Development of Probability Based Sampling Methods for Southeast Headboat Survey Dockside Intercept Sampling Program

FY 2009 Proposal

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1. Overview

1.1. Sponsor

1.2. Focus Group

Survey Design and Evaluation

1.3. Background

The National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) is required to collect statistics on marine recreational fishing. The NMFS uses numerous data collection programs, including surveys and census techniques, to gather information on (1) the participation, fishing effort, and catch in marine recreational fishing. One of the longest running programs used to collect marine recreational fishing statistics is the Southeast Region Headboat Survey (SRHS), operated by the NMFS Beaufort Laboratory since 1972. This survey currently operates from North Carolina through Texas and collects fishing statistics from headboats (large for-hire fishing vessels licensed to carry more than six passengers).

1.4. Project Description

The SRHS consists of two complementary components: dockside bioprofile sampling by trained port agents, and paper logbooks (daily trip reports) collected from the vessel personnel for each trip. Improvement to the logbook program is the focus of a separate proposal to the MRIP Operations Team. This proposal focuses on an area identified by the For Hire Review Panel's recent report, needed improvements in the design of the SRHS dockside intercept survey.The purpose of the intercept survey is to obtain length measurements and weights from harvested fish for the generation of mean weights by species, time and area strata, to go into the calculation of the overall catch summary (mean weights are multiplied by the estimated numbers from the logbook portion of the survey to compute estimated total weight of harvested species). Additionally, the SRHS intercept survey is also tasked to collect biological materials such as otoliths and gonads for the estimation of life history parameters of important species. The SRHS collections have been an integral input into the SEDAR stock assessment process over the last several years by providing up to date age-growth studies so that accurate age-frequencies can be used in the models.Port agents in the SRHS are responsible for a specific geographic area (e.g., Florida Keys). For vessel selection, agents are instructed to systematically sample vessels in their area of responsibility on a rotational schedule in order to sample all vessels as equally as possible. Some vessels run more often than others and thus are likely to get sampled more frequently. Once agents have sampled a frequently running vessel, they concentrate on getting samples from vessels that run infrequently. When deciding which vessels to sample, they note who they have and have not sampled already that month. They are instructed to try and do all vessels once, and then start over. Samplers have a lot of personal freedom in devising sampling agenda. They are instructed to try to sample all headboats equally.In the next stage, anglers are selected when a headboat unloads and the crew starts passing out fish, a port agent walks up to an angler and asks to measure and weigh the catch, explaining that this is part of a fish survey to obtain biological information. Most anglers willingly cooperate with the sampling. Port agents are instructed to select anglers whose stringers contain less common species. The assumption is that stringers with less common fish will undoubtedly also have the more common fishes caught by the majority of anglers, and thus port agents will obtain a sample of the catch consisting of common, uncommon, and rarely caught species.Finally, when selecting which fish on a stringer to sample, port agents are instructed to sample all fish on the initial stringer. Once ten measurements are taken from a species, sampling that species from subsequent stringers is omitted, allowing the port agent more time to choose uncommon fishes, fish for which they do not yet have 10 measurements.In reviewing these procedures, the For-Hire Review Panel noted in its recent report about the SRHS intercept survey that:"On site vessel selection appears to be very opportunistic with few details listed as to how vessels are sampled, except on a convenience basis? The instructions advise interviewers to systematically sample vessels in their area of responsibility on a rotational schedule in order to sample all vessels as equally as possible; but no details are provided as to specific procedures used to accomplish that? Oversampling of frequently running vessels is acknowledged. Anglers on a selected boat are a population. The current selection of anglers departing the boat is a convenience sample, with no procedures in place to assure randomness."The Review Panel recommended:-Anglers on a selected boat are a population. The current selection of anglers departing the boat is a convenience sample, with no procedures in place to assure randomness.-A more structured and randomized sampling procedure for selecting boats should be implemented and adhered to.-A random selection process for choosing anglers to inspect upon arrival at the dock should be implemented, to support a probability sampling approach.The reviewers were unanimous in their conclusion that the current SRHS intercept sampling procedure puts entirely too much choice in the hands of the sampler to be defensible statistically and allow for the proper estimation of variances. They recommend, as shown above, the development of probability sampling methods used to select the sample at all stages of sample selection.Project funds, when appropriated, will be used to hire a contractor with the desired expertise in sample/survey design. We anticipate having a contract in place by mid June 2009, and meeting with the contractor shortly after that for initial discussions. Meetings are expected to occur not only at the contractor's place of business, but in the field as well, so that the contractor may see what exactly occurs on the dock, in order for their design to be realistic. Anticipated completion date of a sampling protocol for the intercept survey for field testing is Sept 30, 2009. Funds for implementation of the new intercept methodology will be the subject of the next MRIP proposal cycle.The product of this project will be a field-ready sampling design, based in probability sampling methods, for dockside intercept sampling of headboats in the southeastern U.S. This method will lead to improved estimates of fish size and average weights, which will in turn result in more reliable estimates of overall catch in weight of fishes in the southeast headboat fishery.

