

FORM CD-450 (REV 10/98)		[X] GRANT [] COOPERATIVE AGREEMENT	
U. S. DEPARTMENT OF COMMERCE		ACCOUNTING CODE	
FINANCIAL ASSISTANCE AWARD			
RECIPIENT NAME Gulf and South Atlantic Fisheries Foundation, Inc.		AWARD NUMBER NA08NMF4330406	
STREET ADDRESS 5401 W. Kennedy Blvd., Suite 740		FEDERAL SHARE OF COST \$ 289,659.00	
CITY, STATE, ZIP CODE Tampa FL 33609-2447		RECIPIENT SHARE OF COST \$ 0.00	
AWARD PERIOD 07/01/2008-06/30/2009		TOTAL ESTIMATED COST \$ 289,659.00	
AUTHORITY 15 U.S.C. 713 c-3(d)			
CFDA NO. AND PROJECT TITLE 11.433 Development and Assessment of Bycatch Reduction Devices within the Southeastern Shrimp Trawl Fishery			
This Award approved by the Grants Officer is issued in triplicate and constitute an obligation of Federal funding. By signing the three documents, the Recipient agrees to comply with the Award provisions checked below and attached. Upon acceptance by the Recipient, two signed Award documents shall be returned to the Grants Officer and the third document shall be retained by the Recipient. If not signed and returned without modification by the Recipient within 30 days of receipt, the Grants Officer may unilaterally terminate this Award.			
<p>[X] Department of Commerce Financial Assistance Standard Terms and Conditions</p> <p>[X] Special Award Conditions (Attachment B)</p> <p>[X] Line Item Budget (Attachment A)</p> <p>[X] 15 CFR Part 14, Uniform Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals, Other Non-Profit, and Commercial Organizations</p> <p>[] 15 CFR Part 24, Uniform Administrative Requirements for Grants and Agreements to State and Local Governments</p> <p>[] OMB Circular A-21, Cost Principles for Educational Institutions</p> <p>[] OMB Circular A-87, Cost Principles for State, Local, and Indian Tribal Governments</p> <p>[X] OMB Circular A-122, Cost Principles for Nonprofit Organizations</p> <p>[] 48 CFR Part 31, Contract Cost Principles and Procedures</p> <p>[X] OMB Circular A-133, Audits of States, Local Governments, and Non-Profit Organizations</p> <p>[X] Other(s) Department of Commerce Pre-Award Notification Requirements for Grants and Cooperative Agreements, 69 FR 78389 (December 30, 2004). FRN Vol. 73, No. 28, page 7696 dated 02/11/08; FRN Vol. 72 pages 36244-36274, dated 07/02/07</p>			
SIGNATURE OF DEPARTMENT OF COMMERCE GRANTS OFFICER Vivian Smith		TITLE Grants Officer	DATE 05/27/2008
TYPE NAME AND SIGNATURE OF AUTHORIZED RECIPIENT OFFICIAL Judy Jamison		TITLE	DATE 07/11/2008

Revised

MARFIN PROJECT SUMMARY

Project Title: Development and Assessment of Bycatch Reduction Devices within the Southeastern Shrimp Trawl Fishery

Project Status/Duration: July 1, 2008 – June 30, 2009 New Cont'd Project Period: 12 Months

Name, Address, and Telephone Number of Applicant:

Gulf & South Atlantic Fisheries Foundation, Inc.
Lincoln Center, Suite 740
5401 W. Kennedy Blvd.
Tampa, FL 33609-2447
(813) 286-8390

Principle Investigator(s) and Brief Statement of Qualifications:

Ms. Judy Jamison; Over 27 years administrative and grants management experience.
Dr. Michael Jepson; Over 20 years experience in social impact assessment and grants management.

Project Objectives:

(1) Solicit and test new and/or promising BRDs that show potential for reducing the quantity of bycatch incidentally harvested during shrimp trawling efforts; (2) Quantify the bycatch reduced by new and/or promising experimental BRDs within the EEZ of the Gulf of Mexico and South Atlantic; (3) Calculate reduction rates achieved for each BRD tested to include total shrimp, finfish, and total bycatch, and estimate red snapper fishing mortality (F); and (4) Increase the shrimp industry's participation in BRD research and development to enhance awareness and involvement in fisheries management.

Specific Priority(ies) in Solicitation to Which Project Reponds:

1. Bycatch, a. Shrimp Trawl Fisheries, (2) Identification, development, and evaluation of gear, non-gear, and tactical fishing options to reduce bycatch.

Summary of Work:

The object of this project is to field test 3 new or promising bycatch reduction devices (BRDs) for certification following the NMFS BRD Certification Testing Protocol for the Gulf of Mexico and South Atlantic. Devices will be field tested aboard commercial fishing vessels with onboard observers collecting data outlined within the Testing Protocols. Collected data will be analyzed to identify the reduction in fishing mortality achieved by BRDs. To increase industry's involvement in the process of BRD research and development, the Foundation will solicit industry designed BRDs, contribute funds for industry BRD development, and reimburse the travel of industry members to Panama City to observe underwater hydrodynamic performance tests of fishing gear.

Project Funding:	Federal	\$289,659
	<u>Non-Federal</u>	<u>\$ 0</u>
	Total	\$289,659

Revised

Project Statement

Project Title:

Development and Assessment of Bycatch Reduction Devices within the Southeastern Shrimp Trawl Fishery

Project Goals and Objectives:

- 1.) Solicit and test new and/or promising BRDs that show potential for reducing the quantity of bycatch incidentally harvested during shrimp trawling efforts;
- 2.) Quantify the bycatch reduced by new and/or promising experimental BRDs within the EEZ of the Gulf of Mexico and South Atlantic;
- 3.) Calculate reduction rates achieved for each BRD tested to include total shrimp, finfish, and total bycatch, and estimate red snapper fishing mortality (F); and
- 4.) Increase the shrimp industry's participation in BRD research and development to enhance fisheries management awareness and involvement.

Identification of Problem and Need for Government Assistance:

The otter trawl revolutionized the commercial fishing industry by allowing fishermen to increase their catch-per-unit-effort (CPUE). A significant disadvantage to this gear is that it is non-selective with respect to catch. While fishermen direct their efforts at harvesting targeted species, other marine species are harvested as bycatch. Finfish bycatch is a contentious issue facing commercial fisheries worldwide and is defined as the discarded catch of a living marine resource, plus the retained incidental catch and unobserved mortality of a marine resource due to a direct encounter with fishing gear (NOAA 1998).

Commercial shrimp fishermen of the southeastern United States have historically altered their fishing strategies and/or gear to reduce the harvest of non-target species. This has occurred through the use of increased mesh sizes to allow the escapement of small organisms and the integration of the "fisheye" and "cannonball shooter" (precursor to the TED) bycatch reduction devices (BRDs) into trawl net designs (Aparicio 1999). These gear designs were integrated into trawl nets prior to the implementation of national and regional bycatch regulations.

