



Request for Proposals: Red Snapper (*Lutjanus campechanus*) Abundance Estimate in the U.S. Gulf of Mexico Region



Funding Opportunity Title: Red Snapper (*Lutjanus campechanus*) Absolute Abundance Estimate in the U.S. Gulf of Mexico Region

Announcement Type: Notice of request for proposals (RFP)

Release Date: March 14, 2017

Funding Source: The National Oceanic and Atmospheric Administration's (NOAA) National Sea Grant College Program and NOAA National Marine Fisheries Service (NMFS)

Funding Type: Funding will be provided to successful applicant(s) through a contract with the Mississippi-Alabama Sea Grant Consortium's (MASGC) fiscal host at the University of Southern Mississippi's Office of Sponsored Programs Administration.

Funding Opportunity Summary: This notice advises the public of a funding opportunity to develop an independent abundance estimate of Age-2 and older red snapper in the U.S. waters in the Gulf of Mexico. The successful applicant will determine the absolute abundance of the red snapper population by habitat type including artificial reefs, natural reefs and unclassified habitats. The design must include mark-recapture tagging and advanced technology methods.

The award period will be from October 1, 2017, through September 30, 2019. The grant program is managed MASGC for the National Sea Grant College Program and the NMFS.

Eligibility: MASGC welcomes proposals from institutions of higher education. The proposal principal investigator (PI) must be located within a U.S. Gulf of Mexico state. Co-investigators, including state agencies, non-governmental organizations and the fishing industry, may be in any U.S. region. Federal partners may also participate as uncompensated collaborators. No person shall be excluded on grounds of race, color, age, sex, national origin or disability from participation in, denied benefits of, or be subjected to discrimination under any program or activity receiving financial assistance from MASGC.

Funding Levels: MASGC anticipates funding one consortium proposal at level of \$9.5 million plus a non-federal match requirement of \$2.5 million.

Reporting: Semi-annual progress reports will be required.

Deadlines: A Letter of Intent (LOI) is required to submit a full proposal and is due by 5 p.m. Central Time on Friday, April 7, 2017. Full proposals are due by 5 p.m. Central Time on Friday, June 9, 2017. Submissions after either deadline will not be reviewed or considered for funding.

Funding Priority

Program Objective: Provide an independent absolute abundance estimate of Age-2 and older red snapper in the U.S. waters in the Gulf of Mexico by habitat type including artificial reefs, natural reefs and unclassified habitats.

MASGC invites proposal submissions to estimate the abundance of red snapper in the U.S. waters in the Gulf of Mexico using the design criteria described in this funding request. The red snapper is economically important to sportfishers and the commercial fishing industry throughout the Gulf of Mexico. Historical overharvesting resulted in a depleted population, but under current management measures the population is recovering, with full recovery expected by 2032. The current stock assessment for red snapper may undersample fish in certain habitat types, particularly on artificial reefs and other structures where sampling is difficult. Given this, there is a need to obtain an independent estimate of red snapper abundance in the U.S. waters in the Gulf of Mexico.

Design Guidelines

Guidance for this funding request was obtained through a previous research competition in which experimental designs were developed. The results of six proposed designs and input from stock assessment experts were critical in identifying appropriate methods for conducting a Gulf-wide absolute abundance estimate using mark-recapture tagging and advanced technology methods by habitat type (including artificial reefs and other structures) to provide an estimate of the red snapper population.

General guidance includes:

1. **Projects can be up to 2 years:** no more than 6 months to prepare and the remaining time (no less than 18 months) to implement and complete data analysis.
2. Investigators should **include a power analysis in their proposal showing the expected coefficient of variation (CV) of the abundance estimates** from their sampling plan (a **CV < 0.3** is desired, but may be difficult to achieve).
3. Relative abundance estimates must be converted to an estimate of absolute abundance.

Other guidelines were developed for Geographic Areas and Sampling Depths, Habitat Types, Working with the Fishing Industries and Sampling Methods. Applicants must follow these guidelines:

Geographic Areas and Sampling Depths

1. Proposals should utilize at least two geographic areas. The study area must be divided into Eastern and Western Gulf sub-regions with the division near the Mississippi River to align with the current NOAA stock assessment. At least two additional strata per sub-region should be considered for the purposes of looking at spatial differences in age structure, movement and mortality. A rationale should be provided for the proposed boundaries including consideration of the ability to detect differences between strata.

2. The eastern boundary of the study is the Dry Tortugas and the western boundary is the Texas-Mexico border.
3. Sampling should be distributed sufficiently across a depth range of 10-150 meters to provide age-structured abundance estimates for Age-2 and older red snapper in that depth range.

