and Black Grouper.

In the Atlantic waters off the southeast United States, Yellowfin Grouper are managed by the South Atlantic Fishery Management Council under the Snapper-Grouper Fishery Management Plan and are subject to annual catch limits, size and bag limits, gear restrictions, and a spawning season closure.

Coney

Editor(s): Marcel Reichert and George Sedberry
(Edited by MR 2-13-2017, references removed; GRS 30Mar17)

Cephalopholis fulva - Coney

Coney is a small grouper with red fins, many small blue spots edged with black line scattered on the body, a caudal peduncle with two prominent black spots on the upper edge, and a pair of black blotches on the tip of the lower jaw. The overall body color is highly variable, from yellow or red to brown or bicolored.

Coney occurs in the Western Atlantic, ranging from South Carolina and Bermuda to southern Brazil. The Coney is a common species in shallow waters, and is a sedentary species that usually hides in caves or under ledges during the day. It is often seen in coral reefs and clear water, and can be found to depths as great as 492 ft. Coneys are predators, feeding mostly on crustaceans and small fish; they may also follow morays and snake eels to feed.

The maximum reported length for coneys is 16 in. and they can reach an age of 11 years.

Coney is a protogynous hermaphrodite transitioning from female to male at a length of about 8 in. Females mature at about 5.1-6.3 in. Spawning occurs in small groups composed of one male and multiple females. Although ripe ovaries can be found in female Coney from November to March, spawning activity appears to be linked to particular moon phases (several days around the last quarter and new moon) in January and February.

In the SE, Coney is managed by the SAFMC under the Snapper/Grouper FMP. There is not much of a directed fishery for coney, which are most commonly caught off the southeast Florida and in the Caribbean. Most commercial landings of coney are often labeled as unclassified grouper. They are mostly caught by hook and line gear.

Yellowmouth Grouper

Editors: Marcel Reichert and Dave Wyanski.
(Edited by MR 2-13-2017, references removed)

Mycteroperca interstitialis - Yellowmouth grouper

Yellowmouth grouper is a tan or brown grouper with darker spots. It has spots, or a network of spots, fused into lines on the body, and a distinct yellow wash behind the jaws, yellow around the eyes and the outer edges of fins yellowish. Young fish are bi-colored, dark above with white below. It is very similar to Scamp, but adults generally occurs in deeper waters.

Yellowmouth grouper occurs along the eastern U.S. coast, Bermuda, Bahamas, Gulf of Mexico, and in the Caribbean south to Brazil. Adults are found over rocky hard bottom and coral reefs near the shoreline to depths of up to 150 m. Young commonly occur in mangrove lined lagoons. Yellowmouth grouper mostly eat fish, but also consumes crustaceans.

Yellowmouth grouper can l grow to about 850 mm (33 inches), weighing over 10 kg (22.5 lbs). The maximum age is reported to be between 28 to 41 years.

Yellowmouth grouper is a protogynous hermaphrodite transitioning from female to male at a length of about 500 to 600 mm cm (20-25 inches) at an age between 5 and 14 years. Females mature at about 400-450 mm (16-18 inches) and between the age of 2 and 4 years. Yellowmouth grouper may spawn all year, but peak spawning (in the Gulf of Mexico) is in March to May. Spawning occurs in small groups composed of one male and multiple females

In the SE, Yellowmouth grouper is managed by the SAFMC under the Snapper/Grouper FMP. There is not much of a directed fishery for yellowmouth grouper, but is is generally caught with other deep water snapper/grouper species by both commercial and recreational fishers. They are mostly caught by hook and line gear, including snapper reel.

