PALOS VERDES SHELF

SEAFOOD CONSUMPTION STUDY

Technical Report

2014

EPA United States Environmental Protection Agency

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This report is the result of the contributions of many dedicated people. The Technical Advisory Committee guided this Study from inception to completion, and their countless contributions are greatly appreciated.

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ABBREVIATIONS

AWQC	Ambient Water Quality Criteria
CTE	Central Tendency Exposure
DDT	Dichloro-Diphenyl-Trichloroethane
DNC	Do Not Consume
EPA	Environmental Protection Agency
FCEC	Fish Contamination Education Collaborative
IC	Institutional Controls
MSRP	Montrose Settlements Restoration Program
NOAA	National Oceanic and Atmospheric Administration
OMB	Office of Management and Budget
PCB	Polychlorinated Biphenyls
QA	Quality Assurance
QC	Quality Control
RME	Reasonable Maximum Exposure
ROD	Record of Decision
SGA	S. Groner Associates, Inc.
SMBRP	Santa Monica Bay Seafood Consumption Study
SPSS	Statistical Package for the Social Sciences
TAC	Technical Advisory Committee
U.C.L.	Upper Confidence Limit

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The Palos Verdes Shelf superfund site is a large area of contaminated sediment located approximately two miles off the coast of the Palos Verdes Peninsula. Since the 1970s, studies have shown that fish caught in the region (from the Santa Monica Pier to Seal Beach Pier) have elevated levels of DDT and PCBs. Palos Verdes Shelf is a main source of the DDT and PCBs contamination in the fish. The presence of chemically contaminated fish has generated public concern regarding the safety of consuming seafood from the region. To properly determine the health risks from the consumption of contaminated seafood, data on the consumption rates of anglers fishing in the region is required.

This seafood consumption study replicates to the extent possible the 1994 Santa Monica Bay Seafood Consumption Study (1994 Study) to provide data to conduct trend analysis and to achieve the following objectives:

- To conduct a statistically valid survey of recreational anglers that fish in the greater PV Shelf area to determine the fish species that are being caught and consumed at the highest rates;
- To gather quantitative data that can be used to characterize exposures of the general fishing population of the PV Shelf area to DDTs and PCBs from consumption of fish and shellfish caught in the PV Shelf area;
- To identify demographic and ethnic subgroups within the general fishing population of the PV Shelf area that may be consuming large quantities of contaminants through selection, quantity, and/or cooking method of fish species; and
- To gather sufficient information to determine whether the existing human health risk assessment needs to be revised before its use in a final Record of Decision.

Anglers were interviewed between February 2012 to January 2013 at piers, jetties, private boats, charter boats, and beach and intertidal zones. Interview days occurred on both weekdays and weekends. Answers to the questionnaire were numerically coded, entered into a computer database, and analyzed. A total of 693 in-person survey responses were collected over 128 interview days at 61 different fishing sites in the region. The volume of responses allows for a ±4% margin of error for findings at the population level. The total number of anglers counted was 64% lower than in 1994.

The study finds that:

- Fish Species that are being caught and consumed:
    - At least 35 species of fish taken from the area by recreational anglers.

    - The most abundant species caught by anglers and intended for consumptions are: mackerel (27% of anglers), Pacific sardine (21%), perch (19%), topsmelt (19%), California scorpionfish (14%) and bass (12%).
- Fish Consumption rate for exposure rate characterization:
    - Thirty-nine percent of anglers interviewed reported consuming fish from the region within the four weeks prior to being surveyed.
    - The average daily consumption rate per angler consumer is 18.55 grams per day.
    - The 90th percentile angler-consumers consume 42.86 grams per individual per day or more than twice as much fish from PV Shelf as the average angler consumer.
- Demographic and ethnic subgroups:
    - Many ethnic groups were identified: Hispanic, White, Asian (which included Filipino, Japanese, Korean, Chinese, and Vietnamese), as well as anglers of mixed or other ethnic origins.
    - The ethnic breakdown of the anglers is as follows: Hispanic (37%) with White (24%), Asian (24%), Black (6%), and 9% of mixed or other ethnic background.
    - The overwhelming majority of anglers were men (94%).
    - The age of anglers ranges from 14 to 87 years old. Mean angler age of is 44 years old.
    - Hispanics are the most abundant ethnic group on piers and jetties, whereas Whites are the most abundant group on charter boats and private boats.
    - Black anglers report among the highest rates of consumption and consumption of DNC fish, as well as the lowest overall awareness of health advisory warnings and regard for these warnings.
- Effectiveness of the Institutional Controls:
    - The decrease in average daily seafood consumption rate suggests that EPA's public outreach efforts have been successful in changing angler consumer behaviors and reduced human health exposure to contaminated fish.
    - 61% of anglers (425 of 693) reported awareness of advisory warnings disseminated in the past decade, and of those who reported awareness, 42% (175 of 693) reported adopting a more healthy behavior.
- Trend Analysis:
    - Shift in fish species caught: the most common species intended for consumption were mackerel (27% of anglers), Pacific sardine (21%), perch (19%), topsmelt (19%), California scorpionfish (14%) and bass (12%). In 1994, the most commonly consumed fish were Pacific bonito (77.5%), barracuda (74.2%) and halibut (69.6%).
    - There is a 50% reduction in fish consumption rate compare to the 1994 consumption rate.
    - The preparation methods remained consistent from 1994 to present: the majority of consumers (63% in the current study and 65% in 1994) reported eating the fish as a steak or fillet without the skin.
    - Since the 1994 study, the percent of anglers who are White has declined from 43% to 24% while the percentage of Hispanic and Asian have increased, from 25% to 37% and 18% to 24%, respectively. Despite the population level changes, trends across fishing modes have remained consistent since the 1994 study.

Several recommendations for future outreach are made as a result of this study: Language difficulties were the main reasons given for declined surveys, and therefore, continuing to recruit outreach workers to match the diverse ethnic backgrounds of the Southern California angler population is critical. For instance, the survey team consisted of Spanish, Vietnamese, Mandarin, Cantonese, and Tagalog speakers, but lacked a Korean speaker and therefore had difficulty reaching Korean anglers. Also, finding that more than 20% of anglers have less than a year's experience fishing leads to the recommendation to take into consideration the relative inexperience of anglers when conducting outreach, especially when developing messaging. Discovering that Black anglers report among the highest rates of consumption and consumption of DNC fish, as well as the lowest overall awareness of health advisory warnings and regard for these warnings, efforts to target this particular group shall be increased and sustained. Outreach activities targeting Asian anglers will take place in the winter months, as Asian angler activities increase in the winter months unlike the other ethnic groups do. Barred sand bass had the highest rate of intended consumption of all five fish species listed with the "Do-Not-Consume" status. Therefore, additional outreach focused on this species should be undertaken, with a strong recommendation to review risk findings that will come from the EPA 2014-15 Palos Verdes Shelf fish sampling activity.

While public outreach and education have made a difference in reducing the public health risk of consuming contaminated fish from the Palos Verdes Shelf superfund site, there is more to be done. With a deep understanding of the results from this study and the guidance provided, EPA and partners will continue to monitor vulnerable populations and carry out activities to reach, educate, and ultimately foster healthy fish consumption behaviors in all who consume fish caught in the impacted region.

SECTION 1

INTRODUCTION

SECTION 1 – INTRODUCTION

1.1. HISTORY OF PALOS VERDES SHELF SUPERFUND SITE

The Palos Verdes Superfund Site (Study Area) is an 88-square kilometer (34-square mile) area of sediment on the continental shelf and slope off the coast of the Palos Verdes Peninsula in Los Angeles County, California, that has been contaminated with dichloro-diphenyl-trichloroethane (DDT) and polychlorinated biphenyls (PCBs). The primary source of chemical contaminants in the Study Area is effluent discharged through submarine outfalls at White Point on the Palos Verdes Peninsula. Since 1937, wastewaters have been discharged to the ocean off Palos Verdes Peninsula.

An estimated 1000 metric tons of DDTs were discharged from the outfalls from the 1950s through 1971. Approximately 10 percent of the discharge (estimated at 110 metric tons) settled on the Study Area, forming an identifiable layer of contaminated sediment from five to 60 centimeters thick. An additional 10 metric tons of PCBs are also estimated to remain in the sediment of the Study Area.

The area of highest DDT and PCB contamination in sediment is located roughly two miles offshore and extends approximately four miles westward along the shelf. However, contaminant levels in all ocean waters across the site exceeded the California Ocean Plan standards for DDT and PCBs. These chemicals of concern could accumulate over time to elevated levels in benthic and aquatic receptors in the Study Area. Sediment and surface water do not pose a direct threat to human health, but could pose an indirect human health threat due to consumption of fish contaminated with DDTs and PCBs in the sediments and surface water in the Study Area.

The 2002-2004 Southern California Coastal Marine Fish Contaminants Survey (EPA/NOAA, 2007) presented data showing that white croaker, barred sandbass, California Scorpion fish, Pacific Sardine, and Kelp bass were the five fish species in the Study Area with high concentrations of DDTs and PCBs, with white croaker having the highest concentration. DDT concentrations were also highest in white croaker from the Coastal Area (Ventura harbor to San Mateo Point) whereas Topsmelt had the highest concentrations of PCBs.

The Environmental Protection Agency (EPA) signed an Interim Record of Decision (IROD) (EPA, 2009) that selected an interim remedy for the Study Area. The interim remedy includes (a) placement of a cap of clean sediment over the most contaminated sediment areas, (b) monitoring natural recovery, and (c) continuance of the existing institutional controls (IC) program.

The remediation plan directly addresses the contaminated sediments. Specific remedial action objectives (RAOs) for the Study Area include (a) the reduction to acceptable levels the risks to human health due to ingestion of fish contaminated with DDTs and PCBs, (b) reduction to acceptable levels the risk to the ecological community (i.e., benthic invertebrates and fish) from DDTs and PCBs, and (c) reduction of DDTs and PCBs in the Study Area surface waters to levels that meet the ambient water quality criteria (AWQC) for protection of human and ecological health.

The ICs program, on the other hand, focuses on modifying fish consumption behaviors to reduce exposure. The three major elements of the ICs program are public outreach and education, fish monitoring, and enforcement. The goal of the public outreach and education component is to increase awareness and understanding of existing fish advisories and fishing restrictions. A list of Do Not Consume (DNC) fish was developed to identify five fish that could potentially pose a threat to human health. Three of the DNC fish, namely, barred sand bass, white croaker, and topsmelt pose a health threat due to DDTs and PCBs from the Study Area. Two of the DNC fish, barracuda and black croaker, could potentially pose a health threat due to high levels of mercury from outside the Study Area. To mitigate the risk faced by anglers fishing in the Study Area, the Fish Contamination Education Collaborative (FCEC) was formed to conduct public outreach at public piers, jetties, beaches, intertidal zones, and to organize outreach efforts to anglers on private and commercial boats. The FCEC conducts angler outreach along the Southern California coastline from Santa Monica Pier in the north to Seal Beach Pier in the south.

1.2. CONTAMINATION & ASSOCIATED HEALTH RISKS

Consumption of fish contaminated with DDTs and PCBs could increase the likelihood of cancer over a lifetime of 70 years. Levels of these contaminants are routinely monitored in fish until the RAOs identified in the IROD are achieved. Human consumption of potentially contaminated fish is being limited by educating the public on safe fishing practices, by supporting state commercial fishing ban and fish advisories, and by monitoring potential exposures of consumers to contaminated fish through the ICs program.

The ICs program provides immediate protection to the public and reduces exposure of consumers to contaminated fish by partnering with other federal, state, and local agencies, as well as community-based organizations. In addition to establishing the FCEC, the EPA partners with OEHHA and Counties of Los Angeles and Orange in placing fish advisory warnings at popular fishing locations throughout the Study Area. The State Legislature passed the Marine Life Protection Act (MLPA, or Act) in 1999, which directed the California Department of Fish and Wildlife to reevaluate all existing marine protected areas (MPAs) and to redesign MPAs along California's 1,100-mile coast. The Act established MPAs to help protect the State's marine life, habitats, and ecosystems. The MLPA also directed the California Department of Fish and Wildlife to consider including the Study Area—from Santa Monica Pier to Seal Beach Pier—as a new MPA.

1.3. APPLICATION OF FINDINGS FROM PREVIOUS STUDIES

One goal of the IROD is to reduce the health risks associated with the consumption of contaminated fish to an acceptable level. A Human Health Risk Evaluation (HHRE) was conducted (EPA, 2007) to evaluate potential cancer risks and noncancer hazards based on ocean fish data collected by the Montrose Settlements Restoration Program (MSRP) and EPA in 2002, and by the Los Angeles County Sanitation District in 2002. The MSRP/EPA fish sampling effort collected 23 species of fish representing a mix of water column and bottom feeders, and pelagic and local dwelling species. However, the HHRE (EPA, 2007) only used data from six fish species (White Croaker, Kelp Bass, Rockfish, Surfperches, California scorpionfish, and barred sandbass) caught from Point Fermin area to Redondo Canyon. These fish species were selected because the number of samples from each species was statistically valid. The HHRE applied the fish consumption rates that represented the reasonable maximum exposure (RME) or high-end fish consumption scenario and the average or central tendency exposure (CTE) scenario (Santa Monica Bay Restoration Program [SMBRP], 1994). The HHRE evaluated two populations of consumers, namely, all anglers and Asian anglers who consumed fish at a higher rate. The results of the HHRE indicated that for all six species, the cancer risk estimates based on the consumption rates of both angler populations (i.e., all anglers and of Asian anglers) exceeded one-in-a million (1×10^{-6}) for the RME and CTE scenarios. The noncancer hazard index estimates for both angler populations exceeded the threshold level of one under the RME scenario but were less than one under the CTE scenario, except for the white croaker, California Scorpion fish, and Barred Sandbass.

With the population in the greater Los Angeles/Orange County areas having undergone significant economic and demographic changes, EPA deemed it essential to update the data on angler fish consumption habits. Changes in fishing patterns, consumption or cooking methods, or angler demographics could result in either increased or reduced health risks to angler consumers.

The methodologies and findings presented in this Fish Consumption Study will indicate whether or not the ICs program has been effective in reducing human health risks by preventing exposures to fish contaminated with DDTs and PCBs.

SECTION 2

STUDY GOAL AND OBJECTIVES

SECTION 2 – GOAL AND OBJECTIVES

2.1. GOAL

The goal of the Seafood Consumption Study (the Study) is to update the data on seafood consumption patterns of anglers fishing within an area that extends beyond the Superfund Site's – Study Area and is referred to as the "study region". The updated seafood consumption rates will provide supporting information in determining whether the risks associated with consumption of fish in the study region had been reduced to acceptable levels due, in part, to the ICs program.

2.2. OBJECTIVES

The objectives of this study include the following:

- To conduct a statistically valid survey of recreational anglers that fish in the study region to determine the fish species that are being caught and consumed at the highest rates;
- To gather quantitative data that can be used to characterize exposures of the general fishing population to DDT and PCBs from consumption of fish and shellfish caught in the study region;
- To identify demographic and ethnic subgroups within the general fishing population of the study region that may be consuming large quantities of contaminants through selection, quantity, and/or cooking method of fish species; and
- To gather sufficient information to determine whether the existing human health risk assessment needs to be revised before its use in a final Record of Decision.

SECTION 3

STUDY DESIGN AND ADMINISTRATION

SECTION 3 – STUDY DESIGN AND ADMINISTRATION

3.1. STUDY OVERSIGHT AND STAFF

The Study was designed and administered with the help and support of a diverse cross-section of public and nonprofit entities. The Study was funded and overseen by the EPA and executed by EPA Contractor, S. Groner Associates, Inc. (SGA).

The EPA formed a Technical Advisory Committee (TAC) which provided critical input and support in the design of the survey tools and analysis of the collected data. The TAC also assisted in report preparation and review. Members of the Committee include representatives from federal, state, and local government agencies, academic institutions, and environmental organizations (see Acknowledgements for a full list of Committee members).

Professor Michael Franklin of the California State University at Northridge was the Study's Consulting Ichthyologist and provided training for surveyors on identifying fish species.

The survey tools were designed by a consulting firm, Action Research, who also analyzed survey data. Action Research provided support with training surveyors and with issues that came up during data collection and report preparation.

3.2. STUDY OVERVIEW

The Study was designed to closely follow the 1994 *Santa Monica Bay Seafood Consumption Study* so that the data collected could be directly compared and to provide a comparison of changes in demographic and angler catch and consumption data over the 20-year period. Similar to the 1994 Study, data were collected for a full year. The study data were collected between February 2012 and January 2013 at fishing sites throughout the study region. The manner in which data collection activities were scheduled allowed for a representative sample of all anglers fishing in the study region. The survey design was based on a stratified random sampling, which took into account geographic region, fishing mode, time of day, and seasonality. The resulting approach was designed to produce a representative sample of the local angler population. Data were collected with industry-standard confidence intervals for each group and with acceptable levels of statistical power.

3.3. SURVEY METHOD

All surveys and data collection were conducted through personal interviews. Indirect survey methods such as mail and phone surveys were not selected because a significant amount of fishing activity occurs on public piers in the study region. However, a complete target list of anglers could not be produced because fishing licenses are not required to fish on public piers. On-site interviews were conducted by bilingual surveyors to facilitate the participation of anglers who may have difficulty understanding written surveys due to literacy, cultural, and/or language barriers. Finally, for the purpose of estimating consumption rate, surveyors used a physical model of a fish with a delineation of the fillet portion so that information can be obtained about the quantity of fish typically eaten by the respondent.

3.4. RESPONSE RATE GOAL

The percent response rate is equivalent to the number of anglers who agreed to participate in the survey divided by the number of all anglers approached, including those who refused to be surveyed. Consistent with the 1994 Study, a target of 1000 respondents was established. The goal was a response rate of 75%. The 1994 Study indicated that the angler response rate was lowest on piers (66%) and highest at intertidal sites (100%).

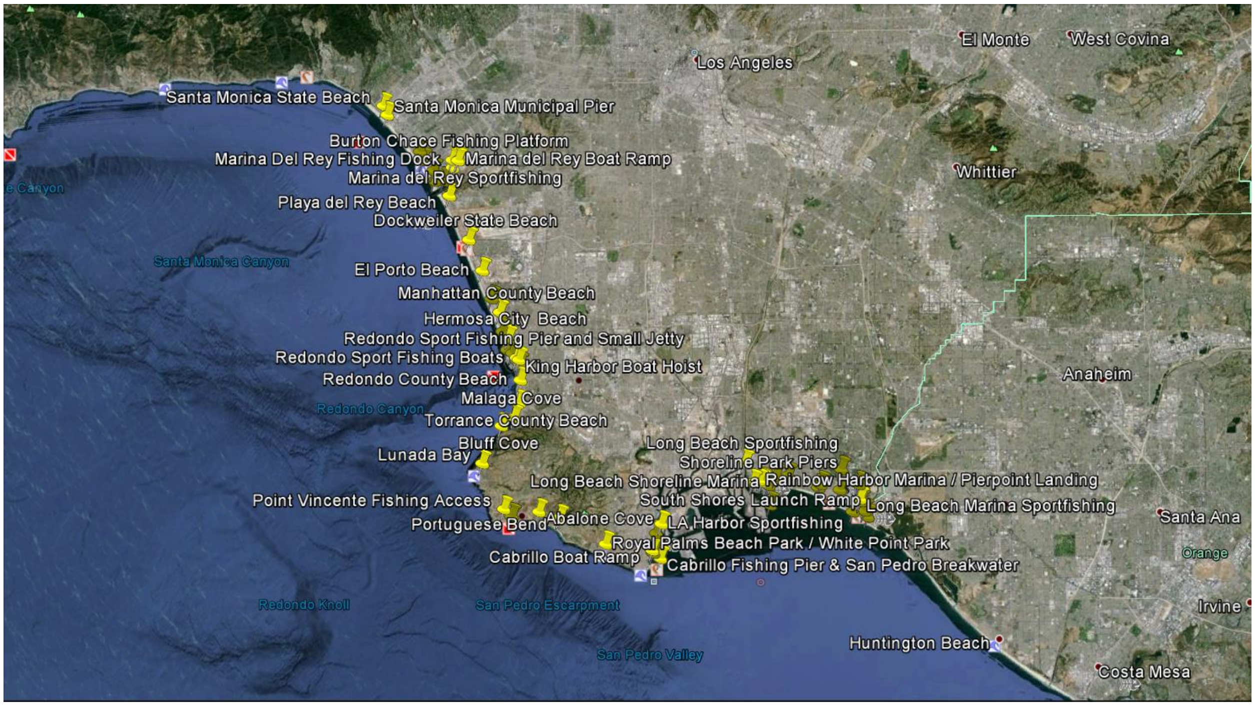
The ultimate sample size was smaller than anticipated due to a notable decrease in the number of anglers since 1994. Census estimates indicate a net 64% drop in anglers over the last two decades. Despite that, the number of respondents afforded statistical significance across all demographic strata.

3.5. SITE SELECTION

3.5.1. GEOGRAPHIC LOGISTICS

Figure 1 shows the 61 fishing sites within the study region that were identified for data collection. A complete list of sites and a map of the study region are in **Appendix A**. The geographic area comprising the entire study region is further divided into four geographical sub-regions, namely: Central Bay (Santa Monica Municipal Pier to Playa Del Rey Beach), South Bay (Manhattan Beach to Redondo Beach), Los Angeles Harbor (Cabrillo Pier and Cabrillo Boat Ramp), and Long Beach (Cabrillo Boat Ramp to Seal Beach Pier). The study region for this study differs slightly from the 1994 Study, which included the northern region from Paradise Cove to Malibu, and excluded the region from Cabrillo to Seal Beach.

Figure 1. Palos Verdes Shelf Superfund Site sampling locations.



Preliminary scouting trips were taken to identify target locations and to assess the level of fishing at each site. Fishing sites with limited activity were replaced with alternate sites known to attract more anglers. Alternate sites were always from within the same geographic sub-region as the site that was being replaced to maintain the geographical stratification.

3.5.2. MODES OF FISHING

The four modes of fishing included in this study are pier or jetty, private boat, charter boat, and beach or intertidal zone. Surveyed sites were selected to provide adequate coverage of each mode within each geographic sub-region identified in Section 3.5.1. Sampling procedures were modified by taking into account the characteristic nature of the various modes at each location.

Selected sites for each fishing mode are discussed below:

- **Pier or Jetty**. Piers or jetties with significant fishing activity were selected. A total of 23 sites were included for the pier or jetty mode: Cabrillo Fishing Pier, Hermosa Beach Municipal Pier, Manhattan Beach Municipal Pier, Marina Del Rey Jetty, Ballona Creek Bridge and Jetties, Playa Del Rey Beach, Redondo Sport Fishing Pier and Small Jetty, Santa Monica Municipal Pier, King Harbor South Jetty, King Harbor Breakwater, San Pedro Breakwater, Venice Fishing Pier, Redondo Beach Municipal Pier, Shoreline Park Piers, Shoreline Marina Piers, Shoreline Village East Jetty, Belmont Pier, Pier J, Rainbow Harbor, San Pedro Breakwater, Alamitos Bay West Jetty, Seaport Village Jetty, and Seal Beach Pier. To reach the target sample size, two of the sites that were initially selected were replaced due to known low fishing activity. As stated in Section 3.5.1, the alternate sites were located in the same geographic sub-region.

- **Private Boats**. Selected nine boat launch sites with fishing activity include: Rocky Point Skiff Rentals, Cabrillo Boat Ramp, King Harbor Boat Hoist, Marina Del Rey Boat Ramp, South Shores Launch Ramp, Belmont Pier Launch Area, Granada Launch Area, Claremont Launch Ramp, and Marine Stadium Launch Area.
- **Charter Boats**. Surveyors targeted seven charter boat locations that offered full- and half-day trips: Marina Del Rey Sportfishing, Rocky Point Charters, Redondo Sport Fishing Boats, 22nd Street Landing, LA Harbor Sportfishing, Long Beach Sportfishing, and Long Beach Marina Sportfishing.
- **Beach or Intertidal Zone**. Surveys were conducted at beaches adjacent to the pier or jetty locations being sampled, for a combined total of 22 individual sites: Santa Monica State Beach, Venice City Beach, Burton Chace Fishing Platform, Marina del Rey Beach, Marina del Rey Fishing Dock, Playa Del Rey Beach, Dockweller State Beach, El Porto Beach, Manhattan County Beach, Hermosa City Beach, Redondo County Beach, Torrance County Beach, Malaga Cove, Bluff Cove, Lunada Bay, Ablaone Cove, Portuguese Bend, Royal Palms Beach/White Point Beach, Cabrillo Beach, Shoreline Village, Cherry Beach, Bayshore, and Seal Beach.

3.6. SAMPLING PERIOD

One-half of the data collection days occurred on weekdays (Monday through Friday) and one-half took place on weekends (Saturday and Sunday) to incorporate changes in angler activity. The volume of weekend anglers is higher relative to the rest of the week. Consequently, there were 64 collection days on the weekdays and 64 on the weekends, for a total of 128 collection days over the year.

To account for variations attributable to time of day, surveys at the selected sites were randomly chosen to be conducted during specific time periods. Surveys at Pier or Jetty, Private Boats, and Beach or Intertidal Zone sites were randomly conducted during one of three time periods: morning (8:00am to 12:00pm), afternoon (12:00pm to 4:00pm), or evening (4:00pm to 8:00pm). Surveyors remained at a single site for the entire shift.

Surveys at charter boat sites were conducted during either one of two time periods, early period (10:30am to 2:30pm) or late period (2:30pm to 4:30pm). These time periods were occasionally adjusted due to changes in boating schedules and seasonal changes.

3.6.1. SEASONALITY IN SAMPLING

Table 1 shows weekday and weekend collection days for the summer and non-summer periods to account for seasonality. Surveys conducted on weekdays and weekends during the four summer months (May through August) each represent a quadrant for a total of two quadrants. Weekday and weekend surveys conducted during the eight non-summer months (September through April) represented the remaining two quadrants. Each of the four quadrants was sampled equally for each of the four fishing modes. Hence, the eight surveys per mode resulted in 32 data collection days for the four modes in each quadrant, and a total of 128-collection days for the four quadrants.

Table 1. Seasonal survey collection days (per each of the four modes).

	Summer (May – Aug)	**Non-Summer** (Sept – Apr)
Weekdays	2/month (8 total surveys/mode)	1/month (8 total surveys/mode)
Weekends	2/month (8 total surveys/mode)	1/month (8 total surveys/mode)

3.7. SURVEY INSTRUMENTS

Surveyors used the following survey instruments to collect data from anglers. Please refer to the appropriate appendices to view copies and photos of all the instruments. All surveyors were provided with each of the following survey instruments:

- Survey site map (**Appendix A**)
- Survey questionnaires (**Appendix B**)
- Shift summary sheet (**Appendix C**)
- Refusal log (**Appendix C**)
- Beaufort Sea Scale (**Appendix D**)
- Census and site summary forms (**Appendix E**)
- A weather report to help record conditions on the Census (**Appendix E**)
- Map of the study region (**Appendix F**)
- Plastic model of whole fish with a representation of internal parts and fillet (**Appendix G**)
- Fish identification cards (**Appendix H**)
- Language identification card (**Appendix I**)
- Tape measure to determine the length of the various fish species found in participating anglers' buckets (**Appendix J**)
- Fisherman's gloves to handle the fish in the anglers' buckets in order to identify type of species and/or measure their lengths (**Appendix J**)
- FCEC Tip cards (**Appendix K**)

3.7.1. QUESTIONNAIRE

The questionnaire was designed to gather information needed to address the specific objectives presented in Section 2.2 of this report. Responses to the 20-questions in the questionnaire would provide a better understanding of the demographic composition of the anglers within the study region, angler consumption rates of locally caught fish, types of fish eaten, the portion size consumed, preferred cooking methods, and awareness and knowledge of health advisories. To facilitate administration and data entry, the questions followed a partially closed-end question format that consisted of discrete response categories and an "other" category for a write-in response, if necessary. The questionnaire was also translated into Spanish, Vietnamese, Tagalog, and Chinese.

The questionnaire was reviewed and approved by the Office of Management and Budget (OMB) to ensure that the surveys were conducted pursuant to the Standards and Guidelines of the OMB. Trained surveyors personally administered the questionnaire to anglers at selected survey sites. All surveys were conducted anonymously, and no personally identifying information was collected from respondents. Participation in the Study was completely voluntary, and anglers could refuse or withdraw from the survey at any time.

3.7.2. CENSUS

Prior to surveying anglers in each of the proposed locations, the field surveyors conducted a census of the survey sites. The census collected site-specific information, including temperature, weather, sea state, number of anglers, and approximate demographics of the anglers at the survey site. The survey site's unique code (coded for data analysis), fishing mode category, date, and start time were also recorded.

3.7.3. REFUSAL LOG

Refusal by anglers to participate in the survey was recorded in a refusal log. Information including the angler's gender, estimated age, language, ethnicity, as well as the location and time, were coded by the surveyor.

3.7.4. BEAUFORT SEA STATE SCALE

The Beaufort Sea State Scale is an empirical measure that relates wind speed to observed conditions at sea or on land. To ensure consistent data collection methods, surveyors referred to this scale when recording the sea state in the census.

3.7.5. REGIONAL MAP

Surveyors carried a regional map to indicate to anglers the study region, which spans from Santa Monica to Seal Beach piers.

3.7.6. FISH MODEL

Surveyors showed the angler a plastic cast model of a whole fish to assist the angler in estimating the portion size and in identifying the specific parts of the fish typically consumed each time. The size of a 150-gram fillet portion is demarcated on the side of the fish model.

3.7.7. FISH IDENTIFICATION CARDS

Fish identification cards were provided to aid surveyors in identifying the fish species observed in each angler's bucket. One 8.5"x11" card developed by the Montrose Settlements Restoration Program (MSRP) depicts 23 common subsistence and sport fish of Southern California, including all five DNC fish. Two additional detailed informational cards were also developed and used during survey administration. One of these cards depicted the five DNC fish and the other showed eight fish species commonly caught locally with detailed descriptions of their appearance.

3.7.8. LANGUAGE IDENTIFICATION CARD

The language identification card helped surveyors communicate with anglers who did not speak English or one of the non-English languages spoken by surveyors. In such a case, surveyors presented the language card to the angler so that the angler could identify their spoken language. Surveyors attempted to match anglers who did not speak English with a surveyor who spoke their language. If an angler refused due to the language barrier, this information was recorded on the survey refusal log, with *language* being the reason for the uncollected data.

3.7.9. TIP CARD

At their discretion, surveyors provided an educational tip card if the angler inquired about the program after completion of the survey. The tip card is an outreach material developed by FCEC to educate anglers about DNC fish species and other fish species that could be consumed in moderation. The tip card is the primary outreach tool distributed to anglers on an ongoing basis as a component of the FCEC angler outreach program.

