# SUPPORTING STATEMENT <br> U.S. Department of Commerce <br> National Oceanic \& Atmospheric Administration Marine Recreational Information Program Fishing Effort Survey OMB Control No. 0648-0652 


#### Abstract

This request is for revision and extension of a currently approved collection. The request includes a new pilot study to test a shorter reference period that will increase the utility of survey data and estimates for fisheries managers and stock assessment scientists by providing greater resolution and more timely access to survey products. Additionally, the Reporting Sensitivity Experiment survey has been completed and that collection will be removed from this control number.


## Justification

1. Explain the circumstances that make the collection of information necessary. Identify any legal or administrative requirements that necessitate the collection. Attach a copy of the appropriate section of each statute and regulation mandating or authorizing the collection of information.

Collection of recreational fisheries catch and effort data is necessary to fulfill statutory requirements of Section 303 of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1852 et. seq.) and to comply with Executive Order 12962 on Recreational Fisheries. Section 303 (a) of the Magnuson-Stevens Act specifies data and analyses to be included in Fishery Management Plans (FMPs), as well as pertinent data that shall be submitted to the Secretary of Commerce under the plan.

The MRIP Fishing Effort Survey (FES) is a cross-sectional, self-administered, household mail survey. The FES utilizes address-based samples (ABS) within coastal states to collect information about recent recreational saltwater fishing activity. The sample frame is derived from the United States Postal Service Computerized Delivery Sequence File (CDS). Because recreational saltwater fishing is a relatively rare activity, the ABS frame is supplemented by matching addresses on the CDS to lists of licensed saltwater anglers in each state. Augmenting the ABS sample frame with fishing license information creates additional strata (license matched and unmatched) and allows households with and without licensed anglers to be sampled at different rates. This is an efficient and economical approach for collecting recreational fishing effort information.

The FES will be conducted for five, two-month reference waves (March/April November/December) in the states along the Atlantic Coast, with the exception of North Carolina and Florida. In Hawaii, North Carolina and the Gulf States, the FES will be conducted for six reference waves (January/February - November/December). These specific reference periods encompass the majority of annual recreational saltwater fishing activity within the study area. Prior surveys indicated recreational fishing outside these periods was uncommon, contributed a very small percentage of annual fishing effort and fishery landings, and would be
disproportionately expensive to sample. This information collection will fulfill statutory requirements of Section 401 of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act. Section 401 (g) requires that the Secretary of Commerce, "establish a program to improve the quality and accuracy of information generated by the Marine Recreational Fishery Statistics Survey". MSA further specifies that future surveys should, "target anglers registered or licensed at the State or Federal level to collect participation and effort data".

## 2. Indicate how, by whom, and for what purpose the information is to be used. Except for a new collection, indicate the actual use the agency has made of the information received from the current collection.

The FES estimates marine recreational fishing effort (i.e. number of fishing days) for twomonth reference waves. Recreational fishing catch and effort data are used on an ongoing basis by NOAA Fisheries, regional fishery management councils, interstate marine fisheries commissions and state natural resource agencies in developing, implementing and monitoring fishery management programs, per statutory requirements of the MagnusonStevens Fishery Conservation and Management Act. Catch and effort statistics are fundamental for assessing the influence of fishing on any fish stock. Accurate estimates of the quantities taken, fishing effort, and both the seasonal and geographic distributions of catch and effort are required for the development of regional management policies and plans.

