

# Non-response Bias Study for the Large Pelagics Telephone Survey

FY 2011 Proposal

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# 1. Overview

## 1.1. Sponsor

## 1.2. Focus Group

Survey Design and Evaluation

## 1.3. Background

Non-response error occurs when the following two conditions are met: 1) a significant number of people in the survey sample do not respond to the questionnaire, and 2) non-respondents differ from respondents in a way that is important to the study. The U.S. Office of Management and Budget (OMB) has established the following standard on response rates for federal agencies: "Standard 1.3: Agencies must design the survey to achieve the highest practical rates of response....Nonresponse bias analyses must be conducted when unit or item response rates or other factors suggest the potential for bias to occur...."For telephone surveys non-response generally results from one of the following: contacted refusals, wrong/bad phone numbers, or non-contacts. In recent years the potential for non-response bias due to non-contacts has increased with the use of answering machines, voicemail, and caller identification features used to screen calls. The relative use of these technologies may vary across different segments of the survey population and these segments may differ in attributes important to the study. In addition, some segments of the population may simply be more difficult to reach at home than others. For example, with fisheries surveys more avid anglers may be more difficult to reach at home because they spend more time outdoors fishing. Groups that are easier to contact by phone are not necessarily the most cooperative though. Thus, understanding non-response bias in telephone survey research requires understanding the interplay between two important factors, "contactability" and cooperation level, for various segments of society. For segments of the population that are both difficult to contact and uncooperative, these factors have an additive effect. Under-representation of such segments should be an area of concern for telephone survey researchers. Regarding what is considered "significant" non-response, OMB suggests federal agencies plan for a nonresponse bias analysis if the expected unit response rate is below 80 percent. Nonresponse bias studies use a variety of techniques to answer the important question: Do the nonrespondents differ from respondents in a meaningful way that could bias the survey results? One technique involves use of additional external data for benchmarking or matching with the sample. However, such external data may not always exist, particularly for subject specific questions such as fishing avidity or fish species targeted. Another type of nonresponse analysis utilizes variables already available on the sampling frame. Sampling frame variables that may correlate with survey instrument variables of interest can be used to compare response rates between subgroups. This is a fairly simple and inexpensive technique (no additional data collection needed) that can provide some evidence about potential bias. The drawbacks are that subgroup formation is limited to the variables already on the frame, and this technique does not provide a direct estimate of nonresponse bias. Another approach is to followup directly with nonrespondents. Following up with nonrespondents is one of the most effective nonresponse study techniques since it directly compares respondents with initial nonrespondents who are ultimately converted to respondents. It is also one of the most commonly used techniques since it does not rely on external data sources or on correlated variables being available on the sampling frame. Additional effort (cost and time) is needed to get initial nonrespondents to respond. This can include more call attempts for a phone survey, incentives, change of mode, use of "elite" interviewers, or some combination of these. Depending on time and budget constraints, nonrespondent followup can involve attempting to contact all initial nonrespondents or just a subset of nonrespondents (i.e. "two phase" or "double sampling"). NOAA Fisheries has conducted the Large Pelagic Survey (LPS) in the Northeast Region (Maine through Virginia) since 1992. The LPS is designed as a specialized survey that focuses specifically on estimating catch and effort for large pelagic species (e.g., tunas, billfishes, swordfish, sharks, wahoo, dolphins, and amberjacks). The LPS includes two independent, yet complementary surveys which provide the effort (Large Pelagic Telephone Survey) and mean catch-per-unit-effort (Large Pelagic Intercept Survey) estimates needed to estimate total catch by species. The LPTS is stratified into two sampling modes: Private and Charter. This project will focus only on the Private boat mode, or Private LPTS. The Private LPTS is a biweekly survey of boats in which interviews with boat operators are used to collect fishing effort information. The survey is typically conducted with vessels from Virginia through Maine from June through October. Private LPTS data are used to estimate the total number of boat trips on which anglers fished for large pelagic species. The survey covers private vessels with either the commercial Atlantic Tunas General category permit or the recreational HMS Angler category permit. Interviewing for each two-week reporting period is conducted during a 7-day period (from Monday through Sunday) immediately following the two-week period. Once a vessel has been selected, a minimum of 10 attempts must be made to contact that vessel's representative. Telephone calls are made during the time of day that maximizes the potential to contact vessel operators. All first attempts are made the first day, and repeat attempts are distributed among weekend/weekday and day/evening time periods following a set protocol. At least five additional attempts are made to reach each representative once a phone contact with a co-resident has been made. Phone interviewers continue to attempt to contact vessel representatives until they have conducted an interview, determined that the boat is no longer operating, or made 10 call attempts. Table 1 and Figure 1 show the final disposition of all Private LPTS vessels selected in 2009. Overall response rate averaged 73% with not much variation among states. Most of the nonresponse is from non-contacts including answering machines (13.0%) and respondent not available (4.6%). Although outright refusals account for only 1.2% of the nonrespondents, some proportion of the non-contacts might be viewed as passive refusals where permit holders are screening their calls or using a gatekeeper to avoid being interviewed. Wrong or bad telephone numbers accounted for the second largest contribution to nonresponse (6.9% overall). Phone numbers are obtained from the permit database and are provided by the vessel representative when purchasing their permit. Although response rates are reasonably good for a telephone survey, nonresponse

