

**SUPPORTING STATEMENT
ECONOMIC SURVEYS OF U.S. COMMERCIAL FISHERIES
OMB CONTROL NO. 0648-0369**

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.

For the U.S. commercial fishing industry, which includes fishing vessels in the commercial and charter fishing sectors (i.e., catcher vessels, charter vessels, catcher/processor vessels, and motherships) and onshore post-harvesting sector facilities through primary processing if it occurs (i.e., onshore fish processors, dealers, wholesalers, and auctions), the potential respondent universe is any fishing vessel that holds a federal or state permit or license, any post-harvest facility that receives fish from those vessels, and their crew/employees. These surveys will primarily focus on vessels, facilities and their crew/employees that actively participate in federally-managed fisheries. Based on information from USCG files and federal permit files, it is estimated that there are at least 20,000 federally-permitted fishing vessels, and possibly as many as 25,000-30,000 state permitted fishing vessels. In addition, NMFS data indicate that there are more than 1,000 onshore post-harvesting sector facilities and more than 50,000 full- and part-time crew/employees. Each of the economic surveys to be conducted under this OMB authorization will involve a subset of these vessels, facilities, or crew/employees that will vary according to the scope of the particular survey.

The information that will be used to develop the fishing vessel sampling strategy for an economic survey will vary by fishery but will generally come from three types of data collections. The first component of this data is USCG, federal permit and state registration data. This data includes information on vessel characteristics such as vessel length, gross and net tonnages, horsepower, and year built. In addition, address information for vessel and processor owners is available.

The second important component of this data is the landings information for individual vessels. In each NMFS region, fish ticket information and dealer data provide additional information on a vessel's fishing trip, including date, port of landing, species, fish condition codes, pounds landed, round pound equivalents, and revenue received.

The third component of the data analysts may have available for developing sample strata are logbook programs, which provide detailed trip information on catch (target species, species landed, species discarded, etc.) and effort (gear used, duration or intensity of effort such as hooks used, to w duration or soak time and crew size.). In addition, because logbooks tend to require reporting on all trips, it is possible to distinguish full-time vs. part time operators. Combined,

these three information sources provide analysts with a rich data set with which to develop informed sampling plans and ascertain the representativeness of potential respondents.

The NMFS processed product survey (OMB Control No. 0648-0018) and the fish ticket and dealer databases will be the primary sources of data for defining the potential respondent universe and sampling strategy for the post-harvest sector surveys. The NMFS processed product survey collects contact and location information for processor companies and their plants as well as information on monthly employment and the volume and value of processed products. It is mandatory in the Northeast Region for some federally-managed species and voluntary elsewhere. This processed product database may be supplemented in the Alaska Region by using Federal processor permit, Federal at-sea groundfish processor weekly productions and State of Alaska processor information that is unique to Alaska.

There is not a good method for defining the potential respondent universe for fishing vessel and post-harvesting sector crew/employees. For example, with the exception of Alaska, there are no crew licensing or registration programs. Therefore, the sampling strategy for these individuals will make use of the sampling strategies for the vessels or facilities with which they are associated and those entities will be asked for contact information for their crew/employees or intercept surveys at the sampled vessels and facilities will be used to contact them.

In terms of response rates, sampling strategies developed for recent submissions under this clearance show that obtaining a sample mean within 15% of the population mean at the 95% confidence level requires, on average, a response rate of roughly 50%. Obtaining a sample mean within 10% of the population mean at the 95% confidence level requires, on average, a response rate of roughly 65%.

Response rate information is provided below by Science Center for each of eight economic data collection surveys for commercial fisheries. These are the most recent surveys conducted under this Clearance.

The four surveys conducted by the Northwest Fisheries Science Center and the Pacific States Marine Fisheries Commission were: (1) the limited entry groundfish trawl fleet survey (2009); (2) the limited entry groundfish fixed gear fleet survey (2009); (3) the open access groundfish/nontribal salmon/crab/shrimp fleet survey (2011); and (4) the limited entry groundfish fixed gear fleet survey (2012). The 2009 limited entry groundfish trawl survey obtained responses from 73 of the 127 survey population members (a 57% response rate). The 2009 limited entry groundfish fixed gear survey obtained responses from 50 of 128 vessel owners (a 39% response rate). The higher response rate among limited entry groundfish trawl vessels was likely due to regulatory events taking place at the time of the surveys, the size of vessel operations, and ownership patterns. The nature of each these three factors is explained below. First, when the limited entry groundfish survey was fielded during 2009 (the trawl and fixed gear components of the survey were fielded simultaneously to minimize the travel costs of in-person interviewers), the Pacific Fisheries Management Council was designing the catch shares management regime that was implemented in 2011 for the limited entry groundfish trawl fishery and the trawl fleet's widespread support for that regime probably contributed to a higher response rate for the trawl fleet. Second, survey response rates are usually higher for larger scale

operations, and the typical groundfish trawler is a larger scale operation than the typical groundfish fixed gear vessel. Third, nearly 20% of the vessels in the limited entry groundfish fixed gear fleet are owned by members of one family that has historically chosen not to participate in voluntary cost earnings surveys.