## FES Weather and Outdoor Activity Survey

The FES utilizes the Weather and Outdoor Activity Survey instrument, which collects both fishing and non-fishing information. Testing of the FES design suggested that this instrument resulted in higher response rates and more representative samples of the general population than a fishing-specific instrument. Results from this pilot test are described in Appendix 2. All respondent contact materials, including the Weather and Outdoor Activity Survey questionnaire, are provided in Appendix 1. Specific data elements collected in the questionnaire include:
a) Questions about severe weather events, access to weather forecasts, visitation to coastal areas and participation in freshwater fishing (questions 1-5, Appendix 1) are included to engage and encourage response from the household population, including both angling and non-angling households. Because the FES is a household survey, representative responses from both angling and non-angling households is essential for producing unbiased estimates,
b) Total number of household residents, the type of household telephone service, the type of household unit (rented or owned), and demographic information of household residents, including sex, age, race and ethnicity (questions 7-14, Appendix 1), are used to assess the representativeness of survey samples, as well as calculate post-survey weighting adjustments to ensure that weighted samples are representative of the household population.
c) Questions about fishing activity in the past 12 months and 2 months (questions 15-16) are used to screen for recent fishing activity, assist with recall, and estimate the number of private boat and shore fishing trips taken during the reference period.

## FES 2024 Experiments

## One-Month Wave Study

The Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSRA) of 2006 (P.L. 109-479) mandates that the Secretary of Commerce establish a program to improve the quality and accuracy of recreational fishery statistics (formerly collected via the Marine Recreational Fisheries Statistics Survey). Furthermore, the program must take into consideration recommendations from a National Research Council (NRC) Review of Recreational Fisheries Survey Methods (2006), including improving the effectiveness and appropriateness of sampling and estimation procedures and providing for ongoing evaluation and modification as needed to meet management needs. MSRA also requires Regional Fishery Management Councils, under the purview of the Secretary of Commerce, to establish annual catch limits (ACLs) for all federally managed fisheries, and NOAA Fisheries National Standard 1 (50 CFR 600.310) specifies that whenever possible, Fishery Management Plans should include in-season monitoring and management measures to prevent catch from exceeding ACLs.

Subsequently, NOAA Fisheries established the Marine Recreational Information Program (MRIP) and implemented enhanced survey designs that were designed and evaluated through a rigorous testing and peer review process. A key improvement was implementation of the MRIP Fishing Effort Survey. In 2017, a follow-up review of MRIP by the National Academies of Sciences, Engineering, and Medicine (NAS) concluded that the FES was a major improvement over the previous telephone survey design. However, the FES produces estimates for two-month reference periods (waves), which are not available until approximately 45 days after the completion of each wave.

In both the 2017 and a follow-up review released in 2021, the NAS concluded that implementation of ACLs is challenged by the lack of timeliness in survey data, resulting in lost fishing opportunities, and that two-month waves make it difficult for fishery managers to respond to changes in a fishery as they are happening. The Modernizing Recreational Fisheries Management Act (MFA) of 2018 (P.L. 115-405) incorporated findings from the 2017 NAS review, requiring MRIP to consider its findings. Transitioning to one-month waves in the FES would address NRC and NAS recommendations, as required by MSRA and MFA, and increase the utility of the survey by supporting in-season management of fisheries.

To date, transitioning to one-month waves has not been possible due to the costs associated with side-by-side testing and benchmarking required to carefully evaluate and adjust for (via calibration) potential systematic differences in survey estimates resulting from a design change. However, funding from the Inflation Reduction Act (IRA) of 2022 (P.L. 117-169) has recently become available to complete this work. This request is to test a revised version of the FES that will collect data for one-month waves using an improved questionnaire while retaining all other features of the current design. The pilot study must be conducted concurrently with the current FES design to quantify any systematic differences in survey estimates and develop a calibration model to facilitate the transition to the new design.

NOAA Fisheries will retain control over the information and safeguard it from improper access, modification, and destruction, consistent with NOAA standards for confidentiality, privacy, and electronic information. See response to Question 10 of this Supporting Statement for more information on confidentiality and privacy. The information collection is designed to yield data that meet all applicable information quality guidelines. The data collected by the MFES will be subject to the quality control measures and pre-dissemination review pursuant to Section 515 of Public Law 106-554.
3. Describe whether, and to what extent, the collection of information involves the use of automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g. permitting electronic submission of responses, and the basis for the decision for adopting this means of collection. Also, describe any consideration of using information technology to reduce burden.