3.7.10. SHIFT SUMMARY SHEET

Surveyors tracked information throughout the course of each shift. At the end of the shift, they consolidated their separate information onto a single shift summary sheet. The summary sheet included the total number of completions and refusals, along with relevant information such as refusal information and observations of the day.

3.8. FIELD SURVEY METHODS

3.8.1. BASIC SURVEY METHODOLOGY

Surveyors were trained to ensure that the surveying methodology is consistent. Surveyors were also trained to identify the most common fish species caught in the study region and were provided with materials to assist in the identification process. Surveys were always conducted by a team of two surveyors, along with a backup surveyor. Each survey shift was started by collecting information on the survey site, temperature, weather, sea state, number of anglers, and approximate demographics of the anglers at the study region.

Past experience with recreational anglers in the study region demonstrated a diverse population. Therefore, each survey team included at least one surveyor who is fluent in a language other than English, including Spanish, and either Vietnamese, Tagalog, Mandarin or Cantonese. This fluency facilitated surveyors in conducting interviews with a paper-and-pencil questionnaire in the native language of more than 99% of respondents. Surveyors with specific language skills were assigned to locations where most of the anglers spoke the corresponding language (i.e. Spanish speakers at Cabrillo Pier, Tagalog speakers at Redondo Pier, etc.).

3.8.2. SURVEY VARIATIONS BY FISHING MODE

The approach used to survey anglers differed according to each fishing mode:

- **Pier or Jetty**. Interviews were conducted as frequently as possible in the study region where anglers are actively fishing. If anglers encountered in the study region are not actively fishing (i.e., may be walking to or from their fishing site), surveyors initially confirmed that the angler had fished in the study region by showing a map before conducting an interview.
- **Private Boats**. Surveyors interviewed anglers as they were preparing to depart or were packing up their boats. Surveyors also targeted fueling stations and bait shops near marinas to reach anglers with private boats. This mode had the lowest refusal rate because the anglers in this mode tended to have more time while preparing their boats and, therefore, were more inclined to be surveyed than in some of the other fishing modes.
- **Charter Boats**. Surveys were not conducted on the charter boats. Instead, surveyors approached anglers before boarding or while they were waiting for the boats because they tended to have more time to spare and were in no hurry. Although most anglers were

often in a hurry to go home after their fishing trip, some anglers answered the survey questions while having their fish filleted or while walking to the parking lot.

- **Beach or Intertidal Zone**. Surveyors searched for anglers on the beach or in intertidal zones for two hours prior to surveying at pier/jetty locations. Anglers on the beach who were within sight from the pier or jetty (using binoculars) were approached and interviewed while they were fishing.

3.8.3. RANDOM SAMPLING IN HIGH VOLUME AREAS

Surveyors attempted to survey every angler during each day of data collection. When the volume of anglers was high, a random sampling procedure was used to target every k-th angler where "k" was a ratio of the total number of anglers surveyed to the total population. The "k" value was set by a pre-established randomization sheet that took into consideration the volume of anglers at the given location. This procedure aided in providing a representative sample when surveyors were unable to collect data from all anglers.

3.8.4. CONDUCTING INTERVIEWS IN NON-ENGLISH LANGUAGES

Southern California consists of a diverse population. As indicated in Section 3.8.1, surveyors with specific non-English language skills were assigned to locations where majority of the anglers spoke the same non-English language.

3.9. ADMINISTERING THE SURVEY

Surveyors approached and asked target anglers if they were willing to participate in a survey. Participation was entirely voluntary and respondents could quit at any time. The survey was conducted verbally within five to ten minutes, and responses were recorded in a paper-and-pencil form. Prior experience indicated that paper-pencil administration is the best mode of field data collection. The project team considered the use of tablets as data collection devices, but previous outreach experience showed that such devices could introduce problems in the field, especially in wet coastal locations. Using paper forms provided a hard copy of the collected information, eliminated technical difficulties in the field, avoided loss of data due to technical connectivity glitches, and reduced up-front administration time.

The questionnaire included the following categories of information:

- Basic site characteristics;
- The angler's fishing history at the location and other locations within the study region;
- Inventory of each angler's catch;

- Seafood consumption and preparation patterns;
- Behavioral patterns with seafood that had been caught;
- Health warning awareness; and
- Demographic information.

Surveyors assisted anglers in identifying different fish species by using pictures of fish common in the study region. Surveyors also used individual training and fish identification cards to assist in the identification process. When all these methods proved inadequate, surveyors enlisted Professor Franklin's assistance via a photo text message.

To ascertain what portions of fish are routinely consumed by anglers, surveyors utilized a fish model so that survey participants could indicate which parts of the fish were consumed. This approach was modeled after the 1994 Study (SCCWRP/MBC, 1994) but expanded to include an entire fish rather than merely a fillet (see **Appendix G** for a review of the model). By presenting a model of the entire fish, linguistic and cultural barriers were reduced by affording a universal standard in identifying what portions of the fish were consumed. This is an important methodological control because all populations and individual participants may have different perceptions of what constitutes a "fillet," or any other parts of the fish.

After each shift, survey teams completed a summary sheet that included the total number of completions and refusals for each shift, along with other relevant information such as angler demographics and reason for refusals.

3.10. STUDY LIMITATIONS

Key limitations of the Study include the following:

- Avidity bias – The probability that anglers who are more active (i.e., avid) are more likely to be interviewed in fishing locations. Prior research had shown that estimates of consumption can be affected by angling avidity (EHIB 2000). However, the results of this Study were not adjusted for avidity in order to be consistent with the prior seafood consumption study (SCCWRP/MBC, 1994) that did not adjust for avidity.
- Outreach saturation - The Fish Contamination Education Collaborative (FCEC) monitors the effectiveness of surveys, messages, and angler education (i.e., at events and through community based organizations). Prior experience with FCEC efforts may have influenced anglers' responses to questions pertaining to the health advisory and fish consumption. Inundating the anglers with information could result in survey fatigue that could potentially affect the number of anglers who decline the surveys or provide detailed responses.
- Linguistic barriers - While the surveyor team was able to communicate in Spanish, Mandarin, Cantonese, Vietnamese, and Tagalog, the survey team did not have anyone who could

communicate in the Korean language. The absence of surveyors who could speak the Korean language limited the ability to survey a large Korean angler population who did not speak English.

- Smaller sample size than the 1994 Study (SCCWRP/MBC, 1994) – The reduced sample size is attributed to the observed 64% decline in overall angler population. Although the sample size remains statistically significant, a smaller sample size increases the margin of error associated with the conclusions drawn from the data, particularly, the data localized to a particular stratum or mode.
- Rate of Decliners – Table 2 shows that nearly 23% of anglers who were approached (205/898) declined the surveys. The two fishing modes with the highest rate of decliners are pier or jetty and charter boats. Language barrier was the primary reason for the rate of decliners at piers. Anglers with language barriers or who declined due to lack of time may be underreported in these findings.

Table 2. Angler rationale for declining to be interviewed by fishing mode.

Mode	Percent Declined	Declined	Approached	Reason for decline
Pier or Jetty	24.7%	111	449	Language difficult or lack of time.
Charter Boat	26.5%	68	257	Lack of time
Private boat	13.7%	22	161	Lack of time
Beach or Intertidal Zone	12.9%	4	31	Language difficulties
Total	22.8%	205	898	n/a

SECTION 4

DATA MANAGEMENT, QUALITY ASSURANCE & CONTROL, AND DATA ANALYSIS

SECTION 4 – DATA MANAGEMENT, QUALITY ASSURANCE & CONTROL, AND DATA ANALYSIS

4.1. DATA MANAGEMENT

Data collected through surveys were managed to ensure quality and accuracy throughout the process. At the end of each shift, surveyors returned the hardcopy paper questionnaires and log sheets for physical storage. All questionnaires were preprinted with unique sequential identification numbers for data management purposes, and stored in unique shift folders. Surveyors entered the data into a Microsoft Access database. The coded-in variables are in **Appendix L**. Within 72 hours, new entries were checked against the original questionnaire for data entry errors by a surveyor other than the surveyor who gathered and originally entered the data.

Entries were reviewed and manually corrected if specific information was missing, entered incorrectly, or entered in a manner inconsistent with protocols. If missing information cannot be manually corrected, a "Missing Case" was created. "Missing Case" is also applied when there is no response to a specific question. In some instances, "don't know" or "not applicable" are considered missing cases when they are not directly related to the analysis being conducted, and are not included in the presented percentages.

Each survey form was uniquely numbered for identification and retrieval purposes. Text entries were manually coded into predefined categories. The Access database files were then converted to a data file compatible with SPSS (Statistical Package for the Social Sciences) version 19 in order to conduct data editing and analyses. All paper questionnaires were scanned into a digital format for backup.

4.2. STATISTICAL POWER AND MARGIN OF ERROR

The final working sample size of 693 completed interviews allows for statistical estimates of the full population at ±4% margin of error (using a 95% confidence interval). This established margin of error indicates that there is a 95% confidence that the values derived from the surveys could be higher or lower than four percent of the actual value if the entire population of anglers had been interviewed and had responded to the interviews. Table 3 shows that the margins of error among the different fishing modes ranged from ±5% for the Pier or Jetty mode and ±18% for the Beach or Intertidal Zone. The sample provides sufficient statistical power for detecting small-to-medium sized effects using traditional inferential statistics, such as regression, chi-square, or mean-comparisons.

Table 3. Margin of error for each fishing mode.

Mode	Sample Size	Margin of Error (95% CI)
Pier or Jetty	338	±5%
Charter Boat	189	±7%
Private boat	139	±8%
Beach/Intertidal Zone	27	±18%
Total	693	±4%

4.3. QUALITY ASSURANCE AND QUALITY CONTROL

A range of quality assurance (QA) and quality control (QC) measures were incorporated into the survey design. The first measure was to ensure that all survey materials and protocols were reviewed by the Technical Advisory Committee. Surveyors were selected based on experience in research and outreach, and on targeted linguistic skills. Training was provided in all aspects of survey administration, including best practices, fish identification, and data management. In addition, all survey staff were given the same equipment set to facilitate survey collection. A complete list and discussion of this equipment is available in **Appendix J**.

The summarized data from the surveys (see Section 3.9) were compared to the census information to assure consistency. Non-identifying personal information was collected from each respondent in the form of initials and birth year to create a near-unique code to minimize the chance that an angler was randomly sampled more than once. Additional ideas on how to improve response rates or the process were discussed during a 15-minute debrief session with a shift supervisor.

Hard copy data were scanned and archived. Random entries in the data that were uploaded to Microsoft Access were identified for verification to ensure quality control. Quality control was always conducted by someone other than the data collector to mitigate bias. All data reviews occurred within 72 hours of collection and individual surveyors were monitored for error rates. Problems with both surveyors and survey questions were identified. After completion of the survey collection period, all of the data were reviewed to correct data entry errors or inconsistencies, if any, before conversion into SPSS (Statistical Package for Social Sciences) version 19 for subsequent analysis.

The entire survey administration team met every quarter at an all-hands meeting to discuss lessons learned in the field, data entry, morale, and any issues encountered in the preceding quarter. The meeting included reviews of key metrics, successes and challenges, and setting the survey schedule for the upcoming quarter. Tactics were adjusted when necessary.

4.4. CALCULATION OF FISH CONSUMPTION RATE

A primary goal of the Study is to calculate the rate of seafood consumption for anglers fishing at the study region. Consequently, two different measures of seafood consumption were estimated for each angler. The first was an overall consumption estimate, based on reported frequency of eating fish from the study region over the past four weeks (Question Q3), coupled with the amount of fish eaten in a typical meal (question Q6). The four-week period was consistent with the time period used in the 1994 report, and it was easier for anglers to recall their fish consumption within this time period. Based on a 150-gram fillet representation, each angler estimated what portion of the 150-gram fillet was consumed each time. The portion consumed was multiplied by 150 and by the frequency of consumption during the four-week period to calculate the total grams consumed over four weeks. The calculated total grams consumed over four weeks was divided by 28 (number of days in the past four weeks) to calculated the consumption rate of grams/individual/day.

The second measure of consumption was based on each angler's reported frequency and consumption of specific species. Anglers who had fish in their buckets were asked about the frequency and quantity eaten for each fish type identified in their bucket (question Q12 and Q15). All anglers were asked about consumption for the five DNC fish (questions Q17 and Q20). However, if anglers had any of the five DNC fish in their bucket, they were not asked again about frequency and quantity eaten for that particular species.

The angler was shown a photograph of each of the five DNC fish (questions Q16 – Q20), and asked how many times they had eaten any one type of fish in the past four weeks. The angler was shown a fillet portion size that was approximately 10 centimeters (cm) x 7cm x 2cm thick, which represents the standard size of 150 grams for a typical fish meal. The estimated amount of a 150-gram portion that was consumed each meal was multiplied by 150, and the product was multipled by the angler's frequency of consumption during the four weeks prior to the interview. The total number of grams consumed was divided by 28 (four weeks) to produce an estimated grams consumed per day for each type of DNC fish. This measure of consumption includes responses from anglers who caught (question Q9) or stated they had caught one of the five DNC fish (question Q16).

Descriptive statistics for consumption rates are presented in the Results Section.

4.5. INTERPRETING FISH CONSUMPTION VOLUME DATA

The Upper Confidence Limit and the Upper Decile are two measures of data used to describe fish consumption volume. Both statistical measurements help provide a perspective on measurements of mean and median.

The Upper Confidence Limit (UCL) is a measurement of confidence with regards to the reported mean. In this Study a 95% confidence level is used. The 95% UCL provides reasonable confidence that the mean is not underestimated. The 95% UCL for a mean is defined as a value that, when repeatedly calculated for randomly drawn subsets of "n" samples, equals or exceeds the true population mean 95% of the time.

When the data are separated into 10 equal parts, each part is called a decile. This Study applies the 90% Upper Decile (UD), for determining the reasonable maximum exposure consumption rates for higher end and higher risk anglers and consumers.

4.6. STATISTICAL METHODS

Analyses were conducted to describe fishing populations, and to measure consumption frequency and habits of anglers in the study region. Descriptive statistics provided information about the fishing mode, characteristics of the fishing population, fish species, fish consumption, and awareness of consumption warnings for fish in the study region. Categorical variables were analyzed using chi-square tests. Continuous variables that predict consumption were analyzed with correlations and with regression analyses. The statistical analyses reported throughout this report were conducted using SPSS version 19.

SECTION 5

RESULTS

SECTION 5 – RESULTS

This section presents information that addresses the goals and objectives of this Study (see Section 2). Tabulated data, figures, and graphs shown in this section illustrate the results and key trends. A more detailed data presentation is included in **Appendix M.**

This section begins by describing the fishing mode, language of interview, and time of year the surveys were conducted. The section will then describe the demographic characteristics of the respondents, exposure, seafood consumption, and health advisory awareness findings.

5.1. SUMMARY OF SURVEY RESULTS

5.1.1. ANGLER CHARACTERISTICS

Table 4 shows that the anglers are predominantly male (94.2%), with the Hispanic/Latino/Spanish ethnic group most represented at 36.9%. Of Asian anglers that represent 23.8% of all anglers surveyed, Filipinos comprised 40.9 % of that ethnic group. Table 4 also shows that 92.9% of the anglers spoke English.

Table 4. Population level angler characteristics (N=693).		
Gender	**Count**	**Percentage**
Male	653	94.2%
Female	40	5.8%
Total	693	100.0%
Anglers of Hispanic, Latino, or Spanish Origin (Q25)	**Count**	**Percentage**
No	406	60.4%
Yes	266	39.6%
Total	672	100.0%
Ethnicity (Q26)	**Count**	**Percentage**
Hispanic, Latino, Spanish	256	36.9%
White	167	24.1%
Asian	165	23.8%
Black	43	6.2%
Other (including Mixed)	62	8.9%
Total	693	100.0%
Asian Ethnicity Specified	**Count**	**Percentage**
Filipino	63	40.9%
Japanese	24	15.6%
Korean	19	12.3%
Chinese	16	10.4%
Vietnamese	14	9.1%
Other	18	11.7%
Total (excluding 11 Asian anglers who declined)	154	100.0%
Language of Survey	**Count**	**Percentage**
English	644	92.9%
Spanish	48	6.9%
Vietnamese	1	0.1%
Total	693	100.0%
	Mean	**Median**
Age (Q24)	44 years	43 years

5.2. VARIATIONS BY FISHING MODE AND SEASON

The study design distributed survey dates across days of the week, seasons, and fishing modes to ensure a statistically significant representative sample in all strata. Table 5 shows the distribution of different fishing modes during the summer and non-summer months. Over the 12-month interview period, approximately 53% (N=366) of the surveys were collected during the four summer months of June through September. The remaining 47% (N=327) were distributed throughout the eight winter months of October through May.

Table 5. Interview mode across summer and non summer months (N=693).

	Summer		Non-Summer		Total
Mode	**# interviews**	**% by season**	**# interviews**	**% by season**	**Count**
Pier or Jetty	146	39.9%	192	58.7%	338
Private boat	80	21.9%	59	18.0%	139
Charter boat	118	32.2%	71	21.7%	189
Beach/Intertidal zone	22	6.0%	5	1.5%	27
Total by count	366	100.0%	327	100.0%	693
Total by season	366	52.8%	327	47.2%	100.0%

Major findings of the survey are the following:

- Anglers in charter boats are more prevalent in the summer months (32.2%) compared to the winter months (21.7%).
- All fishing modes, except piers/jetties, experienced a decline in number of anglers per month during the winter months compared to summer months. Based on monthly usage of each mode, anglers on piers/jetties had approximately 37 anglers a month during the summer, and 24 anglers a month during the winter months. There were approximately 30 anglers a month on charter boats during the summer months and approximately 9 anglers a month during the winter months. Anglers in private boats and in beach/intertidal zones also declined in the winter months compared to the summer months. Overall, the data indicate that piers/jetties have a more consistent usage pattern throughout the year.

5.3. SURVEY DECLINERS

Table 6 shows the number of anglers in each fishing mode that declined the survey and the reason for declining. Overall, twenty-three percent of anglers declined to be interviewed (205 decliners out of 898 anglers approached). Survey records indicated that ninety-four percent of those who declined the surveys were male.

Among the 205 individuals who declined to be interviewed, lack of time and language difficulties were cited as the main reasons for declining. The number of decliners (26.5%) among charter boat anglers was slightly higher than the number of decliners (24.7%) in piers/jetties due to lack of time. Anglers on pier/jetty locations most often cited lack of time and language difficulties as reasons for not participating. Anglers in charter boats and private boat areas indicated lack of time as the reason for declining the surveys. Language difficulties were cited as the main reason for survey refusals at beach/intertidal zones.

Table 6. Angler rationale for declining to be interviewed by fishing mode.

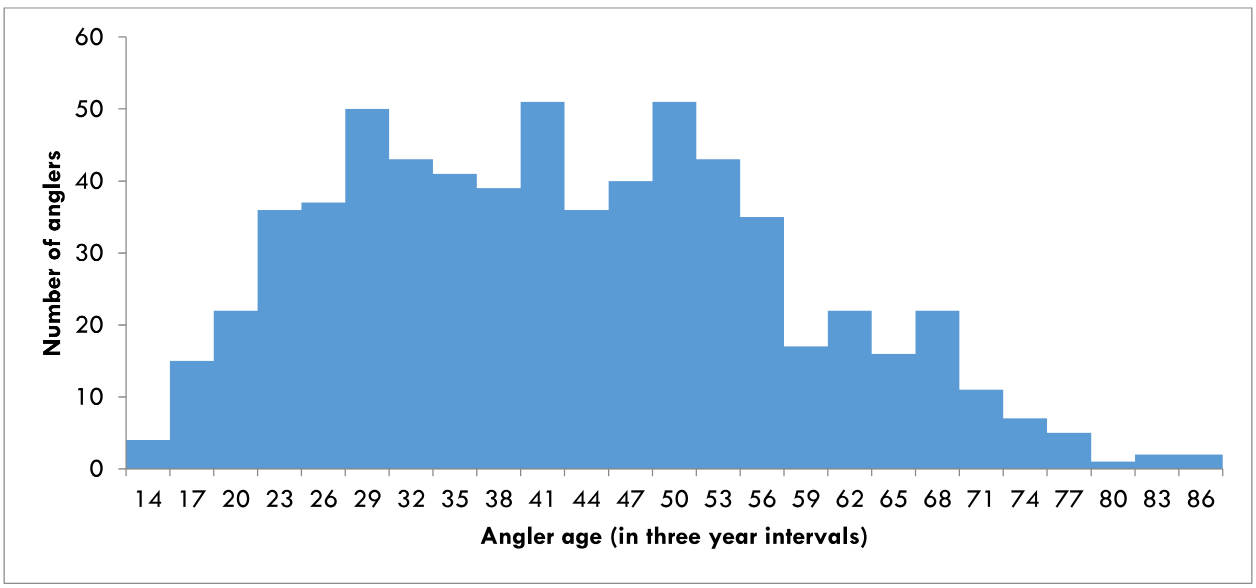
Mode	Percent Declined	Declined	Approached	Reason for decline
Pier or Jetty	24.7%	111	449	Language difficult or lack of time.
Charter Boat	26.5%	68	257	Lack of time
Private boat	13.7%	22	161	Lack of time
Beach or Intertidal Zone	12.9%	4	31	Language difficulties
Total	22.8%	205	898	n/a

5.4. ANGLER CHARACTERISTICS

5.4.1. ANGLER AGE

Figure 2 shows that anglers ranged in age from 14 to 87 years of age with a median of 44 years of age.

Figure 2. Histogram of angler age (in three year intervals) (N=693).



5.4.2. ANGLER ETHNICITY DEMOGRAPHICS

The United States Census Office recently attempted to standardize the classification of race and ethnicity. Under the new categorization system, participants are initially asked whether they are of Hispanic or Latino origin, and then asked about race. Table 7 shows that anglers were categorized into Hispanic/Latino/Spanish, White (non-Hispanic), Black, Asian, and other (including respondents of mixed ethnic background).

Table 7 also shows that, based on the new categorization system, Hispanic, Latino, or Spanish were represented more than any other race (36.9%). One-fourth of the anglers (N=167, 24.1% and N=165, 23.8% respectively) identified themselves as White or Asian.

Table 7. Angler ethnicity (N=693)(Q26).

Ethnicity	Count	Percentage
Hispanic, Latino, or Spanish	256	36.9%
White (non-Hispanic)	167	24.1%
Asian	165	23.8%
Black	43	6.2%
Other (including individuals of Mixed ethnic background)	62	8.9%
Totals	693	100.0%

NOTE. TWENTY-ONE RESPONDENTS DECLINED TO ANSWER AND WERE INCLUDED IN *OTHER* IF ETHNICITY WAS NOT READILY APPARENT.

Table 8 shows the specific ethnic breakdown of respondents who identified themselves as Asian. The follow-up question asked the Asian respondents to narrowly identify their ethnicity, i.e., Cambodian, Chinese, Filipino, Japanese, Korean, Pacific Islander, and Vietnamese. Among those who identified themselves as Asian, 41% (N=63) specified their ethnicity as Filipino. Among the nine anglers who identified their race as Pacific Islander, four were Samoan, one was Native Hawaiian, one as other, and three refused to answer the question.

Table 8. Ethnic breakdown for anglers identified as Asian (N=154)(Q26).

Ethnicity	Count	Percentage
Filipino	63	40.9%
Japanese	24	15.6%
Korean	19	12.3%
Chinese	16	10.5%
Vietnamese	14	9.1%
Other	18	11.7%
Totals	154	100.0%

NOTE. This table excludes 11 Asian anglers who declined to respond.

5.4.3. SURVEY LINGUISTIC DEMOGRAPHICS

Table 9 shows that 93% (644 out of 693) of the interviews were conducted in English. Approximately 7% of the interviews were conducted in Spanish (N=48) and a single interview was conducted in Vietnamese (N=1).

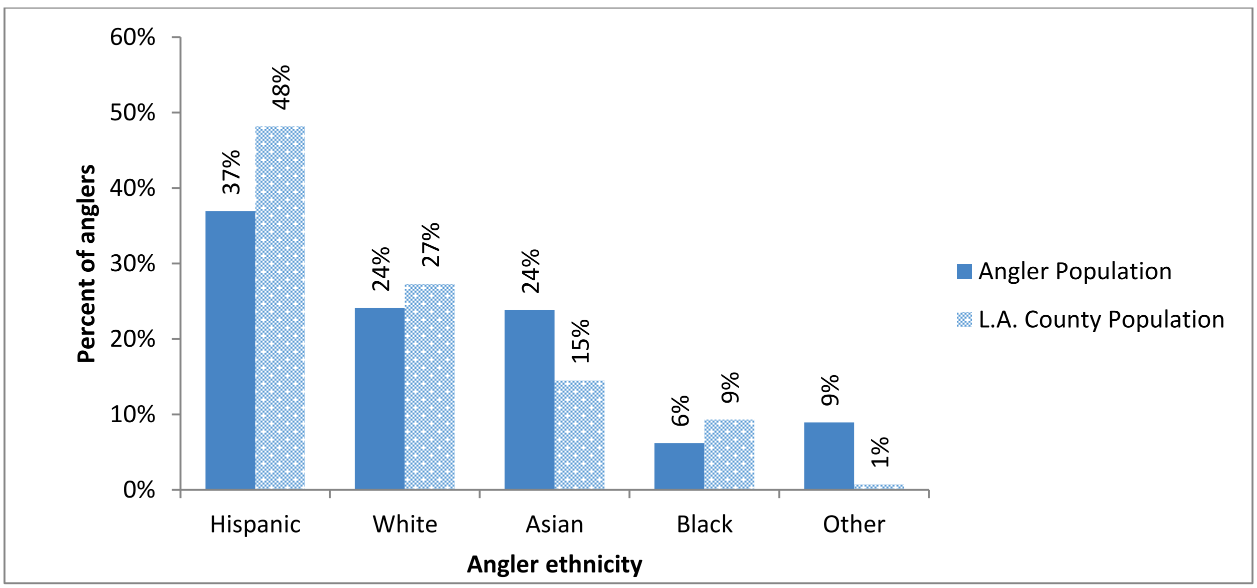
Table 9. Language used during interview (N=693).		
Language	**Interviews**	**Percentage**
English	644	93.0%
Spanish	48	6.9%
Vietnamese	1	0.1%
Totals	693	100.0%

NOTE. 11respondents declined to answer.

5.4.4. ANGLER ETHNICITIES VS. LA COUNTY POPULATION ETHNICITIES

Figure 3 compares the ethnic distribution of anglers and their corresponding distribution in the general population of Los Angeles County (based on the 2010 US Census for Los Angeles County, updated in 2012). Hispanic, White, and Black angler populations are lower than their corresponding population in Los Angeles County. The difference between the percent Hispanics in the angler population and the percent Hispanics in the Los Angeles County population is higher than among the White and Black ethnic groups. Asians, on the other hand, comprise a higher percentage among anglers compared to their percentage among the Los Angeles County population. These results suggest that fishing is a more prevalent activity among Asians than among other ethnic groups.

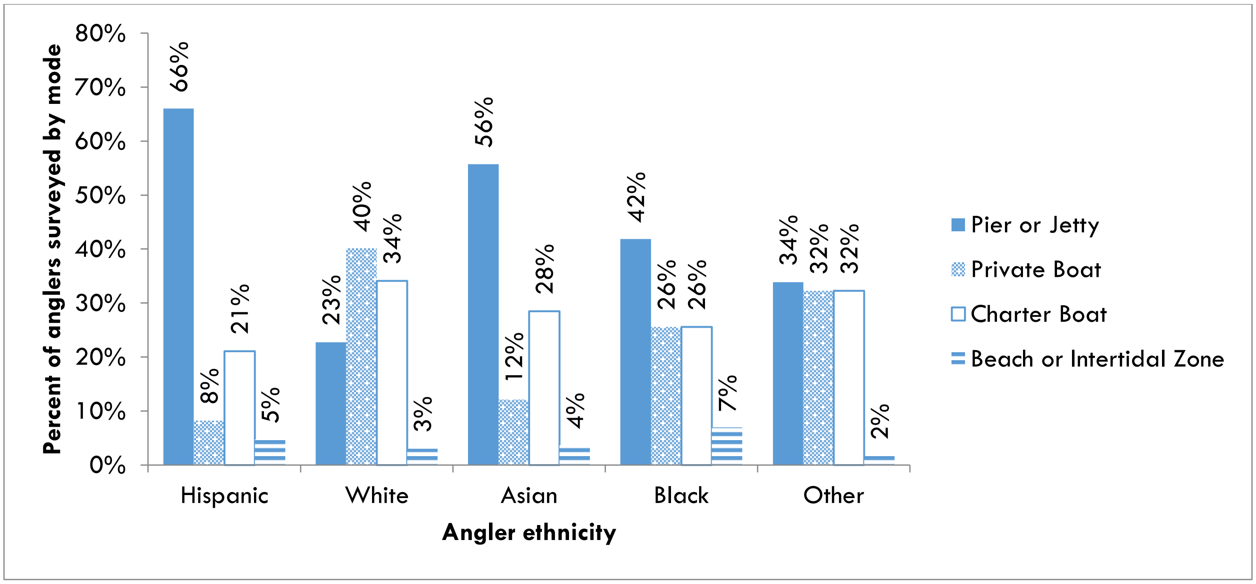
Figure 3. Comparison of angler race in angler population vs. L.A. county population (N=693).



5.4.5. ANGLER ETHNICITY BY FISHING MODE

Figure 4 shows the ethnic distribution of anglers in the different fishing modes. The data demonstrate that Hispanic, Asian, and Black anglers are the most frequent anglers at the Piers or Jetties. Approximately 66% of all anglers at piers or jetties are Hispanic, 56% are Asian, 42% are Black, and 34% are a different or mixed ethnic group. White anglers largely fish from private and charter boats. Among the different modes, charter boats have the least variance, ranging from a low of 21% to a high of 34%.

