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GULF COUNTY RESTORE ACT PROJECT PRE-PROPOSAL FORM

Project Name: **Gulf County Reef Biomass Estimation Project**

Submitting Entity: **Science Applications International Corporation**

I. Please select one or more eligible activity that the project is classified under:

- **X** *Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region.*
- **X** *Mitigation of damage to fish, wildlife and natural resources.*
- **X** *Implementation of a federally approved marine, coastal or comprehensive conservation management plan, including fisheries monitoring.*
- O *Workforce development and job creation.*
- O *Improvements to or on State parks located in coastal areas affected by the Deepwater Horizon oil spill.*
- O *Infrastructure projects benefitting the economy or ecological resources, including port infrastructure.*
- O *Coastal flood protection and related infrastructure.*
- O *Planning assistance.*
- O *Promotion of tourism and seafood in the Gulf Coast region.*

II. Please provide an executive summary of the project. Describe/quantify the economic (jobs, infrastructure, tourism, etc.) and environmental benefits (habitat, quality, knowledge, long-term sustainability, etc.).

Introduction

The project proposed in this document represents the type of science that must be performed to provide decision makers with the data required to sustain the productivity of the marine fishery off the Northwest Florida coast. The data provided by this effort will also determine whether artificial reefs can promote the growth of marine fisheries to support the growing demand for seafood and recreational opportunities in Gulf waters. Projects like the one proposed in this document can demonstrate to the public through advertisement, promotion and marketing, that the stewards of Gulf resources are willing to invest in programs necessary to produce a reliable means of quantifying the health of the ecosystem on which great demands are placed. Seafood industry resources offshore from Gulf County are finite. The ability to manage, grow and harvest the resource is worth promoting.

The hydroacoustic technology that is proposed in this document has been in existence for quite some time. However, over the last few years, advances in physical data collection and the computer software that process data have brought the application of the technology to a point

where it can be considered as a viable data gathering alternative. Multiple science centers under the National Marine Fisheries Service (NMFS) are already using this technology for a variety of applications. The Alaska Fisheries Science Center (AFSC) uses hydroacoustics to gather the data on distributional patterns, species abundance estimates, predator-prey relationships, and estimates of biomass for a variety of marine species including marine mammals and commercially important fish species (AFSC, 2013). The Northwest Fisheries Science Center conducts hydroacoustic surveys for collecting data used in developing stock assessments for the Pacific hake (NWFSC, 2010). Finally, the Northeast Fisheries Science Center Advanced Sampling Technologies Research Group applies hydroacoustic technology to provide fisheries-independent population estimates of commercially important pelagic fish stocks in the NW Atlantic Ocean (NEFC, 2013). However, costs to purchase and operate the hydroacoustic equipment and software used to analyze the data are relatively high and typically not within the reach of those who would benefit the most from the results of its application. Nevertheless, utilizing hydroacoustic technology in the Gulf of Mexico to assess the current status of our local fisheries will supply concrete evidence to decision makers, regulators, and other stakeholders that will provide the basis for developing environmentally sustainable solutions for the entire seafood industry. The immediate impact of the dataset generated from this project will be the establishment of a baseline for future analyses over many years to come.

The relationship between offshore reef users and fishing industry regulators is not always amicable. The primary issue between these two entities is centered around the restrictions on the harvesting of target species. Regulators are reliant on antiquated field survey methods and computer modeling to estimate the amount of fishery resources available and use those results to set the resource quantities that can be safely harvested without depleting the entire fish stock. These calculated resource quantities apply to both recreational and commercial fishing industries. Computer modeling requires assumptions to be made in the absence of empirical data. This proposal describes a project that will produce empirical data allowing regulators and the fishing industry to view and assess offshore resources in a new way. Ultimately, the data may affect the fundamental assumptions used in developing fish stock assessments which could provide the justification needed to modify fish harvest restrictions in the future.

Project Summary

This project would provide a baseline of fisheries data in support of Gulf tourism and seafood promotions. Researchers would employ split and/or multi-beam in concert with underwater video to rapidly assess known artificial and natural reefs. The project team would estimate fish biomass using hydroacoustic survey equipment to scan reef areas. Biomass would be estimated by statistical means through a sample of water area around artificial and natural reefs. Selected reefs Global positioning system (GPS) data will be collected in real-time to correlate to the areas surveyed. Post processed data would be imported into the software tool, Eonfusion®, for additional 4-D visualization (space and time) and analysis. Results of the data collection would be compiled into a final report.

