

SUPPORTING STATEMENT
MARINE RECREATIONAL FISHING EXPENDITURE SURVEY
OMB CONTROL NO. 0648-XXXX

B. COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS

1. Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection method to be used. Data on the number of entities (e.g., establishments, State and local governmental units, households, or persons) in the universe and the corresponding sample are to be provided in tabular form. The tabulation must also include expected response rates for the collection as a whole. If the collection has been conducted before, provide the actual response rate achieved.

The potential respondent universe consists of saltwater recreational anglers in the contiguous U.S., Hawaii, Alaska, and Puerto Rico. The sampling frame will be based on anglers intercepted after a fishing trip, the National Registry of Saltwater Anglers which contains contact information for anglers who purchased a saltwater fishing license during the last year, and those anglers who purchased an Atlantic HMS Angling permit from NMFS. Note that some states collect their own license information but provide that information to the National Registry. For states that are exempted from the National Registry (CA, WA, OR, AK, TX) we will obtain license data that includes angler contact information from either the Pacific States Marine Fisheries Commission or the state agency that collects the data, as they are required to provide NMFS with the data necessary to conduct surveys (i.e., contact information) if they are exempt from the National Registry.

For the durable good portion of the survey, respondents will be stratified by state of fishing license. For the trip expenditure portion, respondents will be stratified by the state of intercepted fishing trip or by state of fishing license. A separate sample will be done for Atlantic HMS Angling permit holders which will be stratified by state of residence.

NOAA Fisheries will use a stratified random sample (proportionally sampled from each state) to select the sampling population from the frame. The sampling frame will be cleaned to remove duplicates. Table 1 describes data on each stakeholder entity.

Response rates for the intercept based trip expenditure questions have averaged about 72% in past expenditure surveys. For the mail based surveys, response rates varied by state, but averaged around 40%.

Table 1. Intercept based sample

Column A. Respondent Entity	Column B. Number of Entries in Sampling Frame (number of MRIP APAIS interviews per year)	Column C. Response rate from previous economic add-on surveys to APAIS	Column D. Expected number of respondents (Column C * 72%)
Trip Expenditures, Intercept survey for states from Maine to Louisiana, Hawaii, and Puerto Rico	102,000	72%	73,440

Table 2. License-frame based sample

Column A. Respondent Entity	Column B. Number of Entries in Sampling Frame	Column C. Minimum observations required to estimate true population value¹ using proportional sampling rate for each strata² (see Equation 1)	Column D. Sample size required under assumption of 40% response rate (Column C / 40%)	Column E. Sample size with 15% Buffer (Column D * 115%)
Trip Expenditures, Shore mode -license frame based survey (CA, OR, WA, TX, AK)	2,337,000	3,314	8,285	9,528
Trip Expenditures, Private Boat mode -license frame based survey (CA, OR, WA, TX, AK)	2,337,000	3,314	8,285	9,528
Trip Expenditures, For-Hire mode -license frame based survey (CA, OR, WA, TX, AK)	2,337,000	3,314	8,285	9,528
Durable Good expenditures	12,639,000	14,380	35,950	41,342
Atlantic HMS expenditures	21,700	1,112	2,780	3,197
Total	19,671,700	25,434	63,585	73,122

¹ n = 278 is the minimum number of observations required for true population estimate for each state or sub-region within a state and resident status strata

² proportional sampling rate per strata = 0.0638%.

2. Describe the procedures for the collection, including: the statistical methodology for stratification and sample selection; the estimation procedure; the degree of accuracy needed for the purpose described in the justification; any unusual problems requiring specialized sampling procedures; and any use of periodic (less frequent than annual) data collection cycles to reduce burden.

For the intercept based trip expenditure portion of the survey, the sampling design will follow the procedures described for the APAIS survey approved under OMB Control No. 0648-0659, which is a multi-stage, stratified cluster sampling design that is based on fishing effort at available public access fishing sites within coastal counties within coastal states. The sample is stratified

by state, two-month wave, type of day (weekday or weekend) and fishing mode (for-hire boats, private boats, and shore). The primary sampling unit is a specific site-day combination within a state and wave. For the shore mode, secondary sampling units are anglers; for the boat modes, secondary sampling units are boat trips and tertiary units are anglers. For more information on the statistical design, please see the supporting statement for OMB Control No. 0648-0659, included as a supplementary document. All anglers 16 years of age and older who complete the basic catch portion of the APAIS are eligible for the economic add-on.