The surveys will be conducted by mail. Survey responses will be automatically captured through optical character recognition (OCR), which ensures the accuracy and efficiency of data collection.

A "web push" design that encouraged response to the FES through an online instrument before providing a paper instrument was tested in 2018-2019. The web-push design resulted in response rates that were 7-11 percentage points lower than FES response rates. In addition to increasing the risk for nonresponse bias, lower response rates would increase data collection costs by approximately $15 \%$ on a per-complete basis. The web-push and FES designs were approximately equal in terms of data editing rates, while the web-push design had a longer median response time than the FES. At present, the current FES design is more cost effective and provides more timely survey results than the web-push design. Consequently, it is unlikely that NOAA will transition to a web-pus design within the next three years.

## 4. Describe efforts to identify duplication. Show specifically why any similar information already available cannot be used or modified for use for the purposes described in Question 2

NOAA Fisheries collaborates with state natural resource agencies and regional interstate fisheries commissions on the Atlantic and Gulf coasts to ensure that recreational fisheries data collections are not duplicative. Every five years, the Fish and Wildlife Service (FWS) of the U.S. Department of the Interior conducts the National Survey of Fishing, Hunting and WildlifeAssociated Recreation (OMB Control No. 1018-0088). This survey collects minimal information about annual recreational saltwater fishing activity within the context of additional recreation activities. That survey does not provide the spatial or temporal resolution needed by managers of fishery resources to monitor and manage recreational fisheries landings.

## 5. If the collection of information impacts small businesses or other small entities, describe any methods used to minimize burden.

No small businesses will be impacted by this revision. Individuals or households are the
respondents.
6. Describe the consequence to Federal program or policy activities if the collection is not conducted or is conducted less frequently, as well as any technical or legal obstacles to reducing burden.

If the survey was not conducted or was conducted less frequently, NOAA Fisheries and state natural resource agencies would experience difficulty in effectively carrying out their responsibilities to meet statutory, administrative, and other obligations to end overfishing of marine fishery resources. An ongoing survey of recreational anglers is required to monitor changing conditions in the fishery and support modifications in fishery regulations both within fishing seasons and among fishing years. In addition, a continuous time series of data is scientifically essential to assess the impact of recreational fishing on fish stocks.

## 7. Explain any special circumstances that would cause an information collection to be conducted in a manner inconsistent with OMB guidelines.

The collection is consistent with OMB guidelines.
8. If applicable, provide a copy and identify the date and page number of publications in the Federal Register of the agency's notice, required by 5 CFR 1320.8 (d), soliciting comments on the information collection prior to submission to OMB. Summarize public comments received in response to that notice and describe actions taken by the agency in response to these comments. Specifically address comments received on cost and hour burden.

A Federal Register Notice, published on April 11, 2023 (88 FR 21628) solicited public comment on this revision. No comments were received.

MRIP is a collaborative effort among government agencies, independent scientists, recreational fishing groups and conservation organizations to ensure scientifically rigorous collection of appropriate information that meets manager and stakeholder needs. MRIP staff members maintain regular communication with customers, through workshops, workgroup meetings and one-on-one consultations. Most recently, MRIP staff participated in workshops with Scientific and Statistical Committees for the South Atlantic Fishery Management Council (August 2019), the Mid Atlantic Fishery Management Council (March 2020) and The Gulf of Mexico Fishery Management Council (July 2020). MRIP staff provided detailed overviews of the FES design and responded to questions from committee members.

Additionally, the MRIP Executive Steering Committee (ESC), which includes senior managers from NOAA Fisheries, the Executive Directors of the Interstate Marine Fisheries Commissions, and a representative from the Marine Fisheries Advisory Committee, provides general oversight of MRIP and ensures that the program satisfies Federal, state and stakeholder needs for recreational fishing statistics. The ESC meets annually to review program activities, strategically
allocate funds to addresses data needs and approve research priorities. The ESC most recently met in December 2022.