Habitat Types

4. Habitat suitability maps (HSMs) are not sufficiently comprehensive to represent all red snapper habitat in the Gulf of Mexico. However, HSMs may be appropriate to inform targeted sampling.
5. At a minimum, there should be known artificial reefs, known natural reefs and unknown/uncharacterized bottom habitat classifications. Depth or other stratifications within each of these may improve statistical performance of the chosen sampling methods.
 - a. Known artificial reefs. There are thousands of known and mapped artificial reefs where red snapper are found.
 - b. Known natural reefs. Natural hard bottom features are widely distributed throughout the Gulf of Mexico.
 - c. Unknown/uncharacterized bottom. This stratum should include all habitats that fall outside the domains of known artificial and natural reefs. It is recognized that the bottom in many of these areas is made up of unconsolidated sediments of various types and hold low densities of red snapper. However, these areas are vast in extent and may include a significant number of red snapper. Uncharacterized bottom will also contain uncharted artificial reefs and natural reefs.
6. Include a description of the process for identifying habitat types to be randomly sampled.
7. Seek out high-resolution habitat maps to leverage the funds available for this program. A component of the proposal can include the synthesis of habitat maps from various sources. Include the sources of the locations of known natural and artificial reefs.
8. Proposals must use power analysis/simulations to determine the percent of each habitat category necessary to sample and the expected precision (CV) of the overall estimate for the eastern and western Gulf, separately.

Working with the Fishing Industries

9. Investigators should work directly with the commercial and recreational fishing industries. Engagement with fishermen should be included from the start of program and be a key component of your proposal. It is possible to hire commercial fishermen to assist with catching and tagging fish, as well as keep and sell fish using Individual Fishing Quotas (IFQ) that would otherwise die from discard mortality or that are kept for biological sampling purposes. This could offset some boat charter costs.
10. Proposals will include an outreach strategy to ensure the fishing community, resource managers and other stakeholders are regularly updated on the status of the project.

Sampling Methods

11. It is not expected that a single sampling method is capable of providing one absolute abundance measurement in each habitat type. The sampling methods considered most likely to succeed are:
 - a. Depletion method coupled with mark-recapture for artificial and small natural reefs that have high densities of red snapper. A diverse and broadly distributed set of reefs of various types and sizes would need to be sampled to extrapolate to all known reefs.
 - b. A combination of acoustics and visual advanced technology surveys could be used on larger reefs. If all known large reefs cannot be sampled, the sampled reefs need to be representative and well-distributed. Acoustics could provide total fish counts while visual surveys could provide species composition for larger natural reefs.
 - c. Because of the geographic size of the unknown bottom category, this habitat type will need a sampling strategy different than the methods used for known artificial and natural reefs. Sampling tools such as acoustics and towed cameras appear most promising to sample this stratum across the entire Gulf. Known reefs in this category should not be sampled, but randomly sampled unknown reefs should be sampled.
12. For all methods, investigators will need to provide detailed steps for calibration and how to avoid sampling biases.
13. A simulation analysis or power analysis must be conducted and results included in the proposal to understand the sensitivity of the estimates to some of the more obvious sources of bias associated with a mixed survey spatial allocation design. Investigators must clearly lay out all of the assumptions of their methods.
14. Tagging and depletion methods
 - a. For known artificial reefs, an effective strategy for obtaining a total abundance estimate for a single reef or close cluster of reefs is a mark-recapture tagging method such as the Petersen mark-recapture coupled to a depletion method. Sampling assumptions for the selected mark-recapture method and depletion method must be addressed. Tag survey analysis will need to account for known sources of bias (e.g. tag-loss, release mortality, reporting rates) and this accounting should be based on measured rates for these factors. Where possible the fishing industry should be involved in tag recovery. A sample size to cost determination should be included.
 - b. For tagging and depletion methods, additional consideration should be given to:
 - i. Validation of acoustics (mortality and movement), visual, double tagging and catchability
 - ii. Archival tags and high-dollar tags need to be included.
 - iii. When sampling, collect tissue samples and archive for genetic work using future or existing funding sources outside this funding request.
 - iv. Collect otoliths to determine age structure. The added expense of collecting otoliths may require the use of a more imprecise estimate using length frequency data.

