



NOAA Technical Memorandum NMFS-AFSC-228

A Guide to Designing, Testing, and Implementing Alaska Fisheries Science Center Economic and Social Surveys

by

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ABSTRACT

Economic and social surveys are useful and powerful tools used to help better understand the characteristics, attitudes, opinions, and behavior of specific populations. However, it is not always clear to researchers how these surveys should be developed and implemented so that the most accurate information is obtained. This guide is intended to address this concern and to guide Alaska Fisheries Science Center (AFSC) researchers through the survey research and development process with the basic protocols and techniques developed in the survey research literature for maximizing item and unit response, minimizing biases, and generally producing surveys that will yield high quality information. The information presented is generally applicable to all voluntary economic and social surveys conducted by AFSC researchers and its contractors and provides a number of guidelines intended to ensure that economic and social surveys produced by the AFSC are developed and implemented according to the standards of the survey literature and required administrative and internal protocols.

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INTRODUCTION

This document is intended to provide guidance for voluntary economic and social surveys conducted by the Alaska Fisheries Science Center (AFSC). Some of the information is also appropriate and applicable for mandatory data collections conducted by the AFSC. Conducting voluntary economic and social surveys of fishery participants poses challenges that general population surveys do not, such as often needing to get buy-in from key members of the target population and from parallel fisheries management agencies to minimize duplication and implementation problems. Shepherding a proposed mandatory data collection to fruition through a complex political and regulatory environment requires similar techniques in order to engender support for, and confidence in, the resulting data. However, details of navigating through that process are beyond the scope of this guide. This guide is intended to familiarize AFSC researchers with the basic protocols and techniques developed in the survey research literature for maximizing item and unit response, minimizing biases, and generally producing surveys that will yield high quality information. These protocols and techniques can and should be applied to how the AFSC or its contractors conduct voluntary surveys so that such surveys and the data collected stand up to scrutiny in both the policy and scholarly realms.

This document provides a number of guidelines intended to ensure economic and social surveys produced by the AFSC are developed and implemented according to the standards identified in the survey literature and required administrative and internal protocols. These guidelines are generally applicable to all voluntary economic and social surveys conducted by AFSC researchers and its contractors, whether they are surveys of commercial fishermen,

processors and their employees, fishing community members, recreational anglers, the general public, or other specialized population of interest. Following them will ensure that AFSC surveys exceed or surpass established minimum levels of quality when fielded, maximize the chances of obtaining high quality data from the most respondents in the target populations, and ensure that researchers have thought about key administrative and political aspects of conducting a survey for the AFSC. Many of the guidelines are appropriate for generating high quality mandatory data collections as well, albeit without many of the steps associated with increasing survey response rates.

The guidelines discussed herein are derived from our experiences conducting economic and social surveys of fisheries participants, other specialized populations, and the public, and from concepts and advice provided in several industry-standard textbooks on survey methodology, including Dillman et al. (2009), Rea and Parker (2005) and Groves et al. (2004). We encourage the interested reader to go directly to these books and others referenced in this document for additional details about survey methodologies not provided in this document.

TYPES OF SURVEYS COVERED

AFSC researchers often seek information from the general public or from businesses, consumers, anglers, employees, employers, decision-makers, community leaders, or other specialized target populations. In this document, we make the distinction between three general types of surveys.

General population (GP) surveys are surveys of households or individuals from a general non-specialized population. These can be spatially defined, such as all Alaska

households or all U.S. households, for example. However, the respondent population does not have to consist of participants in fisheries-related activities or have any other special attribute. For example, the AFSC has conducted GP surveys to measure the public's preferences and values for threatened and endangered marine species.

Organized targeted population (OTP) surveys are surveys of populations that are at least loosely organized or contained in one or more organizations or associations. Some examples are surveys of community leaders, resource managers, commercial fishing processors, the catcher-processor fleet, and saltwater sportfishing charter boat operators. These populations have a significant presence politically and economically, and as a result, the majority of the population tends to be a part of one or more organized associations which advocate on behalf of the targeted populations and disseminate information to their members. The majority of AFSC surveys fall within this category.

Disaggregate targeted population (DTP) surveys are surveys of populations that are diffuse in organization. Some examples of disaggregate targeted populations include saltwater sport anglers and seafood consumers. Both groups may have small subpopulations that are associated with associations, such as angler associations and seafood safety advocate groups, but the vast majority of the populations are only linked by the common activity (i.e., saltwater sport fishing and buying seafood). Members of these populations are not likely to communicate with one another, at least in any appreciably systematic, or en masse, way.

To provide practical guidance for such a wide variety of populations, when appropriate we note throughout the guidance for what type(s) of surveys the guidelines are appropriate.

AN OVERVIEW OF THE PROCESS OF DESIGNING, TESTING, AND IMPLEMENTING AN AFSC ECONOMIC OR SOCIAL SURVEY

The process of developing, testing, and implementing an economic or social survey at AFSC can generally be described by five main stages: (1) Initial planning and project set-up, (2) survey development and testing, (3) testing survey protocols and final approvals, (4) full survey implementation, and (5) post-implementation activities (Fig. 1). Although these stages are generally sequential, the overall process is often iterative, particularly in the first three stages, both within and between the individual stages. The individual stages are described more fully in subsequent sections. Table 1 lists the approximate amount of time each of the tasks described below will take. As the table shows, there is considerable variability in the time required to complete each of the stages and the individual steps comprising the stages. This is due to a number of factors including, but not limited to, the following: the nature and complexity of the survey, outcomes of pretesting activities, the survey protocols followed, political resistance, funding and contracting issues, administrative delays, and FTE availability. Survey researchers should factor in the potential for these issues when determining the likely timeframe for conducting the survey.

Stage 1: Initial Planning and Project Set-up

There are four main activities in the first stage (see Fig. 2):

- a. Setting goals and identifying data desired or needed.
- b. Assessing the availability of information and project feasibility.

- c. Researching the population and understanding the issues.
- d. Initial planning, budgeting, and developing an initial survey plan.

These four activities make up the initial project planning steps. Step 1a is the problem identification step and involves identifying the research problem the data collection is intended to inform, determining what type of information is needed, and determining the population or populations from which the information can be obtained. Step 1b involves assessing the current level and quality of information available about the issue, as well as what has been done in the past and data that are planned to be collected in the future to gather information about the issue. Depending upon the issue, these first two steps may require consulting with other National Marine Fisheries Service (NMFS) economists and social scientists, the NMFS Alaska Regional Office, North Pacific Fishery Management Council (NPFMC), Alaska Department of Fish and Game (ADF&G), and other experts in addition to library and web research. This stage should also include some initial planning and budget development. How much the survey will cost to fully implement depends critically upon the **survey plan**, which describes how the target population will be sampled, specifics about the sampling methods used, the sampling frame (a list of all population members from which to sample), and survey modes employed, as well as the testing activities that will be followed. This survey plan will likely evolve over time as budgetary, timing, administrative, and other issues arise. Basic elements of a survey plan include the following:

- The purpose of the data collection.
- Identification of the population to be surveyed.

- Identification of a sampling frame and sampling methods to use.
- A description of the survey protocols to follow (mail, telephone, in-person, internet, or mixed-mode survey).
- Assessment of pretesting needs.
- Estimate of sample size(s) needs.
- Timeline.
- Assessment of personnel needs.
- Budget.

