SUPPORTING STATEMENT
U.S. Department of Commerce
National Oceanic & Atmospheric Administration
Economic Surveys of American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands (CNMI) Small Boat-Based Fisheries
OMB Control No. 0648-0635

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 government units, households, or persons) in the universe covered by the collection and in the corresponding sample are to be provided in tabular form for the universe as a whole and for each of the strata in the proposed sample. Indicate expected response rates for the collection as a whole. If the collection had been conducted previously, include the actual response rate achieved during the last collection.

Potential Respondent Universe

The potential respondent universe in terms of number of active small boats is difficult to estimate because there are no definitive measures of small boat fishing participation in the three island areas. The most relevant estimation of the active vessels was done by Western Pacific Fisheries Information Network (WPacFIN) based on the creel survey programs administered by American Samoa Department of Marine and Wildlife Resources (DMWR), Guam Department of Agriculture's Division of Aquatic and Wildlife Resources (DAWR), and CNMI government Department of Lands and Natural Resources' Division of Fish & Wildlife (DFW). The potential universe in American Samoa small boat fishery is about 20 boats, this is based on the average number of small boats from the boat-based creel survey in 2001-2018. WPacFIN estimated the number of active vessels were 398 in Guam and 75 in CNMI in 2018. However, WPacFIN's estimates for CNMI only include the island of Saipan; there are also small boat fishing in Tinian and Rota. It is estimated that there are 15 small boats in the island of Tinian and 20 small boats in the island of Rota. Therefore, the total number of small boats in the CNMI is estimated to be 110 in 2018.

Sampling and Other Respondent Selection Methods

Since the trip-level economic surveys are add-on to the existing creel survey data collection program, the statistical methods related to sampling for the trip-level economic surveys follow the creel survey data collection program design (https://inport.nmfs.noaa.gov/inport/item/5612). Details of the creel survey sampling methodologies are documented in Oram et al. (2011a, 2011b, 2011c)[1]. The sampling frame of the Boat-based Interview in the creel survey was

1 Oram R., N. Tuisamoa, J. Tomanogi, M. Sabater, M. Quach, D.C. Hamm, and C. Graham. 2011a. American Samoa boat-based creel survey documentation. Online at http://www.wpcouncil.org/wp-content/uploads/2015/08/American-Samoa-boat-based_Final_3_7_11_KB.pdf [accessed 27 November 2017].
Oram R., T. Flores Jr, B. Tibbatts, J. Gutierrez, J.P. Gesner, S. Wusstig, M. Quach, D.C. Hamm, and P. Tao. 2011b. Guam boat-based creel survey documentation. Online at http://www.wpcouncil.org/wp-content/uploads/2015/08/Guam_boat_based_Final_3_4_11_KB.pdf [accessed 27 November 2017].

developed by WPacFIN and the three local fisheries agencies as described in Question 4. Interviews are conducted several times a month (4 to 10 times) using a systematic random sampling protocol at sites (ramps/docks) that are actively used for launching fishing boats. Sample dates are drawn for monthly sampling which continues throughout the year. Each selected sample date contains two shifts: AM and PM. In addition, opportunistic interviews are conducted one to two times per month when there is not enough interview data for a particular fishing method. Opportunistic data are collected on non-scheduled survey dates at sample ports and sometimes other areas. These opportunistic surveys adjust the possible sampling bias resulting from "the scheduled creel surveys". The data collection efforts are organized and carried by the local fisheries agencies. An interview is conducted during the shift time by well-trained fisheries staff at the scheduled site when fishermen return from their fishing trip.

Expected Response Rate

The detailed sampling design and response rate for the economic survey are shown in Table 6. The creel survey intercept sample sizes and expected response rate of economic survey are calculated based on the average number of creel surveys completed and the average responses of economic surveys among the creel surveys in CNMI (2011-2018), American Samoa (2011-2018), and Guam (2013-2018), respectively.

The actual response rate of the economic survey from the creel survey in terms of boat coverage was 90% in American Samoa, 85% in CNMI, and 57% in Guam. And the actual response rate of the economic survey from the creel survey in terms of fishing trip was 84% in American Samoa, 79% in CNMI, and 32% in Guam. Based on these response rates, we are confident that we can expect relatively high response rates for the future.

Table 6. Sampling Design & Response Rate for the Economic Add-on to the Creel Survey

Add-on (economic forms) to creel survey	Guam	CNMI	American Samoa
Estimated number of respondent universe (boats)	398	110	20
Creel survey intercept sample (boats)	222	65	20
Expected response rate	57%	85%	90%
Target number of economic surveys (boats)	127	55	18
Creel survey intercept sample (trips)	585	140	215
Expected response rate	32%	79%	84%
Target number of economic surveys (trips)	190	110	180

2. Describe the procedures for the collection of information including:

- Statistical methodology for stratification and sample selection,
- Estimation procedure,

Oram R., R. Roberto, M. Trianni, M. Quach, D.C. Hamm, and P. Tao. 2011c. Saipan boat-based creel survey documentation. Online at http://www.wpcouncil.org/wp-content/uploads/2015/08/CNMI_boat_based_Final_3_16_11_KB.pdf [accessed 27 November 2017].