- v. Maintain spatial and temporal consistency.
15. Advanced technology methods
- a. Cameras on remotely operated vehicles (ROV) is an option on natural reefs larger than 90 meters.
 - b. Dual use of sonar and towed cameras is an option for sampling larger natural reefs.
 - c. ROVs is an option for sampling small artificial reefs.
 - d. Towed cameras is an option for unknown bottom. A rapidly towed video technology like the Camera-Based Assessment Survey System (C-BASS) should be considered for this habitat type, but other acoustic and optical platforms may be feasible. Data processing and analysis time would be substantial for all technologies relying on camera and video imagery and this needs to be accounted for in the budgets. Information on known automated image analysis software can be provided on request.
 - e. Camera deployment vehicles are known to repel or attract some species of fish, and to have a range of detection that is difficult to quantify depending on lighting and water clarity. To address these challenges a specific calibration experiment is necessary to demonstrate calibration of camera observations into measurements of red snapper per unit bottom area.

Phase II Timeline

- RFP released on March 14, 2017
- Letter of Intent due April 7, 2017
- Proposals due June 9, 2017
- Notification of funding decisions on September 1, 2017
- Project initiation on October 1, 2017
- Project end date on September 30, 2019

Contacts for Additional Information

For additional information, contact LaDon Swann (swanndl@auburn.edu or 251-648-5877). Contact Loretta Leist (loretta.leist@usm.edu) for submission guidance or Amanda Seymour (amanda.k.seymour@usm.edu) for budget questions.

Letter of Intent Instructions

A Letter of Intent (LOI) is required to be eligible to submit a full proposal to MASGC. The LOI should be submitted to MASGC to Loretta Leist, MASGC Research Coordinator at: Loretta.leist@usm.edu. The LOI should include the project title, names and work affiliation of investigators and a short description of the proposed approach. The LOI must be no more than 2 pages. There will be no formal review of LOIs. The LOI will help expedite the process for identifying full proposal reviewers and is due on **Friday, April 7, 2017, by 5 p.m. Central Time.**

Full Proposal Development Instructions

The full proposal must be submitted to MASGC through eSeaGrant: <http://eseagrant.masgc.org>. User instructions for eSeaGrant, proposal development instructions, required forms and other information can be obtained at: <http://masgc.org/red-snapper/RFP>. The proposal submission deadline is 5 p.m. Central Time on Friday, June 9, 2017. Applicants will receive a confirmation email after submitting a proposal. If you do not receive a confirmation email, please contact Loretta Leist (loretta.leist@usm.edu or 228-238-8835). Changes can be made to proposal until the closing date and time.

Required Proposal Elements

Each of the following sections and sub-sections are required proposal elements. **Omission of any element from I-XIII will result in the proposal being disqualified.** Instructions for each section and sub-section are available through eSeaGrant.

Proposals must include:

- I. 2017 Red Snapper Phase II- Project Summary Form 90-2
- II. Completed 2017 Red Snapper Phase II Cover Form
- III. Project Narrative: a full proposal narrative of **no more than 25 pages** (A-D) to fully describe the approach.
 - A. **Rationale:** Use the research literature and/or preliminary research to describe the problem or opportunity at hand. Document the magnitude of the situation and the relevance of the issue or problem in the Gulf of Mexico region. Describe how this work would add to the body of knowledge in the research area. The rationale section needs to address both the scientific rationale for the project and quantify from a practical standpoint why the issue is a high priority. Describe what makes this project innovative and why this topic is important. The goal of the proposal should flow logically from this discussion. **The overarching approach including the use of tagging and advanced technologies should be included under the rationale.**
 - B. **Scientific and Professional Merit:** Describe in **detail the overall project design** and include enough detail to demonstrate the technical qualities of the proposed approach so that the salient features can be quantitatively assessed by those who review the proposal. This section must include sub-sections for hypotheses; objectives; approach; and links to other projects.
 1. Hypotheses: Include all hypotheses related to the proposed work. These must be presented in bulleted format.
 2. Objectives: The objectives should be a numbered list and each objective should begin with the word "To" followed by a verb. Be specific and brief. Proposals that state objectives in a way that is specific, measurable, attainable, realistic and time-bound will fare best during the review process.