Finally, MRIP Regional Implementation Teams (RIT's), representing NOAA Fisheries regional offices and science centers, state natural resource agencies and interstate marine fisheries commissions, develop Regional Implementation Plans and convene annually to identify specific needs for recreational fisheries statistics, including needs for survey coverage, resolution, precision and timeliness of survey estimates. The Implementation Teams most recently met in September 2022. Regional priorities, as determined by the RIT's are documented on the MRIP website.

Recent comments and priorities resulting from these forums include the following:

- Current sampling levels are adequate to produce precise annual, regional catch estimates for many state managed species.
- The SSC agrees that the FES design is an improvement over the CHTS and considers it Best Scientific Information Available.
- Produce more timely estimates.


## 9. Explain any decision to provide any payment or gift to respondents, other than remuneration of contractors or grantees.

The benefits of prepaid cash incentives on improving survey response rates are well documented. Dillman (2009) describes a small, prepaid cash incentive as a "token of appreciation" that encourages response and brings attention to the survey request. In addition to improving response rates, incentives may reduce nonresponse bias by encouraging participation from individuals with little or no interest in the survey topic (Groves et al., 2006).

Church (1993) presents a meta-analysis of 38 experimental studies testing the impact of cash incentives on mail survey response rates. The incentives, which ranged from $\$ 0.01$ to $\$ 5.00$ increased response rates over control groups by an average of $19.1 \%$.

More recently, Trussell and Lavrakas (2004) reported that providing an incentive of at least $\$ 1.00$ increased response rates and cooperation rates to the second phase of a two-phase, mixedmode (RDD/mail diary) survey, and that incremental increases in incentive amounts up to $\$ 10.00$ increased response rates in a linear fashion. These conclusions were consistent even for individuals who initially refused to participate in the second phase of the study.

Similarly, Brick et al. (2011) concluded that a prepaid cash incentive of $\$ 15.00$ significantly increased response rates to the second phase of a national, two-phase mail survey, and that response rates for a $\$ 5.00$ incentive treatment, while not significantly different from either a control group or the $\$ 15.00$ experimental treatment, were in the expected direction. In addition, the effect of the incentives was most pronounced for the initial mailing, which could result in decreased costs for follow-up mailings.

The initial two waves of the 2012-2013 FES pilot study (OMB Control No. 0648-0652) included
an experiment to test the impact of cash incentives on response rates, survey measures and cost (see Appendix 2 for details). Three levels of incentives, $\$ 1.00, \$ 2.00$ and $\$ 5.00$, and a zero dollar control were tested. Incentives were included in the initial survey mailing for each wave.

Table 1 provides the response rates, total number of completed surveys and relative cost per completed survey for each incentive treatment. The probability that a household responded increased significantly with increasing incentive amounts, and differences in response propensity among incentive treatments were highly significant ( $\mathrm{p}<0.0001$ ). However, while the $\$ 5.00$ incentive resulted in the highest response rate, the $\$ 1.00$ and $\$ 2.00$ treatments were the most efficient in terms of cost; including a $\$ 1.00$ or $\$ 2.00$ cash incentive lowered the cost per completed survey by approximately $20 \%$. Appendix 2 provides additional details about the incentive testing.

