Review of Current Sampling and Estimation Methods for the Large Pelagics Survey (LPS)

FY 2011 Proposal

Ron Salz

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1. Overview

1.1. Sponsor
Ron Salz

1.2. Focus Group
Survey Design and Evaluation

1.3. Background
NOAA Fisheries Service is responsible for monitoring and managing United States marine fisheries resources. Large pelagic species (e.g., tunas, billfish, swordfish, and sharks) are of particular management interest as they support socially and economically important recreational and commercial fisheries. The collection of catch and effort information on large pelagics also fulfills U.S. obligations to the International Commission for the Conservation of Atlantic Tunas. The Large Pelagics Survey (LPS) is designed to collect information on recreational fishing directed at large pelagics. Offshore trips targeting large pelagics typically make up a relatively small proportion of all recreational fishing trips. Use of this specialized survey design allows for higher levels of sampling for large pelagic trips, which ultimately improves estimates of catch and effort for large pelagics. The survey is comprised of two independent, complementary surveys: the Large Pelagics Telephone Survey (LPTS), which collects fishing effort information from a list frame of captains holding federal permits required to fish for some large pelagic species, and the Large Pelagics Intercept Survey (LPIS), an access point intercept survey of private and charter boat captains that provides detailed trip and catch characterization data along with supplemental effort information used to account for undercoverage in the telephone survey. Together, these two surveys provide the effort and mean catch rates needed to estimate recreational catch of large pelagics. In response to a 2006 National Research Council (NRC) review of recreational data collection methods, the Marine Recreational Information Program (MRIP) was initiated to address issues identified in the current surveys, including the LPS. The NRC report identified problems in the Access Point Angler Intercept Survey (APAIS, or “intercept survey”) that the NOAA Fisheries Service has conducted for many years as a component of the Marine Recreational Fisheries Statistics Survey (MRFSS). Three main issues were identified: 1) the survey estimators and measures of precision were not accounting for the complex sampling design, 2) the data collection protocols were combining formal randomization with subjective decision-making in ways that make it difficult to develop statistically valid estimators, and 3) the spatio-temporal sampling frame was not providing coverage of fishing trips ending on private property or at night. To address these issues, an MRIP project completed in 2011 produced a new weighted estimation method that appropriately accounts for the MRFSS sampling design (Breidt et al., 2011). The NOAA Fisheries Service subsequently applied this method to produce design-unbiased annual estimates of 2004-2011 total finfish catches for the Atlantic and Gulf of Mexico. A second project completed in 2012 focused on developing a new sampling design for the intercept survey that would address additional NRC concerns about the data collection protocols and temporal coverage of sampling, as well as specific recommendations provided by Breidt et al. (2011) to further improve its statistical validity and accuracy. Recommendations from this study were used to develop a new intercept survey design that will be implemented along the Atlantic and Gulf of Mexico coasts in 2013.

1.4. Project Description
The MRFSS design reviewed by the NRC and the LPS are similar in some respects but differ in several others. Thus, some of the issues identified by NRC and already addressed by MRIP are relevant to the LPS while others are not. There are also survey design issues and potential improvements particular to the LPS that were neither discussed in the NRC report nor addressed in the MRIP projects described above. This project will critically review all aspects of the Large Pelagics Survey including the intercept survey (LPIS), the effort survey (LPTS), and the estimation methodology. Similar to the MRFSS review, this project will address statistical considerations associated with the validity, accuracy, and efficiency of the current LPS sampling and estimation methods. This project will also address HMS management and stock assessment needs for recreational survey data, and recommend survey design and estimation method improvements aimed at better meeting those needs where current or anticipated deficiencies exist. How the data are used in fisheries management will, to a large extent, inform statistical recommendations related to the precision, timeliness, and spatial resolution of catch estimates.

1.5. Public Description

1.6. Objectives
The primary objectives of this project are to 1) review the current LPS sampling and estimation designs that produce data for monitoring recreational catches of highly migratory species from Virginia through Maine, 2) identify potential sources of bias, evaluate applications of sampling theory, and evaluate the utilization of sampling probabilities in estimation methods, 3) identify survey design and estimation method improvements aimed at better meeting HMS management and stock assessment needs for recreational survey data, and 4) provide recommendations and develop proposals for future projects that would design and test necessary improvements in the sampling and estimation designs.

1.7. References
Foster et al. 2008. Large Pelagics Survey: Methodology overview and issues. ICES CM 2008/K:22. National Research Council.

2006. Review of Recreational Fisheries Survey Methods. National Academy Press, Washington, DC.

2. Methodology

2.1. Methodology

The review of the LPS will be coordinated by NMFS staff in the Office of Science and Technology working in collaboration with private consultants with expertise in survey statistics, state agency partners, NMFS staff in the Highly Migratory Species Management Division of the Office of Sustainable Fisheries, and from the Southeast Fisheries Science Center. The project team will also include representatives from the recreational HMS fishing industry. A project kick-off workshop will be held to: 1) clarify and clearly define project objectives and scope, 2) familiarize project team members with the current LPS survey design, estimation methods, and data uses, 3) identify and discuss potential biases, inefficiencies and data gaps with the current approach, 4) identify specific areas of investigation and analysis required (quantitative and qualitative) for making informed recommendations, and 5) assign tasks to specific individuals and groups with timelines for completion. Specific issues addressed by this review will include (but are not limited to) the following: 1) potential bias due to undercoverage of trips returning at night and early morning, 2) potential bias due to undercoverage of trips returning to private access sites, 3) approach for weighting intercept data properly for estimation, particularly HMS tournament data, 4) geographic stratification and trade-offs associated with temporal and geographic resolution of catch and effort estimates, 5) potential bias associated with sampling rates of Angling and General category permit holders in the private boat mode frame 6) survey design effects 7) survey data precision, timeliness, resolution, and temporal/spatial coverage in relation to management and stock assessment needs for HMS recreational data. The project team will also be asked to evaluate the option of integrating the specialized LPIS into the general Access Point Angler Intercept Survey (APAIS). The presumed benefits of integration associated with gains in sampling efficiency will need to be carefully weighed against identified costs (e.g. start-up costs, administrative costs, time-series considerations, questionnaire changes, public perception, and others).