Although fishermen have voluntarily made efforts to reduce the quantity and composition of incidental harvest, bycatch mortality is thought to contribute largely to the overall fishing mortality of finfish species. Stock assessments for red snapper (*Lutjanus campechanus*), weakfish (*Cynoscion regalis*), and Spanish mackerel (*Scomberomorus maculatus*) stocks indicated that incidental harvest by southeastern U.S. shrimp trawlers was a factor affecting fish populations (e.g., overfished). This information led to the implementation of BRD regulations for shrimp trawls operating in the Gulf of Mexico and South Atlantic EEZ (Federal Register 1997, 1998, 2004).

Currently, five BRDs are certified for use in portions of the Gulf of Mexico and/or South Atlantic. These devices are the Gulf fisheye, fisheye, expanded mesh, extended funnel, and Jones-Davis. Most commercial shrimp fishermen have integrated the fisheye or Gulf fisheye into trawl nets due to the low cost and simplicity of these devices.

For a BRD to become certified, it must undergo certification tests outlined within regional NMFS Bycatch Reduction Device Testing Protocol Manuals (Manuals). These Manuals specify a reduction in fishing mortality (F) for certain target species (e.g., red snapper, F = 44%; weakfish, F = 50%, and Spanish mackerel, F = 50%) or an overall reduction in bycatch (measured in % weight). Target species were selected based on stock status (overfished), the extent to which the shrimp fishery impacted their populations, and the rebuilding strategies set forth for these species by the Regional Councils and NMFS.

Since the finalization of the Manuals, Spanish mackerel and weakfish populations within the South Atlantic are no longer overfished. With the reauthorization of the Magnuson-Stevens Act and the implementation of National Standard Number 9, bycatch, in all forms, must be minimized “to the extent practicable”. This has resulted in the South Atlantic Fisheries Management Council submitting an amendment to their Protocol to utilize a 30% finfish bycatch reduction as the sole criteria for BRD certification, in addition to transferring future responsibility for BRD certification to NMFS (Federal Register, 2005). Because BRDs currently certified for use within the federal EEZ are achieving the finfish reduction rates required by the South Atlantic Council and NMFS, there has been little work focused on certifying new gear within the South Atlantic.

Bycatch issues within the Gulf of Mexico are more complex due to the continued overfished status of the red snapper stock. The NMFS Pascagoula Laboratory, under the auspices of the 1998 Red Snapper Initiative, conducted reevaluation studies on currently certified BRDs within the Gulf of Mexico shrimp fishery. The conclusions derived from this study indicated that the red snapper reduction achieved by the Gulf fisheye was lower than the finfish reduction originally used to certify this device (Foster 2004). Further analysis on the configuration of fishing gear revealed that the codend retrieval system (elephant ear) can obstruct the BRD opening and negatively affect finfish escapement (Foster 2004). This information led to an amendment of the BRD regulations and disallowed the placement of the fisheye and Gulf fisheye BRDs in an area obstructed by the elephant ear (Federal Register 1999).

BRD reevaluation efforts continued after the conclusion of the 1998 Red Snapper Initiative. From 2001-2003, onboard observers were contracted by NMFS and the Foundation to collect CPUE data aboard commercial fishing vessels operating within the Gulf of Mexico. A total of 4,089 tows were conducted with the cooperation of 32 commercial fishing vessels. Of these tows, 2,202 tows met the criteria for certification analysis. These criteria included (1) all paired tows with a functional BRD in the experimental net and a disabled BRD (or no BRD) in the control net, and (2) all successful tows (i.e., problem free; z-tows) with at least one red snapper present in one net. It is important to note that these criteria are not explicitly listed within the Manuals and that this is an alternate analysis.

Results from the 2001-2003 studies indicated that the red snapper F-mortality reduction achieved by the Gulf Fisheye was drastically lower (F = 11.7%) than that of the 1998 study and the original data used to certify the device (Foster 2004). Also, performance of the Gulf Fisheye was highly variable among vessels, but under no circumstance was the 44% reduction in red snapper fishing mortality achieved (Foster 2004). Results also indicated that the Gulf Fisheye achieved a higher finfish reduction when placed closer to the tie rings or during net retrieval; a time in which shrimp loss can also be magnified. Due to the economic incentive of maintaining shrimp catch, it has been speculated that adaptations in fishing techniques used to increase shrimp retention (i.e., haul back speed, towing speed, codend funnels, etc.) are also reducing the effectiveness of the fisheye and Gulf Fisheye BRDs. Gallaway and Cole (1999) have also published results suggesting that the Gulf fisheye BRD does not produce mortality reductions necessary to rebuild the red snapper stock. The results of these studies are of great concern to commercial shrimp fishermen since decertification of the Gulf fisheye BRDs is likely, thus mandating the use of other, more expensive and complex devices currently certified. Furthermore, the recent Amendment 27/15 to the Reef fish and Shrimp management plans establishes a target reduction rate for juvenile red snapper mortality within the Gulf shrimp fishery of 74% from baseline years of 2001-2003.

Although a portion of this reduction is realized from reductions in effort from both hurricanes and global market forces, there will be a need for new viable bycatch reduction devices to meet target goals. To facilitate the certification of new gears, the Gulf of Mexico Fishery Management Council, like the South Atlantic Council, has submitted a regulatory amendment to revise BRD criterion to a 30% overall reduction of finfish bycatch into amended/ revised BRD Certification Protocols. While, these protocols are anticipated in the near future, they have not been finalized by NOAA/NMFS at this time.

Decertification of the Gulf Fisheye BRD would create confusion within the shrimp fishing community likely equal to that experienced during the development and regulation of TEDs. The successful completion of this project would likely result in the certification of new, operationally simple bycatch reduction devices within the southeastern U.S. shrimp trawl fisheries. Additionally, this project will address several national priorities set forth by the Magnuson-Stevens Act, priorities outlined within FY-2007 MARFIN solicitation (e.g. Section 1. Bycatch; a. Shrimp Trawl Fisheries; (2.) Identification, development, and evaluation of gear, non-gear, and tactical fishing options to reduce bycatch), and those outlined within the Cooperative Bycatch Plan for the Southeast. U.S. fisheries resources and marine ecosystems are a public commodity and, as such, are managed by the United States Government. The research outlined within this proposal has the potential of impacting the commercial fishing industry, state and federal fisheries management agencies, seafood consumers, recreational anglers and the public-at-large. Given the extent of the benefits gained from this project by interest groups, it is fair and reasonable to ask for federal assistance to conduct this study.

Project Impacts/Results or Benefits Expected:

The Gulf & South Atlantic Fisheries Foundation, Inc (Foundation) has been instrumental in BRD research and development (Branstetter 1997; GSAFFI 2002; GSAFFI 1995; Hoar *et al.* 1992; Jamir 2001; Jamir 1999; Medici 2004). Serving as the only regional research and development organization aimed at assisting the commercial fishing industries of the Gulf of Mexico and South Atlantic, the Foundation has developed a high level of credibility among the commercial shrimp fishing industry. By allowing the Foundation to continue their research and development efforts to reduce bycatch within the shrimp trawl fisheries, commercial fishermen will become actively involved in BRD research and development and will be more trustworthy of the data generated aboard their vessels and would be more accepting of those devices tested (e.g., fishermen will be more willing to utilize a device they helped certify). With greater industry “buy-in” achieved through the use of a device they help certify, the greater the impact in reducing bycatch within the fishery.