bias could still be an issue affecting Private LPTS survey results and estimated fishing effort. One way nonrespondents may differ from respondents is in whether or not they fished during the reporting period. That is, many permit holders may be operating under the false assumption that if they did not fish (or more specifically did not fish for large pelagics) during the two-week reporting period they do not need to be interviewed. The existence of this false assumption is supported anecdotally by emails and phone calls from sampled permit holders to the NOAA Fisheries project manager (R. Salz, personal communication). If this is true then avidity may be artificially inflated due to nonresponse bias resulting from underrepresentation of zero trip reports. Similarly, trip rates could be biased high if more dedicated or enthusiastic anglers are both more likely to participate in the survey and generally take more large pelagic fishing trips. This could be counterbalanced if more avid anglers are also more difficult to contact by phone.

#### **1.4. Project Description**

Work will be ordered through a modification to the existing contract for the LPTS to conduct a non-response follow-up study in 2012. The contractor will complete all tasks for the private LPTS non-response followup study including collection of data, data entry, editing of data, quality assurance of survey operations, and quality control of the data. Non-respondents will be re-contacted through additional phone calls and through a mail survey. Both treatments will use a short form of the LPTS questionnaire. The Contractor will also be responsible for documenting and delivering all required databases and programs developed for data entry and data processing. The LPTS non-response follow-up study will be conducted in the Northeast Region (Maine through Virginia) during a 22-week period from June through November 2012. States will be grouped into the following strata: Virginia, Maryland/Delaware, New Jersey, New York, Connecticut/Rhode Island, Massachusetts, and Maine/New Hampshire.

#### **1.5. Public Description**

#### **1.6. Objectives**

Conduct a nonresponse study of the Private boat Large Pelagics Telephone Survey/Identify subgroups within the Private LPTS frame that exhibit different characteristics and different response rates

#### **1.7. References**

Salent, Priscilla and Don A. Dillman. 1994. How to Conduct Your Own Survey. New York: John Wiley. Office of Management and Budget. 2006. Standards and Guidelines for Statistical Surveys.