2.2. Region

Mid-Atlantic, North Atlantic

2.3. Geographic Coverage

Current LPS Virginia to Maine;Evaluate options/trade-offs associated with expansion to other regions

2.4. Temporal Coverage

Current LPS June-October; Evaluate options/trade-offs associated with expansion to other months

2.5. Frequency

Annual

2.6. Unit of Analysis

Variable among the surveys to be reviewed and evaluated

2.7. Collection Mode

Variable among the surveys to be reviewed and evaluated

3. Communication

3.1. Internal Communication

1) Project workshop2) Face-to-face meetings as needed for detailed review and analysis3) Conference calls every 2 to 4 weeks as needed

3.2. External Communication

1) Monthly reports to OT through MDMS2) Bi-annual update presentations at Highly Migratory Species Advisory Panel Meetings3) Posting of Workshop materials and summary on MRIP website

4. Assumptions/Constraints

4.1. New Data Collection

N

4.2. Is funding needed for this project?

4.3. Funding Vehicle

travel funded directly by MRIP; consultants hired as subcontractors under existing support vehicle

4.4. Data Resources
LPS data and statistics for 2002 to present

4.5. Other Resources
Consultant labor hours will be needed to perform the reviews, provide reports of recommendations, and support development of new project proposals to address those recommendations.Partner and consultant travel will be needed to attend face-to-face meetings held for focused reviews of the current methods..

4.6. Regulations
Not applicable

4.7. Other

5. Final Deliverables

5.1. Additional Reports
Final project team report with recommendations for LPS estimation and survey design.

5.2. New Data Set(s)
None

5.3. New System(s)
None

6. Project Leadership

6.1. Project Leader and Members

First Name	Last Name	Title	Role	Organization	Email	Phone 1	Phone 2
Jean	Opsomer	consultant	Team Member	Colorado State University	jopsomer@stat.colostate.edu		
Rick	Bellevance	constituent	Team Member	HMS AP member recreational	makosrule@verizon.net		
Jay	Breidt	consultant	Team Member	Colorado State University	jbreidt@stat.colostate.edu		
Craig	Brown	Chief HMS Branch SEFSC	Team Member	NOAA Fisheries	craig.brown@noaa.gov	305-361-4590 x590	
Joseph	Desfosse	Fishery Management Specialist	Team Member	NOAA Fisheries	joseph.desfosse@noaa.gov	228-549-1719	
Guillermo	Diaz	Research Fishery Biologist	Team Member	NOAA Fisheries	guillermo.diaz@noaa.gov	301-427-8589	
John	Foster	Mathematical Statistician	Team Member	NOAA Fisheries	john.foster@noaa.gov	301-427-8130	

First Name	Last Name	Title	Role	Organization	Email	Phone 1	Phone 2
Bruce	Joule		Team Member	Maine Division of Marine Resources	bruce.joule@maine.gov		
Brad	McHale	Branch Chief - HMS NERO	Team Member	NOAA Fisheries	brad.mchale@noaa.gov	978-281-9260	
Ronald	Salz	Fishery Biologist	Team Leader	NOAA Fisheries	ron.salz@noaa.gov	301-427-8171	
Lynn	Stokes	consultant	Team Member	SMU	slstokes@smu.edu	214-768-2270	
Ana	Valentin	Survey Statistician	Team Member	NOAA Fisheries	ana.valentin@noaa.gov	301-427-8187	
Rom	Whitaker	constituent	Team Member	HMS AP member recreational	rom@hatterasrelease.com		

7. Project Estimates

7.1. Project Schedule

Task #	Schedule Description	Prerequisite	Schedule Start Date	Schedule Finish Date	Milestone
1	Plan and hold 2-day project workshop		01/15/2013	04/15/2013	Y
3	Preliminary report on LPS estimation methodology with recommendations	2	08/01/2013	09/02/2013	Y
5	Review Large Pelagics Telephone Survey Design	1	09/03/2013	11/04/2013	
6	Preliminary report on LPIS and LPTS survey designs with recommendations	4,5	11/05/2013	01/15/2014	Y
7	Final project team report with recommendations for LPS estimation and survey design	2, 6	01/16/2014	03/03/2014	Y
4	Review Large Pelagics Intercept Survey Design	1	05/01/2013	09/02/2013	

Task #	Schedule Description	Prerequisite	Schedule Start Date	Schedule Finish Date	Milestone
2	Review LPS estimation methodology	1	04/16/2013	08/01/2013	

7.2. Cost Estimates

Cost Name	Cost Description	Cost Amount	Date Needed
consultant fees	Support of two consultants on project team	$20000.00	04/01/2013
travel	Travel for project team members and other invited guests to workshop	$20000.00	03/04/2013
travel	Travel associated with review team meetings	$5000.00	04/15/2013
TOTAL COST		$45000.00	

8. Risk

8.1. Project Risk

Risk Description	Risk Impact	Risk Probability	Risk Mitigation Approach
Higher MRIP priorities may limit time available for key NMFS personnel to focus on the timely completion of this project	Could result in milestone completion delays.	Low	Rely more heavily on consultant support for design analysis and report writing.

9. Supporting Documents