

## B. COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS

*(If your collection does not employ statistical methods, just say that and delete the following five questions from the format.)*

**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.**

The absence of federal fishing licenses in the U.S. Caribbean requires the use of trip ticket and fishermen census databases to build sampling frames.<sup>1</sup> The sampling frame was developed by merging Puerto Rico's DNER and U.S. Virgin Islands F&W trip ticket databases with the Puerto Rico's and U.S. Virgin Islands' fishermen census databases, respectively. The trip ticket database provided us a list of active fishermen (i.e., fishermen actively landing fish) while the censuses supplied us with their most current addresses.

Because of Puerto Rican fishermen animosity towards the newly instituted Commonwealth regulations, there has been a pointed decrease in the number of the trip ticket forms returned in recent years. Therefore, we decided to include trip ticket data from 2001-2004 in the design of the sampling framework. Our intention is minimize any bias caused by the low reporting compliance with the industry reporting requirements (i.e., capture trip ticket non-respondents). Unlike in Puerto Rico, trip ticket reporting has remained constant in the U.S. Virgin Islands during the last years. For consistency, we also used 2001-2004 data in the U.S. Virgin Islands.

The sampling design requires that stratified random sample of 1,000 fishermen. We plan to survey 700 fishermen in Puerto Rico and 300 fishermen in the U.S. Virgin Islands. Gear type will be used to stratify the sample. We weighed the number of sub-gears to be sampled by their contribution to total landings.<sup>2</sup> For instance, if bottom line contributed 40% of the total landings then we weighted the sample appropriately.

Tables 2 and 3 summarize the number of fishermen who participate in the hook and line, net and dive fisheries in Puerto Rico and U.S. Virgin Islands, respectively. Note that the same fisherman may use multiple gears during a given year. Agar et al (2005) reported an average response rate of 0.8 in a recent study (see, Agar, J. J., M. Shivrani, J. R. Waters, M. Valdés-Pizzini, T. Murray, J. Kirkley and D. Suman, 2005. U.S. Caribbean Fish Trap Fishery Costs and Earnings Study. NOAA Technical Memorandum NMFS-SEFSC- 534, 127 p.)

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<sup>1</sup> The only exception is the HMS permit, which is required for those vessels harvesting tunas, swordfish, and sharks in the Atlantic Ocean, including Gulf of Mexico and Caribbean waters.

<sup>2</sup> For instance, hook and line gear is made up of four sub-gears: bottom line, longline, rod and reel, and trolling.

**Table 2: Sampling design for gear operating in the Commonwealth of Puerto Rico.**

| Geographical Area | Gear type    | Population Size | Survey Sample | Expected Response Rate | Target Number of Surveys per Strata |
|-------------------|--------------|-----------------|---------------|------------------------|-------------------------------------|
| Puerto Rico       | Bottom line  | 2550            | 325           | 0.8                    | 260                                 |
|                   | Longline     | 277             | 18            | 0.8                    | 14                                  |
|                   | Trolling     | 918             | 90            | 0.8                    | 72                                  |
|                   | Rod and line | 61              | 26            | 0.8                    | 21                                  |
|                   | Beach Seine  | 201             | 26            | 0.8                    | 21                                  |
|                   | Trammel      | 222             | 20            | 0.8                    | 16                                  |
|                   | Gillnet      | 1158            | 139           | 0.8                    | 111                                 |
|                   | Cast net     | 352             | 21            | 0.8                    | 17                                  |
|                   | Scuba diving | 1317            | 188           | 0.8                    | 150                                 |
|                   | Skin diving  | 321             | 23            | 0.8                    | 18                                  |
| <b>Total</b>      |              |                 |               |                        | <b>700</b>                          |

**Table 3: Sampling design for gear operating in the U.S. Virgin Islands.**

| Geographical Area   | Gear type    | Population Size | Survey Sample | Expected Response Rate | Target Number of Surveys per Strata |
|---------------------|--------------|-----------------|---------------|------------------------|-------------------------------------|
| St. Thomas/St. John | Gillnet      | 3               | 3             | 0.8                    | 3                                   |
|                     | Cast net     | 16              | 16            | 0.8                    | 13                                  |
|                     | Seine net    | 28              | 26            | 0.8                    | 21                                  |
|                     | Trammel      | 0               | 0             | 0.8                    | 0                                   |
|                     | Line         | 128             | 101           | 0.8                    | 82                                  |
|                     | Longline     | 0               | 0             | 0.8                    | 0                                   |
|                     | Scuba diving | 20              | 16            | 0.8                    | 13                                  |
|                     | Skin diving  | 23              | 18            | 0.8                    | 14                                  |
| St. Croix           | Gillnet      | 44              | 26            | 0.8                    | 21                                  |
|                     | Cast net     | 8               | 10            | 0.8                    | 8                                   |
|                     | Seine net    | 19              | 21            | 0.8                    | 17                                  |
|                     | Trammel      | 1               | 1             | 0.8                    | 1                                   |
|                     | Line         | 169             | 63            | 0.8                    | 50                                  |
|                     | Longline     | 2               | 0             | 0.8                    | 0                                   |
|                     | Scuba diving | 96              | 84            | 0.8                    | 67                                  |
|                     | Skin diving  | 34              | 31            | 0.8                    | 25                                  |
| <b>Total</b>        |              |                 |               |                        | <b>300</b>                          |

**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, voluntary surveys will be used to elicit costs and earnings information. The method of sampling will be stratified random. The survey will encompass different gear and sub-gears (e.g., trolling and longline belong to the hook and line gear category) and geographical strata (Puerto Rico, St. Thomas & St. John, and St. Croix). The stratification is needed because 1) the fleet's economic performance is likely to vary by gear used (e.g., scuba diving is more efficient than skin diving) and geographically due to the spatial and temporal availability of various reef fish species, 2) the proposed regulations could inadvertently marginalize or exclude some of the user groups.

To minimize the burden on fishermen, a list containing a random sample of fishermen for each sub-gear and area will be provided to the selected contractor. The list will contain the following information: fisherman name, address, and phone number. A list in excess of 1,000 names will be provided to take into account the possibility that some fishermen will decline to participate in this voluntary survey. Should a fisherman decline to participate in the survey, the contractor could then select an additional fisherman from the list until the survey goal for the given stratum is reached.

The data collected will be used for descriptive and analytical purposes. Descriptive uses include the estimation of average harvesting costs per trip and total harvesting costs for the fleet. The procedures for estimating harvesting costs in the sampling universe will be based on the standard equations available in various statistical texts such as Thompson (1992).<sup>3</sup> For a description of analytical purposes the reader is directed to section A.2.

**3. Describe the methods used to maximize response rates and to deal with non-response. 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 will be selected for survey experience and familiarity with local fishing communities and practices. Second, trained interviewers 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 and two-phase sampling procedures as described in textbooks such as Lohr's. (See, Lohr's, S., 1998. Sampling: design and analysis). The sample size of 1,000 will provide reliable estimates of the cost structure of the industry.

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<sup>3</sup> 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.**

We pre-tested the survey with 5 fishermen to make instrument easier to understand and complete.

**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.**

Drs. Jim Waters and Juan Agar, social scientists employed by the NMFS, were consulted on the statistical design.<sup>4</sup> NMFS social scientists and CFMC staff will use the data for regulatory analysis.

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<sup>4</sup>Drs. Jim Waters and Juan J. Agar, Southeast Fisheries Science Center, National Marine Fisheries Service and be reached at 252-728-8710 and 305-361-4218, respectively.