The development of an initial survey plan in Step 1d should be done in the initial planning stage to provide the basis for seeking funding, but the survey plan may, and often does, change depending upon the actual funds available, as well as changes to the survey protocols, survey design, or implementation issues that arise in later stages. The initial planning stage also involves researching the target population and gaining a deeper understanding of the issues that will be covered in the survey (Step 1c).

For information on sampling, such as selecting an appropriate sample size and sampling methods, see chapters 3 and 4 of Groves et al. (2004), Lohr (2010), and Seung (2010).

Questions to ask during Stage 1 (see Table 2 for a complete checklist):

Setting goals and identifying data desired or needed

1. What are the research or management questions that are driving the need for a survey?

2. What are the goals and objectives for this proposed survey? Is the survey justified?
3. What data are needed to answer the identified questions?

Assessing availability of information and project feasibility

4. Is the population identifiable and reachable?
5. What obstacles are there to collecting data from this population?
6. What, if anything, has been done in the past to collect this information? How successful were past efforts and how recent are the data?
7. Is adequate data available from existing sources? Can the data to be collected with the survey be obtained by secondary sources?
8. Is anyone else within the AFSC, the NMFS Alaska Regional Office, NPFMC, or other state/federal agencies conducting a survey or research with the same target population? If so, what efforts can be taken to reduce the burden on the target population?

Researching the population and understanding the issues

9. What agencies (e.g., NMFS Alaska Regional Office, NPFMC, or other state/federal agencies), interested parties or key individuals, if any, should be consulted about collecting this information (including other researchers at the AFSC)?
10. [OTP and DTP surveys] Are there key members of the target population that should have input in the survey development process? If so, how can they be involved?

11. [OTP and DTP surveys] Is there a plan for engaging key members of the target population to encourage them to advocate for the survey among the population to promote a higher response rate?
12. Will the survey census the entire target population? If not, is there a sampling frame available that adequately covers the target population? What are the desired sample size and the sample selection procedures that will be employed?

Initial planning, budgeting, and developing an initial survey plan

13. What survey mode(s) (mail, internet, telephone, in-person) will be employed? Have the feasibility and effectiveness of conducting the surveys by the mode(s) been assessed?
14. What specific survey protocols do you expect will be followed to collect the data? Has an assessment of the protocols been made in terms of costs, timing, and effectiveness in minimizing potential biases and maximizing response to the survey?
15. Has a timeline for developing, implementing, and analyzing the survey been developed?
16. Is the timeline flexible enough to accommodate unforeseen delays in the project?
17. Is there sufficient funding and time to conduct the survey to the standards of this guidance?
18. How will contractors be involved, if at all? Will they have the time and resources to conduct their tasks to the standards of this guidance?

Stage 2: Survey Development and Testing

The second stage involves the development and testing of the survey. Key components of this stage include the development of questions, formatting of survey materials, and getting input from subject matter experts and the target population (see Fig. 3). The stage is described in seven primary steps:

- a. Developing questions, subject matter expert input, and initial testing and feedback.
- b. Developing the initial survey.
- c. Pretesting the initial survey.
- d. Revising the survey and retesting activities.
- e. Revising the survey plan.
- f. Developing supplemental materials.
- g. Begin preparing a Paperwork Reduction Act (PRA) clearance request.

The development of good survey questions is an iterative and difficult process. For advice on how to develop survey questions and improve their wording, see Fowler (1995), chapters 4 and 5 of Dillman et al. (2009), chapter 7 of Groves et al. (2004), and chapter 3 of Rea and Parker (2005). Fowler (1995, p. 2-4) identifies the following five standards for what makes a good survey question:

1. *Questions need to be consistently understood.* A good survey question is one that all people answering it understand in a consistent way and in the same way the researchers intend it to mean.
2. *Questions need to be consistently administered or communicated to respondents.* This may be important if the survey is being administered in different languages where the question wording may be difficult to present consistent meaning across languages used. Additionally, this standard applies to how interviewers present the question in in-person or telephone surveys—it should be asked in the exact wording consistently across interviewers. In mail surveys, all respondents should be able to read the question.
3. *What constitutes an adequate answer should be consistently communicated.* Respondents should clearly understand what types of answers are desired and acceptable. Questions that are ambiguous in the form of the response being asked for fail this standard. For example, the open-ended question “When did you last go fishing?” lends itself to answers ranging from “last year” to “when I was 18”. Rewording the question to “In what month and year did you last go fishing?” or providing several response categories to choose from provides the respondent with guidance on what types of answers are expected.
4. *Unless measuring knowledge is the goal of the question, all respondents should have access to the information needed to answer the question accurately.* This standard relates to the respondent’s ability to answer the question. If they do not have the ability to accurately answer the question, it is obviously not a good question to ask unless the intention is to actually test their knowledge.

5. *Respondents must be willing to provide the answers called for in the question.* A good question is one for which people are willing to provide truthful and accurate answers. Otherwise, if they have an incentive to purposefully provide misleading or inaccurate responses, results will be biased.

In addition, for AFSC surveys good survey questions must also abide by another standard:

6. *The information the question is seeking from the respondent should not be available from another source accessible to AFSC researchers.* This standard ensures that respondents are not overburdened and asked more questions than are necessary to provide the AFSC with the data needed to address the issue in question.

The initial development of survey questions (Step 2a) often involves getting input from subject matter experts and, for more complex surveys, conducting focus groups to identify key issues and assess ways of asking about certain concepts. For many AFSC surveys, expert input is needed during early question development. For example, NPFMC staff may provide insights into recent policy discussions at Council meetings that may affect the types of questions one would ask in the survey. For complex surveys, focus groups are often used.

Focus groups involve gathering a small group of people together (typically between 5 and 10) for a group discussion of materials and/or topics.¹ These people are from the target

¹ Note that the Paperwork Reduction Act (PRA) limits the number of people that can participate in testing activities for federal agency surveys without getting formal clearance from the Office of Management and Budget (OMB), a process that takes months. The most recent interpretation of how many people may participate in testing activities for a survey without formally triggering the requirements of PRA is that no more than nine people in aggregate

population. Focus groups are led by a trained moderator familiar with the materials and issues who leads the group through a focused discussion. They can be useful in the preliminary stages of survey development for gaining insights into how members of the target population think about or process certain issues and to test different types of questions, but are usually not very useful for fine tuning full survey instruments. In many cases, more than one focus group is needed to fully explore issues in the survey. Some of the pitfalls associated with relying on focus groups for evaluating survey materials can be found in Dillman, et al. (2009, p. 226) and Willis (2005, p. 233-236). For reference and additional details about focus groups and how to conduct them, see chapter 14 of Willis (2005), and chapter 5 of Fowler (1995).

Once the survey questions have been developed, they should be organized into a formal survey instrument (Step 2b). The specific format depends largely upon how the survey will be administered—as a mail survey, over the phone or internet, or in person. See chapter 6 of Dillman et al. (2009), chapter 4 of Fowler (1995), and chapter 4 of Rea and Parker (2005).