The expected benefits and impacts of this proposed research can be divided into at least two separate categories, (1) resource user impacts, and (2) biological impacts. When considering the current state of the shrimp trawl fishery, revenue is a concern. An influx of foreign, pond-raised imports has drastically reduced the price of shrimp since its zenith in 2000. Shrimp prices, in combination with increased management restrictions, the affects of hurricanes, and fuel prices, have drastically reduced effort within the fishery (commercial fishermen, Foundation Coordinator, and NOAA Fisheries/NMFS staff). This project has the ability to increase the gross revenue of an individual shrimp fishing business by increasing product quality and reducing the resources (fuel and labor) necessary to harvest the product.

Shrimp quality has been a concern since antidumping petitions were filed by the Southern Shrimp Alliance in recent years. Due to reduced labor, land, and environmental costs associated with the production of foreign, pond-raised product, the visual quality of the product being imported into the U.S. is superior to that of the domestic wild-harvest product. Although culinary presentation is a major factor affecting the price and demand for a seafood product, so is taste. One way in which pond-raised product cannot contend with domestic product is taste – domestic product is highly sought after by chefs and restaurateurs (Miget *et al.* 2004). An increased amount of bycatch associated with shrimp trawl fishing

has a negative impact on the quality of a shrimp and can result in uropod breakage (e.g., the shrimp being 'smashed' by the total catch within the trawl condens). Increased bycatch also extends product cull time. Shortening cull time would allow the crew to take preventative measures against spoilage, thus increasing shelf life of the product. An increased product quality associated with a decrease in bycatch, combined with the taste of domestic, wild-caught product, could generate greater revenue for shrimp fishermen.

Revenues could also be increased by decreasing the amount of fuel needed to harvest shrimp. During shrimp trawling operations, the codend accumulates a greater quantity of catch over time (both target and non-target species). Greater amounts of bycatch within the condens increases the size and weight of the trawl net, thus necessitating more power needed to drag the trawl nets, e.g., an increase in fuel consumption. By reducing the quantity of bycatch caught within the shrimp trawl, the size and weight of the codend is reduced and allows the vessel to trawl at lower RPMs. Decreased fuel consumption reduces the price associated with the harvest of the product thereby increasing revenues for the captain, crew, and small business.

Biological impacts associated with the reduction of bycatch are also beneficial. With the national programmatic goal of reducing finfish bycatch mortality, an increase in the number of certified BRDs will create a significant positive impact on faunal assemblages with cascading effects within both a top-down and bottom-up controlled ecosystem. These effects have been studied within primary literature and have direct and indirect impacts on population and foodweb dynamics (Goni 1998). Successful completion of this project will also add to the overall success of the national bycatch reduction program. The mortality reduction achieved by newly certified BRDs will allow Federal and State fishery management agencies to enhance finfish populations, especially those potentially impacted by shrimp trawl fishing.

Project results also have the potential of impacting global fisheries. Cooperative research conducted by the Foundation, the southeastern shrimp fisheries, and NMFS has lead to international efforts to reduce sea turtle mortality. As of August 31, 2004, turtle excluder devices are compulsory for all foreign, wild-harvest shrimp fishing fleets wanting to import shrimp into the US market. Non-compliance with this regulation can result in an embargo of the foreign-harvested product. Since bycatch is a contentious issue worldwide, the same import regulations could be imposed for the reduction of finfish bycatch. The continued efforts of Southeastern shrimp fishermen to refine and design BRDs will assist in the global problem of incidental bycatch and define the U.S. shrimp fleet as international innovators in fishing gear technology.

Current BRD programs are relatively strong on the technology component, but weak in the area of communication/technology transfer strategy. Development of the latter becomes easier as industry leaders and innovators get involved in the BRD certification process. The benefits that accrue as a result of the direct cooperation and contribution of numerous fishermen in this project are important as they give the members of the fishing industry the opportunity to take ownership of research that may lead to the development of certified BRDs or fishery management strategies. Industry involvement will also serve as a conduit to integrate other fishermen into the management process. Many commercial fishermen are unaware of how, when and where fisheries related research is conducted. This project will help acclimate fishermen to the management process and make the necessary connections (either through the Foundation, Councils, or NMFS) to stay active in the process.

Participation by Persons or Groups Other Than the Applicant:

A project of this magnitude requires the cooperation and active participation of many organizations and individuals with close management by those experienced in federal grants administration. The Foundation has chosen to contract with several persons in conjunction with this project. These essential personnel needed to complete project objects are:

Mr. Gary Graham, Gulf of Mexico Regional Coordinator (Texas A&M University Sea Grant)

Mr. Lindsey Parker, South Atlantic Regional Coordinator (Georgia Marine Extension)

Mr. Russell O'Brien, Observer/Vessel Coordinator

Mr. Phil Diller, Data Manager

Dr. Benny Gallaway (LGL Ecological Research Associates) and Staff, Data Analyst

2 Fishery Observers (To be contracted from those below or TBA)

Mr. Robert Timmeney
Mr. Konstantin Kopylov
Mr. Michael Gordon
Mr. J.L. Wiswell
Mr. Frank Helies

The above individuals have been associated with other, similar, Foundation research programs and projects. Their continued involvement will provide stability and allow for a smooth progression into this project from both a management and performance perspective.

Through years of experience, the Foundation has found that working closely with local Sea Grant – Marine Extension Service personnel (Mr. Graham & Mr. Parker), who have years of experience with the local fishing industry, is an efficient way to achieve rapid communication and cooperation with local shrimp fishermen. The Regional Coordinator and the Observer/Vessel Coordinator will act as a liaison between the Foundation and vessel owners, relaying information about the project goals and securing vessel participation.

The Observer/Vessel Coordinator will assist the Foundation Program Director and Regional Coordinator in their day-to-day activities and will coordinate all field efforts through constant communication with Foundation staff and contractors. The Observer/Vessel Coordinator will recruit and train all observers and coordinate field sampling efforts. He will also contact and establish a good working relationship with various cooperating vessel owners, captains and crew, and provide this information to fishery observers. Prior to the deployment of a fishery observer, the Observer/Vessel Coordinator will review with each observer all established protocols on how and what data to collect while onboard a participating vessel. He will also provide all necessary sampling and safety equipment and is responsible for reviewing all data for completeness prior to data entry.

Only observers that have undergone NMFS certification training will be contracted by the Foundation. This training will include safety training, onboard practices to avoid interference with the participating vessel captain and crew, turtle handling, sampling, and tagging, data collection protocols (both classroom and at-sea training), and administrative protocols. It is the job of the fishery observers to collect all data from the experimental and control nets, ensure that all experimental gear is fished optimally (i.e., highly tuned nets), and proof all collected data for completeness and accuracy before being debriefed by the Foundation Observer/Vessel Coordinator. The Foundation currently has five contracted observers working on complementary projects. Because the above listed individuals possess the skills needed to fulfill the position and have proved themselves under field conditions during other Foundation projects, the contracted observer positions will be offered to these individuals. If additional observers are needed

to collect data and conduct experimental tests, observers will be solicited from other complementary Foundation projects or through job advertisements.

