

FINAL REPORT

DEVELOPMENT OF A QUESTIONNAIRE FOR A SUBSISTENCE FISHER CONSUMPTION SURVEY FOR SAN FRANCISCO BAY

PREPARED FOR THE

SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD

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Executive Summary

In San Francisco Bay, contaminant concentrations pose a threat to human consumers of Bay-caught fish. In 2017 the State Water Resources Control Board defined a new beneficial use to protect subsistence fishers (SUB) . It is up to the nine regional Water Boards to decide whether to designate the SUB beneficial use for waters in their region. The San Francisco Bay Regional Water Quality Control Board (Water Board) would like to designate a SUB beneficial use for the Bay if it is necessary. In order to determine whether a SUB designation is necessary, the Water Board has initiated a process to obtain updated and expanded information on Bay fish consumption to assess whether the existing objectives and thresholds that were established to support the existing COMM beneficial use (i.e., the general fishing population) are protective of Bay subsistence fishers.

A three-phase workplan has been developed to generate this information. A crucial aspect of the workplan is that it includes the involvement of community members in implementing a new consumption survey. The phases are as follows.

Phase 1: Development of a questionnaire and survey implementation guidance with input from community members.

Phase 2: Pilot-testing of the questionnaire and survey plan by community groups.

Phase 3: Region-wide implementation of the survey by communities throughout the Bay Area.

This report describes work performed for Phase 1. In creating the new San Francisco Bay questionnaire, six past fish consumption surveys were closely reviewed. The 2000 San Francisco Bay survey was the primary starting point. An additional five surveys were also reviewed, chosen for their geographical proximity or similarity to San Francisco Bay and their intentionality in reaching specific communities.

This project included a robust process for obtaining technical peer review. A panel of four reviewers was assembled to provide technical advice throughout the entire course of the project. The reviewers were selected for their specific expertise related to performing consumption surveys

This questionnaire development effort also prioritized input from representatives of community-based organizations. A major emphasis was placed on the wealth of knowledge that communities could offer from their firsthand experience as fishers and fish consumers.

The project consisted of three workshops with community-based organizations, scientific advisors, the Water Board, and other government agency representatives. The first workshop focused on developing a draft questionnaire; the second workshop focused on refining the questionnaire; and the third workshop will focus on best practices for survey implementation.

The survey questionnaire was designed to gather information needed on types (species, locations, tissues, etc.) and rates of consumption to allow a thorough assessment of exposure of subsistence fishers to contaminants in Bay fish. The questionnaire generally followed the precedents set by the 2000 San Francisco Bay survey. Considerable resources and thought went into the design and implementation of that survey. In addition, comparability of new data with the data from 2000 could provide valuable insights on long-term trends in consumption of Bay fish, and how community-specific data compare to data for the general fishing population.

1) Introduction

In San Francisco Bay, contaminant concentrations pose a threat to human consumers of Bay-caught fish, and have led to the establishment of Total Maximum Daily Load (TMDL) control plans and related water quality objectives and evaluation guidelines for mercury and PCBs, as well as a Bay-wide fish consumption advisory. Between 1997 and 1999, a large study was conducted to better understand the consumption habits of anglers in the Bay (SFEI 2000). Since 2000, there has been growing concern from the public about those who consume fish for sustenance from the Bay. To address this concern, the Water Board contracted with the San Francisco Estuary Institute (SFEI) to better understand this more vulnerable population.

In 2017 the State Water Resources Control Board defined a new beneficial use to protect subsistence fishers (SUB), with the following definition:

Uses of water involving the non-commercial catching or gathering of natural aquatic resources, including fish and shellfish, for consumption by individuals, households, or communities, to meet needs for sustenance, due to cultural tradition, lack of personal economic resources, or both.

It is up to the nine regional Water Boards to decide whether to designate the SUB beneficial use for waters in their region. The objectives and guidelines currently in place were established to protect the long-standing commercial and sport fishing beneficial use (COMM) in the Bay. The definition of COMM is:

Uses of water for commercial or recreational collection of fish, shellfish, or other organisms, including, but not limited to, uses involving organisms intended for human consumption or bait purposes.

The San Francisco Bay Regional Water Quality Control Board (Water Board) would like to designate a subsistence beneficial use (SUB) for the Bay or other water bodies if and where it is necessary. In order to determine whether SUB designations are necessary, the Water Board has initiated a process to obtain updated and expanded information on fish consumption to assess whether the existing objectives and thresholds that were established to support the COMM beneficial use (i.e., the general fishing population) are protective of San Francisco Bay subsistence fishers. These existing objectives were based on consumption rate information obtained in a survey of the general (non-commercial) fishing population in the Bay - the San Francisco Bay Seafood Consumption Survey (SFEI 2000) - in the late 1990s. That survey was a major effort that generated a wealth of valuable information and established a solid general foundation in terms of survey methods. However, the survey did not target subsistence fishers and the results obtained are now 25 old and may not reflect current conditions.

Based on the 2000 survey, the Water Board set allowable fish tissue contaminant concentrations assuming a consumption rate of 32 grams/day (1 meal a week). This is the consumption rate used in TMDLs and permits to protect the COMM use. This was the 95th percentile of observed consumption rates (95% of the population surveyed ate less than 32 g/d). In contrast, the default consumption rate associated with SUB is 142 g/d (about 4.5 meals per week). The Water Board will consider site-specific consumption data when designating the SUB use. The site-specific approach should be based on data that are specific to the water body of interest and the populations of interest, including their rate of fish consumption and the form of fish consumption (e.g., whole body, fillet with skin, skinless fillet).

To assess whether SUB designation is warranted for the Bay, the Water Board needs updated consumption rate information for subsistence fishers. A three-phase workplan has been developed to generate this information. A crucial aspect of the workplan is that it includes the involvement of community-based organizations (CBOs) in developing and implementing a new survey. Consumption survey and risk communication projects in the Bay-Delta region over the past 20 years have demonstrated that community members possess essential knowledge and the connections necessary to effectively engage those in their communities with the greatest dependence on consumption of Bay fish and that have the highest consumption rates. The three phases of the workplan therefore are as follows.

Phase 1: Development of a questionnaire and survey implementation guidance with input from community members.

Phase 2: Pilot-testing of the questionnaire and survey plan in collaboration with community groups.

Phase 3: Region-wide implementation of the survey by communities throughout the Bay Area.

The goal of the survey will be to better understand the subsistence fishing population so they can safely consume Bay fish and shellfish. More specifically, the goal is:

to gather quantitative data that can be used to characterize exposures of high-rate consumers of San Francisco Bay fish and shellfish to chemical contaminants.

