SUPPORTING STATEMENT
SOCIO-ECONOMIC ASSESSMENT OF SNAPPER GROUPER (SASG) FISHERIES IN THE U.S. CARIBBEAN
OMB CONTROL NO. 0648-XXXX

B. COLLECTION OF INFORMATION EMPLOYING STATISTICAL METHODS

1. Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection method to be used. Data on the number of entities (e.g. establishments, State and local governmental units, households, or persons) in the universe and the corresponding sample are to be provided in tabular form. The tabulation must also include expected response rates for the collection as a whole. If the collection has been conducted before, provide the actual response rate achieved.

Because of the absence of federal fishing licenses in the U.S. Caribbean, it is unlikely that the entire population of deep-water snapper fishermen will be known completely. Therefore, the sampling frame was derived from several sources of information pooled together, including licensing reports, catch trip tickets, 2008 Puerto Rico fishermen census conducted by the Puerto Rico's Department of Natural and Environmental Resources, 2011 U.S. Virgin Islands fishermen census, (conducted by Drs. Kojis and Quinn (independent contractors- Dr. Kojis formerly worked at the U.S. Virgin Islands Division of Fish and Wildlife), and key informants, which include federal and commonwealth fishery managers and industry leaders.

The sources suggest that there are about 150 deep-water snapper fishermen in Puerto Rico and 100 deep-water snapper fishermen in the U.S. Virgin Islands. Thus, we anticipate conducting about 250 in-person interviews. The timing of the data collection will be determined by the contractor in consultation with CMFC staff.

Although we intend to sample the entire universe of fishermen (250), we expect to complete 200 surveys. This figure assumes an 80% response rate, which was observed in a similar study conducted by Knapp[1]. The study by Knapp surveyed 129 Alaska halibut IFQ shareholders to assess their perceptions about the performance of the program.

Table 1 summarizes the key statistics about the proposed sampling strategy. Our strategy is based on work by Green (1991) who provides a comprehensive overview of the procedures used to determine regression sample sizes.[2] He suggests $N > 50 + 8 m$ (where m is the number of independent variables) for testing the multiple correlation and $N > 104 + m$ for testing individual predictors (assuming a medium-sized relationship) and if testing both, to use the larger sample size. Given our budget constraints, we anticipated multiple correlations for both jurisdictions and regressions for at least Puerto Rico.

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[1] Knapp, G., 1997. Initial Effects of the Alaska Halibut IFQ Program: Survey Comments of Alaska Fishers. Marine Resource Economics, Volume 12, pp. 239–248

[2] Green, S. B. (1991). How many subjects does it take to do a regression analysis? *Multivariate Behavioral Research, 26,* 499-510.

Table 1: Sampling strategy for deep-water snapper-grouper fishermen.

Geographical Area	Population size (estimated)	Target Sample	Expected Response Rate	Anticipated sample*
PR deep-snapper fishermen	150	150	80%	120
USVI deep-snapper fishermen	100	100	80%	80
Total	**250**	**250**		**200**

2. Describe the procedures for the collection, including: the statistical methodology for stratification and sample selection; the estimation procedure; the degree of accuracy needed for the purpose described in the justification; any unusual problems requiring specialized sampling procedures; and any use of periodic (less frequent than annual) data collection cycles to reduce burden.

One-time, in-person, voluntary surveys will be used to elicit information on the socio-economic performance of the deep-water snapper fishery. The list of shareholders will be provided by NMFS to the contractor. The contractor will attempt to survey the entire universe of shareholders provided. Because the universe of fishermen is not completely known due to the absence of federal fishing licenses, the contractor will ask key informants and/or active fishermen to help identify additional deep-water snapper fishermen not present in the list.

The data collected will be used for descriptive and analytical purposes. Descriptive uses include the estimation of indexes of community dependence. The procedures for estimating these indexes will be based on the standard equations available in various statistical texts such as Thompson (1992)[3].

3. Describe the methods used to maximize response rates and to deal with nonresponse. The accuracy and reliability of the information collected must be shown to be adequate for the intended uses. For collections based on sampling, a special justification must be provided if they will not yield "reliable" data that can be generalized to the universe studied.

Several steps will be taken to maximize the response rates. First, the contractor was selected for her survey experience and familiarity with local fishing communities and practices. Second, the contractor will conduct in-person surveys at times and places that are convenient to fishermen. This will minimize any potential disruption to fishermen's fishing practices. Third, the contractor will work with local authorities to ensure that the wording facilitates understanding and reflects local idioms. Last, surveys will be available in English and Spanish to further reduce any burden to non-English speaking fishermen.

To deal with non-response we will use call-backs as described in textbooks such as Lohr's (see, Lohr's, S., 1998. Sampling: design and analysis).

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3 Thompson, Steven K., 1992. Sampling. John Wiley and Sons, Inc., New York, 343 p.

4. Describe any tests of procedures or methods to be undertaken. Tests are encouraged as effective means to refine collections, but if ten or more test respondents are involved OMB must give prior approval.

In addition to sharing the survey instrument with NMFS and Caribbean Fishery Management staff (CFMC) staff, the contractor made it available to the members of the CFMC Catch Share Advisory Panel, which is made up with active deep-water snapper fishermen. Members of NMFS, CFMC and the advisory panel on catch shares provided suggestions to improve the content and clarity of the questions.

5. Provide the name and telephone number of individuals consulted on the statistical aspects of the design, and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze the information for the agency.

Ms. Flavia Tonioli from the Cooperative Institute for Marine and Atmospheric Studies (CIMAS) was hired to design a statistically sound data collection strategy, conduct the data collection and analyze the survey information for the NMFS. Ms. Tonioli can be reached at 305-361-4567.

Dr. Juan Agar, a social scientist employed by the NMFS, was also consulted on the statistical design. NMFS social scientists and CFMC staff will use the data for regulatory analysis.