Observer collected data for this project will be electronically entered by a Foundation contracted Data Manager and archived at both the NMFS Galveston Laboratory and Foundation's Office. The Data Manager is responsible for checking and transferring all raw data into a manageable computer database for data archive. Once the data are ready, they will then be forwarded to the Data Analyst (LGL Ecological Research Associates, Inc.) and Foundation Program Director.

The contracted Data Analyst will conduct all statistical tests on observer-collected data with overview and direction from the Foundation's Program Director. Statistical tests will be varied and are listed below. The overall objective of the Data Analyst is to compute the reduction rates (shrimp, finfish, red snapper, and total catch) achieved by experimental BRDs. The Foundation will rely on the analytical and scientific skills of the Data Analyst to assist in any ancillary statistical tests (i.e., spatiotemporal reduction rates achieved by experimental BRDs, etc.) that could be completed during the performance of this award. The NMFS Galveston Database Administrator will work closely with the Foundation's contracted Data Analyst and Program Director in this regard.

All data will be gathered through the cooperation and direct participation of the commercial shrimp fishing industry of the Gulf of Mexico and South Atlantic regions. Without the cooperation of industry, this project would not be possible. The use of fishing vessels as research platforms, not only reduces the costs associated with this project, but ensures that industry is aware of the research and allows them to be involved in all steps of the scientific method. By allowing fishermen to actively participate in the collection of data, they will be more trusting of the results generated from this research and will be more willing to assist in future research.

The Foundation has historically worked cooperatively with staff and personnel at the NMFS Harvesting Systems and Engineering Division (Pascagoula Laboratory, Pascagoula, MS) to assist in the identification, pre-screening, modification, certification validation, and underwater hydrodynamic testing of various experimental BRDs. We propose to extend this cooperative participation during the award and will include NMFS personnel on the Gear Review Panel and provide regular and frequent updates to allow for the close monitoring of this project.

Project Management:

Principal Investigators:

Ms. Judy Jamison, Executive Director
Dr. Michael Jepson, Program Director

Foundation Staff:

Ms. Gwen Hughes, Program Specialist
Ms. Charlotte Irsch, Grants/Contracts Specialist
Ms. Catherine Bowker, Administrative Assistant

Overall project quality control and assurance will be assumed by the Gulf & South Atlantic Fisheries Foundation, Inc. through its office in Tampa, FL. Foundation personnel will each spend 20% of their time over the course of the 12 month project period in the performance of this award. This percentage is similar (if not reduced) when compared to the overhead ('indirect rate') of academic institutions. A

project of this enormity is time consuming and requires the attention of each Foundation employee. Qualifications of the Principal Investigators are highlighted in the attached resumes.

The Foundation's Executive Director, Ms. Judy Jamison, has ultimate responsibility for all Foundation administrative and programmatic activities, with oversight by the Foundation's Board of Trustees. She ensures timely progress of activities to meet project objectives and confirms compliance of all activities with NOAA/NMFS.

The Foundation's Program Director, Dr. Michael Jepson, has overall responsibility for all technical aspects of Foundation projects and coordinates performance activities of all project personnel, including contractors. He confirms and evaluates the effectiveness of projects and subcontracts and ascertains timeframe for the project. Should alterations to the described experimental design or data collection protocols be necessary, he confirms that all data are collected in a scientifically rigorous manner to ensure the usefulness of all experimentally collected data. Additionally, he coordinates all analytical efforts, prepares all progress and final reports concerning project performance, and drafts the Foundation's quarterly newsletter.

The Grant/Contracts Specialist, Ms. Charlotte Irsch, is responsible for maintaining general financial accounting of all Foundation funds including all Cooperative Agreements and contracts, as well as communicating with NOAA Grants Management personnel, and assisting fiscal auditors in their reviews. She conducts/documents internal and program (single and desk) audits, prepares backup documentation for fiscal audits, and drafts award extension requests (if applicable). Ms. Irsch provides the Executive and Program Directors with projected budgets concerning program performance and ensures that these budgets adhere to the proposed budget. Finally, she prepares the annual administrative budget, NOAA Financial Reports, and confirms compliance of all activities with NOAA/NMFS and OMB guidelines.

The Program Specialist, Ms. Gwen Hughes, is responsible for tracking programmatic activities, securing federal and state collection and experimental permits required for experimental testing, and individual scientific collection permits for contracted observers. She is also responsible for generating supporting documentation to assist in any and all programmatic audits. Ms. Hughes is responsible for the coordination of all program related workshops (Gear Review Panel) and auditing and paying program related invoices. She processes requests for reimbursement to conform with federal guidelines and prepares and maintains all subcontracts and amendments. Additionally, she is responsible for maintaining vessel insurance and verifies that all cooperators are maintaining worker's compensation coverage on their employees, if applicable.

The Administrative Assistant, Ms. Catherine Bowker, is responsible for receptionist/clerical duties, word processing, filing correspondence, dissemination of materials to industry (final reports, press releases, newsletter). She is also responsible for creating and organizing meeting files, processing invoices and maintaining cooperative program files.

Monitoring of Project Performance:

Given the current controversies and conflicts among various interest groups related to the programmatic concepts outlined here, there is a possibility that one (or more) of these groups will question the validity of the Foundation's findings. For internally conducted studies, Principal Investigators (PIs) will regularly communicate with observers and Foundation Coordinator concerning fieldwork. PIs also review data for completeness and accuracy, and the Program Director will monitor the data management procedure to ensure that all data analyses meet objectives outlined within the proposal. The quality of the data collected, and the procedures used to collect those data, will be assured through the use of highly qualified and knowledgeable observers who are experienced in this line of work.

Internal and external monitors will oversee the PIs' activities and responsibilities. The Foundation's Board of Trustees, representing various commercial fishing and seafood interests throughout the southeastern United States, oversee the PIs' tasks and are kept aware of and critically review interim and final project reports. This program will be conducted as an award from the NMFS and the timely completion of project objectives will be externally monitored by the Program Office of the NMFS Southeast Regional Office, NOAA Grants Management, and a NMFS Technical Monitor. Interim and final progress and financial reports concerning the program will be submitted to NOAA/NMFS, as required, to help the agency track the successful implementation, performance, and completion of the various tasks outlined in this proposal. During the period when analysis of the data is being conducted, the PIs and peer review consultants will discuss data, data analyses, and data interpretation. Only after the analyses have undergone rigorous evaluation will the final report be accepted and printed.