This information can be used to assess the following question:

What is the likelihood that a value greater than the rate used for COMM (32 g/d) is necessary to protect SUB (142 g/d)? In other words, do subsistence fishers eat more than 32 g/d from the Bay?

The data to be collected in the survey to answer this question will include:

- number of servings per week for fisher and household (especially pregnant women and children),
- species consumed,
- preparation method for the fish,
- size of fish consumed,
- fishing location, and
- duration of fish consumption.

Community-specific data on these parameters will be obtained. The survey will also gather information on motives for fishing to better understand subsistence fishing in the Bay.

If the current COMM beneficial use is not protective of San Francisco Bay subsistence fishers, then the Water Board will recommend designation of SUB beneficial uses in the Bay to ensure subsistence fishers are protected.

This report describes work performed for Phase 1: development of a questionnaire to characterize consumption of Bay-caught fish by subsistence fishers.

2) The Questionnaire Development Process

a) Review of Questionnaires Developed for Other Studies

In creating the new San Francisco Bay questionnaire, six past fish consumption surveys were closely reviewed. The 2000 San Francisco Bay survey was the primary starting point. An additional five surveys were also reviewed, chosen for their geographical proximity or similarity to San Francisco Bay and their intentionality in reaching specific communities. Short summaries of these surveys are provided below, including how each one influenced the new questionnaire.

San Francisco Bay Seafood Consumption Survey

Summary of the Original Survey Goals

In 1994, the Water Board conducted a pilot study to determine the levels of contaminants found in fish commonly caught and consumed in San Francisco Bay (SFBRWQCB 1995). This effort found six analytes (mercury, PCBs, dioxins, dieldrin, chlordane, and DDT) at concentrations of potential health concern to people who regularly consume fish from the Bay. Follow-up monitoring by the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP) in 1997 found similar concentrations. In response to these public health concerns, the RMP conducted a comprehensive Seafood Consumption Survey of people who catch and consume fish and shellfish from the Bay (SFEI 2000). The survey sought to estimate the consumption rates of fishers in the Bay and identify groups at risk of contaminant exposure due to their fish consumption habits. Fish consumption rates were determined from responses to questions about how often a meal of fish was eaten and the size of the meal. This study was a large-scale effort; included a robust development and review process that included technical peer reviewers, local experts, and community representatives; was very well-documented; and was particularly relevant given its focus on San Francisco Bay.

The study area was defined to include all of San Francisco Bay. This effort surveyed fishers in modes: piers, beaches and banks, private boats, and party boats. For the final combination of shore-based sites, 14 public piers were selected with adjacent beach or bank areas to be sampled once each month. Between July 1998 and June 1999, 1331 unique fishers were interviewed. Of these fishers, 1152 (87%) responded that they consumed the fish they caught. 537 (47%) of consumers reported they ate fish caught from the Bay within the last four weeks. The survey included questions on ethnicity, income, education, age, fishing frequency, amount of fish eaten, types of fish eaten, preparation and cooking methods, others in the household who eat Bay fish, and awareness and knowledge of the Bay health advisory. Trained interviewers administered the questionnaire to anglers at selected sites.

New Consumption Survey Take-aways

This study served as a foundation for the new questionnaire. A key consideration in the revised questionnaire design was to maintain backwards compatibility to the original survey so the new dataset can be compared to the previous dataset. As such, many questions are similar or adapted from this survey. However, the new survey design has acknowledged the need to update wording and questions to better target subsistence fishers in the 2020s. The new questionnaire has been structured to flow similarly, however there is more space for open-ended responses from respondents to

get a better sense of the cultural, social, and economic motivations for fishing. This will help us better identify subsistence fishers, which was not a consideration or focus of the original study.

San Diego Bay Fish Consumption Study

Summary of the Original Survey Goals

In 2013, the Office of Environmental Health Hazard Assessment (OEHHA) released a health advisory and consumption guidelines for San Diego Bay (OEHHA 2013). When this advisory was released, there had not been a recent study of fishing activity that showed how many anglers were consuming fish from San Diego Bay or their consumption rates. With this in mind, the San Diego Fish Consumption Study (Steinberg and Moore 2017) sought to provide consumption data for finfish from a representative sample of anglers fishing in San Diego Bay. The survey aimed to identify consumption rates of San Diego fishers (comparing these data to advisory recommendations) and differentiate between anglers fishing for recreation defined as those who were anglers practicing catch and release versus those who keep and consume some portion of their catch. The survey also sought to determine whether consumption rates were correlated (or associated) with angler socioeconomic characteristics, timing (seasonality), or fishing location. These data would support development of locally relevant recommendations and improved outreach and education for specific higher risk segments of the fishing community.

Between May 2015 and April 2016, 1549 anglers at boat landings, piers, and shoreline locations were interviewed. The survey included questions on ethnicity, age, fishing frequency, amount of fish eaten, types of fish eaten, preparation and cooking methods, others in the household who eat the catch, and awareness of the consumption advisory.

New Consumption Survey Take-aways

This survey design provided insight on how to conduct an electronic survey as surveys were primarily recorded on a mobile application on an Android tablet. To accommodate this, questions had to be distinct and close-ended. This survey used multiple sizes of fish filet models ranging from 1.5 to 7.5 oz. In contrast, the 2000 San Francisco Bay survey used one 8 oz filet model. The pilot testing of the new San Francisco Bay questionnaire will include the use of multiple filet models.

Santa Cruz Santa Cruz Wharf Seafood Consumption Survey

Summary of the Original Survey Goals

The Santa Cruz Wharf Seafood Consumption Survey was conducted to characterize wharf anglers and their fishing catch and consumption patterns. The study was motivated by concerns about potential exposure to domoic acid toxins associated with harmful algal blooms. Anglers, along with their catch and consumption patterns, were characterized based on an intercept survey that asked about their cultural and socio-economic characteristics, seafood catch, disposition and consumption patterns, and motivations for catching and consuming certain species (Silver et al. 2009). In total, 746 interviews were conducted over a 12-month period from May 2007 through May 2008. Analysis was conducted comparing angler demographics and seafood consumption rates and patterns, particularly those of high risk and high consumption populations. These data were then used to determine correlations between angler consumption and potential domoic acid exposure.

New Consumption Survey Take-aways

The Santa Cruz Wharf Seafood Consumption survey provided a comprehensive question list that our questionnaire was able to draw from. Key elements borrowed from the Santa Cruz questionnaire include providing discrete options as to why people fished (cultural or otherwise) as well as the ability to rank those options in order of importance or relevance. This questionnaire was also relatively detailed about how and when fish was handled, cooked and prepared.