The cost per completed survey is slightly higher for a $\$ 2.00$ incentive than a $\$ 1.00$ incentive. However, the $\$ 2.00$ incentive results in significantly higher response probabilities that will reduce the risk of nonresponse bias. In addition, testing demonstrated that the incentive amount was more important for those households that were less likely to be interested in the survey topic - larger incentives resulted in higher response rates (Appendix 2). In contrast, the incentive amount was less important for households that were more likely to be interested in the survey topic. In a survey about birding, Groves et al. (2006) observed that a $\$ 2.00$ prepaid incentive reduced differential response between birders and non-birders. In the FES, differential response between households that do and do not fish will result in biased estimates of fishing activity. As in the birding survey, a prepaid cash incentive is likely to reduce differential response between households with and without anglers. In addition, results from incentive testing suggest that a larger incentive will reduce differential reporting to greater extent than a smaller incentive because larger incentives have a greater impact on households that are less likely to be interested in the survey topic. Considering the potential risks of associated with lower response rates, as well as the similar costs per completed survey between a $\$ 1.00$ and $\$ 2.00$ incentive, the FES will include a $\$ 2.00$ cash incentive in the initial survey mailings.

Table 1. Response rates, number of completed surveys and relative data collection costs for each incentive treatment tested during the first two waves of the MFES.

| Incentive <br> Amount | Response <br> Rate | Completed <br> Surveys | Relative Cost per <br> Complete $^{1}$ |
| :---: | :---: | :---: | :---: |
| $\$ 0.00$ | 22.6 | 2,154 | 1 |
| $\$ 1.00$ | 32.2 | 3,065 | 0.78 |
| $\$ 2.00$ | 36.0 | 3,415 | 0.80 |
| $\$ 5.00$ | 40.8 | 3,807 | 1.15 |

## 10. Describe any assurance of confidentiality provided to respondents and the basis for the

[^0]assurance in statute, regulation, or agency policy. If the collection requires a systems of records notice (SORN) or privacy impact assessment (PIA), those should be cited and described here.

No personally identifiable information will be collected through the survey. Responses will only be associated with a unique, randomly assigned identification code. Any public release of survey data will be without identification as to its source or in aggregate statistical form. All survey data will be stored on secured, password protected servers, and all transfer of survey data will utilize secure file transfer protocols.
11. Provide additional justification for any questions of a sensitive nature, such as sexual behavior or attitudes, religious beliefs, and other matters that are commonly considered private. This justification should include the reasons why the agency considers the questions necessary, the specific uses to be made of the information, the explanation to be given to persons from whom the information is requested, and any steps to be taken to obtain their consent.

No sensitive questions are asked.

## 12. Provide estimates of the hour burden of the collection of information.

The estimated annual response burden per survey activity and the total estimated annual response burden are shown in Table 2. The expected number of respondents and responses are based upon anticipated sample sizes and historical FES response rates. The hourly rate of $\$ 28.88$ is based upon the average for all civilian workers from the September 2022 National Compensation Survey (https://www.bls.gov/news.release/ecec.t02.htm). There are no other costs to respondents, and there are no recordkeeping requirements associated with MRIP Fishing Effort Survey. A total of 15,278 annual burden hours is anticipated, resulting in an annual cost to respondents of approximately $\$ 441,229$.

Table 2. Estimated annual response burden
$\left.\begin{array}{lcccccc}\hline & & & & & & \\ & & & & \text { Estimated } \\ \text { Number }\end{array}\right]$

| Information Collection | Type of | \# of | Annual \# of | Total \# of | Burden | Total | Hourly Wage |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |

[^1]|  | Respondent (e.g., <br> Occupational Title) | Respondents/y <br> ear <br> (a) | Responses / <br> Respondent <br> (b) | Annual Responses $(c)=(a) x(b)$ | Hrs / Response <br> (d) | Annual Burden Hrs (e) $=(c) x$ <br> (d) | Rate (for <br> Type of Respondent) <br> (f) | Wage Burden <br> Costs $(g)=(e) x(f)$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Weather and Outdoor Activity Survey | Civilian Workers | 110,000 | 1 | 110,000 | 5 min | 9,167 | \$28.88 | 264,743 |
| One-Month Wave Study | Civilian Workers | 73,333 | 1 | 73,333 | 5 min | 6,111 | \$28.88 | 176,486 |
| Totals |  |  |  | 183,333 |  | 15,278 |  | 441,229 |

13. Provide an estimate for the total annual cost burden to respondents or record keepers resulting from the collection of information. (Do not include the cost of any hour burden already reflected on the burden worksheet).

