

**SUPPORTING STATEMENT
MARINE DEBRIS SURVEY IN THE COASTAL NORTH CAROLINA REGION
OMB CONTROL NO. 0648-xxxx**

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 sampling frame includes the target population of fishers licensed by NC DMF (commercial license or recreational using commercial gear license) or assisting crew. The area frame will include only those fishers or assistants who fish within the geographic area of Core and Back Sounds, NC, including The Straits (defined and referred to in the survey as the Core Sound Area). This area frame was determined because the area overlaps with the ecological study area of the funded marine debris project. Nonrespondents will include those we cannot contact as well as those who refuse to give the information. This collection has not been attempted before.

This sampling and part of the area frame (fishers using Core Sound only, not including Back Sound or The Straits) was targeted previously by NC DMF in 2002 and 2006 via phone surveys. These NC DMF surveys were administered to determine the perceptions of fishers in the areas of fisheries management and challenges inherent in commercial fishing. In 2006, a list of 286 commercial fishing license holders was identified from the NC DMF license database. The NC DMF obtained a 58% (165 respondents) response rate of their expected 286 universe. Our survey will also include fishers using Back Sound and The Straits and fishers holding a Recreational Users of Commercial Gear License (RCGL).

Table 1: Number of fishers using two geographic areas within our sample frame, divided into subgroups of licenses.

Group	Population size ¹				Expected response rate in this survey
	Core Sound ²	North River and Back Sound ²	Total fishers reporting catch from the Core Sound, North River/ Back Sound area ^{2,3}	Monthly range of fishers using the NC Central Area (South River to the White Oak River including the Core Sound Area) ⁴	
Number of fishers using Standard Commercial Fishing License (SCFL), Retired Standard Commercial Fishing License (RSCFL), and shellfish endorsement	407	147 (288 total, less those who also use Core Sound)	554	N/A	285 respondents or 51%, including 26 respondents or 80% of aquaculture leaseholders and 10 respondents or 77% of pound net leaseholders
Subgroup of fishers above (SCFL, RSCFL, &/or shellfish endorsement): Aquaculture lease	33	0	N/A	N/A	
Subgroup of SCFL or RSCFL fishers above: Pound net lease	13	0	N/A	N/A	
Recreational Commercial Gear License (RCGL)	N/A	N/A	117 ⁴	0-352 ⁴	50 respondents or 42%
TOTAL RESPONDENTS			671		333 or 50% overall

¹ Number of fishers in 2007 provided by NC DMF. The number of fishers actively fishing does not equal the total number of SCFL and RSCFL licenses for several reasons. One of these reasons is that fishers may hold multiple SCFL or RSCFL licenses because there is a limited number available, so they are viewed as a commodity. When fishers hold multiple licenses, they may either subcontract license(s) to others or may not actively fish the licenses. Many license holders participate in multiple seasonal fisheries and fish in both Core Sound and North River/Back Sound.

² NC DMF arranges their geographic area differently than we do in this survey: we include all of Core Sound, and all of Back Sound, but not North River. Therefore, we can include all of the total number of fishers using Core Sound as part of our sampling universe, but only part of the number using North River/Back Sound. The number of total fishers (554) is an overestimate because our geographic area frame is smaller.

³ The total number does not equal the sum of Core Sound and North River/Back Sound because many fishers fish in both areas due to their geographic proximity. It is likely that our total population number for the Core Sound Area is between 407 and 554.

⁴ NC DMF surveys their RCGL license fishing effort over a geographic area much bigger than our study area. NC DMF results present a monthly extraction of RCGL fishing effort: over the 2007 calendar year, RCGL license effort fluctuated from a low of 0 to a high of 352 fishers using the geographic area from South River to White Oak River, NC. Because we have no other way to extrapolate these numbers to our geographic area, we have estimated the geographic area of our study (Core Sound Area) to be approximately 1/3 that of the NC DMF Central Area and conjecture that our survey population in the Core Sound Area may be approximately 1/3 that of the total Central Area.

This will be a sample survey rather than a census because it would be too burdensome, expensive, and logistically impractical to collect data from the target population in its entirety. Personal information on fishing license holders (SCFL, RSCFL, RCGL) is not public and may not be obtained from the NC DMF due to privacy reasons. However, names of leaseholders (Pound net and aquaculture leases, subgroups of SCFL, RSCFL) are public information and have been obtained from NC DMF. We are uncertain of the exact population size of fishers holding NC DMF licenses because, due to privacy reasons, we are unable to utilize NC DMF's license database of contact information for fishers in our area frame, except in the case of lease holders,

when the information is public. This is particularly confounding for determining numbers of RCGL license holders. We are unable to determine an exact number of RCGL fishers within our geographic frame because NC DMF estimates RCGL usage on a monthly basis over a much larger geographic area. For this reason, we will not be able to make the claim that our RCGL results are as representative of the population as our commercial fisher results may be, but may be able to compare responses of recreational license holders using commercial gear to those of commercial fishers.