Methods

The objective of the project is provide detailed scientific study of relative biomass and estimates of species on up to 100 publically known artificial and natural reefs. The project will provide meaningful results in terms of which artificial reefs produce more biomass and different species aggregates. Data collection methods would be scientifically acceptable with proven field methods and are appropriate for the specific monitoring objectives.

Hydroacoustic surveys using a split-beam echosounder would be conducted seasonally (winter, spring, summer, and fall) around artificial and natural reefs offshore of Gulf County, FL. (Figure 1). The survey areas will include up to 100 reefs encompassing a 100-meter radius around each site. Reefs to be surveyed would be strategically selected to include a variety of structures and configurations. An underwater video camera data would also be used to verify and supplement the hydroacoustic data collected at each reef.

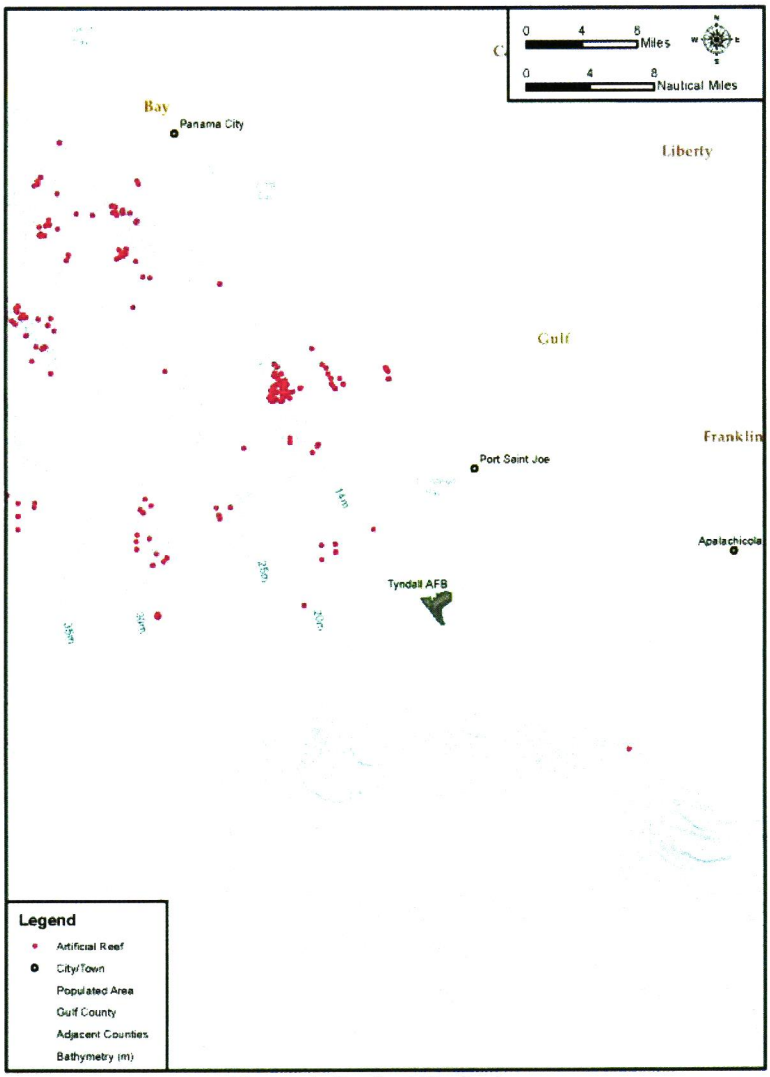

Figure 1. Project Study Area

Once the data is collected, SAIC's team of scientist would begin data analysis which would include characterization of reef habitat areas, identifying and confirming fish species captured during the surveys, calculating biomass at each reef site, and visualization of the data results.

III. Please provide a cost summary/budget. Detail any matching/cooperative funds available for use, and any cooperative support from governmental or other agencies.

