Exploring Differences Between Mail and Telephone Survey Estimates of Fishing Effort: Measurement Error

FY 2016 Proposal

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1. Overview

1.1. Sponsor
Rob Andrews

1.2. Focus Group
Survey Design and Evaluation

1.3. Background
MRIP has designed and certified a mail survey design, the Fishing Effort Survey (FES), as an alternative to the Coastal Household Telephone Survey (CHTS) for monitoring recreational fishing effort. Testing of the FES resulted in effort estimates that were systematically larger than CHTS estimates. Given the magnitude of the differences between CHTS and FES estimates, MRIP has developed a three-year Transition Plan (http://www.st.nmfs.noaa.gov/Assets/recreational/pdf/MRIP%20FES%20Transition%20Plan%20FINAL.pdf) to ensure that the impacts of survey design changes on assessment and management processes are evaluated and mitigated to the greatest extent possible. The Transition Plan includes a three-year benchmarking period to evaluate differences between FES and CHTS estimates, development of a statistical model to predict the impact of survey errors on historical CHTS effort estimates, and revision of historical effort estimates based upon model results.

Differences between FES and CHTS estimates have been attributed to survey errors that impact the CHTS and result in an under-estimate of fishing effort (Andrews et al, 2014). The effects of nonresponse error and coverage error on survey estimates were directly evaluated during testing of the FES design and are relatively understood. In contrast, the impact of measurement error is more hypothetical. Andrews et al. (2015) and Brick et al. (2012) hypothesized that a type of measurement error, referred to as a “gatekeeper effect”, contributes to differences between CHTS and mail survey estimates of fishing effort. The gatekeeper hypothesis suggests that the initial CHTS respondent, whose responses to screening questions determines whether or not a household is classified as a fishing household, under-reports household fishing activity, resulting in an under-estimate of fishing effort. The hypothesis is based upon the observation that approximately 2/3 of initial CHTS respondents (i.e. the person who answers the telephone) are female, and that females are much less likely to report household fishing activity than males.

A gatekeeper effect has been experimentally observed in samples of licensed anglers – households with licensed anglers are less likely to report fishing when screening questions about fishing are administered to the individual who answers the phone than when they are administered to a licensed angler. We expect that the impact of the gatekeeper effect is greater in landline telephone samples than in samples of licensed anglers, which include cell phone numbers and are more likely to be answered by the licensed angler (negating the gatekeeper effect). This project will attempt to quantify the magnitude of the gatekeeper effect in the CHTS and help explain differences between CHTS and FES estimates.

1.4. Project Description
This project will explore the gatekeeper effect in the Coastal Household Telephone Survey. We anticipate that this project will result in a better understanding of bias in the CHTS, which will help explain differences between CHTS and FES estimates and contribute to the development of a calibration model that will be used to revise historical MRIP effort and catch estimates. Assessing bias in existing surveys is identified as a Survey Design and Evaluation priority.

1.5. Public Description

1.6. Objectives
1) Quantify the magnitude of measurement error, specifically the gatekeeper effect, in the CHTS; 2) Determine the extent to which the gatekeeper effect contributes to differences between FES and CHTS effort estimates.

1.7. References
Brick. J.M., W.R. Andrews, and N.A. Mathiowetz. 2012a. A Comparison of recreational fishing effort survey designs. Available: https://www.st.nmfs.noaa.gov/mdms/doc/08A_Comparison_of_Fishing_Effort_Surveys_Report_FINAL.pdf.

Andrews, W.R., J.M. Brick, and N.A. Mathiowetz. 2014. Development and testing of recreational fishing effort surveys: Testing a mail survey design. Available: http://www.st.nmfs.noaa.gov/Assets/recreational/pdf/2012-FES_w_review_and_comments_FINAL.pdf.

2. Methodology

2.1. Methodology
The gatekeeper experiment will utilize CHTS sampling protocols to select landline telephone numbers and initiate telephone

interviews (http://www.st.nmfs.noaa.gov/Assets/recreational/pdf/CHTS%20SOW%202014.pdf). Samples of telephone numbers will be allocated into two treatments, a CHTS-like control group, in which fishing questions are administered to the individual who answers the telephone (the gatekeeper), and an experimental treatment, in which fishing questions are administered to a randomly selected household member (e.g. household member with the next birthday). Within household sampling in the experimental treatment will ensure that screening questions are administered to a representative sample of household members. The survey for both groups will consist of a series of questions designed to determine 1) if the individual respondent fished during a two-month reference wave; 2) if any other household members fished during the reference wave, and 3) demographic information, including the total number of household members, as well as the age and gender at a minimum, for each household member.

Survey data and estimates will be compared among treatments to determine if household screening procedures impact estimated household fishing activity. In addition, data will be examined within and among treatments to determine if reported household fishing activity is influenced by the demographic characteristics of the responding household member and/or the demographic characteristics of the household. Finally, results from both treatments will be compared to estimates from the CHTS, which will be conducted concurrently with the gatekeeper experiment.

The gatekeeper experiment will be conducted in two states during two, two-month reference waves. The locations and timing of the study will reflect a variety of demographic characteristics and expected fishing activity.

2.2. Region
Gulf of Mexico, Mid-Atlantic, North Atlantic, South Atlantic

2.3. Geographic Coverage
TBD - two states

2.4. Temporal Coverage
TBD - 2 reference waves

2.5. Frequency
Bi-Monthly

2.6. Unit of Analysis

2.7. Collection Mode
Telephone

3. Communication

3.1. Internal Communication
The project will be administered by the Office of Science and Technology Effort Survey Team. The team participates in face-to-face meetings approximately monthly and conducts weekly or bi-weekly conference calls with data collection contractors.

3.2. External Communication
The team will submit a final project report at the conclusion of the study and complete monthly project updates. The team will support the MRIP Communications and Education Team as needed.

4. Assumptions/Constraints

4.1. New Data Collection
Y

4.2. Is funding needed for this project?
Y

4.3. Funding Vehicle
S&T Contract

4.4. Data Resources

4.5. Other Resources

4.6. Regulations

4.7. Other

5. Final Deliverables

5.1. Additional Reports

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 Leader	NMFS, Office of Science and Technology			
John	Foster		Team Member	NMFS, Office of Science and Technology			
Ryan	Kitts-Jensen		Team Member	NMFS, Office of Science and Technology			
Anjel	Lewis		Team Member	NMFS, Office of Science and Technology			

7. Project Estimates

7.1. Project Schedule

Task #	Schedule Description	Prerequisite	Schedule Start Date	Schedule Finish Date	Milestone
2	Develop Survey Instrument		12/01/2015	02/29/2016	
3	Data Collection		08/28/2016	11/07/2016	
4	Data Analysis		11/28/2016	04/30/2017	
5	Draft project report		05/01/2017	07/31/2017	
1	Modify CHTS contract		11/01/2015	12/31/2015	

7.2. Cost Estimates

Cost Name	Cost Description	Cost Amount	Date Needed
Data collection contract	15,000 completed interviews @ $10.00 per interview	$150000.00	
TOTAL COST		$150000.00	

8. Risk

8.1. Project Risk

Risk Description	Risk Impact	Risk Probability	Risk Mitigation Approach
OMB does not approve data collection	The project cannot be completed	Low	Utilize current CHTS instrument, which will not require OMB approval

9. Supporting Documents