THE UNIVERSITY of MISSISSIPPI

Dr. Roy Crabtree, Regional Administrator
NOAA Fisheries Service
Southeast Regional Office
Sustainable Fisheries Office
Sustainable Fisheries Division
263 13th Ave. South
St. Petersburg, FL 33701

Dear Dr. Crabtree,

You will find my application for an Exempted Fishing Permit attached. I am providing, free of charge, a new bycatch reduction device (BRD) to shrimpers in the Gulf of Mexico to gauge their acceptance ahead of final administrative certification. While the BRD has passed certification trials and was found to outperform the most wide-spread BRD in the GOM (the "Fisheye"), we hoped to obtain opinions, comments, and suggestions from shrimpers that might encourage them to use the device.

As an FYI, during certification trials the device enjoyed about 44% overall bycatch reduction and, perhaps most significant to fishers, resulted in about 1.8% shrimp loss (compared to the fisheye's over 10% loss). It was also significant that in fishery observer trials (prior to the certification trials) off the coast of Texas, juvenile red snapper bycatch reduction was even higher than overall bycatch reduction (about 50%). The device seems to be more effective on fish that are the most highly active since it requires them to swim forward in the BRD to affect their escape.

This work is being conducted with BREP funding and the project will conclude at the end of August of this year.

Respectfully,

Dr. Glenn Parsons, Director, Center for Biodiversity and Conservation Research, University of Mississippi, University, MS 38677

Exempted Fishing Permit (EFP) Applications

Date Submitted: 3/8/19

Research end date: 8/31/19

Project coordinator: Glenn R. Parsons; Shoemaker Hall Room 120; Department of Biology; The University of Mississippi; University, MS, 38677; phone, 662 915 7479; email, bygrp@olemiss.edu

Point of contact: same as above

Purposes and goals of activity: Using BREP provided funds, we are providing free of charge a new bycatch reduction device (the cylinder BRD) for use in the Gulf of Mexico shrimp fishery. The advantage of the NCBRD is that it provides high bycatch reduction (mean = 42.6%) while enjoying one of the lowest shrimp losses (mean = 1.9%) thus far reported. This can be compared with the most widely used BRD in the Gulf of Mexico, the "Fisheye", which reduces bycatch on average by 37% but suffers from high shrimp loss of 10.4% (over 5x the shrimp loss of the NCBRD). An extremely important and unique advantage of the NCBRD is its ability to reduce red snapper bycatch. Although red snapper were not captured in large numbers during NMFS certification trials, the NCBRD reduced capture of red snapper (>130 mm) by 41% over controls. Additionally, in NMFS observer acquired data off the coast of Texas, a similarly configured device was shown to reduce *total* red snapper bycatch by 48.0 and 51.7%, depending upon configuration (Parsons and Foster 2015). An interesting aspect of the NCBRD is its differential effect on red snapper bycatch when compared with *total* bycatch. The NCBRD was found to reduce red snapper bycatch by 48% while total fish bycatch was reduced by 32% (Parsons and Foster 2015). In short, the rationale for this project is to provide the NCBRD to commercial shrimpers in the Gulf of Mexico such that they can provide feedback regarding its use. Prior to petitioning the NMFS for certification of the BRD, it would be beneficial to understand the potential for acceptance of the device.

For the above reasons, BRD's were provided last year (on an LOA) to various shrimpers in the GOM to gauge acceptance but also to gather recommendations regarding any minor changes that might encourage wider acceptance of the device. The LOA expired at the end of 2018. Recently, we were informed that an EFP was required for this work, rather than an LOA, and I am herewith applying for that document.

List of specific regulation from which exemption is being requested: The request we are making is to simply remove an administratively certified BRD from shrimp trawls and replace it with the cylinder BRD for a limited amount of time. We are requesting that shrimpers provide try the device for 30 "drags" and then fill out a simple questionnaire regarding the device. They will be paid an honorarium for their troubles. There is no exemption from BRD requirement at all.

Catch information: This is difficult to describe since the target is to eliminate bycatch. Since the present device enjoys about 43% bycatch reduction and the fisheye provides 37% reduction, the device will result in an additional 6% of bycatch eliminated from the trawl unharmed. As pointed out to all shrimpers that have shown interest in the device, there will result an increase in shrimp retained of about 8%. Assuming a vessel lands 1000 lbs of shrimp per night, the new BRD will result in an additional 80 pounds of shrimp for the same amount of effort. Additionally, more *effective* trawling, a reduction in sorting time, and happier deck hands will result.