Goliath Grouper

Editors: Grant Gilmore and Luiz Barbieri

Epinephelus itajara - Goliath Grouper,

(2) Goliath Grouper, Epinephelus itajara is one of the largest and most distinctive groupers in the US SEA whose first (spinous) dorsal consists of a series of short spines not seen in other regional groupers.
(3) Goliath Grouper is a tropical reef species whose spawning populations are limited to Florida in the USSEA, the Caribbean, and Gulf of Mexico to Brazil. It occurs estuaries as post-larvae, juveniles (in mangroves and seagrass) and adults with a center of abundance in shallow nearshore and mid-shelf reefs, rarely to depths of 100 m (328 ft)
(4) The goliath grouper is the largest grouper in the Western North Atlantic. Maximum reported size is 250 cm (99 in) TL (male) and 455 kg (1,003 lbs) (Heemstra and Randall 1993). Bullock et al. (1992) indicated that fish taken from exploited populations have a maximum age of 37 years. However, it is likely that this species could live much longer if left unexploited. Froese and Pauly (2003) estimate M to be 0.13. Porch et al. (2003) use M between 0.04 and 0.19. There is some evidence that males may transform from immature females (Bullock et al. 1992). Males exhibit a similar testicular structure to those of other serranids that are protogynous, however, mature males are observed at smaller lengths than those of mature females (Bullock et al. 1992). Males mature at 110.0 cm (43.6 in) TL, age 4, with all males mature by 115.2 cm (45.6 in), age 7. Females mature at 120.0 cm (47.0 in) TL, age 6, all are mature by 135.0 cm (53.1 in) TL, age 8.
Goliath grouper form consistent spawning aggregations (Sadovy and Eklund 1999; Coleman et al. 2000). July through September during the full moon on shipwrecks, rock ledges, and isolated patch reefs off both east-central, south and southwest Florida Bullock et al. (1992) reported that goliath grouper spawn during June through December with a peak in July to September in the eastern Gulf of Mexico.
(6) In the SE, Goliath Grouper are managed by the SAFMC under the Snapper/Grouper FMP.
(7) Goliath Groupers are presently protected from all harvest.
(8) Goliath Groupers are presently protected from all harvest, therefore captures are typically on hook and line incidental to other bottom fisheries (grouper/snapper and snook).
(9) Because Goliath Grouper post-larvae and juveniles depend on specific estuarine micro-habitats, seagrass and mangrove forest, estuarine reefs, non-fishery mortality can be high with the loss of these habitats or major declines in water quality. Unfortunately the majority of estuarine seagrass and most mangrove habitat (over 90%) has been lost in estuaries of the USSEA due to coastal urbanization and impoundment for mosquito control. Predation mortality is most likely in early developmental stages potentially by a wide variety of estuarine predators including larger Goliath Groupers.
Goliath grouper feed primarily on crustaceans, particularly spiny lobsters, as well as turtles and fishes, including stingrays. It is a territorial species, and larger individuals have reportedly stalked and attempted to eat human divers (Heemstra and Randall 1993).

Text from SAFMC website:
Physical description:
The largest of the groupers, weighing up to 750 pounds. Head and fins covered with small black spots; irregular dark vertical bars present on the sides of body; pectoral and caudal fin rounded; first dorsal fin shorter than and not separated from second dorsal; adults huge, up to 800 pounds; eyes small.

Biological description:
Found nearshore around docks, in deep holes, and on ledges; young often occur in estuaries, especially around oyster bars; more abundant in southern Florida than in northern waters. Spawns over summer

months; lifespan of 30 to 50 years; feeds on crustaceans and fish.
Note: Goliath grouper must be released by cutting the line and NOT removed from the water. The Florida Fish and Wildlife Conservation Commission has provided additional guidelines on release techniques for Goliath grouper.

Nassau Grouper

Editors: George Sedberry and Grant Gilmore.

(Text from original FEP –)
GRS edits 1 May 17

The Nassau Grouper, *Epinephelus striatus*, occurs on coral reefs and associated habitats in the tropical Western Atlantic. It is easily distinguished from other shallow-water groupers by the five dark bars on the body and the black saddle on the tail, just before the tail fin. It is a medium-sized grouper (48 inches and 30 pounds maximum) that is famous for its large spawning aggregations that form at predictable times and places, primarily in winter. Nassau Grouper range from Bermuda, the Bahamas, and Florida to southern Brazil, including the Gulf of Mexico. Juveniles are common in seagrass beds. Unlike most other groupers, where some large females become males, Nassau Grouper have individuals that begin life as males, with some females having a potential for sex change. Male and female Nassau Grouper mature between 16 and 20 inches and 4-8 years of age. Most individuals can spawn at 20 inches and by age 7. The spawning season is brief and associated with water temperature and the moon phase. At lower latitudes, reproductive activity lasts for about one week per month during December-February. In more northern latitudes (e.g. Bermuda), reproduction occurs between May and August, with a peak in July. Spawning aggregations in the Caribbean occur on the outer reef shelf edge, in December and January around the time of the full moon . In the southeastern U.S. Atlantic, the range limited to south Florid

All harvest of this species is prohibited, and has been since 1992.

Yellowedge Grouper

Editors: Grant Gilmore and George Sedberry

GRS 1May17

Hyporthodus flavolimbatus - Yellowedge Grouper,

YellowedgeGrouper belongs to a complex of deepwater groupers that include the Warsaw, Snowy and Misty Groupers all of which can confused with one another in the fishery as all can show similar color patterns. The Yellowedge and Snowy Groupers lack the elongate second dorsal spine that is so obvious in the Warsaw Groupers. Yellowedge Grouper typically do not show the classical lateral spot pattern that the Snowy Grouper has.