3. **Approach: Provide specific details for developing and implementing the sampling plan and a plan for data analysis.** Include proposed methods, approaches and techniques to meet the stated objectives. Proposals must describe major aspects of the project, such as controls, replication, sampling surveys, validation, assumptions and other information needed to adequately understand the proposed approach. The approach must describe the reliability and validity of the sampling method(s) for estimating absolute abundance. Include information about facilities, equipment, personnel, management and interactions with other institutions or other resources that are directly applicable to the proposed project.
 - C. **Expected Benefits:** Describe the overall impacts of the completed project and how results can be applied to improve governmental and other management decisions, improve technological or economic efficiency and/or benefits to community members, industry or others.
 - D. **End-users, partners and co-sponsors:** Successful application of the research results will depend on the inclusion of end-users, partners and, in some cases, co-sponsors. This section should identify approaches to involve the recreational and commercial fishing industries.
- IV. A 2-page description of how the overall project will be managed and coordinated.
- V. A 2-page description of how an additional \$10 million in funding, pending FY17 appropriations, would be used to improve the abundance estimate.
- VI. **Curriculum Vitae:** Two pages per investigator using National Science Foundation (NSF), National Institutes of Health (NIH), United States Department of Agriculture (USDA) or similar formats.
- VII. **Project Schedule:** A detailed timeline of major milestones of the proposed project.
- VIII. **Data Management Plan:** Proposals must include a data management plan to store, access and archive raw and processed data.
- IX. **Literature Cited (no page limit):** Use any standard format for peer reviewed publications
- X. **Current and Pending Support** for each investigator using NSF, NIH, USDA or similar formats.
- XI. **MASGC Budget Form 90-4:** A budget estimate to implement the proposed experimental design.
- XII. **MASGC Budget Justification:** A description of each item listed in the budget.
- XIII. **Letters of support** from end-users, participants and co-sponsors.
- XIV. (Optional) **List of people** who should not review the proposal.

Question-and-Answer Webinar

One webinar will be held to discuss this funding opportunity on March 31, 2017, from 1-2:30 p.m. Central Time. Please visit the MASGC red snapper funding webpage (<http://masgc.org/red-snapper/RFP>) for instructions on how to participate in the webinar. The webinar will be recorded and posted on the MASGC funding webpage after the webinar.

Evaluation of Proposals

Proposals are expected to be highly integrated and multidisciplinary projects that address the program objective identified in this request. Multi-state and multi-institutional projects involving the fishing industries are strongly encouraged.

Proposals will be evaluated using merit reviews from national fisheries experts, followed by a review by a Technical Review Panel (TRP). The TRP includes scientists from universities and fisheries agencies around the U.S. and federal employees who have the necessary technical expertise. The TRP will recommend placement of each proposal into one of three categories (“fundable,” “maybe fundable” and “not fundable”) based on their reviews and the merit reviews. The funding request will be closed in the event no proposals are identified as “fundable” by the TRP.

The top ranked “fundable” proposal(s) will be recommended for funding and will be funded as resources permit. The final funding decision will be made in consultation with the four Gulf of Mexico Sea Grant Programs and with concurrence from the NOAA National Sea Grant Office and NOAA NMFS.

Evaluation Criteria

All proposals will be evaluated by external reviewers and the TRP based on the following criteria:

1. **Rationale (10%)** – Evaluates how well the proposed project addresses this RFP.
2. **Scientific and Professional Merit (50%)** – This section will be evaluated to determine the degree to which approaches will meet the program objective of the funding request. This section will also assess whether there is a clearly stated testable hypothesis, whether there are clear objectives, if the approach is technically sound, if methods are appropriate and whether the research will advance the science of stock assessments. Proposed budgets will also be evaluated under this criterion.
3. **Expected Benefits (15%)** – Evaluates the overall impacts of the completed project and whether results can be applied to inform red snapper resource managers, the fishing industry and other stakeholders.

4. **End-users, Participants and Co-Sponsors (10%)** – Assesses the degree of engagement with the fishing industry or other stakeholders in the implementation of the proposed project.
5. **Investigator Qualifications (15%)** – The degree to which the applicant and identified collaborators possess the necessary education, training and/or experience to execute the proposed project. This assessment will be primarily based on the investigator(s) CV(s). This criterion will also assess the stage of career development and record of productivity with previous funding.

Post-Project Selection Requirements

Applicants selected for funding will be required to submit additional materials prior to project initiation. These include:

1. Applicant response to any significant review comments.
2. Consent Form – Intellectual Property.
3. Form CD-512 or CD-511 (Certification Regarding Lobbying).
4. Standard Form 424B (Assurances – Non-Construction Programs).
5. NOAA Data Sharing Plan.
6. Participate in one or more conference calls with program managers.
7. Additional materials may be requested as needed.

NOAA Data Sharing Plan

Environmental data and information collected and/or created under NOAA grants/cooperative agreements must be made visible, accessible and independently understandable to general users, free of charge or at minimal cost, in a timely manner except where limited by law, regulation, policy or security requirements. Applicants of selected project(s) will be required to submit an acceptable Data Sharing Plan before project initiation.

About the Sea Grant Programs in the Gulf of Mexico Region

The Sea Grant programs in the Gulf of Mexico region represent four of the 33 Sea Grant Programs around the United States. Sea Grant is a National Oceanic and Atmospheric Administration (NOAA) sponsored partnership with institutions of higher learning engaged in research, communications, education, extension service and legal advisory activities to enhance the value and sustainability of the nation's ocean and coastal resources for the benefit of the public.