- Degree of accuracy needed for the purpose described in the justification,
- Unusual problems requiring specialized sampling procedures, and
- Any use of periodic (less frequent than annual) data collection cycles to reduce burden.

Stratification and Sample Selection

The sampling methodology of the proposed survey will follow that used for the Boat-based Interview, as our survey is an 'add-on' portion to the creel survey. The Boat-based Creel Survey programs in the three island areas have been running for over 30 years. The creel survey is conducted several times a month, based on random sampling by type of day (weekday/weekend/ holiday) at sites that are actively used for launching fishing boats, throughout the year on an ongoing basis. Details of the survey locations, minimum survey days and shift times are shown in Appendix B. An interview is conducted by well-trained fisheries staff at the scheduled site and time when fishermen return from their fishing trip. If possible, all boats returning to the ramps/docks during the sample shift time will be interviewed, in the order of arriving time. When too many boats return at the same time and cannot all be interviewed, staff prioritize interviews so that boats fishing with the least-encountered fishing methods for the past month are interviewed first.

Estimation Procedures

The NMFS needs to measure the trip-level economic performance of American Samoa, Guam, and the CNMI small boat fisheries in order to meet legal and regulatory requirements, support fisheries management decision making, and undertake economic research. This survey collects the data that is needed (but not currently available from other sources) to continue updating our knowledge of fishing expenses in these three island areas, so that the trends of fishing expenses in each island areas can be maintained and the regional comparisons of fishing expenses can be supported.

The data collected will be used to generate statistical description of fishing trip costs in the three island areas in general and by major fishing method. The estimated trip costs are useful in and of itself to help understand the economic condition of the fishery and how it may have changed. Such data summaries are the type of information that fishery managers, participants, and the public commonly wish to have provided. The data summaries on trip cost structure and trends were included in Council's Annual Stock Assessment and Fishery Evaluation Reports by the Western Pacific Fishery Management Council.

Desired Accuracy Needed for the Intended Purpose

Using the trip cost data collected between 2011 and 2019 for each island area, the annual average margin of errors for estimation of the population mean at the 95% confidence level are 10% for Guam, 8% for American Samoa, and 8% for CNMI.[2] This level of accuracy will provide good estimation of fishing expenses in general. The data collected will be used for economic analyses.

2 The margin of error for each island area is estimated using the trip cost data for 2011-2019 in the formula $e = 1.96 \times s/\sqrt{n}$. Each year's trip cost data were used to calculate the sample standard deviation "s", the number of responses "n", and the margin of error "e" at 95% confidence level for each year. Then, an average of the margin of errors across 2011-2019 was calculated for each island area.

Detailed economic analyses are described in Part A, Question 2.

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

Methods Used to Maximize Response Rates

Several steps will be taken to maximize the response rates. First, all staff members are trained in in-person interviewing techniques to make sure the survey is administered properly. This includes requesting permission to do the interview. Second, the participation is completely voluntary. If the interviewers feel the fisherman does not want to participate, they immediately terminate the survey and thank the fisherman for the time. This approach is respectful of island customs and cultural etiquette across the Pacific Islands Region and will ensure the agency maintains a good relationship with the local fishing communities. Given the small, tight-knit, island fishing communities in the three island areas, this will avoid any negative impact to survey participation by other fishermen and negative impacts on future survey participation. Third, the survey is short in length, only five major trip cost item questions and one question about engine type will be asked; the estimated time to complete the questions is 5 to 10 minutes. Fourth, because of the long history of the creel survey with the economic data having been collected in the past few years, the interviewers have already established good relationships with small boat fishermen and fishermen are also familiar with the questions being asked. Finally, we are planning to produce a brochure summarizing the economic data from previous years and distribute it to the fishermen during their community meetings as one of the outreach activities so fishermen may have better understand how the data are presented and used in publications. We feel that sharing the information can build trust within the community and encourage fishermen to participate in data collection and provide additional incentive to fishermen for survey participation. The response rate in Guam was the lowest across the three island areas, we contacted the offshore biologist in DAWR, Thomas Flores, Jr., who is managing the offshore boat based creel survey program about the issue and he confirmed that he will remind his staff to encourage fishermen to respond to the economic questions.

Addressing Non-Response

Based on the previous years' data collection, the trip-level economic surveys received high response rates. The trips with economic data compared to the total creel survey responses in terms of fishing trip was 84% in American Samoa, 79% in CNMI, and 32% in Guam. In addition, we collected a large number of economic surveys in all years (110-190 surveys per year on average in each island area). In addition, opportunistic creel surveys are conducted if not enough interview data are available for a particular fishing method. This helps to supplement data for the less common fishing methods. Since the add-on economic surveys are voluntary, there are non-responses. Trip costs are likely to differ among fishing methods due to different trip length and target. Therefore, it is possible to compare respondents and non-respondents with regard to fishing method. If there is a significant difference in the fishing method between the two groups, weights can be applied when estimating the average fishing expenses for the less representative groups.

