

Pilot study of the queen conch (*Strombus gigas*) and spiny lobster (*Panulirus argus*) recreational fishery in Puerto Rico

FY 2013 Proposal

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1. Overview

1.1. Sponsor

Graciela Garcia-Moliner

1.2. Focus Group

Survey Design and Evaluation

1.3. Background

The marine recreational fishery statistics survey (MRFSS) has been conducted in Puerto Rico since the year 2000. Standard MRFSS protocol has traditionally specified that only finfish may be included in surveys. Nevertheless, in Puerto Rico queen conch (*Strombus gigas*) and spiny lobsters (*Panulirus argus*) are harvested both by commercial fishers and recreational fishers. Queen conch and spiny lobster are regulated in state waters under Fishing Regulation #7949. In federal waters they are regulated under the Queen Conch FMP and the Spiny Lobster FMP and 50 CFR Part 622 Fisheries of the Caribbean, Gulf, and South Atlantic. In the case of queen conch, the fishery in federal waters around Puerto Rico has been closed since 2005. The commercial value of these two species is the highest of any exploited species in Puerto Rico; however the recreational fishery has never been quantified nor formally described. Appeldoorn and Valdez-Pizzini (1996) initially described the lack of recreational information for queen conch. Garcia-Moliner et al. (2001) pointed out the importance of SCUBA divers as an element of recreational fishing effort on queen conch. An amendment to the MSA required establishing annual catch limits (ACL) for species under management (CFMC 2010). The amendments to the FMPs established ACLs for the commercial and recreational sectors for most finfish FMUs. However, the lack of recreational data on the harvest of queen conch and spiny lobsters resulted in one comprehensive ACL for both sectors. Monitoring of ACLs is required and the accountability measures that are triggered by overages could result in reducing the length of the harvest season in subsequent years. Data on the recreational sector are needed so the two sectors can be managed separately and accountability measure applied accordingly. ACL Amendments also established a bag limit for recreational fishers for spiny lobster. The decision for MRIP not to cover invertebrates results in a major data gap for important and highly valuable species. Invertebrates are important in other US jurisdictions, so requests for MRIP to cover them in other areas are likely. Puerto Rico DNER believes that it may be warranted to include queen conch and spiny lobster in the MRFSS/MRIP survey, in order to obtain a more complete picture of the overall harvest of these species. The results of this project would provide much needed information for Puerto Rico and a methodology for consideration by other regions. Informal observations of the recreational fishery for these species suggest several potential issues: Recreational fishers may be targeting queen conch and/or spiny lobster or retaining these species at higher rates than expected when targeting finfish species. Recreational fishers may be harvesting species of conch and/or lobster which are not regulated, in unknown numbers. The high proportion of juveniles in mounds of queen conch shells seem to indicate significant recreational harvest on conch nursery grounds. Recreational fishers may be harvesting undersized queen conch and/or spiny lobster. This is important because the recreational fishery might be removing a significant portion of the young recruits prior to reaching reproductive size. Although those nursery areas are not in the EEZ, these recruits would be the future EEZ spawning population. Although catch and effort data for the Puerto Rico queen conch stock have been insufficient to conduct sophisticated stock assessments, signs of declining abundance and overfished/overfishing conditions were found by Valle (2002a, b, 2005) with standardized catch rate analyses and non-equilibrium production model (ASPIC) assessments. A subsequent SEDAR assessment in 2007 confirmed signs of overfishing, although a complete stock assessment analysis was not possible due to the inadequacy of the available data. The case for spiny lobster is similar. In 2005-2006 a SEDAR assessment was conducted, concluding that data were insufficient to draw conclusions, although signs of population declines and overfishing were also present in the relative abundance indices, the production model assessments, and the Bayesian approaches (data-free model). MRIP data would be helpful in providing data for improved and more successful stock assessments of queen conch and spiny lobster of Puerto Rico. The National Marine Fisheries Service lists queen conch, but not spiny lobster, as overfished. It is likely that the recreational fishery contributes to overfishing of queen conch and exerts fishing pressure on spiny lobster that could lead to overfishing. The extent of the problem needs to be quantified, particularly if the recreational fishery is harvesting juveniles and hindering recruitment into the adult stock.

