

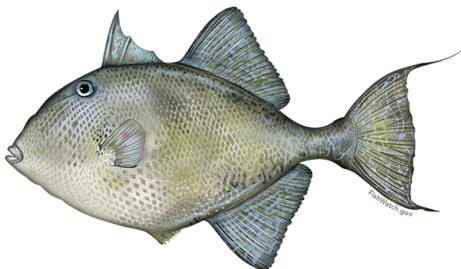


SEDAR 82 US South Atlantic Gray Triggerfish Review Workshop: Background on the species and fisheries

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- 1 Background
 - Taxonomy
 - Life cycle
 - Distribution
 - Habitat and community
 - Fisheries
 - Federal management history
 - Assessment history

- Order: Tetraodontiformes (cowfish, filefish, leatherjackets, pufferfish, triggerfish)



- Family: Balistidae (filefish, triggerfish)

- ▶ Monophyletic group (McCord and Westneat 2016)
- ▶ 47 species of triggerfishes, including gray triggerfish (*Balistes capriscus*)

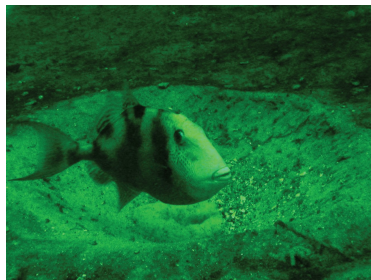


Background

Life cycle



- Gonochoristic (separate sexes)
- Spawn Apr - Sep (peak May - Aug) in the US South Atlantic (Kelly, A.M. 2014)
- 700,000+ \approx 0.6 mm eggs per spawn
- Males build nests (simple sandy depression)
- Successful males form harems of up to five females
- Both sexes guard eggs in nests (Simmons and Szedlmeyer 2012)



Female gray triggerfish guarding nest (Simmons and Szedlmeyer 2012)

Background

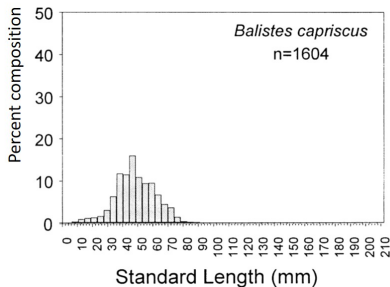
Life cycle



- Eggs hatch in 24 – 48 hours (Simmons and Szedlmeyer 2012)
- Larvae 2 – 3 mm at 6 days (Wells and Rooker 2004)
- End of larval stage at 6 mm (Matsuura and Katsuragawa)
- Juveniles first detected in *Sargassum* mats around 10 mm (Wells and Rooker 2004)
- Larvae and juveniles remain in *Sargassum* mats for 4-7 months and then settle to benthic habitats (Antoni and Saillant 2017)



Balistids in *Sargassum* (NOAA photo)



Length distribution of gray triggerfish in *Sargassum* (Wells and Rooker 2004)

Background

Distribution



- Triggerfish species are distributed on coral or rock reefs in tropical to temperate waters ([McCord and Westneat 2016](#))
- Gray triggerfish are found in the eastern Atlantic from Europe to West Africa, and the Mediterranean, and in the Western Atlantic, in South, Central and North America
- Mitochondrial ([Antoni et al. 2011](#)) and microsatellite ([Antoni and Saillant 2017](#)) DNA suggest that Gray Triggerfish are genetically homogeneous from the waters off of east Texas in the Gulf of Mexico to South Carolina (i.e. the northern extent of sampling in the western Atlantic)

Background

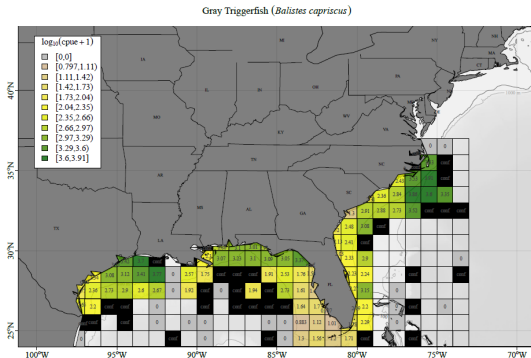
Distribution



US South Atlantic and Gulf of Mexico

- Southeast Regional Headboat Survey catch records (1973-2018)