Once a draft survey instrument has been developed, it should be qualitatively pretested (Step 2c). Pretesting surveys is a key step in ensuring that survey questions work—that they are not misinterpreted, incomprehensible, biased, or invite strategic misreporting by members of the target population. Problems can occur with questions due to grammatical ambiguity, excessive complexity, vague or unfamiliar concepts or terms, or misleading or biased wording (Groves et

across all activities can be questioned. However, as of March 2011, a blanket clearance for all testing activities by federal agencies is being sought by OMB on behalf of all agencies. If it is approved, the process for seeking approval for pretesting activities will be greatly shortened for the life of the clearance (3 years).

al. 2004). As noted above, focus groups can be helpful in preliminary testing of questions, but in-depth testing of specific questions and the survey instrument itself must be dealt with by other pretesting mechanisms. Survey instruments are typically evaluated through the use of several pretesting activities. Some of the key methodologies that should be considered when testing survey instruments include cognitive interviews and review by survey research experts.

Cognitive interviews (Dillman et al. 2009, p. 221-227) are in-depth, one-on-one interviews conducted with a member of the target population. There are two main types of cognitive interviews typically employed, verbal protocols and verbal probes (Willis 2005). *Verbal protocols*, or think aloud interviews, involve the interviewee talking and “thinking aloud” (verbalizing their thoughts) while filling out the survey. This is a cognitively difficult exercise, but it can be extremely informative as it provides insights into what the respondent is thinking while taking the survey, how the respondent is interpreting the questions, and whether and where there are problems with the flow of the survey. There are two types of *verbal probe* interviews: concurrent and retrospective. Concurrent verbal probes are interactive interviews where the respondent answers a question, and the interviewer asks one or more probe questions before moving on. Retrospective verbal probes, on the other hand, involve the respondent taking part of, or the whole, survey prior to being asked probing questions by the interviewer.² For a discussion of the advantages and disadvantages of each of these cognitive interview types, see Willis (2005).

² These are also called self-administered with follow-up debriefing interviews.

When planning cognitive interviews, two considerations should be made. First, the number of cognitive interviews required depends upon the feedback obtained through the interviews. Since the survey development process is iterative, one should expect to revise and retest the survey a number of times, depending upon the issues and problems that arise. Second, it is important to conduct cognitive interviews in a manner that closely resembles the way in which the data will be collected. For instance, if the survey will be administered as a mail survey, interview respondents should fill out the paper questionnaire. However, if the survey will be conducted in person or over the phone, the interviewer should read the respondent the questions to better emulate the way they would get the survey in the field. The same applies to web-based surveys, where testing the survey on a laptop computer will best simulate the way the respondent would get the survey.

Another useful means of evaluating survey questions is to get **peer review** from both subject matter and survey design experts. As noted earlier, subject matter experts are often needed early in the development of survey questions. After the questions have been developed and tested on members of the target population through cognitive interviews, it is usually useful to get subject matter experts to look at the revised questions. Additionally, review by an expert in survey design methods is desirable at this stage. Following this peer review, it may be necessary to retest the survey instrument or specific questions to ensure the changes have not affected respondents' comprehension of, or ability to answer, the questions (Step 2d).

Once the survey is in a near-final form, the survey plan should be updated to reflect any changes to the project timing and budget, as well as to the methods that will be used (Step 2e). After this step is complete, efforts to get OMB clearance for full survey implementation under

the Paperwork Reduction Act (PRA) (Step 2g) should begin. Note that if a formal pretest will be undertaken, OMB clearance must be sought for the pretest and the full survey implementation, either in a separate or in a joint clearance request. PRA requires OMB to review and clear all federal agency data collections, including surveys and pretesting activities, before they are conducted. The supporting statement that accompanies the clearance request must include a description and justification for questions in the survey instrument, along with most of the information in the survey plan. Supporting statements will differ in each case due to the specifics of the survey project. It may be useful for AFSC researchers to consult with others who have successfully obtained recent OMB approval under the PRA for examples of materials submitted (http://www.cio.noaa.gov/Policy_Programs/prasubs.html).

The PRA clearance request must include all survey materials. For mail surveys, for example, this would include the survey instrument itself, cover letters, reminder postcards, and any other communications that may be employed. These supplemental survey materials should be developed during Stage 2 (Step 2f) for inclusion in the PRA clearance request. Other supplemental materials that may not be required in the PRA clearance package, but that may be developed during this time, include a frequently asked questions (FAQ) information sheet that may be made available during survey implementation, or sent out to key organizations or agencies in the case of OTP surveys. Peer review of all supplemental materials is highly recommended.

The process for seeking PRA clearance is a lengthy one that generally takes from 6 months to well over a year (and sometimes much longer) to complete. As such, it is critically important to account for this period in survey planning and to ensure your PRA package is

complete in order to avoid problems which may cause delays in the PRA clearance process. To help navigate the requirements, see NOAA's PRA page (http://www.cio.noaa.gov/Policy_Programs/pr.html) for specific guidance and information on submitting a PRA clearance request.

Questions to ask during Stage 2 (see Table 2 for a complete checklist):

Developing questions, expert input, and initial testing and feedback

1. Have issues with confidentiality and privacy been considered in the development of questions?
2. Does every question provide meaningful information?
3. Do the questions convey an unbiased perspective and use terms that are understandable and capable of being comprehended by every respondent?
4. Could the respondent interpret the questions differently than intended?
5. For closed-ended questions, have sufficient response choices been provided to comprehensively cover a range of answers for each question?
6. Is it clear how answers are to be provided in each question?
7. Has the use of open-ended questions, which are less desirable than closed-ended questions for standardizing responses, been minimized?
8. How difficult will it be for the respondents to answer open-ended questions?
9. Has an attempt been made to minimize the time and effort the respondent will likely need to answer each question?

10. Have considerations for how much time respondents will need to answer each question been made in terms of overall burden and its effect on item (question) response rate?
11. Are focus groups needed to help develop concepts and questions?

Developing the initial survey

12. Have survey research experts been consulted on survey design?
13. In what format will the data be collected (e.g., mail-out, telephone, web-based, intercept or in-person interview)?
14. Is the survey clear and easily followed?
15. Have similar questions been grouped together?
16. Have considerations for the total time burden of the survey been made?

Pretesting the initial survey

17. Have cognitive interviews with members of the targeted population been conducted to test the survey?
18. Have subject matter and/or survey design experts reviewed the survey materials?
19. Has the survey been peer reviewed at AFSC or with cooperating entities?
20. Have poorly worded questions been identified and revised accordingly?
21. Does the overall quality of the survey instrument need to be refined and fine-tuned for use in the actual survey process?

Revising the survey and retesting

- 22. Based on what was learned through pretesting, can any of the questions be reworded or clarified?
- 23. Are more cognitive interviews or reviews necessary?

Revising the survey plan

- 24. Did pretesting provide insights into how the initial survey plan should be modified?

Developing supplemental materials

- 25. Have all supporting materials that will be seen by respondents been prepared?
- 26. Do these materials need to be reviewed by experts or cooperating entities?
- 27. Do these materials need to be cleared by AFSC management or others?
- 28. Have instructions been provided for how the respondent should complete and return the survey?

Begin preparing Paperwork Reduction Act (PRA) clearance request

- 29. Have NOAA and NMFS PRA Officers been briefed on the timeline of the clearance request (see http://www.cio.noaa.gov/Policy_Programs/pr.html)?
- 30. For potentially sensitive surveys, has AFSC upper management reviewed the Federal Register Notice of Proposed Data Collection?
- 31. Has a Federal Register Notice of Proposed Data Collection been drafted and submitted to the NOAA and NMFS PRA Officers?

32. [OTP and DTP surveys] Are there key members of the target population that should be contacted regarding the Federal Register notice regarding the solicitation of public comments on the proposed survey?
33. [OTP and DTP surveys] Is there a plan for engaging key members of the target population to encourage them to advocate for the survey among the target population to promote a higher response rate?