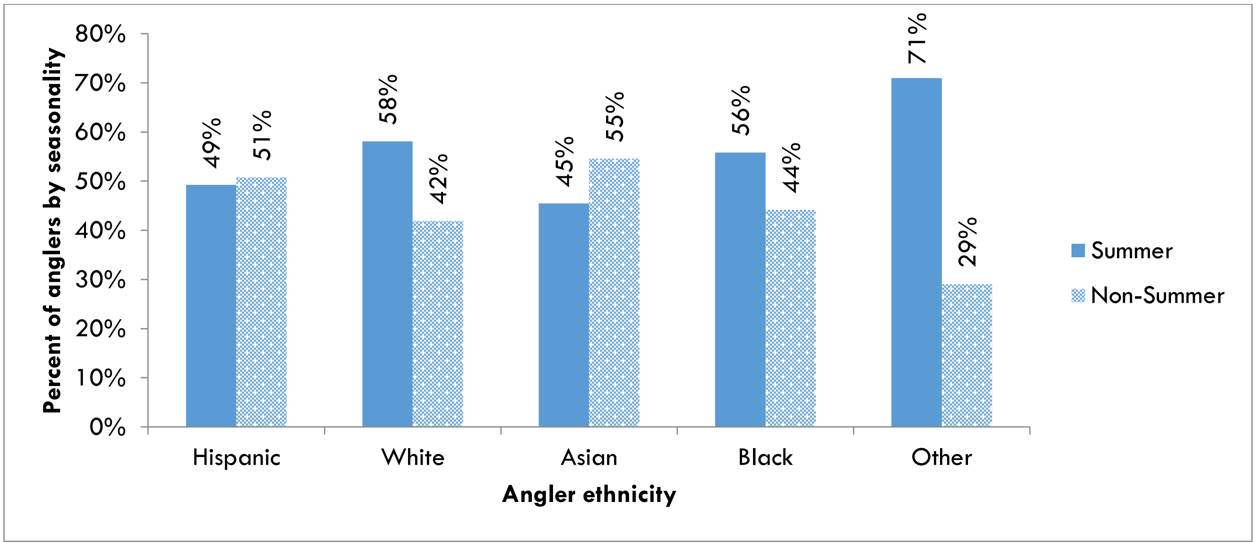
Figure 4. Angler ethnicity distribution (during survey administration) by fishing mode (N=693).



5.4.6. ANGLER ETHNICITY BY SEASON

Figure 5 shows that the proportion of White anglers and Black anglers surveyed in the summer months was higher than in non-summer months, i.e., 58% versus 42% and 56% versus 44%, respectively. There was little difference in the proportion of Hispanic anglers interviewed during the summer and non-summer months, i.e., 49% versus 51%, respectively. The proportion of Asian anglers surveyed in the summer months (45%) was lower than non-summer months (55%). The surveys among other ethnic groups, including those of mixed ethnic background, were significantly reduced in the non-summer months (29%) compared to the summer months (71%).

Figure 5. Angler ethnicity by summer and non-summer months (N=693).

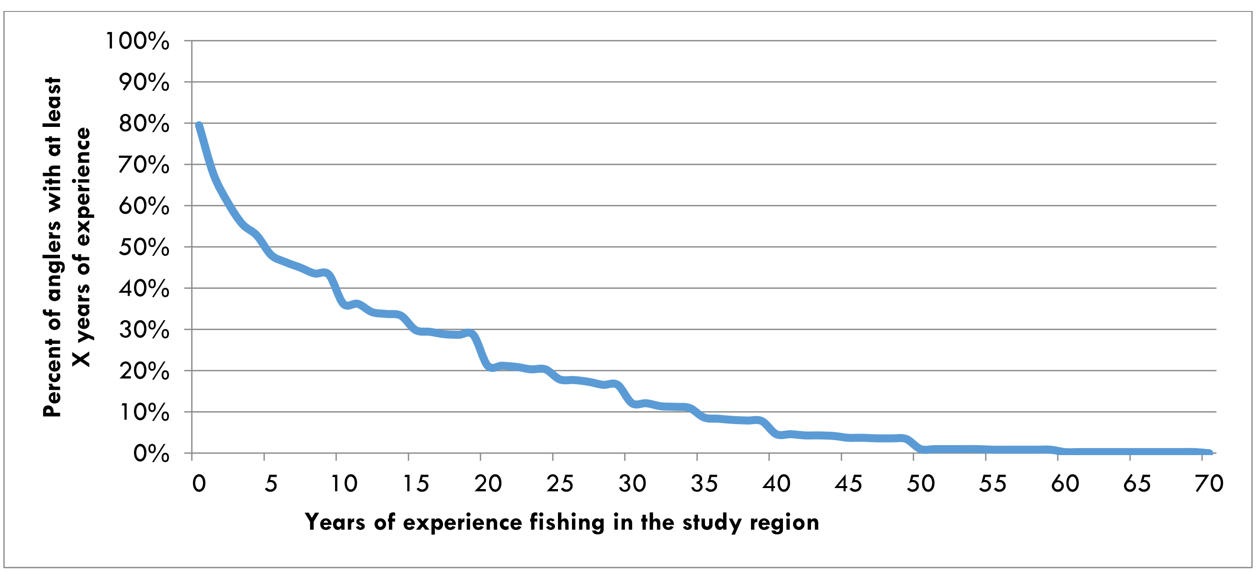


5.5. FISHING BEHAVIORS AND CHARACTERISTICS

5.5.1. NUMBER OF YEARS FISHING

Figure 6 shows the level of fishing experience among anglers. The answers ranged from less than a year to 70 years. The mean number of years was 12, and the median was 5. The Study indicates that a high percentage of the anglers surveyed were relatively new to fishing.

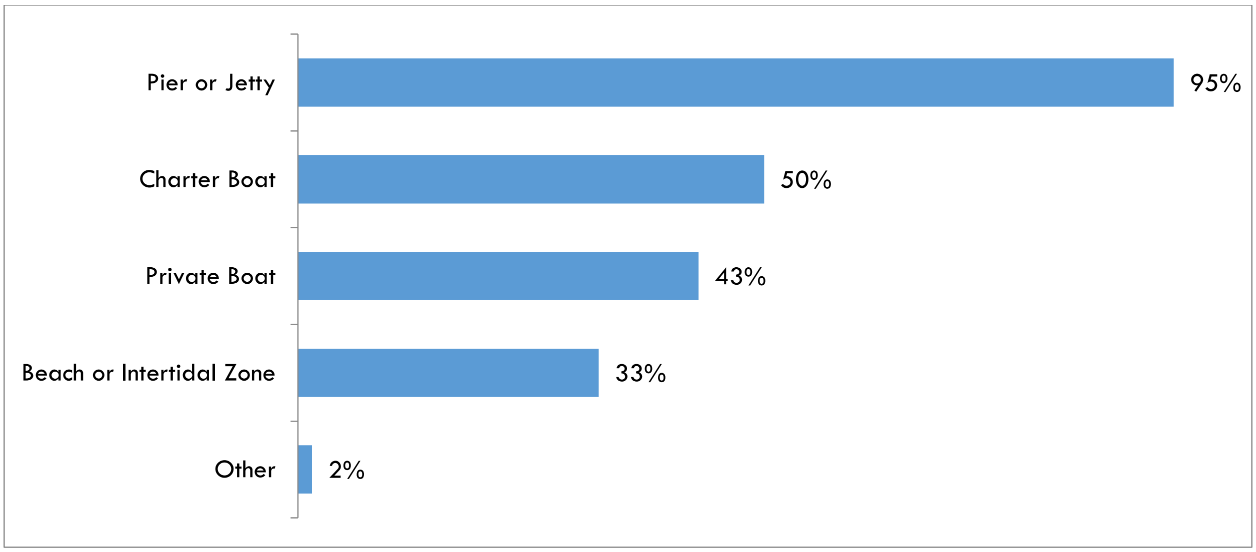
Figure 6. Percent of anglers with at least a given year's experience fishing in the Study Area (N=693).



5.5.2. MODE OF FISHING OVER THE PAST YEAR

Figure 7 shows the number of anglers in each fishing mode over the past year within the study region. Anglers were encouraged to select all that apply. Nearly all anglers, (95%) had fished at either piers or jetties within the last year. Beach/intertidal zone survey sites were the least common at 33%. *Other* responses, reported by 2% of anglers, included "fishing from a kayak" and "scuba fishing".

Figure 7. Percent of anglers who fish at various fishing modes over the course of the year (N=693).



NOTE. RESPONDENTS WERE ASKED TO CHOOSE ALL THAT APPLY. PERCENTAGE MAY SUM TO GREATER THAN 100%.

Anglers were also asked to report where in the study region they had fished in the past year (including the current trip). The *mode of interview* was removed from the *mode in the past year* responses (Q2) to display other angler modes. Anglers were encouraged to select all that apply, therefore, percentages may sum to greater than 100%.

Table 10 shows the fishing mode at the time of the interview and the percent of time that the angler had used other fishing modes within the past year. Anglers surveyed reported fishing across several modes during the past survey year. As an example, among the anglers interviewed at a pier or jetty, 25.4% reported having also fished from a private boat in the last year, 25.7% from a charter boat, and 27.8% from a beach or intertidal zone. Table 10 also shows that more of the anglers at beach/intertidal sites also reported fishing from piers or jetties compared to anglers at private or charter boats ($p < 0.05$).

Table 10. Mode of fishing in the past year by mode at time of interview (N=693)(Q2).					
		Mode at time of interview			
		Pier or Jetty	Private Boat	Charter Boat	Beach or Intertidal zone
Mode in past year (Q2)		N=338	N=139	N=189	N=27
Pier/Jetty	Interview Count	–	55	71	17
	% within Mode	–	39.6%	37.6%	63.0%
Private Boat	Interview Count	86	–	60	11
	% within Mode	25.4%	–	31.7%	40.7%
Charter Boat	Interview Count	87	71	–	8
	% within Mode	25.7%	51.1%	–	29.6%
Beach or Intertidal Zone	Interview Count	94	55	45	–
	% within Mode	27.8%	39.6%	23.8%	–

NOTE. Respondents could choose more than one mode in the past year. Results may sum to more than 100%.

5.5.3. ANGLER CATCH OVERVIEW

All anglers were interviewed about the species of fish they catch. Thirty-four percent of anglers (N=235) reported catching fish on the day they were surveyed. 57% (N=125) allowed surveyors to identify their catch. Approximately 25% (N=56) of the 235 anglers who reported catching fish stated that they could not have their fish identified because they had already thrown back their catch. There was no follow-up with anglers about the species and quantity of fish that were no longer in their bucket (i.e., already thrown back, filleted, or given away).

Table 11 shows the types of fish in anglers' buckets for the four fishing modes. A total of 1,118 fish were observed across 125 angler buckets. The mean number of fish for all anglers was 1.61 (SD = 8.84) and the mean number of fish for anglers with fish in their buckets was 9.01 (SD=19.309). Table 11 records the 35 different species of fish or invertebrates that were observed in angler buckets. Chub mackerel, Pacific sardines, and perch were the most common species observed. Table 13 shows the types of fish identified in buckets of anglers for each fishing mode. Anglers on piers or jetties (n=75) were identified with the most fish in their buckets, followed by anglers in charter boats (n=24), in private boats (n=12), and beach or intertidal zones (n=2).

Table 11. Percentage of anglers with specific types of fish by fishing mode (N=125).							
Common Name	**Scientific Name**		**Pier or Jetty**	**Private Boat**	**Charter Boat**	**Beach or Intertidal**	**Total**
			(N=75)	(N=12)	(N=24)	(N=2)	113
white croaker DNC	*Genyonemus lineatus*	Angler Count:	6	1	0	1	8
		% within Mode:	8.0%	8.3%	0.0%	50.0%	
barred sand bass DNC	*Paralabrax nebulifer*	Angler Count:	4	3	1	0	8
		% within Mode:	5.3%	25.0%	4.2%	0.0%	

black croaker DNC	*Cheilotrema saturnum*	Angler Count:	0	0	0	0	0
		% within Mode:	0%	0%	0%	0%	
topsmelt DNC	*Atherinops affinis*	Angler Count:	9	2	1	0	12
		% within Mode:	12.0%	16.7%	4.2%	0.0%	
Pacific barracuda DNC	*Sphryraena argentea*	Angler Count:	0	0	3	0	3
		% within Mode:	0.0%	0.0%	12.5%	0.0%	
barred surfperch	*Amphistichus argenteus*	Angler Count:	0	0	1	0	1
		% within Mode:	0.0%	0.0%	4.2%	0.0%	
sargo	*Anisotremus davidsonii*	Angler Count:	2	0	0	0	2
		% within Mode:	2.7%	0.0%	0.0%	0.0%	
jacksmelt	*Atherinopsis californiensis*	Angler Count:	5	0	0	0	5
		% within Mode:	6.7%	0.0%	0.0%	0.0%	
shark	*Chondrichthyes, unid.*	Angler Count:	0	0	1	0	1
		% within Mode:	0.0%	0.0%	4.2%	0.0%	
blacksmith	*Chromis punctipinnis*	Angler Count:	0	1	0	0	1
		% within Mode:	0.0%	8.3%	0.0%	0.0%	
sanddab	*Citharichthys spp.*	Angler Count:	0	3	0	0	3
		% within Mode:	0.0%	25.0%	0.0%	0.0%	
black perch	*Embiotoca jacksoni*	Angler Count:	0	0	2	0	2
		% within Mode:	0.0%	0.0%	8.3%	0.0%	
surfperch, unspecified	*Embiotocidae*	Angler Count:	0	1	0	0	1
		% within Mode:	0.0%	8.3%	0.0%	0.0%	
opaleye perch	*Girella nigricans*	Angler Count:	1	0	1	0	2
		% within Mode:	1.3%	0.0%	4.2%	0.0%	
zebra perch	*Hermosilla azurea*	Angler Count:	1	0	0	0	1
		% within Mode:	1.3%	0.0%	0.0%	0.0%	
walleye surfperch	*Hyperprosopon argenteum*	Angler Count:	1	0	0	0	1
		% within Mode:	1.3%	0.0%	0.0%	0.0%	
California corbina	*Menticirrhus undulatus*	Angler Count:	1	0	0	0	1
		% within Mode:	1.3%	0.0%	0.0%	0.0%	
lingcod	*Ophiodon elongatus*	Angler Count:	0	1	0	0	1
		% within Mode:	0.0%	8.3%	0.0%	0.0%	
senorita	*Oxyjulis californica*	Angler Count:	0	1	0	0	1
		% within Mode:	0.0%	8.3%	0.0%	0.0%	
kelp bass	*Paralabrax clathratus*	Angler Count:	0	2	1	0	3
		% within Mode:	0.0%	16.7%	4.2%	0.0%	
California halibut	*Paralichthys californicus*	Angler Count:	2	0	2	0	4
		% within Mode:	2.7%	0.0%	8.3%	0.0%	
ray, unspecified	*Rajiformes, unid.*	Angler Count:	1	0	0	0	1
		% within Mode:	1.3%	0.0%	0.0%	0.0%	
shovelnose guitarfish	*Rhinobatos productus*	Angler Count:	1	0	0	0	1
		% within Mode:	1.3%	0.0%	0.0%	0.0%	
spotfin croaker	*Roncador stearnsii*	Angler Count:	2	0	0	0	2
		% within Mode:	2.7%	0.0%	0.0%	0.0%	

Pacific sardine	*Sardinops sagax*	Angler Count:	26	0	0	0	26
		% within Mode:	34.7%	0.0%	0.0%	0.0%	
California scorpionfish	*Scorpaena guttata*	Angler Count:	1	2	8	0	11
		% within Mode:	1.3%	16.7%	33.3%	0.0%	
chilipepper rockfish	*Sebastes goodei*	Angler Count:	0	0	1	0	1
		% within Mode:	0.0%	0.0%	4.2%	0.0%	
vermilion rockfish	*Sebastes miniatus*	Angler Count:	0	1	1	0	2
		% within Mode:	0.0%	8.3%	4.2%	0.0%	
California sheephead	*Semicossyphus pulcher*	Angler Count:	0	0	2	0	2
		% within Mode:	0.0%	0.0%	8.3%	0.0%	
queenfish	*Seriphus politus*	Angler Count:	2	0	0	0	2
		% within Mode:	2.7%	0.0%	0.0%	0.0%	
California lizardfish	*Synodus lucioceps*	Angler Count:	5	1	0	0	6
		% within Mode:	6.7%	8.3%	0.0%	0.0%	
yellow croaker	*Umbrina roncador*	Angler Count:	2	0	0	0	2
		% within Mode:	2.7%	0.0%	0.0%	0.0%	
bass, unspecified		Angler Count:	2	0	6	0	8
		% within Mode:	2.7%	0.0%	25.0%	0.0%	
chub mackerel		Angler Count:	26	1	0	0	27
		% within Mode:	34.7%	8.3%	0.0%	0.0%	
perch, unspecified		Angler Count:	15	0	1	1	17
		% within Mode:	20.0%	0.0%	4.2%	50.0%	
rockfish, unspecified		Angler Count:	1	2	6	0	9
		% within Mode:	1.3%	16.7%	25.0%	0.0%	

NOTE. There are 12 missing cases.

Figure 8 is a graphical presentation of fish caught by anglers fishing at piers or jetties. Club mackerel (35%), Pacific sardine (35%), and perch (20%) were the three fish species most commonly caught, and topsmelt (12%), white croaker (8%), and barred sand bass (5%) were the DNC fish identified in angler's buckets.

Figure 8. Angler catch at pier or jetty.

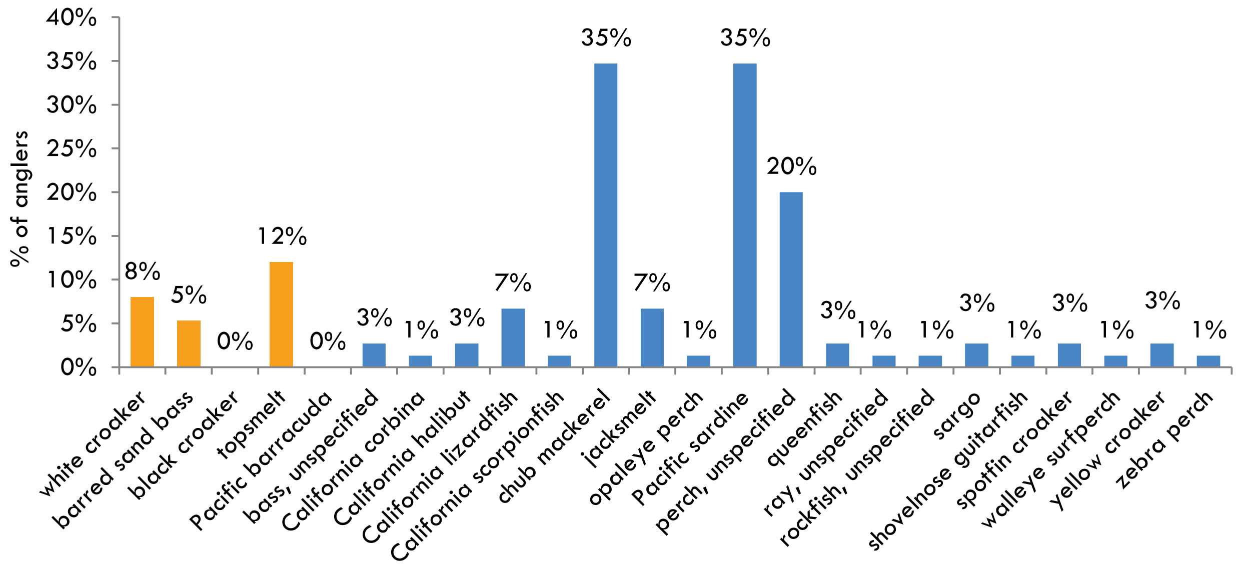


Figure 9 is a graphical presentation of fish caught by anglers fishing on private boats. Barred sand bass^{DNC} (25%) and sanddab (25%) were the most commonly caught. Topsmelt^{DNC}, California scorpionfish, kelp bass, and rockfish were all caught at a rate of 17%.

Figure 9. Angler catch by private boat.

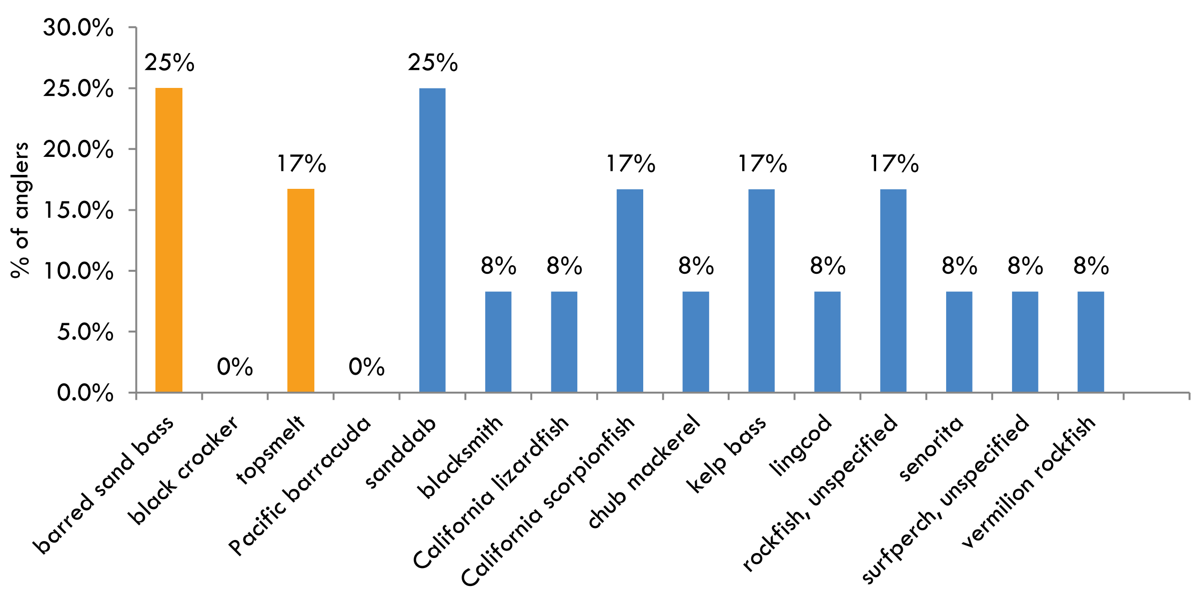
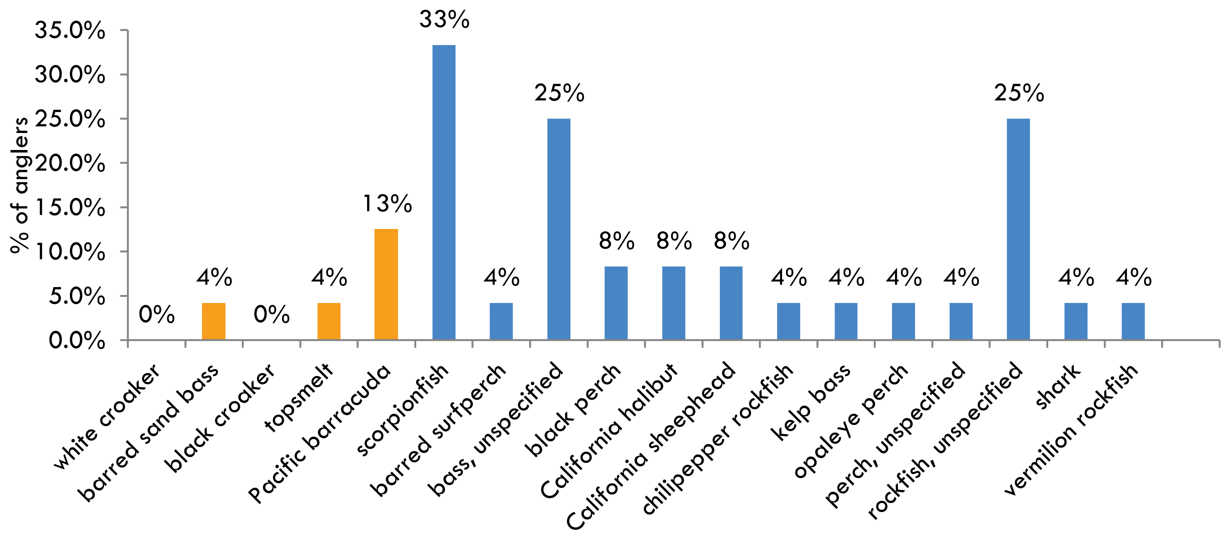


Figure 10 shows that anglers fishing on charter boats most commonly caught California scorpionfish (33%), bass (25%), and rockfish (25%). Pacific barracuda (13%), topsmelt (4%), and barred sand bass (4%) were DNC fish identified in angler's buckets.

Figure 10. Angler catch by charter boat.



5.5.4. ANGLER CATCH BY SEASON

Table 12 shows that the most common species observed in anglers' buckets were chub mackerel during the non-summer months and Pacific sardine during summer months. Nearly all observed fish species demonstrated variability from non-summer to summer months. The largest degree of variability was observed in topsmelt and barred sandbass. The presence of topsmelt in anglers' buckets decreased by 13% from non-summer to summer months, while barred sandbass catches increased by nearly 8% from non-summer to summer months. Table 12, below, displays seasonal variation of specific fish identified in anglers' buckets.

Table 12. Number of anglers with specific fish species by season (N=113).

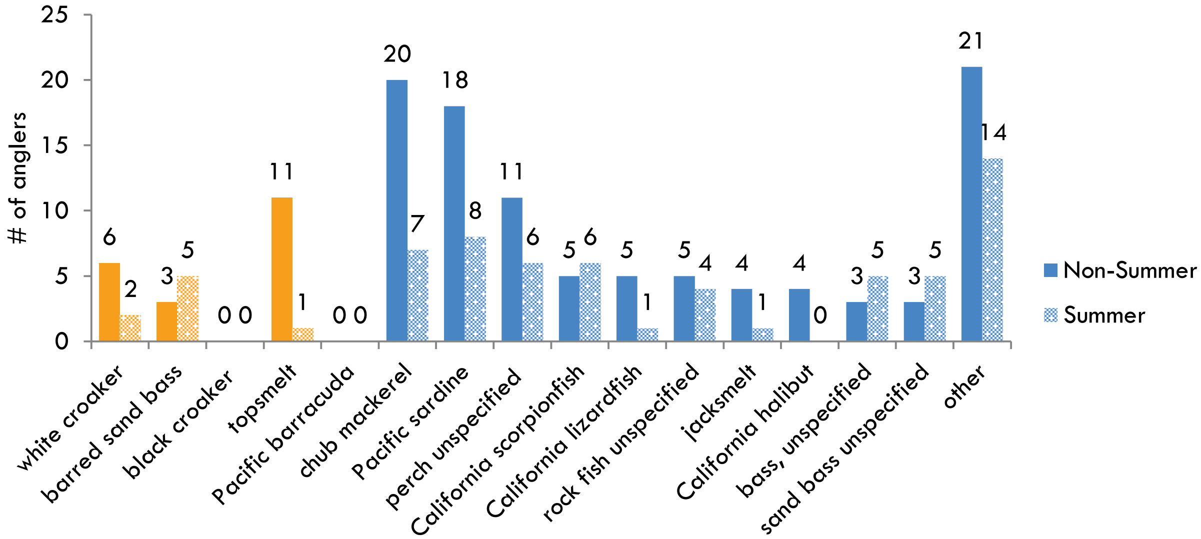
Common Name	Scientific Name		Non-Summer	Summer	Total
			(N=71)	(N=42)	113
white croaker DNC	*Genyonemus lineatus*	Angler Count:	6	2	8
		% within Mode:	8.5%	4.8%	
barred sand bass DNC	*Paralabrax nebulifer*	Angler Count:	3	5	8
		% within Mode:	4.2%	11.9%	
black croaker DNC	*Cheilotrema saturnum*	Angler Count:	0	0	0
		% within Mode:	0.0%	0.0%	

topsmelt DNC	*Atherinops affinis*	Angler Count:	11	1	12
		% within Mode:	15.5%	2.4%	
Pacific barracuda DNC	*Sphryraena argentea*	Angler Count:	1	2	3
		% within Mode:	1.4%	4.8%	
barred surfperch	*Amphistichus argenteus*	Angler Count:	0	1	1
		% within Mode:	0.0%	2.4%	
sargo	*Anisotremus davidsonii*	Angler Count:	2	0	2
		% within Mode:	2.8%	0.0%	
jacksmelt	*Atherinopsis californiensis*	Angler Count:	4	1	5
		% within Mode:	5.6%	2.4%	
shark	*Chondrichthyes, unid.*	Angler Count:	1	0	1
		% within Mode:	1.4%	0.0%	
blacksmith	*Chromis punctipinnis*	Angler Count:	1	0	1
		% within Mode:	1.4%	0.0%	
sanddab, unspecified	*Citharichthys spp.*	Angler Count:	2	1	3
		% within Mode:	2.8%	2.4%	
black perch	*Embiotoca jacksoni*	Angler Count:	0	2	2
		% within Mode:	0.0%	4.8%	
surfperch, unspecified	*Embiotocidae*	Angler Count:	1	0	1
		% within Mode:	1.4%	0.0%	
opaleye perch	*Girella nigricans*	Angler Count:	1	1	2
		% within Mode:	1.4%	2.4%	
zebra perch	*Hermosilla azurea*	Angler Count:	0	1	1
		% within Mode:	0.0%	2.4%	
walleye surfperch	*Hyperprosopon argenteum*	Angler Count:	0	1	1
		% within Mode:	0.0%	2.4%	
California corbina	*Menticirrhus undulatus*	Angler Count:	1	0	1
		% within Mode:	1.4%	0.0%	
lingcod	*Ophiodon elongatus*	Angler Count:	0	1	1
		% within Mode:	0.0%	2.4%	
senorita	*Oxyjulis californica*	Angler Count:	1	0	1
		% within Mode:	1.4%	0.0%	
kelp bass	*Paralabrax clathratus*	Angler Count:	2	1	3
		% within Mode:	2.8%	2.4%	
California halibut	*Paralichthys californicus*	Angler Count:	4	0	4
		% within Mode:	5.6%	0.0%	
ray, unspecified	*Rajiformes, unid.*	Angler Count:	1	0	1
		% within Mode:	1.4%	0.0%	
shovelnose guitarfish	*Rhinobatos productus*	Angler Count:	0	1	1
		% within Mode:	0.0%	2.4%	
spotfin croaker	*Roncador stearnsii*	Angler Count:	1	1	2
		% within Mode:	1.4%	2.4%	
Pacific sardine	*Sardinops sagax*	Angler Count:	18	8	26

		% within Mode:	25.4%	19.0%	
California scorpionfish	*Scorpaena guttata*	Angler Count:	5	6	11
		% within Mode:	7.0%	14.3%	
chilipepper rockfish	*Sebastes goodei*	Angler Count:	1	0	1
		% within Mode:	1.4%	0.0%	
vermilion rockfish	*Sebastes miniatus*	Angler Count:	0	2	2
		% within Mode:	0.0%	4.8%	
California sheephead	*Semicossyphus pulcher*	Angler Count:	1	1	2
		% within Mode:	1.4%	2.4%	
queenfish	*Seriphus politus*	Angler Count:	2	0	2
		% within Mode:	2.8%	0.0%	
California lizardfish	*Synodus lucioceps*	Angler Count:	5	1	6
		% within Mode:	7.0%	2.4%	
yellow croaker	*Umbrina roncador*	Angler Count:	2	0	2
		% within Mode:	2.8%	0.0%	
bass, unspecified		Angler Count:	3	5	8
		% within Mode:	4.2%	11.9%	
chub mackerel		Angler Count:	20	7	27
		% within Mode:	28.2%	16.7%	
perch unspecified		Angler Count:	11	6	17
		% within Mode:	15.5%	14.3%	
rock fish unspecified		Angler Count:	5	4	9
		% within Mode:	7.0%	9.5%	
sand bass unspecified		Angler Count:	3	5	8
		% within Mode:	4.2%	11.9%	

Figure 11 is a graphical presentation of fish species caught in the summer and non-summer months. Except for the California scorpionfish, barred sand bass (DNC fish), bass (unspecified), and sand bass (unspecified), all other types of fish were more commonly caught in the non-summer months rather than in the summer months. The difference in observed catch between summer and non-summer months for California scorpionfish, barred sand bass, bass (unspecified), and sand bass (unspecified) was small. White croaker and topsmelt were DNC fish that showed the most significant variance between non-summer and summer months.

