SEFSC response to SAFMC Research Recommendations

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NOAA FISHERIES
SouthEast Fisheries Science Center

SAFMC
June, 2022

Outline

1. ***Research takes a community and SEFSC is far from alone in this response - numerous state, academic and federal partners***

1. ***Update of status on 2020-2025 Research Plan***

1. ***Highlight several key projects***

Research progress

needs	complete	ongoing: research in progress or routine	delayed/not planned	total	complete or ongoing rate
I. Short Term stock assessments need 2020-2023	8	10	8	26	69%
II. Long Term research stock assessments needs 5 years.		4	7	11	36%
III. Short Term Spawning Special Management Zones 5 years.		4	1	5	80%
IV. Short Term MPA monitoring 5 years.		3	3	6	50%
V. Long Term other Needs 5 years.		11	1	12	92%
VI. Habitat Research and Monitoring Needs		2		2	100%
VII. Specific Monitoring Priorities		12		12	100%
VIII. SPECIFIC ANNUAL REPORTING REQUESTS		1	2	3	33%
total	**8**	**47**	**22**	**77**	71%

1 completed assessment (gag)
several more in progress (spanish mackerel, gray triggerfish research track, black seabass operational, scamp operational)

Covid and SEDAR Steering Committee decisions have caused several delays.

heading	topic
I. Short Term stock assessments need 2020-2023	o (Spanish mackerel) Evaluate stock structure using updated data and modern techniques, such as genetics. In particular evaluate if there is newer data available on steepness from other analyses of S-R for pelagic stocks with similar reproductive strategies.
I. Short Term stock assessments need 2020-2023	• Gray Triggerfish Research Track Assessment 2022:
I. Short Term stock assessments need 2020-2023	o Address age determination issues for Gray Triggerfish by January 2020 so age structures can be evaluated for a research track assessment tentatively scheduled for 2021, including re-aging of the spines by the start of the RT.
I. Short Term stock assessments need 2020-2023	• Black Sea Bass Operational Assessment 2021:
I. Short Term stock assessments need 2020-2023	o Recommend the use of more direct methods of estimating M, such as Tag-Recapture studies.
I. Short Term stock assessments need 2020-2023	• Red Grouper Operational Assessment 2021:
I. Short Term stock assessments need 2020-2023	• White Grunt Research Track Assessment, 2023
I. Short Term stock assessments need 2020-2023	o Conduct stock identification studies for White Grunt.

Several delays due to really challenging questions often beyond simple (or 2 year) solutions

II. Long Term research stock assessments needs 5 years.	§ Investigate possible effects of hermaphroditism on the steepness parameter.
II. Long Term research stock assessments needs 5 years.	§ Investigate temporal patterns in sexual transition and develop explanations for any patterns identified.
II. Long Term research stock assessments needs 5 years.	§ Investigate methods for incorporating the dynamics of sexual transition in assessment models.
II. Long Term research stock assessments needs 5 years.	o Examine how schooling or migratory dynamics may influence the catchability of the species. In particular, research the assumption of the hyperstability of indices that sample the schooling portion of the stock.
II. Long Term research stock assessments needs 5 years.	o Evaluate otolith chemistry as an approach to define Gag population structure.
II. Long Term research stock assessments needs 5 years.	o Compare genetics of spawning Gag captured by commercial fishermen to juveniles collected in different areas in subsequent months to determine the source of recruits. Consider expanding research to include samples from Mexico to explore gene flow and connectivity.

Possible gag Close-kin mark recapture, success depends on sample availability

A number of delays/non-starts due to MPA research limitations (some call for invasive techniques that are not preferred in MPAs)

III. Short Term Spawning Special Management Zones 5 years.	o Design a multi-year study to collect age and gonad samples at spawning sites during the spawning season. This should entail identifying the diurnal usage patterns at spawning sites during the year.
III. Short Term Spawning Special Management Zones 5 years.	• Document spawning within Spawning SMZs by priority species in the Snapper Grouper complex.
IV. Short Term MPA monitoring 5 years.	• Characterize spawning by managed species within the MPAs.
IV. Short Term MPA monitoring 5 years.	• Evaluate the sampling program of the SAFMC MPAs. The evaluation should review data on compliance, species abundance and diversity, and determine if current sampling targets are sufficient.
IV. Short Term MPA monitoring 5 years.	• Develop methods for incorporating the impacts of MPA on management actions and stock status.
V. Long Term other Needs 5 years.	• Investigate juvenile habitat and abundance of shallow water groupers (such as Gag and Red Grouper), to evaluate the effectiveness of current regulations in protecting these species, by looking at changes in abundance and frequency of occurrence.