A detailed budget is described below to accomplish the proposed work:

Table 1. Annual Budget - Year 1

Task	Title	$000s
Task 1: Survey, Data Collection and Reporting	Sub-task 1. Project Management	30
	Sub-task 2. Field Validation	10
	Sub-task 3. Data Collection ((labor for three marine scientists to complete 4 seasons of monitoring– Jan, April, July, Oct)	90
	Sub-task 4. Analysis and Reporting	90
	Boat rental costs	40
	Fuel	30
	Hydroacoustic Equipment Rental	40
	Miscellaneous (maintenance, repairs, safety)	20
	Echoview software consultant subcontract, software calibration, and QA/QC	20
TOTAL YEAR 1		**370**

IV. Please provide a timeline for project completion. Explain the technical and environmental feasibility (including any permitting considerations) of the project.

SAIC proposes to complete this project in three phases, each designated as specific tasks and described below with estimated time needed to complete upon funding/award of the project:

Task 1: Project Management Plan – Begin immediately after award. Complete 60 days after award.

- Documentation of multi-year plan, costs, contracting, safety plan.
    1.) Report ~ 50 pages
    2.) Figures and spatial GIS layers (in shapefiles) of proposed reef areas and surveying transects.
    3.) Presentation (in PowerPoint) including calculations for frequency, boat speed, and proposed data analysis methodologies.

Task 2: Field Validation: Survey and Data Gathering (Year 1) - Begin 60 days after award. Complete 360 days after award.

- Conduct surveys during all four seasons and gather data
    1.) Technical report of survey results ~100 pages
    2.) Data per reef in Excel or CSV format

3.) Figures and spatial GIS layers (in shapefiles)
4.) Presentation (in PowerPoint) of results

Task 3: Data analysis and reporting – Deliver 360 days after award

- Conduct detailed analysis of each reef system and associated data.
  1.) Technical report ~ 1000 pages (electronic)
  2.) Data per reef in Excel or CSV format
  3.) Biomass per reef in Excel or CSV format
  4.) Figures and spatial GIS layers (in shapefile)
  5.) Presentation (in Powerpoint) of results

Given that this technology and similar methodologies are being used to study fisheries on the Atlantic and Pacific coasts of the U.S., the technical and environmental feasibility to successfully complete this project is high. The operating frequencies of the equipment are outside the normal hearing ranges of marine mammals and pose no threat to disrupt behavioral patterns of protected marine species. There is also no potential for physical impacts to the marine environment while conducting these surveys. Therefore, no federal or state permits are required to conduct this project.

V. Please provide the qualifications of the Submitting Entity, the financial feasibility/sustainability and the economic feasibility and sustainability of the project (probability of success, etc.).

SAIC's marine scientists have decades of combined experience in both marine and terrestrial natural resources research and species management. The proximity of our Shalimar office to multiple marinas provides easy access to the Gulf of Mexico, Choctawhatchee Bay, Pensacola Bay, and Santa Rosa Sound. SAIC has an excellent reputation in working with the U. S. Fish and Wildlife Service (USFWS), the NMFS, the Department of Defense, and State and local agencies. The main component of our support includes writing technical reports and conducting scientific analyses to support environmental impact assessments for federal activities and providing environmental management recommendations as part of consultations with federal regulatory agencies such as NMFS and USFWS.

Even though hydroacoustic technology is relatively new to the Gulf of Mexico, SAIC's marine scientists have successfully utilized the equipment and associated software packages for a Pilot Project conducted during the summer of 2012 surveying reef areas offshore of Okaloosa County. Figures 2 and 3 show example outputs and associated video confirmations obtained during this study.

> ***"I was very encouraged to hear about the high quality work you're doing and that you hopefully will get to continue to do in a much bigger way."***
> **- Dr. Doug Devries**
> **National Marine Fisheries Service**