Statement of Work:

Applicant:

Gulf & South Atlantic Fisheries Foundation, Inc.
Ms. Judy Jamison, Executive Director

Proposed Budget Period:

July 1, 2008 – June 30, 2009

Title of Proposal:

Development and Assessment of Bycatch Reduction Devices within the Southeastern Shrimp Trawl Fishery

Objectives and Procedures:

This research proposal addresses activities within a budget period of July 1, 2008 through June 30, 2009. Throughout this period, the Foundation will provide support for the continued development and field certification of new and promising industry-generated BRD prototypes.

Pre-Certification Activities:

Foundation will solicit BRD designs and/or prototypes from the shrimp industry, net designers/fishing gear construction shops, NMFS (Pascagoula Laboratory) fishing gear experts, and various Sea Grant/Marine Extension fishing technologists. For those devices that show the greatest potential of reducing finfish bycatch, limited funds will be made available to the developer to allow construction and or modification of the device.

Previous field testing efforts conducted by the Foundation have revealed that certain BRD designs show greater potential than others at reducing finfish bycatch (Cooperative Agreement No.'s NA17FF2009 and NA87FM0221). These gears include the C.J. Kiffe and the Double Opposed Fisheye. Although these devices were tested during previous field efforts, variance between tows and trips was large. To reduce variance, additional data are necessary. These devices will be considered for evaluation. Additionally, the participation of industry at NMFS annual hydrodynamic tests and conversations with NMFS personnel have revealed other devices that may considered for review. These devices include mixed

mesh nets (trawl nets with 2"-4" top panels and standard mesh floor and wings), T-90 codends (large mesh turned 90°), the Coulon TED/BRD, and 2" bar spacing for TEDs.

Other industry designs will also be solicited to increase the pool of devices reviewed. The Foundation has initiated conversation with industry under a complementary project (Coop. Agree. No. NA04NMF4540112) and these devices will also be considered.

Criteria for Vessel Selection and Vessel Compensation:

After the three experimental devices are identified, Foundation staff and Regional Coordinator will seek fishing vessels and captains willing to participate in the field testing of these experimental bycatch reduction devices. Although vessel selection will be non-random, all efforts will be made to utilize vessels whose captain and crew are attentive to their gear. This will ensure that a greater number of tows conducted are "problem free" and thus usable in any and all analyses. The Foundation will make available to cooperating fishing vessels funds that will cover or offset the costs of materials, labor, and shrimp loss associated with the development and evaluation of experimental BRDs. Fishing vessel owners who agree to cooperate in this project will be compensated \$350/day while testing the device and \$50/day when cruising to and from fishing grounds or no tow days.

Observer Training, Permits, and Insurance:

All contracted fishery observers will have undergone specific and detailed training prior to their deployment on any commercial fishing vessel. It is the responsibility of the Observer/Vessel Coordinator to schedule and train all fishery observers. Training details all administrative and programmatic procedures necessary to conduct the proposed research listed below. This includes (but is not limited to): overview of the data collection protocols outlined within the Manuals, review and identification of all fauna harvested during shrimp trawling efforts (classroom and at-sea education), identification of sea turtles and proper handling/tagging procedures, description of fishing gear, and best practices while aboard a commercial fishing vessel. In addition, all observers and the Observer/Vessel Coordinator will undergo marine safety training that outlines the procedures on how to respond properly to a variety of situations that could be encountered during experimental tests (e.g., man overboard drills, firefighting, radio communication, etc.). Each observer will also be certified in first-aid and CPR. Due to changes in NMFS policies regarding the certification of fishery observers, each observer will undergo extensive turtle training that outlines methods for the collection of biopsy samples and the tagging of individual turtles (flipper tags, PIT tags, etc.), however, observers will only be required to tag turtles with flipper tags. At the conclusion of observer training, individual observers are certified by NMFS (per Elizabeth Scott-Denton, NMFS Galveston Laboratory).

The Foundation will secure all special permits required to test experimental BRDs onboard a commercial shrimp fishing vessel. These permits include a Letter of Authorization from the NMFS-Southeast Regional Office allowing the testing of experimental devices within the federal EEZ, any and all necessary permits required to conduct experimental tests in state waters.

Vessel liability insurance will be secured and funded by the Foundation prior to any observer being placed onboard a participating vessel. Insurance protects the vessel owners in the event of a catastrophic incident resulting in the injury of a fishery observer.

Field Data Collection:

The Foundation will work cooperatively with commercial shrimp fishing vessels to ensure that all tests are conducted according to protocols and guidelines outlined in the following documents:

- 1.) "Shrimp Trawl Bycatch Research Requirements". November 1991. Published by U.S. DOC/NOAA/NMFS, Southeast Fisheries Science Center (Miami) and Southeast Regional Office (St. Petersburg).
- 2.) "A Research Plan Addressing Finfish Bycatch in the Gulf of Mexico and South Atlantic Shrimp Fisheries". August 1992. Published by the Gulf & South Atlantic Fisheries Foundation, Inc. with support of NOAA/NMFS under Cooperative Agreements NA17FF0233-01 and NA17FD0103-01.
- 3.) "Shrimp Trawl Bycatch Characterization Sampling Protocol Manual for Data Collection". September 1992. Published by U.S. DOC/NOAA/NMFS, Southeast Fisheries Science Center (Galveston).
- 4.) "Evaluation of Bycatch Reduction Devices Sampling Protocol Manual for Data Collection". September 1992. Published by U.S. DOC/NOAA/NMFS Southeast Fisheries Science Center (Galveston).
- 5.) "Bycatch Reduction Device Testing Protocol Manual". March 1997. Published by the South Atlantic Fishery Management Council.
- 6.) "Bycatch Reduction Device Testing Protocol Manual". February 2000. Published by NOAA/NMFS Southeast Regional Office and equivalent protocol for the Gulf of Mexico Fishery Management Council.

Extensive descriptions of the sampling protocols are contained in the above documents, and the reader is referred to them for such detail, especially the latest official NMFS/Regional Fishery Management Councils' approved protocol (e.g., finfish reduction as the sole criteria for BRD certification). Additional changes that NMFS might develop, will be followed accordingly (especially regarding the inclusion of new certification criteria under review by the Gulf and South Atlantic Councils). Under the current guidelines, all BRDs are subjected to a 4-step testing process. It is assumed, for the purpose of this research project, that the burden of steps one and two will be placed on industry. The scope of work contained within this proposal will focus on step three only, the Operational Testing Phase:

- 1.) Prototype Development – Developer designs a BRD and makes initial limited field tests recording bycatch and shrimp CPUE data.
- 2.) Proof of Concept – The prototype is installed on a research or commercial vessel and the standard sampling protocols are followed to collect data on bycatch reduction and shrimp retention for a minimum of 20 tows.
- 3.) Operational Testing – The BRD is installed in nets aboard commercial fishing vessels throughout the southeast U.S. The BRD is evaluated under normal working conditions with an observer collecting data on bycatch reduction and shrimp retention according to standard sampling protocols. The observer also documents any comments and suggestions of the captain concerning the gear's efficiency and/or necessary modifications
- 4.) Industry Evaluation – The BRD is distributed to selected commercial fishing vessels throughout the southeast U.S. to be employed during normal fishing activities. The captain is required to collect data concerning bycatch reduction and shrimp retention, and is requested to provide comments and suggestions concerning its acceptability and/or necessary modifications.

