

## DRAFT REQUEST FOR PROPOSALS NOT COUNCIL APPROVED

### Conduct an Age Validation Study on Gulf of Mexico Gray Triggerfish

**Proposal Submission Deadline:** TBD

**Term of Contract:** 24 months

**Minimum and Maximum Funding Available for Work:** \$250,000 – TBD by Council

The Gulf of Mexico Fishery Management Council (Council) seeks a highly-qualified contractor to organize and conduct an age validation study on Gulf of Mexico (Gulf) gray triggerfish, *Balistes capriscus*. The contractor is tasked with evaluating and proposing new techniques (e.g., bomb radiocarbon validation, mark-recapture, etc.) to complete sex-specific age validation of hard parts (i.e., spines, otoliths, and vertebrae) for gray triggerfish in the Gulf. If practicable, the project should utilize landed fish that have been sampled for hard parts and sex from previously collected gray triggerfish from across the Gulf. These samples may be housed at state and federal marine laboratories. If evaluating existing samples is not practicable due to the proposed work needed, the methodology for the collection of an adequate sample size (n=20+) of fish by age (0-14 years) and sex should be detailed and justified in the proposal. The selected contractor will work with Council and Southeast Fisheries Science Center (SEFSC) staff throughout the project. Milestones for progress and deliverables will be established.

**Background:** During its January 2021 meeting, the Council identified unspent Council funds in 2020. These unspent funds were primarily due to limited travel during the COVID-19 pandemic. The Council is considering funding a research study, such as age validation of gray triggerfish, that could be completed, available, and contributory to the scheduled SEDAR Research Track assessment of Gulf gray triggerfish to begin in 2023. The last assessment for Gulf gray triggerfish (SEDAR 62) was terminated because of irreconcilable data issues, with aging of gray triggerfish being a top concern.

Gray triggerfish have historically been aged by counting translucent zones on the first dorsal spines instead of using otoliths; gray triggerfish otoliths tend to be small, fragile, and difficult to extract. Allman et al. (2016) conducted an age validation study of gray triggerfish that revealed two peaks in translucent zone formation, which was interpreted as a doublet pattern (two closely spaced translucent zones) representing a single year in the life. However, during the Data/Assessment workshop deliberations for SEDAR 62, it was noted that a study applying bomb radiocarbon validation to compare spines and otolith ages routinely resulted in lower age estimates from spines versus otoliths. Whereas, the comparison of vertebra versus otolith-derived ages indicated a close agreement (Patterson et al. 2019: SEDAR62-WP-17).

Shervette et al. 2021, conducted a study on gray triggerfish in Ghana and U.S. South Atlantic that compared aging of spines and otoliths. Authors also determined an easier methodology for removing the otoliths from gray triggerfish. Otoliths were submerged in water and read against a black background with magnified stereoscope, and then each opaque zone was counted. Spines were also read and fish were aged by counting the number of translucent zones on the spine section. Two independent readers with aging experience of 8 years<sup>+</sup>, read the otoliths and spines. This study found age estimates for spines ranged from 1 to 8 years and for otoliths 3 to 13 years. An age bias plot indicating a potential aging bias starting at age-3 between spines and otoliths of gray triggerfish. Therefore, the Council is interested in funding an age validation study for Gulf gray triggerfish to reconcile aging differences in hard parts.

### **References:**

Allman, R.J., C.L. Fioramonti, W.F. Patterson III, and A.E. Pacicco. 2016. Validation of annual growth zone formation in grey triggerfish (*Balistes capriscus*) dorsal spines, fin rays and vertebrae. Gulf of Mexico Science 1:68-76.

Allman, R.J., W.F. Patterson III, C.L. Fioramonti, and A.E. Pacicco. 2017. Factors affecting estimates of size at age and growth in grey triggerfish *Balistes capriscus* from the northern Gulf of Mexico. Journal of Fish Biology: 1-13.

Patterson, W.F. III, V.R. Shervette, and B. K. Barnett, and R. J. Allman. 2019. Do sagittal otoliths provide more reliable age estimates than dorsal spines for gray triggerfish? SEDAR62 WP-17. SEDAR, North Charleston, SC. 37pp.

Shervette, V.R., J.M. Rivera Hernandez, and F.K.E. Nunoo. 2021. Age and growth of grey triggerfish *Balistes capriscus* from trans-Atlantic populations. Journal Fish Biology. 1-17.

<https://uni.hi.is/scampana/otoliths/scientists/age-validation-methods/>

## **Application Process:**

**Contractor Qualifications:** The successful applicant or applicant team will have demonstrable experience in marine ecology.

### **How to Apply:**

*Executive Summary:* A summary of the work proposed, including a brief summary of the applicant's qualifications.

*Proposed Plan of Work:* A proposal outlining work recommended, including aging methodology and rationale. The anticipated sample size by age and sex of fish for the geographic range of Gulf gray triggerfish should be included.

*Qualifications of Applicant:* A summary of the qualifications of the applicant and other team members, if applicable. A curriculum vitae should be included for each individual who is expected to work on the project.

*Proposed Budget:* A detailed budget, including the basis for the charges (e.g., hourly rates, fixed fees, overhead costs).

*Applicant References:* Names, titles, full addresses, email addresses, and phone numbers for three clients for whom the applicant has provided similar services to those requested or are familiar with the applicant's work and the quality of the applicant's work products.

**Proposal Evaluation Criteria and Next Steps:** Proposals will be evaluated based on methodology and scope outlined in the proposed work plan. Ability to deliver, in a timely manner, a quality work product as determined by qualifications including prior experience, references, and budget. The Council may request additional information as deemed necessary or negotiate modifications prior to providing support for a proposal. Once a proposal is selected for funding, a formal contract will be provided to the applicants.