It is difficult to estimate an actual response rate within our respondent universe during this initial study. The number of respondents we are able to encounter may be reduced due to the logistics of capturing our respondents. Based on discussion with NC DMF social scientists and commercial and recreational fishers, we suspect that the number of fishers actively fishing (though still retaining a license) this year may have decreased significantly from 2006 due to economic concerns including high fuel costs. A reduction of a fisher's days on the water reduces the chance of an encounter for our survey. This is particularly true for RCGL license holders, a higher proportion of whom may not be from the local area, who do not frequent local fish houses or supply houses, and whose effort varies considerably on a monthly basis⁴.

We expect to sample 285 respondents holding commercial fishing licenses (51%) and 50 respondents holding RCGL licenses (42%). We expect that within the commercial fishing license group, we will be able to sample higher percentages of: 1) the percentage of aquaculture leaseholders because NC DMF has provided us with contact information and 2) pound net leaseholders, because NC DMF has provided us with names (but not contact information) and GPS coordinates of their pound net location(s).

During high points in respective fishing seasons, members of the target population will be surveyed at fishing houses where catch is sold, at supply stores that are social congregation points, at docks and harbors, and on the water (fishing), with supplemental sampling at community meetings. For those leaseholders whose contact information we have, we will call them to arrange a convenient time and location for surveying that will minimally impact their business. Those who choose not to participate will not be sampled. Our sampling locations that are social congregation points are fish houses, supply stores, harbors, and docks. We will also ask each respondent to refer prospective, interested respondents via a snowball sampling approach. We believe that a combination of sampling these social congregation points, snowball sampling, and directly contacting leaseholders will be an efficient strategy at getting the highest representation of our target universe, while providing minimal impact to small businesses. Our likelihood of encountering respondents will be increased by the fact that most fishers within the target population do multiple types of fishing throughout the year.

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.

This population is distributed over a low-density geographic area, with limited group locations (fish houses, supply stores, docks, and harbors). Interviewers will work within a specific area of North Carolina (Core Sound Area) and will attempt to obtain data that is representative of

commercial fishers in these areas. This is a small population that is hard to locate. We have publicly available contact information (names only, or names and addresses) provided by NC DMF for the small subgroups listed above (aquaculture leaseholders, pound net leaseholders) of the total number of license holders.

When we have publicly available contact information, we will contact the fisher and, if the fisher chooses to participate, will arrange a convenient sampling time and location. To address the larger group of license holders for which we have no contact information, we will utilize a combination of convenience sampling and snowball sampling. *Convenience sampling* will be used to opportunistically select samples at supply stores, fish houses, docks and harbors, and on the water. Because many fishers use fish houses, supply stores, docks, and harbors near the sampling area, we will focus our efforts upon these group locations. On the water sampling will be used when 1) the fisher is known and has a productive working relationship with CCFHR scientists or 2) when surveyors observe the fishers to not be in the process of active fishing (i.e. taking a break), to prevent interference with active fishing. *Snowball sampling*: each respondent may refer the surveyor to other interested parties, to sample the population that may not be encountered otherwise. We believe snowball sampling will be an effective strategy because this is a culturally tight-knit community with a small degree of separation among fishers.

Due to the opportunistic nature of encountering respondents, no statistical sampling methods will be used in selecting them. This is a small population with few gathering points. It will take a planned effort to encounter respondents, based on contributors' knowledge of local fisheries and their patterns to achieve our goals. Responses will be stratified for analysis by type of license and type of fishing. Percentage of total respondents will be compared to the NC DMF total number of respondents from their 2006-7 survey.

This is a one-time collection and no periodic data collection cycles will be used.

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.

To maximize the response rates, we will use in-person, face-to-face surveys. Questions will be as simple and brief as possible. Other NOAA colleagues have a prior positive working relationship with this group of fishers. We will strive to enhance this group's perception that actions based on the information collected will be helpful to them. We will attempt to conduct interviews so that they have minimal impact on business activity.

Our complete survey instrument may be administered over the phone in the following situations:

- 1) For leaseholders, we have some publicly available contact information. In these circumstances, we will call the phone number and ask if the license holder would like to participate and if s/he would be able to meet at a convenient, pre-arranged public location (i.e. dock or harbor) to conduct the survey in person. If the license holder would like to participate but can not arrange a meeting point, we will offer to conduct the survey over the phone.

2) For referral information that we have obtained from previously completed surveys (snowball survey methodology). In this situation, we may phone the referred person, if a number is provided, and ask if s/he would like to participate and if they would prefer to complete the survey over the phone or to meet at a convenient, pre-arranged location.

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.

Methods and some questions have been tested in a survey done by the North Carolina National Estuarine Research Reserve in July-August, 2008. Surveys have been tested on 7 respondents prior to beginning the study.

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.

Individuals consulted on the statistical aspects of the design:

Ryan Kelty, PhD	Washington College, Department of Sociology (800)422-1782
Chris Ellis, PhD	NOAA Coastal Services Center, Human Dimensions Program (843) 740-1195
Zoe Meletis, PhD	University of Northern British Columbia, Department of Outdoor Recreation & Tourism Management (250) 960-5114

Names of Agency unit, contractor(s), grantee(s) or other person who will actually collect and/or analyze the information for the agency:

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