Adequacy of Accuracy and Reliability of the Information for Intended Uses

Because the fishing expense data will be collected right after the fishing trip is completed, it is expected that the fisherman will have good recall and can provide accurate data of the fishing expenses. From the interviews with the creel data survey managers (Question 8 above), they all agreed fishermen are able to provide accurate answers.

In addition, to ensure the quality of the collected data, all staff in the creel survey programs undergo quality assurance and quality control training for data handling, backing up the database, and archiving the raw data.

Based on the actual economic survey response rates, we should have an adequate sample size for reliable estimates of fishing expenses. As mentioned in Part B, Question 2, the margin of errors for estimation of the population mean at the 95% confidence level are 10% for Guam, 8% for American Samoa, and 8% for CNMI.

For a description of the specific uses the agency plans for the data collected, see the response to Question 2 in Part A.

4. Testing is encouraged as an effective means of refining collections of information to minimize burden and improve utility. Tests must be approved if they call for answers to identical questions from 10 or more respondents. A proposed test or set of tests may be submitted for approval separately or in combination with the main collection of information.

This economic survey has been conducted in the three island areas for nine years; there is no need to pre-test the survey.

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.

Dr. Minling Pan, economist and project lead, employed by the NMFS, was consulted on the statistical design. Dr. Minling Pan can be reached at 808-725-5349. The creel survey fieldworkers/crew in the three local agencies are collecting the data (as listed in Section A, Question 4). NMFS economists will oversee the data collection program, and NMFS economists and WPRFMC staff and the local agencies will use the data for regulatory analysis.

APPENDIX A

Economic Data Requirements for Federally Managed Commercial Fisheries

1. Introduction

NMFS uses economic data and the models and analyses they support to monitor, explain and predict changes in the economic performance and impacts of federally managed fisheries. The legal and policy requirements for economic data and analyses are intended to promote better informed conservation and management decisions on the use of living marine resources and marine habitat in federally managed fisheries by improving the ability of NMFS and the Councils to monitor, explain and predict those changes.

In this appendix, we address the following 13 laws, Executive Orders (EOs) and NOAA Fisheries strategy and policy statements with requirements for economic data, models and analyses.

1. The Magnuson-Stevens Fishery Conservation and Management Act (MSA)
2. The Marine Mammal Protection Act (MMPA)
3. The Endangered Species Act (ESA)
4. The National Environmental Policy Act (NEPA)
5. The Regulatory Flexibility Act (RFA)
6. EO 12866 (Regulatory Planning and Review)
7. EO 13771 (Reducing Regulation and Controlling Regulatory Costs)
8. EO 13840 (Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States)
9. The NOAA Fisheries Guidelines for Economic Reviews of Regulatory Actions
10. The NOAA Fisheries Strategic Plan 2019-2022 (Strategic Plan)
11. The NOAA Fisheries Ecosystem-Based Fishery Management (EBFM) Road Map
12. The NOAA Fisheries National Bycatch Reduction Strategy
13. NOAA's Catch Share Policy

We use the terms "needed" and "required", with respect to economic data, to refer to data that would support more than a highly superficial effort to comply with or support those laws, EOs and statements.

2. MSA

In addition to identifying the importance of economic information, the MSA includes requirements that NMFS and the Councils can at best meet superficially without basic economic data. Specifically, NMFS and the Councils need economic data to meet and/or to know if they have met each of the 10 National Standards, 9 of the 15 required provisions of a Fishery Management Plan (FMP), some discretionary provisions of an FMP, and some of the required actions by the Secretary. Below, we present examples of the most explicit MSA requirements for economic data.

2.1 National Standards

National Standard 1:

> Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry (see 16 USC Ch 38 §1851 (a)(1)).

As defined in the MSA (see 16 USC Ch 38 §1802(33)), "The term "optimum", with respect to the yield from a fishery, means the amount of fish which—(A) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; (B) is prescribed on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant social, economic, or ecological factor; and (C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery."

NMFS requires basic economic data and the economic models and analyses they support to determine the amount of fish that "will provide the greatest overall benefit to the Nation" and whether there are economic factors that justify setting the OY below the MSY.

National Standard 2:

> Conservation and management measures shall be based upon the best scientific information available (see 16 USC Ch 38 §1851 (a) (2)).

Various sections of the MSA make it clear that scientific information includes economic information. Further, current NOAA guidelines for National Standard 2 explicitly state that:

> Fishery conservation and management require high quality and timely … economic … scientific information to effectively conserve and manage living marine resources.
>
> Management decisions should recognize the … economic (e.g., loss of fishery benefits) risks associated with the sources of uncertainty and gaps in the scientific information.
>
> Each SAFE (Stock Assessment and Fishery Evaluation) report should contain the following scientific information when it exists: … Pertinent economic … information for assessing the success and impacts of management measures or the achievement of objectives of each FMP.