Utilizing data collected during the NMFS 1998 Red Snapper Initiative, approximately 68% of all tows conducted were sampled. The remaining 32% of the tows remained un-sampled due to gear (fouled gear, torn nets, etc.) and non-gear (weather, lost nets, etc.) related events. A lower number of tows were sampled during a similar project conducted by the Foundation (Cooperative Agreement No. NA17FF2009), on the order of 28% of all tows were sampled. The remaining 72% of the tows were un-sampled due to gear and non-gear related events. Upon receiving comments from the NMFS Technical Monitor, the Foundation conducted a *post hoc* analysis of the project, including experimental design and data collection procedures, to help illuminate any discrepancies between Foundation and NMFS collected data. Differences in spatiotemporal sampling likely account for a portion of the observed differences between the two studies.

All observers (Foundation and NMFS) are trained to only sample tows that are free of problems, both gear and non-gear related. We believe that the definition of a “problem-free” tow is subjective and that a wide degree of variance is associated with what is or is not perceived as a problem-free tow. The most common problem resulting in an un-sampled tow is the fouling of the tickler chain (Personal communication, Mr. Russell O’Brien). During training, Foundation contracted observers are instructed that any fouling of the tickler chain can result in a problem tow; this would include any material hanging from the chain (seaweed, a short shot of line, wire, etc.). This discerning data collection, or the perception of what is considered to be a problem tow, probably leads to the observed difference between sampling rates. We propose to alleviate this problem by having on-going communication with NMFS personnel prior to deploying observers aboard vessels. These discussions will revolve around what constitutes a problem tow and what techniques are used to collect field data. Any discrepancies found to exist will be identified and sampling techniques altered (on the part of NMFS or the Foundation) to allow the collection of consistent, quality data.

Assuming a 28% success rate for sampled tows, that the average shrimp fishing trip lasts 30 days, and that 3 tows are conducted per day, it would take 1.5 trips per device to collect the necessary number of tows needed to certify an experimental device (minimum of 30 tows; $30 \text{ days/trip} \times 3 \text{ tows/day} \times 1.5 \text{ trips/BRD} = 135 \text{ tows/BRD}$; $135 \text{ tows/BRD} \times 28\% \text{ of tows are sampled} = 37.5 \text{ sampled tows}$). Although these assumptions are variable based upon geography and time of year, these figures provide a reasonable and average estimate of the fishing effort of the Gulf of Mexico shrimp fishing fleet. Therefore, ~150 at-sea days of observer coverage are needed to accurately sample 3 experimental devices ($3 \text{ BRDs} \times 1.5 \text{ Trips/BRD} \times 30 \text{ days/trip} = 135 \text{ days}$ or ~150 at-sea days). We also anticipate that 10 cruising days are needed for vessels to travel to and from fishing grounds (2 days per trip). For each tow sampled, the contracted observer will gather a detailed set of information concerning gear configuration, location, time, and catch in accordance with the Regional Council/NMFS BRD Certification Testing Protocol Manuals. Although bycatch is a contentious issue for most U.S. commercial and recreational fisheries, due to the possible decertification of the Gulf Fisheye BRD within the Gulf of Mexico, the scope of the work outlined within this proposal will focus efforts on certifying experimental BRDs within the Gulf of Mexico shrimp fishery with minimal effort in the South Atlantic.

Participating commercial shrimp fishing vessels will tow identical trawl nets. Before any data are collected for experimental purposes, a maximum of 20 tuning tows will be conducted. This will ensure that no net or side bias exists. A minimum sample size of 30 successful tows per tests is required. However, additional tows may be necessary for sufficient statistical power. All tows must be no less than 2 hours and no more than 8 hours in duration. Only the outside trawl nets on a quad-rigged vessel will be used for experimental tests. The experimental BRD will be switched every 4-6 tows between the two outermost trawl positions and all efforts will be made to gain an equal number of tows from each side of the vessel.

The total catch of the control and experimental nets will be weighed separately. A '1-basket' (approximately 30 kg) sample (a standard NMFS sampling protocol aboard vessels) from both the control (without BRD) and experimental (with BRD) net will be collected. A predefined set of species (finfish and invertebrates) within these samples will be identified, counted, weighted as a species lot, and individuals of selected species will be randomly chosen and measured. The total number of tows to be sampled per trip will depend upon the fishing activity of the vessel and the logistics of sorting the catch aboard a fishing vessel. (i.e., one sample may not be completed before the next sample is brought aboard, thus the next tow is not sampled). All data will be collected and recorded on OMB approved datasheets to allow for consistent data collection between NMFS and Foundation observers.

All efforts will be made to make the cooperating vessel captain and crew aware of the data collected by fishery observers. At the end of each tow or, at the least, the end of each day, the contracted observer will explain the collected data to the vessel captain and crew and have all data sheets signed by the vessel captain.

Data Entry:

The Foundation will handle all data processing and analysis for this project. Upon completion of an experimental fishing trip, the observer and cooperating vessel captain will verify the accuracy/completeness of all data by signature. Observers will then be debriefed by the Foundation's Observer/Vessel Coordinator and data reviewed for accuracy and completeness. All raw data will then be photocopied; originals will be forwarded to the Data Manager and the copies will be filed by the Observer/Vessel Coordinator. Copies of all raw data, and any completed analyses of those data, will be made available to each BRD prototype originator.

The Foundation's contracted Data Manager will review and archive all data at the Foundation and in the NMFS Galveston Laboratory database system (as part of the overall bycatch program dataset). The Foundation's standardized data management procedure has been modified to accommodate NMFS' adoption of the database management system. Under this system, once the data files are entered by the Data Manager and verified as correct, the data are then archived in a pooled, multi-organizational dataset at the NMFS Galveston Laboratory. All archived data are available for download to Foundation personnel and contracted Data Analyst for final analysis/interpretation. After the Data Manager completes the archive of data, all raw data will be sent to the Foundation's office for storage.

Data Processing and Analysis:

Methodologies for a standardized data analysis are outlined within the Manuals and publications listed above. These protocols have recently been questioned due to the severe data truncation that results through a strict interpretation, e.g., tow times having to be within +/- 10% of an average tow time, and a minimum capture of 5 red snapper in either the control or experimental net. Therefore, we propose a series of analyses.