- ▶ Distribution of gray triggerfish caught by recreational headboats
- ▶ cpue = n fish per 10,000 angler hours
- ▶ plotted on \log_{10} scale



Background

Distribution



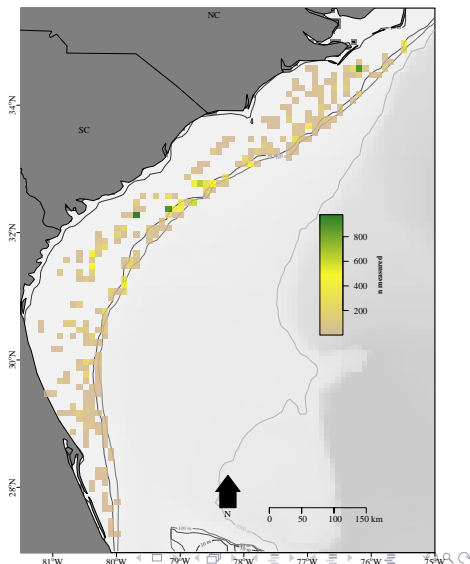
US South Atlantic

- Southeast Reef Fish Survey (1990-2019)
 - ▶ Data from <https://www2.dnr.sc.gov>
 - ▶ Raster shows number of fish measured
 - ▶ Distributed across the southern area from Florida to North Carolina



Chevron trap with mounted cameras, baited with clupeoids. (photo credit SCDNR MARMAP)

SERFS gray triggerfish (1990-2019)



Background

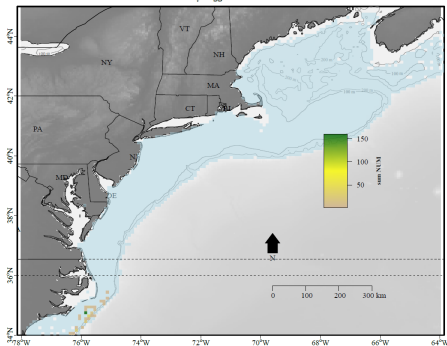
Distribution



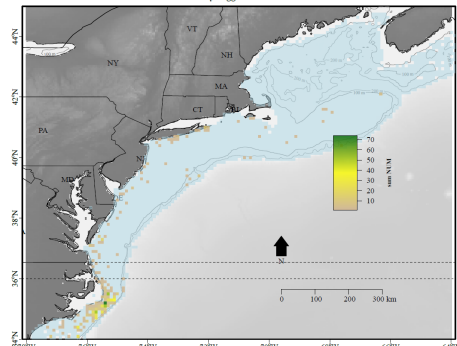
US North Atlantic

- Northeast Fisheries Science Center bottom trawl survey (1963-2022)
- Light blue indicates survey extent

Gray Triggerfish SPRING



Gray Triggerfish FALL



Background

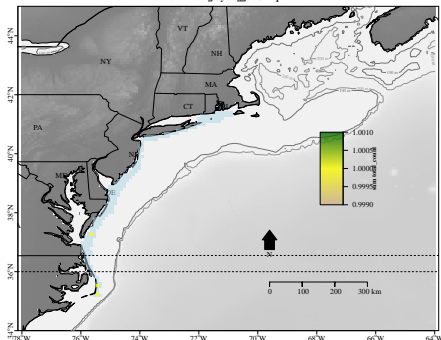
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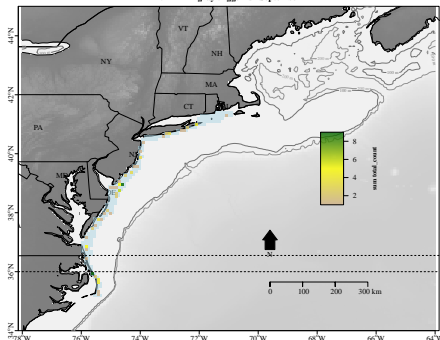
US North Atlantic