Yellowedge Grouper is a warm-temperate species with spawning populations from Cape Hatteras North Carolina to Florida and the Gulf of Mexico to Brazil. It occurs on reefs (artificial and natural) and sand/mud bottom at depths ranging from 210 to 902 ft. On soft-bottom habitats it is often seen within or near trenches or burrow-like excavations. Yellowedge Grouper are one of the longest living groupers as are other members of this deepwater group, likely exceeding 85 yrs . The maximum reported size is 45.3 in. and 41 lbs. Yellowedge Groupers are protogynous hermaphrodites, reversing sex with over half the females having transformed into males at32 in. In the Gulf of Mexico, 50% of fish are mature at 22.4 in. Spawning occurs from April through October in the South Atlantic . Yellowedge Grouper eat a wide variety of invertebrates (mainly brachyuran crabs) and fishes. Yellowedge Grouper spawning aggregations have been observed around deep slope shipwrecks off east central Florida.

Yellowedge Grouper are caught in shelf edge and deep continental slope hook and line fisheries, both in commercial and recreational fisheries. A variety of hook and line gear are used including electric reels and bottom multi-hook long lines. Non-fishery mortality sources are largely unknown as critical post-larvae and juvenile habitat for Yellowedge Grouper has not been documented. Predation mortality is highly likely in early developmental stages principally by syntopic larger groupers and snappers, potentially the exotic lionfish that occurs in deep slope reef habitats.

Warsaw Grouper

Editor(s): George Sedberry and Grant Gilmore

Hyporthodus nigritus - Warsaw Grouper (Jewfish (misnomer), black jewfish, Warsaw)

(2) The Warsaw Grouper belongs to a complex of deep water groupers that include the Yellowedge, Snowy and Misty Groupers all of which have been confused with one another in the fishery as all can show similar color patterns. The Warsaw Grouper can be told from all others in this complex by its elongate second dorsal spine.

(3) Warsaw grouper is a warm-temperate cool water species with permanent breeding populations in deep reefs along the continental shelf edge and deep slope from Cape Hatteras, North Carolina to east central Florida and the Gulf of Mexico (Smith 1971; Gilmore and Jones 1993; Gilmore 2014). The Warsaw Grouper has been consistently observed in small groups typically with a single very large (200 cm TL) individual around deep Oculina coral reefs and shipwrecks at depths from 80 to 200 m on the east central coast of Florida (Gilmore 2014) Warsaw Grouper have been captured at depths from 55 to 525 m (180-1,722 ft) (Heemstra and Randall 1993).

(4) Warsaw Grouper are protogynous hermaphrodites with length – weight data taken from 232 Warsaw Grouper, 30-233 cm TL landed by head-boat fisheries from North Carolina to Key West, Florida showing estimated maturation of females at 100 cm TL at 9 yrs (Gilmore 2012). Female to male transition size is unknown, but the largest females were 114 cm while the smallest male was 10 yrs, 119 cm TL. The oldest and largest male was 41 yrs = 233 cm (n=1, 263 kg, 580 lbs) with maximum estimated age at 44 - 46 yrs. (Gilmore 2012). The von Bertalanffy growth equation is $L_t = 2{,}394^{(1-e^{-0.0544(t+3.616)})}$ where L t is total length in mm at age t. The weight/length relationship is $W=2.097 \times 10^{-5} TL^{2.9797}$ (r = 0.96, n = 108) for W in g and L (total length) in mm. (Gilmore 2012).

(5) The Warsaw Grouper spawning activity has not been documented in the SE US, Atlantic but is estimated to occur from spring into summer based on post-larval collections and aging (Gilmore 2012) and is known to spawn August - October in the Gulf of Mexico (Peter Hood, NOAA Fisheries, personal communication), and during April and May off Cuba (Naranjo 1956).

(6) In the SE Atlantic the Warsaw Grouper is managed by the SAFMC under the Snapper/Grouper FMP.

(7) Warsaw Grouper are caught in shelf edge and deep continental slope hook and line fisheries, both in commercial and recreational fisheries.

(8) A variety of hook and line gear are used including electric reels and bottom multi-hook long lines.

(9) Non-fishery mortality sources are largely unknown as critical post-larvae and juvenile habitat for Warsaw Grouper has not been documented. Predation mortality is highly likely in early developmental stages principally by syntopic larger groupers and snappers, potentially the exotic lionfish that occurs in deep slope reef habitats.