1.4. Project Description

This project is based on recommendations from an MRIP workshop in the US Caribbean to gather and analyze information on recreational catch of conch and lobster. The Puerto Rico Department of Natural and Environmental Resources (DNER) will lead the project with technical support from the Southeast Regional Office and the Caribbean Fishery Management Council. The grant, if successful, will go to the Gulf States Marine Fisheries Commission for administration. The project would hire a fishery consultant to manage personnel and conduct the analysis. MRIP convened the above-mentioned workshop in September 2012 to review progress and needs for improvements of MRFSS data collection for Puerto Rico in preparation for transitioning Puerto Rico's MRFSS program to the MRIP format. A separate but associated workshop developed recommendations for initiating MRIP in the US Virgin Islands. Statistical consultants currently working with MRIP attended the workshops to assist with survey design while ensuring compliance with the overall MRIP goals. This group of consultants also discussed with the workshop participants several pilot projects to provide the Territories and NMFS with information necessary to design a comprehensive MRIP survey in the US Caribbean. The consultants prepared a draft report in November 2012 based on the discussions and documentation provided at the workshops that makes specific recommendations for MRIP in general and provides guidance on

those pilot projects. As no MRFSS surveys had occurred in the USVI, the workshop there focused on applying the general experience gained from limited recreational sampling to a new design that would meet MRIP requirements. Because the MRFSS program has been underway since 2000 in Puerto Rico, a number of issues arose from that experience that suggested the need for improvements. As described in the Background Section, PR DNER identified catches of queen conch and spiny lobster as important to the Commonwealth, but collection of pertinent data are currently not part of the MRFSS program in Puerto Rico. Participants at the PR workshop identified conch and lobster recreational data as a high priority for MRIP. The consultants agreed with the participants on the value of a pilot project to obtain background information on the distribution of catch and effort data for queen conch and spiny lobster, including collection of biological data for both species. The report states: "Puerto Rico is currently not obtaining information of some species that are important to their assessment. In order to summarize effort for other species not currently collected in the MRIP questionnaire, options that include conch, whelk and spiny lobster as targeted species should be included in the MRIP questionnaire. Puerto Rico should consider a pilot study on how to best estimate catch (e.g., counts, sizes, counts at different sizes, etc.) for these species." This proposal was developed in response to the recommendation from the Puerto Rico MRIP workshop and is fully consistent with the recommendations of the statistical consultants. If the project is approved, the field survey design will be finalized during the first month of the project, and the project will take place over the timeline specified in the Schedule section. The project design calls for additional interviewers, in addition to those currently employed by MRIP, whose focus will be to collect information throughout Puerto Rico to provide a preliminary characterization of the recreational catch of conch and lobster. The participants from the PR workshop also identified that the MRFSS sampling procedures did not work for remote locations, specifically Vieques, Culebra, and offshore cays. The consultants' report recommended several possibilities for sampling these locations, and the final survey design will incorporate one or more of these possibilities. Although queen conch and spiny lobster have minimum size limits and queen conch has a closed period, workshop participants suspect that not all recreational fishers are aware of or comply with these regulations. Juvenile (sublegal) conchs and lobsters occur on specific habitats, and therefore may be susceptible to recreational fishers who fish in these areas. The distribution of interviewer effort will gather data to determine if sublegal conch and lobster are disproportionately landed at those sites. Evidence indicates that violations of size limits and closed seasons are occurring. Fishers, both commercial and recreational, often remove conch meat from the shells at the site of landing. Mounds of conch shells build up over time, and give both an indicator of prime landing sites and an opportunity to measure shells for size distribution to help inform the distribution of sublegal conch. The period of the project will encompass the three-month conch closed period and three months of open recreational season. While avoiding any perception of interviewers acting as enforcement agents, the project will collect size distribution data to compare the legal and sublegal landings, both within and outside of the open harvest season. Species of conch and lobster, other than queen conch and spiny lobster, are likely landed by recreational fishers. It will be very useful to know the relative quantities of these other species; as they tend to grow smaller than queen conch and spiny lobster, landings of these other species may give a perception of illegal take of undersized individuals. Therefore, some minimal level of biological data collection on all harvested species of conch and lobster will make up an important aspect of this project. Recreational fishers often harvest opportunistically, so may land a diversity of species. The interviewers will identify and enumerate the catch of species of finfish and other incidental harvest. Data collection for incidental harvest will follow the current MRFSS/MRIP protocol so that the data can supplement the current MRFSS program.