Figure 11. Number of anglers with specific fish species by season.



5.5.5. SPECIES IDENTIFICATION

Upon examination of fish species in anglers' buckets, surveyors asked respondents for the name of each fish. Surveyors recorded angler responses to determine the common names (or mistakenly identified names) for each fish used by anglers.

Table 13 shows the common names used by anglers to identify fish they had caught and the corresponding number of anglers. DNC fish are identified in the table with a super script.

Table 13. Angler common names for identified fish species (N=125).

Common Name	Scientific Name	Angler Common Names	# Anglers
white croaker [DNC]	*Genyonemus lineatus*	queen fish corbina	8
topsmelt [DNC]	*Atherinops affinis*	topsmelt jacksmelt	12
barred sand bass [DNC]	*Paralabrax nebulifer*	barred sand bass calico bass	8
Pacific barracuda [DNC]	*Sphryraena argentea*	barracuda	3
barred surfperch	*Amphistichus argenteus*	buttermouth perch	1
sargo	*Anisotremus davidsonii*	sargo	2
jacksmelt	*Atherinopsis californiensis*	jacksmelt topsmelt	5
shark	*Chondrichthyes, unid.*		1
blacksmith	*Chromis punctipinnis*	blacksmith	1
sanddab	*Citharichthys spp.*	sand dab	3
black perch	*Embiotoca jacksoni*	black perch	2

surfperch, unspecified	*Embiotocidae*	surfperch	1
opaleye perch	*Girella nigricans*	opal eye	2
walleye surfperch	*Hyperprosopon argenteum*	no answer	1
California corbina	*Menticirrhus undulatus*	no answer	1
lingcod	*Ophiodon elongatus*	lingcod	1
senorita	*Oxyjulis californica*	senorita	1
kelp bass	*Paralabrax clathratus*	calico bass white croaker	3
California halibut	*Paralichthys californicus*	halibut	4
ray, unspecified	*Rajiformes, unid.*	skate thornback	1
shovelnose guitarfish	*Rhinobatos productus*	guitar fish	1
spotfin croaker	*Roncador stearnsii*	yellow croaker	2
Pacific sardine	*Sardinops sagax*	sardine	26
California scorpionfish	*Scorpaena guttata*	sculpin scorpion scorpion fish	11
chilipepper rockfish	*Sebastes goodei*		1
vermilion rockfish	*Sebastes miniatus*	red snapper	2
California sheephead	*Semicossyphus pulcher*		2
queenfish	*Seriphus politus*		2
California lizardfish	*Synodus lucioceps*	topsmelt	6
yellow croaker	*Umbrinaroncador*	yellow croaker	2
Mackerel		mackerel topsmelt perch	27
perch, unspecified		perch	17
rock fish, unspecified		rock fish	9
bass unspecified		sand bass	8
smelt, unspecified			1

NOTE. All 125 anglers with fish in their bucket were asked what they called the fish but answers were not required.

5.6. FISH CONSUMPTION PATTERNS

5.6.1. OVERALL CONSUMPTION PATTERNS

All anglers were asked if they had consumed fish caught from the study region within the past four weeks (Q3). Among the 693 anglers interviewed, 270 (39%) reported consuming fish at an average of 4.27 times (SD=4.96) in the last four weeks. Frequencies of fish consumption ranged from one to 31 times, with a median of three and a mode of two (Q4).

All respondents were asked to identify their approximate typical serving size based on a 150-gram fish fillet model that was shown. Anglers reported consuming an average amount of 0.83

fillet, which is equivalent to approximately 124 grams per sitting (SD=0.44). 49% of the respondents reported consuming a portion approximately half the fillet model per meal, 44% reported consuming a portion equal to the size of a fillet per meal, 6% reported consuming twice the size of the fillet model per meal, and 1% reported consuming portions three or more times larger than the 150-gram fish fillet model per meal (Q6).

Overall, anglers who reported eating fish in the past four weeks were:

- Older (M=46.95 years, SD=15.62) compared to those who reported not eating fish (M=41.50, SD=14.06, t=5.46, p<0.001);
- More likely to be Asian (48% reported eating fish caught in the study region), Black (45%), compared to White (35%), or Hispanic/Latino (34%). *Chi-square* = 11.03, p=0.026, df=4;
- Fishing from a charter boat (45%), private boat (44%), or beach or intertidal zone (41%), compared to a pier or jetty (34%). *Chi-square*= 8.97, p=.004, df=3;
- Familiar with health advisory warnings related to fish caught in the study region (*Chi-square* = 9.58, p=.002, N=693, *phi* = 0.12);
- More experienced anglers (M=14.95 years, SD=15.22) than those who had not eaten fish (M=10.15 years, SD=13.30, t=4.37, p<0.001); and
- Equally distributed between male and female groups (males 39% compared to 35% of females).

Although anglers who consume fish shared certain traits, those traits were not necessarily predictors of consumption behavior. A regression analysis was performed to identify variables that were significantly related to the amount of seafood consumed in the study region. The predictor variables were age, gender, race, fishing mode, awareness of warning signs, and years spent fishing in the study region. The results indicated none of these variables significantly influenced the amount of fish consumed in the past four weeks.

5.6.2. FISH CONSUMPTION BY SPECIES

All anglers with fish in their buckets were asked how they intend to use the fish. This information was applied to determine consumption frequency by species. Table 14 shows the number of anglers who caught each type of fish and the percentage of caught fish that were eaten, given away, thrown back, or used as bait. The most highly consumed fish were topsmelt[DNC] (19.2%), mackerel (27.3%), Pacific sardine (21.2%), and perch (19.2%). White croaker (10.1%) and Pacific barracuda (5.1%) were also DNC fish that were reported for consumption. Note that the percentages are calculated for the fate category across all fish species, therefore, these consumption rates are skewed higher for the fish that were more often caught. The number of anglers who caught a particular DNC fish and who responded to this question is very low. Therefore, definite conclusions cannot be drawn from these data.

Table 14. Fate of fish from angler's bucket by species (N=109 angler responses).

		Fate of Fish				
		Eat	Give Away	Throw Back	Bait	Other
Species		(N=99)	(N=25)	(N=12)	(N=34)	(N=2)
topsmelt DNC	Angler Count:	19	7	2	6	0
	% by Fate:	19.2%	28.0%	16.7%	17.6%	0.0%
white croaker DNC	Angler Count	10	3	0	0	0
	% by Fate:	10.1%	12.0%	0.0%	0.0%	0.0%
barred sand bass DNC	Angler Count:	0	0	0	0	0
	% by Fate:	0.0%	0.0%	0.0%	0.0%	0.0%
black croaker DNC	Angler Count:	0	0	0	0	0
	% by Fate:	0.0%	0.0%	0.0%	0.0%	0.0%
Pacific barracuda DNC	Angler Count:	5	2	0	0	0
	% by Fate:	5.1%	8.0%	0.0%	0.0%	0.0%
barred surfperch	Angler Count:	0	3	0	0	0
	% by Fate:	0.0%	12.0%	0.0%	0.0%	0.0%
sargo	Angler Count:	2	4	1	0	0
	% by Fate:	2.0%	16.0%	8.3%	0.0%	0.0%
jacksmelt	Angler Count:	5	0	0	4	0
	% by Fate:	5.1%	0.0%	0.0%	11.8%	0.0%
shark	Angler Count:	1	0	1	0	0
	% by Fate:	1.0%	0.0%	8.3%	0.0%	0.0%
blacksmith	Angler Count:	2	0	1	0	0
	% by Fate:	2.0%	0.0%	8.3%	0.0%	0.0%
sanddab, unidentified	Angler Count:	3	0	0	0	0
	% by Fate:	3.0%	0.0%	0.0%	0.0%	0.0%
black perch	Angler Count:	1	3	0	0	0
	% by Fate:	1.0%	12.0%	0.0%	0.0%	0.0%
surfperch, unidentified	Angler Count:	2	0	1	0	0
	% by Fate:	2.0%	0.0%	8.3%	0.0%	0.0%
opaleye perch	Angler Count:	2	3	1	0	0
	% by Fate:	2.0%	12.0%	8.3%	0.0%	0.0%
zebra perch	Angler Count:	0	1	0	0	0
	% by Fate:	0.0%	4.0%	0.0%	0.0%	0.0%
walleye surfperch	Angler Count:	0	0	0	1	0
	% by Fate:	0.0%	0.0%	0.0%	2.9%	0.0%
California corbina	Angler Count:	0	4	0	0	0
	% by Fate:	0.0%	16.0%	0.0%	0.0%	0.0%
lingcod	Angler Count:	3	0	0	0	0
	% by Fate:	3.0%	0.0%	0.0%	0.0%	0.0%
senorita	Angler Count:	2	0	1	0	0

	% by Fate:	2.0%	0.0%	8.3%	0.0%	0.0%
kelp bass	Angler Count:	6	2	1	0	0
	% by Fate:	6.1%	8.0%	8.3%	0.0%	0.0%
California halibut	Angler Count:	4	2	2	0	0
	% by Fate:	4.0%	8.0%	16.7%	0.0%	0.0%
ray, unidentified	Angler Count:	2	0	0	0	0
	% by Fate:	2.0%	0.0%	0.0%	0.0%	0.0%
shovelnose guitarfish	Angler Count:	0	0	1	0	0
	% by Fate:	0.0%	0.0%	8.3%	0.0%	0.0%
spotfin croaker	Angler Count:	3	4	0	0	0
	% by Fate:	3.0%	16.0%	0.0%	0.0%	0.0%
Pacific sardine	Angler Count:	21	4	0	16	0
	% by Fate:	21.2%	16.0%	0.0%	47.1%	0.0%
California scorpionfish	Angler Count:	14	3	1	2	0
	% by Fate:	14.1%	12.0%	8.3%	5.9%	0.0%
chilipepper rockfish	Angler Count:	2	0	0	0	0
	% by Fate:	2.0%	0.0%	0.0%	0.0%	0.0%
vermilion rockfish	Angler Count:	4	0	0	0	0
	% by Fate:	4.0%	0.0%	0.0%	0.0%	0.0%
California sheephead	Angler Count:	3	1	0	0	0
	% by Fate:	3.0%	4.0%	0.0%	0.0%	0.0%
queenfish	Angler Count:	0	1	2	0	1
	% by Fate:	0.0%	4.0%	16.7%	0.0%	50.0%
California lizardfish	Angler Count:	6	2	2	3	0
	% by Fate:	6.1%	8.0%	16.7%	8.8%	0.0%
yellow croaker	Angler Count:	3	5	0	0	0
	% by Fate:	3.0%	20.0%	0.0%	0.0%	0.0%
bass, unspecified	Angler Count:	12	2	3	0	0
	% by Fate:	12.1%	8.0%	25.0%	0.0%	0.0%
mackerel unspecified	Angler Count:	27	1	1	16	0
	% by Fate:	27.3%	4.0%	8.3%	47.1%	0.0%
perch unspecified	Angler Count:	19	3	3	7	1
	% by Fate:	19.2%	12.0%	25.0%	20.6%	50.0%
rock fish unspecified	Angler Count:	8	1	1	2	0
	% by Fate:	8.1%	4.0%	8.3%	5.9%	0.0%

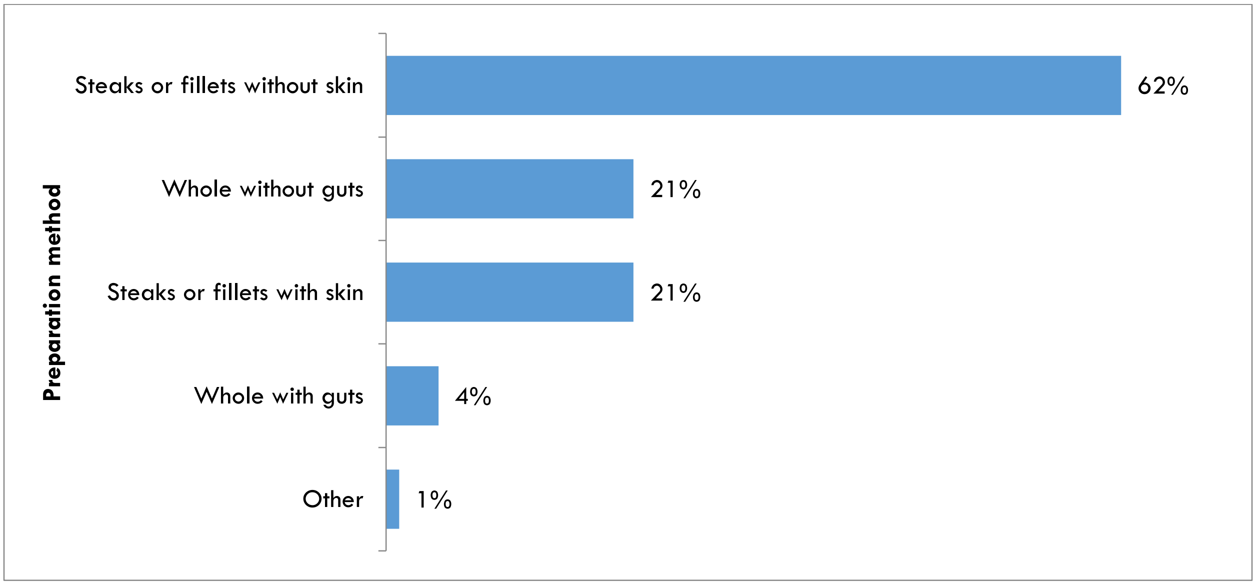
NOTE. N=109 is the number of unique responses. Not all anglers responded.

5.6.3. FISH CONSUMPTION BY FISH PART

Anglers who consumed fish over the past four weeks were asked what parts of the fish they usually consumed (Q5). This information is of interest because contaminant levels are significantly higher in the skin and guts of the fish due to accumulation of contaminants in fatty tissue. Consequently, preparation methods that use the skin or guts present a greater health risk to the angler. Respondents were encouraged to select all preparation methods they have used in the past four weeks. Allowing multiple responses increased the likelihood of respondents reporting "inferior" preparation methods rather than biasing respondents to only selecting *Steaks or Fillets without Skin.*

Figure 12 shows that 62% of anglers reported consuming fish as *steaks or fillet without skin*, the most favored behavior. Only 4% reported consuming whole fish *including guts*, the least protective preparation method.

Figure 12. Percent of anglers who consume fish who also report using a given preparation method (N=270).



NOTE. RESPONDENTS WERE ASKED TO CHOOSE ALL THAT APPLY. PERCENTAGE MAY SUM TO GREATER THAN 100%.

5.6.4. FISH CONSUMPTION BY PART AND ETHNICITY

Table 15 shows how consumption behaviors varied across ethnicities. In general, anglers of all ethnic backgrounds preferred consuming fish as steaks or fillets without skin. Asian anglers also preferred consuming fish as steaks or fillets without skin; however, they were also two to three times more likely to prepare fish whole compared to other ethnicities.

Table 15. Fish consumption by part and angler ethnicity (N=270)(Q19).

Parts consumed		Hispanic	White	Asian	Black	Other	All
Steak or fillets without skin	Angler Count:	53	51	39	18	5	166
	% within Ethnicity:	60.2%	77.3%	47.0%	81.8%	100.0%	61.5%
Steak or fillets with skin	Angler Count:	24	14	16	2	0	56
	% within Ethnicity:	27.3%	21.2%	19.3%	9.1%	0.0%	20.7%
Whole without guts	Angler Count:	15	6	31	4	0	56
	% within Ethnicity:	17.0%	9.1%	37.3%	18.2%	0.0%	20.7%
Whole with guts	Angler Count:	3	1	8	0	0	12
	% within Ethnicity:	3.4%	1.5%	9.6%	0.0%	0.0%	4.4%
Other	Angler Count:	1	0	2	0	0	3
	% within Ethnicity:	1.1%	0.0%	2.4%	0.0%	0.0%	1.1%

NOTE. Respondents were encouraged to choose all that apply. Percentages may sum to greater than 100%.

5.6.5. FISH CONSUMPTION BY MODE

Table 16 shows that there was a small degree of variability in fish consumption by anglers across fishing modes. Anglers fishing from piers or jetties were the least likely to consume their catch (34%) but the most likely to catch fish (38%). Private boats were the most likely to consume their catch (45%) but the least likely to catch fish.

Table 16. Reported consumption among anglers in the Study Area (N=693)(Q3 and Q7).

Survey question	Pier or Jetty	Charter Boat	Private Boat	Beach or Intertidal Zone	Full Sample
	(N=338)	(N=189)	(N=139)	(N=27)	(N=693)
During the past four weeks, have you eaten fish caught in this region (shown map)? (Q3) [Percent reporting "Yes"]	34%	44%	45%	41%	39%
Have you caught any fish today? (Q7) [Percent reporting "Yes"]	38%	34%	23%	37%	34%

5.6.6. QUANTITATIVE MEASURE OF FISH CONSUMPTION RATES

Table 17 shows consumption rates by ethnicity for angler consumers who reported consuming fish within the four weeks prior to being surveyed and anglers who had not consumed fish in the four weeks prior to being surveyed. The mean fish consumption rate of angler consumers from all ethnic backgrounds is 18.55 grams per individual per day (g/ind/day) with a median of 10.71 g/ind/day. All anglers from all ethnic background have a mean fish consumption rate of 6.88 g/ind/day. A comparison of the 95% UCLs or the upper confidence interval on the mean fish consumption rate for a measurement of Central Tendency or average exposure shows that angler consumers represent the higher or more conservative fish consumption rate (21.72 g/ind/day). It is also noted that Black anglers have the highest 95% UCL in fish consumption rate for both groups of anglers.

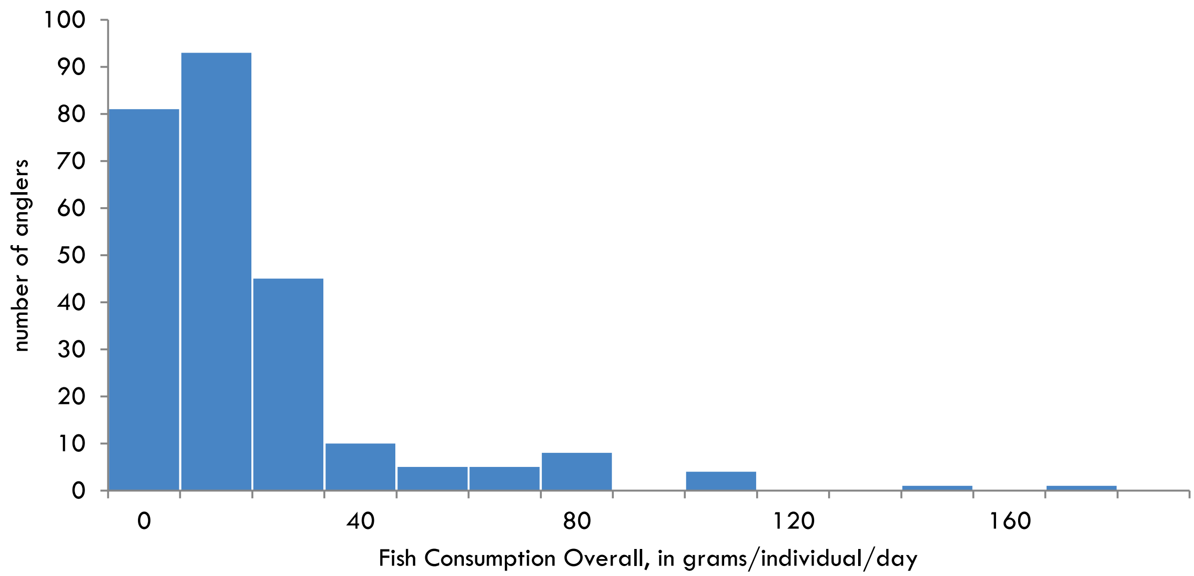
Table 17. Quantitative measure of fish consumption by ethnicity (N=270 & N=693).

	Consumption Rate (g/ind./day)									
	Angler Consumers (Q3, Q6)*					Anglers (all)**				
Ethnicity	**n**	**Mean**	**U.C.L.**	**Md**	**U.D.**	**n**	**Mean**	**U.C.L.**	**Md**	**U.D.**
Hispanic	80	16.41	20.69	10.71	41.79	258	5.09	6.76	0.00	16.07
Asian	76	20.76	26.36	10.71	64.29	162	9.74	12.95	0.00	25.18
White	54	19.25	29.31	9.38	42.86	164	6.34	9.86	0.00	16.07
Black	17	23.00	34.40	16.07	60.00	44	8.88	13.81	0.00	32.14
Other	22	12.78	20.98	6.70	36.43	51	5.51	9.72	0.00	16.07
Total	270[a]	18.55	21.72	10.71	42.86	693[b]	6.88	8.47	0.00	21.43

NOTE: U.C.L. = UPPER CONFIDENCE LIMIT (95%); MD = MEDIAN (50%); U.D. = UPPER DECILE (90%); *ANGLER-CONSUMERS ARE DEFINED AS ANGLERS WHO REPORTED CONSUMING FISH IN THE 4 WEEKS PRIOR TO BEING SURVEYED – CONSISTENT WITH THE 1994 STUDY METHOD; **ANGLERS (ALL) ASSUMES THAT ANGLERS WHO HAD NOT CONSUMED A FISH IN THE FOUR WEEKS PRIOR TO BEING SURVEYED ARE NOT CONSUMERS OF FISH – THIS CALCULATION UNDERREPORTS ACTUAL CONSUMPTION RATES; [A] THERE WERE 21 INSTANCES OF MISSING DATA; [B] THERE WERE 14 INSTANCES OF MISSING DATA; U.C.L. CALCULATED USING A BOOTSTRAPPING TECHNIQUE APPLIED TO THE MEAN.

Figure 13 is a histogram of reported consumption rates of anglers who consume fish from the study region. The responses were grouped into consumption rate increments of 10 g/ind/day. As shown in the histogram, more than 90% of the anglers consumed fish at a rate of 20 g/ind/day. This value is fairly consistent with the data shown in Table 17 wherein the more conservative or higher-end range (95% UCL) of the mean fish consumption rate was 21.72 g/ind/day. It is noted that the human health risk evaluations conducted in 2007 assumed a higher-end reasonable maximum exposure (RME) of 107 g/ind/day (all anglers) and 116 g/ind/day (Asian anglers), which are more conservative assumptions. RME values are used for determining the potential environmental exposures to ethnic subgroups from higher seafood consumption rates. The highest UCL reported for any ethnic group on Table 17 is substantially below the RME determined by EPA in 2007.

Figure 13: Histogram – Overall consumption rate among 270 anglers who reported consuming fish from the study region in the past four weeks (N=270)



5.7. DNC FISH CONSUMPTION PATTERNS

This section focuses solely on *intended* consumption patterns of DNC fish. Information from anglers was gathered either by identifying DNC fish in their buckets or by showing pictures of DNC fish to anglers and asking them what they would do if they caught DNC fish. A review of the collected data indicated that the sample size was too limited to have statistical significance. These analyses are included in the appendix.

5.7.1. OVERALL DNC CONSUMPTION PATTERNS

In addition to assessing overall fish consumption behaviors, the Study sought to better understand consumption patterns of the five DNC fish. 98 anglers (14%) reported eating one or more of the five DNC fish. Compared to the general angler population, respondents who reported consuming these fish had been fishing in the Study region longer ($M=15.29$, $SD=13.92$) than those who had not eaten one of the five DNC fish ($M=11.52$, $SD=15.80$, $t=2.43$, $p<0.05$). There were no statistical differences between gender, age, ethnicity, fishing mode, or awareness of a warning sign.

To determine the extent that warning signs may alter angler's consumption of the five DNC fish, an analysis was conducted comparing the 98 anglers who reported eating one or more of the DNC fish and the 172 anglers who reported consuming one or more non-DNC fish. The results indicate that 65% of anglers who reported consuming one of the five DNC fish were aware of the advisory, compared with 70% of anglers who consumed other fish. This result could point to the possibility that exposure to the warning sign may have reduced consumption of the five DNC fish, while potentially increasing the consumption of other fish species deemed safe. Despite an apparent trend towards the expected direction, the reported results were not shown to be statistically significant (chi-square=0.67, df=1, p=0.41).

Finally, the analyses examined the effects of the medium used to communicate the warning: television, newspaper or magazine, sign on the beach or pier, heard from other fishermen or friends, or other. Only one of the media emerged as a statistically significant predictor of consumption. Those anglers who reported eating one or more of the five DNC fish were *more* likely to report seeing a warning sign on a beach or pier (83%), compared with anglers who reported eating other fish species (68%, chi-square = 4.99, df=1, $p<0.05$). This result is inconsistent with the expected relationship between awareness of health advisory warnings and avoidance of DNC fish.

5.7.2. ANGLER INTENTION TO CONSUME DNC FISH

All anglers were asked about their consumption of the five DNC fish. If a surveyor identified one of the DNC fish in an angler's bucket, the angler was asked about their intended use of the specific fish (Q13). If the fish was not present, anglers were asked about consumption while being shown a picture of the fish (Q16–Q19). See **Appendix H** for samples of the fish identification pictures.

Table 18 shows that more than 40% of the anglers would consume barred sand bass and barracuda. Approximately 24% of the anglers would consume black croaker, and approximately 18% of the anglers would consume white croaker. It is important to note that these findings indicate an intention to consume DNC species, *should the angler come into possession of the fish*.

Table 18. Fate of DNC fish for all anglers (N=693)(Q13 & Q18).										
Fish species	**white croaker**		**barred sand bass**		**black croaker**		**topsmelt**		**barracuda**	
Fate of fish	Count	%	Count	%	Count	%	Count	%	Count	%
Eat them	46	18.1%	110	41.2%	20	24.1%	35	14.0%	112	40.7%
Give away	26	10.2%	39	14.6%	7	8.4%	25	10.0%	59	21.5%
Throw back	169	66.5%	115	43.1%	54	65.1%	102	40.8%	98	35.6%
Bait	11	4.3%	1	0.4%	1	1.2%	87	34.8%	3	1.1%
Other	2	0.8%	2	0.7%	1	1.2%	1	0.4%	3	1.1%
TOTAL	254	100%	267	100%	83	100%	250	100%	275	100%

NOTE. There were 142 missing cases (27 missing white croaker, 37 missing barred sand bass, 11 missing black croaker, 32 missing topsmelt, and 35 missing barracuda).

Data were also collected to determine the number of anglers who would consume DNC fish found in their buckets. However, the sample size was too small to draw definitive conclusions. These data were tabulate and included in **Appendix M**.

Similarly, analysis was conducted for each mode of fishing, breaking down anglers who have consumed DNC fish in the four weeks prior to being surveyed into percentages by race or ethnicity. The sample sizes were too small to draw definitive conclusions. The four tables can be found in **Appendix M**.

5.7.3. CONSUMPTION OF DNC FISH BY ETHNICITY

Table 19 shows the reported consumption rates of the five DNC fish (Q12, Q15, Q16, Q20) in the last four weeks according to ethnicity. Consumption patterns vary across ethnicity but are driven by relatively small sample sizes.

Table 19. Fish consumption by angler ethnicity (N=661).											
Angler Ethnicity	**Hispanic**		**White**		**Asian**		**Black**		**Other**		**Total**
DNC Fish	Count	%	Count	%	Count	%	Count	%	Count	%	Count
White croaker	9	16.7%	4	14.3%	9	26.5%	4	40.0%	1	16.7%	27
Barred sand bass	21	38.9%	16	57.1%	10	29.4%	5	50.0%	2	33.3%	54
Black croaker	2	3.7%	1	3.6%	3	8.8%	0	0.0%	0	0.0%	6
Topsmelt	5	9.3%	0	0.0%	6	17.6%	0	0.0%	0	0.0%	11
Barracuda	17	31.5%	7	25.0%	6	17.6%	1	10.0%	3	50.0%	34
TOTAL	54	100%	28	100%	34	100%	10	100%	6	100%	132

Note. There are 32 missing cases. Count refers to the number of anglers observed.

Table 20 shows how anglers reportedly prepared DNC fish for consumption. White croaker, barred sand bass, black croaker, and barracuda had similar preparation patterns wherein approximately half of the caught fish were prepared as steaks or fillets without skin. The remaining half was prepared using less ideal methods, with roughly one-in-five being prepared whole.

In contrast, topsmelt had a different consumption pattern with only 30% being prepared as a steak or fillet without skin and 35% being prepared whole with guts, which is the least protective preparation method.

Table 20. Reported fish preparation methods for consumption of DNC fish (N=110).

Q19	white croaker		barred sand bass		black croaker		barracuda		topsmelt	
Fish part	Count	%	Count	%	Count	%	Count	%	Count	%
Whole with guts	3	7.3%	4	3.4%	1	5.0%	1	0.9%	0	0.0%
Whole without guts	7	17.1 %	21	18.1 %	4	20.0 %	18	16.8 %	7	35.0 %
As steaks or fillets without the skin	21	51.2 %	62	53.4 %	12	60.0 %	62	57.9 %	5	25.0 %
As steaks or fillets with the skin	6	14.6 %	20	17.2 %	2	10.0 %	19	17.8 %	6	30.0 %
Other parts of fish	1	2.4%	0	0.0%	1	5.0%	1	0.9%	0	0.0%
Don't Know	3	7.3%	9	7.8%	0	0.0%	6	5.6%	2	10.0 %
TOTAL	41	100%	116	100%	20	100%	107	100%	20	100%

5.7.4. DNC FISH CONSUMPTION VOLUME

All anglers were asked specifically about consumption of the five DNC fish either through Q12 or Q17. Table 21 shows a comparison of the consumption rate of the five DNC fish for anglers who reported consuming DNC fish in the four weeks prior to being surveyed (Angler-Consumers) and those who had not consumed fish in the four weeks prior to being surveyed (Those Who Catch). There were 106 angler-consumers and 483 "Those Who Catch." The number of anglers who reported eating a specific DNC fish in both groups of anglers is represented by (n). Some anglers consumed multiple types of DNC fish, therefore, the populations overlap and the (n) displayed in the table sum to more than 100 for both groups.