With the implementation of the catch share management regime in the West Coast groundfish trawl fishery, economic data collection became a mandatory program and was not fielded under this OMB clearance. Mandatory data collection in the groundfish trawl fishery began with the 2009 fiscal year under OMB Control No. 0648-0618. The survey of the limited entry groundfish fixed gear fleet conducted during 2011-12 obtained responses from 56 of the 130 vessels in the survey population (a 43% response rate). Although OMB considers nonresponse bias very probable if response rate is less than 80%, non-response bias was not statistically significant at the vessel type level. The statistical test for non-response bias used data on vessel physical characteristics and landings (location, timing, gear, species, weight, and revenue) that were available for both survey respondents and non-respondents. However, the calculation of summary statistics for the entire limited entry groundfish fixed gear fleet required weighting survey responses due to different response rates across vessel types.

The open access survey conducted in 2011 collected similar data to the limited entry groundfish trawl and fixed gear surveys discussed above, but differences in survey population size and available contact information for survey population members necessitated some differences in fielding methodology. This survey covered vessels that participate in four West Coast fisheries --- groundfish, salmon, crab, and shrimp. While the limited entry groundfish trawl and limited entry groundfish fixed gear surveys each had survey populations of less than 150 vessels, the open access survey had a survey population of more than 1,700 vessels. While telephone numbers were available for all members of the limited entry groundfish fleet, telephone numbers for the open access survey were obtained through a public records search based on vessel owner name and address. This public records search provided telephone numbers for 60% of the survey population members.

The open access survey population included 1,712 vessels, and telephone numbers were available for 1,020 of the 1,712 vessel owners. Each of the 1,712 vessels in the survey population was placed in either the telephone sample (1,020 vessels) or the non-telephone sample (692 vessels). There were no statistically significant differences between vessels in the telephone sample and vessels in the non-telephone sample. Survey responses were obtained from 601 of the 1,020 vessels owners in the telephone sample (a 59% response rate). Survey responses were received from 162 of the 692 vessels owners in the non-telephone sample (a 23% response rate). Overall, survey responses were received from 763 of the 1,712 vessels in the survey population (a 45% response rate).

In 2010, the Southwest Fisheries Science Center conducted cost and earnings surveys for the large-mesh drift gillnet (DGN) and harpoon (HPN) vessels. There were a prospective 81 active vessels in the survey population, including 5 that participated in both fisheries, 44 DGN-only vessels and 32 HPN-only vessels. Responses were obtained from 12 (24%) of the 49 DGN vessels, 17 (46%) of the 37 HPN vessels and 29 (36%) of the total of 81 vessels. The lower-than-anticipated response rate to the survey likely reflects severe attrition from participation in the

DGN fishery in recent years, aging of the fleet, and poor recent experience in the swordfish fishery around the time the survey was conducted due to unusually cold waters off the California West Coast. Despite the low response rate, the data collected are valuable for addressing questions of interest regarding the relative economic viability of DGN versus HPN as a means of targeting swordfish in the U.S. West Coast EEZ.

The Pacific Islands Fisheries Science Center has conducted the following three surveys: (1) the Main Hawaiian Islands Bottomfish fishery survey (2010); (2) the Marianas small boat fleet (Guam and the Commonwealth of the Northern Mariana Islands (CNMI) survey (2011); and (3) the Hawaii Charter/For-Hire Fishing Fleet survey (2012). Response rates for surveys in the Hawaiian Islands were similar across efforts with 519 of 1012 (51%) bottomfish fishermen completing the survey, whereas 81 of 170 (48%) charter fishing operations completed surveys. While the Hawaii-based surveys were conducted through mail-based survey methods, the logistics for the survey in the Marianas was much more difficult. Because there are no license or reporting requirements and because there are tight-knit fishing communities, non-probabilistic methods were implemented including a number of community meetings coupled with in-person interviews with key members of the fishing community. Therefore, comparable response rates are not available for this survey effort. A total of 260 surveys were completed across the Marianas Archipelago (Guam (n=146), Saipan (n=95), Tinian (n=11), and Rota (n=8)) by fishermen who attended the community meetings. The people attending the meetings who did not complete surveys were ineligible (either family members that do not fish on boats or strictly shore-based fishermen). By all accounts from individuals familiar with these fishing communities, we are comfortable that we obtained a representative sample of active small boat fishermen from these fishing communities.