South Atlantic MARFIN (2021 projects)

- Investigating chevron trap selectivity; a collaborative effort to compare trap, underwater stereo camera, and hook and lines gears in the SE US waters SCDNR
- Development of a Juvenile Survey and Recruitment Indices in the U.S. South Atlantic SCDNR
- Genetic Stock Structure of Mutton Snapper, University of Southern Mississippi

Cooperative Research Program funded projects (2021 projects)

- Early growth and maturity data collection for blueline tilefish along the U.S. Atlantic. Virginia Tech
- Using a citizen-science approach to characterize shark depredation in the recreational fisheries of the southeast United States. Florida Atlantic University

South Atlantic State research projects

- Staff from all states have been involved in data collection or stock assessments for federally managed species.
  - Collecting fishery dependent data on commercial, recreational, and for-hire trips
  - Sending observers on charter and for-hire vessels
  - Collecting length, age, reproduction, diet, and genetic samples from fishery dependent and fishery independent samples
  - Monitoring Red Snapper mini-season
  - Improving estimates of recreational catch through FWC's new State Reef Fish Survey and validating results through video monitoring
  - Validating and updating conversion factors for gutted and whole fish

- Research and Monitoring Plan
  - Addressing 71% of the Research and Monitoring Plan main bullets.
  - Developing surveys to monitor deep-water species such as Blueline Tilefish, Snowy Grouper, and Tilefish; on-going trap and video survey (SERFS), new hook and line surveys focused on Red Snapper, and dive survey in Florida Keys.
  - Assisting in both Red Snapper and Greater Amberjack abundance estimates
  - Maintaining receiver arrays for acoustic telemetry studies
    - monitoring species movements and spawning habits

VII. Specific Monitoring Priorities (progress)

"Increase funding for fisheries independent monitoring in the South Atlantic." [*note that SEFSC does not necessarily make funding allocations*]

- Great South Atlantic Red Snapper Count - ongoing
- Great Amberjack count - ongoing

"Develop monitoring programs for Dolphin"

- Dolphin MSE (see additional presentation, later in the program)

"Maintain/improve the ability to document commercial and recreational landings and discards."

- Doubling of commercial observer coverage

Additional research

Expanding fishing opportunities for the South Atlantic Snapper Grouper Fishery by minimizing discards (Scott Crosson SSC and SEFSC): Compute improved discard estimates for the reef fish fishery in the U.S. South Atlantic, then model the economic and biological effects of a limited number of different regulatory regimes that would minimize those discards while potentially increasing retained catch. (SEFSC funded)

Conclusions

Since 2019 of 77 research priorities 71% (up from 68% in June 2021) are completed or in progress

MARFIN, S-K, CRP and CRCP has funded several of these projects, the remainder comes from NOAA-fisheries base funding or state partner contributions

We look forward to working to further align research with NOAA and SEFSC strategic priorities

Research highlights (additional material, not presented, if requested we can schedule additional presentations)

Research Highlights (red snapper)