Table 21. Quantitative measure of fish consumption of the five DNC fish (N=106 & N=483).

All Races/ Ethnicities	**Consumption Rate (g/ind./day)**									
	Angler-Consumers*					**Those Who Catch (Q9, Q16)****				
Fish Type	**n**	**Mean**	**U.C.L.**	**Md**	**U.D.**	**n**	**Mean**	**U.C.L.**	**Md**	**U.D.**
white croaker DNC	23	8.73	11.10	5.36	19.29	263	0.76	1.17	0.00	0.00
barred sand bass DNC	56	9.04	13.39	5.36	17.67	299	1.69	2.42	0.00	5.36
black croaker DNC	6	10.27	17.41	8.04	--	94	0.66	1.42	0.00	0.00
topsmelt DNC	8	17.41	39.50	8.04	--	239	0.58	1.47	0.00	0.00
barracuda DNC	32	9.71	15.64	5.36	17.95	298	1.04	1.81	0.00	2.68
Total	106	11.50	16.54	5.36	24.11	483	2.52	3.52	0.00	5.36

NOTE: U.C.L. = UPPER CONFIDENCE LIMIT (95%); MD = MEDIAN (50%); U.D. = UPPER DECILE (90%); *ANGLER-CONSUMERS ARE DEFINED AS ANGLERS WHO REPORTED CONSUMING FISH IN THE 4 WEEKS PRIOR TO BEING SURVEYED – CONSISTENT WITH THE 1994 STUDY METHOD; **FULL SAMPLE OF "THOSE WHO CATCH" ASSUMES THAT ANGLERS WITH FISH WHO HAD NOT CONSUMED A FISH IN THE FOUR WEEKS PRIOR TO BEING SURVEYED ARE NOT CONSUMERS OF FISH – THIS CALCULATION UNDERREPORTS ACTUAL CONSUMPTION RATES; TOTAL INDICATES COMBINED CONSUMPTION RATES IN G/IND/DAY ACROSS THE FIVE FISH OF INTEREST. CONSUMERS ARE ANGLERS WHO REPORTED EATING THE FISH SPECIES IN THE PAST FOUR WEEKS. ANGLERS WERE ASKED TO REPORT ALL THAT APPLIED.

Consumption rates by ethnicity were also calculated for each DNC fish. However, sample sizes were not adequate for potential application in future risk evaluations. The results are displayed in Tables 21.b.–21.g. in **Appendix M**.

Table 22 shows the consumption rate according to fishing mode between two angler groups. Anglers were grouped either as anglers who reported consuming fish within the past four weeks (Q3, Q6) prior to being surveyed (Angler-Consumers) and anglers who indicated they had not consumed within the past four weeks (Full Sample). Mean consumption rates were generally consistent among the different modes for both groups of anglers. Charter boats had the lowest mean consumption rate among angler-consumers whereas pier/jetty had the lowest mean consumption rate among the Full Sample anglers. Beach or intertidal zones had the highest mean consumption rate for angler-consumers whereas private boats had the highest mean consumption rate among the Full Sample anglers. The median for all modes was 10.71for angler consumers but the median consumption rate for the Full Sample anglers was coded as zero.

Table 22. Quantitative measure of fish consumption by mode (N=270 & N=693).

	Consumption Rate (g/ind./day)									
All Races/ Ethnicities	**Angler-Consumers***					**Full Sample****				
Mode	**n**	**Mean**	**U.C.L.**	**Md**	**U.D.**	**n**	**Mean**	**U.C.L.**	**Md**	**U.D.**
Pier or Jetty	102	19.22	24.11	10.71	61.07	338	5.80	7.59	0.00	16.07
Charter Boat	82	16.69	21.85	10.71	32.14	189	7.24	9.79	0.00	21.43
Private Boat	55	19.48	28.49	10.71	42.86	139	7.71	11.81	0.00	21.43
Beach/Intertidal Zone	10	20.09	28.92	16.07	42.86	27	7.44	12.60	0.00	30.00
Total	270[a]	18.55	21.41	10.71	42.86	693	6.64	7.95	0.00	21.43

NOTE: U.C.L. = UPPER CONFIDENCE LIMIT (95%); MD = MEDIAN (50%); U.D. = UPPER DECILE (90%); **FISH CONSUMERS ARE DEFINED AS ANGLERS WHO REPORTED CONSUMING FISH IN THE FOUR WEEKS PRIOR TO BEING SURVEYED – CONSISTENT WITH THE 1994 STUDY METHOD; **FULL SAMPLE ASSUMES THAT ANGLERS WHO HAD NOT CONSUMED A FISH IN THE FOUR WEEKS PRIOR TO BEING SURVEYED ARE NOT CONSUMERS OF FISH – THIS CALCULATION UNDERREPORTS ACTUAL CONSUMPTION RATES; [A] THERE WERE 21 INSTANCES OF MISSING DATA. N=270 REPRESENTS NUMBER OF ANGLERS. ANGLERS WERE ASKED TO REPORT ALL THAT APPLIED.

5.8. AWARENESS OF ADVISORY & BEHAVIOR

5.8.1. AWARENESS OF HEALTH ADVISORY WARNINGS

Anglers were asked a series of questions pertaining to their awareness of heard health advisory warnings regarding eating fish caught in the study region (Q21). Figure 14 shows that 61% of anglers (N=425) were aware of the health warnings.

Figure 14. Percentage of anglers who reported being aware of the health advisory (N=693).

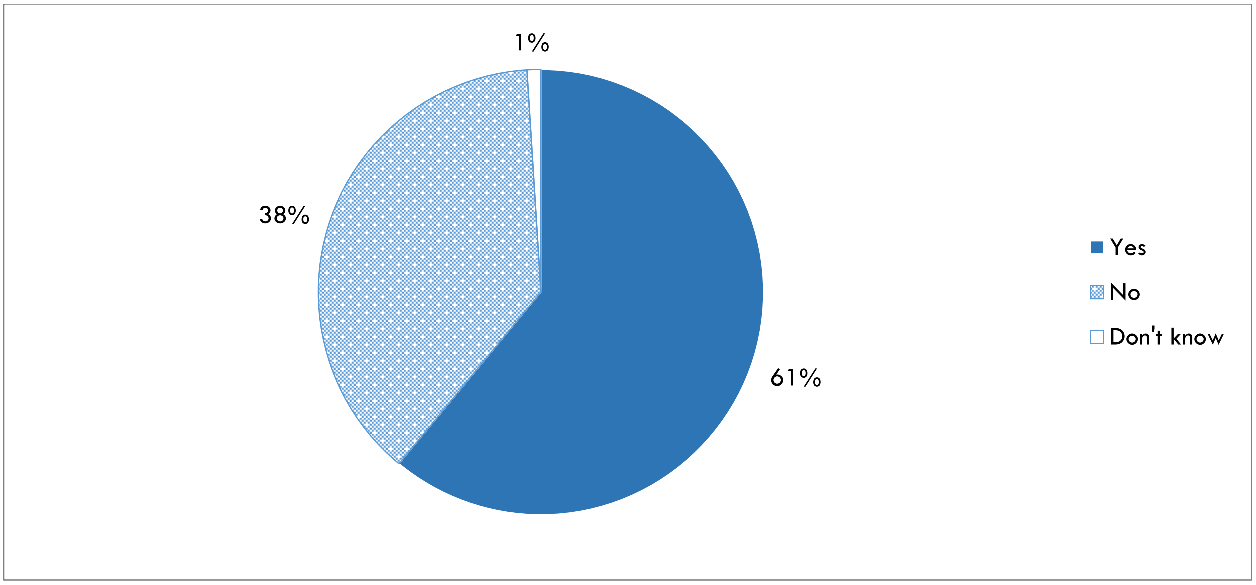
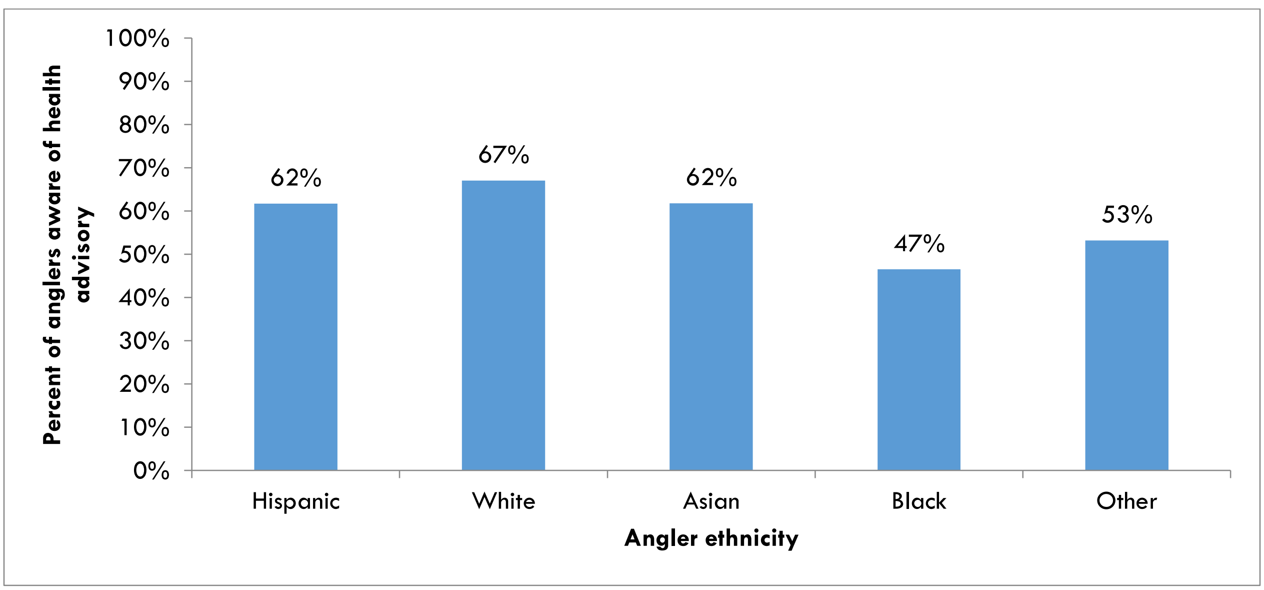


Figure 15 shows that awareness of advisory warnings varied across angler ethnicities. White anglers were most aware (67%) and Black anglers were the least aware (47%) of the advisory warnings.

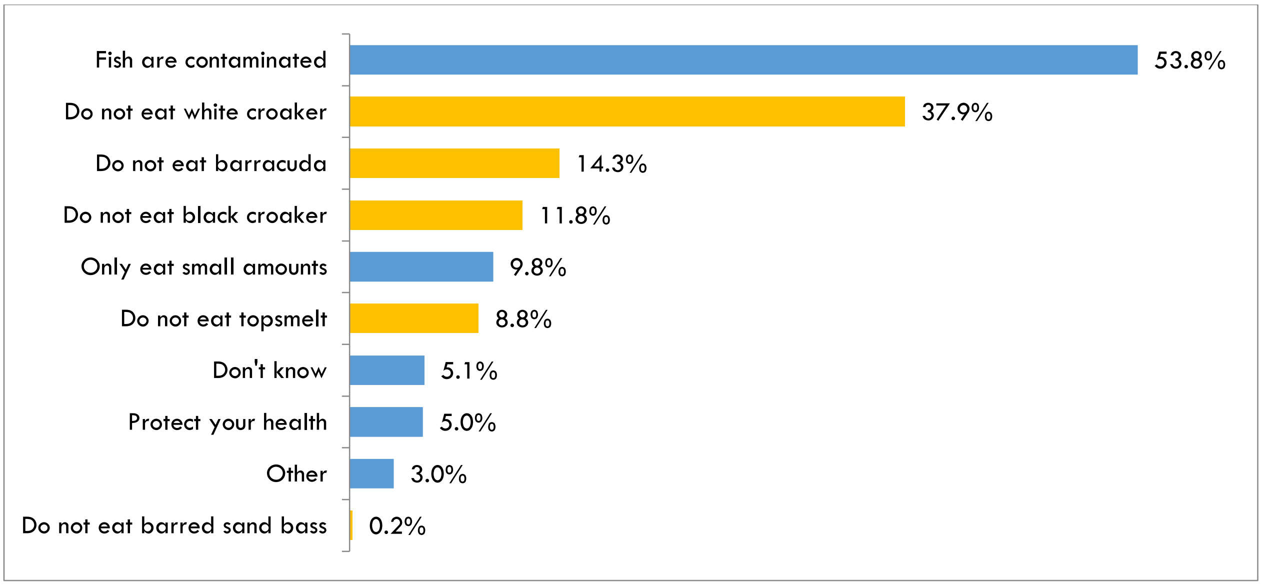
Figure 15. Percentage of anglers who reported being aware of the health advisory by ethnicity (N=693).



5.8.2. AWARENESS OF HEALTH ADVISORY CONTENT

Figure 16 shows the relationship between awareness of fish advisories and consumption of contaminated fish. Anglers who reported being aware of health advisory warnings were asked about the content of the warning in an open-ended manner that allowed for respondents to select more than one identifiable message. More than half (53.8%) indicated that the advisory warned that *fish are contaminated*. The second most popular response (37%) was "*do not eat white croaker*." Awareness of the risks of other DNC fish were: 14.3% for barracuda, 11.8% for black croaker, 8.8% for topsmelt, and 0.2% for barred sand bass. Approximately 8% of anglers who reported being slightly aware of the health advisory warnings were unable to identify any particular content of the warnings (*Don't know* at 5.1% and *Other* at 3.0%).

Figure 16. Percent of aware angler population able to identify each outreach message (N=425).

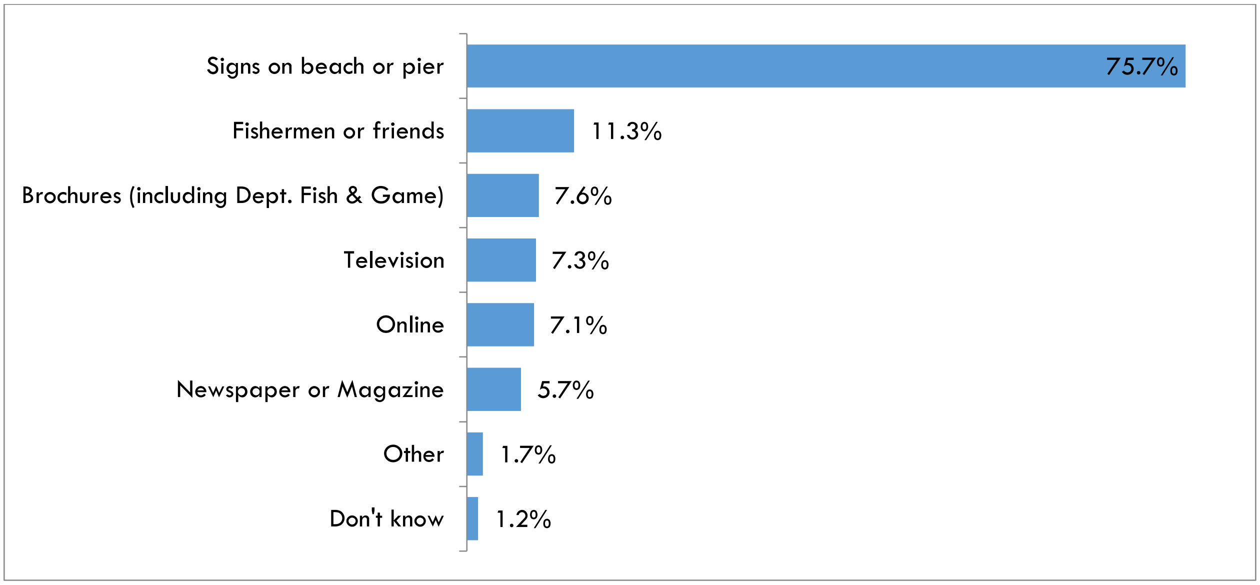


NOTE. RESPONDENTS COULD CHOOSE MORE THAN ONE ANSWER. PERCENTAGE MAY SUM TO MORE THAN 100%. ORANGE BARS REPRESENT RESPONSES RELATING TO DNC FISH.

5.8.3. ADVISORY COMMUNICATION CHANNEL

Figure 17 shows how anglers became aware of the fish advisories or warnings. The overwhelming majority of anglers (76%) who had seen or heard of a warning stated that they had seen signs on the beach or pier. The second most popular response was by word of mouth, via other fishermen or friends. Only 20% reported learning about the warning from traditional media such as television, online a newspaper or a magazine. *Other* responses included the government, food packages, and "everywhere."

Figure 17. Method of learning about the health advisory (N=425).

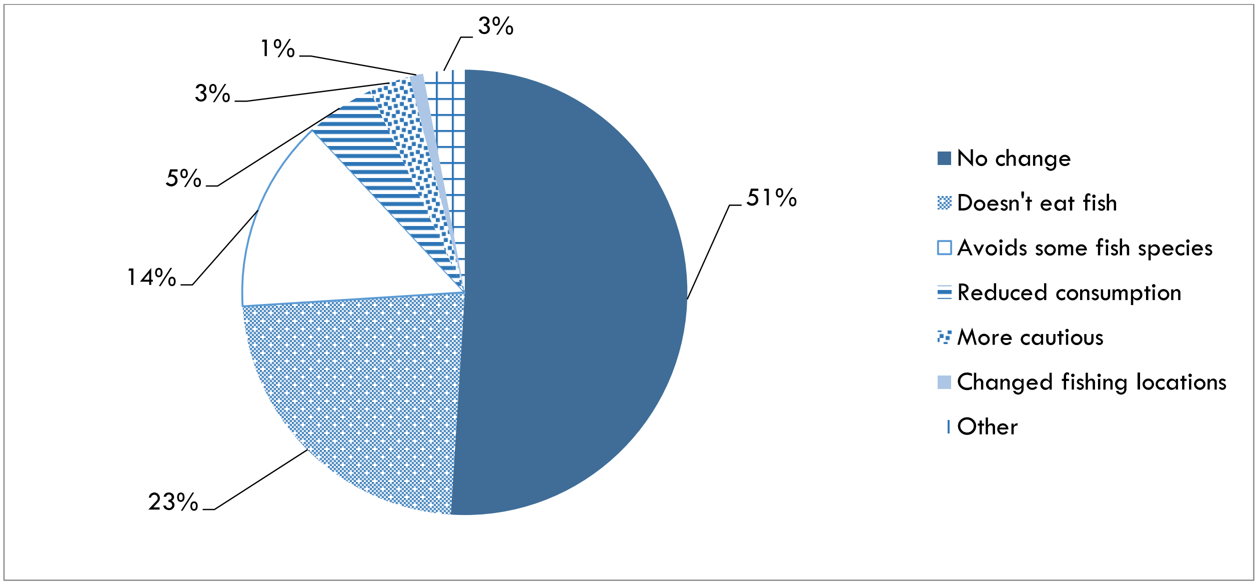


NOTE. RESPONDENTS COULD CHOOSE MORE THAN ONE ANSWER. PERCENTAGE MAY SUM TO MORE THAN 100%.

5.8.4. ADVISORY AWARENESS AND BEHAVIOR CHANGE

Those who had seen or heard a warning were asked how the warning changed their fishing or fish-eating habits. Figure 18 shows that 51% of those who had seen or heard warnings (N=212) stated that they had not changed their fishing or fish-eating habits despite more than 80% of anglers indicating that they found the message to be *important* or *very important*. More than 40% of anglers reported adopting a healthier behavior due to the warnings (23% no longer eat the fish, 14% avoid target fish species, and 5% reduce overall consumption). "Other" responses included, "not sure" and "now I'll look for the [warnings]".

Figure 18. Change in behavior as a result of advisory awareness (N=425).



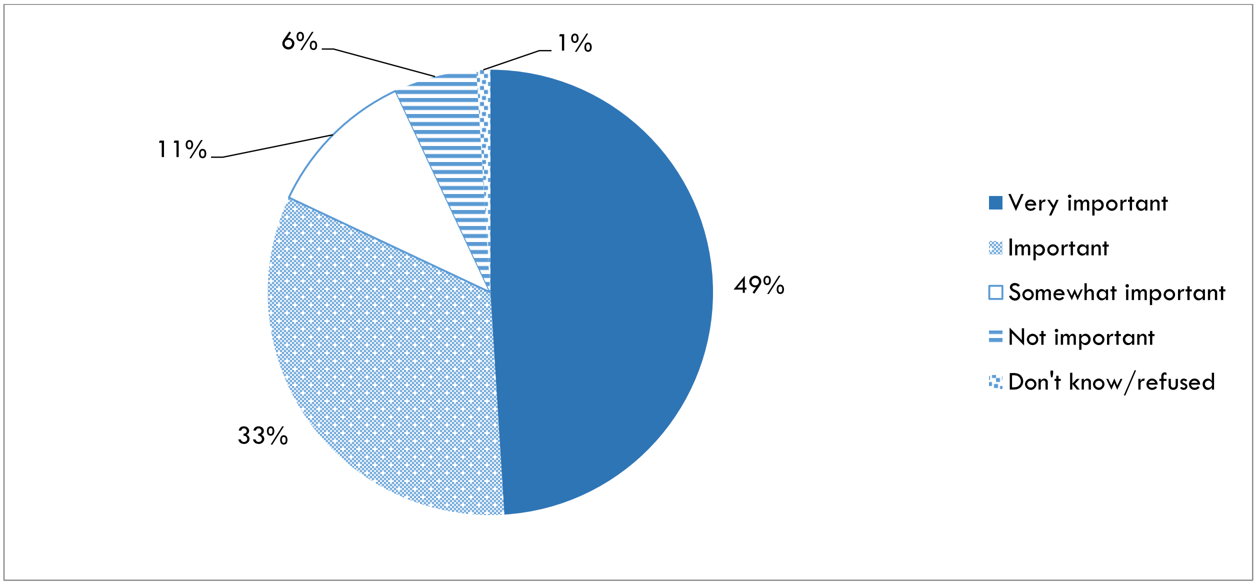
NOTE. EIGHT MISSING CASES

Analysis was conducted to evaluate Advisory Awareness and Behavior Change by ethnicity mode. However, the dataset was too small to draw meaningful conclusions. The data can be found in Table 25 in **Appendix M**.

5.8.5. PERCEIVED IMPORTANCE OF ADVISORY

Figure 19 shows how the importance of the warnings was perceived by those who had seen or heard a warning. Results of the survey shows that more than 80% of those who had seen or heard the advisories or warnings (N=348) stated that the warnings were either *important* or *very important*.

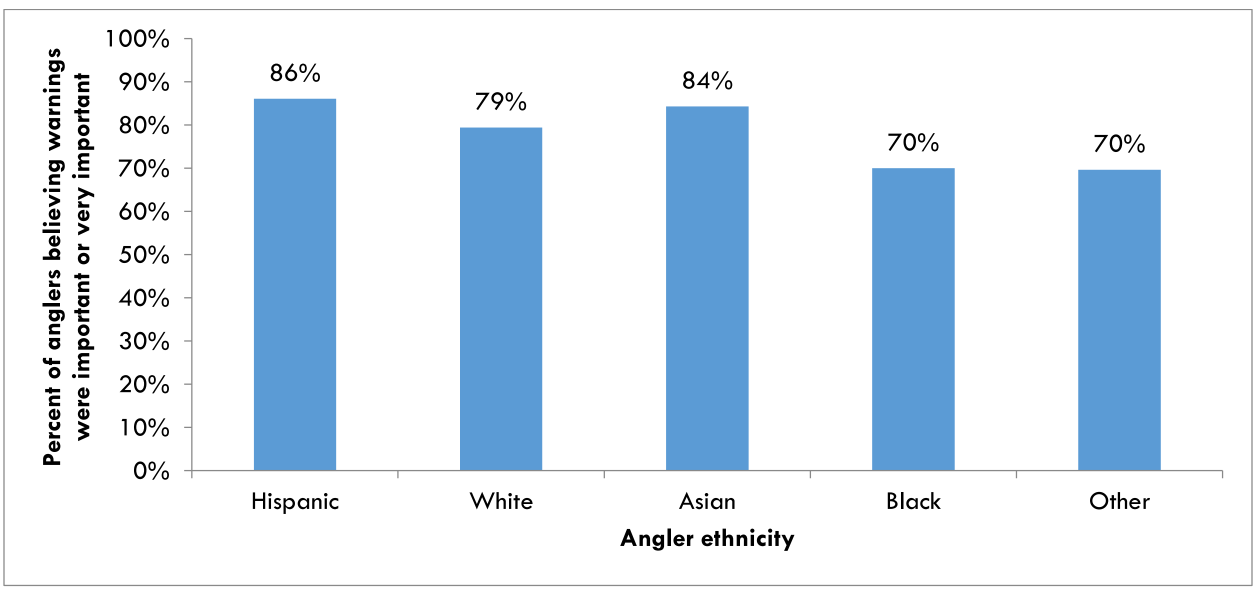
Figure 19. Importance of the advisory/warnings as reported by anglers (N=425).



NOTE. THERE WAS 1 MISSING CASE

Figure 20 shows that angler perception of the importance of the advisory varied across ethnicities. Hispanic and Asian anglers considered the advisory to be highly important at 86% and 84%, respectively. Black anglers and anglers of different or mixed ethnicities placed the lowest importance (70%) on the advisories or warnings.

Figure 20. Percentage of anglers believing advisory warnings are important by ethnicity (N=458).



When the data were analyzed to compare the perceived importance of the warning based on ethnicity and fishing mode, the sample size was too small to draw meaningful conclusions. The data can be found in Table 25.a. in **Appendix M**.

5.9. COMPARISONS OVER TIME

The survey methodology used in the Study was modeled on the methods reported in the 1994 Seafood Consumption Study conducted by the Santa Monica Bay Restoration Project. Similar to the methodology reported here, the 1994 Study involved surveys conducted over a one year period, using the same four fishing modes and comparable survey hours in the field. The similarity in methods allows for a comparison of changes in angler characteristics, durations of exposure and consumption habits over time, as described below.

5.9.1. SAMPLE SIZE

Table 23 shows that the 1994 Study reported a final sample size of 1243 anglers and a response rate of 71%. The sample size obtained in the current Study was 693 and a higher response rate of 78%. The decline in total number of responses may be attributed to a possible decline in the angler population; however, this is only supported by the decreased number in anglers who were surveyed or counted. Although the Study had more days in the field across more sites than the 1994 Study, fewer surveys were completed.

Surveyors conducted a census wherein all anglers were counted. The total number of anglers counted across all fishing modes in 2014 was 1449 compared to 2376 in 1994. Another indicator is the number of fishing licenses issued in the State of California. In the two decades since the data were collected for the 1994 report, the number of fishing licenses issued has decreased by 21%. In 1994, the State issued 3.27 million sport fishing licenses, and in 2012 the State issued 2.59 million licenses (www.dfg.ca.gov/licensing/statistics).

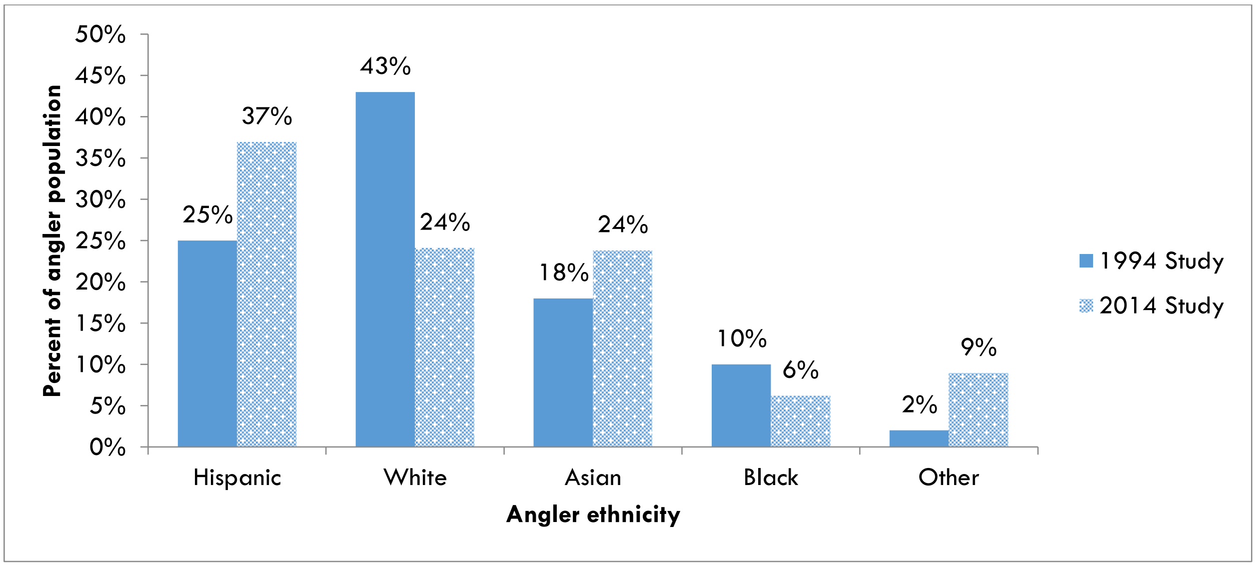
Table 23. Comparison across Seafood Consumption Studies 1994 vs 2014.

Study	1994 Study (SMBRP 1994)	2014 Seafood Consumption Study
Surveying days	99	128
Fishing sites	29	61
Anglers counted	2376	1449
Anglers approached	1751	888
Angler responses	1243	693
Response rate	71%	78%

5.9.2. ANGLER CHARACTERISTICS

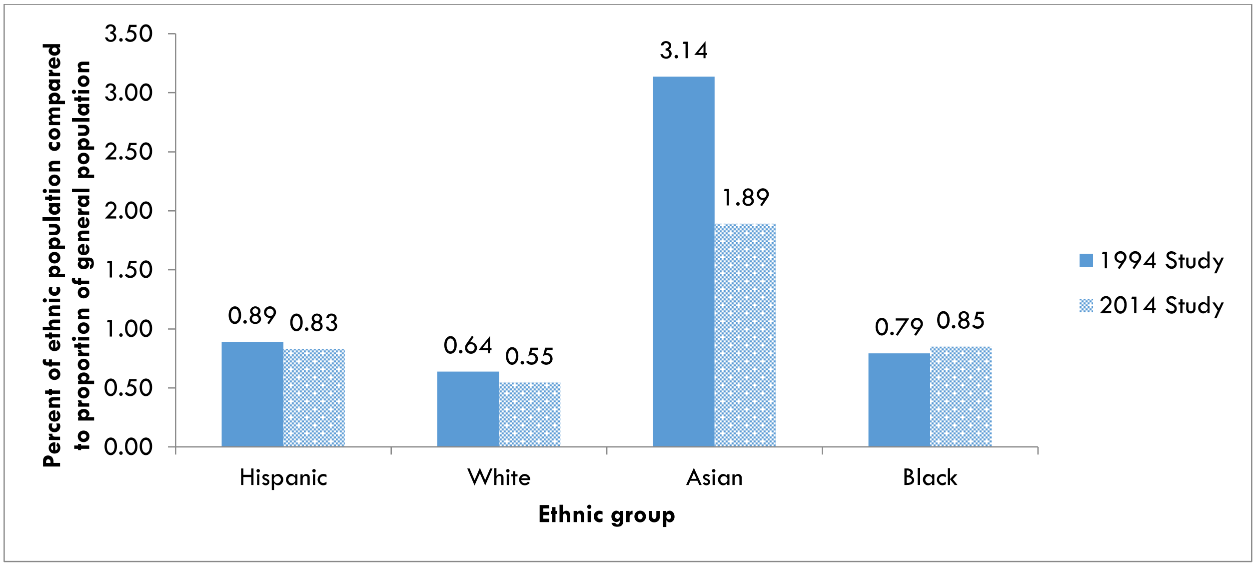
Figure 21 shows the change in ethnicity of anglers from 1994 to 2014. White anglers comprised 43% of anglers in the 1994 Study compared to only 24% in 2014. Hispanic, Asian, and anglers of other ethnic backgrounds made significant increases in the overall population. Collectively, they made up only 45% of the angling population in 1994 and now comprise approximately 70%.