## **2. Methodology**

### **2.1. Methodology**

The sample frame will consist of all LPTS private boat non-respondents for that particular two-week sampling period including all non-contacts, bad/wrong phone numbers, and refusals. The Contractor will keep track of all LPTS pre-notification letters that are returned as undeliverable. The Contractor will attempt to correct any identified bad addresses and/or wrong/bad phone numbers for all initial nonrespondents (prior to assigning non-respondents to a particular treatment) using the following two techniques: • Updating information in the LPTS frame with the most current HMS Angling and Atlantic Tunas General category permit lists. NOAA Fisheries will provide Quantech with access to the permit lists which are updated daily. • Reverse look-up techniques (phone number from address or address from phone number). If both the address and phone number are incorrect and neither could be corrected the non-respondent will be flagged and removed from the frame. In addition to the regular LPTS sample frame variables, the non-response follow-up frame will include the following: • Disposition of the non-response (e.g., refusal, no answer, bad number etc.); • For any contacts that did not result in a completed interview include the day of week and time of the contact(s), day/time of any appointments, and any interviewer comments regarding the contact; • Interviewer comments regarding refusals; • A field indicating if the original LPTS pre-notification letter was returned to the Contractor as undeliverable; • A field indicating whether the phone number in the non-response frame was the same as the phone number in the original frame, was changed based on updated permit list information, or was changed based on reverse look-up; • A field indicating whether the address in the non-response frame was the same as the phone number in the original frame, was changed based on updated permit list information, or was changed based on reverse look-up; Design Treatments Once the non-response sampling frame is developed each non-respondent will be assigned to one of two possible data collection treatments: Treatment One – Phone survey, Treatment Two – Mail Survey. Rules for assigning non-respondents to a treatment are as follows: • If the initial LPTS pre-notification letter was returned as undeliverable and the address could not be corrected using either an updated permit list or reverse look-up then the non-respondent will automatically be assigned to the Phone Survey treatment. • If the initial non-response disposition was bad/wrong number and the phone number could not be corrected using either an updated permit list or reverse look-up then the non-respondent will automatically be assigned to the Mail Survey treatment. • For the remaining units, the non-response frame will be sorted by permit category (General and Angling) and then randomized within category. For a complete census of non-respondents, all odd numbered units will be assigned to Treatment 1 and all even numbered units to Treatment 2. Treatment One: Phone Survey Follow-up Non-response Notification Letter A notification letter will be mailed to all non-respondents selected for Treatment One. Emphasis will be placed on the importance of the survey in general, the need for zero trip reports, the very short time required for non-response (short form) interviews, and the mandatory reporting requirement as a condition of the HMS permit. A non-monetary incentive for participating (e.g. waterproof fish guide)

provided by NOAA Fisheries will also be included in the mailing. The Contractor will assure that all notification letters are post-marked no later than the first Tuesday following the end of the initial LPTS dialing period. Non-response Phone Survey Followup All interviewing will be done through a Computer Assisted Telephone Interviewing (CATI) system. Dialing for the non-response phone survey will begin on the second Monday following the end of the initial LPTS fielding period. The non-response phone survey fielding period is 7 days (Monday-Sunday). Once a vessel has been selected for non-response Treatment One, a minimum of 10 call attempts during the non-response fielding period must be made to contact that vessel's representative. Dialing procedures will be similar to the regular LPTS procedures. The Contractor will use information obtained during the initial LPTS call attempts to increase the probability of contacting a respondent and conducting an interview. This could include the day of week and time of any previous contacts, the day of week and time of any scheduled interviews, information regarding proxies, phone number updates, and any other interviewer comments regarding the contact. The Contractor will use "elite interviewers" for all dispositions of "refusal" from the initial LPTS contact. Elite interviewers will have extensive experience with the LPTS and will be particularly skilled at refusal conversion. Contractor interviewers will leave a standardized message if the call is answered by an answering machine or voice mail system. The standardized message will only be for the first call that an answering machine or voice mail is reached. Treatment Two: Mail Survey Follow-up The mail survey treatment will consist of multiple mailings to further encourage participation. The schedule for the mailings will be as follows: 1. First mailing – post marked no later than the first Tuesday after the regular LPTS dialing period ends. 2. Second mailing – post marked no later than the second Tuesday after the regular LPTS dialing period ends (i.e. 1 week after initial mailing). 3. Third mailing - post marked no later than the third Thursday after the regular LPTS dialing period ends. All permit holders in Treatment Two will receive the first mailing. Materials in the first mailing will include the questionnaire, a cover letter, postage paid envelope for returning the questionnaire, and a non-monetary incentive for participating (provided by NOAA Fisheries). The second mailing is a postcard sent to all permit holders selected for Treatment Two. The postcard reminder will provide further encouragement to return the survey and also serve as a thank you note for those who already sent it in. The post card will also include a phone number and email address to contact if the respondent lost the original survey or has any questions. The third mailing will only be sent to those permit holders for whom a completed survey had not yet been received back. The third mailing includes the questionnaire, a cover letter, and a postage paid envelope for returning the questionnaire. The Contractor will be responsible for tracking all mailings and returned surveys including the date each mailing was sent out, the postmarked date on all returns, and any undeliverable mailings by type of nondelivery, following AAPOR's standard definitions for mail surveys. All mailed surveys will contain a unique identification number that will be linked to a particular vessel for tracking purposes.