A modified t-test will be used to determine the bycatch reduction performance of candidate BRDs. Species number and weight for the entire tow of the designated sample nets will be extrapolated using the ratio of the sample weight (or number) vs. the total net weight:

$$\text{Equation 1: } \frac{(\text{Sample Species Weight}) \times (\text{Total Net Weight})}{\text{Total Sample Weight}} = \text{Extrapolated Species Weight}$$

These extrapolated values will then be converted into catch-per-unit-effort (CPUE) based on the hours towed:

$$\text{Equation 2: } \frac{(\text{Extrapolated Species Weight})}{(\text{Tow Time in Hours})} = \text{Catch Per Hour}$$

These CPUE values will be compared between the “control” and “experimental” net for shrimp retention, total biomass reduction, finfish reductions, and red snapper reduction. Total biomass reduction will be calculated as:

$$\text{Equation 3: } [(\text{BRD Net Weight}) \div (\text{Control Net Weight}) - 1] \times 100\% = \text{Percent Reduction}$$

For the various species, reductions will be calculated by:

1. Extrapolation using Equation 1, the total weight (or number) of species taken in both the control and BRD net based on the weight (or number) of that species present in the sample tow;
2. Generating a CPUE using Equation 2;
3. Generating a mean trip CPUE (or other unit of measure) for both the Control and BRD net, and;
4. Calculating an overall percent reduction in the BRD net based on these means using the format of Equation 3.

Only tows with at least 5 red snapper in the control or experimental net and within +/- 10% of an average tow time will be analyzed. The CPUE means will be tested for significant difference ($p < 0.05$) through the use of paired t-tests according to the following hypotheses:

$$\begin{aligned} H_0: & \mu_{\text{control}} - \mu_{\text{BRD}} = 0 \\ H_a: & \mu_{\text{control}} - \mu_{\text{BRD}} \neq 0 \end{aligned}$$

To illuminate the reduction in red snapper fishing mortality achieved by experimental BRDs on a per trip and per gear basis, we will use the following equation:

$$\text{Equation 4: } (0.3)(\% \text{ Reduction Age-0 Fish}) + (0.7)(\% \text{ Reduction Age-1 Fish}) = \text{F-Mortality}^1$$

This equation is consistent with methodologies used by NMFS to compute the reduction in red snapper F-mortality achieved by BRDs (Foster 2004). We define age-0 fish to be <130mm, and age-1 fish to be >130mm, but no larger than 300mm.

Although the standardized analysis listed within the Manuals (and above) was agreed upon to alleviate the weighting of any outliers within the data, it severely truncates the data used in the final analysis due to a lack of red snapper being caught in either the control or experimental nets, or tow times being outside the +/- 10% average. Therefore we also propose to analyze all collected data according to the analysis contained within a paper presented at the SEDAR-7 Data Assessment workshop (Foster 2004). This analysis utilized the Manuals as a guidance document and allows for leeway during analysis. The analysis is standardized (e.g., the computation of CPUE and percent reduction is the same as listed above), but the criteria used to select data to include in the analysis is slightly modified and allows the use of all tows with one or more red snapper in either the control or experimental net as long as the tow duration is between 2 and 8 hours.

¹ Staff will verify these mortality rates are considered the most current and update accordingly as dictated by recent SEDAR.

When all datasets have been archived and analyzed, they will be reported in an aggregate summary where comparisons between and among the various BRDs can be more readily interpreted. Should the need arise, these results will be provided to appropriate fishery management agencies and organizations for certification. All data analyses will be conducted by Dr. Benny Gallaway and the staff of LGL Ecological Research Associates, Inc. with oversight and comment by the Foundation's Program Director and Regional Coordinator.

Efforts to Increase Industry Participation:

The Harvesting Systems and Engineering Division of the NMFS Pascagoula Laboratory annually conducts hydrodynamic evaluations of commercial fishing gear. The purpose of these evaluations is multifaceted, but one objective is to increase the number of industry-designed gears certified for use within the commercial shrimp fisheries of the southeastern U.S. The Foundation and NMFS actively solicit industry members for new and innovative TED and bycatch reduction device (BRD) designs they believe will enhance the efficiency of commercial shrimp fishing operations while still allowing bycatch to escape shrimp trawl nets.

Gear submitted for hydrodynamic testing is brought to Panama City, FL, evaluated and recorded *in situ* by NOAA divers. Upon completion of individual gear tests, a video recording of the gear is mailed to the industry designer and allows the designer to assess and modify the gear if necessary. Due to funding limitations, gear designers are often absent during hydrodynamic tests and immediate feedback is impossible. Thus, if gear modifications are needed, the modified gear must be resubmitted and tested during subsequent years. This process is time consuming and slows development and possible certification of BRDs.

To assist in the research and development of BRD designs and to increase the commercial shrimp industry's participation in cooperative research, funds will be made available for three fishermen to attend hydrodynamic evaluations in Panama City, FL. Fishermen will be solicited by Foundation Regional Coordinator to design and build new and innovative bycatch reduction devices. Fishermen will be compensated for time and labor and all materials needed to produce experimental devices and all participating fishermen will accompany their respective gear designs to Panama City and observe any and all tests that occur. By having the gear designer present during hydrodynamic tests, gear modification can occur in the field, expediting the assessment, modification, and certification of industry designed devices.

Information Dissemination:

Summary reports of the project's findings will be published as part of the "Foundation Project Update" section of the "Gulf and South Atlantic News," the quarterly publication of the Gulf & South Atlantic Fisheries Foundation, Inc. This newsletter is distributed to over 300 organizations and individuals throughout the region. An electronic version of this newsletter (PDF) is also included in the regular updates to the Foundation's website (www.gulfsouthfoundation.org). Dr. Jepson will also provide summary results at a variety of advisory panel meetings and other venues while conducting Foundation business.

Copies of this project's final report will be published and distributed to various federal and state fishery agencies, university extension/Sea Grant offices, and industry associations. In addition, PDF copies of the final report will be made available for download from the Foundation's website.

Applicant's Administrative Office:

Ms. Judy Jamison
Gulf & South Atlantic Fisheries Foundation, Inc.
Lincoln Center, Suite 740
5401 West Kennedy Blvd.
Tampa, FL 33609-2447
Phone: (813) 286-8390
Fax: (813) 286-8261

Project Personnel and Responsibilities

Principal Investigators:

Ms. Judy Jamison, Executive Director
Dr. Michael Jepson, Program Director

Foundation Staff:

Ms. Gwen Hughes, Program Specialist
Ms. Charlotte Irsch, Grants/Contracts Specialist
Ms. Catherine Bowker, Administrative Assistant

Overall project quality control and assurance will be assumed by the Gulf & South Atlantic Fisheries Foundation, Inc. through its office in Tampa, FL. Foundation personnel will each spend 20% of their time over the course of the 12 month project period in the performance of this award. This percentage is similar (if not reduced) when compared to the overhead ('indirect rate') of academic institutions. A project of this enormity is time consuming and requires the attention of each Foundation employee. Qualifications of the Principal Investigators are highlighted in the attached resumes.

The Foundation's Executive Director, Ms. Judy Jamison, has ultimate responsibility for all Foundation administrative and programmatic activities, with oversight by the Foundation's Board of Trustees. She ensures timely progress of activities to meet project objectives and confirms compliance of all activities with NOAA/NMFS.

The Foundation's Program Director, Dr. Michael Jepson, has overall responsibility for all technical aspects of Foundation projects and coordinates performance activities of all project personnel, including contractors. He confirms and evaluates the effectiveness of projects and subcontracts and ascertains timeframe and funding limitations for the project. Should alterations to the described experimental design or data collection protocols be necessary, he confirms that all data are collected in a scientifically rigorous manner to ensure the usefulness of all experimentally collected data. Additionally, he coordinates all analytical efforts, prepares all progress and final reports concerning project performance, and drafts the Foundation's quarterly newsletter.