Text from the SAFMC website:

Physical description:

The warsaw grouper is the only member of the genus Epinephelus that has 10 dorsal spines, the second of which is much longer than the third. The color is a grayish brown to dark reddish-brown background with numerous small, irregular white blotches on the sides. The color appears much lighter around the nape and along the posterior margin of the operculum. All of the fins are dark brown, except the white-splotched spiny portion of the dorsal fin. The young are characterized by a yellow caudal fin; dark saddle on caudal peduncle; and some whitish spots on body.

Biological description:

The warsaw grouper has a wider distribution along the southern United States than the other large

grouper, the goliath grouper (E. itajara). Warsaw range from North Carolina to the Florida Keys and throughout much of the Caribbean and Gulf of Mexico to the northern coast of South America. The species inhabits irregular bottom, notches, valleys, and drop-offs, occurring in the continental shelf break in waters 350 to 650 feet deep. Other species inhabiting this productive deep-water zone are snowy and yellowedge groupers, tilefish, and silk snappers. Warsaw are long-lived, reaching up to 6 feet and over 300 pounds. The warsaw's huge mouth enables it to engulf prey whole after capturing it.

Tiger Grouper

Editors: Jack McGovern
(Edited by JCM 3-22-2017, references removed)

Mycteroperca tigris - Tiger grouper

Tiger grouper have a dark back crossed by 9 to 11 pale narrow lines that slope downward and forward. It can dramatically change color, pale or darken. Tiger grouper are occasionally bright red; juveniles are yellow with a dusky midbody streak.

Tiger grouper occur in the Western Atlantic, ranging from Bermuda and south Florida (USA) to Venezuela and, possibly Brazil, including the Gulf of Mexico and the Caribbean Sea. It inhabits coral reefs and rocky areas at depths of 10 to 40 m.

Maximum reported size is 101.0 cm TL (male) and 10 kg. Tiger grouper is probably protogynous. It forms aggregations at specific times and locations each year. Spawning aggregations of tiger grouper occur one week after the full moon during January through April off Puerto Rico. Tiger grouper spawn from December through April off southwest Cuba. The tiger grouper preys on a variety of fishes, and frequents cleaning stations (Heemstra and Randall 1993 in Froese and Pauly 2003).

Tiger grouper are rare in landings in the southeastern United States, and are not subject to federal management by the South Atlantic Council.

Tilefishes
Blueline Tilefish

Editors: Marcel Reichert and Wally Bubley (ask Kevin Kolmos and Mike Schmidtke to review)

(Edited by MR 2-13-2017, references removed)(Edited by WB 4/3/2017)

Caulolatilus microps - Blueline Tilefish (Gray Tilefish, Tilefish)

Blueline Tilefish has a dull olive-gray overall appearance with white below. It has elongate, continuous dorsal and anal fins more than half the length of body, and a long snout with narrow gold stripe underlined in blue from snout to the tip of the eye. The gill cover has a strong, flat spine. The lack of fleshy protuberance behind the head distinguishes it from (Golden) Tilefish (*Lopholatilus chamaeleonticeps*).

Blueline Tilefish is patchily distributed along the outer continental shelf of North America from Cape Lookout, NC, to Campeche Bank, Mexico. Adults appear to move little, inhabiting areas along the outer continental shelf, shelf break, and upper slope on irregular bottom. Usual adult habitats include ledges or crevices and around boulders or rubble piles at depths of 160-820 ft, at water temperatures between 15-25^{o}C. Individuals have been observed hovering near or entering burrows under rocks as observed in many other tilefishes (malacanthids). Blueline Tilefish feeds on bottom creatures, such as crabs, shrimp, snails, worms, sea urchins, and small fish.

Blueline Tilfefish can live to at least 26 year but the expected maximum age may be closer to 45 years. There is dimorphic growth with males growing larger at age than females, with both sexes reaching over 32 inches in length.

Blueline Tilefish are gonochorists with an extended spawning season from February to October, with a peak March – September. They mature at the age of about 3 when they are 13 to 14 inches long. Females spawn multiple batches during the spawning season producing over 3 million eggs during a season.

In the SE, Blueline Tilefish is managed by the SAFMC under the Snapper/Grouper FMP and is subject to annual catch limits, bag limits, trip limits, and gear restrictions. They are caught by both commercial and recreational fishers. Hook and line is most commonly used by recreational fishers, snapper reels and longlines are the gear used most by commercial fishers to catch Blueline Tilefish.