The "best scientific information available" requirement of NS2 is not the same as the "best reasonably obtainable information" requirement of EO 12866.

National Standard 3:

> To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination (see 16 USC Ch 38 §1851 (a)(3)).

NMFS principally uses biological information to identify the range of a stock of fish and the interrelated stocks of fish. However, stocks of fish can be interrelated due to fishing vessels that participate in multiple fisheries, take multiple species in a fishery, and stocks that compete in similar markets. NMFS can use economic data to address these additional stock interactions.

National Standard 4:

> Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges (see 16 USC Ch 38 §1851 (a)(4)).

NMFS uses basic economic data, including cost and earnings data for participants in the fishery, to identify some of the effects of such allocations and therefore to provide information that is useful in determining whether such allocations are "fair and equitable." In addition, economic data are useful in determining what constitutes "an excessive share of such privileges."

National Standard 5:

> Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose (see 16 USC Ch 38 §1851 (a)(5)).

NMFS uses cost and earnings data and other data to evaluate the effects of proposed measures on efficiency.

National Standard 6:

> Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches (see 16 USC Ch 38 §1851 (a)(6)).

The "variations among and contingencies in fisheries" are in part defined in terms of economic variables. Therefore, NMFS requires basic economic data to meet this standard.

National Standard 7:

> Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication (see 16 USC Ch 38 §1851 (a)(7)).

NMFS needs economic data, including cost and earnings data, to determine if it has met this national standard.

National Standard 8:

> Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirements of paragraph (2), in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities (see 16 USC Ch 38 §1851 (a)(8)).

There is an explicit requirement to use the best available economic and social data to meet this national standard. Specifically, we need economic data to predict the extent to which we expect conservation and management measures to provide for the sustained participation and to minimize adverse economic impacts.

National Standard 9:

> Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch (see 16 USC Ch 38 §1851 (a)(9)).

Congress and NMFS have made it clear that the broadly defined benefits and costs of further reductions in the levels of bycatch or discard mortality rates are critical for determining if further reductions are practicable. Therefore, NMFS requires economic data to determine if we have met this national standard.

National Standard 10:

> Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea (see 16 USC Ch 38 §1851 (a)(10)).

NMFS uses economic data in determining what further improvements in safety are practicable and, therefore, if it has met this national standard.

2.2 Regional Fishery Management Councils

The following two MSA requirements for Council Scientific and Statistical Committees (SSCs) make it explicit that basic economic data, models and analyses are part of the scientific information that the Councils are required to consider.

> Each Council shall establish, maintain, and appoint the members of a scientific and statistical committee to assist it in the development, collection, evaluation, and peer review of such statistical, biological, economic, social, and other scientific information as

is relevant to such Council's development and amendment of any fishery management plan (see 16 USC Ch 38 §1852 (g)(1)(A)).

Each scientific and statistical committee shall provide its Council ongoing scientific advice for fishery management decisions, including … reports on social and economic impacts of management measures … (see 16 USC Ch 38 §1852 (g)(1)(B)].

2.3 FMP Required Provisions

NMFS needs basic economic data to meet 9 of the 15 MSA required provisions for FMPs prepared by either a Council or the Secretary. The following are the four most explicit examples of those required provisions.

FMPs are required to "contain a description of the fishery, including, but not limited to … the cost likely to be incurred in management, actual and potential revenues from the fishery …" (see 16 USC Ch 38 §1853 (a)(2)). We need basic economic data to describe the cost likely to be incurred in management and the actual and potential revenues from the fishery.

FMPs are required to "include a fishery impact statement for the plan or amendment …. which shall assess, specify, and analyze the likely effects, if any, including the cumulative conservation, economic, and social impacts, of the conservation and management measures … and possible mitigation measures" (see 16 USC Ch 38 §1853 (a)(9)). We need economic data to assess, specify, and analyze the likely effects, if any, including the cumulative conservation, economic, and social impacts, of the conservation and management measures and possible mitigation measures.

FMPs are required to "include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery, including its economic impact …" (see 16 USC Ch 38 §1853 (a)(13)). We need economic data to describe the fishing sectors of a fishery and to estimate and describe the economic impacts.

FMPs are required to "to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate, taking into consideration the economic impact of the harvest restrictions or recovery benefits on the fishery participants in each sector, any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery;" (see 16 USC Ch 38 §1853 (a)(14)). NMFS needs economic data to: (1) identify and consider either the economic impact of the harvest restrictions or the recovery benefits on the fishery participants in each sector and (2) determine if the associated impacts and benefits are allocated fairly and equitably.

The MSA recognizes the importance of economic data for its effective implementation. Therefore, it requires each FMP to "specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, charter fishing, and fish processing in the fishery, including … economic information necessary to meet the requirements of this chapter (see 16 USC Ch 38 §1853 (a)(5)).