Stage 3: Testing survey protocols and final approvals

After the survey has been developed and thoroughly vetted in Stage 2, the survey protocols must be evaluated, other materials may need to be prepared, and official clearances obtained. Specifically, the main third stage activities are the following (see Fig. 4):

- a. Obtain PRA clearance and other clearances as necessary.
- b. Preparing for implementation – database development, data processing set-up, training of interviewers.
- c. Formal pretest implementation and evaluation.

Surveys are rarely considered final until the day they are implemented. Wording and formatting changes in particular are often made up until the last minute to streamline wording, create a more pleasing aesthetic appearance, and to correct typos. However, unless further testing is available, changes of a substantive nature, for instance ones that may change the meaning of

questions, should be avoided. By the beginning of Stage 3, the survey instrument should be in its more-or-less final form, barring minor edits (e.g., typos).

Activities in Stage 3 are geared towards testing the survey protocols in a formal pretest implementation (Step 3c). The formal pretest is a small-scale implementation of the survey using the same survey protocols as would be used when the full survey is fielded. Formal pretests are desirable for evaluating the survey and the methods for implementing the survey in real-world conditions. These “dress rehearsals” are standard practice in the survey research field. Two main types of information can be gathered from them: quantitative information based on the survey responses and qualitative information from the interviewers or others who administered the survey. The former type of information provides insights into questions that may have high item non-response (where respondents left the question blank or refused to answer it), have responses that are unrealistic or out-of-range, or have responses that are not logically consistent with other answers. The former type of information occurs when, for example, in-person interviewers provide information on the problems they experienced with the interviews, which questions were problematic for respondents for the interviewer, etc. In addition, if interviewers are used to administer the survey, the pretest may be used to evaluate them and identify areas where they can improve (e.g., reducing interviewer bias, etc.).³

In preparing for the formal pretest, activities like hiring and training of interviewers, setting up a database for the data, and other logistics are the central focus (Step 3b). For surveys

³ Formal pretests are also sometimes used to conduct small field tests, such as split-sample tests to evaluate which of several different upfront monetary incentives provides the biggest boost to response rates.

involving telephone and in-person interviewing, chapter 9 of Groves et al. (2004) provides a useful discussion of these methods.⁴ In addition to a section on hiring, training, supervising, and monitoring interviewers, Groves et al. (2004) covers topics such as interviewer bias and interviewer variance, as well as ways to reduce both. Setting up a database, coding scheme, and protocols for inputting the data is important in Stage 3 when the quantitative pretest data will be used to evaluate item non-response or other issues. At this time one should also begin to work out the kinks associated with data entry and coding with a smaller volume of data in anticipation of the full survey implementation. Note that many AFSC economic and social surveys involve handling personally-identifiable information (PII) or other confidential information collected in the survey. Researchers should ensure that the data handling procedures developed for data entry, storage, and transmitting protect these data and follow all applicable privacy laws. Chapter 10 of Groves et al. (2004) and chapter 8 of Fowler (2002) cover issues related to data coding and entry.

The formal pretest can commence once preparations have been made and OMB clearance under the PRA has been given (Step 3a). Note that some surveys of a sensitive nature will require approval by the ESSRP manager or other NMFS or AFSC management prior to fielding. In these cases, ample time should be built into the project timeline to allow for these approvals.

Questions to ask during Stage 3 (see Table 2 for a complete checklist):

Obtain PRA clearance and other clearances as necessary

1. Has the PRA clearance supporting statement been drafted and reviewed by the NOAA and NMFS PRA Clearance Officers?

⁴ See chapter 7 of Fowler (2002) as well.

2. Has the NOAA PRA Officer submitted the PRA clearance request to the Department of Commerce for review?
3. Has the Department of Commerce PRA Officer submitted the PRA clearance request to OMB?
4. Have you responded to OMB questions and addressed any concerns regarding the clearance request?
5. Has OMB approved the survey and provided a control number?

Preparing for implementation – database development, data processing set-up, training of interviewers

6. Has a database structure been created to facilitate data entry?
7. Has the survey been coded and structured so that data can be entered easily?
8. Have data entry protocols been established, including handling of confidential data?
9. Have those conducting data entry been trained in the data entry protocols?
10. For face-to-face and telephone interviews, have interviewers been trained on the protocols for administering and the use of the survey?
11. Have interviewers been given specific instructions on conducting the interviews and guidelines for handling uncooperative respondents?

Formal pretest implementation and evaluation

12. Has the OMB control number for the formal pretest been included on the survey (i.e., interview script, paper surveys, or web surveys)?

13. Is the formal pretest being done in a fashion similar to how the actual survey will be administered (e.g., If a mail survey, did respondents fill out the survey themselves? If a web survey, were respondents given the survey on a computer and then debriefed)? If not, why was this not considered?

Stage 4: Full survey implementation

Assuming any problems with the formal pretest implementation have been resolved and OMB clearance has been received for the full implementation, the next step is the full survey implementation. The implementation stage includes two main activities (see Fig. 5):

- a. Administer and monitor implementation.
- b. Data entry, cleaning, and processing.

Administering the survey may involve a series of mailings, initiating phone calls, making a website live, sending interviewers into the field, or a combination of these things (Step 4a). AFSC surveys often include a means for the respondent to contact either the researchers or survey contractors to answer questions about the survey, such as a name, e-mail, phone number, or hyperlink to a website. Being responsive to respondents in a timely fashion when contacted through these means is also important during the survey implementation. The formal pretest should have helped iron out any difficulties in the specific sampling methods, survey protocols, and implementation, but it is still important to regularly monitor all the activities, even if the implementation is being done by a survey contractor. Being vigilant in monitoring the survey administration will ensure the process remains on target in terms of time and the number of

returns/responses that are coming in, and should a problem begin to appear, provide a chance to address it as quickly as possible. In addition, monitoring activities should ensure that survey administrators adhere to protocols put in place to protect confidential data and respondents' privacy.

For some survey modes, such as web-based surveys and computer-assisted telephone interviews (CATI), data entry is concurrent with implementation. For others, data entry is more periodic. Whenever data are entered, data entry protocols established in Stage 3 should be adhered to in order to ensure the accuracy of the data and to protect confidentiality. Data entry of responses to open-ended questions at this stage involves entering the response verbatim, or inputting a code associated with a coding scheme developed for the various types of responses to these questions.

Data cleaning occurs after data entry to ensure the data file is complete and everything is in order. Responses are checked to ensure they fall within logical bounds (no outliers) and are internally consistent. Often, this requires checking the data entered against the original data source (e.g., paper questionnaire). Coded variables are also checked to ensure they are entered consistently across individuals that keyed in the data. Some data cleaning can be automatically done in the data entry step provided the data entry procedures and software have been structured to do so. See chapter 10 of Groves et al. (2004) for more details.

In addition, it is important to ensure that the data files and protocols that were followed are properly documented. For the former, a detailed codebook describing each variable and the values it can take should be developed. The codebook should clearly identify what values are assigned to item non-responses (blanks) and refusals. For the latter, a system development

lifecycle process (SDLC) should be developed to document the collection of data, data entry, and the cleaning, processing, storing, and securing of data.