Richmond Laotian Seafood Consumption Research and Education Project

Summary of the Original Survey Goals

In 1997, the Richmond Laotian Seafood Consumption Research and Education Project was conducted in west Contra Costa County with the primary goal of providing insights into seafood consumption practices, knowledge, and attitudes within the Laotian community (Chiang, 1998). The study aimed to build capacity within the community to conduct a community-based survey, involving community members in all stages from planning to evaluation, thus serving as a model for future community-based survey work. The geographic scope of the study was focused specifically on west Contra Costa County, targeting a sample of 200 surveys. Despite challenges such as refusals and unreachable participants, a total of 229 fishers were surveyed from late June to September 1997, with efforts reaching out to 285 families out of 600 initially

identified. The questionnaire included elements such as reasons for fishing, portion sizes, fish sources, locations, species, and consumption habits.

New Consumption Survey Take-aways

This study's approach to random sampling within the community, including obtaining extensive lists of families and consideration of cultural factors, served as a valuable reference point for the design of the new San Francisco Bay questionnaire. This insight helped inform our approach to engaging diverse communities and ensuring relevance and cultural sensitivity in the survey instruments. This study also emphasized the different cultural aspects of catching and consuming fish as well as the seasonality of fishing. Their method of how to indicate the seasonality of catch through a table was adopted in our questionnaire.

Asian/Pacific Islander Community Exposures Project

Summary of the Original Survey Goals

Biomonitoring California was established in 2006 by Senate Bill 1379 as a collaboration between California Department of Public Health (CDPH), Office of Environmental Health Hazard Assessment (OEHHA), and Department of Toxic Substances Control (DTSC). In 2016 and 2017, Biomonitoring California conducted an Asian/Pacific Islander Community Exposures (ACE) 1 study in collaboration with APA Family Support Services (APA) and ACE 2 with Vietnamese Voluntary Foundation (VIVO), two community-based non-profit organizations serving low-income and non-English speaking communities in San Francisco's Chinatown and San Jose, California respectively (ACE Project, 2019). APA and VIVO have long-standing reputations for providing vital health education and support within their respective communities. The goals of ACE 1 and 2 were achieved through concerted efforts involving engagement with community leaders, recruitment of participants, conducting exposure assessment interviews with bilingual staff as needed, development of language- and culturally-appropriate project materials, reporting laboratory results to individuals, and presenting overall study findings to the community. The study targeted 100 Chinese adults in 2016 and 100 Vietnamese adults in 2017 from the San Francisco Bay area. Questionnaire elements encompassed various aspects of fish consumption, including where fish were obtained, species, type, cooking methods, consumption frequency, who caught the fish, and associated products.

New Consumption Survey Take-aways

This study provided valuable insights into working with distinct ethnic communities, particularly non-English speaking populations, informing the present study's approach to questionnaire design and community engagement strategies for

ensuring cultural relevance and accessibility. Although these questionnaires did ask about subsistence fishing, they were focused on many pathways of exposure. As they were targeting specific ethnic groups, these questions could be tailored to ethnic and community specifics, something that the new San Francisco Bay survey aims to achieve through communities administering the survey themselves.

CIEA Study: Eating Fish Safely - Past, Present, and Future Survey

Summary of the Original Survey Goals

The Eating Fish Safely survey was an effort conducted by the California Indian Environmental Alliance (CIEA) to understand the fish consumption patterns and habits of Bay Area tribes and provide communities and agencies with data to be used in establishing water quality objectives once Tribal Beneficial Use definitions are adopted. Those conducting the survey met Bay Area tribal communities at local membership meetings as well as community events such as powwows and other health-focused events.

New Consumption Survey Take-aways

This survey served as a great example for working with tribal and native communities, highlighting specific fish species and the cultural significance of seasonal fishing. Implementation strategies for reaching tribal communities will be adopted from this survey.

b) Technical Peer Review

This project included a robust process for obtaining technical peer review. A panel of four reviewers was assembled to provide technical advice throughout the entire course of the project. The reviewers were selected for their specific expertise related to performing consumption surveys (Table 1).

Table 1. Technical peer reviewers.

Reviewer	Affiliation	Background
Dr. Carrie Pomeroy	University of Santa Cruz	<ul style="list-style-type: none"> ● Research social scientist ● Reviewer for the 2000 Survey ● Led Santa Cruz Wharf survey
Dr. Camille Antinori	San Francisco State University	<ul style="list-style-type: none"> ● Research economist ● Led “Fishing at the Berkeley Waterfront” economic valuation project
Dr. Shelly Moore	Moore Institute for Plastic Pollution Research	<ul style="list-style-type: none"> ● Co-principal investigator of San Diego Bay Consumption Survey
Dr. Nicole Smith	Colorado School of Mines	<ul style="list-style-type: none"> ● Cultural anthropologist

c) Workshops with Community-Based Organizations

This questionnaire development effort prioritized input from both community-based organizations and technical advisors. A major emphasis was placed on the wealth of knowledge that communities could offer from their firsthand experience as fishers and fish consumers. Community insights offer nuanced understandings rooted in local knowledge and experiences and encompass a wealth of knowledge accumulated over generations, intricately linked to the local environment and its resources. Questionnaire development also benefited greatly from input from technical advisors who shared their experiences implementing technically sound subsistence fishing and consumption surveys.

This project consisted of three workshops with community-based organizations, scientific advisors, the Water Board, and other government agency representatives; and one final report on the questionnaire and best practices to implement the survey. The first workshop focused on developing a draft questionnaire; the second workshop focused on refining the questionnaire; and the third workshop will focus on best practices for survey implementation.

Before the first workshop, a first draft questionnaire was developed with substantial input from the technical advisors and Water Board staff. The advisors also provided input in developing the agenda for the first workshop held in November 2023. The primary goal of the first workshop was obtaining input from community representatives on this draft questionnaire. After workshop one, the questionnaire was revised and then discussed again with the advisors prior to the second workshop.

Workshop two was held in February 2024 with the primary goal of obtaining final comments on the questionnaire from community representatives.

The technical advisors and community representatives all received honoraria for their participation in the process and the workshop meetings. Through these meetings and workshops, we successfully obtained substantial input from the advisors and community representatives.

Agendas, Powerpoint presentations, and meeting summaries for the workshops are available on the [webpage for this project](#).