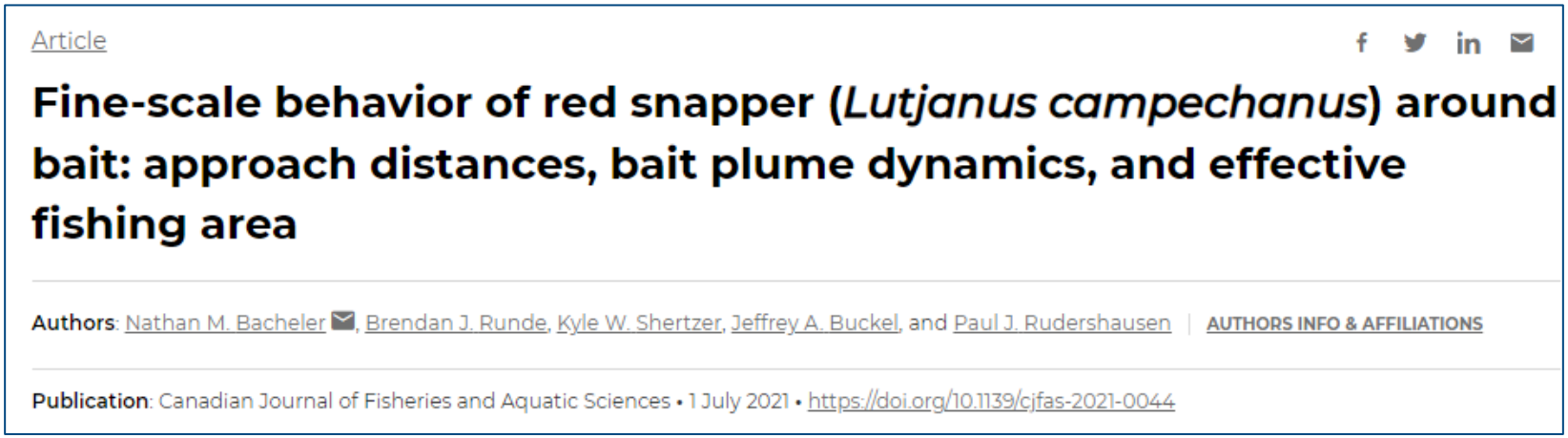
Marine and Coastal Fisheries
Dynamics, Management, and Ecosystem Science

Article | Open Access

Discard Mortality of Red Snapper Released with Descender Devices in the U.S. South Atlantic

Brendan J. Runde, Nathan M. Bacheler, Kyle W. Shertzer, Paul J. Rudershausen, Beverly Sauls, Jeffrey A. Buckel

First published: 22 September 2021 | https://doi.org/10.1002/mcf2.10175 | Citations: 1



Article

Fine-scale behavior of red snapper (*Lutjanus campechanus*) around bait: approach distances, bait plume dynamics, and effective fishing area

Authors: Nathan M. Bacheler, Brendan J. Runde, Kyle W. Shertzer, Jeffrey A. Buckel, and Paul J. Rudershausen | AUTHORS INFO & AFFILIATIONS

Publication: Canadian Journal of Fisheries and Aquatic Sciences • 1 July 2021 • https://doi.org/10.1139/cjfas-2021-0044

NOAA FISHERIES

Research Highlights (Snapper Grouper complex)

Reef fish community structure along the southeastern US Atlantic continental shelf break and upper slope appears resistant to increasing lionfish (*Pterois volitans / miles*) density

Download Article:
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Authors: Bacheler, Nathan M [1]; Schobernd, Christina M [1]; Harter, Stacey L [2]; David, Andrew W [2]; Sedberry, George R [3]; Kellison, G. Todd [1];
Source: Bulletin of Marine Science, Volume 98, Number 1, January 2022, pp. 75-98(24)
Publisher: University of Miami - Rosenstiel School of Marine and Atmospheric Science
DOI: https://doi.org/10.5343/bms.2021.0008