Based on these results, due to lessons learned regarding the use of in-person interviews and telephone follow-up to mail surveys, and due to planned efforts to obtain higher industry involvement and support for the data collection, we anticipate higher response rates for surveys to be submitted under this clearance. Each survey that will be submitted under this clearance will include detailed plans for maximizing response rates and addressing non-response bias, as required in the Supplemental Questions for this generic clearance package.

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.

The surveys conducted under this clearance will include those conducted in-person, via telephone interview, and mail. Depending upon the size of the respondent universe, the data collection will be conducted as a census or a stratified random sample. Existing data sources such as landings revenue, logbook catch and effort information, and vessel characteristics obtained from permit data will be used to define the sample frame as well as to calculate the desired degree of accuracy and corresponding response rates.

Survey data will be used in combination with other data sources to: (1) assess the economic status of fisheries; (2) conduct regulatory analyses that describe the effects of regulations on the fishery; and (3) estimate behavioral models that provide insights into the nature and extent of management problems (e.g., overcapacity) or predict industry response to changes in regulations.

We do not expect any unusual problems that would require specialized sampling procedures.

The following plan will be used to reduce burden associated with the frequency of data collection:

The economic surveys to be conducted under this clearance will typically be rotated among different fisheries from one year to the next, depending on management needs. The expectation is that a fishery will appear in the rotation only once every 2-4 years. If it is deemed necessary to survey a fishery more frequently, the sampling frame will, to the extent practicable, take into account whether a potential respondent had been previously selected to participate in a survey (e.g., sampling with no replacement of previously selected vessels may be used, depending upon the statistical validity of this approach in the survey fishery). Overall, this approach will ensure coverage of the different fisheries for which economic data are lacking, while minimizing the burden on participants in any one of those fisheries.

Many vessels participate in multiple fisheries. Therefore, in situations where it is appropriate, surveys will be designed to cover predominant combinations of fisheries rather than single fisheries. Economists and fishery managers will want the data collected in this manner to better understand the economic effect of restrictions in one fishery based on the alternative opportunities available to the vessels in other fisheries. Focusing surveys on predominant fishery combinations will also reduce respondent burden, as it will help to avert situations where a vessel is surveyed one year regarding one of its fishery activities and the next year regarding another activity.

Important objectives of survey design include data accuracy and data precision. Measuring and minimizing non-response bias is an important aspect of assuring accurate data. As discussed in the response to Question 3, data on vessel physical characteristics and landings (location, timing, gear, species, weight, and revenue) is available for both survey respondents and non-respondents, and will be used to test the representativeness of survey respondents. This data will also be used to adjust the models and/or data for any non-response bias that is detected.

The desired degree of precision, and corresponding desired response rate, depends upon the application for which the data is being used. Some applications of the data collected in a specific survey may use data from all survey respondents, while others applications will only use data from a subset of the respondents, such as vessels that operate in specific fisheries or geographic locations. Data collected through this survey will be used for both statistical inference of population values from sample respondents and for estimation of econometric models used for policy making purposes. While more precise data is clearly preferred, standards do not exist regarding the precision of data required for estimation of an econometric model. Factors such as the minimization of model specification error also contribute to the quality of the empirical

results obtained using survey data. It is not possible to state a level of precision that is required for all uses and applications of data collected by this survey.

The following example focuses on the desired degree of accuracy and corresponding required response rate for the West Coast limited entry fixed gear fishery to illustrate, in a general way, how the economic surveys will be conducted.

Example

The following table for the West Coast limited entry fixed gear fishery shows the number of responses (and corresponding response rate) needed to get a response sample mean within 10%, 15%, and 25% of the population mean at the 95% confidence level. In this calculation, revenues associated with West Coast landings (which were known for all vessels) were used as a proxy for revenues from other sources and for expenditures (which were not known and were the focus of this survey).