Workshop 1

On November 3, 2023, the San Francisco Estuary Institute (SFEI) and the Water Board held a workshop with representatives of community-based organizations, agency representatives, and scientists to discuss a first draft of the questionnaire. Key items on the agenda included the project background by the Water Board, a presentation on the general plan for the project by SFEI, reviews of past consumption surveys, the first draft of the questionnaire, and preliminary discussions on survey implementation. The bulk of the discussion focused on what questions to include in the survey.

Throughout the discussion, community members and technical advisors emphasized the need for a holistic and empathetic approach to data collection, considering the complexities and sensitivities involved in the context of subsistence fishing. They highlighted the importance of understanding the target population and effectively mapping out the fishing areas. The participants recognized the challenges associated with data collection and emphasized the need for strategic planning and sensitivity when engaging with the communities involved in subsistence fishing. Considerations were made for gathering data from both intercept and community event-based surveys as well as appropriate sample size. Community representatives emphasized the impact of seasonality on fishing cultural practices. Other considerations included making sure respondents were properly compensated for their participation, survey language was accessible and easily communicated, and certain sensitive language involving gender and income were properly worded.

Figure 1. Photo from Workshop One at SFEI on November 3, 2023.



Table 2. Attendees of Workshop One.

Attendees	Affiliation	Representing
Keta Price	Hood Planning Group	Community Organizer
Janet Johnson	Richmond Shoreline Alliance	CBO
Francis Ranstead	Sogorea Te Land Trust	CBO
Rosa Nelson	Nuestra Casa	CBO
Skylar Sacoolas	Greenaction for Health and Environmental Justice	CBO
Lauren Weston	Acterra: Action for a Healthy Planet	CBO
Michelle Rivera	California Indian Environmental Alliance	NGO
Sherri Norris	California Indian Environmental Alliance	NGO
Andria Ventura	Clean Water Action/ Clean Water Fund	NGO
Kelly Chen	Biomonitoring CA/CA Department of Public Health	Agency
Duyen Kauffman	Biomonitoring CA/CA Department of Public Health	Agency
Tran Pham	California EPA OEHHA	Agency
Wesley Smith	California EPA OEHHA	Agency
Loren Chumney	California EPA OEHHA	Agency
Shannon Murphy	California EPA OEHHA	Agency
Nicholas Fowlks	California State Parks - Candlestick Point SRA	Agency
Mary Cousins	Bay Area Clean Water Agencies	Agency
Carrie Pomeroy	University of Santa Cruz	Technical Advisor
Camille Antinori	San Francisco State University	Technical Advisor
Shelly Moore	Moore Institute for Plastic Pollution Research	Technical Advisor
Anna Holder	California State Water Resources Control Board	Agency
Jenalyn Guzman	SF Regional Water Quality Control Board	
Sami Harper	SF Regional Water Quality Control Board	
Gerardo Martinez	SF Regional Water Quality Control Board	
Kevin Lunde	SF Regional Water Quality Control Board	
Jay Davis	San Francisco Estuary Institute	
Martin Trinh	San Francisco Estuary Institute	

Workshop 2

Following the first Workshop, SFEI and the Water Board, with input from the advisors, revised the questionnaire based on the feedback received. The team reviewed multiple iterations of the questionnaire to optimize for clear, concise, inclusive language and proper flow as well as ensuring all of the Water Board's information needs were met.

At the second workshop, the technical advisors, represented by Carrie Pomeroy from UC Santa Cruz, expressed their support for the revised version of the survey and stressed the importance of community input in further refining the survey. The primary goals of the second workshop was to solicit final input and approval from community representatives. Community groups and the advisors had expressed interest in pre-testing the survey within communities. The Water Board made it clear that this step would be conducted in a future second phase of the project, and explained that this first phase is focused on refining the questionnaire itself. Community and agency representatives emphasized the importance of softening the survey language for inclusivity and suggested considering language barriers and translation issues. Further discussion was held on the importance of targeting high-risk groups, which could eliminate some concerns with question language involving gender. Community groups recommended providing explicit information on survey materials, such as pamphlets and maps, to facilitate survey accessibility.

Table 3. Attendees of Workshop Two.

Attendees	Affiliation	Representing
Keta Price	Hood Planning Group	Community Organizer
Janet Johnson	Richmond Shoreline Alliance	CBO
Skylar Sacoolas	Greenaction	CBO
Lauren Weston	Acterra: Action for a Healthy Planet	CBO
Hollis Pierce Jenkins	Literacy for Environmental Justice	CBO
Arrienn Harrison	SF Marie Harrison Community Foundation	CBO
Tonia Randell	SF Marie Harrison Community Foundation	CBO
Kelly Chen	Biomonitoring CA Department of Public Health	Agency
Duyen Kauffman	Biomonitoring CA Department of Public Health	Agency
Tran Pham	California EPA OEHHA	Agency
Wesley Smith	California EPA OEHHA	Agency
Anna Holder	California State Water Resources Control Board	Agency
Carrie Pomeroy	University of Santa Cruz	Technical Advisor
Camille Antinori	San Francisco State University	Technical Advisor
Shelly Moore	Moore Institute for Plastic Pollution Research	Technical Advisor
Sami Harper	SF Regional Water Quality Control Board	
Gerardo Martinez	SF Regional Water Quality Control Board	
Kevin Lunde	SF Regional Water Quality Control Board	
Jay Davis	San Francisco Estuary Institute	
Martin Trinh	San Francisco Estuary Institute	

Workshop 3

Following the second Workshop, SFEI and the Water Board, with input from the advisors, drafted a report detailing the creation of the questionnaire and the rationale behind it. This workshop focused on obtaining guidance on implementation strategies from communities

Martin outlined the implementation guidance drawn from the shared experiences of technical advisors based on surveys conducted in San Diego, Berkeley, and Santa Cruz. He emphasized the importance of engaging community-based organizations (CBOs) to gather their input on effective strategies before pre-testing the survey.

SFEI recommended bringing on an experienced survey coordinator to lead the effort. This coordinator would train community surveyors, compile data, and ensure data quality and consistency. Community members raised questions about the coordinator's affiliation and funding, with suggestions to direct more funds to community groups rather than external professionals. Community members also emphasized the importance of addressing cross-cultural and language barriers and the feasibility of surveying a large number of individuals within a specific timeframe.

Discussions highlighted the importance of standardized training for CBOs and community engagement in identifying priorities and conducting surveys. Emphasis was placed on voluntary participation, anonymity, and non-threatening attire for survey administrators to ensure comfort and cooperation. Additional considerations included the need for translation services, community involvement in outreach, and incentives for participation, such as public health information and project updates.