These data collections will incur no cost burden on respondents beyond the costs of response time. Envelopes with prepaid postage will be included in the questionnaire mailing.
14. Provide estimates of annualized cost to the Federal government. Also, provide a description of the method used to estimate cost, which should include quantification of hours, operational expenses (such as equipment, overhead, printing, and support staff), and any other expense that would not have been incurred without this collection of information.

Annual cost to the Federal government is approximately \$4,999,969: \$4,789,969 in data collection costs and $\$ 210,000$ in professional staff salaries.

| Cost Descriptions | Grade/Step | Loaded Salary and/or Cost | \% of Effort | Fringe (if Applicable) | Total Cost to Government |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Federal Salaries |  |  |  |  |  |  |
| Fishery Biologist | ZP4/03 | 160,000 | 100 |  | \$ | 160,000 |
| Survey Statistician | ZP4/01 | 100,000 | 50 |  | \$ | 50,000 |
| Operations \& Maintenance |  |  |  |  |  |  |
| Data collection costs |  | 4,789,969 |  |  | \$ | 4,789,969 |
| Labor |  | 766,395 |  |  |  |  |
| Non-Labor |  | 4,023,574 |  |  |  |  |
| Travel |  |  |  |  |  |  |
| Other Costs: |  |  |  |  |  |  |


| roral |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |

15. Explain the reasons for any program changes or adjustments reported in ROCIS.

This requested revision results in a net increase of $\mathbf{7 0 , 3 3 3}$ respondents and responses and 5,861 hours.

Program Change: The Reporting Sensitivity Experiment has been completed, resulting in an annual decrease of 3,000 respondents and responses and 250 hours. Including the One-Month Wave Study results in an annual increase of 73,333 respondents and responses and 6,111 hours. Overall, the program change results in a net increase of 70,333 respondents and responses and 5,861 hours.

| Information Collection | Respondents |  | Responses |  | Burden Hours |  | Reason for change or adjustment |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Current <br> Renewal / <br> Revision | Previous <br> Renewal / <br> Revision | Current <br> Renewal / <br> Revision | Previous <br> Renewal / <br> Revision | Current <br> Renewal / <br> Revision | Previous <br> Renewal/ <br> Revision |  |
| Weather and Outdoor Activity Survey | 110,000 | 110,000 | 110,000 | 110,000 | 9,167 | 9,167 | No change |
| Reporting Sensitivity Experiment | N/A | 3,000 | N/A | 3,000 | N/A | 250 | This one-time information collection has been completed and will be removed. |
| One-Month Wave Study | 73,333 | $\mathrm{N} / \mathrm{A}$ | 73,333 | N/A | 6,111 | N/A | New IC pilot study |
| Total for Collection | 183,333 | $113,000$ | 183,333 | $113,000$ | 15,278 | $9,417$ |  |
| Difference | 70,333 |  | 70,333 |  | 5,861 |  |  |


| Information Collection | Labor Costs |  | Miscellaneous Costs |  | Reason for change or adjustment |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Current | Previous | Current | Previous |  |
| Weather and Outdoor Activity Survey | 264,743 | 231,192 | 0 | 0 | Increased labor costs |
| Reporting Sensitivity Experiment | N/A | 6,305 | N/A | 0 | IC being removed |
| One-Month Wave Study | 176,486 | N/A | 0 | N/A | New IC |
| Total for Collection | $\$ 441,229$ | \$237,497 | 0 | 0 |  |
| Difference | 20 | 732 |  |  |  |

16. For collections of information whose results will be published, outline plans for tabulation and publication. Address any complex analytical techniques that will be used. Provide the time schedule for the entire project, including beginning and ending dates of the collection of information, completion of report, publication dates, and other actions.

