UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
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MEMORANDUM FOR: The Record

FROM: Richard Merrick, Ph.D.,
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SUBJECT: Certification of Marine Recreational Information Program (MRIP) Fishing Effort Survey Method

This memorandum certifies the Fishing Effort Survey design described herein as an approved method for derivation of estimates of recreational fishing effort under the Marine Recreational Information Program (MRIP).

BACKGROUND

The Marine Recreational Fisheries Statistics Survey (MRFSS), initiated in 1979, has been the primary source for national recreational fishery statistics in the United States. The MRFSS is a survey design that includes the Coastal Household Telephone Survey (CHTS) and the Access-Point Angler Intercept Survey (APAIS). The CHTS collects data on angler fishing effort from a telephone-based random sample survey of residential households in each coastal state. The APAIS is a shore-side survey that collects data on angler catch through probabilistic sampling of fishing access points and days. Data from the two surveys are combined to estimate total fishing effort, participation, and catch by species. At present, the CHTS is being conducted in the Atlantic coast states, the Gulf coast states (except Texas), Hawaii, and Puerto Rico.

NMFS commissioned the National Research Council (NRC) of the National Academies of Science to conduct a scientific review of the MRFSS in 2005. The NRC's Ocean Studies Board formed a 10-member committee of experts in sampling design and statistics to conduct the review. A final report of their findings (*Review of Recreational Fisheries Survey Methods*) was published in April 2006. The committee identified a number of potential problems with the MRFSS sampling and estimation designs. The report provides recommendations to redesign current surveys to improve: their effectiveness, the appropriateness of their sampling procedures, their applicability to various kinds of management decisions, and their usefulness for social and economic analyses.

The 2007 reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) recognizes the NRC study and provides several new requirements for improving recreational fisheries data collection:

- "Within 24 months after the date of enactment of the [MSRA], the Secretary, in consultation with representatives of the recreational fishing industry and experts in statistics, technology, and other appropriate fields, shall establish a program to improve the quality and accuracy of information generated by the Marine Recreational Fishery Statistics Survey, with a goal of achieving acceptable accuracy and utility for each individual fishery." 16 U.S.C. § 1881(g)(3)(A).
- "The program shall take into consideration and, to the extent feasible, implement the recommendations of the National Research Council in its report *Review of Recreational Fishing Survey Methods* (2006), including...redesigning the survey to improve the effectiveness of sampling and estimation procedures, its applicability to various kinds of management decisions, and its usefulness for social and economic analyses..." *Id.* § 1881(g)(3)(B).

In response to the NRC report and the MSA requirements, the NMFS decided to develop a new program for estimation of recreational marine fish catches designated as the Marine Recreational Information Program (MRIP). MRIP was formally established upon adoption of an Implementation Plan in October 2008 which focused on developing revising estimation procedures, the APAIS intercept surveys, and the CHTS angler effort surveys.

TOWARDS A REVISED ESTIMATE OF ANGLER FISHING EFFORT

In its *Review of Recreational Fisheries Survey Methods* (2006), the NRC expressed several findings and recommendations regarding the traditional design of the MRFSS CHTS:

- The existing random digit dialing (RDD) survey suffers in [in]efficiency from the low proportion of fishing households among the general population and may allow bias in estimation from its restriction to coastal counties only;
- Offsite sampling methods that rely on telephone interviews are complicated by the increasing use of cell phones, especially in surveys of residents of coastal counties;
- This frame (the MRFSS RDD list frame of all working landline telephone numbers in coastal counties) suffers from overcoverage since not all households contain anglers, undercoverage since some anglers do not live in coastal counties or live in coastal counties but have no landline telephones, and duplications since some anglers live in households with more than one working landline;

- A comprehensive, universal sampling frame with national coverage should be established;
- Dual-frame procedures should be used whenever possible to reduce sample bias.

In response to the NRC findings and recommendations, and as directed and authorized by § 401(g) of the MSA, MRIP has undertaken a series of actions to establish more suitable sample frames and to develop and test survey methods which will result in more accurate estimates of fishing effort than provided by the CHTS.

NMFS adopted a final rule in January 2009 that established the National Saltwater Angler Registry and State Exemption Program (NSAR). Under NSAR, anglers and for-hire vessels that fish in the U.S. Exclusive Economic Zone, or that fish for anadromous species, are required to register with NOAA. States that agree to provide NMFS with lists of state-licensed anglers and for-hire vessels or that provide recreational catch data via regional surveys approved per the provisions of the rule may be designated as Exempted States. Anglers and for-hire vessels licensed or registered by such Exempted States are not required to register with NMFS. At present, all U.S. states and territories except Hawaii, Puerto Rico, and the U.S. Virgin Islands are designated as Exempted States. All the states and territories in which the CHTS is currently conducted, except Hawaii and Puerto Rico, are providing NMFS with current lists of licensed/registered anglers at least annually.

Beginning in 2007, MRIP initiated a series of pilot projects to develop and test methods that incorporate angler registries into the survey design. The projects also tested alternative modes of data collection, including use of both telephone and mail sampling frames. A complete listing of the pilot projects, with links to the project reports, is attached to this Memorandum. These projects resulted in a dual-frame mail survey design that was tested over 16 months in four states. The Project Team members were:

- Rob Andrews, NMFS Office of Science and Technology
- Nancy Mathiowetz, Ph.D., University of Wisconsin-Milwaukee
- J. Michael Brick, Ph.D., Westat, Inc.