Table 4. Attendees of Workshop 3

Attendees	Affiliation	Representing
Skylar Sacoolas	Greenaction	CBO
Tonia Randell	SF Marie Harrison Community Foundation	CBO
Rosa Nelson	Nuestra Casa	CBO
Yasmine El Hage	Surfrider	CBO
Francis Ranstead	Sogorea Te Land Trust	CBO
Andria Ventura	Clean Water Action	Environmental Group
Duyen Kauffman	Biomonitoring CA Department of Public Health	Agency
Tran Pham	California EPA OEHHA	Agency
Anna Holder	California State Water Board	Agency
Mary Cousins	Bay Area Clean Water Agencies	Permittees
Carrie Pomeroy	University of Santa Cruz	Science Advisor
Camille Antinori	San Francisco State University	Science Advisor
Shelly Moore	Moore Institute for Plastic Pollution Research	Science Advisor
Sami Harper	SF Regional Water Quality Control Board	
Gerardo Martinez	SF Regional Water Quality Control Board	
Kevin Lunde	SF Regional Water Quality Control Board	
Jay Davis	San Francisco Estuary Institute	
Martin Trinh	San Francisco Estuary Institute	

3) The Questionnaire

The survey questionnaire was designed to gather information needed to address the specific goals listed in Section 1. Data will be gathered on types (species, locations, tissues, etc.) and rates of consumption to allow a thorough assessment of exposure of subsistence fishers to contaminants in Bay fish. The full questionnaire is provided in Appendix 1.

The questionnaire includes seven sections to obtain the data. Obtaining information on risk communication effectiveness is not a goal of this study, which is driven by Water Board information needs. However, an optional eighth section on risk communication is included that communities can include in the survey if they choose.

General Notes Regarding the Questionnaire

- This questionnaire generally followed the precedents set by the 2000 San Francisco Bay survey. Considerable resources and thought went into the design and implementation of that survey. In addition, comparability of new data with the data from 2000 could provide valuable insights on long-term trends in consumption of Bay fish, and how community-specific data compare to data for the general fishing population.
- The questionnaire is primarily intended to be used in an intercept survey, with on-site, Bay-side personal interviews as the method to gather fish consumption and demographic information from anglers. The questionnaire can also be used, however, with minor adaptations, in off-site surveys - for example, via tabling at community events.
- There is no precise and generally accepted definition of the term “subsistence fishing.” The survey includes several questions that approach motives for fishing from different angles to try to obtain information that can be used to evaluate which fishers can be classified as subsistence fishers.
- To maximize the number of surveys that can be completed, the target amount of time to complete the survey is 15-20 minutes. The number of questions included in the questionnaire was limited with this target in mind.
- Following the approach used in the 2000 San Francisco Bay survey, in order to facilitate administration and data entry, the questions mainly followed a partially closed-end question format, with discrete response categories, supplemented by opportunities to gather open-ended responses to gain key cultural and social context.
- It is anticipated that the questionnaire will be translated from English into other languages to reach the diverse communities that consume Bay fish.

Notes on Specific Questionnaire Elements

- In addition to asking for consumption rate information for four week and one year recall periods as in the 2000 survey, this questionnaire will gather information about the seasonality of consumption. The types and rates of consumption will vary seasonally, driven by seasonal patterns in the availability of different fish species, weather, daylength, and cultural practices.
- Because of the importance of estimating consumption rate, we chose to use physical models of fish fillets in order to elicit information about the quantity of fish typically eaten by the angler. The 2000 survey used one model, but the San Diego survey demonstrated the effectiveness of using a set of models of multiple sizes.
- Whether to include a question on income was a subject of discussion at the first workshop. It was decided to include such a question (Question 21) as a potential indicator of socioeconomic motives for subsistence fishing, and also to allow for comparability to census data as well as other studies.
- The questionnaire does not include a discrete question about the gender of respondents. This decision stemmed from an intentional focus on identifying individuals belonging to specific high-risk populations: children and those capable of bearing children. This information need was chosen to be addressed in a table rather in the form of a discrete question.

Recommendations on Implementation Guidance

General

A contractor should be hired to coordinate the project, ideally someone with experience in conducting fish consumption surveys. The coordinator could convene meetings for additional planning and progress updates, train community interviewers, conduct pretests, and compile results from multiple communities and intercept surveys. It is important that each surveying community undergo a standardized training process to ensure the comparability and usability of data collected from different communities. While CBOs are experts on fishing in their communities, they will require support in conducting surveys. An external coordinator would help bridge this gap by providing necessary training and ensuring data consistency across different communities.

Within the limits of funding, a small number of community groups should pilot the survey in the next phase of this project. A multi-lingual team may be necessary. The survey will be pretested through meetings with community groups where the coordinator can have more in-depth conversations and work with wording, and develop response options that can streamline the questionnaire and save time in the field. It is essential to continue including community members, and continuing to include technical advisors would be valuable. Once the coordinator has developed a sufficient training process, community interviewers can be selected by their organizations and trained by the coordinator to administer the survey. Interviewers should practice administering the questionnaire initially with the coordinator and then in the field.

Sampling Design

The sampling design should follow the basic approach used in the 2000 study, targeting shore-based fishers at selected shoreline based locations, and also being open to piloting off-site surveys. The survey effort should primarily utilize intercept surveys but could arrange with communities to conduct surveys at tabling events and/or gather initial lists of locations where people fish. Communities should assist in selecting intercept survey locations. Locations can be cross-referenced with CDFW/CRFS maps to ensure comprehensive coverage. Criteria for location selection will consider high rates of subsistence fishing, community importance, and interest to regulatory agencies, with a focus on avoiding sampling bias. Community input will guide this process, ensuring surveys are scheduled across various times and seasons. Discussions will explore the possibility of random sampling in communities, similar to the APEN survey, depending on the availability of a good target population list. Metadata will be captured during surveys, including site information and angler demographics. Sample size evaluation will consider feasibility based on pilot testing and historical data, aiming for 100-200 successful surveys over the course of the study.

Conducting the Survey

Community members emphasized that surveyors should approach fishers organically, rather than following a script. Surveyors should ensure participants understand that their participation is voluntary and their responses are anonymous. All questions will be asked, and responses should be clearly recorded using tablets, though paper forms may also be used. The method for recording open-ended responses will need to be determined. Survey administrators should use portable, laminated posters of fish pictures and multiple fish models across a range of sizes, as well as maps of the Bay and local fishing locations to enhance response accuracy, considering that places might have multiple names. Administrators will wear identifiable informal outerwear with appropriate insignia and will clearly state that they are not looking for fishing licenses. To minimize barriers for non-English speakers, the questionnaire should be translated into multiple languages. Additional survey materials should include interviewer ID cards, name tags, and physical cards with QR codes for coordinator contact and further information. Surveyors can coordinate interview schedules with communities by arranging plans with community members ahead of time to conduct surveys at “tabling” events.