Figure 21. Angler ethnicities across 1994 and 2014 Study (N=693).



Although the ethnic makeup of anglers has changed, it is important to understand that change in relation to the overall population. Figure 22 shows that the increase in the number of Hispanic anglers closely correlated with the increase in the regional population. Hispanic anglers made up 25% of the angling population in 1994 and 28% of the general population (1990 census). This is equivalent to an ethnic participation rate of 0.89 (0.25/0.28). In 2014, Hispanic anglers made up 37% of the angling population and 48% of the general population (2010 census). This is equivalent to an ethnic participation rate of 0.83. Although Hispanics currently make up a greater portion of all anglers, participation among Hispanics is actually declining.

Figure 22. Ethnic participation rate across 1994 and 2014 Study (N=693).



Ethnic participation is declining for all races except Black anglers. Although Black anglers have declined from 10% of anglers in 1994 to 6% in 2012, interest in angling has actually increased among the Black population. In interpreting the data, the participation rate is not a percentage of an ethnicity that participates in fishing activities, but rather the percent of an ethnic group that participates in angling activities compared against their statistically expected proportion.

5.9.3. AGE AND YEARS OF FISHING EXPERIENCE

In addition to shifts in ethnicity, there were also large shifts in average age of anglers. In 1994, 54% of the anglers were reported to be between 21 and 40 years of age. In this Study, only 40% of the anglers are within that age range. This trend demonstrates a general aging of the angling population.

Length of fishing experience in the general angler population seems to have remained constant over the past two decades. In the 1994 Study, 46% of the anglers reported fishing in the study region between zero and five years. In the Study, 52% reported fishing in the study region for the same amount of time.

5.9.4. FREQUENCY AND AMOUNT CONSUMED

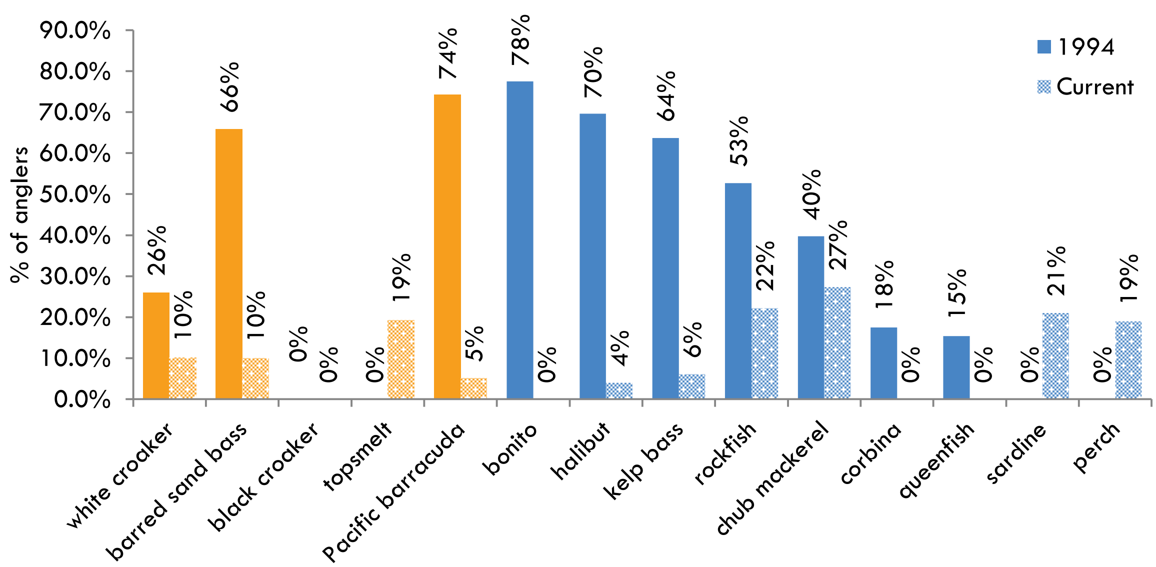
Approximately 39% of anglers reported eating fish in 1994 from the slightly larger study region. That percentage remained the same two decades later. While the percentage of anglers who reported eating fish remained the same, there have been changes in consumption amounts. The 1994 study reported a median consumption rate of 21.4 g/ind/day across all species for anglers who had fish in hand. In the current study, the median consumption rate is 10.7 g/ind/day. This change cannot be attributed to differing survey methods because the survey methods were nearly identical.

One possible explanation for the reduction in consumption amount is the limited number of fish species included in the 1994 Study estimate. The 1994 Study calculated consumptions rates for anglers who reported consuming one or more of eight fish of interest; for this Study calculated consumption rates were based on anglers who reported consuming *any and all* locally caught fish species. However, this computational difference would actually *underestimate* overall consumption in the 1994 Study.

5.9.5. COMMONLY CONSUMED FISH

Figure 23 shows that the most commonly consumed fish in 1994 were Pacific bonito (77.5%), barracuda (74.2%) and halibut (69.6%). In the current Study, the most commonly consumed species were mackerel (27%), Pacific sardine (21%), perch (19%) and topsmelt[DNC] (19%).

Figure 23. Commonly consumed fish species 1994 and 2014 Study.



5.9.6. PREPARATION METHODS

Preparation methods remained consistent from 1994 to present. The majority of consumers (63% in the current Study and 65% in 1994) reported eating the fish as a steak or fillet without the skin.

5.9.7. COMPARISON TO SAN FRANCISCO STUDY

A review of the 2000 San Francisco Bay Seafood Consumption Report indicated that the consumption results from that study were significantly similar to the result of this Study. However, the same caveats used in the San Francisco study are repeated here: "Comparisons of consumption rates between studies are inherently difficult to make. Study methodologies are rarely identical and differences in method can greatly affect the results." For example, the San Francisco report used a 227-gram filet model during interviews while other surveys, including this most recent report, tended to use a 150-gram filet model. The San Francisco report noted that the different size model biased results, although the magnitude and influence of the bias cannot be known.

Table 24 shows that the total mean in the current study is higher than the total mean in the San Francisco study, but the total median is lower. This indicates that the results from the current study are biased by a number of high consumers while the San Francisco consumption results are comprised of a more consistent distribution of consumers. In each report, Black anglers reported the highest mean consumption rate.

Table 24. Comparison of Palos Verdes Shelf vs San Francisco consumption report.

	Consumption Rate (g/ind./day)				
	Palos Verdes Shelf 2014 Study			San Francisco 2000 Study	
Ethnicity	**n**	**Mean**	**Median**	**Mean**	**Median**
Hispanic	80	16.41	10.71	16.6	16.0
Asian	76	20.76	10.71	17.8	16.0
White	54	19.25	9.38	14.4	16.0
Black	17	23.00	16.07	19.4	16.0
Other	22	12.78	6.70	-	-
Total	270[a]	18.55	10.71	16.5	16.0

SECTION 6

RECOMMENDATIONS FOR FUTURE OUTREACH

SECTION 6 – RECOMMENDATIONS FOR FUTURE OUTREACH

In reviewing the Study data, the following findings emerged as potential areas around which to shape future outreach efforts.

With regard to the findings in this Seafood Consumption Study indicating whether or not the ICs Program has been effective in reducing human health risks by preventing exposures to fish contaminated with DDT and PCBs, it is conclusion of this Study that Educational Outreach has been effective at reducing human exposures to contaminated fish and shellfish within the Study region from Palos Verdes Shelf Superfund Site' contamination. However, as fish continue to exceed protective levels for human consumption as established in EPA's IROD, the Educational Outreach program will continue to serve as a major Institutional Control component of EPA's interim remedy for the Study Area/study region.

6.1. ANGLER LANGUAGE NEEDS

Despite having a diverse survey team speaking a range of languages (English, Spanish, Vietnamese, Mandarin, Cantonese, and Tagalog), English and Spanish covered 99.9% of all anglers surveyed. However, there was limited additional data that could be collected from Korean anglers because the survey team lacked a Korean-speaking surveyor. Surveyors did not collect hard data on the language spoken by anglers who declined to be surveyed due to language barriers. In part, this was due to logistical issues and the inability to accurately determine what language was actually being spoken. Nearly 23% of all anglers approached declined to be surveyed and the main reason given was language difficulties. Continuing to recruit outreach workers who match the diverse ethnic backgrounds of the Southern California angler population is recommended, particularly as the ethnic makeup changes over time.

6.2. ANGLER AGE

The Study demonstrated that there is a decline in number of anglers between 21 and 40 years of age. However, the length of fishing experience did not change and remained between 0 to five years.

Consequently, future outreach should take into consideration the relative inexperience of anglers and the need for ongoing outreach due to a 20% rate of turn-over in the angler population each year.

6.3. BLACK ANGLERS

Black anglers are reported to have the highest consumptions rates of fish and DNC fish. Black anglers also have the least overall awareness of health advisory warnings (47%) and are reported to be the least concerned about the importance of health advisory warnings. Black anglers are overrepresented in the beach or intertidal zone mode of fishing, which is also the most challenging mode to outreach or survey.

It is recommended that outreach programs include activities that directly target this particular ethnic group of anglers. EPA has begun increasing efforts specifically designed to reach the Black angler population.

6.4. ASIAN ANGLER OUTREACH

The Asian population remains an important population of anglers. In contrast to other ethnic group of anglers whose activity diminishes in the winter months, Asian angler activity increases in the winter months.

While outreach activities have been somewhat curtailed in the winter months, it is recommended that future outreach to this large ethnic group be effectively increased during the winter in order to have continuity and consistency in conveying the messages to anglers.

6.5. BARRED SAND BASS

All anglers were asked about DNC fish consumption intentions. Barred sand bass had the highest rate of intended consumption at 41.2%. Moreover, when asked about health advisory warnings, only 0.2% of anglers indicated awareness of warnings about barred sand bass. Collectively, these findings suggest a need for additional outreach on barred sand bass identification and risks.

EPA is including barred sand bass in the 2014–15 Palos Verdes Shelf fish sampling activity. This information will be used to reassess human health risks from consumption and for updating the EPA's outreach message for this species.

6.6. HEALTH ADVISORY AWARENESS

General outreach efforts are being significantly expanded at piers to have a greater impact and to increase targeted ethnic outreach.

While public outreach and education have made a difference in reducing health risk due to consumption of contaminated fish, continued efforts to increase public awareness of health advisories are warranted. EPA and partners will continue to monitor vulnerable angler populations and will implement activities to reach, educate, and ultimately foster healthy fish consumption behaviors among those who consume fish caught in the study region.

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APPENDIX A

REGIONAL MAP OF PV SHELF AREA, LIST AND MAP OF FISHING LOCATIONS

Appendix A

Regional Map of PV Shelf Area

PV Shelf Geographical Region	Code	Description
Central Bay	A	Santa Monica Municipal Pier to Playa Del Rey Beach
South Bay	B	Manhattan Beach to Redondo Beach
Los Angeles Harbor	C	Cabrillo Fishing Pier and Cabrillo Boat Ramp
Long Beach	D	S of Cabrillo Boat Ramp to Seal Beach Pier

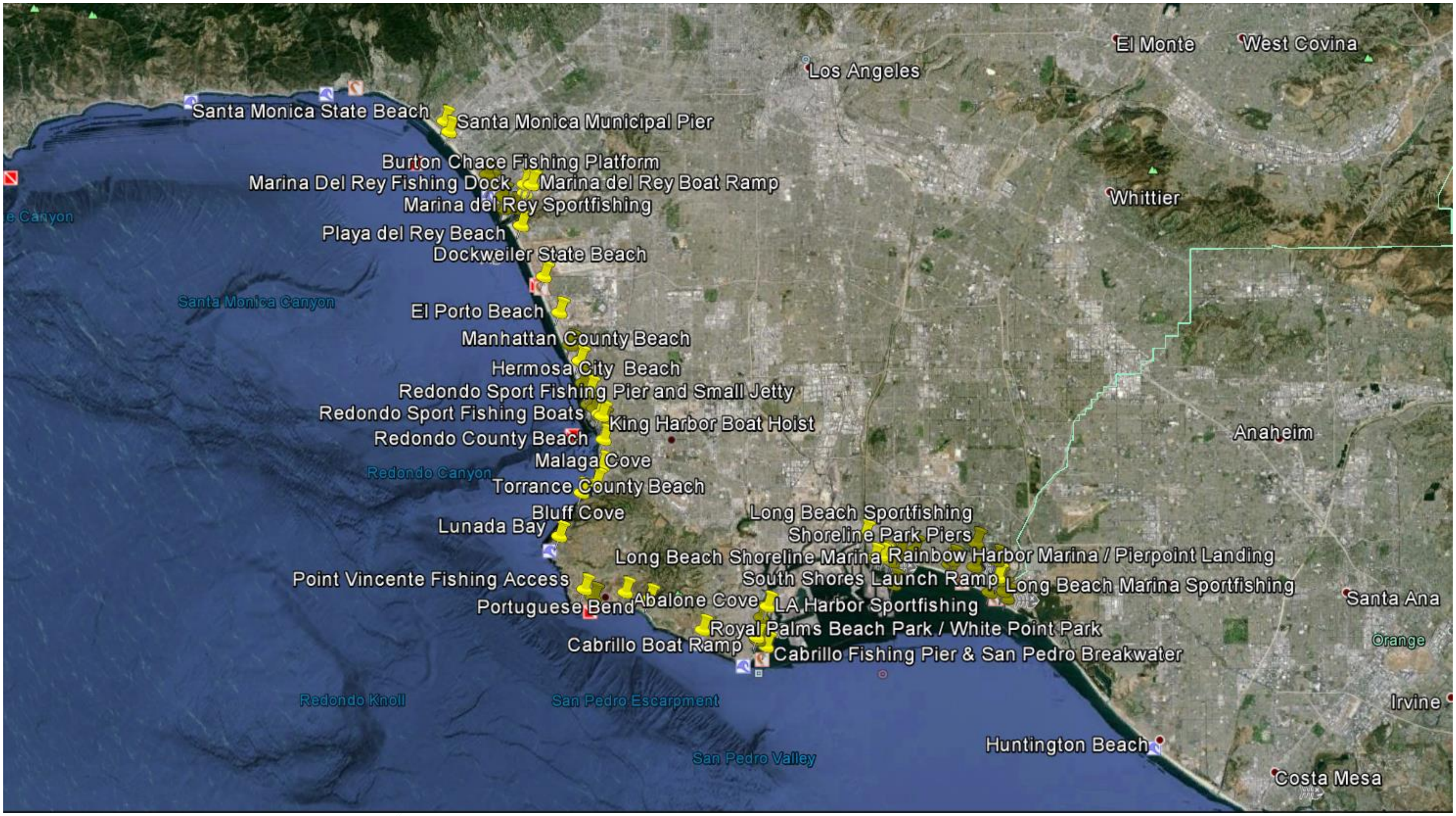
Fishing Mode	Code	Description
Piers and jetties	1	morning (08:00-12:00) afternoon (12:00-16:00) evening (16:00-20:00)
Private boats	2	morning (08:00-12:00) afternoon (12:00-16:00) evening (16:00-20:00)
Party boats	3	late morning (10:30-14:30) afternoon (14:30-18:30)
Beaches and Rocky Intertidal Zones	4	conducted prior to associated Pier/Jetty surveys for 1 hr

List of Fishing Locations

Name	Region Code	Type Number	Associated Pier/Jetty
Santa Monica State Beach	A	4	Santa Monica Municipal Pier
Santa Monica Municipal Pier	A	1	
Venice City Beach	A	4	Venice Fishing Pier
Venice Fishing Pier	A	1	
Marina del Rey Boat Ramp	A	2	
Burton Chace Fishing Platform	A	4	Marina del Rey Jetty
Marina del Rey Beach	A	4	Marina del Rey Jetty
Marina del Rey Sportfishing	A	3	
Marina del Rey Fishing Dock	A	4	Marina del Rey Jetty
Marina del Rey Jetty	A	1	
Ballona Creek Bridge and Jetties	A	1	
Playa Del Rey Beach	A	4	Ballona Creek Bridge and Jetties
Dockweiler State Beach	A	4	Standalone
El Porto Beach	B	4	Standalone
Manhattan Beach Municipal Pier	B	1	
Manhattan County Beach	B	4	Manhattan Beach Municipal Pier
Hermosa Beach Municipal Pier	B	1	
Hermosa City Beach	B	4	Hermosa Beach Municipal Pier
King Harbor Breakwater	B	1	
Rocky Point Skiff Rentals	B	2	
Rocky Point Charters	B	3	
Redondo Sport Fishing Boats	B	3	
Redondo Sport Fishing Pier and Small Jetty	B	1	
King Harbor Boat Hoist	B	2	
King Harbor South Jetty	B	1	
Redondo Beach Municipal Pier	B	1	
Redondo County Beach	B	4	Redondo Beach Municipal Pier

Torrance County Beach	C	4	Standalone
Malaga Cove	C	4	Standalone
Bluff Cove	C	4	Standalone
Lunada Bay	C	4	Standalone
Abalone Cove	C	4	Standalone
Portuguese Bend	C	4	Standalone
Royal Palms Beach / White Point Beach	C	4	Standalone
Cabrillo Fishing Pier	C	1	
San Pedro Breakwater	C	1	
Cabrillo Beach	C	4	Cabrillo Fishing Pier & San Pedro Breakwater
Cabrillo Boat Ramp	C	2	
22nd Street Landing	C	3	
LA Harbor Sportfishing	D	3	
Pier J	D	1	
Long Beach Sportfishing	D	3	
South Shores Launch Ramp	D	2	
Rainbow Harbor Marina / Pierpoint Landing	D	1	
Shoreline Park Piers	D	1	
Shoreline Village	D	4	Shorline Village Park Piers
Shoreline Marina Piers	D	1	
Shoreline Village East Jetty	D	1	
Cherry Beach	D	4	Shoreline Village East Jetty and Shoreline Marina Piers
Belmont Pier	D	1	
Belmont Pier Launch Area	D	2	
Granada Launch Ramp	D	2	
Claremont Launch Ramp	D	2	
Bayshore	D	4	Belmont Pier
Marine Stadium Launch Area	D	2	
Davies Launch Ramp	D	2	
Long Beach Marina Sportfishing	D	3	
Alamitos Bay West Jetty	D	1	
Seaport Village Jetty	D	1	
Seal Beach	D	4	Seal Beach Pier
Seal Beach Pier	D	1	

Map of Fishing Locations



APPENDIX B

QUESTIONNAIRES IN ENGLISH, SPANISH, VIETNAMESE, CHINESE AND TAGALOG

English Questionnaire

Participant Questionnaire

Survey ID ____________________

Shift # ____________________

COMPLETE BY SURVEYOR PRIOR TO INTERVIEW

Surveyor ______________ Date __________ Time _________

Location ____________________

Mode (circle one) Pier/Jetty Private boat Party boat Beach

MAP SHOW REGIONAL MAP TO ANGLER
SHOW FISH MODEL TO ANGLER

I'd like to start by asking you for some information about your fishing experiences.

Q1. How many years have you fished between Santa Monica Pier and Seal Beach Pier? MAP

____

Q2. In the past year and including this trip, have you fished in this region from... MAP

- 1 a pier?
- 2 a jetty?
- 3 private boat?
- 4 party boat?
- 5 beach or intertidal zone?
- 6 Any others? (specify) ____________________
- 8 DON'T KNOW
- 9 REFUSED

Now I'd like to ask you a few questions about the fish you or someone you know catch in this region. MAP

Q3. During the past four weeks, have you eaten fish caught in this region? MAP

- 0 NO (SKIP TO Q7)
- 1 YES
- 8 DON'T KNOW (SKIP TO Q7)
- 9 REFUSED (SKIP TO Q7)

Q4. During the past four weeks, how many times have you eaten fish caught in this region? MAP

____

Q5. What parts of the fish you catch do you usually eat?

- 1 Whole with guts
- 2 Whole without guts
- 3 As steaks or fillets without the skin
- 4 As steaks or fillets with the skin
- 5 Other parts of fish (specify) ________
- 8 DON'T KNOW
- 9 REFUSED

IF MORE THAN ONE ANSWER GIVEN FOR Q5, ASK:

Q5a. Which way do you eat it most often? ________

Q6. For fish caught in this region MAP, how much do you usually eat at any one time compared to this model?

- 1 About this amount
- 2 About half this amount
- 3 About twice this amount
- 4 More than twice this amount

Q7. Have you caught any fish today?

- 0 NO
- 1 YES (SKIP TO Q8)
- 9 REFUSED (SKIP TO Q16)

Q7a. Did you throw any back?

- 0 NO (SKIP TO Q16)
- 1 YES (SKIP TO Q16)
- 9 REFUSED (SKIP TO Q16)

Q8. May I see what you've caught today?

- 0 NO
- 1 YES (SKIP TO Q9)

Q8a: May I ask why not?

____

TURN OVER AND COMPLETE FISH SURVEYS

Next I'd like to ask you a few questions about health warnings regarding eating fish caught in this region. MAP

Q21. Have you seen or heard any health warnings related to eating fish caught in this region? MAP

- 0 NO (SKIP TO Q22)
- 1 YES
- 8 DON'T KNOW (SKIP TO Q22)
- 9 REFUSED (SKIP TO Q22)

Q21a. What did this warning say?

- 1 Do not eat White Croaker
- 2 Do not eat Barred Sand Bass
- 3 Do not eat Black Croaker
- 4 Do not eat Topsmelt
- 5 Do not eat Barracuda
- 6 Protect your health
- 7 Fish are contaminated
- 8 Only eat small amounts
- 9 OTHER (specify) ____________________
- 88 DON'T KNOW
- 99 REFUSED

Q21b. Where have you seen or heard this warning?

- 1 Television
- 2 Newspaper or magazine article
- 3 Signs on the beaches or piers
- 4 Other fishermen or friends
- 5 Other (specify) ____________________
- 8 DON'T KNOW
- 9 REFUSED

Q21c. How has this warning changed your fishing or fish-eating habits?

____

Q21d. Do you think these warnings are…

- 1 Very important?
- 2 Important?
- 3 Somewhat important?
- 4 Not important?
- 8 DON'T KNOW
- 9 REFUSED

Finally, I'd like to ask you a few questions about yourself. Remember that your answers will be kept strictly confidential.

Q22. What is your zip code? ____________________

- 88888 DON'T KNOW
- 99999 REFUSED

Q23. Including yourself, how many people are currently living in your household? ____________________

- 88 DON'T KNOW
- 99 REFUSED

Q24. In what year were you born? ____________________

- 8 DON'T KNOW
- 9 REFUSED

Q25. Are you of Hispanic, Latino/a, or Spanish origin?

- 0 NO
- 1 YES
- 8 DON'T KNOW
- 9 REFUSED

Q26. What is your race? (CHOOSE ALL THAT APPLY)

- 1 White
- 2 Black or African American
- 3 Hispanic, Latino/a, or Spanish
- 4 American Indian or Alaska Native
- 5 Asian (specify)
  - 6 Asian Indian
  - 7 Chinese
  - 8 Filipino
  - 9 Japanese
  - 10 Korean
  - 11 Vietnamese
  - 12 Other Asian (specify) ____________________
- 13 Pacific Islander (specify)
  - 14 Native Hawaiian
  - 15 Guamanian or Chamorro
  - 16 Samoan
  - 17 Other Pacific Islander (specify) ____________________
- 18 Other (specify) ____________________
- 88 DON'T KNOW
- 99 REFUSED

You may be asked to do another survey in the future. If we can **connect today's answers to your future answers it improves our** education efforts. Giving us your initials and birth date allows us to connect the answers without identifying you.

Q27. What are the first letters of your first and last names? ______ ______

- 8 DON'T KNOW
- 9 REFUSED

Q28. What is your birth date? ______/______/______

- 88/88/8888 DON'T KNOW
- 99/99/9999 REFUSED

Thank you for taking the time to do this survey.

TURN OVER AND COMPLETE BOTTOM SECTION

Participant Questionnaire

NOTE: USE 8 TO DENOTE **"DON'T KNOW"** RESPONSES AND 9 TO DENOTE "REFUSED" RESPONSES

Bucket Count, Identification, and Behavior

FOR EACH FISH TYPE IN ANGLER'S BUCKET, ASK Q9 – Q15.	Fish Species (WRITE IN VERTICALLY)								
	A	B	C	D	E	F	G	H	I
In order to understand more about the types of fish caught in this area we would like to measure the length of the fish. Would that be okay with you? Q9_FISH. NOTE NAME OF FISH TYPE IN BUCKET → →									
Q9. Number of fish in possession.									
Q10. Total length of fish (in inches).									
Q11. What do you call this fish? 1 – CORRECTLY IDENTIFIED 2 – INCORRECTLY IDENTIFIED									
IF Q11=2, NOTE INCORRECT NAME → → →									
Q12. In the past four weeks, how many times have you eaten this fish?									
Q13. What do you usually do with this fish? 1 – Eat them 2 – Give away (SKIP TO NEXT FISH TYPE) 3 – Throw back (SKIP TO NEXT FISH TYPE) 4 – Bait (SKIP TO NEXT FISH TYPE) 5 – Other (specify) ________________(SKIP TO NEXT FISH TYPE)									
Q14. What parts of the fish you catch do you usually eat? 1 – Whole with guts 2 – Whole without guts 3 – As steaks or fillets without the skin 4 – As steaks or fillets with the skin 5 – Other part(s) of fish (specify)________________									
Q15. How much of this fish do you usually eat at any one time compared to this model? 1 – About this amount 2 – About half this amount 3 – About twice this amount 4 – More than twice this amount									

FOR EACH OF THE FISH TYPES ASK Q16 – Q20. SKIP FISH TYPES THAT WERE IN **ANGLER'S** BUCKET. Now I have a few questions about specific types of fish.	A. White Croaker	B. Barred Sand Bass	C. Topsmelt	D. Barracuda	E. Black Croaker
Q16. Do you ever catch (SHOW PHOTO)?					
Q17. In the past four weeks, how many times have you eaten this fish?					
Q18. What do you usually do with this fish? 1 – Eat them 2 – Give away (IF Q17=0, SKIP TO NEXT FISH TYPE) 3 – Throw back (IF Q17=0, SKIP TO NEXT FISH TYPE) 4 – Bait (IF Q17=0, SKIP TO NEXT FISH TYPE) 5 – Other (specify) ________________(IF Q17=0, SKIP TO NEXT FISH TYPE)					
Q19. What parts of the fish you catch do you usually eat? 1 – Whole with guts 2 – Whole without guts 3 – As steaks or fillets without the skin 4 – As steaks or fillets with the skin 5 – Other part(s) of fish (specify)________________					
Q20. How much of this fish do you usually eat at any one time compared to this model? 1 – About this amount 2 – About half this amount 3 – About twice this amount 4 – More than twice this amount					

TURN OVER AND COMPLETE SECOND COLUMN

TO BE COMPLETED AFTER INTERVIEW

S1. Gender ______ Male ______ Female ______ Unknown

S2. Language ______ English ______ Spanish _ Vietnamese ______ Tagalog ______ Cantonese ______ Mandarin

S3. How well did respondent understand questions? ______ Very well ______ Somewhat well ______ Not at all well

S4. How attentive was the respondent? ______ Very ______ Somewhat ______ Not at all

S5. How cooperative was the respondent? ______ Very ______ Somewhat ______ Not at all

Spanish Questionnaire

Cuestionario de participantes

ID de encuesta ____________________
N.º de turno: ____________________

PARA COMPLETAR POR EL ENCUESTADOR ANTES DE LA ENTREVISTA

Entrevistador ___________ Fecha _________ Hora __________
Ubicación ______________________________
Modo (marque uno con un círculo)
muelle / malecón   bote privado   bote de pesca de recreo   playa

MAP MOSTRAR MAPA REGIONAL AL PESCADOR
MOSTRAR MODELO DE PEZ AL PESCADOR

Me gustaría comenzar por pedirle información sobre sus experiencias de pesca.

P 1. ¿Cuántos años hace que pesca entre los muelles de Santa Mónica y Seal Beach? MAP

____

P 2. En el año pasado, e incluido este viaje, ¿ha pescado en esta región desde... MAP

- 1 un muelle?
- 2 un malecón?
- 3 un bote privado?
- 4 un bote de pesca de recreo?
- 5 la playa o zona de intermareas?
- 6 algún otro sitio? (especifique)________________
- 8 NO SABE
- 9 SE REHÚSA A RESPONDER

Ahora desearía hacerle algunas preguntas sobre los peces que usted o alguien que conozca atrapan en esta región. MAP

P 3. Durante las últimas cuatro semanas, ¿ha comido alguna vez el pescado que capturado en esta región? MAP

- 0 NO (PASE A LA P 7)
- 1 SÍ
- 8 NO SABE (PASE A P 7)
- 9 SE REHÚSA A RESPONDER (PASE A P 7)

P 4. Durante las últimas cuatro semanas, ¿cuántas veces ha comido pescado capturado en esta región? MAP

____

P 5. ¿Qué partes del pescado que captura come por lo general?

- 1 Entero, incluidas las visceras
- 2 Entero, sin las visceras
- 3 En filetes, sin piel
- 4 En filetes, con la piel
- 5 Otras partes (especifique) ____________
- 8 NO SABE
- 9 SE REHÚSA A RESPONDER

SI SE BRINDÓ MÁS DE UNA RESPUESTA PARA P5, PREGUNTE:
P 5a. ¿De qué forma lo come con más frecuencia? ________

P 6. En cuanto a lo que se pesca en esta región, MAP ¿cuánto come por lo general en una comida, comparado con este modelo?