1.5. Public Description

1.6. Objectives

This pilot study seeks to provide answers to several questions regarding the recreational harvest of queen conch and spiny lobster in Puerto Rico: Is the recreational fishery for these species significant enough to warrant inclusion in the MRFSS survey? Are queen conch and spiny lobster target species of the recreational fishery, or retained/ discarded when harvesting finfishes? What is the proportion of undersized queen conch and spiny lobster to adults in the recreational harvest? Where are recreational fishers harvesting queen conch and spiny lobster? When are recreational fishers harvesting queen conch and spiny lobster? How much queen conch and spiny lobster is recreationally caught (total and by location)? How many recreational fishers harvest queen conch/spiny lobster and how often (for example, number of trips, total catch, harvest location)? What methods do the recreational fishers employ to harvest queen conch/spiny lobster?

1.7. References

Appeldoorn, R. and M. Valdez-Pizzini. 1996. Survey of recreational fishing in Puerto Rico, with emphasis on queen conch. Report submitted to Caribbean Fishery Management Council. CFMC. 2012. ACL Amendment. http://caribbeanfmc.com/SCANNED%20FMPS/annual_catch_limit.htm Garcia-Moliner, G., W. Keithly, and I. Oliveras. Recreational SCUBA diving activity in the US Caribbean. GCFI 52. pp. 363-371. SEDAR. 2006. Caribbean spiny lobster. http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=08%20A SEDAR. 2007. Queen conch. http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=14 Valle, M. 2002a. <http://www.sefsc.noaa.gov/docs/QueenConchUpdate.pdf> Valle, M. 2002b. <http://www.sefsc.noaa.gov/docs/QueenConchAssessment.pdf>

2. Methodology

2.1. Methodology

This pilot study will utilize port sampling interviews at recreational fishing sites around Puerto Rico for a six-month period that