Any anticipated impacts: There are no deleterious environmental, marine mammal, essential fish habitat or endangered species impacts anticipated as a result of this work.

The following anticipated effort information for each vessel: At present, we have only a few potential participants that fish in federal waters where a BRD is required. I would hope that the EFP provided is flexible enough for us to add participants in a relatively short amount of time at a later date.

<u>For mobile gear</u>:

Type and size of gear to be used. Otter trawls will range from 45 to 53 foot nets

Number of tows to be made per day. We are requesting 30 drags completed over the duration of the EFP for each participant.

Duration and speed of each tow. We require tows to be at least 1 hour but preferably several. Tows are normally less than 3 knots.

Number of days during which the experiment will be conducted. The project will begin upon receipt of the EFP and conclude on August 31, 2019.

Sampling locations (including depth). All trawling will be conducted in the northern Gulf of Mexico shrimp grounds offshore of Alabama, Mississippi, Louisiana and Texas. Depths typically range from a few meters out to about 65 meters.

Information for vessels to be used for the EFP as soon as the information is available and before operations begin under the EFP:

Vessel name. Blood and Guts; **USCG documentation number** USCG 504945; **Vessel home port.** Brownsville, Texas; **Vessel owner information –** Charles Burnell, 2230 Fisherman Place Road, Brownsville, TX, 78521; 956-831-3502; burnelltrawlers@yahoo.com; **Vessel captain;** Charles Burnell

Vessel name; Captain Bligh; **USCG documentation number,** USCG 919517; same as above

Vessel name; Defiance; **USCG documentation number,** USCG 509898; same as above

Vessel name; Waymaker; **USCG documentation number,** 1040733; **Vessel home port;** Chauvin, LA; **Vessel owner information**; James Blanchard, 3389 Caleb Drive, Houma, LA, 985-688-0637, jblanc1961@gmail.com : **Vessel captain**; James Blanchard

Principal Investigator's (including the applicant's and/or project coordinator's) CVs. **(see attached document)**

Signature of applicant.

Application of a New Bycatch Reduction Device

For Use in the U.S. Shrimp Industry

by

Glenn R. Parsons
Shoemaker Hall Room 120
Department of Biology
The University of Mississippi
University, MS 38655

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662 915 7479

Estimated Total Budget Request:
Duration of the Project: May 15, 2017 to August 15, 2018 (no-cost extension until August 15, 2019)

Title: Application of a New Bycatch Reduction Device for Use in the U.S. Shrimp Industry

Background: This proposal specifically addresses Program Priority I.B.1; "*develop innovative and effective technologies, gear modifications… to reduce bycatch impacts*". Estimates of shrimp trawl bycatch is reported to be as high as 64% of total catch. Many of these organisms are returned dead or dying. The importance of the shrimp industry to U.S. coastal communities cannot be over-stated and shrimp trawlers would welcome methods to reduce this bycatch. Shrimp trawl bycatch reduction devices (BRD), allow non-target species to escape the fishing gear to reduce the impact of trawling on the marine environment. Those devices are presently required for shrimp trawling in U.S. waters and several are available for use. The most recent BRD to complete certification trials (but has not yet been certified administratively) is the nested cylinder BRD (NCBRD). The device has been in development for a number of years, the research work being funded through the NMFS and MARFIN. Briefly, the device exploits the natural tendency for fishes to swim up current and to take refuge in reduced flow areas created by the NCBRD (Parsons and Foster 2015). Over the past several years, the NCBRD has been used on a variety of Gulf of Mexico and Atlantic commercial shrimp vessels contracted for research evaluation and was observer tested off of the Texas coast. There has been a significant investment of time and federal dollars to bring this device to its final stage of development and successful certification trials were completed in December 2016.