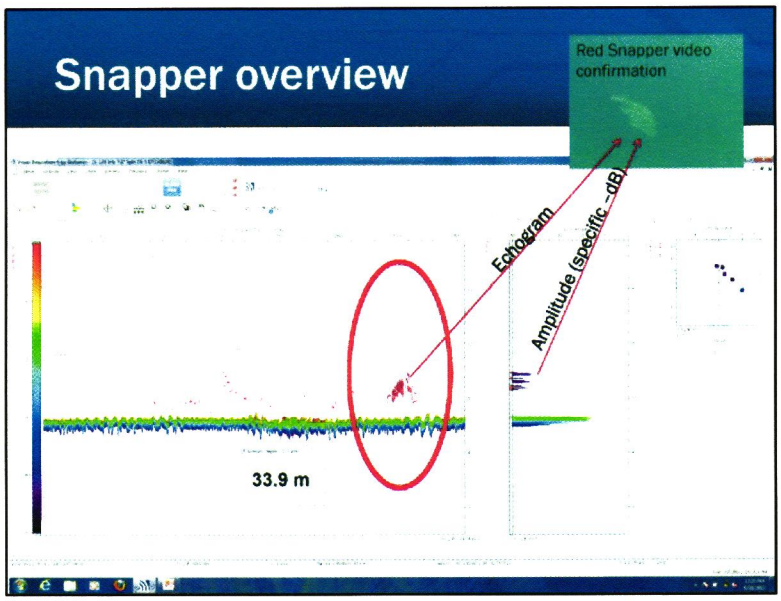

Figure 2. Echogram and Video Confirmation of Red Snapper Captured During 2012 Pilot Project

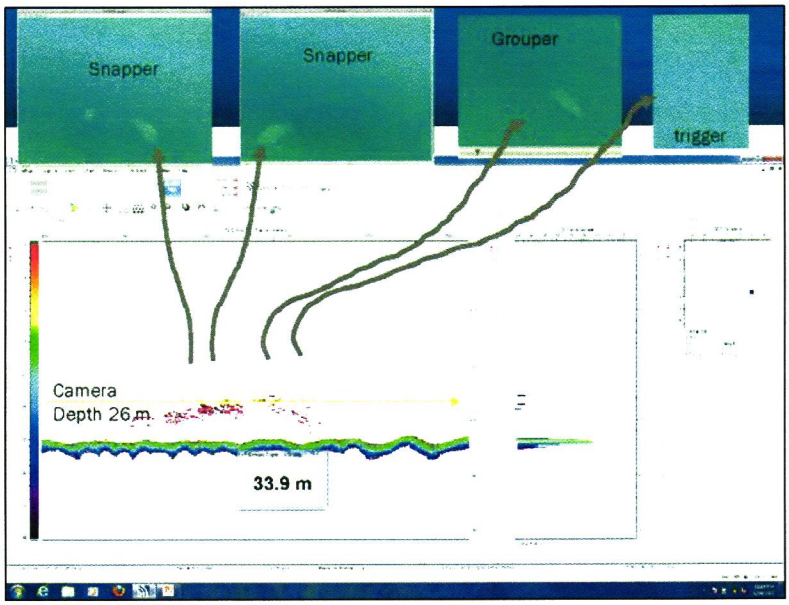

Figure 3. Echogram and Video Confirmation of Snapper, Grouper, and Triggerfish

When reviewing the literature and information already available on similar studies being conducted in other parts of the country, the scientific/financial/economic feasibility and sustainability of this project are high. As mentioned above, scientifically these methods are already being used and SAIC's methodology will remain consistent with those that have already been proven valid and successful. Financially, this project can easily be completed given the proposed budget. It can also be reduced in scope to monitor fewer reefs if deemed necessary by

the County. Economically, this project and its results will provide both short- and long-term benefits to the local economy. It will give an accurate assessment of the current status of the areas local fisheries and it will provide the baseline information needed to potentially adjust fish stock assessments which drive current recreational and commercial fishing restrictions for this area.

VI. Please provide the anticipated results of the project, and whether it is included in a City of Port St. Joe, City of Wewahitchka or Gulf County Comprehensive and Mitigation Plan?

The results of this project will provide information needed to further understand the socioeconomic benefits of seafood resources associated with artificial reefs through investigation of the existing artificial reef materials within the Gulf County nearshore waters (<20 miles) and comparing that to natural reef densities. This study will characterize each reef structure by design, dimension and material and provide photos, videos, and hydroacoustic data. Based on the biomass estimate per type, orientation, and age (or other attributes) of each reef, SAIC scientists will be able to equip decision makers with recommendations or information that could assist with future reef deployments and fisheries management. Additionally, information on fish populations on all reef structures within a given study area would allow for comparisons of the efficacy of different reef designs with regard to the biomass that they each support. As management decisions are often best made with an entire understanding of the problem at hand, the acoustic hydrography approach to natural and artificial reef assessment allows for the collection, compilation and understanding of enormous amounts of data over large geographical areas that otherwise could not be collected within a reasonable amount of time and cost.