2.4 Discretionary Provisions

NMFS needs basic economic data for some of the discretionary provisions of FMPs. For example, it needs such data to "take into account ... the economics of the fishery" when establishing a limited access system for the fishery in order to achieve optimum yield (see 16 USC Ch 38 §1853 (b)(6)(C)). Similarly, it needs economic data to meet the following MSA requirements for a limited access privilege program (LAPP) or to determine if it has met these requirements.

1. Contribute to reducing capacity if established in the fishery with overcapacity (16 USC Ch 38 §1853a (c)(1)(B)).

2. Promote fishing safety, fishery conservation and management; and social and economic benefits (16 USC Ch 38 §1853a (c)(1)(C)).

3. Monitor and review the program to determine progress in meeting the goals of the program and this Act, and any necessary modification of the program to meet those goals (16 USC Ch 38 §1853a (c)(1)(G)).

4. Develop a community sustainability plan that demonstrates how the plan will address the social and economic development needs of coastal communities (16 USC Ch 38 §1853a (c)(3)(A)(i)(IV).

5. Consider the economic barriers to access to fishery and the existence and severity of projected economic and social impacts associated with implementation of limited access privilege programs on harvesters, captains, crew, processors, and other businesses substantially dependent upon the fishery in the region or subregion (16 USC Ch 38 §1853a (c)(3)(B)).

2.5 Action by the Secretary

Finally, NMFS requires basic economic data and the economic models and analyses they support to meet more than superficially the following three required actions by the Secretary.

1. Review the plan or amendment to determine whether it is consistent with the national standards, the other provisions of this Act, and any other applicable law (16 USC Ch 38 §1854 (a)(1)(A)).

2. Evaluate the proposed regulations to determine whether they are consistent with the fishery management plan, plan amendment, this Act and other applicable law (16 USC Ch 38 §1854 (b)(1)).

3. Allocate both overfishing restrictions and recovery benefits fairly and equitably among sectors of the fishery (16 USC Ch 38 §1854 (e)(4)(B)).

3. Marine Mammal Protection Act (MMPA)

When prescribing conservation regulations, under the MMPA, NMFS must take into account the economics of the fishery, the availability of existing technology, and existing state or regional fishery management plans (16 U.S.C. § 1387(f)). We need basic economic data to do that.

4. Endangered Species Act (ESA)

The ESA includes requirements for economic data and analysis. For example, under §4(b)(2), NMFS must consider the economic and other effects of critical habitat designation. Similarly, under §4(f), which governs recovery plans for listed species, NMFS must develop "estimates of the time required and the cost to carry out those measures needed to achieve the [recovery] plan's goal and to achieve intermediate steps toward that goal." We need basic economic data for the commercial fisheries to meet those requirements effectively.

5. National Environmental Policy Act (NEPA)

NEPA requires Federal agencies to consider the interactions of natural and human environments, and the impacts on both systems of any changes due to governmental activities or policies. NMFS is to do this with "a systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences ... in planning and in decision-making …." [NEPA Sec. 102(2)(A)] and, further, to "identify and develop methods and procedures, ….., which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making along with economic and technical considerations" [NEPA Sec. 102(2)(B)]. In addition, NOAA's NEPA implementation guidelines require that the environmental impact statement (required under NEPA Sec. 102(2)(C)(i)) include biological, ecological, economic, and social consequences. NMFS needs economic data and the models they support to conduct the required analyses and to predict the behavioral response of fishermen and others that affect the biological, ecological, economic, and social consequences.

6. Regulatory Flexibility Act (RFA)

If the agency does not have a factual basis for a determination that there are not a substantial number of directly regulated small entities or that no significant adverse impact on directly regulated small entities will occur, it must prepare an initial regulatory flexibility analysis (IRFA) and a final regulatory flexibility analysis (FRFA). The IRFA: (1) describes the impact of the proposed rule on small entities [Sec. 603(a)] and (2) identifies the directly regulated small entities and any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and that minimize any significant economic impact of the proposed rule on small entities [Sec. 603(c)]. Each FRFA is required to describe the steps the agency has taken to minimize the significant economic impact on small entities consistent with the stated objectives of applicable statutes [Sec. 604(a)(5)]. In addition, several Sections of the RFA require Federal agencies to analyze the effects of regulations to determine whether an action will have or has had "a significant economic impact on a substantial number of small entities." Cost, revenue and ownership information for the specific activity in question (e.g., commercial fishing), as well as some level of general information on the full range of income

producing activities in which firms are engaged are necessary to effectively conduct the RFA analyses. The RFA also requires that agencies consider all affiliations, worldwide, of regulated entities such as ownership affiliations and cooperative affiliations.

7. EO 12866 "Regulatory Planning and Review"

EO 12866 (58 FR 51735, October 4, 1993) requires analysis of the impacts of regulations implementing fishery conservation and management actions. Specifically, it includes the following requirements.

> In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach [Sec. 1(a)].
>
> Each agency shall base its decisions on the best reasonably obtainable scientific, technical, economic and other information concerning the need for, and consequences of, the intended regulation" [Sec. 1(b)(7)].