Questions to ask during Stage 4 (see Table 2 for a complete checklist):

Administer and monitor implementation

1. Are the survey sampling, administration protocols, and timetables being adhered to in implementation?
2. Has the OMB control number for the full implementation been included on the survey (i.e., interview script, paper surveys, or web surveys)?
3. Are the data being collected in a way to ensure that confidentiality and privacy concerns are protected?

Data entry, cleaning, and processing

4. Has the data been cleaned? Have the appropriate number of entries been marked for each question? Are there any extraneous responses? Have enough of the questions been answered to make the questionnaire valid in the results?
5. Has a codebook been developed?
6. Have open-ended answers been categorized and coded?
7. Are there any significant outliers in the responses?
8. Has a system development lifecycle process been developed to document data collection, entry and processing?

Stage 5: Post-implementation activities

After the data have been collected and entered, there are some additional steps that should be taken (see Fig. 6):

- a. Archiving.
- b. Follow-up activities (if necessary).
- c. Post-survey assessment.

Archiving refers to the storage of the original survey materials, such as paper questionnaires and interviewer data entry forms, in a manner that is accessible should the original data be needed in the future (Step 5a). For instance, the need to review the original documents sometimes arises when strange patterns of responses emerge or one or more data points do not seem to make sense.

AFSC economic and social surveys collect information viewed as valuable to other agencies, organizations, or individuals. Some of these entities may have contributed to the development of the survey, such as through expert input or peer review, or otherwise were helpful in supporting the survey. In many cases, the results of a survey are summarized in a memorandum or report that describes the survey, the type of survey protocols followed, sampling methods used, and the results of the survey implementation. Specific information typically provided in such reports are descriptions of the survey sample, response rates, sample size, and descriptive statistics and response distributions to key survey questions. If dealing with confidential data, all applicable laws should be followed to ensure the reporting of the results is

compliant. If and when such a report, or other papers or products from the survey, are produced, they should be shared with the entities that have requested information on the results of the survey, as well as others that have been identified to receive such information, such as interested survey respondents (Step 5b).⁵ In addition to disseminating the results of the survey, there are two other post-implementation activities that may be necessary: evaluating non-response behavior and weighting the data (Step 5b).

Most surveys will not achieve response rates close to 100%. As a result, it is important to ask whether the people that responded to the survey are systematically different from those who did not respond. Non-response bias exists to the extent that people who responded are different from non-respondents. Post-survey evaluation of non-response commonly involves comparing characteristics of those who responded to the survey with those who did not. To this end, data for non-respondents are needed. Such data are sometimes collected as part of the survey implementation. For example, in mail surveys, follow-up telephone interviews with individuals who have not completed and returned the questionnaire may be made to encourage the individuals to respond and collect basic demographic or other information that can be used to evaluate how they differ from those who have previously responded. However, if no such supplemental information is available, researchers generally rely on assessing the presence or absence of non-response bias based on how similar the sample is to the population in terms of demographics or other known characteristics. In these cases, information from other representative surveys or U.S. Census information about the target information are used. However, it should be noted that non-response bias may exist with respect to specific questions

⁵ Many surveys include a question asking if the respondent would like to receive the results of the survey.

(e.g., regarding fishing behavior) even if the sample is similar to the population in terms of demographics or other observable characteristics (Peytcheva and Groves, 2009). See Groves et al. (2001) for more details about non-response bias in surveys and specific ways to reduce it through survey design, implementation, and post-implementation.

Weighting is important when the sampling procedure is complex. In some of these cases, the sample population surveyed may deviate from the targeted population on key known variables (e.g., income or age) or may have subgroups with unequal probabilities of being selected for inclusion in the sample. These cases suggest that estimates based on the sample will not be representative of the population. To correct for this, a set of weights are often generated and applied to the data for the purpose of adjusting the estimates from the sample to better reflect the population. For details on when weighting is appropriate and how to create weights, see Groves et al. (2004) and Lohr (2010).

A final post-implementation activity is to evaluate the survey (Step 5c). Assessing what worked and did not work, as well as identifying problems experienced and how they might be avoided in the future are key to pieces of information that can help similar survey efforts conducted in the future by AFSC staff or others.

Questions to ask during Stage 5 (see Table 2 for a complete checklist):

Archiving

1. Where and how will the original survey materials be kept?
2. When archived, how accessible will the original survey materials be?
3. Can data stored in databases be easily retrieved or converted?

Follow-up activities (if necessary)

4. Who should be notified that your results are available?
5. Have any analyses or summaries of confidential data been assessed to ensure they meet reporting of confidential data requirements?
6. Has a summary of the survey results been prepared and given to respondents who requested the results of the survey?

Post-survey assessment

7. What was the overall response rate?
8. How much item non-response was there?
9. What are the possible reasons for non-response?
10. Is the portion of the survey population that did not respond different in any way from those that did respond? Could this bias the results?
11. Were the goals and objectives of the survey achieved?
12. What are the lessons learned from survey implementation?

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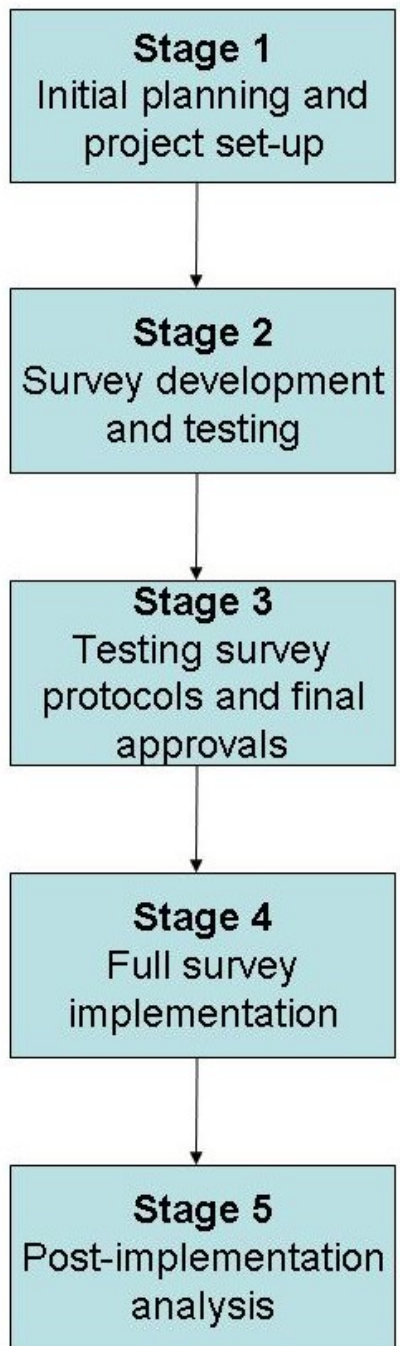


Figure 1. -- Overview of the process of designing, testing, and implementing an AFSC economic or social survey.