N Population	N 10%	N 15%	N 25%	Response Rate 10%	Response Rate 15%	Response Rate 25%
153	89	69	28	58%	45%	18%

As shown in the accompanying table, having a sample mean within 15% of the population mean at the 95% confidence level requires a response rate of 45%. The expected 65% response rate would have allowed calculation of a sample mean within less than 10% of the population mean. The actual response rate was 43%. Although OMB considers nonresponse bias very probable if response rate is less than 80%, non-response bias was not statistically significant at the vessel type level. The statistical test for non-response bias used data on vessel physical characteristics and landings (location, timing, gear, species, weight, and revenue) that were available for both survey respondents and non-respondents. However, the calculation of summary statistics for the entire limited entry groundfish fixed gear fleet required weighting survey responses due to different response rates across vessel types.

At least two reasons can be identified for desiring higher response rates than those needed to support inference of population means from sample means:

- 1) Data from this survey will be used to develop a variety of economic models covering applications such as fleet efficiency and fishery participation. In these applications, error will arise not only from the representativeness of data used for model development, but also from model specification and estimation errors. Since it is not possible to completely avoid specification and estimation error in model development, there is good reason to desire a higher response rate and higher degree of precision in the data collection process.
- 2) Future applications of the data may require further disaggregating the population into smaller groups according to factors such as state of operation or species targeted. Identification of all such future disaggregated data needs is not possible at the present time. A higher response rate and higher degree of precision in the current data collection process will facilitate such future population disaggregation.

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.

In order to enhance response rates and ensure data quality, all economic surveys conducted under this OMB authorization will be planned in close consultation with industry representatives.

Industry input will be solicited regarding a variety of issues, including the following:

- a. the best way to introduce the survey to potential respondents,
- b. the preferred elicitation method (e.g., mail questionnaires, telephone or in-person interviews),
- c. the best person to provide survey information (e.g., skipper, vessel owner, vessel owner’s accountant) and how to facilitate that person’s cooperation,
- d. types of data confidentiality assurances needed to make industry comfortable with survey,
- e. the best time of year to conduct survey,
- f. types of data that may be considered proprietary and ways to overcome this sensitivity,
- g. questionnaire formats and data formats that make it easier for respondents to answer survey questions,
- h. the most effective way to follow up with people who do not respond to initial solicitation,
- i. the most effective ways to communicate survey results back to the industry.

Dillman’s Total Design Method (1978) will also be followed to ensure maximum participation and to minimize non-response bias. Overall, past submissions under this clearance indicate that a 50% response rate will achieve an estimated sample mean within 15% of the population mean with a 95% confidence limit. The surveys completed under this clearance since 2009 had response rates that approached or exceeded 50%. With the lessons learned from those surveys and with enhanced efforts to increase response rates, we expect higher response rates for the future surveys that will be conducted under the renewed clearance. Therefore, each of these surveys should achieve a response rate that will ensure estimated sample means will be useful for estimating population means and for conducting the required economic analyses. Nevertheless, to ensure that the results are representative of the population being studied, survey data will be compared with information from existing data sources (landings revenue, logbook catch and effort data, etc.). If the comparison reveals sampling biases, information obtained from the alternative data source(s) will be used to help devise methods (e.g., post-stratification) for correcting for any bias.

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.

All surveys conducted under this OMB authorization will be subject to pretest involving fewer than ten respondents. As part of the pretest, representatives from the fishery being surveyed will be asked to complete a draft version of the questionnaire and to provide feedback regarding the

clarity and completeness of the questionnaire and suggestions regarding how the survey can be improved, including methods for decreasing the burden hours, and what the burden hours will be.

5. Provide the name and telephone number of individuals consulted in 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.

The individuals responsible for designing or conducting data collections for the agency include:

- Northeast NMFS economists: Scott Steinback: (508) 495-2371; Andrew Kitts (508) 495-2231; Tammy Murphy (508) 495-2137; and Barbara Roundtree (508) 495-2240
- Southeast NMFS economists: Juan Agar (305) 361-4218 x218; Larry Perruso (305)-361-4278; and Michael Travis (727)-824-5335
- West Coast NMFS economists: Todd Lee (206) 302-2436; Carl Lian (206) 860-3412; Cindy Thomson (831) 420-3911, Stephan Stohs (858) 546-7084; and James Hilger (858) 546-7140
- Alaska NMFS economists: Ron Felthoven (206) 526-4114 and Brian Garber Yonts, (206) 526-6301
- Pacific Islands NMFS economists: Minling Pan (808) 983-5347 and Justin Hospital, (808) 983-5347
- Pacific Fishery Management Plan (PFMC) economist: Jim Seger (503) 820-2280.
- Headquarters NMFS economists: Eric Thunberg (508) 495-2272 and Sabrina Lovell (301) 427-8153

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- Northeast NMFS economists: Scott Steinback: (508) 495-2371; Andrew Kitts (508) 495-2231; Tammy Murphy (508) 495-2137
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