Follow Up

After the initial survey, CBOS will continue to engage with respondents by collecting optional preferred contact information to notify them when results are released, along with providing a link or QR code to the project page as well as other materials. The inclusion of an advisory section is optional and is left up to the communities, with physical copies or links to current advisories provided accordingly. Additionally, an advisory poster may be handy for reference. Regarding compensation or gifts for participation, CBOs have strongly indicated that monetary compensation or gift cards should be standard practice.

Data Analysis and QA/QC

Throughout the survey and after the survey is completed, data QA/QC should follow measures listed for the 2000 survey. Data analysis will be conducted by the coordinator (or other designated data analyst). The survey should include a variable indicating the mode of survey to allow comparisons of data from multiple approaches. The coordinator should be tasked with combining data from intercept surveys and surveys from community events. The coordinator will maintain a way to identify how each survey interview was conducted, e.g. intercept, fish event, community meeting, etc., as sampling probability will be completely different. They will then develop summary statistics by survey mode and by socioeconomic group to compare. If results are really different, the coordinator will investigate why and if it matters.

4) Next Steps

This report is a major deliverable for Phase 1 of the overall effort to develop and implement surveys to gather information on consumption rates of San Francisco Bay subsistence fishers. The final task in Phase 1 will be to hold a third workshop in May 2024 that will focus on discussion of implementation of the survey in Phases 2 and 3. Key elements that need to be developed as part of the implementation plan include:

- selecting communities for pilot testing
- training for surveyors
- how to capture responses (tablets?)
- what metadata to capture
- types of incentive gifts
- translation into other languages
- preparing survey materials (e.g., fish models)
- sample size evaluation
- location selection
- combining data from different survey modes (intercept versus off-site)

Phase 2 will include further development of an implementation plan, pilot testing of the questionnaire by a small number of community groups, and refinement of the questionnaire and implementation plan based on the pilot testing results.

Phase 3 will include full implementation of the survey by communities across the Bay region.

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APPENDIX 1

Subsistence Fisher Consumption Questionnaire for San Francisco Bay

Section 1) Introduction

Date :

Time Start :

Time End :

Location :

Interviewer Code :

Mode of Interview :

- Intercept Community Event Random

Introduction: Hello, my name is _. **I am not checking fishing licenses or checking your catch.** I am from [CBO Name] and we are doing a survey to understand how much fish and shellfish are caught and consumed by people fishing in the Bay. The survey will support efforts to promote safe consumption of Bay fish. In exchange for your participation in this survey, we will be offering a gift of \$_____.

There are no right or wrong answers to any of these questions. You can skip any question you don't want to answer. You can also stop the interview at any time. Your responses will be kept anonymous. The survey will only take about 15-20 minutes. Are you willing to take the survey?

Question 1) Our study is called the San Francisco Bay Subsistence Fisher Consumption Study. Have you been interviewed before for this study?

- Yes No No Response

Question 2) Not including today, in the last 4 weeks, how many days have you gone fishing in the Bay? (Show maps, communities can show smaller local map)

Question 3) What do you usually do with your catch? (Select 2, then add)

- | | | |
|--|--|--------------------------------------|
| <input type="checkbox"/> Eat myself | <input type="checkbox"/> Use for bait | <input type="checkbox"/> Catch and |
| <input type="checkbox"/> Share with my | <input type="checkbox"/> Give to | Release |
| household | community/Friend | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> | <input type="checkbox"/> Trade or Sell | <input type="checkbox"/> No Response |

Question 4a) Do you consume any of the fish you or others catch from the Bay?

If no, direct them to location section (Questions 13-16) and then end survey

- Yes No No Response

Question 4b) (if yes) - Which of the below are the top 3 reasons you eat fish from the Bay?

- | | | |
|--|--|--------------------------------------|
| <input type="checkbox"/> Cultural heritage | <input type="checkbox"/> Health/nutrition | <input type="checkbox"/> Inexpensive |
| <input type="checkbox"/> To have fun/relax | <input type="checkbox"/> To be with friends/family | food source |
| <input type="checkbox"/> Family tradition | <input type="checkbox"/> Other _____ | <input type="checkbox"/> Barter/Sell |
| | | <input type="checkbox"/> No Response |

Question 4c) If your fishing relates to cultural/traditional/familial practices, please explain how:

Question 4d) If you couldn't eat fish from the Bay, how hard would it be for you to replace that food with food bought from stores, restaurants, or other commercial sources? (on a scale from 1 to 5: 1 being easy and 5 being very hard) _____

Section 2) Consumption

Question 5) How many years have you been eating fish that you or someone you know has caught from the Bay?

- < 1 Year 1-5 Years 6-10 Years
 11-20 Years 21-29 Years > 30 Years
 No Response

Question 6) In the last 4 weeks, how many times did you eat fish that you or someone you know caught from the Bay?

- > once a day About every day 3-4 times a week
 1-2 times a week 2-3 times a month < once a month or never
 No Response

Question 7) In the last 12 months, how many times did you eat fish that you or someone you know caught from the Bay?

- > once a day About every day 3-4 times a week
 1-2 times a week 2-3 times a month 1-6 times per year
 < once a month No Response

Question 8) Please indicate how often you catch and eat fish from the Bay in certain seasons

	July - Sept (Summer)	Oct - Dec (Fall)	Jan - March (Winter)	April - June (Spring)
More than once a week				
Once a week				
Once a month				
Less than once a month				
Don't know				

Question 8a) Please specify reasons for each season ie. Fish Availability, cultural practice, etc.

Question 9) These models show different sizes of raw fish fillet [SHOW MODELS]. When you eat a meal that includes fish from the Bay, is the amount that you eat approximately:

- | | | |
|---------------------------------|---------------------------------|---------------------------------|
| <input type="checkbox"/> 1.5 oz | <input type="checkbox"/> 4.5 oz | <input type="checkbox"/> 7.5 oz |
| <input type="checkbox"/> 3 oz | <input type="checkbox"/> 6 oz | <input type="checkbox"/> Other |

Question 10) Have you changed the amount you eat fish over the past 5 years?