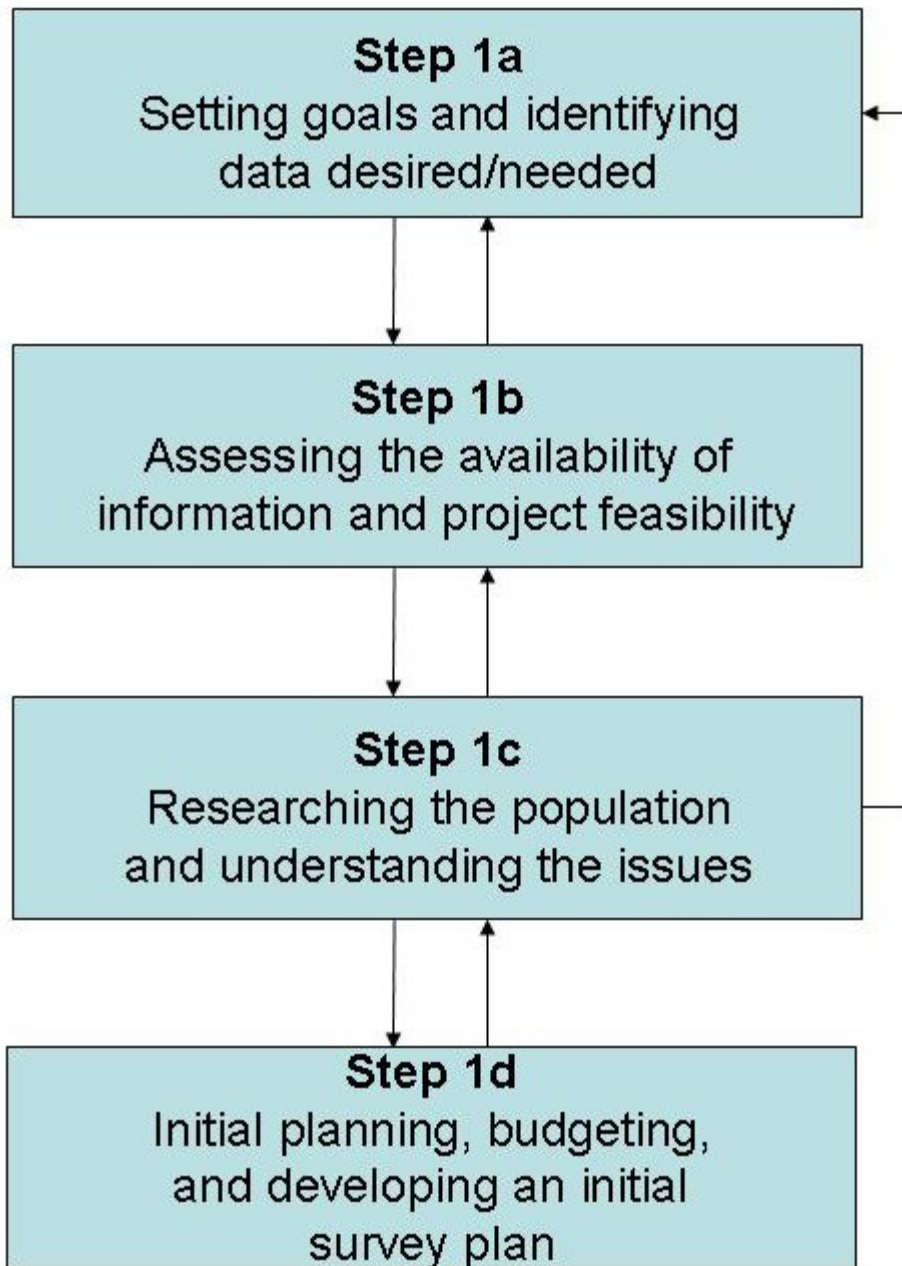


Figure 2. -- Stage 1: Initial planning and project set-up.