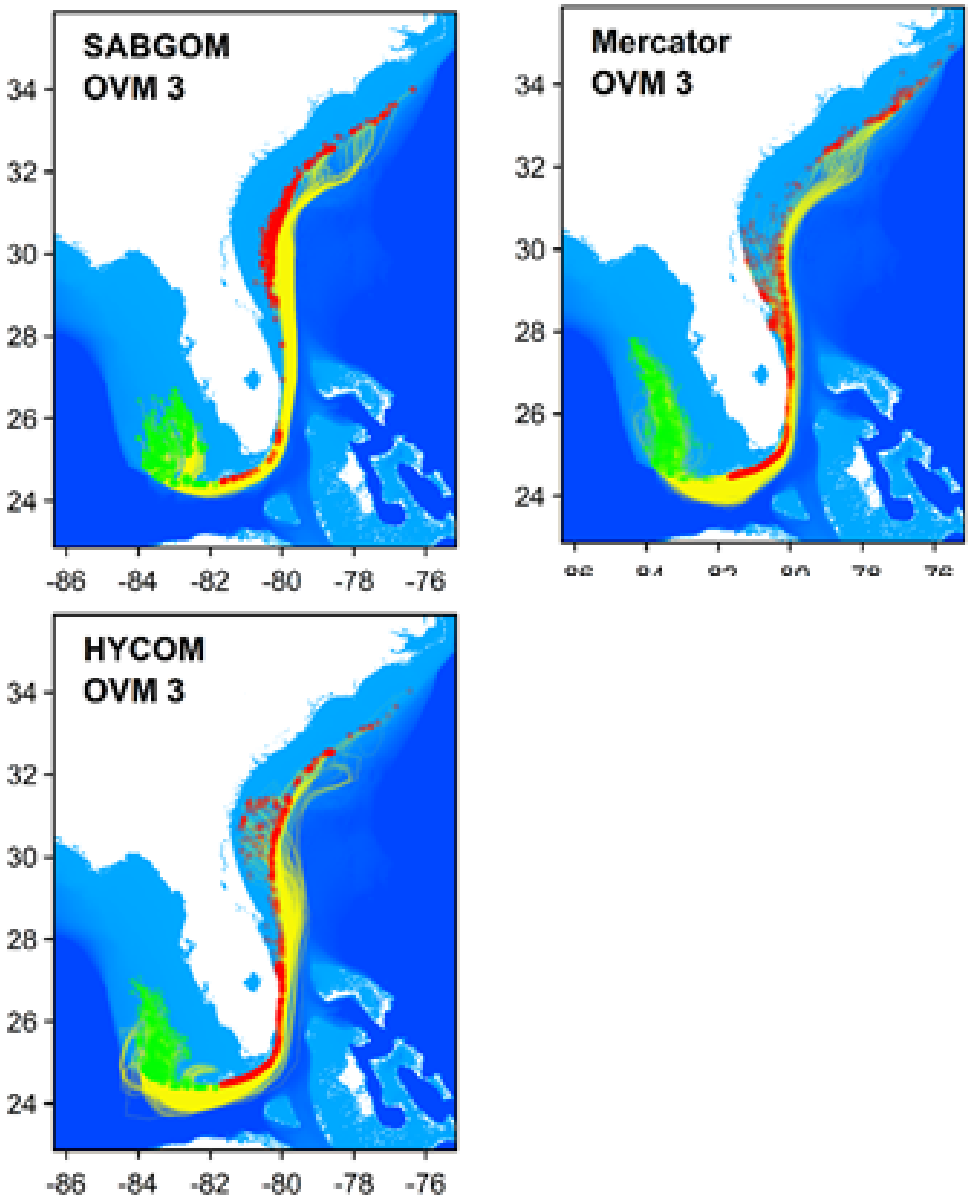
ELSEVIER

Fisheries Research
Volume 249, May 2022, 106238

Using stationary video data to infer relative abundance and distribution of four *Seriola* species along the southeast United States Atlantic coast

Nathan M. Bacheler [a], Kevan C. Gregalis [a], Zachary D. Gillum [a, b], Erin P. Pickett [a, b], Christina M. Schobernd [a], Zebulon H. Schobernd [a], Bradford Z. Teer [a, b]

Connectivity modeling



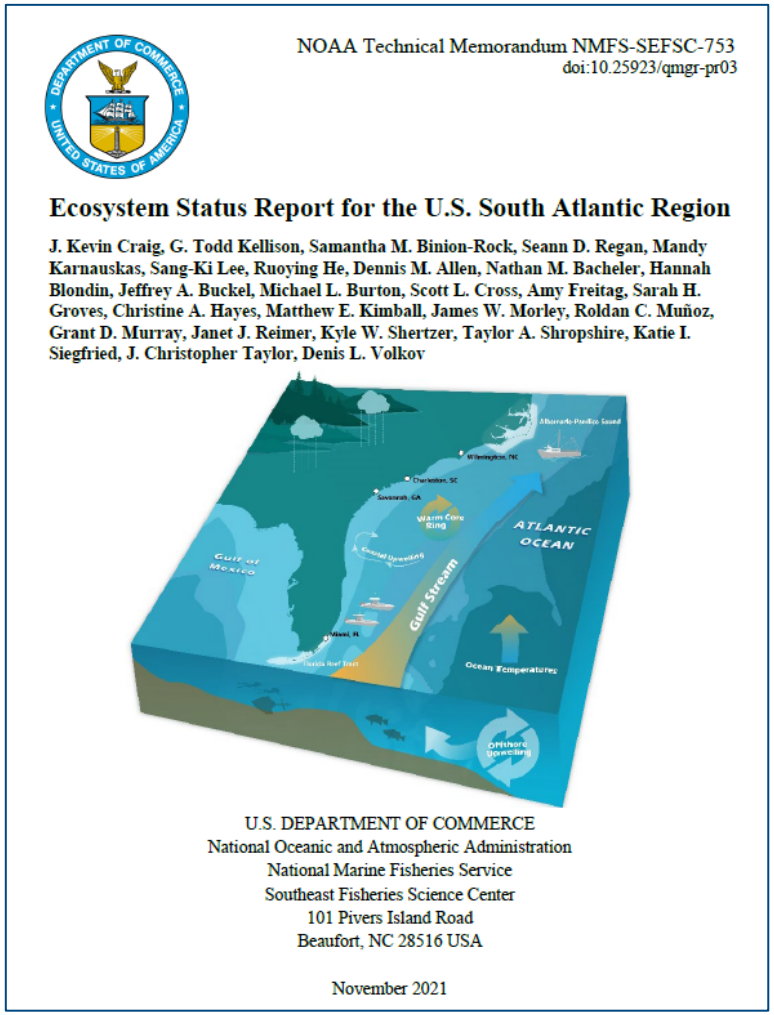
Source-sink recruitment of red snapper in the U.S.: Connectivity between the Gulf of Mexico and Atlantic Ocean