In an effort to meet the requirements of EO 12866, NMFS or a Council prepares a Regulatory Impact Review (RIR) for each proposed regulatory action. The economic data, models and analyses used in an RIR in part determine its success in meeting those requirements and contributing to having a well-informed regulatory decision.

8. EO 13771 "Reducing Regulation and Controlling Regulatory Costs"

EO 13771 (82 FR 9339, January 30, 2017) is intended to manage the costs of government regulation on private industry. It requires that "any new incremental costs associated with new regulations shall, to the extent permitted by law, be offset by the elimination of existing costs associated with at least two prior regulations." In addition, it states that "the head of each agency shall identify, for each regulation that increases incremental cost, the offsetting regulations … and provide the agency's best approximation of the total costs or savings associated with each new regulation or repealed regulation" (see Sec 3). NMFS needs economic data, models and analyses to meet these requirements.

9. EO 13840 "Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States"

Two of the seven stated policies of EO 13840 (83 FR 29431; June 22, 2018) require economic data, models and analyses. Those two policies are as follows:

(d) facilitate the economic growth of coastal communities and promote ocean industries, which employ millions of Americans, advance ocean science and technology, feed the American people, transport American goods, expand recreational opportunities, and enhance America's energy security;

(e) ensure that Federal regulations and management decisions do not prevent productive and sustainable use of ocean, coastal, and Great Lakes waters;

10. NOAA Fisheries Guidelines for Economic Reviews of Regulatory Actions[3]

NMFS issued the guidelines, in part, to assist in understanding and meeting the analytical requirements of EO 12866 and the RFA for regulatory actions it plans to promulgate. EO 12866 and the RFA are two of the most direct mandates for the preparation of economic analyses and, therefore, for economic data.

Largely, the EO 12866 and RFA include similar requirement for economic analyses. The guidelines include the following two principal differences.

1. The RFAA must address the impacts of a proposed rule only on small entities subject to the regulation (i.e., small entities to which the rule will directly apply) and not on all small entities that are affected by the regulation (i.e., small entities to which the rule will indirectly apply).

2. Impacts under EO 12866 need not be identified at the vessel or firm level in the RIR, whereas, these levels remains the focus of the RFAA.

The guidelines note the analyses are intended to identify the economic effects of the preferred action and alternative actions, in contrast to taking "no action", where "The types of effects to consider include the following:

1. Changes in net benefits within a benefit-cost framework;
2. Changes in the distribution of benefits and costs among groups of individuals, businesses of differing sizes, and other entities (including small communities and governmental entities);
3. Changes in income and employment;

3*ation Report for the American Samoa Archipelago Fishery Ecosystem Plan 2018.* Remington, T., Sabater, M., Ishizaki, A. (Eds.) Western Pacific Regional Fishery Management Council. Honolulu, Hawaii 96813 USA. 157 pp. + Appendices.

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See https://www.bls.gov/oes/current/oes_gu.htm#45-0000

See "Guidelines for Economic Reviews of National Marine Fisheries Service Regulatory Actions" (NMFS, 2007)

4. Cumulative impacts of regulations; and
5. Changes in other social concerns.

More specifically, the guidelines include the following examples of the information that an RIR for commercial fishery management actions should provide:

1. Expected levels or changes in participation (number of fishing vessels) and activity (number of fishing trips, days at sea, etc.);
2. Expected levels or changes in harvests (commercial, recreational, and subsistence) and their distribution by sector;
3. Expected changes in commercial ex-vessel prices;
4. Expected changes in harvesting costs (fixed and variable costs, including capital and labor costs);
5. Expected levels and costs of processing.
6. Expected changes in benefits or costs incurred by specific user groups, including effects on small entities;
7. Expected effects on employment;
8. Expected effects on profits, competitive position, productivity or efficiency of individual fishermen, user groups, or fishing communities;
9. Expected effects on the reporting burden.
10. Expected impacts on consumer surplus;
11. Expected management and implementation costs attributable to the action, including enforcement costs;
12. Expected effects on non-use values; and
13. Expected effects on fishing capacity.

The guidelines state, "The proper comparison is with the action to without the action, rather than to before and after the action, since certain changes may occur even without action and should not be attributed to the regulation." Economic data, including cost and earnings data, and the models and analyses they support are required for more than a very superficial attempt to analyze those types of effects and to provide those types of information for the proper comparison. This conclusion applies to both quantitative and qualitative analyses intended to meet the requirements of EO 12866 and the RFA.

11. NOAA Fisheries Strategic Plan 2019-2022

NOAA Fisheries Strategic Plan 2019-2022 (Strategic Plan) addresses the importance of economic data. For example, the Mission and Mandates Section includes the following three statements concerning the requirements for economic data.

> NOAA Fisheries is responsible for the stewardship of the nation's ocean resources and their habitat. We provide vital services for the nation … all backed by sound science and an ecosystem-based approach to management.
>
> The U.S. science-based fishery management process, as mandated by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and other acts, is designed to provide optimum yield while preventing overfishing and taking into account the protection of habitat and marine ecosystems.
>
> We also conduct extensive data collection programs in collaboration with states, and provide … socioeconomic information required for the federal management of fisheries and their essential habitats.