- 1 Alrededor de esta cantidad
- 2 Alrededor de la mitad de esta cantidad
- 3 Alrededor del doble de esta cantidad
- 4 Más del doble de esta cantidad

P 7. ¿Ha pescado algo hoy?

- 0 NO
- 1 SÍ (PASE A LA P 8)
- 9 SE REHÚSA A RESPONDER (PASE A P 16)

P 7a. ¿Regresó alguno al agua?

- 0 NO (PASE A LA P 16)
- 1 SÍ (PASE A LA P 16)
- 9 SE REHÚSA A RESPONDER (PASE A P 16)

P 8. ¿Puede mostrarme lo que pescó hoy?

- 0 NO
- 1 SÍ (PASE A P 9)

P 8a. ¿Puedo preguntar por qué no?

____

VUELVA LA PÁGINA Y COMPLETE LAS PREGUNTAS SOBRE LA LOS PESCADOS

A continuación desearía preguntarle sobre advertencias de salud relacionadas con comer pescado atrapado en esta región. MAP

P 21. ¿Ha visto o oído alguna advertencia sobre salud relacionada con comer pescado atrapado en esta región? MAP

- 0 NO (PASE A P 22)
- 1 SÍ
- 8 NO SABE (PASE A P 22)
- 9 SE REHÚSA A RESPONDER(PASE A P 22)

P 21a. ¿Qué recomendaba la advertencia?

- 1 No coma corvina blanca contaminados
- 2 No coma cabrilla cantidades
- 3 No coma corvina negra
- 4 No coma pejerrey
- 5 No coma barracuda
- 6 Proteja su salud
- 7 Los peces están
- 8 Coma sólo pequeñas
- 9 OTRAS (especifique) ____________
- 88 NO SABE
- 99 SE REHÚSA A RESPONDER

P 21b. ¿Dónde vio o oyó la advertencia?

- 1 Televisión
- 2 Artículo en un periódico o revista
- 3 Carteles colocados en las playas o muelles
- 4 Otros pescadores o amigos
- 5 OTRAS (especifique) ____________
- 8 NO SABE
- 9 SE REHÚSA A RESPONDER

P 21c. ¿En qué cambió esta advertencia sus hábitos de pesca o de comer pescado?

____

P 21d. ¿Cree que estas advertencias...

- 1 son muy importantes?
- 2 son importantes?
- 3 tienen alguna importancia?
- 4 no son importantes?
- 8 NO SABE
- 9 SE REHÚSA A RESPONDER

Por último, desearía hacerle unas preguntas sobre usted.
Quiero recordarle que todas las respuestas que brinde gozarán de estricta confidencialidad.

P 22. ¿Cuál es su código postal? ____________

- 88888 NO SABE
- 99999 SE REHÚSA A RESPONDER

P 23. ¿Cuántas personas viven en la actualidad en su hogar, incluido usted?

____

- 88 NO SABE
- 99 SE REHÚSA A RESPONDER

P 24. ¿En qué año nació? ____________

- 8 NO SABE
- 9 SE REHÚSA A RESPONDER

P 25. ¿Es usted de origen hispano, latino o español?

- 0 NO
- 1 SÍ
- 8 NO SABE
- 9 SE REHÚSA A RESPONDER

P 26. ¿De qué origen es? (ELIJA TODAS LAS RESPUESTAS QUE CORRESPONDAN)

- 1 raza blanca
- 2 raza negra o afroamericana
- 3 hispano, latino o español
- 4 indoamericano o nativo de Alaska
- 5 asiático (especifique)
  - 6 indoasiático
  - 7 chino
  - 8 filipino
  - 9 japonés
  - 10 coreano
  - 11 vietnamita
  - 12 otro origen asiático (especifique) ____________
- 13 de una isla del Pacífico (especifique)
  - 14 nativo de Hawai
  - 15 de Guam o chamorro
  - 16 samoano
  - 17 de otra isla del Pacífico (especifique) __________
- 18 otro (especifique) ________________
- 88 NO SABE
- 99 SE REHÚSA A RESPONDER

Usted puede pedir que haga otro estudio en el futuro. Si podemos conectar las respuestas de hoy a sus futras respuestas que mejora nuestros esfuerzos de educación. Dándonos sus iniciales y fecha de nacimiento nos permite conectar las respuestas, sin identificarlo.

Q27. ¿Cuáles son las primeras letras de su nombre y apellido? ______ ______

- 8 NO SABE
- 9 SE REHÚSA A RESPONDER

Q28. ¿Cuál es su fecha de nacimiento? ________/________/________

- 88/88/8888 NO SABE
- 99/99/9999 SE REHÚSA A RESPONDER

Gracias por tomarse el tiempo para tomar este estudio.

VUELVA LA PÁGINA Y COMPLETE LA SECCIÓN INFERIOR

Cuestionario de participantes

NOTA: UTILICE UN 8 PARA INDICAR QUE RESPONDE "NO SABE" Y UN 9 PARA INDICAR QUE "SE REHÚSA A RESPONDER"

Recuento e identificación de cubetas y comportamiento									
PARA CADA TIPO DE PESCADO EN LA CUBETA DEL PESCADOR, HAGA LAS PREGUNTAS P 9 A P 15.	Especies de pescado (ESCRIBA EN SENTIDO VERTICAL)								
A fin de entender más sobre los tipos de peces que se atrapan en esta área, nos gustaría medir la longitud del pescado. ¿Le parece bien? P 9. PESCADO. ANOTE EL NOMBRE DEL TIPO DE PESCADO EN LA CUBETA →→	A	B	C	D	E	F	G	H	I
P 9. Cantidad de pescados en su posesión.									
P 10. Longitud total del pescado (en pulgadas).									
P 11. ¿Cómo se llama este pescado? 1 - IDENTIFICADO EN FORMA CORRECTA 2 - IDENTIFICADO EN FORMA INCORRECTA									
SI P 11 = 2, ANOTE EL NOMBRE INCORRECTO → → →									
P 12. En las últimas cuatro semanas, ¿cuántas veces comió este pescado?									
P 13. ¿Qué hace por lo general con este pescado? 1 - comerlo 2 - obsequiarlo (PASE AL TIPO DE PESCADO SIGUIENTE) 3 - regresarlo al agua (PASE AL TIPO DE PESCADO SIGUIENTE) 4 - usarlo como carnada (PASE AL TIPO DE PESCADO SIGUIENTE) 5 - otro (especifique)____________________ (PASE AL TIPO DE PESCADO SIGUIENTE)									
P 14. ¿Qué partes del pescado que captura come por lo general? 1 - Entero, incluidas las vísceras 2 - Entero, sin las vísceras 3 - En filetes, sin piel 4 - En filetes, con la piel 5 - Otra/s parte/s (especifique) ____________________									
P 15. ¿Cuánto del pescado come por lo general en una sola comida, en comparación con este modelo? 1 - Alrededor de esta cantidad 2 - Alrededor de la mitad de esta cantidad 3 - Alrededor del doble de esta cantidad 4 - Más del doble de esta cantidad									

PARA CADA UNO DE LOS TIPOS DE PESCADO, HAGA LAS PREGUNTAS P 16 A P 20. PASE POR ALTO LOS TIPOS DE PESCADO QUE ESTABAN EN LA CUBETA DEL PESCADOR. Ahora tengo unas preguntas sobre tipos específicos de pescado.	A. corvina blanca	B. cabrilla	C. pejerrey	D. barracuda	E. corvina negra
P 16. ¿Alguna vez pesca (MUESTRE LA FOTO)?					
P 17. En las últimas cuatro semanas, ¿cuántas veces comió este pescado?					
P 18. ¿Qué hace por lo general con este pescado? 1 - comerlo 2 - obsequiarlo (SI P 17 = 0, PASE AL TIPO DE PESCADO SIGUIENTE) 3 - regresarlo al agua (SI P 17 = 0, PASE AL TIPO DE PESCADO SIGUIENTE) 4 - usarlo como carnada (SI P 17 = 0, PASE AL TIPO DE PESCADO SIGUIENTE) 5- otro (especifique) ________ (SI P 17 = 0, PASE AL TIPO DE PESCADO SIGUIENTE)					
P 19. ¿Qué partes del pescado que captura come por lo general? 1 - Entero, incluidas las vísceras 2 - Entero, sin las vísceras 3 - En filetes, sin piel 4 - En filetes, con la piel 5 - Otra/s parte/s (especifique) ____________________					
P 20. ¿Cuánto del pescado come por lo general en una sola comida, en comparación con este modelo? 1- Alrededor de esta cantidad 2 - Alrededor de la mitad de esta cantidad 3 - Alrededor del doble de esta cantidad 4 - Más del doble de esta cantidad					

VUELVA LA PÁGINA Y COMPLETE LA SEGUNDA COLUMNA

PARA COMPLETAR LUEGO DE LA ENTREVISTA

S 1. Sexo ______ Masculino ______ Femenino ____ Desconocido

S 2. Idioma ______ inglés ______ español vietnamita ______ tagalo ______ cantonés ______ mandarín

S 3. ¿En qué medida el encuestado entendió las preguntas? _____ muy bien _____ bastante bien ______ nada bien

S 4, ¿Qué tan atento estuvo el encuestado? _____ muy _____ algo _____ no prestaba atención

S 5. ¿Cuán cooperativo fue el encuestado? _____ muy _____ algo _____ no cooperó en absoluto

Vietnamese Questionnaire

Câu hỏi dành cho người tham gia

Survey ID ________
Shift # ________

NGƯỜI KHẢO SÁT HOÀN THÀNH TRƯỚC KHI PHỎNG VẤN
Tên người khảo sát___ Ngày_________Giờ ___________
Địa điểm ______________________________
Phương thức (khoanh vào một lựa chọn)
bến tàu /cầu tàu thuyền riêng thuyền của nhóm bãi biển

BẢN ĐỒ CHO NGƯỜI CÂU CÁ XEM BẢN ĐỒ KHU VỰC
CHO NGƯỜI CÂU CÁ XEM MÔ HÌNH ĐÁNH CÁ

Tôi xin được bắt đầu hỏi một số thông tin về kinh nghiệm đánh bắt cá của quý vị.

CH 1. Quý vị đã đánh bắt cá ở khu vực giữa bến tầu Santa Monica và bến tầu Seal Beach được bao nhiêu năm rồi? BẢN ĐỒ

____

CH 2. Trong năm qua và cả trong chuyến đi này quý vị đã từng đánh bắt trong khu vực này từ... BẢN ĐỒ

- 1 bến tầu?
- 2 cầu tàu?
- 3 thuyền riêng?
- 4 thuyền của nhóm?
- 5 bãi biển hoặc vùng liên triều?
- 6 Khu vực nào khác? (cụ thể)__________
- 8 KHÔNG BIẾT
- 9 TỪ CHỐI TRẢ LỜI

Bây giờ tôi muốn hỏi quý vị về một số thông tin về loài cá mà quý vị hoặc người mà quý vị biết đã đánh bắt được trong khu vực này. BẢN ĐỒ

CH 3. Trong bốn tuần qua, quý vị đã từng ăn cá đánh bắt được trong khu vực này chưa? BẢN ĐỒ

- 0 KHÔNG (CHUYỂN QUA **CH 7**)
- 1 CÓ
- 8 KHÔNG BIẾT (CHUYỂN QUA **CH 7**)
- 9 TỪ CHỐI TRẢ LỜI (CHUYỂN QUA **CH 7**)

CH4. Trong bốn tuần qua, quý vị đã ăn cá đánh bắt được trong khu vực này bao nhiêu lần? BẢN ĐỒ

____

CH 5. Quý vị thường ăn những bộ phận nào của cá đã đánh bắt được?

- 1 Toàn bộ con cá kể cả ruột
- 2 Toàn bộ con cá trừ ruột
- 3 Lát cá hoặc khúc cá không có da
- 4 Lát cá hoặc khúc cá có da
- 5 Các phần khác của con cá (cụ thể) _______
- 8 KHÔNG BIẾT
- 9 TỪ CHỐI TRẢ LỜI

NẾU QUÝ VỊ CÓ TỪ MỘT ĐÁP ÁN TRỞ LÊN VỚI CH 5 THÌ TRẢ LỜI THÊM CÂU HỎI SAU:
CH 5a. Quý vị hay ăn cá theo cách nào nhất? ________

CH 6. Đối với cá được đánh bắt trong vùng này BẢN ĐỒ mỗi lần ăn, quý vị thường ăn bao nhiêu cá so với mô hình dưới đây?

- 1 Một lượng bằng khoảng lượng như thế này
- 2 Một lượng bằng nửa lượng như thế này
- 3 Một lượng khoảng gấp hai lần lượng như thế này
- 4 Một lượng hơn gấp hai lần lượng như thế này

CH7. Hôm nay quý vị đã bắt được con cá nào chưa?

- 0 CHƯA
- 1 RỒI (CHUYỂN QUA **CH 8**)
- 9 TỪ CHỐI TRẢ LỜI (CHUYỂN QUA **CH 16**)

CH7a. Quý vị có vứt bỏ lại con cá nào không?

- 0 KHÔNG (CHUYỂN QUA **CH 16**)
- 1 CÓ (CHUYỂN QUA **CH 16**)
- 9 TỪ CHỐI TRẢ LỜI (CHUYỂN QUA **CH16**)

CH8. Tôi có thể xem quý vị đã bắt được gì trong ngày hôm nay không?

- 0 KHÔNG
- 1 CÓ (CHUYỂN QUA **CH 9**)

CH8a: Tôi có thể biết vì sao quý vị không bắt được con cá nào không?

____

LẬT SANG VÀ TRẢ LỜI NỐT PHẦN KHẢO SÁT VỀ CÁ

Tiếp theo tôi muốn hỏi quý vị một số câu hỏi về những cảnh báo về sức khỏe có liên quan đến việc ăn cá đã đánh bắt được trong khu vực này. BẢN ĐỒ

CH21. Quý vị đã từng nhìn thấy hoặc nghe thấy bất cứ các cảnh báo về sức khỏe có liên quan đến việc ăn cá đánh bắt được trong khu vực này chưa? BẢN ĐỒ

- 0 Chưa (CHUYỂN QUA **CH 22**)
- 1 Có
- 8 KHÔNG BIẾT (CHUYỂN QUA **CH 22**)
- 9 TỪ CHỐI TRẢ LỜI (CHUYỂN QUA **CH 22**)

CH 21a. Những cảnh báo đó nói gì?

- 1 Không được ăn cá lù đù trắng
- 2 Không được ăn cá vược cát vằn
- 3 Không ăn được cá lù đù đen
- 4 Không được ăn cá hanh sọc
- 5 Không ăn cá nhồng
- 6 Bảo vệ sức khỏe của quý vị
- 7 Cá bị ô nhiễm
- 8 Chỉ ăn một ít
- 9 KHÁC(cụ thể) __________
- 88 KHÔNG BIẾT
- 99 TỪ CHỐI TRẢ LỜI

CH 21b. Quý vị đã từng nhìn thấy hay nghe thấy cảnh báo này ở đâu?

- 1 Tivi
- 2 Báo hoặc tạp chí
- 3 Biển báo trên bờ biển hoặc bến tầu
- 4 Thợ bắt cá khác/hoặc bạn bè
- 5 Khác (cụ thể) __________
- 8 KHÔNG BIẾT
- 9 TỪ CHỐI TRẢ LỜI

CH 21c. Cảnh báo này đã thay đổi thói quen đánh bắt hoặc thói quen ăn cá của quý vị như thế nào?

____

CH 21d. Quý vị có nghĩ những cảnh báo này là...

- 1 Rất quan trọng?
- 2 Quan trọng?
- 3 Hơi quan trọng?
- 4 Không quan trọng?
- 8 KHÔNG BIẾT
- 9 TỪ CHỐI TRẢ LỜI

Cuối cùng, tôi xin được hỏi quý vị một số câu hỏi về chính quý vị. Tôi muốn nhắc lại là tất cả các câu trả lời mà quý vị đưa ra đều được giữ bí mật tuyệt đối .

CH 22. zip code của quý vị là gì? ________________
88888 KHÔNG BIẾT 99999 KHÔNG TRẢ LỜI

CH 23. Kể cả quý vị, có bao nhiêu người hiện đang sống trong gia đình của quý vị?________________
88 KHÔNG BIẾT 99 TỪ CHỐI TRẢ LỜI

CH 24. Quý vị sinh năm nào? ________________
8 KHÔNG BIẾT 9 TỪ CHỐI TRẢ LỜI

CH 25. Quý vị có nguồn gốc là người từ Hispanic, Latino/a, hay Tây Ban Nha không?

- 0 KHÔNG
- 1 CÓ
- 8 KHÔNG BIẾT
- 9 TỪ CHỐI TRẢ LỜI

CH 26. Chủng tộc của quý vị là? (CHỌN TẤT CẢ MỤC PHÙ HỢP)

- 1 Da trắng
- 2 Da đen hoặc người Mỹ gốc Phi
- 3 Hispanic, Latino/a, hoặc Tây Ban Nha
- 4 Ấn Độ Mỹ hoặc người Alaska bản địa
- 5 Châu Á (cụ thể)
  - 6 Ấn Độ
  - 7 Trung Quốc
  - 8 Philipin
  - 9 Nhật
  - 10 Hàn Quốc
  - 11 Việt Nam
  - 12 Người châu Á khác (cụ thể) __________
- 13 Dân đảo Thái Bình Dương (cụ thể)
  - 14 Người Hawai bản địa
  - 15 Người Guamania hoặc Chamorro
  - 16 Người Xa – mô - a
  - 17 Người dân đảo Thái Bình Dương (cụ thể) _______
- 18 Khác (cụ thể) __________
- 88 KHÔNG BIẾT
- 99 TỪ CHỐI

Bác có thể sẽ làm một khảo sát khác trong tủong lai. Nếu chúng tôi có thể liên kết các câu trả lời hôm nay với các câu trả lời trong tủong lai thì kiến thức của chúng tôi sẽ tốt hỏn. Bác cho tên tắt và ngày sinh để chúng tôi có thể liên kết các câu trả lời mà không phải nhận diện bác.

Q27. Chữ đầu tiên của tên và họ?____ ____
8 KHÔNG BIẾT 9 TỪ CHỐI TRẢ LỜI

Q28. Ngày sinh của bác là gì ?______/_______/_________
88/88/8888 KHÔNG BIẾT 99/99/9999 TỪ CHỐI TRẢ LỜI

Cảm ơn bác đã để thí giờ trả lời cuộc khảo sát này.

LẬT SANG VÀ TRẢ LỜI NỐT PHẦN CUỐI

Câu hỏi dành cho người tham gia

GHI CHÚ: DÙNG SỐ 8 ĐỂ BIỂU THỊ CHO CÂU TRẢ LỜI **"KHÔNG BIẾT"** VÀ SỐ 9 ĐỂ BIỂU THỊ CHO CÂU TRẢ LỜI **"TỪ CHỐI TRẢ LỜI"**

Đếm thùng, nhận biết, và hành vi									
ĐỐI VỚI MỖI LOẠI CÁ TRONG THÙNG **CỦA NGƯỜI** CÂU, HỎI TỪ **CH 9 ĐẾN** CH 15	Loại cá (Viết theo cột thẳng đứng)								
Để hiểu thêm về những loại **cá đã đánh bắt được** trong khu vực này chúng tôi muốn **đo độ** dài của cá. Quý **vị có đồng** ý không? CH 9_CÁ. GHI TÊN LOẠI CÁ TRONG THÙNG → →	A	B	C	D	E	F	G	H	I
CH 9. Số cá sở hữu.									
CH 10. Tổng độ dài của cá (tính bằng inch).									
CH 11. Quý vị gọi loại cá này là gì? 1 – ĐƯỢC NHẬN BIẾT CHÍNH XÁC 2 – KHÔNG ĐƯỢC NHẬN BIẾT CHÍNH XÁC NẾU CH 11=2, **GHI TÊN KHÔNG ĐÚNG** → → →									
CH 12. Trong bốn tuần qua, quý vị đã ăn loại cá này bao nhiêu lần?									
CH 13. Quý vị thường làm gì với loại cá này? 1 – Ăn 2 – Vứt đi (CHUYỂN QUA LOẠI CÁ TIẾP THEO) 3 – Vứt trả lại (CHUYỂN QUA LOẠI CÁ TIẾP THEO) 4 – Dùng làm mồi (CHUYỂN QUA LOẠI CÁ TIẾP THEO) 5 – Khác (cụ thể)____________________(CHUYỂN QUA LOẠI CÁ TIẾP THEO)									
CH 14. Quý vị thường ăn những phần nào của con cá mà quý vị đã đánh bắt được? 1 – Toàn bộ con cá kể cả ruột 2 – Toàn bộ con cá trừ ruột 3 – Lát cá hoạt khúc cá không có da 4 – Lát cá hoặc khúc cá có da 5 – Các phần khác của con cá (cụ thể)__________________________									
CH 15. Mỗi lần ăn bất kỳ, quý vị thường ăn bao nhiêu cá này so với mô hình dưới đây? 1 – Một lượng khoảng bằng lượng như thế này 2 – Một lượng khoảng một nửa lượng như thế này 3 – Một lượng khoảng gấp hai lần lượng như thế này 3 – Một lượng nhiều hơn gấp hai lần lượng như thế này									

ĐỐI VỚI MỖI LOẠI CÁ HỎI TỪ CH 16 – CH 20. BỎ QUA NHỮNG LOẠI **CÁ ĐÃ CÓ TRONG THÙNG CỦA NGƯỜI** CÂU. Bây giờ **tôi xin đưa ra một** số câu hỏi về các loại cá cụ thể.	**A. Cá lù đù** trắng	**B. Cá vược** cát vằn	C. Cá Hanh sọc	D. Cá Nhồng	**E. Cá lù đù đen**
CH 16. Quý vị đã từng bắt (Cho xem ảnh)?					
CH 17. Trong bốn tuần qua, quý vị đã ăn loại cá này bao nhiêu lần?					
CH 18. Quý vị thường làm gì với loại cá này? 1 – Ăn 2 – Vứt đi (NẾU CH 17=0, CHUYỂN QUA LOẠI CÁ TIẾP THEO) 3 – Vứt trả lại (NẾU CH 17=0, CHUYỂN QUA LOẠI CÁ TIẾP THEO) 4 – Làm mồi câu (NẾU CH 17=0, CHUYỂN QUA LOẠI CÁ TIẾP THEO) 5 – Khác (cụ thể)_________(NẾU CH 17=0, CHUYỂN QUA LOẠI CÁ TIẾP THEO)					
CH 19. Quý vị thường ăn những phần nào của con cá đã đánh bắt được? 1 – Toàn bộ con cá kể cả ruột 2 – Toàn bộ con cá trừ ruột 3 – Lát cá hoặc khúc cá không có da 4 – Lát cá hoặc khúc cá có da 5 – Những phần khác của con cá (cụ thể)____________________________					
CH 20. Mỗi lần ăn bất kỳ, quý vị thường ăn bao nhiêu mỗi lần so với lượng dưới đây? 1 – Một lượng khoảng bằng lượng như thế này 2 – Một lượng khoảng một nửa lượng như thế này 3 – Một lượng khoảng gấp hai lần lượng như thế này 4 – Một lượng nhiều hơn gấp hai lần lượng như thế này					

LẬT SANG VÀ HOÀN TẤT CỘT THỨ HAI

HOÀN THÀNH SAU KHI PHỎNG VẤN

S1. Giới tính _______ Nam _______ Nữ __ không rõ

S2. Ngôn ngữ _______ Tiếng Anh_____Tiếng Tây Ban Nha _____ Tiếng Việt _____ Tiếng Tagalog __ Tiếng Quảng Đông __ Tiếng Quan thoại

S3. **Người** trả lời hiểu câu hỏi **như thế** nào? _____ Rất rõ _________ hiểu một phần _______ không hiểu

S4. **Người** trả lời **chăm chú như thế** nào? _____ Rất chăm chú_____ Chăm chú một phần____ Không chăm chú lắm

S5. **Người** trả lời hợp tác **như thế** nào? _____ Rất hợp tác _____ Hợp tác một phần ____ Không hợp tác

Chinese Questionnaire

參與者問卷調查

問卷編號 ______________
輸值編號 ______________

由訪員在訪談前填寫

訪員 __________ 日期 __________ 時間 __________
地點 ______________________
模式（請圈選一項） 碼頭/堤防　私人遊艇　娛樂漁船　海灘

MAP 向釣客出示區域地圖
向釣客釣者出示魚模型

我想先請問一些與您釣魚經驗的相關資訊。

問題 1. 您在聖塔莫尼卡碼頭 (Santa Monica Pier) 和海豹灘碼頭 (Seal Beach Pier) 釣魚有幾年了？
____

問題 2.
過去的一年中，MAP 這次在內，您曾經在這個區域的以下地點釣過魚嗎？

1 碼頭？
2 堤防？
3 私人遊艇？
4 娛樂漁船？
5 海灘或潮間帶？
6 任何其他地點？（請註明）__________
8 不知道
9 拒答

現在我想請問關於您或您認識的人在此區域釣魚的幾個問題。 MAP

問題 3. 在過去四個星期中，您有沒有吃過在這個區域釣到的魚？MAP

0 沒有（跳至**問題** 7）
1 有
8 不知道（跳至**問題** 7）
9 拒答（跳至**問題** 7）

問題 4. 在過去的四個星期中，您吃過幾次在這個區域釣到的魚？MAP
____

問題 5. 對於您釣到的魚，您通常食用哪些部位？

1 整條魚，含內臟
2 整條魚，不含內臟
3 去皮的魚柳和魚片
4 帶皮的魚柳和魚片
5 魚的其他部位（請註明）__________
8 不知道
9 拒答

若問題 5 的回答不只一個，請詢問：
問題 5a. 您最常用哪種方法吃魚？ ______________

問題 6. 對於在這個區域 MAP 釣到的魚，拿這個模型做比較，您通常一次吃多少？

1 大約這個數量
2 大約這個數量的一半
3 大約這個數量的兩倍
4 大約這個數量的兩倍以上

問題 7. 您今天釣到魚了嗎？

0 沒有
1 有（跳至**問題** 8）
9 拒答（跳至**問題** 16）

問題 7a. 您有把魚放回水中嗎？

0 沒有（跳至**問題** 16）
1 有（跳至**問題** 16）
9 拒答（跳至**問題** 16）

問題 8. 我可以看看您今天釣到的魚嗎？

0 不可以
1 可以（跳至**問題** 9）

問題 8a： 能不能告訴我為什麼不可以？
____

請檢視釣客的魚桶，並翻面填寫問卷

就食用此區域釣到的魚，接下來想請問您幾個與健康警告有關的問題。

問題 21. 您有沒有看過或聽過任何與食用這個區域釣到的魚有關的健康警告？MAP

0 沒有（跳至**問題** 22）
1 有
8 不知道（跳至**問題** 22）
9 拒答（跳至**問題** 22）

問題 21a. 該警告是什么內容？

1 不要吃白姑魚 (White Croaker)
2 不要吃星雲副鱸 (Barred Sand Bass)
3 不要吃黑姑魚 (Black Croaker)
4 不要吃擬銀漢魚 (Topsmelt)
5 不要吃梭子魚 (Barracuda)
6 保護您的健康
7 魚遭到污染
8 限少量食用
9 其他（請註明）__________
88 不知道
99 拒答

問題 21b. 您在哪裡看到或聽到該警告？

1 電視
2 報紙或雜誌文章
3 海灘或碼頭上張貼的標誌
4 其他漁夫和/或朋友
5 其他（請註明）__________
8 不知道
9 拒答

問題 21c. 該警告對您釣魚或吃魚的習慣有何改變？
____

問題 21d. 您認為這些警告...

1 非常重要？
2 重要？
3 有些重要？
4 不重要？
8 不知道
9 拒答

最後，我想請問幾個與您本身有關的問題。
請您放心，我們會對您提供的所有答案嚴格保密。

問題 22. 您的郵遞區號是？ ______________
88888 不知道　99999 拒答

問題 23. 包括您自己在內，您家裡目前住了多少人？ ______________
88 不知道　99 拒答

問題 24. 您在哪一年出生？ ______________
8 不知道　9 拒答

問題 25. 您是否為西語裔、拉丁美洲裔或西班牙裔？

0 否
1 有
8 不知道
9 拒答

問題 26. 您是什麼種族？（複選）

1 白種人
2 黑人或非裔美國人
3 西語裔、拉丁美洲裔或西班牙裔
4 美洲印第安人或阿拉斯加原住民
5 亞裔（請註明）
  6 印度人
  7 華人
  8 菲律賓人
  9 日本人
  10 韓國人
  11 越南人
  12 其他亞裔（請註明）__________
13 太平洋島民（請註明）
  14 夏威夷原住民
  15 關島人或查摩羅人
  16 薩摩亞人
  17 其他太平洋島民（請註明）__________
18 其他（請註明）__________
88 不知道
99 拒答

在未來您很可能會參與另一份問卷調查，因此如果能將您今日的回答與未來的回答作連結將對我們的研究有很大的幫助。請提供我們您的姓名縮寫以及出生年月以便我們連結您的回答。(我們並不能且不會使用此資料對您做身分鑑定)

Q27. 請問您英文名字與姓氏的縮寫? ____ ____
8 不知道　9 拒答

Q28. 請問您的生日與出生年份? ______/______/______
88/88/8888 不知道　99/99/9999 拒答

非常感謝您撥空參與這份問卷。

請翻面填寫底下部分

參與者問卷調查

注意： 以 8 代表回答「不知道」，9 代表「拒答」

對於釣客魚桶中的各種魚型，請詢問問題 9-15。									
針對釣客魚桶中各種類型的魚，請詢問問題 9-15。	**魚種（以直式書寫）**								
	A	B	C	D	E	F	G	H	I
為了更深入了解這個區域釣到魚的種類，我們想測量一下魚身的長度。 **您方便嗎？** **問題 9_魚。 註明桶中魚類型名稱 → →**									
問題 9. 魚獲的數目。									
問題 10. 魚身的總長度（以吋為單位）。									
問題 11. 您怎麼稱呼這種魚？ 1 – 正確辨識 2 – 錯誤辨識									
若問題 11=2，註明錯誤名稱 → → →									
問題 12. 在過去四個星期中，您吃過幾次這種魚？									
問題 13. 您通常如何處理這種魚？ 1 – 自己食用 2 – 送人（跳至下一種類型的魚） 3 – 放回水中（跳至下一種類型的魚） 4 – 當做魚餌（跳至下一種類型的魚） 5 – 其他（請註明）________________（跳至下一種類型的魚）									
問題 14. 就您釣到的魚，您通常食用哪些部位？ 1 – 整條魚，含內臟 2 – 整條魚，不含內臟 3 – 去皮的魚柳和魚片 4 – 帶皮的魚柳和魚片 5 – 魚的其他部位（請註明）________________									
問題 15. 用這個模型做比較，您通常一次食用多少這種魚？ 1 – 大約這個數量 2 – 大約這個數量的一半 3 – 大約這個數量的兩倍 4 – 大約這個數量的兩倍以上									

就每一種類型的魚，請詢問問題 16-20。 **跳過釣客魚桶中魚的類型。** **現在，我將詢問幾個與特定類型魚有關的問題。**	A. 白姑魚	B. 細鱗副鱸	C. 藍鰓鯛魚	D. 梭子魚	E. 黑姑魚
問題 16. 您曾經釣過 **（顯示照片）** 嗎？					
問題 17. 在過去四個星期中，您吃過這種魚幾次？					
問題 18. 您通常如何處理這種魚？ 1 – 吃掉 2 – 送人（如果問題 17=0，跳至下一種類型的魚） 3 – 放回水中（如果問題 17=0，請跳至下一種魚型，跳至下一種類型的魚） 4 – 當做魚餌（如果問題 17=0，跳至下一種類型的魚） 5 – 其他（請註明）________________（如果問題 17=0，跳至下一種類型的魚）					
問題 19. 您釣到的魚您通常食用哪些部位？ 1 – 整條魚，含內臟 2 – 整條魚，不含內臟 3 – 去皮的魚柳和魚片 4 – 帶皮的魚柳和魚片 5 – 魚的其他部位（請註明）________________					
問題 20. 拿這個模型做比較，您通常一次食用多少這種魚？ 1 – 大約這個數量 2 – 大約這個數量的一半 3 – 大約這個數量的兩倍 4 – 大約這個數量的兩倍以上					

請翻面填寫第二欄

<u>訪談後填寫</u>

S1. 性別______ 男性 ______ 女性 _ 不明

S2. 語言______ 英語 ______ 西班牙語 __________越南語_______塔加洛語 _____ 廣東話 中文

S3. 受訪者對問題的理解程度？ ____ 非常理解 ______ 有些理解 ______ 完全不理解

S4. 受訪者的專注程度？ ____ 非常專注 ____ 有些專注 ____ 完全不專注

S5. 受訪者的配合程度？ ____ 非常配合 ____ 有些配合 ____ 完全不配合

Tagalog Questionnaire

Palatanungan ng Kaalám

ID sa Pagsusuri ____________________

Paglilipat #____________________

KUMPLETUHIN NG TAGASURI BAGO ANG PANAYAM

Tagasuri __________ Petsa ____________ Oras ____________

Lugar ______________________________

Paraan (bilugan ang isa)

Pyer/Saplad   Pribadong bangka   Partidong bangka   Aplaya

MAPA IPAKITA ANG PANREHIYONG MAPA SA MAMIMINGWIT
IPAKITA ANG MODELONG ISDA SA MAMIMINGWIT

Nais kong magsimula sa pamamagitan ng pagtatanong ng ilang impormasyon tungkol sa iyong karanasan sa pamimingwit.