Oceanographic modeling indicates connectivity between Gulf and south Atlantic.

Trajectories of larvae spawned in the Gulf that successfully recruited to the Atlantic, for different assumptions regarding oceanographic forcing. Spawning locations are represented by green points and settlement locations are represented by red points. Points are transparent such that darker colors represent greater numbers of larvae spawning or settling in those areas.

Karnauskas, Shertzer, Kellison, Farmer, He, Lowerre-Barbieri, Paris, Switzer, Vaz (in review). *Fisheries Oceanography*

Environmentally-linked changes in recruitment?



NOAA Technical Memorandum NMFS-SEFSC-753
doi:10.25923/qmgr-pr03

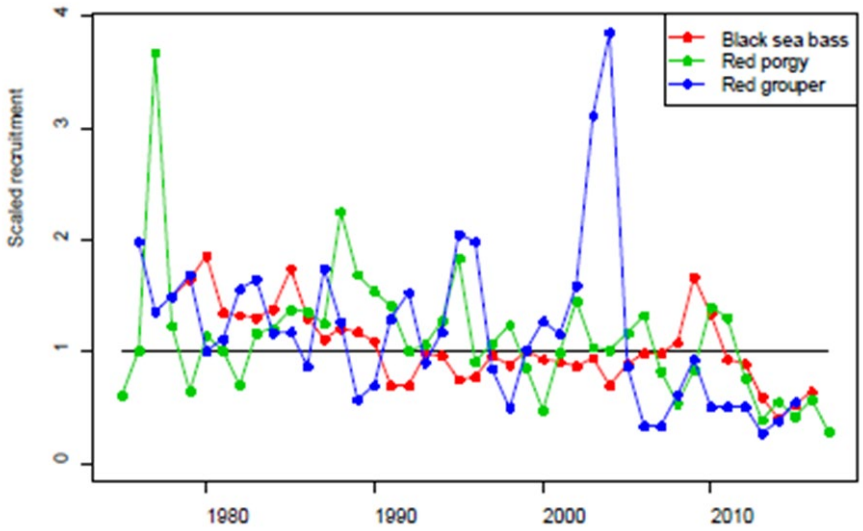
Ecosystem Status Report for the U.S. South Atlantic Region

J. Kevin Craig, G. Todd Kellison, Samantha M. Binion-Rock, Seann D. Regan, Mandy Karnauskas, Sang-Ki Lee, Ruoying He, Dennis M. Allen, Nathan M. Bacheler, Hannah Blondin, Jeffrey A. Buckel, Michael L. Burton, Scott L. Cross, Amy Freitag, Sarah H. Groves, Christine A. Hayes, Matthew E. Kimball, James W. Morley, Roldan C. Muñoz, Grant D. Murray, Janet J. Reimer, Kyle W. Shertzer, Taylor A. Shropshire, Katie I. Siegfried, J. Christopher Taylor, Denis L. Volkov

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Science Center
101 Pivers Island Road
Beaufort, NC 28516 USA