- | | |
|-----------------------------------|--|
| <input type="checkbox"/> Increase | <input type="checkbox"/> Stayed the same |
| <input type="checkbox"/> Decrease | <input type="checkbox"/> No Response |

Question 11) Do you also eat fish that you purchased from a store or restaurant?

- | | | |
|------------------------------|-----------------------------|--------------------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> No Response |
|------------------------------|-----------------------------|--------------------------------------|

Question 11a) If yes to the previous question, how often?

- | | | |
|---------------------------------------|--|--------------------------------------|
| <input type="checkbox"/> once a week | <input type="checkbox"/> A few times a week | <input type="checkbox"/> No Response |
| <input type="checkbox"/> Once a month | <input type="checkbox"/> A few times a month | |

Section 3) Species

Question 12a) I have some pictures of fish that can be caught from the Bay. Looking at these pictures, please show me which fish you have eaten in the past year. Again, these are the fish you ate in the past year which you caught or someone you know caught from the Bay. The fish could have been fresh, frozen, dried, canned or smoked. Please provide more information starting with the species that you eat the most.

A poster will be created that includes the species in the advisory plus bat rays and rock crabs

Question 12b) How many times have you eaten this fish in the last four weeks?

- | | | |
|---|--|--|
| <input type="checkbox"/> > once a day | <input type="checkbox"/> About every day | <input type="checkbox"/> 3-4 times a week |
| <input type="checkbox"/> 1-2 times a week | <input type="checkbox"/> 2-3 times a month | <input type="checkbox"/> < once a month or never |
| | <input type="checkbox"/> No Response | |

Question 12c) How long in inches is this species of fish that you eat? (Have tape measure)

- | | | |
|---|--|--------------------------------------|
| <input type="checkbox"/> 0 - 6 inches | <input type="checkbox"/> 6 - 12 inches | <input type="checkbox"/> No Response |
| <input type="checkbox"/> 12 - 18 inches | <input type="checkbox"/> 18 + inches | |

Question 12d) Which parts of this fish species do you eat? (Select all that apply)

- | | | |
|---|---------------------------------|--------------------------------------|
| <input type="checkbox"/> The whole fish | <input type="checkbox"/> Eyes | <input type="checkbox"/> Eggs |
| <input type="checkbox"/> Fillet | <input type="checkbox"/> Cheeks | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Skin | <input type="checkbox"/> Guts | <input type="checkbox"/> No Response |

Question 12e) How do you prepare and cook this species? (Select all that apply)

- | | | |
|---------------------------------|----------------------------------|---------------------------------------|
| <input type="checkbox"/> Raw | <input type="checkbox"/> Baked | <input type="checkbox"/> Paste |
| <input type="checkbox"/> Smoked | <input type="checkbox"/> Tinned | <input type="checkbox"/> Stew/soup |
| <input type="checkbox"/> Boiled | <input type="checkbox"/> Grilled | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Fried | <input type="checkbox"/> Jerky | |

Question 12f) What do you do with the parts of this fish that you do not eat?

- | | | |
|----------------------------------|---|--|
| <input type="checkbox"/> Discard | <input type="checkbox"/> Give to others | <input type="checkbox"/> Other: please specify |
| <input type="checkbox"/> Stock | <input type="checkbox"/> No Response | |
-

Section 4) Location (Have maps available for local area and Baywide)

Question 13) How often do you fish at this location? (if this is not a shoreline intercept survey ask for last place they fished)

- | | | |
|--|--|--------------------------------------|
| <input type="checkbox"/> About every day | <input type="checkbox"/> < once a month or never | <input type="checkbox"/> No Response |
| <input type="checkbox"/> 2-3 times a month | <input type="checkbox"/> 1-2 times a week | |
| <input type="checkbox"/> 3-4 times a week | <input type="checkbox"/> Other _____ | |

Question 13a) Where was the last place you fished? _____

Question 14a) At what Bay location do you fish the most? _____

How often do you fish there?

- | | | |
|--|--|--------------------------------------|
| <input type="checkbox"/> About every day | <input type="checkbox"/> < once a month or never | <input type="checkbox"/> No Response |
| <input type="checkbox"/> 2-3 times a month | <input type="checkbox"/> 1-2 times a week | |
| <input type="checkbox"/> 3-4 times a week | <input type="checkbox"/> Other _____ | |

Question 14b) Why this specific location, provide top two reasons

- | | | |
|---|--|--|
| <input type="checkbox"/> Close to home/work | <input type="checkbox"/> Specific fish available | <input type="checkbox"/> Lots of fish available |
| <input type="checkbox"/> Convenient parking | <input type="checkbox"/> Don't need license | <input type="checkbox"/> Other things for others to do |
| <input type="checkbox"/> Easy Access | <input type="checkbox"/> Tidal Access | <input type="checkbox"/> No Response |

Question 15a) Do you fish at other locations?

- Yes (continue with 15b) No (got to section 5)

Question 15b) If yes, where? _____

Question 15c) How often? _____

Question 15d) Why those specific locations, provide top two reasons

- | | | |
|---|--|--|
| <input type="checkbox"/> Close to home/work | <input type="checkbox"/> Specific fish available | <input type="checkbox"/> Lots of fish available |
| <input type="checkbox"/> Convenient parking | <input type="checkbox"/> Don't need license | <input type="checkbox"/> Other things for others to do |
| <input type="checkbox"/> Easy Access | <input type="checkbox"/> Tidal Access | <input type="checkbox"/> No Response |

Question 16) What is your zip code?

Section 5) Sharing of Catch

Question 17) How many people altogether, including yourself, do you live with?

