

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 is facilitating 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 will provide 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

<i>Invited Participants: SAFMC FEP II Managed Species Team/ Ecospecies System Development Participants- Follow-up Meeting- November 17, 2016 FWRI</i>	
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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

Directions to Editors: If you edit your assigned work PLEASE note you are finished with your edits at the top, beside the species and your name.

Please add any references or leave them in, so we can add them to the on-line data base.

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 Suggest 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.
- **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.

Please check the species descriptions at www.safmc.net and review to incorporate or correct.

Snapper Grouper Complex
Seabasses and groupers

Seabasses: Family Serranidae

Black Sea Bass

Editors: Grant Gilmore, Marcel Reichert and Walter Bublely)

(Edited my 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 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 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.

Bank Sea Bass

Editors: Marcel Reichert and Walter Bublely (Suggested: Paulette Mikell and Charlie Barans)
(Edited by MR 2-13-2017, references removed)

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

Bank sea bass is small demersal serranid with a tapering bodies with tri-lobed caudal fin, and are yellow-brown with black blotches and spots. The black markings 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 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. Bank sea bass can grow to about 400mm (15.5 inches) and 780 grams, 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 125mm and 170mm 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: R. Grant Gilmore, Jr., Marcel Reichert and Wally Bublely.

(Edited by MR 2-13-2017, references removed)

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. Large gag are dark brownish-gray above and paler below, with traces of dark wavy markings on the sides. Adult females and juveniles are generally brownish gray with dark short squiggles. 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 be distinguished by its distinct reticulate body color pattern and caudal fin shape. The deeply notched preopercles further distinguish them from the most similar Black grouper.

Gag is a warm temperate species, whose principal spawning populations occur on reef formations 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. Post larval Gag routinely recruit to estuarine seagrass and oyster reef habitats at depths less than 1.0 m (39 in.) and adult spawning aggregations have been reported on shelf edge reefs at depths of 80 to 100 m (240 – 300 ft). Red groupers are opportunistic predators ambushing their prey and swallow it whole. They prey on crabs, shrimp, lobster, octopus, squid and fish that live close to reefs.

Gag can grow to over 1.5 meter in length and live over 30 years.

Gag are protogynous hermaphrodites transitioning from females to male at an age of about 10 years and a length of about 1 meter. Female Gag mature at an age of 3-4 yrs, when they are about 70-80 cm long. The sex ration may have been changed from historical levels as a result of over-fishing. 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. Larvae and/or juveniles migrate to specific estuarine seagrass and oyster reef habitats and leave for shallow coastal shelf reefs in the fall and winter of their first year.

In the SE, Gag grouper are managed by the SAFMC under the Snapper/Grouper FMP and are subject to Annual Catch Limits, size and bag limits, trip limits, gear restrictions, and a spawning season closure. Gag groupers are a popular target in commercial and recreational fisheries using a variety of hook and line gears, including electric reels 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. Early life history stages of gag are vulnerable to habitat loss and lowered water quality. Oyster reef habitats have declined as a result of overharvest, disease, sedimentation, freshwater flow manipulation and sealevel rise. Seagrass beds are also in decline as a result of sedimentation, vessel groundings, and altered hydrology.

Red Grouper

Editors: Marcel Reichert and Walter Bubley (ask Ted and Ed)

(Edited by MR 2-13-2017, references removed)

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 24-120 m. It inhabits ledges, crevices, and caverns of rocky limestone reefs, and also lower-profile, live-bottom areas in waters 10 to 40 feet deep.

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, and tiny black specks dot the cheeks and operculum. 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 700 mm. Female Red grouper mature at an age of about 3 years, when they are about 500 mm long. 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. 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 Buble, ask Dave Wyanski)

(Edited by MR 2-13-2017, references removed)

Mycteroperca phenax - Scamp

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. Yellowfin 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 and will swallow crabs, shrimp, and fish whole.

Scamp can live up to 30 years and reach lengths to over 1 meter weighing more than 35 pounds.

Scamp are protogynous hermaphrodites transitioning from female to male at the age of 5 to 9 when they are 500 to 750mm long. Female Scamp mature at an age of 1-2 yrs, when they are about 350 mm 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. Scamp are highly prized and have been targeted by commercial and recreational fisheries. They are caught using various hook and line gear, including snapper reels, and spearguns.