includes the August-October closed period for queen conch. Depending on MRIP approval and funding, sampling is expected to begin in June 2013. We anticipate that the project will involve the seven steps described below. 1) Outreach activities to inform and involve recreational fishers before the project begins. 2) Interviews at recreational landing sites. 3) Identification and stratification of recreational fishing sites (Conch-Lobster strata) based on interviews (1). 4) Sampling recreational catch directly from fishers (based on site stratification (2), following a survey design (to be developed)). 5) Analysis of recreational survey data. 6) Sampling conch species and sizes from shell mounds on the shore. 7) Intercept sampling. 1) Outreach activities. Meetings will be held to inform recreational fishermen and key stakeholders about the project before interviews are conducted. Other activities may include mailing lists, distributing flyers with information about the project, phone calls, etc. 2) Interviews at recreational landing sites. The investigators will develop an interview form based on MRFSS and the suggestions from the September MRIP workshop to understand where, when, and how the recreational fishery for conch and lobster occurs. The Project Team will contract with a fishery consultant to provide personnel and technical support. The consultant will hire approximately four interviewers and one supervisor/interviewer. Ideally, the interviewers will have previous fisher interviewing experience and will receive training for the specific requirements of the project. Approximately 147 landing sites for recreational queen conch or spiny lobster harvesters have been identified (DNER, pers com.). Interviews will be conducted with recreational and commercial fishers, dive masters, port agents and MRFSS interviewers to obtain the best information possible about sites where queen conch and spiny lobster may be harvested by recreational fishers to clarify the sites and potentially stratify the areas by (recreational) catch or effort levels. 3) Identification and stratification of recreational fishing sites (Conch-Lobster strata) based on interviews. Based on the results of those initial interviews, we will divide the sites into strata (e.g., north, west, south, and east coasts and offshore islands and cays) and assign interviewers to cover each stratum. We will randomly sample the sites, interviewing active fishers in each stratum according to a sampling design to be developed at the beginning of the project. 4) Sampling recreational catch following a survey design. The fishery consultant will develop a survey instrument to address all the questions listed above. To reduce the rate of interview refusals, we intend for the interview to take no more than 15 minutes. The survey instrument will include filter questions to exclude licensed commercial fishers and appropriately identify, to the degree practicable, the remaining fishers as recreational (personal use) or commercial without valid licenses (sales outside of the authorized commercial system). The consultant will oversee the interviewers, will provide coordination among the team members; will provide quality control for data collected, and will provide data analysis and draft reports. The Project Team chose to engage a fishery consultant because DNER does not have the internal capacity to conduct the project, and personnel restrictions would not allow adding new personnel to do the work. 5) Analysis of recreational survey data. Survey data will be analyzed by the fishery consultant, with technical feedback from the NMFS. One of the main outcomes expected from this analysis are the verification or rejection on the recreational use of the sites for queen conch and spiny lobster harvest; the spatial distribution of catch and effort; and the differences among sites and times of the day. 6) Sampling conch species and sizes from conch shell mounds on the shore. During the surveys, presence of conch shell mounds by the shore will be noted, coordinates and photographs taken, and a subsample of the shells will be identified to species and measured. 7) Intercept sampling. When recreational fishers of conch and lobster species are encountered, they will be intercepted. The coordinates of the site will be recorded, they will be interviewed and their catch identified to species, photographed and measured. Any by-catch will be identified, weighed and measured as appropriate. Preliminary outreach meetings may be needed prior to the beginning of the project, to inform and involve recreational fishers from the inception.

2.2. Region

Caribbean

2.3. Geographic Coverage

Puerto Rico

2.4. Temporal Coverage

May 2013 to April 2014

2.5. Frequency

Continuous sampling during six month field season

2.6. Unit of Analysis

Individual fisher landings

2.7. Collection Mode

paper form, photographs

3. Communication

3.1. Internal Communication

As the project relies on interviewers to collect information from recreational fishers, a rigorous communications schedule will be set up between the Interviewers and the Interviewer Supervisor and between the Interviewer Supervisor and the Fishery

Consultant and the DNER Project Leader. During the final design plan for the project, the Fishery Consultant will communicate at least two times per month with the project team to present draft designs, and to present a final design prior to the start of the sampling. Once sampling starts, at least weekly communications will occur between the Fishery Consultant and the Team Leader, by email and by telephone, to review previous sampling and agree on the priorities for the upcoming week. The Fishery Consultant will pass the schedule to the Interviewer Supervisor on a weekly basis; the Interviewer Supervisor will then set up a weekly schedule for each Interviewer. The Interviewer Supervisor will maintain regular contact with the Interviewers to assure compliance with the survey design and to help resolve any issues that may arise. The Supervisor will confer with the Fishery Consultant and the Team Leader whenever questions arise. On at least a monthly basis, the Fishery Consultant will present a review of the project to the full project team; the project team and the Fishery Consultant will agree to any modifications needed in the design.

3.2. External Communication

Following the monthly team review, the Fishery Consultant and Team Leader will prepare a monthly report to the MRIP Operations Team describing the operations of the project, including any problems encountered and solutions implemented. Should the Project Team identify any issues that need resolution at a higher level, the Team Leader will prepare an inquiry on behalf of the team to send to the Operations Team. If necessary, the Team Leader and Fishery Consultant will confer directly with the Operations Team. The team will prepare a final report upon completion of the project.