All data collected and analyzed will be included in table format available on the Web page of the Fisheries Statistics Division, Office of Science and Technology, National Marine Fisheries Service. The Web site address is http://www.st.nmfs.noaa.gov/recreational-fisheries/index. Data from this survey may support research and analyses to be presented at appropriate professional meetings (e.g., American Fisheries Society, Joint Statistical Meetings) and may be submitted for publication in appropriate statistical or fisheries peer-reviewed journals. Summary marine recreational fishery catch statistics produced using data from this survey are included in the annual publication by NOAA Fisheries, Fisheries of the United States.
17. If seeking approval to not display the expiration date for OMB approval of the information collection, explain the reasons that display would be inappropriate.

The expiration date will be displayed.

## 18. Explain each exception to the certification statement identified in "Certification for Paperwork Reduction Act Submissions."

The agency certifies compliance with 5 CFR 1320.9 and the related provisions of 5 CFR 1320.8(b)(3).

## References

Andrews, W.R., J.M. Brick and N.A. Mathiowetz (2010). Pilot Test of Dual Frame Two-Phase Mail Survey of anglers in North Carolina. https://www.st.nmfs.noaa.gov/pims/main/public?method=DOWNLOAD FR PDF\&record id=455.

Andrews, W.R., J.M. Brick and N.A. Mathiowetz (2013). Continued Development and Testing of Dual Frame Surveys of Fishing Effort (Testing a Dual-Frame, Mixed Mode Survey Design). https://www.st.nmfs.noaa.gov/pims/main/public?method=DOWNLOAD FR PDF\&record id=931.

Andrews, W.R., J.M. Brick, N.A. Mathiowetz (2014). Development and Testing of Recreational Fishing Effort Surveys (Testing a Mail Survey Design).
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Brick, J.M., D. Williams, and J.M. Montaquila (2011). Address-Based Sampling for Subpopulation Surveys. Public Opinion Quarterly 75: 409-428.

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Brick, J.M., W.R. Andrews, P.D. Brick, H. King, N.A. Mathiowetz, and L. Stokes (2012b). Methods for improving response rates in two-phase mail surveys. Survey Practice 5(3). Available: https://www.surveypractice.org/article/3093-methods-for-improving-response-rates-in-two-phase-mail-surveys.

Brick, J.M., W.R. Andrews and N.M. Mathiowetz (2016). Single-phase Mail Survey Design for Rare Population Subgroups. Field Methods 28(4): 381-395.

Church, A.H. (1993). Estimating the Effect of Incentives on Mail Survey Response Rates: A Meta-Analysis. Public Opinion Quarterly 57:62-79.

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National Academies of Sciences, Engineering, and Medicine (2021). Data and management strategies for recreational fisheries with annual catch limits. Retrieved from https://www.nationalacademies.org/our-work/dataand-management-strategies-for-recreational-fisheries-with-annual-catchlimits.

National Research Council (2006). Review of recreational fisheries survey methods. Retrieved from: https://www.nap.edu/catalog/11616/review-ofrecreational-fisheries-survey-methods.

Trussell, N. and P.J. Lavrakas (2004). The influence of incremental increases in token cash incentives on mail survey response: Is there an optimal amount? Public Opinion Quarterly 68: 349-367.


[^0]:    ${ }^{1}$ Data collection costs include costs associated with printing survey materials, assembling survey packets, postage, receipting and processing completed surveys, and incentives. The relative cost per complete survey set the $\$ 0.00$ incentive's cost to 1 ; the other incentives' costs were calculated relative to the $\$ 0.00$ incentive's cost. These are relative values and not true costs.

[^1]:    ${ }^{2}$ Based upon 2020 FES results, approximately $6 \%$ of addresses will be returned by USPS as invalid reducing the eligible sample size to 330,004 addresses. Calculations of number of respondents are based upon 330,004 addresses.
    ${ }^{3}$ Annualized value for the 3-year approval period.