Golden Tilefish

Editors: Marcel Reichert and Wally Bubley (ask Wyanski and Ben Hartig to review)

(Edited by WB 4/3/2017)
Lopholatilus chamaeleonticeps – Tilefish (Golden Tilefish)

Tilefish is a long-lived, slow-growing deepwater demersal member of the family Malacanthidae distributed along the outer continental shelf of North America from Nova Scotia to Key West, FL; in the Gulf of Mexico from the northern shoreline to Campeche Bank, Mexico, and off South America from Venezuela to Surinam. Tilefish move little as adults and occupy burrows within clay bottoms or scour depressions around boulders or rubble piles in depths of 250-1,500 ft and water temperatures of about 9° - 14° C.

Tilefish can reach a length of 38 inches and 40 years of age. It is easily distinguishable from other members of the family Malacanthidae by the large adipose flap, or crest, on the head. The species is blue-green and iridescent on the back, with numerous spots of bright yellow and gold, and a white belly.

Females are smaller than males, although whether or not the species displays hermaphroditism is still under investigation. Sexual maturity is reached when fish are about 27 inches long, 3 years of age, and weigh about 9 pounds. Female Tilefish spawns from March through November with a spawning peak occurring between April and June. Male Tilefish was also in spawning condition from March through November, however, most spawning activity occurred from April through June.

Tilefish feed during the day on the bottom on crustaceans, clams, snails, worms, anemones and sea cucumbers. In the Atlantic waters off the SE United States, Tilefish is managed by the SAFMC under the Snapper/Grouper FMP and are subject to annual catch limits, bag limits, and gear restrictions. They are caught by both commercial and recreational fishers. Hook and line is most commonly used by recreational fishers, while snapper reels and longlines are the gear used most by commercial fishers.

Sand Tilefish

Editor: George Sedberry (1May17)

Malacanthus plumieri - Sand Tilefish

Sand Tilefish are elongate and slender pale gray fish that may have a bluish cast. They are reef-associated but are found over sand and coral or rock rubble from near shore to depths of about 150, from Cape Lookout, NC, to Santos, Brazil, including Bermuda, Bahamas, Gulf of Mexico, and Caribbean (also around Ascension Island in South Atlantic). Sand Tilefish build mounds of rubble and shell fragments near reefs and grass beds, where males guard territories that include several haremic females. The maximum reported size is 28 in. and 2.4 lbs; however the common average size is much smaller. There is little information on the life history of this species. Tilefishes that have been studied are not hermaphroditic, and it is likely that sand tilefish is also a gonochorist. Prey items include stomatopods, fishes, polychaete worms, chitons, sea urchins, sea stars, amphipods, and shrimps.

Sand Tilefish is of minor economic importance, but is proabably landed and sold as mixed unidentified tilefish or reef fish. It is included in the SAFMC recreational grouper aggregate bag limit (3 per person per day). This species is managed under an Annual Catch Limit of ??? (can't find this information, other than the SAFMC smartphone app).

Triggerfishes
Gray Triggerfish

Editors: Marcel Reichert and Walter Bubley (ask Kevin Kolmos, Tracey Smart, and Mike Burton to review)
(Edited by WB 4/4/2017)
Balistes capriscus - Gray Triggerfish (Taly, Leatherjacket, Leatherneck)

The Gray Triggerfish,, has large incisor teeth and a deep laterally compressed body covered with tough, sandpaper-like skin. The Gray Triggerfish is easily distinguished from other triggerfishes in the SE, such as Queen Triggerfish, by its drab gray color. Triggerfish can be distinguished from filefish species by the presence of more than one dorsal spine.

Gray Triggerfish is a warm-temperate, gonochorist species in the family Balistidae that is found throughout the Atlantic Ocean, including the Mediterranean Sea. Gray Triggerfish occurs in coastal waters of the western Atlantic from Nova Scotia (Canada) to Argentina, including the Gulf of Mexico and Bermuda. Throughout this distribution they generally are found at depths to 330 ft, though they are commonly found between 40 and 140 ft among reefs and hard-bottom habitat, such as wrecks and rock outcroppings. The most common items in their diet as small mussels, sea urchins and barnacles, which they dislodge and crush with their teeth.

Gray Triggerfish can reach a maximum age of 15 years and length of 22 inches, with females growing larger and living longer than males. Female Gray Triggerfish begin maturing at 1 year of age and around 6 inches in length. Spawning occurs off-shore during the spring and summer, with Gray Triggerfish having demersal eggs that are deposited in guarded nests. Typically a single male guards a territory that houses several nests belonging to several females in a harem-like system.

In the Atlantic waters off the SE US, Gray Triggerfish is managed by the SAFMC under the Snapper/Grouper FMP and is subject to annual catch limits, size and bag limits, trip limits, and gear restrictions. They are caught by both commercial and recreational fishers, with hook and line gear being the most commonly used.