The first two statements make it clear that: (1) NOAA Fisheries meets its stewardship responsibilities and provides vital services for the nation using sound science and an ecosystem-based approach to management and (2) a science-based fishery management process is mandated. The third statement and the separate discussions of the MSA and the NOAA Fisheries EBFM Road Map make it clear that economic data for federally managed commercial fisheries are among the information NOAA Fisheries requires for the successful implementation of a science-based ecosystem approach to management. For example, the determination of optimum yield (OY) requires economic data because the MSA defines OY partly in terms the amount of fish that will provide the greatest overall benefit to the Nation.

The Meeting the Challenges Section of the Strategic Plan lists 12 "high-priority areas of focus highlighted in this plan." Below, we discuss two of those high-priority areas of focus and the associated need for economic data.

> **Maximize the economic yield of U.S. fisheries**, enhancing the value of our fisheries to local fishing communities and the U.S. economy.

NOAA Fisheries requires economic data to determine the fishery conservation and management actions that it expects to enhance the value of our fisheries, as well as to measure and explain changes in their value.

> **Integrate ecosystem considerations** into stock assessments, fishery management, and aquaculture.

As noted above and in the separate discussions of the NOAA Fisheries EBFM Road Map, EBFM, which Integrates ecosystem considerations into fishery management, requires economic data.

The Strategic Plan identifies three Plan goals and key strategies for meeting them, which provide additional information concerning the requirements for economic data.

Goal 1: Amplify the economic value of commercial and recreational fisheries while ensuring their sustainability

The Strategic Plan states "NOAA Fisheries expects to amplify the economic value of U.S. seafood production by optimizing commercial harvest… Effective science-based management is essential to reaching optimum yield while preventing overfishing." Economic data are among the information NOAA Fisheries uses for effective science-based management, which includes determining the optimum commercial harvest and identifying the conservation and management actions that it expects will increase the economic value of commercial fisheries while ensuring their sustainability.

With respect to the requirements for economic data, the two most relevant key strategies for meeting Goal 1 and the identified requirements for economic data are discussed below.

Manage stocks for Optimum Yield

The stated strategy is to, among other things, "improve economic performance." NOAA Fisheries requires economic data to identify OY, to identify the expected effects on economic performance of alternative conservation and management actions and to monitor and explain changes in economic performance.

Modernize fishery information collection, management, and dissemination systems, and enhance cooperative data collection and sharing

The stated strategy is to "Support and coordinate with states to advance user-centered fishery information networks and data platforms, with greater efficiency and lower cost, to improve the ability to effectively manage stocks. Partner with industry to supplement the collection of additional valuable data and share fishery data (as appropriate) with the public and other industry partners." The strategy applies to a broad range of data including economic data.

Goal 2: Conserve and recover protected species while supporting responsible fishing and resource development

With respect to the requirements for economic data, the most relevant key strategy for meeting Goal 2 and the identified requirements for economic data are discussed below.

Minimize bycatch and entanglement of protected species while supporting fisheries

The stated strategy is to "Support continued fishing opportunities and aquaculture by understanding and minimizing protected species interactions and mortality. Work with the fishing industry, scientists, environmental organizations, academia, and other stakeholders to develop bycatch and entanglement prevention measures domestically and internationally." The

separate discussion of the National Bycatch Reduction Strategy recognizes the need for economic data to identify effective and efficient bycatch and entanglement prevention measures.

Goal 3: Improve organizational excellence and regulatory efficiency

The Strategic Plan states, "Improving business processes and implementing best practices conducted in a priority-based environment, along with continuous regulatory reform, will ensure our operations best support our customers and partners." With respect to the requirements for economic data, the three most relevant key strategies for meeting Goal 3 and the identified requirements for economic data are discussed below.

Institutionalize prioritization and performance management practices

For this key strategy, NOAA Fisheries is to "Use priority-based methodologies to optimize investments for maximum economic return while meeting conservation mandates. Analyze performance, risk and opportunities to ensure the best value to the American public." Economic data are required to assess economic return and to analyze performance, risk and opportunities.

Review agency regulations and remove or modify rules that unnecessarily burden businesses and economic growth

To meet this key strategy, NOAA Fisheries will "Implement Executive Order 13771 by reviewing regulations to identify and modify or repeal rules that are outdated, unnecessary, or ineffective. Continue to work with the regional fishery management councils to identify additional potential flexibilities for regulated entities that maximize fishing opportunities, while continuing to meet conservation objectives." As noted in the separate section on EO 13771, economic data are required for the effective and efficient implementation of that EO. For example, NOAA Fisheries uses economic data to estimate how alternative management actions will burden businesses and economic growth.

