Measurement Error in the CHTS and ALDS: Assessing the Effects of Length of Recall Period on Data Quality

FY 2010 Proposal

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1. Overview

1.1. Sponsor

1.2. Focus Group

Survey Design and Evaluation

1.3. Background

The current designs of the CHTS and ALDS involve an interviewer-administered, telephone survey, during which one respondent (typically) reports on the fishing activities for him- or herself as well as all other anglers in the household. The respondent is queried about characteristics of anglers in the household, number of days in the past two months that anglers fished, and then details about the trips for each of the days on which the angler fished.With the exception of some discussion of the use of panel surveys (to improve efficiency) and the internet as a mode of data capture, the NRC report on Recreational Fisheries Survey Methods did not address measurement error issues. See pages 6, 17, 46, and 48 of the report for the limited discussion.We know little about the extent to which measurement error impacts data quality for the CHTS and the ALDS. Measurement error in the reporting of a valid license will impact dual frame designs (which need to account for probability of sampling from both frames) whereas error in the reporting of the number of trips or the details of those trips will impact the overall estimates of effort, and therefore, the estimates of catch. Although there are many design features of the CHTS and the ALDS which could be examined with respect to assessing measurement error, one factor which may have a large impact on the quality of CHTS and ALDS estimates is the use of a 2-month recall period for reporting effort. With respect to length of recall period, we know that the longer the length of the recall period, (that is, the time between the behavioral event and the date of the interview) the greater the likelihood that the event will not be reported. This has been well documented across the reporting of many different types of behaviors (e.g., purchases, unemployment spells, health care utilization) and often follows a pattern of exponential decay –that is, higher levels (more accurate reporting) of reporting for events close in proximity to the date of the interview, with sharp fall off as the recall period increases. Figure 1 illustrates this pattern using the 2008 CHTS data. We see in Figure 1, a higher frequency of fishing trips reported for trips falling within a week or two prior to the interview than for trips occurring earlier in the two month reference period. The exception to the pattern is for Wave 5—but the general pattern even with Wave 5 is for higher reporting of trips for trips closest to the date of the interview.DesignExperimental design would allow for the measurement of the effects of various design features in the CHTS and/or ALDS. We propose an experiment to assess the effects of the two month recall period on data quality. The study would involve interviewing random replicates across time, such that, for example, for some respondents a fixed reference week is the previous week, for some respondents it is two weeks ago, for some respondents it is three weeks ago, etc., etc. The underlying assumption is that the fishing experience for a fixed week across the replicate samples is equivalent and that the shortest recall period results in the most accurate (lowest rates of omissions) data.So as to be relatively efficient, we would propose that an angler license frame be used; the methodology would involve the fielding of 1/8th of the total sample each week for an eight week period. Each week, the reference period for the study would shift by one week (see Table 1); under the assumption of equal rates of fishing among the random replicates, the design would allow us to measure the effects of declining recall (or more specifically reporting) as the recall period between the interview date and the fishing trip increases. For example, in Table 1, we only focus on examining effort data for the period between May 23 and May 30th. Depending upon the field date, for some respondents this week represents a 1-week recall period, while for others it represents a 2-week or longer recall period.Critical to the success of such a study is the successful fielding and completion of cases during the week they are assigned.To detect a difference in percentage of anglers who fished in a given week of 5% or greater, we will need to have 305 completed interviews per week. To detect a 4% difference between adjacent weeks would require a sample size of just less than 500 cases per week. We would propose the smaller sample, resulting in 2440 completed interviews. Assuming a 25% response rate, 10,000 total cases should be sampled and fielded.

1.4. Project Description

1.5. Public Description

1.6. Objectives

The objectives of the research are to assess the extent to which the length of the recall period impacts the quality of the estimates of effort in the CHTS and/or ALDS. The information derived from the experiments will assist in redesign efforts for CHTS and/or ALDS, regardless of whether or not the studies continue to be conduct by telephone or move to a self-administered (mail or internet based) questionnaire.