- Northeast Area Monitoring and Assessment Program bottom trawl survey (2007-2023)
- Light blue indicates survey extent

NEAMAP gray triggerfish April



NEAMAP gray triggerfish September



Background

Habitat and community



- Found on “hardbottom” habitat, such as rock, coral reef, wrecks, consolidated substrate and other structure
- Typically present in mixed communities including other fisheries species



photo credit nceseagrnt



photo credit Emily Pickering

Background

Habitat and community



- Cluster analysis of fisheries catch data from the US Southeast Atlantic [Shertzer and Williams 2008](#)

Recreational headboat

1. Bank sea bass
2. Black sea bass
3. Gag grouper
4. **Gray triggerfish**
5. Greater amberjack
6. Knobbed porgy
7. Red porgy
8. Red snapper
9. Scamp grouper
10. Tomtate grunt
11. Vermilion snapper
12. White grunt
13. Whitebone porgy

Commercial handline (i.e. hook and line)

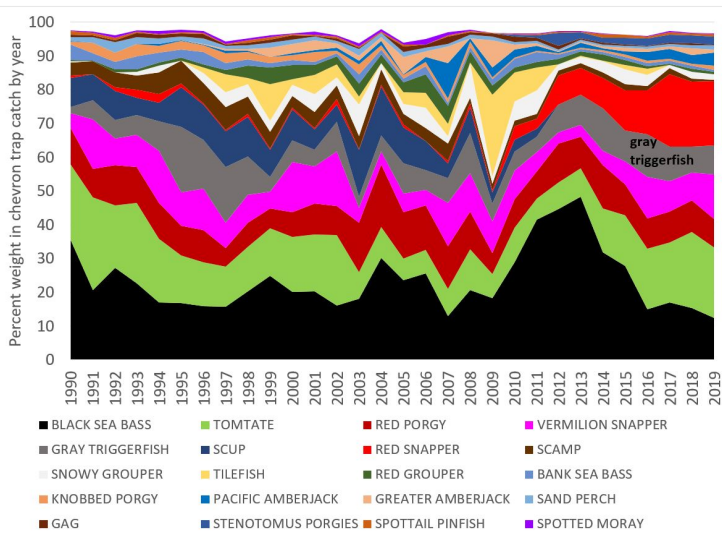
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10. White grunt

Background

Habitat and community



- Proportion of SERFS chevron trap survey catch by weight over time



Background

Fisheries



- Predominantly harvested with hook and line gear in both commercial and recreational fleets
- Typically caught in mixed fishery of multiple species
- Fishing fleets include relatively many small boats
- Recreational harvest is an increasing proportion of the catch over time as in other species in the region (Shertzer et al 2019)



Bandit reels on a commercial vessel

Baker et al. 2016



photo credit NOAA

Background

Federal management history



- **Three US stocks:** Gulf of Mexico, South Atlantic, and Puerto Rico (triggerfish complex)
- No management north of North Carolina waters
- Detailed management history for the US South Atlantic is provided in [Malone et al. 2022](#)

Background

Federal management history



- Commercial

- ▶ Annual catch limits (ACLs; 2012 - present)
 - 272,880 - 312,325 lb
- ▶ Seasonal closures (2012 - 2020+)
- ▶ Retention limit: 1000 lb per trip (2015 - present)
- ▶ Minimum size limit
 - ★ North Carolina, South Carolina, Georgia
 - 12" FL (2015 - present)
 - ★ Florida, east
 - 12" TL (1995 - 2015)
 - 14" FL (2016 - 2020 March)
 - 12" FL (2020 April - present)

Background

Federal management history



- Recreational

- ▶ Annual Catch Limits (ACLs; 2012 - present)
 - 353,638 - 404,675 lb
- ▶ Seasonal closures (2014)
- ▶ Retention limit: - part of 20 fish snapper-grouper daily bag limit (1999 - present)
 - up to 10 fish per day from one species (2020 - present)
- ▶ Minimum size limit
 - ★ North Carolina, South Carolina, Georgia
 - 12" FL (2015 - present)
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Background

Assessment history



- SEDAR 41, 2016 Benchmark assessment
- SEDAR 82 research track assessment