Rationale: The modified NCBRD is now ready to be placed on-board shrimp vessels to obtain industry feedback. The advantage of the NCBRD is that it provides high bycatch reduction (mean = 42.6%) while enjoying one of the lowest shrimp losses (mean = 1.9%) thus far reported. This can be compared with the most widely used BRD in the Gulf of Mexico, the "Fisheye", which reduces bycatch on average by 37% but suffers from high shrimp loss of 10.4% (over 5x the shrimp loss of the NCBRD). An extremely important and unique advantage of the NCBRD is its ability to reduce red snapper bycatch. Although red snapper were not captured in large numbers during NMFS certification trials, the NCBRD reduced capture of red snapper (>130 mm) by 41% over controls. Additionally, in NMFS observer acquired data off the coast of Texas, a similarly configured device was shown to reduce *total* red snapper bycatch by 48.0 and 51.7%, depending upon configuration (Parsons and Foster 2015). An interesting aspect of the NCBRD is its differential effect on red snapper bycatch when compared with *total* bycatch. The NCBRD was found to reduce red snapper bycatch by 48% while total fish bycatch was reduced by 32% (Parsons and Foster 2015). In short, the rationale for this project is to provide the NCBRD to commercial shrimpers in the Gulf of Mexico such that they can provide feedback regarding its use. Prior to petitioning the NMFS for certification of the BRD, it would be beneficial to understand the potential for acceptance of the device. Given that several design modifications were necessary to obtain the desired results presented above, it would be a waste of time and money administratively to certify this device without acceptance of the final design by the fishery.

Statement of Research Objectives and Methodology: In this proposal, we will provide the

above described bycatch reduction device for use on commercial shrimp vessels in the Gulf of Mexico (and potentially other areas). The NCBRD (Figure 1) will be constructed during spring and early summer 2017 and will be distributed to all shrimpers that have agreed to participate soon afterwards. The device is sewn into the trawl "bag" downstream of the TED. The device has a continuous collar (Fig. 1, #1) that creates a region of reduced flow that attracts fish. This reduced flow area is adjacent to large mesh netting (#2) that creates escape openings (#3) and provides the opportunity for fish to exit the trawl. A webbing "funnel" (#4) displaces all organisms, downstream of the escape opening such that the fish must swim upstream into the flow "shadow" to exit the trawl. This BRD exploits the behavioral differences between shrimp and fish, i.e. shrimp are not powerful directional swimmers and are less likely to swim upstream whereas fish effectively locate the slow flow area. An interesting advantage of this device is that its performance can be altered by changing the funnel (#4) length. While certification was accomplished with a 40 inch sock (providing 43% bycatch reduction and 1.9% shrimp loss) which is the maximum allowable, shorter sock lengths will provide much higher bycatch reduction (in excess of 60%) but will result in higher shrimp loss (10%).

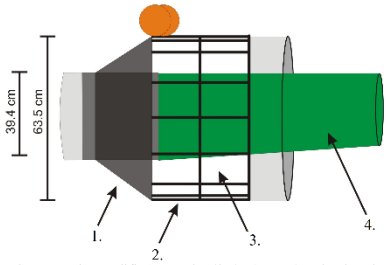

Figure 1. The modified nested cylinder bycatch reduction device.

I estimate approximately 30 NCBRD's will be produced but will of course depend upon the number of shrimpers that agree to participate. The devices will be provided free of charge and a small $250 "honorarium" will be provided to encourage participation. To ensure proper use of the BRD, we will make site visits to each participant to demonstrate proper installation in the trawl. We will request that shrimpers use the device for at least 30 trawls and hopefully they will continue using the device voluntarily after that (but only as long as they are allowed to use it under the Letter of Authorization from NMFS). We will suggest that shrimpers place the NCBRD in one trawl and leave the "Fisheye" in another to provide a clear comparison. After they have used the trawl for the agreed period of time, all participants will be asked to fill out and submit an evaluation form. The form will include a series of questions with rankings to assess the acceptability of the device by the shrimper, to gauge the perception by the shrimper of how well it works, to identify any shortcomings of the device, and to solicit recommendations for possible changes. The obvious intent is to introduce this new BRD to the shrimping community and gauge its acceptability. The Principal Investigator has a close working relationship with several shrimpers in the GOM and already has an informal agreement from Bosarge Boats (personal communication, Sandra Bosarge) to place the device on their vessels. To further encourage participation, we will place an advertisement in the appropriate trade publication(s) describing this program.

Identification of required permits: The BRD described in the proposal has not been officially certified. Therefore, we will request a Letter of Authorization for each vessel using the device. The PI has used LOA's for BRD research work on several occasions in the past.

Estimated budget amount: $60,000