1.7. References

2. Methodology

2.1. Methodology

2.2. Region
Alaska, Caribbean, Gulf of Mexico, Mid-Atlantic, North Atlantic, Pacific, South Atlantic, Western Pacific Islands

2.3. Geographic Coverage

2.4. Temporal Coverage

2.5. Frequency

2.6. Unit of Analysis

2.7. Collection Mode

3. Communication
3.1. Internal Communication

3.2. External Communication

4. Assumptions/Constraints
4.1. New Data Collection

4.2. Is funding needed for this project?

4.3. Funding Vehicle
ST Data Collection Contract

4.4. Data Resources

4.5. Other Resources

4.6. Regulations

4.7. Other
The ability to successfully contact anglers is dependent upon the completeness and quality of contact information (telephone) numbers included in the sample frame.

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 Member				
Mike	Brick		Team Member				

First Name	Last Name	Title	Role	Organization	Email	Phone 1	Phone 2
Nancy	Mathiowetz		Team Leader				
Lynne	Stokes		Team Member				

7. Project Estimates

7.1. Project Schedule

Task #	Schedule Description	Prerequisite	Schedule Start Date	Schedule Finish Date	Milestone
1	Identify State or states for conducting study		03/01/2010	03/31/2010	
2	Draft sample design document		03/01/2010	06/30/2010	
3	Procure data collection contractor	1	03/01/2010	05/01/2010	
4	Data Collection / Monitor field progress	3	05/30/2010	07/17/2010	
5	Analyze data	4	08/17/2010	09/30/2010	
7	Present findings at American Statistical Association Meetings		11/30/2010	11/30/2010	
8	Submit paper for publication		11/30/2010	11/30/2010	
6	Draft Report	5	10/01/2010	11/30/2010	

7.2. Cost Estimates

Cost Name	Cost Description	Cost Amount	Date Needed
Project-specific Travel		$5000.00	05/15/2010
Data Collection Contracts		$50000.00	04/01/2010
TOTAL COST		$55000.00	

