

Redesign California Recreational Fisheries Survey (CRFS) sampling and estimation procedures for surveys at man-made structures and secondary private and rental boat sites

FY 2012 Proposal

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1. Overview

1.1. Sponsor

Russell Porter

1.2. Focus Group

Survey Design and Evaluation

1.3. Background

MRIP and Pacific RecFIN sponsored a review by statistical consultants of the California Recreational Fisheries Survey (CRFS) sampling designs and estimation procedures (NOAA Fisheries, 2011). The review identified potential improvements and some specific concerns regarding the sampling and estimation designs for the surveys at man-made structures (MM) and at secondary private and rental boat sites (PR2) (Breidt et al, 2011). This proposal requests statistical consultant support to assist California Department of Fish and Game (CDFG) with the redesign of the MM and PR2 surveys and estimation procedures. The goals of the redesign are to address the concerns identified in the review, to improve the reliability, accuracy and precision of the catch and effort estimates, and to improve the efficiency of the field surveys. The current CRFS angler intercept surveys MM and PR2 sites collect data that is used to estimate fishing effort during daylight hours and catch rates (CDFG, 2011). The sampling design aggregates MM and PR2 sites into clusters based on geography. Every month each cluster defines an MM survey and a PR2 survey. For logistic efficiency, the two surveys are consolidated into a single field survey, but even so - with current and anticipated sampling resources - each cluster can be sampled only minimally (one weekday and two weekend days monthly) and higher-effort clusters cannot be visited more frequently. The current approach can provide cluster-specific estimates, but at too great a sacrifice in overall district-wide precision and survey efficiency. The consultants recommended redesigning the MM and PR2 surveys so that use of existing sampling resources would be less constrained in space and time, and could intercept more completed fishing trips, thereby increasing sampling efficiency and enabling more precise aggregate estimates for each district and statewide. Suitably redesigned, sampling would better match the spatiotemporal resolution actually needed for estimates of effort and catch, sampling protocols would be standardized and well documented, and estimation formulas would incorporate correct weights and match the multi-stage design.

1.4. Project Description

This project requests statistical consultant support to implement the MRIP consultants' recommendations for MM and PR2 surveys in California. The project will examine and evaluate various sampling approaches, including the approach used by the MRIP Pilot Study to Test Alternative Sampling Design for Intercept Survey (i.e., the pilot project in North Carolina), to determine the appropriate approach for California's MM and PR2 surveys. For each mode, the project will choose a preferred design with the goal of deploying sampling resources more effectively and improving the precision and reliability of the estimates. The project team will draft a sampling plan and develop estimation formulas which validly match the design. The following is a brief outline of the work plan: 1. Form a Project Team. 2. Project Team develops a scope of work. 3. Identify promising design (including stratification) options for MM and PR2 sampling. 4. Identify analyses needed, and acquire past data needed for analyses. 5. Conduct analyses to explore and compare design options. 6. Choose each mode's preferred sampling design. 7. Specify sampling protocols. 8. Derive and specify estimation formulas. 9. Draft project report.

1.5. Public Description

1.6. Objectives

1. Redesign CRFS MM and PR2 sampling methodology to permit greater efficiency and more reliable and precise (district-level) estimates of effort and catch. 2. For each mode, specify standard sampling protocols including instructions for sample selection, and instructions for samplers. 3. For effort and catch and their variances, specify valid estimation formulas which match the new sampling designs.

1.7. References

Breidt, J., Lesser, V., Opsomer, J. 2011. Review of California Recreational Fisheries Survey. 14p. CDFG (California Department of Fish and Game). 2011. California Recreational Fisheries Survey Methods. 38p. NOAA Fisheries. 2011. Marine Recreational Information Program Implementation Plan, Revision 3: 2011-2012 Update. 30p.

2. Methodology

2.1. Methodology

This will be submitted by the Project Team when it completes the scope of work.

2.2. Region

Pacific

2.3. Geographic Coverage

California

2.4. Temporal Coverage

2.5. Frequency

NA - data already collected

2.6. Unit of Analysis

2.7. Collection Mode

NA - data already collected

3. Communication

3.1. Internal Communication

1. COMMUNICATIONS AND PROJECT TRACKING:(a) Team Co-leaders (Joe Weinstein and Phil Law) will have weekly calls or e-mail exchanges to track progress of the project.(b) Project Team will have, at a minimum, monthly calls or webinars to discuss progress and issues. Additional calls or webinars will be scheduled as needed.(c) Two to three in person meeting and field trips are anticipated with the Team Co-leaders, consultants and various team members.2. SHARING AND DISTRIBUTING INFORMATION AND PRODUCTS: The primary means of distribution will be through e-mail. Files at that are too large for e-mail or documents that will be edited will be placed on the MRIP collaboration tool or on the CDFG/CRFS ftp site.