November 2021

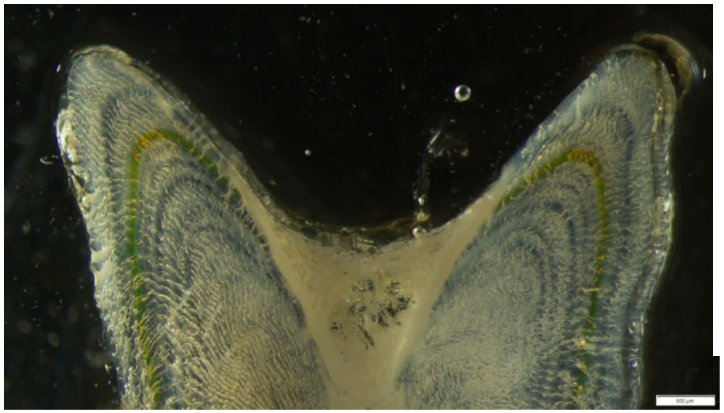
- First Ecosystem Status Report (ESR) completed for the U.S. South Atlantic Region
- Mult-investigator, multi-institution effort (26 authors)



- Recruitment trends from recent South Atlantic assessments
- "Recruitment trends in the South Atlantic: Mechanistic Drivers and Management Implications" (project underway)

  (SEFSC and SCDNR: Shertzer, Bacheler, Craig, Kellison, Klibansky, Bubley, Williams)

Age validation of Gray Triggerfish



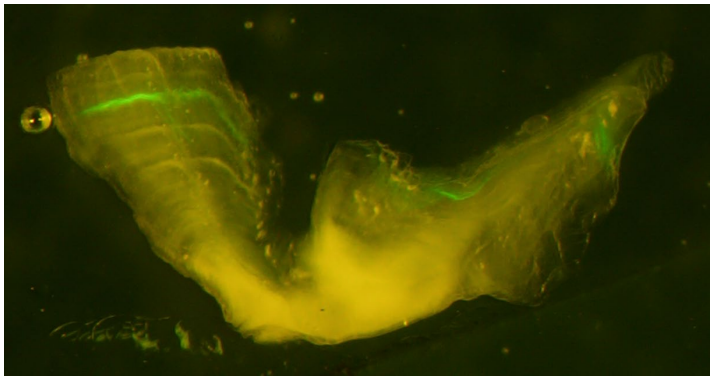


Figure 2. The expected number of growth zones (or annuli) were present on all otoliths (n = 37)

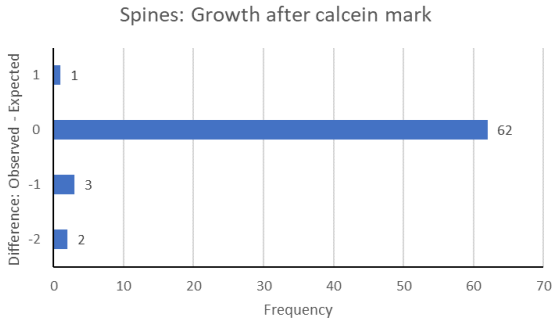


Figure 1. The expected number of growth zones (or annuli) were present on 62 of 68 marked spines.

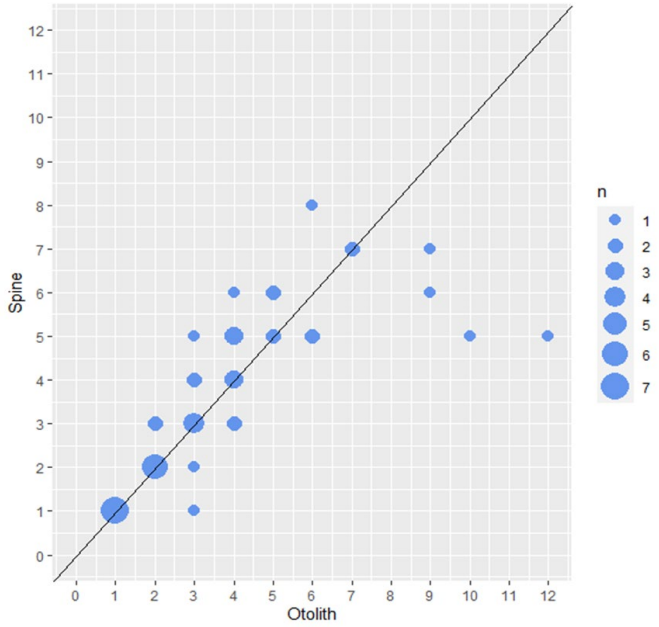


Figure 3. Spine and otolith ages were consistent up to age 6 or 7. Similar to preliminary results found for GTF in GOM (Will Patterson, pers. comm.)