The Grant/Contracts Specialist, Ms. Charlotte Irsch, is responsible for maintaining general financial accounting of all Foundation funds including all Cooperative Agreements and contracts, as well as communicating with NOAA Grants Management personnel, and assisting auditors in their reviews. She conducts/documents internal and program (single and desk) audits, prepares backup documentation for fiscal audits, and drafts award extension requests (if applicable). Ms. Irsch provides the Executive and Program Directors with projected budgets concerning program performance and ensures that these

budgets adhere to the proposed budget. Finally, she prepares the annual administrative budget, NOAA Financial Reports, and confirms compliance of all activities with NOAA/NMFS and OMB guidelines.

The Program Specialist, Ms. Gwen Hughes, is responsible for tracking programmatic activities, securing federal and state collection and experimental permits required for experimental testing, and individual scientific collection permits for contracted observers. She is also responsible for generating supporting documentation to assist in any and all programmatic audits. Ms. Hughes is responsible for the coordination of all program related workshops (Gear Review Panel) and auditing and paying program related invoices. She processes requests for reimbursement to conform with federal guidelines and prepares and maintains all contracts and amendments. Additionally, she is responsible for maintaining vessel insurance and verifies that all cooperators are maintaining worker's compensation on their employees, if applicable.

The Administrative Assistant, Ms. Catherine Bowker, is responsible for receptionist/clerical duties, word processing, filing correspondence, dissemination of materials to industry (final reports, press releases, newsletter). She is also responsible for creating and organizing meeting files, processing invoices and maintaining cooperative program files.

Contracted Personnel:

The Foundation has chosen to sole-source contracts with several persons in conjunction with this project. The essential personnel needed to complete this project are:

Mr. Gary Graham, Gulf of Mexico Regional Coordinator (Texas A&M University Sea Grant)

Mr. Lindsey Parker, South Atlantic Regional Coordinator (Georgia Marine Extension)

Mr. Russell O'Brien, Observer/Vessel Coordinator

Mr. Phil Diller, Data Manager

Dr. Benny Gallaway (LGL Ecological Research Associates) and Staff, Data Analyst

2 Fishery Observers (To be contracted from those below or TBA)

Mr. Robert Timmeney
Mr. Konstantin Kopylov
Mr. Michael Gordon
Mr. J.L. Wiswell
Mr. Frank Helies

The above individuals have been associated with other, similar, Foundation research programs and projects. Their continued involvement will provide stability and allow for a smooth progression into this project from both a management and performance perspective.

Through years of experience, the Foundation has found that working closely with local Sea Grant – Marine Extension Service personnel (Mr. Graham and Mr. Parker), who have years of experience with the local fishing industry, is an efficient way to achieve rapid communication and cooperation with local shrimp fishermen. The Regional Coordinator and the Observer/Vessel Coordinator will act as a liaison between the Foundation and vessel owners, relaying information about the project goals and securing vessel participation.

The Observer/Vessel Coordinator will assist the Program Director and Regional Coordinator in their day-to-day activities and will coordinate all field efforts through constant communication with Foundation staff and contractors. The Observer/Vessel Coordinator will recruit and train all observers and coordinate field sampling efforts. He will also contact and establish a good working relationship with various cooperating vessel owners, captains and crew, and provide this information to fishery observers. Prior to the deployment of a fishery observer, the Observer/Vessel Coordinator will review with each observer all established protocols on how and what data to collect while onboard a participating vessel. He will also provide all necessary sampling and safety equipment and is responsible for reviewing all data for completeness prior to data entry.

Only observers that have undergone NMFS certification training will be contracted by the Foundation. This training will include safety training, onboard practices to avoid interference with the participating vessel captain and crew, data collection protocols (both classroom and at-sea training), and administrative protocols. It is the job of the fishery observers to collect all data from the experimental and control nets, ensure that all experimental gear is fished optimally (i.e., highly tuned nets), and proof all collected data for completeness and accuracy before being debriefed by the Foundation Observer/Vessel Coordinator. The Foundation currently has three contracted observers working on complementary projects, however, these observers may not remain under contract with the Foundation. If additional observers are needed to collect data and conduct experimental tests, observers will be solicited from other complementary Foundation projects or through job advertisements.

Observer collected data for this project will be electronically entered and archived, at both the NMFS Galveston Laboratory and Foundation Office, by a Foundation contracted Data Manager. The Data Manager is responsible for checking and transferring all raw data into a manageable computer database for data archive. Once the data are ready, they will then be forwarded to the Data Analyst and Foundation Program Director.

The contracted Data Analyst will conduct all statistical tests on observer-collected data with overview and direction from the Foundation's Program Director. Statistical tests will be varied and are listed below. The overall objective of the Data Analyst is to compute the reduction rates (shrimp, finfish, red snapper, and total catch) achieved by experimental BRDs. The Foundation will rely on the analytical and scientific skills of the Data Analyst to assist in any ancillary statistical tests (i.e., spatiotemporal reduction rates achieved by experimental BRDs, etc.) that could be completed during the performance of this award. The NMFS Galveston Database Administrator will work closely with the Foundation's contracted Data Analyst and Program Director in this regard.

All data will be gathered through the cooperation and direct participation of the commercial shrimp fishing industry of the Gulf of Mexico and South Atlantic regions. Without the cooperation of industry, this project would not be possible. The use of fishing vessels as research platforms, not only reduces the costs associated with this project, but ensures that industry is aware of the research and allows them to be involved in all steps of the scientific method. By allowing fishermen to actively participate in the collection of data, they will be more trusting of the results generated from this research and will be more willing to assist in future research.

The Foundation has historically worked cooperatively with staff and personnel at the NMFS Harvesting Systems and Engineering Division (Pascagoula, MS) to assist in the identification, pre-screening, modification, certification validation, and underwater hydrodynamic testing of various experimental BRDs. We propose to extend this cooperative participation during the award and will include NMFS personnel on the Gear Review Panel and provide regular and frequent updates to allow for the close monitoring of this project.

Milestone Table:

Project Activities (Start Date 6/1/08)	2008							2009							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Project Start-up Activities/Contract Negotiations	XX														
Project Coordination/Monitoring	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Periodic Planning and Evaluation Meetings	XX	XX													
Training of Observers	XX	XX													
Organize Gear Review Panel Meeting	XX														
Gear Review Panel Meetings		XX													
Finalize GRP Recommendations/ Selection of BRDs for Testing		XX	XX												
Permit Applications & LOAs	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
Selection of Participating Vessels		XX	XX	XX	XX	XX	XX	XX	XX	XX	XX				
Experimental Tests		XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
Evaluation of Test Results							XX	XX	XX	XX	XX	XX			
Hydrodynamic Tests	XX	XX													
Project Closeout & Final Report Preparation													XX	XX	XX
Final Report Submission															XX

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