Question 18) Who in your household? eats the fish that you or someone you know catches from the Bay? Please list those you live with including age, gender, and how often they eat Bay fish:

Relationship to Respondent	Sex	Age	How often they have eaten Bay fish in the last 4 weeks	Does this person live with you?
Self (Interviewee)	<input type="checkbox"/> Female <input type="checkbox"/> Male <input type="checkbox"/> Choose _____ <input type="checkbox"/> No Response		<input type="checkbox"/> > once a day <input type="checkbox"/> 1-2 times a week <input type="checkbox"/> About every day <input type="checkbox"/> 2-3 times a month <input type="checkbox"/> 3-4 times a week <input type="checkbox"/> < once a month or less <input type="checkbox"/> No Response	<input type="checkbox"/> Self <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No Response
	<input type="checkbox"/> Female <input type="checkbox"/> Male <input type="checkbox"/> Choose _____ <input type="checkbox"/> No Response		<input type="checkbox"/> > once a day <input type="checkbox"/> 1-2 times a week <input type="checkbox"/> About every day <input type="checkbox"/> 2-3 times a month <input type="checkbox"/> 3-4 times a week <input type="checkbox"/> < once a month or less <input type="checkbox"/> No Response	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No Response
	<input type="checkbox"/> Female <input type="checkbox"/> Male <input type="checkbox"/> Choose _____ <input type="checkbox"/> No Response		<input type="checkbox"/> > once a day <input type="checkbox"/> 1-2 times a week <input type="checkbox"/> About every day <input type="checkbox"/> 2-3 times a month <input type="checkbox"/> 3-4 times a week <input type="checkbox"/> < once a month or less <input type="checkbox"/> No Response	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No Response

	<input type="checkbox"/> Female <input type="checkbox"/> Male <input type="checkbox"/> Choose <hr/> <input type="checkbox"/> No Response		<input type="checkbox"/> > once a day <input type="checkbox"/> 1-2 times a week <input type="checkbox"/> About every day <input type="checkbox"/> 2-3 times a month <input type="checkbox"/> 3-4 times a week <input type="checkbox"/> < once a month or less <input type="checkbox"/> No Response	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No Response
	<input type="checkbox"/> Female <input type="checkbox"/> Male <input type="checkbox"/> Choose <hr/> <input type="checkbox"/> No Response		<input type="checkbox"/> > once a day <input type="checkbox"/> 1-2 times a week <input type="checkbox"/> About every day <input type="checkbox"/> 2-3 times a month <input type="checkbox"/> 3-4 times a week <input type="checkbox"/> < once a month or less <input type="checkbox"/> No Response	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No Response
	<input type="checkbox"/> Female <input type="checkbox"/> Male <input type="checkbox"/> Choose <hr/> <input type="checkbox"/> No Response		<input type="checkbox"/> > once a day <input type="checkbox"/> 1-2 times a week <input type="checkbox"/> About every day <input type="checkbox"/> 2-3 times a month <input type="checkbox"/> 3-4 times a week <input type="checkbox"/> < once a month or less <input type="checkbox"/> No Response	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No Response
	<input type="checkbox"/> Female <input type="checkbox"/> Male <input type="checkbox"/> Choose <hr/> <input type="checkbox"/> No Response		<input type="checkbox"/> > once a day <input type="checkbox"/> 1-2 times a week <input type="checkbox"/> About every day <input type="checkbox"/> 2-3 times a month <input type="checkbox"/> 3-4 times a week <input type="checkbox"/> < once a month or less <input type="checkbox"/> No Response	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No Response
	<input type="checkbox"/> Female <input type="checkbox"/> Male <input type="checkbox"/> Choose <hr/> <input type="checkbox"/> No Response		<input type="checkbox"/> > once a day <input type="checkbox"/> 1-2 times a week <input type="checkbox"/> About every day <input type="checkbox"/> 2-3 times a month <input type="checkbox"/> 3-4 times a week <input type="checkbox"/> < once a month or less <input type="checkbox"/> No Response	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No Response

Section 6) Describing Bay Fishers - These next few questions will help us describe the people who fish from the Bay. This information will be helpful in developing information and materials for people who fish and protecting those who are most vulnerable to the effects of the contaminants that are in the fish. Children are more vulnerable, for example. Please remember the information is kept confidential and you don't have to answer if you don't want to.

Question 19) What is your racial background? Select all that apply

- | | | |
|--|--|--------------------------------------|
| <input type="checkbox"/> African American/Black | <input type="checkbox"/> Latino | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> American Indian (Native American) | <input type="checkbox"/> White/Caucasian | <input type="checkbox"/> Don't Know |
| | <input type="checkbox"/> Asian | <input type="checkbox"/> No Response |

Question 20) What languages do you primarily speak in your home? _____

Question 21) If you are comfortable, please indicate your household income

- | | | |
|--|---|--------------------------------------|
| <input type="checkbox"/> > \$20,000 | <input type="checkbox"/> \$45,001 - \$65,000 | <input type="checkbox"/> > \$100,000 |
| <input type="checkbox"/> \$20,000 – 45,000 | <input type="checkbox"/> \$65,001 - \$100,000 | <input type="checkbox"/> No Response |

Section 7) Closing

That's all the questions I have. **Thank you for your input!** As a thank you for your participation, we would like to offer you a small gift (OFFER GIFT). We can also send you information about the results of this survey when they become available. **I'd also like to give you some information about the current advisory for the Bay (OFFER COPY OF ADVISORY PAMPHLET)**

Question 22) Are there other places you'd recommend for us to do this survey?

Question 23) Do you have any comments or questions for me?

Question 24) Would you like us to send you information about the results of our survey when they become available? (Have separate card with contact details available)

Question 25) Is there anything else you want me to know about fishing and the seafood you catch in the Bay?

Post Survey Reflection

This is primarily in the case the interview was incomplete. Interviewers should note the observed gender, age, ethnicity, and native language of the interviewee. Other items to note include how many people were in the group and how many children were in the group. Interviewers should also gauge the quality of the interview and if the interview was deemed bad, why so (language, distracted, other, etc).

Section 8) Risk Communication (**Optional: Community doing the survey can decide whether to include.**)

26a) Have you heard or seen any information or the advisory about the pros and cons of eating fish from the Bay? Yes No

26b) What did the information say about fish from the Bay? _____

26c) Where did you get this information?

- | | | |
|---|---------------------------------------|--|
| <input type="checkbox"/> Family | <input type="checkbox"/> Friends | <input type="checkbox"/> Signs |
| <input type="checkbox"/> Fishing Regulation | <input type="checkbox"/> Social Media | <input type="checkbox"/> Other (Elaborate) |

27a) Has the information you have heard or seen about eating fish from the Bay caused you to change your fish-eating habits? Yes No

27b) If yes, how have you changed your fish-eating habits? If no, why not?

- | | | |
|-----------------------------------|-----------------------------------|--------------------------------------|
| <input type="checkbox"/> Increase | <input type="checkbox"/> Decrease | <input type="checkbox"/> No Response |
|-----------------------------------|-----------------------------------|--------------------------------------|

27c) What is the best way for you to get information about catching and eating fish from the Bay? (check all that apply)

- | | | |
|---|---------------------------------------|--|
| <input type="checkbox"/> Family | <input type="checkbox"/> Friends | <input type="checkbox"/> Signs |
| <input type="checkbox"/> Fishing Regulation | <input type="checkbox"/> Social Media | <input type="checkbox"/> Other (Elaborate) |