1.5. Public Description

1.6. Objectives
The goal of this project is to address this timely need for statistically standardizing the dockside intercept portion of the SRHS by hiring a consultant with expertise in statistical sampling and survey design to develop a probability-based sampling protocol for implementation in the SRHS. Workloads of SEFSC personnel with the skills necessary to develop this type of design currently are heavy with SEDAR stock assessment duties and do not allow for the addition of a time consuming task such as this to be concluded in an appropriate timeframe.

1.7. References

2. Methodology
2.1. Methodology
Phase 1: InitiationProcure contractor to design probability based sampling protocol for SRHS intercept survey. May 2009.Phase 2: Planning and AnalysisEstablish contract which specifies deliverable formats, schedules, locations, contact personnel and quality control limits. Determine who (office/staff) will have QC oversight of products delivered.Phase 3: Execution and OversightEstablish one project coordinator as oversight contact for the contractor. This contact will be responsible for working with contractor to answer any questions they may have about operation of SRHS. This task may involve visiting field operations with the contractor.Phase 4: Validation and ImplementationThe three coordinators will work with the members of the For-Hire Workgroup to evaluate the effectiveness of the preliminary products and provide recommendations for the OT to consider in designing future implementation projects.Phase 5: CloseThis project will close when the coordinators have in hand a probability based sampling methodology ready to deploy in a multi-site, multi-sampler intercept survey throughout the southeast. Implementation of the product will be initiated in the next fiscal year.

2.2. Region
South Atlantic

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
Project status reports will be provided at the end of each bi-monthly contract period to the Operations Team.The funds spent on the project will be tracked across all levels of expenditures. For all categories, the costs and expenses will be recorded. The total will be provided on the Status Report for bi-monthly period.

4. Assumptions/Constraints
4.1. New Data Collection

4.2. Is funding needed for this project?

4.3. Funding Vehicle
Gulf FIN Grant

4.4. Data Resources

4.5. Other Resources

4.6. Regulations

4.7. Other

This project is expected to provide crucial support for the recommendation that data collection programs need to produce statistically sound estimates of sizes and weights of harvest and discards for use by fishery management, including variances of those estimates.One possible constraint could be the reaction of the industry personnel and the fishing public to a change in sampling procedure after being familiar with an opportunistic style for so long. Strong public relations, long a hallmark of the SRHS, should help overcome any short term difficulties on this front.

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
Kenneth	Brennan		Team Member	NOAA/NMFS/SEFSC			
Michael	Burton		Team Leader	NOAA/NMFS/SEFSC			
Erik	Williams		Team Member	NOAA/NMFS/SEFSC			

7. Project Estimates

7.1. Project Schedule

Task #	Schedule Description	Prerequisite	Schedule Start Date	Schedule Finish Date	Milestone
4	Agency contact will meet as required with contractor, to answer questions about existing survey.		06/30/2009	09/30/2009	
1	Procurement of a statistical/survey design consultant for development of new sampling methodololgy		05/01/2009	09/30/2009	
2	Procure design consultant contractor		05/01/2009	06/30/2009	

Task #	Schedule Description	Prerequisite	Schedule Start Date	Schedule Finish Date	Milestone
3	Contract specification, staff task definitions, data processing /production coordination determined		05/31/2009	06/30/2009	
5	Evaluation of project products, methods, and timeframe.		09/01/2009	09/30/2009	

7.2. Cost Estimates

Cost Name	Cost Description	Cost Amount	Date Needed
Consultants	Contract for survey design specialist to develop probability based sampling protocols for SRHS	$10000.00	06/01/2009
Project-Specific Travel	Federal travel for SRHS staff to meet with contractor initially and for any followup QA/QC necessary	$2000.00	06/01/2009
TOTAL COST		$12000.00	

8. Risk

8.1. Project Risk

Risk Description	Risk Impact	Risk Probability	Risk Mitigation Approach

9. Supporting Documents