## **2.2. Region**

Mid-Atlantic, North Atlantic

## **2.3. Geographic Coverage**

Virginia through Maine

## **2.4. Temporal Coverage**

June through October

## **2.5. Frequency**

sampling bi-weekly

## **2.6. Unit of Analysis**

## **2.7. Collection Mode**

phone and mail surveys

## **3. Communication**

### **3.1. Internal Communication**

Project team held a kick-off meeting in Silver Spring on June 28 2011. Project team will communicate through conference calls and emails as needed.

### **3.2. External Communication**

Monthly reports submitted to MRIP OT

## **4. Assumptions/Constraints**

### **4.1. New Data Collection**

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## 4.2. Is funding needed for this project?

## 4.3. Funding Vehicle

## 4.4. Data Resources

## 4.5. Other Resources

- Nonresponse followup will be conducted by the current LPTS contractor as a modification to the existing contract vehicle. o This will require justification to do as modification rather than a new competitive procurement. Having two different contractors conduct the initial survey and the followup could raise methodological issues and introduce a data collector effect that may confound results. In addition, if a new procurement is required the followup study could be delayed by several months.
- The current LPTS contractor will be able to take on the additional workload to conduct the followup attempts. o The current contractor is a Government certified Small Business and operates out of a small office with a limited number of calling stations. In addition, followup attempts should be made within a reasonable time frame to minimize the effect of recall bias on results. If capacity is not available to recontact all nonrespondents then a sample will need to be drawn (two phase sampling).

## 4.6. Regulations

- The existing OMB Paperwork Reduction Act (PRA) for the LPTS will cover the followup study or can be modified with a Change Request to meet the needs of this project. o This assumes that the existing LPTS PRA has sufficient burden hours for whatever additional burden the nonresponse followup entails. While burden hours may be sufficient for same mode followups, if a different sampling mode is used (e.g. email or certified mail) it is likely that the current PRA will need to be modified through a Change Request. This usually does not take more than two months to process. If an entirely new PRA is needed it could take up to 6 months.

## 4.7. Other

## 5. Final Deliverables

### 5.1. Additional Reports

final report documenting results of the nonresponse analysis and followup study

### 5.2. New Data Set(s)

### 5.3. New System(s)

## 6. Project Leadership

### 6.1. Project Leader and Members

First Name	Last Name	Title	Role	Organization	Email	Phone 1	Phone 2
Rob	Andrews		Team Member		rob.andrews@noaa.gov	301-427-8105	
John	Foster	Mathematical Statistician	Team Member	NOAA Fisheries	john.foster@noaa.gov	301-427-8130	
Kristen	Olson	Assistant Professor	Team Member	U. Nebraska Lincoln	kolson5@unl.edu	402-472-7737	402-472-6057
Ronald	Salz	Fishery Biologist	Team Leader	NOAA Fisheries	ron.salz@noaa.gov	301-427-8171	
Ana	Valentin		Team Member	NOAA Fisheries	ana.valentin@noaa.gov	301-427-8187	

## 7. Project Estimates

### 7.1. Project Schedule

Task #	Schedule Description	Prerequisite	Schedule Start Date	Schedule Finish Date	Milestone
4	Implement nonresponse followup study	2	06/13/2011	11/30/2011	
5	Finalize report and submit to MRIP Operations Team	4	01/15/2013	02/15/2013	Y
1	Plan/hold project kick-off meeting		06/01/2011	06/28/2011	Y
3	OMB PRA change request for non-response study		01/02/2012	03/05/2012	
2	Finalize SOW and modify current contract for LPTS work	1	06/28/2011	07/29/2011	

## 7.2. Cost Estimates

Cost Name	Cost Description	Cost Amount	Date Needed
Consultants	Hire nonresponse study experts to serve on project team 80 hours @ \$150 per hour	\$12000.00	04/01/2011
Contractual Services	LPTS contract modification cost to conduct nonresponse followup	\$45000.00	08/01/2011
TOTAL COST		\$57000.00	

## 8. Risk

### 8.1. Project Risk

Risk Description	Risk Impact	Risk Probability	Risk Mitigation Approach
Proposed contractor cost of non-response follow-up census exceeds available funds.	moderate	Low	1) Request additional funds from MRIP to cover gap between estimated and actual cost of non-response study. 2) If additional funds not available we will need to select a subsample of non-respondents rather than attempt a complete census as proposed.

## 9. Supporting Documents