4. Assumptions/Constraints

4.1. New Data Collection

Y

4.2. Is funding needed for this project?

4.3. Funding Vehicle

Gulf States Marine Fisheries Commission

4.4. Data Resources

No data required from NOAA

4.5. Other Resources

This project will require hiring four interviewers in addition to the project team identified.

4.6. Regulations

The success of the project is not constrained by regulations.

4.7. Other

The survey design will include sampling the offshore cays and islands of Puerto Rico. Boat access to these sites will be a challenge.

5. Final Deliverables

5.1. Additional Reports

Monthly Progress Reports

5.2. New Data Set(s)

Catch and effort and biological data for queen conch and spiny lobster for the recreational fishery

5.3. New System(s)

None

6. Project Leadership

6.1. Project Leader and Members

First Name	Last Name	Title	Role	Organization	Email	Phone 1	Phone 2
William	Arnold	Caribbean Director	Team Member	SERO	bill.arnold@noaa.gov	(727) 824-5305	
David	Donaldson	Asst Director	Team Member	Gulf States Marine Fisheries Commission	ddonaldson@gsmfc.org	228-875-5912	
Graciela	Garcia-Moliner	FMP Specialist	Team Member	Caribbean Fishery Management Council	graciela_cfmc@yahoo.com	(787) 766-5926	
Craig	Lilyestrom	Director, Marine Resources Division	Team Leader	Puerto Rico DNER	craig.lilyestrom@drna.gobierno.pr	787-999-2200 x 2689	
Grisel	Rodriguez	Sampling Coordinator	Team Member	Puerto Rico DNER	torneo_pr@yahoo.com	787-999-2200	

7. Project Estimates

7.1. Project Schedule

Task #	Schedule Description	Prerequisite	Schedule Start Date	Schedule Finish Date	Milestone
5	Preparation and submittal of final report	4	02/01/2014	03/30/2014	Y
1	Plan final design		05/01/2013	06/01/2013	Y
3	Field evaluation of recreational fishery for queen conch/spiny lobster	2	06/01/2013	11/30/2013	Y
2	Hire Samplers	1	05/15/2013	06/01/2013	
4	Data analysis	3	10/01/2013	01/30/2014	

7.2. Cost Estimates

Cost Name	Cost Description	Cost Amount	Date Needed
Port samplers	5 port samplers for 6 months: salary, benefits, overhead	\$102800.00	05/01/2013
Travel for port samplers	Mileage, per diem, ferry fares, etc.	\$14000.00	05/01/2013
Equipment	Digital cameras, clipboards and other misc	\$1500.00	05/01/2013
Analyst/planner (Fishery Consultant)	Finalizing survey design, lead analysis and reporting	\$25000.00	05/01/2013
DNER support	DNER salary, benefits, and overhead	\$7500.00	06/01/2013
Travel from mainland to PR	Airfare, hotels, subsistence	\$5000.00	06/01/2013

Cost Name	Cost Description	Cost Amount	Date Needed
Project management (Fishery Consultant)	Oversight, review	\$6000.00	07/01/2013
Gulf State Marine Fisheries Commission	Administration	\$10000.00	05/01/2013
TOTAL COST		\$171800.00	

8. Risk

8.1. Project Risk

Risk Description	Risk Impact	Risk Probability	Risk Mitigation Approach
Difficulty in obtaining/retaining samplers	Turnover could result in inconsistent application of protocols or gaps in coverage	Low	Hiring experienced former samplers
Difficulty reaching island and cays	Missing areas or under sampling could bias the data	Medium	Modified sampling strategy for the islands and cays based on recommendation from Consultants' Report
Uncooperative fishers	Refusals could result in missing data for some segments of the fishing population	Medium	Outreach giving explanations of the project before and during sampling
Nighttime sampling	Safety will restrict and possibly preclude night sampling, based on other sampling experience in the US Caribbean	Medium	Add question to questionnaire to determine frequency and quantity of night landings

9. Supporting Documents