A stratified random sample of the frame will be used to draw the sample population from the angler license frames for the durable good portion of the survey and for the trip expenditure portion of the survey for those states which do not participate in the angler intercept surveys; and for the HMS permit license frame. The allocation method for each of the *l* strata (Respondent Entity) will be a proportional allocation ($n_1/N_1 = n_2/N_2 \dots n_l/N_l$). This allocation method is appropriate when unequal variances for each stratum are assumed, which NOAA Fisheries assumes to be true for stakeholder entities in the frame (Rice 1995).

Note that each state is represented within each *l* strata. The survey instrument provided is an example of a state specific survey (only variation among states is the state name and reference to the state of expenditure).

Following Equation 1 (Yamane 1967) approximately 278 observations are required to represent the true value for a population of > 100,000, assuming a +/- 6% precision rate,

$$Equation\ 1.\quad n = \frac{N}{1 + N(e)^2}$$

$$Equation\ 1,\ Example.\quad 278 = \frac{435,700}{1 + 435,700(0.06)^2}$$

where *n* is the sample size, *N* is the population size, and *e* is the level of precision required. The equation assumes a confidence interval of 95% and maximum variability in the sample (.50). An observation unit is an individual respondent. The example shows the calculations given a hypothetical population size of N=435,700.

To ensure proportional allocation among the strata and to ensure that the minimum number of observations is met for each strata (278 observations) requires a sampling rate of 0.0638% (278/435,700 = 0.0638%). Applying this rate to each stratum (state and resident status) results in a combined sample of observations (Table 2).

We assume a 72% response rate for the trip expenditure APAI add-on survey (Table 1). For the mail surveys, we assume an average 40% response rate nationwide.

As described in Dillman (2000):

- Each respondent will receive a pre-notice letter informing the potential respondent of the survey effort, purpose, and forthcoming survey instrument.
- Approximately 9 days after the pre-notice, a survey instrument and cover letter will be mailed to all sampling units.

- A reminder postcard will be sent to all respondents 2 weeks after the survey mailing, and
- A second survey mailing may be sent to all respondents who have not completed and returned their survey within 2 weeks of the reminder postcard.

NOAA Fisheries has previously conducted a non-response test as part of these surveys in order to determine any effects from non-response and both in 2006 and in 2011 has not found any statistically significant differences between responders and non-responders in terms of household income, demographics, fishing experience, or age.

This collection is a periodic, recurring data collection every 3 years.

3. Describe the methods used to maximize response rates and to deal with nonresponse. The accuracy and reliability of the information collected must be shown to be adequate for the intended uses. For collections based on sampling, a special justification must be provided if they will not yield "reliable" data that can be generalized to the universe studied.

The mail survey implementation will follow state-of-the-art protocols described in ‘The Tailored Design Method’ (Dillman, 2000). Protocols include 3-4 mailings with approximately 2 weeks between mailings: (1) a pre-notice letter informing the respondent that they have been selected to receive a survey within the next two weeks; (2) a cover letter describing the importance of filling out the survey completely and the survey questionnaire; (3) a post-card follow up thanking respondents who returned their survey and reminding respondents to complete their survey and return it if they have not already done so; (4) a possible final mailing including a cover letter and survey instrument. The tailored design method is designed to maximize response rates, and components of the design have been scientifically tested and determined to increase response rates for mail surveys (Dillman, 2000).

4. Describe any tests of procedures or methods to be undertaken. Tests are encouraged as effective means to refine collections, but if ten or more test respondents are involved OMB must give prior approval.

The only changes from the 2011 survey approved under OMB Control No. 0648-0052 were:

- 1) One question added to the intercept interview and the mail expenditure survey, regarding the number of people on the applicable day of the trip (today (intercept), or, on most recent day of fishing).
- 2) Two new questions on the CA survey, to obtain expenditures and trips in Northern vs Southern CA (Section A, Q6; and Section B, Q 1). Northern and Southern CA are quite different in terms of vessel and trip characteristics as well as stocks so we would prefer to get expenditures and economic impacts by region of CA.

No testing was considered necessary for these two straightforward questions.

5. Provide the name and telephone number of individuals consulted on the statistical aspects of the design, and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze the information for the agency.

Sampling Design, Data Analysis and Report Writing:

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References

Dillman, D., 2000. Mail and Internet Surveys. The Tailored Design Method, John Wiley and Sons, Inc., New York, New York.

Rice, J., 1995. Mathematical Statistics and Data Analysis, Second Edition, Wadsworth Publishing Company, Belmont, California.

Yamane, Taro, 1967. Statistics, An Introductory Analysis, 2nd Ed., New York: Harper and Row.

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