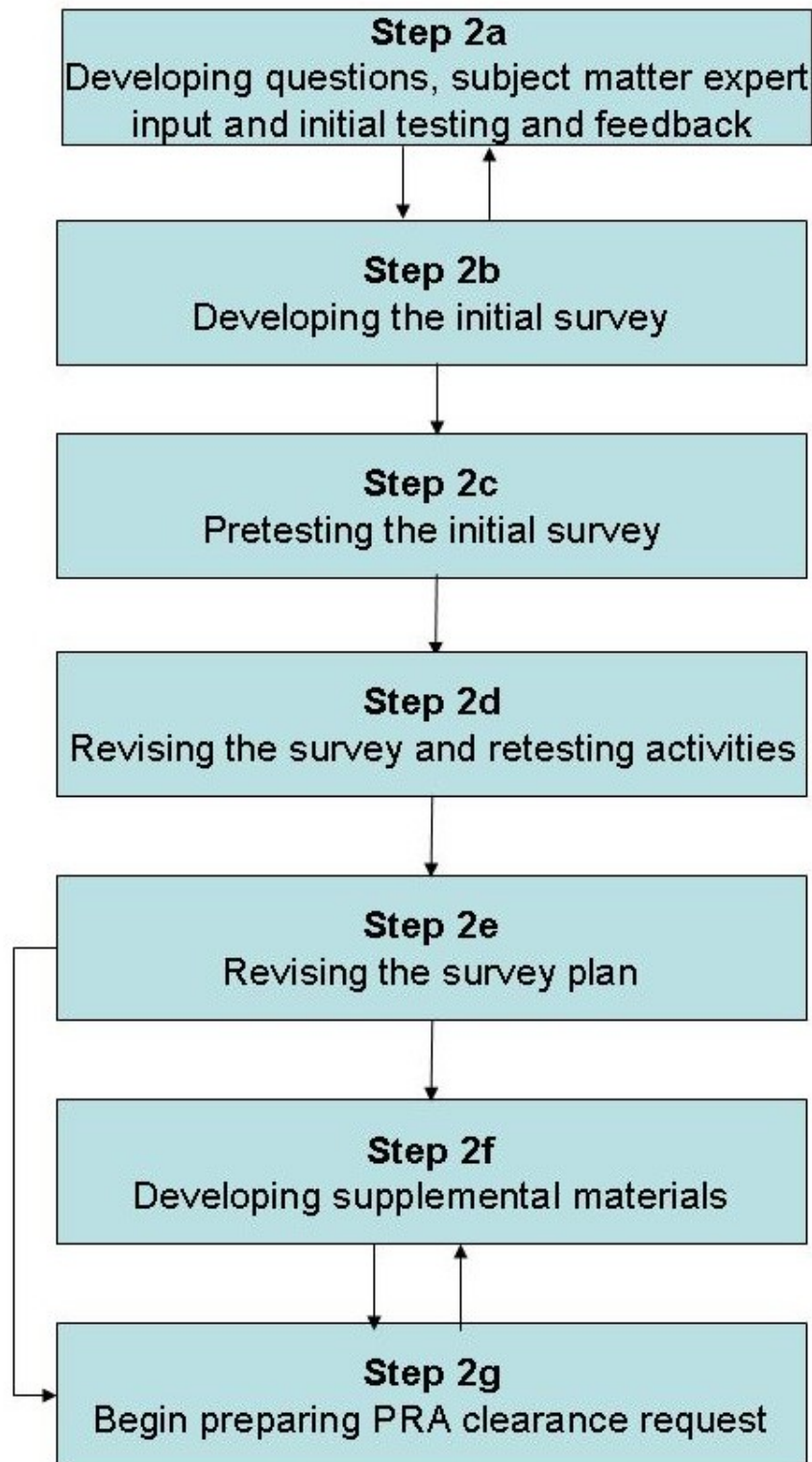


Figure 3. -- Stage 2: Survey development and testing

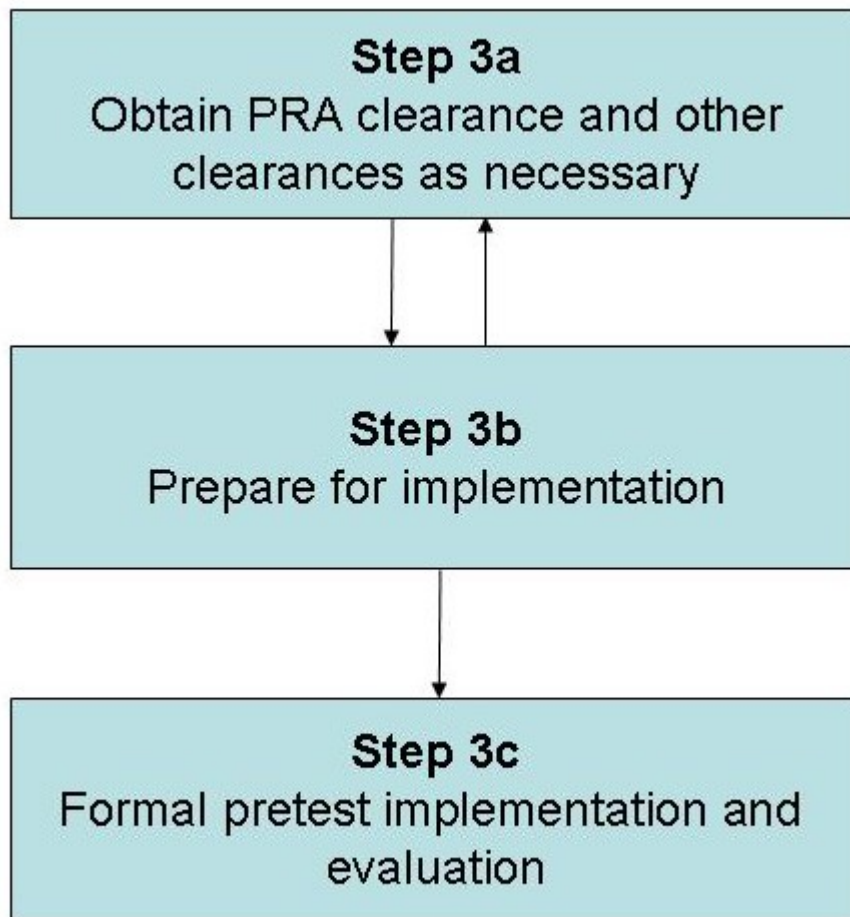


Figure 4. -- Stage 3: Testing survey protocols and final approvals.

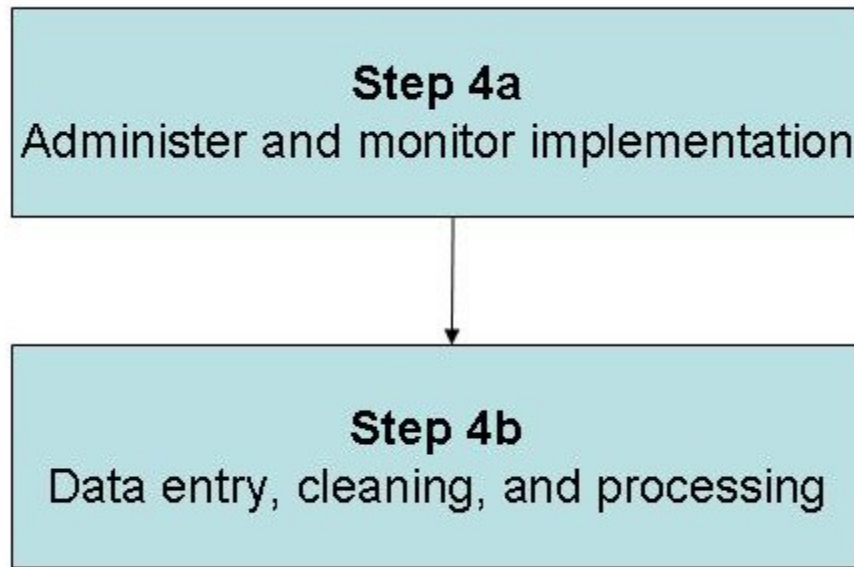


Figure 5. -- Stage 4: Full survey implementation

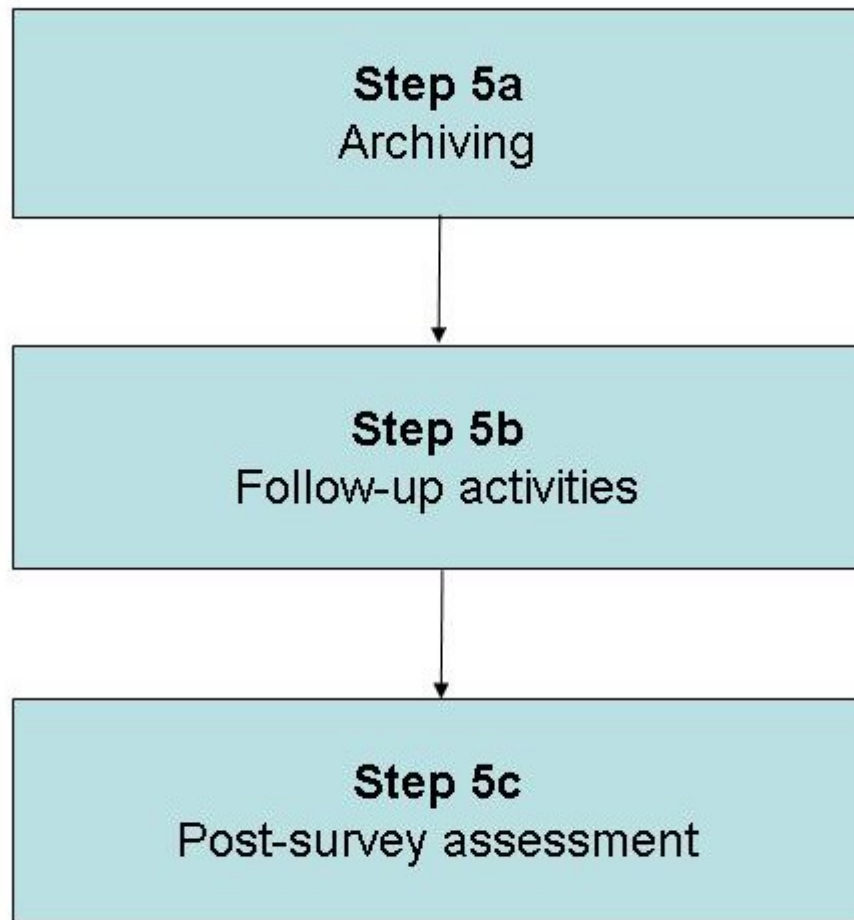


Figure 6. -- Stage 5: Post-implementation activities

Table 1. -- Timeline for completing a survey.*

Activity/Task	Estimated time to complete
<i>Step 1: Initial planning and project set-up</i>	
Setting goals and identifying data desired or needed	1 to 2 weeks
Assessing the availability of information and project feasibility	2 to 8 weeks
Researching the population and understanding the issues	1 to 8 weeks
Initial planning, budgeting, and developing an initial survey plan	1 to 4 weeks
<i>Stage 2: Survey Development and Testing</i>	
Developing questions, subject matter expert input, and initial testing and feedback	1 to 18 months
Developing the initial survey	2 to 12 weeks
Pretesting the initial survey	
Revising the survey and retesting activities	2 to 12 weeks
Revising the survey plan	1 to 2 weeks
Developing supplemental materials	1 to 2 weeks
Begin preparing a Paperwork Reduction Act (PRA) clearance request process	
NOAA PRA Officer review of initial FR notice	1 to 4 weeks
Initial FR notice	60 days
Prepare PRA supporting statement	1 to 4 weeks
<i>Stage 3: Testing survey protocols and final approvals</i>	
Obtain PRA clearance and other clearances as necessary	
NOAA PRA Officer review of supporting statement	Up to a month
DOC review of supporting statement	Approx. 1 month
DOC Federal register notice	30 days
OMB review and approval of supporting statement	30 days to 6 months
Preparing for implementation – database development, data processing set-up, training of interviewers	1 to 4 weeks
Formal pretest implementation and evaluation	1 to 6 months
<i>Stage 4: Full survey implementation</i>	
Administer and monitor implementation	1 to 6 months
Data entry, cleaning, and processing	2 to 6 weeks
<i>Stage 5: Post-implementation activities</i>	
Archiving	1 to 4 weeks
Follow-up activities (if necessary)	Varies
Post-survey assessment	1 to 4 weeks