The findings of this study will indirectly satisfy objectives outlined in the Comprehensive Plans for Gulf County (Chapter 6, Objective 1.4) and the City of Port St. Joe (Section II. B. Conservation, Objective 1.4) which call for them to conserve, protect, and appropriately use its natural resources including fisheries, wildlife, wildlife habitat, marine habitat, minerals, soils, and native vegetative communities. More importantly, this project will respond directly to the City of Port St. Joe's Resolution 2010-04 directed to the State Congress to delegate funding to the NMFS for new stock assessments to be conducted that would correct previous assessments that have been found to be "fatally flawed" by the National Research Council and have resulted in the shut-down of specific fisheries. Specifically, the City "requests support for the establishment of a near real-time data collection system, and the associated update of the Magnuson-Stevens Fishery Management Act so that faith and accountability can be restored it its scientific and management procedures." The hydroacoustic technology described in this proposal is a "real-time data collection system" and can be a powerful fisheries management tool that has the potential to mend the relationship between local fishermen, regulators, and the scientific community.

REFERENCES

Alaska Fisheries Science Center (AFSC), 2013. MESA: Hydroacoustic Surveys. Accessed online at http://www.afsc.noaa.gov/ABL/MESA/mesa_me_ff_hs.htm on 27 February 2013.

Northeast Fisheries Science Center (NEFSC), 2013. Advanced Sampling Technologies Research Group. Ecosystems Surveys Branch. Accessed online at http://www.nefsc.noaa.gov/femad/ecosurvey/acoustics/index.html on 27 February 2013.

Northwest Fisheries Science Center (NWFSC), 2010. The 2009 Integrated Acoustic and Trawl Survey of Pacific Hake (*Merluccius productus*) in U.S. Water off the Pacific Coast. National Marine Fisheries Service. U.S. Department of Commerce. NWFSC Cruise Report, Cruise No. MF2009-03. February 2010.

Submitted By:

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BOARD OF COUNTY COMMISSIONERS
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PUBLIC RECORDS POLICY AND PUBLIC ACCESS ACKNOWLEDGMENT FOR GULF COUNTY RESTORE ACT APPLICANTS

I, W. James McKee, the undersigned authority and/or representative of the entity, Science Applications International Corporation and or the individual who has submitted the Gulf County RESTORE Act Proposal/Pre-Proposal titled "Gulf County Reef Biomass Estimation Project" hereby acknowledge, consent and accept the following representations that coincide with my/our submission for consideration, evaluation and possible recommendation and approval by the Gulf County Board of County Commissioners for funding from the RESTORE Act distribution that strictly complies with the guidelines and regulations set forth under the Restoration and Ecosystems Sustainability, Tourist Opportunities and Revived Economies of the Gulf Coast States Act of 2012:

1. I/We am the authorized representative of the application/pre-proposal referenced above.
2. I/We have thoroughly reviewed and familiarized myself and/or my entity on which I have submitted the application/pre-proposal on behalf of with the entirety of the Gulf County Public Records policy.
3. I/We have thoroughly reviewed and familiarized myself and/or my entity on which I have submitted the application/pre-proposal on behalf of with the entirety of the Florida Statute Chapter 119 which controls and permits public access to information.
4. I/We hereby acknowledge, consent and agree to the controlling policies and statutes above as well as the free and open exchange of any and all submissions provided hereunder this application/pre-proposal and all information exchanged hereafter including but not limited to further amendments to these proposals as well as surveys, studies, research, data production, books, drawings, property records, work papers, county owner lists, files, forms, reports, accounts, documents, manuals, handbooks, instructions, printouts relating in any manner for the production of the application. In addition, all papers, notes, data, reference material, documentation, programs, printouts, and all other media and forms of expression that in any way include, incorporate or reflect any confidential information of what ultimately shall become the Gulf County plans for use and application of the RESTORE Act funding.
5. I/We acknowledge, agree and fully consent to cooperate with the appointed Gulf County RESTORE ACT committee, county officials and staff as a continuing obligation and condition of final review for this RESTORE Act application/pre-proposal.
6. I/We have submitted this acknowledgment to Gulf County RESTORE Act Committee and the Gulf County Board of County Commissioners for the purpose and intent of receiving an evaluation, review and possible recommendations for anticipated funding from the Restoration and Ecosystems Sustainability, Tourist Opportunities and Revived Economies of the Gulf Coast States Act of 2012.

Date: _3/5/203
Signature of RESTORE Act Applicant

___W. James McKee
Printed Name