DESCRIPTION OF THE CERTIFIED METHOD FOR ESTIMATING ANGLER EFFORT

The mail survey design, which estimates recreational private boat and shore fishing activity, was tested in Massachusetts, New York, North Carolina, and Florida during the period of September 2012 through December 2013. The design is a single phase, self-administered mail survey. The sample frame for coastal state residents is the U.S. Postal Service (USPS) Delivery Sequence File, which includes all residential addresses serviced by the USPS. To improve survey efficiency, the design matches the postal address

samples to addresses in the state-provided angler registry list. Matching addresses are sampled at a higher rate and the resultant data are appropriately weighted. The sample frame for non-residents of coastal states is a list of coastal state licenses or registrations issued to non-residents of the state.

Based on the results of the pilot study, the Project Team concluded that:

- Mail survey designs are a feasible alternative to telephone surveys for collecting recreational fishing data;
- Final mail survey response rates were nearly three times higher than CHTS response rates, and preliminary estimates, derived from partial data collected within two weeks from the end of the reference wave, were not significantly different from final estimates;
- Accordingly, a mail survey can generate stable fishing effort estimates within the current estimation schedule for the CHTS;
- The sampling design, which includes over-sampling of households with licensed anglers, is more efficient for collecting fishing data than simple random sampling currently used for the CHTS;
- Differences between mail survey and CHTS estimates can largely be attributed to differences in fishing prevalence; households in the mail survey sample were more likely to report fishing than households in the CHTS sample.
- The mail survey design is less susceptible than the CHTS to bias resulting from nonresponse and non-coverage, and the nature of the mail survey mode results in more accurate responses to questions about fishing activity than the CHTS;
- The mail survey design is a superior approach for monitoring recreational fishing effort; and
- Continued testing and evaluation is recommended to assess additional sources of survey error and ensure that evolving advancements in survey methodology are considered and customer needs are satisfied.

The Final Project Report for the pilot project, *Development and Testing of Recreational Fishing Effort Surveys, Testing a Mail Survey Design, Final Report,* sets forth the tested survey design description and findings in detail. The report is appended to this Memorandum and its findings and conclusions are incorporated by reference.

The Project Report was subject to a two-stage peer review process:

- Three independent peer reviewers were selected by the Research Methods Section of the American Statistical Association.
- In addition, five members of an MRIP external (to NOAA) expert consultant team, who had not been involved in the effort survey methods studies, provided reviews.

Pursuant to the Office of Management and Budget's Final Information Quality Bulletin for Peer Review (OMB Bulletin M-05-03), the peer review plan was submitted for posting to NOAA's peer review plan webpage on December 29, 2014, and will be posted to http://www.cio.noaa.gov/services_programs/prplans/PRsummaries.html.

The peer review reports and the Project Team's responses are appended to this Memorandum. In summary, the peer reviewers concurred with the Project Team's overall findings and conclusions. The Project Report was subsequently reviewed and its approval recommended by the MRIP Operations Team on December 4, 2014, and by the Executive Steering Committee on December 15, 2014.

Pursuant to the provisions of the Paperwork Reduction Act, notice of intent to collect data using the mail survey design was published in the *Federal Register* on April 4, 2013. The collection was approved by the Office of Management and Budget on October 30, 2013, under Control No. 0648-0652.

CERTIFICATION

The mail survey design (the "Fishing Effort Survey" or "FES") described in the attached Project Report titled *Development and Testing of Recreational Fishing Effort Surveys, Testing a Mail Survey Design, Final Report* is certified as a method that has been appropriately developed and peer-reviewed and that is considered scientifically valid. The practical effect of this certification is that NMFS may fund use of this method in benchmarking surveys and fund and/or provide technical support for other similar efforts proposed or used by partner organizations. For example, NMFS plans to initiate the mail survey in 2015 as a benchmarking-only data collection effort to obtain estimates of fishing effort for the Atlantic and Gulf coast states.

This certification does not mean that estimates from the new mail survey are, at this time, the Best Scientific Information Available (BSIA) for purposes of National Standard 2 of the MSA, 16 U.S.C. § 1851(a)(2). Effort estimates from the mail survey cannot be reliably used for fishery stock assessments and management actions until scientifically valid methods have been developed, peer reviewed, and implemented that allow for integration of the new effort estimates into the history of CHTS-derived estimates in a common currency for comparison. Transitioning to full use of the FES mail survey will require that NMFS:

- Conduct the CHTS and FES side-by-side (benchmarking) for a period of time to determine more accurately how the two estimates compare quantitatively,
- Develop a calibration method to adjust the historic estimates to be comparable to the new ones,
- Have the new method peer reviewed, and

- Apply it to catch history time series in updated stock assessments.

A Transition Plan (Plan) will provide for conducting the FES side-by-side with the CHTS in a benchmarking effort for a sufficient time to measure how the results of the two survey methods compare. The Plan will provide for developing calibration factors that will enable conversion of the CHTS estimates into effort estimates that are comparable with the FES estimates. The Plan will also address incorporation of new estimates into existing time series of effort estimates in a manner that results in comparable long-term effort statistics, and a schedule for updating fishery stock assessments and adjusting fishery management measures to reflect the revised catch time series. If such calibration is not feasible or supported by peer review, the Plan will include other methods to update stock assessments in the absence of calibrated long term recreational catch histories.

Until the Plan has been fully executed, the CHTS will continue to be considered as the BSIA for providing effort information on recreational marine fisheries. After the Plan has been executed, the FES will be considered as the source of BSIA for these fisheries.

Appendix: *Development and Testing of Recreational Fishing Effort Surveys, Testing a Mail Survey Design, Final Report*