3.2. External Communication

1. MRIP OPERATION TEAM: (a) A monthly report will be submitted using the MRIP reporting system.(b) The final report will be submitted using the MRIP reporting system.2. PACIFIC RECFIN: A final report will be submitted to Pacific RecFIN.3. CDFG MANAGERS AND PROJECTS: (a) A draft report will be distributed for review.(b) The final report will be distributed.

4. Assumptions/Constraints

4.1. New Data Collection

N

4.2. Is funding needed for this project?

4.3. Funding Vehicle

MRIP support contract (task order).

4.4. Data Resources

It is assumed that existing CRFS and MRFSS data will be adequate to conduct the necessary analysis. The project plans to use existing CRFS data (2004-2011) to assist in the exploration of design options. These data are housed on the Pacific RecFIN server and will be accessible to all team members through the Pacific RecFIN website. If needed, MRFSS site pressure data should also be available from Pacific RecFIN.

4.5. Other Resources

It is assumed that the project will be able to recruit suitable project team members from other agencies, Pacific RecFIN members, and MRIP consultants. California Department of Fish and Game plans to dedicate the time of two statisticians to this project. In addition other CDFG staff will assist with the project.

4.6. Regulations

No regulation should constrain this project.

4.7. Other

The State of California strictly limits out-of-state travel even when travel costs are borne by a federal agency. Therefore, any meetings amongst project team staff would likely need to be held in California. Most project team work can be accomplished via conference call, webinar, e-mail and electronic file transfer.

5. Final Deliverables

5.1. Additional Reports

Final sampling design, protocols and estimation algorithms for each mode (MM and PR2)

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
Jay	Breidt	consultant; professor and assoc. chair statistics	Team Member	Colorado State University	jbreidt@stat.colostate.edu		
Toby	Carpenter	CRFS Field Lead, Environmental Scientist	Team Member	California Dept. Fish and Game	tcarpenter@dfg.ca.gov	562-342-7144	
Marc	Heisdorf	CRFS Supervisor, Senior Environmental Scientist	Team Member	California Dept. Fish and Game	mheisdorf@dfg.ca.gov	707-576-2873	
Ed	Hibsch	RecFIN programmer/analyst	Team Member	Pacific States Marine Fisheries Commission	ehibsch@psmfc.org	503-595-3100	
Matt	Krump	consultant; graduate student	Team Member	Colorado State University	matthewkrump@gmail.com		
Phil	Law	Statistical Method Analyst III	Team Leader	California Dept. Fish & Game	plaw@dfg.ca.gov		
Jean	Opsomer	consultant; professor and chair statistics	Team Member	Colorado State University	jopsomer@stat.colostate.edu		
Connie	Ryan	Staff Environmental Scientist	Team Member	California Dept. Fish & Game	cryan@dfg.ca.gov	650-631-2536	650-996-3268
Joe	Weinstein	Statistical Methods Analyst III	Team Leader	California Dept. Fish & Game	jweinstein@dfg.ca.gov	562-342-7202	

7. Project Estimates

7.1. Project Schedule

Task #	Schedule Description	Prerequisite	Schedule Start Date	Schedule Finish Date	Milestone
1	Form project team; team develops scope of work		05/01/2012	05/31/2012	Y
2	Analyses by project team	1	06/01/2012	11/30/2012	Y
3	Team specifies preferred MM and PR2 sampling designs and protocols	2	12/03/2012	01/31/2013	Y
4	Team specifies estimation formulas, completes deliverables	3	02/01/2013	04/30/2013	

7.2. Cost Estimates

Cost Name	Cost Description	Cost Amount	Date Needed
Statistical consultants	2 PhD-level Statistical consultants each working 73.5 hrs (total 147 hrs) at \$170/hr	\$25000.00	
Graduate Student	12-month stipend for one graduate student plus tuition for two semesters	\$30000.00	
Project Team Travel	10 2-day trips for project team members	\$10000.00	
TOTAL COST		\$65000.00	

8. Risk

8.1. Project Risk

Risk Description	Risk Impact	Risk Probability	Risk Mitigation Approach
Missing or overly degraded survey-site specific data	Delays or suboptimal re-design of PR2 and MM surveys	Low	Use team expertise to impute/estimate missing data. As needed, consult with others who might have knowledge or data on the sites.
Temporary unavailability of CDFG or RecFIN.	Delays or suboptimal final redesign of PR2 and MM surveys.	Low	CDFG and RecFIN staff back-ups exist for nearly all expertise areas. As needed, use the back-up personnel. Schedule builds in generous time margins.
Temporary unavailability of consultants	Delays.	Low	Schedule builds in generous time margins to accommodate any delays.

9. Supporting Documents