8. Risk

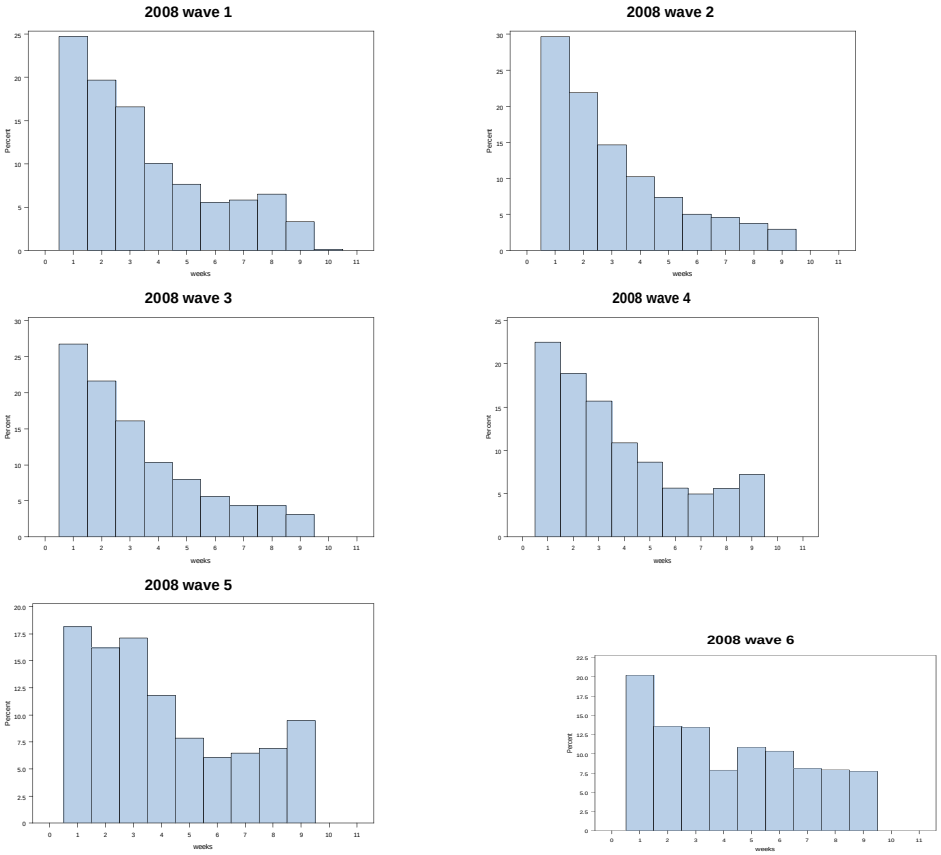
8.1. Project Risk

Risk Description	Risk Impact	Risk Probability	Risk Mitigation Approach

9. Supporting Documents

"Number of Fishing Trips Reported by Number of Weeks Since Trip, 2008 CHTS", page 1

Figure 1. Number of Fishing Trips Reported by Number of Weeks Since Trip, 2008 CHTS



[Note: The wave 5 peak occurring 9-10 weeks prior to the interview could be an artifact of Labor Day weekend Landmark events –such as a holiday –often aid in the recall of events.]

Design

Experimental design would allow for the measurement of the effects of various design features in the CHTS and/or ALDS. We propose an experiment to assess the effects of the two month recall period on data quality. The study would involve interviewing random replicates across time, such that, for example, for some respondents a fixed reference week is the previous week, for some respondents it is two weeks ago, for some respondents it is three weeks ago, etc., etc. The underlying assumption is that the fishing experience for a fixed week across the replicate samples is equivalent and that the shortest recall period results in the most accurate (lowest rates of omissions) data.

"Sample outlining comparisons for experimental to test the effects of recall period", page 1

So as to be relatively efficient, we would propose that an angler license frame be used; the methodology would involve the fielding of 1/8th of the total sample each week for an eight week period. Each week, the reference period for the study would shift by one week (see Table 1); under the assumption of equal rates of fishing among the random replicates, the design would allow us to measure the effects of declining recall (or more specifically reporting) as the recall period between the interview date and the fishing trip increases. For example, in Table 1, we only focus on examining effort data for the period between May 23 and May 30th. Depending upon the field date, for some respondents this week represents a 1-week recall period, while for others it represents a 2-week or longer recall period.

Table 1.Sample outlining comparisons for experimental to test the effects of recall period

FIELD DATES	REFERENCE PERIOD FOR SURVEY	ANALYTIC WEEK OF INTEREST	RECALL PERIOD
May 30-June 5	April 4-May 29	**May 23-May 29**	**1 week**
June 6- June 12	April 11-June 5	**May 23- May 29**	**2 weeks**
		May 30- June 5	1 week
June 13-June 19	April 18-June 12	**May 23- May 29**	**3 weeks**
		May 30 – June 5	2 weeks
		June 6 – June 12	1 week
June 20-June 26	April 25-June 19	**May 23- May 29**	**4 weeks**
		May 30 – June 5	3 weeks
		June 6 – June 12	2 weeks
		June 13- June 19	1 week
June 27- July 3	May 2- June 26	**May 23-May 29**	**5 weeks**
		May 30 – June 5	4 weeks
		June 6 – June 12	3 weeks
		June 13- June 19	2 weeks
		June 20 – June 26	1 week
July 4 – July 10	May 9 – July 3	**May 23-May 29**	**6 weeks**
		May 30 – June 5	5 weeks
		June 6 – June 12	4 weeks
		June 13- June 19	3 weeks
		June 20 – June 26	2 weeks
		June 27 – July 3	1 week
July 11- July 17	May 16- July 10	**May 23- May 29**	**7 weeks**
		May 30 – June 5	6 weeks
		June 6 – June 12	5 weeks
		June 13- June 19	4 weeks
		June 20 – June 26	3 weeks
		June 27 – July 3	2 weeks
		July 4 –July 10	1 week
July 18- July 25	May 23- July 17	**May 23-May 29**	**8 weeks**
		May 30 – June 5	7 weeks
		June 6 – June 12	6 weeks
		June 13- June 19	5 weeks
		June 20 – June 26	4 weeks
		June 27 – July 3	3 weeks
		July 4 –July 10	2 weeks
		July 11- July 17	1 week