Institutionalize the use of innovative technologies

To meet this key strategy, NOAA Fisheries intends to "Support the development, leveraging, and use of powerful technologies (e.g., … advanced … electronic reporting) for … enhancing and improving the accuracy of observing systems, and collecting and sharing data in cost-effective, transparent, and real-time approaches. Work with industry, academia, and other partners to test, deploy, and use these technologies." Some of these technologies apply to economic data. For example, electronic reporting and observing systems, such as observer and electronic logbook programs, can be efficient methods for collecting some economic data.

12. EBFM Road Map

The NOAA Fisheries Ecosystem-Based Fisheries Management Road Map includes many statements that demonstrate the importance of economic data, models and analyses for successfully implementing EBFM. The following are four examples of those statements.

1. NOAA Fisheries defines EBFM as "a systematic approach to fisheries management in a geographically specified area that contributes to the resilience and sustainability of the ecosystem; recognizes the physical, biological, economic, and social interactions among the affected fishery-related components of the ecosystem, including humans; and seeks to optimize benefits among a diverse set of societal goals."

2. A national review of the data collection programs is needed across a wide range of disciplines, including but beyond the typical abundance and basic biological and catch data. For instance, needs that warrant inventory to identify gaps include … broader economic data …

3. NOAA Fisheries supports the consideration of and efforts to take into account various

trade-offs when considering the independent and the cumulative effects of natural and human pressures on the ecosystem, including: Analyze trade-offs to optimize total benefits from all fisheries within each ecosystem or jurisdiction. This will be done by taking into account statutory mandates (e.g., MSA, Marine Mammal Protection Act (MMPA), ESA, National Aquaculture Act, etc.), regional socio-economic considerations ….

4. Evaluating cumulative impacts of proposed management actions for LMRs, their ecosystems, and associated coastal communities, as well as identifying alternative actions that achieve societal goals will further inform EBFM decisions. Cumulative and synergistic impacts are difficult to identify on a species-by-species basis, and systemic analyses will help to identify any such impacts.

13. National Bycatch Reduction Strategy

The National Bycatch Reduction Strategy includes various statements that demonstrate the importance of economic data, models and analyses for reducing bycatch and discard mortality effectively and efficiently. They include the following two selected research and develop actions.

1. Improve understanding of the economic and other social factors contributing to bycatch, and identify regulatory and market incentives that might increase utilization of economic discards.

2. Assess how technology is developed and adopted in fisheries and how technological advances can affect bycatch reduction, including improvements in post-release mortality.

They also include the following two selected conserve and manage actions.

1. Analyze the effectiveness of incentive-based approaches to environmental management, (e.g., catch shares, risk pools, cooperatives, dynamic area management), and consider their application to bycatch reduction programs.

2. Improve understanding of the socio-economic, and other environmental trade-offs of bycatch reduction to better inform stakeholders and to support management decisions and postregulation analyses.

14. NOAA's Catch Share Policy

NOAA's Catch Share Policy contains many guidance, requirements and commitment statements that NOAA Fisheries cannot meet more than superficially without basic economic data and the models and analyses they support. Here are three examples.

1. Councils and NOAA must establish relevant performance measures. Performance metrics for some of the typical fishery goals may include … what were the impacts on fishing communities, participation and entry into the fishery; what happened to prices, revenues and profits.

2. Performance measures need to be linked back to the initial objectives in a FMP. Many current FMPs have general and sometimes vague objectives. Objectives for biological, economic and social outcomes should be readily measurable, such as … improving socio-economic conditions for fishery participants and/or fishery-dependent communities.

3. Catch shares can result in fishery improvements in many areas but the metrics chosen to monitor performance should not be limited by the current availability of data. It is important to ensure in the catch share design stage that share holders will supply relevant data to monitor program performance in return for their allocation. This includes obtaining more specific biological and economic performance data from the participants, all in accordance with applicable law governing maintenance of business trade secrets and confidentiality of data.

APPENDIX B

Creel Survey: Boat-Based Interview Sampling Location and Time

	Minimum Survey Days	Shift: Day	Shift: Night
GUAM			
Agana Boat Basin	2 weekdays and 2 weekends/holidays per month	5:00-12:00	16:00-24:00
Agat Harbor	1 weekday and 1 weekend/holiday per month	5:30-12:00	16:00-24:00
Merizo Pier	1 weekday and 1 weekend/holiday per month	6:00-11:00	16:00-24:00
CNMI			
Sugar Dock, Fishing Base, Smiling Cove	9 weekends and 9 weekdays/holidays per quarter	14:00-18:00	18:00-2:00
AMERICAN SAMOA			
Pago Pago, Fagatogo, Utulei, Faga'alu	12 weekdays and 2 weekends/holidays per month	5:00-13:00	14:00-22:30

Sources: Oram R, Tuisamoa N, Tomanogi J, Sabater M, Quach MMC, Hamm DC, and Graham C. 2011a. American Samoa boat-based creel survey documentation. Online at http://www.wpcouncil.org/wp-content/uploads/2015/08/American-Samoa-boat-based_Final_3_7_11_KB.pdf [accessed 27 November 2017].

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