*The timeframe for each task is based on time estimates from several past surveys, but may vary considerably depending upon the complexity of survey, political, funding, and administrative delays; and FTE availability. Note that many of the above tasks within each stage can be undertaken simultaneously, so overall project time cannot be determined by simply adding up.

Table 2. -- Checklist for tasks associated with survey development, testing, and implementation.

Activity/Task	Completed <input checked="" type="checkbox"/>
<i>Stage 1: Initial planning and project set-up</i>	
Identify research/management questions driving the need for a survey	<input type="checkbox"/>
Develop goals and objectives for proposed survey	<input type="checkbox"/>
Identify data needed to answer the research/management questions	<input type="checkbox"/>
Research demographics of respondent population	<input type="checkbox"/>
Identify obstacles to collecting data from respondent population	<input type="checkbox"/>
Avoid duplicating existing data sources	<input type="checkbox"/>
Confirm whether anyone else within the AFSC or other state/federal agencies is conducting a survey or research with the same target population	<input type="checkbox"/>
Reduce burden on target population	<input type="checkbox"/>
Inform relevant agencies about this survey	<input type="checkbox"/>
Engage key members of the target population in developing/implementing survey	<input type="checkbox"/>
Decide how many people will be surveyed	<input type="checkbox"/>
Select survey mode(s) (mail, internet, telephone, in-person)	<input type="checkbox"/>
Develop survey protocols and assess costs, timing, and effectiveness in minimizing potential biases and maximizing response to the survey	<input type="checkbox"/>
Draft a timeline for developing, implementing, and analyzing the survey	<input type="checkbox"/>
Apply for and secure appropriate funding	<input type="checkbox"/>
If needed, go through the procurement office to hire contractors	<input type="checkbox"/>

Table 2. -- Continued.

Activity/Task	Completed <input checked="" type="checkbox"/>
<i>Stage 2: Survey development and testing</i>	
Consider confidentiality and privacy in question development	<input type="checkbox"/>
Scrutinize ability of each question to provide meaningful information	<input type="checkbox"/>
Questions convey an unbiased perspective and are not subject to interpretation	<input type="checkbox"/>
Sufficient response choices been provided for closed-ended questions	<input type="checkbox"/>
Ensure open-ended questions have been minimized	<input type="checkbox"/>
Assess difficulty for the respondents to answer open-ended questions	<input type="checkbox"/>
Minimize the overall time and effort burden to respondents	<input type="checkbox"/>
Organize focus groups, if needed	<input type="checkbox"/>
Undertake cognitive interviews to test the survey	<input type="checkbox"/>
Consult subject matter and/or survey design experts	<input type="checkbox"/>
Obtain peer review of survey instrument by AFSC staff and cooperating entities	<input type="checkbox"/>
Complete multiple iterations of question wording to clarify and reword	<input type="checkbox"/>
Pretest survey with potential respondents	<input type="checkbox"/>
Prepare and obtain appropriate reviews of all supporting materials that will be seen by respondents	<input type="checkbox"/>
Provide instructions for how the respondent should complete/return the survey	<input type="checkbox"/>
Brief NOAA and NMFS PRA Officers on project timeline	<input type="checkbox"/>
For potentially sensitive surveys, obtain AFSC upper management review	<input type="checkbox"/>
Draft Federal Register Notice of Proposed Data Collection (60 day notice) and submit to NOAA/NMFS PRA Officers	<input type="checkbox"/>
Solicit comments on survey materials from key members of target population	<input type="checkbox"/>

Table 2.-- Continued.

Activity/Task	Completed <input checked="" type="checkbox"/>
<i>Stage 3: Testing survey protocols and final approvals</i>	
Draft PRA supporting statement	<input type="checkbox"/>
Submit PRA supporting statement to NOAA/NMFS PRA Officers	<input type="checkbox"/>
PRA clearance request submitted to the DOC	<input type="checkbox"/>
PRA clearance request submitted to OMB	<input type="checkbox"/>
Respond to all NMFS/DOC/OMB questions and address any concerns	<input type="checkbox"/>
Obtain a control number from OMB	<input type="checkbox"/>
Create database structure facilitate data entry	<input type="checkbox"/>
Code and structure survey so that data can be entered easily	<input type="checkbox"/>
Establish data entry protocols, including handling of confidential data	<input type="checkbox"/>
Train data entry staff in the data entry protocols	<input type="checkbox"/>
Train interviewers on the protocols for administering and the use of the survey	<input type="checkbox"/>
Give interviewers specific instructions on conducting the interviews and guidelines for handling uncooperative respondents	<input type="checkbox"/>
Include OMB control number on all survey materials for pretesting	<input type="checkbox"/>
Conduct formal pretest similar to how the actual survey will be administered	<input type="checkbox"/>

Table 2. -- Continued.

Activity/Task	Completed <input checked="" type="checkbox"/>
<i>Stage 4: Full survey implementation</i>	
Adhere to survey sampling, administration protocols, and timetables	<input type="checkbox"/>
Include OMB control number on all survey materials	<input type="checkbox"/>
Collect data so that that confidentiality and privacy concerns are protected	<input type="checkbox"/>
Develop a codebook for all closed and open ended answers	<input type="checkbox"/>
Enter survey data into database in accordance with codebook	
Clean the data	<input type="checkbox"/>
Ensure appropriate number of entries has been marked for each question	<input type="checkbox"/>
Determine whether enough answers have been given to make each questionnaire valid	<input type="checkbox"/>
Identify any significant outliers in the responses	<input type="checkbox"/>
Develop a system development lifecycle process	<input type="checkbox"/>
<i>Stage 5: Post-implementation activities</i>	
Determine where and how the original survey materials will be kept	<input type="checkbox"/>
Archive original survey materials and make accessible	<input type="checkbox"/>
Ensure data stored in databases that are easily retrieved or converted	<input type="checkbox"/>
Notify appropriate parties when results are available	<input type="checkbox"/>
Conduct analyses or summaries of confidential data to ensure they meet reporting of confidential data requirements	<input type="checkbox"/>
Prepare summary of the survey results and provide to respondents	<input type="checkbox"/>
Calculate overall response rate	<input type="checkbox"/>
Calculate item non-response	<input type="checkbox"/>
Identify possible reasons for non-response	<input type="checkbox"/>
Determine any bias in the results	<input type="checkbox"/>
Goals and objectives of the survey were achieved	<input type="checkbox"/>
Consider the lessons learned from survey implementation	<input type="checkbox"/>

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