T1. Ilang taon ka na nagmimingwit sa pagitan ng Pyer ng Santa Monica at Pyer ng Seal Beach? MAPA

____

T2. Sa nakaraang taon at kabilang ang biyaheng ito, nakapamingwit ka na ba sa rehiyong ito sa … MAPA

- 1 pyer?
- 2 saplad?
- 3 pribadong bangka?
- 4 partidong bangka?
- 5 aplaya o intertidal na sona?
- 6 iba pa? (tukuyin)____________
- 8 HINDI KO ALAM
- 9 TUMANGGI

Ngayon nais kong magtanong saiyo ng ilang katanungan tungkol sa isda na nahuli ninyo o sinuman na kilala mo na nanghuhuli ng isda sa rehiyon na ito. MAPA

T3. Sa nakalipas na apat na linggo, nakakain ka na ba ng isda na nahuli sa rehiyon na ito? MAPA

- 0 HINDI (MAGLAKTAW HANGGANG T7)
- 1 OO
- 8 HINDI KO ALAM (MAGLAKTAW HANGGANG T7)
- 9 TUMANGGI (MAGLAKTAW HANGGANG T7)

T4. Sa nakalipas na apat na linggo, ilang beses ka na nakakain ng isa sa rehiyon na ito ? MAPA

____

T5. Anong mga bahagi ng nahuli ninyong isda ang karaniwan mong kinakain?

- 1 Lahat kasama ang laman loob
- 2 Lahat ngunit walang laman loob
- 3 Bilang bistek o kapirasong hiwa na walang balat
- 4 Bilang bistek o kapirasong hiwa na may balat
- 5 Iba pang bahagi ng isda (tukuyin) ____________
- 8 HINDI KO ALAM
- 9 TUMANGGI

KAPAG HIGIT SA ISA ANG SAGOT NA IBINIGAY SA T5, ITANONG:

T5a. Sa anong paraan mo ito laging kinakain? ____________

T6. Para sa isda na nahuli sa rehiyon na ito MAPA , gaano karami ang kadalasan niyong kinakain sa isang kainan kumpara sa modelo na ito?

- 1 Halos ganito kadami
- 2 Halos kalahati ng dami nito
- 3 Halos doble ng dami nito
- 4 Higit sa dalawa ng dami nito

T7. Nakahuli ka ba ng isda ngayon?

- 0 HINDI
- 1 OO (MAGLAKTAW HANGGANG T8)
- 9 TUMANGGI (MAGLAKTAW HANGGANG T16)

T7a. May ibinalik kang nahuli?

- 0 HINDI (MAGLAKTAW HANGGANG T16)
- 1 OO (MAGLAKTAW HANGGANG T16)
- 9 TUMANGGI (MAGLAKTAW HANGGANG T16)

T8. Maari ko bang makita kung ano ang nahuli mo ngayon?

- 0 HINDI
- 1 OO (MAGLAKTAW HANGGANG T9)

T8a: Maaari ko bang itanong bakit hindi?

IBALIK AT KUMPLETUHIN PAGSUSURI PARA SA ISDA

Kasunod, nais kong itanong sa iyo ang ilang mga katanungan tungkol sa mga babala sa kalusugan hinggil sa pagkain ng isa na nahuli sa rehiyon na ito. MAPA

T21. Nakakita o nakarinig ka na ba ng anumang babala sa kalusugan kaugnay ng pagkain ng isda na nahuli sa rehiyon na ito? MAPA

- 0 HINDI (LAKTAWAN ANG T22)
- 1 Oo
- 8 HINDI KO ALAM (LAKTAWAN ANG T22)
- 9 TUMATANGGI (LAKTAWAN ANG T22)

T21a. Ano ang sinabi ng babalang ito?

- 1 Huwag kumain ng puting Alakaak
- 2 Huwag kumain ng apahap
- 3 Huwag kumain ng itim na Alakaak
- 4 Huwag Kumain ng Topsmelt
- 5 Huwag kumain ng Barracuda
- 6 Protektahan ang iyong kalusugan
- 7 Nahawahan ang mga isda
- 8 Kumain lamang ng kaunti
- 9 IBA PA (tukuyin) ____________
- 88 HINDI KO ALAM
- 99 TUMANGGI

T21b. Saan mo nabasa o narinig ang babalang ito

- 1 Telebisyon
- 2 Pahayagan o artikulo sa magasin
- 3 Mga karatula sa aplaya at mga pyer
- 4 Iba pang mga mangigisda at/o mga kaibigan
- 5 Iba pa (tukuyin) ____________
- 8 HINDI KO ALAM
- 9 TUMATANGGI

T21k. Paano nabago nang babala na ito ang iyong pangingisda o asal sa pagkain ng isda?____________

T21e. Sa palagay mo, ang mga babalang ito ay…

- 1 Napaka halaga?
- 2 Mahalaga?
- 3 Medyo mahalaga?
- 4 Hindi mahalaga?
- 8 HINDI KO ALAM
- 9 TUMATANGGI

Sa wakas, nais kong magtanong saiyo ang ilang mga katanungan tungkol sa iyong sarili. Nais kong ipaalala saiyo na lahat ng mga sagot na iyong ibibigay ay mahigpit na pananatilihing kumpidensiyal.

T22. Ano ang iyong zip code? ____________

- 88888 HINDI KO ALAM
- 99999 TUMATANGGI

T23. Kabilang ang iyong sarili, ilang tao ang kasalukuyang nakatira saiyong tahanan? ____________

88 HINDI KO ALAM   99 TUMATANGGI

T24. Anong taon ka ipinanganak? ____________

- 8 HINDI KO ALAM
- 9 TUMATANGGI

T25. Kayo ba ay Hispaniko, Latino o Espanyol?

- 0 HINDI
- 1 OO
- 8 HINDI KO ALAM
- 9 TUMATANGGI

T26. Ano ang iyong lahi? (PILIIN ANG LAHAT NA NAAANGKOP)

- 1 Puti
- 2 Itim o Aprikano Amerikano
- 3 Hispaniko, Latino/a, o Espanyol
- 4 Indiyano Amerikano o Katutubong Alaska
- 5 Asyano (tukuyin)
  - 6 Asiyano Indiyano
  - 7 Tsino
  - 8 Filipino
  - 9 Hapon
  - 10 Koreano
  - 11 Vietnamese
  - 12 Iba pang Asyano (tukuyin) ____________
- 13 Pasipikong taga-isla (tukuyin)
  - 14 Katutubong Hawayan
  - 15 Guamanyan o Kamoro
  - 16 Samoano
- 17 Ibang pang pasipikong taga-isla (tukuyin) ____________
- 18 Iba pa (tukuyin) ____________
- 88 HINDI KO ALAM
- 99 TUMANGGI

Sa hinaharap, baka kayo are hihilingan nang ibang survey. Kung pwede naming maugnay ang inyong sagot ngayon at sa hinarap na survey, ito ay makakapabuti sa aming karunungan. Sa pagbibigay ng unang letra ng inyong pangalan at apelyido, pati ang buwan at petsa ng inyong kapanganakaan ito ay magbibigay-daan para maikonekta naming ang inyong sagot at walang gamit na palatandaan.

Q27. Ano ang unang letra nang inyong pangalan at apelyido? _____ _____

- 8 HINDI KO ALAM
- 9 TUMANGGI

Q28. Ano ang petsa nang inyong kapanganakaan? ______/______/______

- 88/88/8888 HINDI KO ALAM
- 99/99/9999 TUMANGGI

Salamat sa oras no inyong ipinaglaan para sa survey.

IBALIK AT KUMPLETUHIN PAGSUSURI PARA SA ISDA

Appendix B

Palatanungan ng Kalahok

TANDAAN: GAMITIN ANG 8 UPANG MAGPAKAHULUGAN NA **"HINDI ALAM" ANG SAGOT AT 9 UPANG MAGPAKAHULUGAN NA "TINATANGGIHAN" ANG SAGOT**

Bilang ng Balde, Pagkakakilanlan, at Asal									
SA BAWAT ISANG URI NG ISDA SA BALDE NG MAMIMINGWIT, ITANONG, T9 –T15.	Uri ng Isda (ISULAT NG PATAYO)								
Upang maunawan ng higit ang tungkol sa mga uri ng isda na nahuli sa lugar na ito, nais namin sukatin ang haba ng isda. Ayos lang ba ito sa iyo? T9_ISDA. ITALA ANG PANGALAN NG URI NG ISDA SA BALDE →	A	B	C	D	E	F	G	H	I
T9. Bilangin ng isda na nasa pagmamay-ari.									
T10. Kabuuang haba ng isda(sa pulgada).									
T11. Ano ang tawag mo sa isdang ito? 1 – NATUKOY NG WASTO 2 – HINDI WASTONG NATUKOY									
KAPAG ANG T11=2, ITALA ANG HINDI WASTONG PANGALAN → → →									
Q12. Sa nakaraang apat na linggo, ilang beses ka kumain ng isdang ito?									
Q13. Ano ang karaniwan mong ginagawa sa isda? 1 – Kinakain ang mga ito 2 – Ipinamimigay (LUMAKTAW SA SUSUNOD NA URI NG ISDA) 3 – Ibinabalik (LUMAKTAW SA SUSUNOD NA URI NG ISDA) 4 – Ipinapain (LUMAKTAW SA SUSUNOD NA URI NG ISDA) 5 – Iba pa (tukuyin) ______(LUMAKTAW SA SUSUNOD NA URI NG ISDA)									
Q14. Anong bahagi ng isda na iyong nahuli ang karaniwan mo na kinakain? 1 –Lahat pati na ang laman loob 2 –Lahat ngunit walang laman loob 3 – Bilang bistek o kapirasong hiwa nang walang balat 4 – Bilang bistek o kapirasong hiwa na may balat 5 – Iba pang (mga) bahagi ng isda (tukuyin)______________________									
T15. Gaano karami sa isdang ito ang karaniwan mong kinakain sa isang kainan kumpara sa modelong ito? 1 – Halos ganitong karami 2 – Halos kalahati ng dami nito 3 – Halos doble sa dami nito 4 – Higit sa dalawa ng dami nito									

PARA SA BAWAT URI NG ISDA, ITANONG T16 – Q20. LAKTAWAN ANG MGA URI NG ISDA NA NASA BALDE NG MAMIMINGWIT. Mayroon ako ngayon na mga katanungan tungkol sa tukoy na uri ng mga isda.	A. Puting Alakaak	B.Apahap	C. Topsmelt	D. Barakuda	E. Itim na Alakaak
T16. Nanghuhuli ka ba ng (IPAKITA ANG LARAWAN)?					
T17. Sa nakaraan na apat na linggo, ilang beses ka kumain ng isdang ito?					
T18. Ano ang karaniwan mong ginagawa sa isda? 1 – Kinakain ang mga ito 2 – Ipinamimigay (IF Q17=0, LUMAKTAW SA SUSUNOD NA URI NG ISDA) 3 – Ibinabalik (IF Q17=0, LUMAKTAW SA SUSUNOD NA URI NG ISDA) 4 – Ipinapain(IF Q17=0, LUMAKTAW SA SUSUNOD NA URI NG ISDA) 5 – Iba pa (tukuyin) _______(Kung T17=0, LUMAKTAW SA SUSUNOD NA URI NG ISDA)					
T19. Anong mga bahagi ng isda na iyong nahuli ang iyong karaniwan na kinakain? 1 – Lahat kasama ang laman loob 2 – Lahat ngunit wala ang laman loob 3 –Bilang bistek o kapirasong hiwa na walang balat 4 – Bilang bistek o kapirasong hiwa na may balat 5 – Iba pang (mga) bahagi ng isda (tukuyin)____________________________					
T20. Gaano karami ng isdang ito ang karaniwan mo na kinakain sa isang kainan kumpara sa batayan na ito? 1 – Halos ganito karami 2 – Halos kalahati ng dami nito 3 – Halos doble sa dami nito 4 – Higit sa dalawa ng dami nito					

IBALIK AT KUMPLETUHIN ANG PANGALAWANG HANAY

KUMPLETUHIN PAGKATAPOS NG PANAYAM

S1. Kasarian ________ Lalaki ________ Babae __________ Di matukoy

S2. Wika ________ Ingles___________ Espanyol ________Vietnamese ________ Tagalog ________ Cantonese ________ Mandarin

S3. Gaano kahusay naunawaan ng kaalám ang mga tanong? _____ Napakahusay ____ Medyo mahusay ___ Hindi kailanman

S4. Gaano kasigasig ang kaalám? _____ Napaka _______ Medyo _______ Hindi kailanman

S5. Gaanong matulungin ang kaalám? _____Napaka _______ Medyo _______ Hindi kailanman

APPENDIX C

SHIFT SUMMARY SHEET/REFUSAL LOG

Shift Summary Sheet/Refusal Log

SGA
EPA Seafood Consumption

Shift # ____________________

Shift Summary Sheet

Date: ____________ **Surveyor 1:** __________________ **Surveyor 2:** __________________

Location: ____

Mode:	Pier/Jetty	Party Boat	Private Boat	Beach
Region:	Central Bay	South Bay	L.A. Harbor	Long Beach
Time Period:		Morning 8:00am-12:00pm	Afternoon 12:00pm-4:00pm	Evening 4:00pm-8:00pm

Not Qualified	Male	Female
Persons not qualified due to having already done survey		

Refusals			
Male	**Female**	**Reason**	**Notes**
		Language	
		No Time	
		Not Interested	
Total: ________	Total: ________	Unknown	

Shift End Checklist

☐ Shift Summary Sheet ☐ Census ☐ Seafood Consumption Surveys

Total Surveys Completed

Surveyor 1 ______________

Surveyor 2 ______________

TOTAL ______________

APPENDIX D

BEAUFORT SEA STATE SCALE

Beaufort Sea State Scale

The Beaufort Sea State Scale

Sea State	Description	Conditions	Wave Heights (feet)	Picture
0	Calm	Sea like a mirror	0	
1	Light Air	Ripples but without foam crest	0.25	
2	Light Breeze	Small wavelets. Crests do not break	0.5	
3	Gentle Breeze	Large wavelets. Perhaps scattered white caps	2	
4	Moderate Breeze	Small waves. Fairly frequent white caps	4	
5	Fresh Breeze	Moderate waves, many white caps	6	
6	Strong Breeze	Large waves begin to form; white foam crests, probably spray	10	
7	Near Gale	Sea heaps up and white foam blown in streaks along the direction of the wind	14	
8	Gale	Moderately high waves, crests begin to break into spindrift	18	
9	Strong Gale	High waves. Dense foam along the direction of the wind. Crests of waves begin to roll over. Spray may affect visibility.	23	
10	Storm	Very high waves with long overhanging crests. The surface of the sea takes a white appearance. The tumbling of the sea becomes heavy and shock like. Visibility affected	29	
11	Violent Storm	Exceptionally high waves. The sea is completely covered with long white patches of foam lying in the direction of the wind. Visibility affected.	37	
12	Hurricane	The air is filled with foam and spray. Sea completely white with diving spray. Visibility very seriously affected.	45	No picture available

APPENDIX E

CENSUS SHEET

Census Sheet

SGA

EPA Seafood Consumption

Shift # ____________________

Census

CONDUCT CENSUS AT SITE PRIOR TO ADMINISTERING ANGLER SURVEYS

Site Characteristics

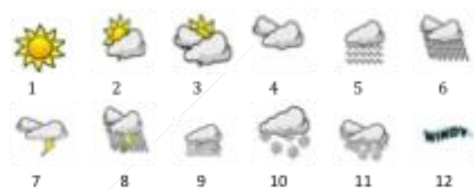
Date: _____________ **Surveyor 1:** ___________________ **Surveyor 2:** __________________

Location: ____

Mode:	Pier/Jetty	Private Boat	Party Boat	Beach
Region:	Central Bay	South Bay	L.A. Harbor	Long Beach
Time Period:		Morning 8:00am-12:00pm	Afternoon 12:00pm-4:00pm	Evening 4:00pm-8:00pm

Start Temperature: _____________F **End Temperature:** _____________F

Weather Conditions:
(circle all that apply)



Sea State (*refer to Beaufort Sea Scale; select number corresponding to observed state*): _______

Additional Observations *(record site characteristics which may be a factor in current angler foot traffic; select all that apply):*

______ Red Tide
______ Heavy Storm on the Previous Day
______ Large Community Event or Festival
______ Other *(describe)*: ____

Basic Demographic Characteristics of the Observed Fishing Population

How many anglers are present in this location? (*an angler is defined as any person at the site who is carrying fishing tackle; do not include children; count anglers starting at your left, then going clockwise; do not include anglers coming or going*)

How many anglers are of each gender?

____________ Male

____________ Female

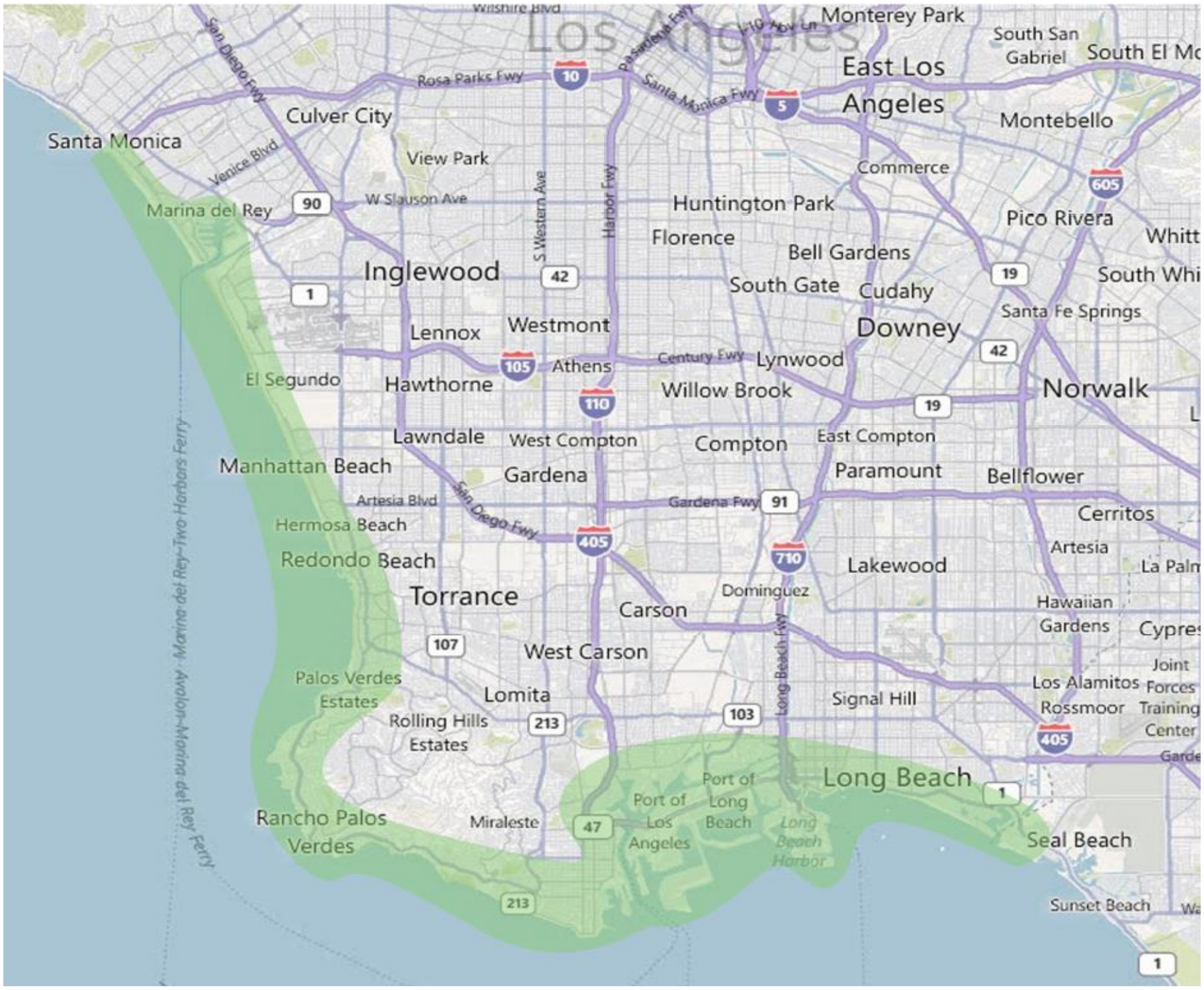
____________ Unknown

APPENDIX F

REGIONAL MAP AND MSRP FISH ID CARD

Appendix F

Map



MSRP Fish ID Card

Montrose Settlements Restoration Program

Restoring natural resources injured by DDTs and PCBs

1 What are DDTs and PCBs?

DDTs and PCBs are toxic mixtures of chemicals that break down very slowly in the environment.

DDT was once a widely used pesticide. One of the largest DDT factories in the United States, Montrose Chemical Corporation, was located in Torrance, CA.

PCBs are a group of chemicals that are resistant to heat and pressure. They were used by many companies for things like making paints and cooling electrical parts.

2 Where did they come from?

Most of the DDTs and PCBs contaminating the marine environment near Los Angeles came from companies that dumped their waste products into the local sewer system many years ago.

Wastewater from these factories was discharged into the ocean through outfall pipes offshore of White Point, between San Pedro and Palos Verdes.

Although releases of DDTs and PCBs ended in the 1970s, over 100 tons of these chemicals still contaminate the sediments, water, and living organisms of Southern California.

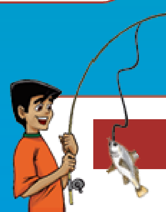
3 What is being done?

Cleaning up the environment
The U.S. Environmental Protection Agency (EPA) is studying ways to cap, clean or remove the contaminated sediments. For more information, visit www.epa.gov/region9/features/pvshelf/, or call (800) 231-3075.

Survey of contaminated fish
The Montrose Settlements Restoration Program (MSRP) and EPA conducted an extensive survey of contaminated fish along southern California. Results will be provided to the public and will be used to update local fishing advisories and the white croaker commercial catch ban area. The data will also be used to plan restoration projects, and will serve as a basis for EPA cleanup decisions.

Public outreach and education
MSRP has joined with EPA, government health agencies, and local community groups to give the public accurate information about the contaminated fish in the Los Angeles- Orange County area. Find out more at www.pvsfish.org or by calling (800) 231-3075.

Restoring healthier fishing
MSRP has developed several projects to provide anglers with more opportunities to fish for clean fish. Find out more at www.montroserestoration.gov or by calling (562) 980-3236.



What can I do?

Reduce your exposure to DDTs and PCBs!

Fish Smart!

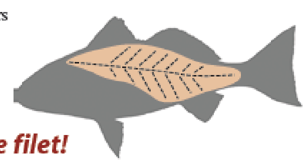
Some of the common fish along the Los Angeles and Orange county coasts are contaminated with the toxic chemicals DDTs and PCBs. The State of California has issued advisories to limit consumption of certain species in parts of the coast.

- Use this card to know the fish you catch.
- Look for signs posted at local piers.
- Talk to the members of community groups distributing information about contaminated fish at fishing areas, health clinics, and community events.
- Visit www.oehha.ca.gov/fish.html. The Office of Environmental Health Hazard Assessment offers information in English and in many other languages.

Cook Smart!

DDTs and PCBs build up in the fatty parts of fish. Try to cook in ways that reduce your exposure to these chemicals.

- Before cooking, remove and throw away the head, guts, kidneys, liver, skin, fat and belly area.
- Eat only the filet, especially when making soups, stews or chowder.
- Bake, broil, steam or grill fish, instead of frying.
- Throw away the cooking juices, which can contain higher concentrations of these chemicals.



Eat only the filet!

The Montrose Settlements Restoration Program is a multi-agency effort to restore natural resources injured by past releases of DDTs and PCBs into the southern California marine environment. Projects include efforts to restore bald eagles, peregrine falcons, seabirds, fishing, and fish habitat. The agencies include the National Oceanic and Atmospheric Administration, U.S. Fish & Wildlife Service, National Park Service, California Department of Fish and Game, California State Parks, and the California State Lands Commission..

APPENDIX G

FISH MODEL

Fish Model

Fillet

APPENDIX H

FISH IDENTIFICATION CHART

Appendix H

Fish Identification Chart

Fish Identification Guide with Quick Characteristics

	**White croaker**, *Genyonemus lineatus*, mouth is subterminal, barbels not present. Narrow notch between spiny and soft ray dorsal fins. Small black spot usually present at base of pectoral fins. Bronze to golden coloration on the dorsal surface, white belly. Common throughout southern CA waters, into northern CA. To 16 in., but most caught on piers are 10-12 inches. May occur with queenfish (see below). Very common.
	**Queenfish**, *Seriphus politus*, large mouth that is terminal. Base of dorsal and anal fin about equal lengths. Spiny and soft ray dorsal fins widely separated. Bluish to bronze on the dorsal surface, white belly. Common throughout southern CA waters, into northern CA. To 12 in.. May occur with white croaker (see above). Very common.
	**Top smelt** (*Atherinopsis affinis*) and Jack smelt (*Atherinopsis californiensis*). Two of the 3 silverside species likely to be encountered. Slimmer than the croakers (above) with a prominent stripe that runs laterally along the body. Up to 17 in., and can be very common in southe[illegible] waters around piers and jett[illegible]
	**Yellowfin croaker**, *Umbr*[illegible] similar to white croaker, b[illegible] croaker have yellowish fin[illegible] an[illegible] along the body. The best character [illegible] fish is frozen/dead, is the barbel on the chin. While common throughout southern CA, these fish are occasionally caught [illegible] piers. They are more commonly caught in the surf. May grow to 20 in. and are highly prized both for sport and table fare.
	**Barred sand bass**, *Paralabrax nebulifer*, is one of the most important sport fish off the coast of southern CA. Blue-gray to gray on the dorsal surface, white belly. The dorsal fin is continuous and the 3rd spine is longest. Barred sand bass and kelp bass (*Paralabrax clathratus*) are rarely caught from piers.
	**Pacific mackerel**, *Scomber japonicus*, is a small pelagic tuna that occasionally is caught from jetties and piers. Blue-black wavy lines extend to the head. The dorsal surface is blue and the ventral surfaces are green to white, with 4-6 finlets between the widely spaced dorsal fins.
	**California cobina**, *Menticirrhus undulatus*, the only other croaker other than the yellowfin croaker with a barbel. Common throughout southern California waters, common caught on beaches, but rarely caught from piers.
	**Spotfin croaker**, *Roncad*[illegible] very distinct. The body is elon[illegible] [illegible]rior (toward the head) is heav[illegible] prominent black spot at [illegible] pectoral fin. Grows to 27 in.

APPENDIX I

LANGUAGE IDENTIFICATION CARD

Appendix I

Language Identification Card

APPENDIX J

SURVEY ADMINISTRATION TOOLS: MESSENGER BAG, GLOVES & TAPE MEASURE

Appendix J

Messenger Bag

Gloves

Tape Measurer

APPENDIX K

TIP CARD IN ENGLISH, SPANISH, VIETNAMESE, CHINESE AND TAGALOG

Tip Card in English

Tip Card in Spanish

Tip Card in Vietnamese

Tip Card in Chinese

APPENDIX L

KEY VARIABLES BY QUESTION NUMBER: FISH CONSUMPTION PATTERNS & AWARENESS OF ADVISORY

Key Variables by Question Number: Fish Consumption Patterns & Awareness of Advisory

Construct	Variable Name	Variable Label
The following variables allow for data collection management (including quality control), and measurement of seasonal and mode effects:		
	sur_ID	Survey ID
	shift_#	Shift #
	surveyor	Surveyor
	sur_date	Date of survey
	sur_time	Time of survey
Survey identifiers	location	Location
Mode of fishing	mode	Mode
The following variables allow for characterization of fishing populations by age, sex, ethnic composition, what language interview was conducted in, zipcode and number of family members living in same household:		
Age	Q24	In what year were you born?
Gender	S1	Gender
Race	Q25	Are you of Hispanic, Latino/a, or Spanish origin?
Race	Q26_1 to Q26_99	What is your race? –White, Black or African American, Hispanic, Latino/a, or Spanish, American Indian or Alaska Native, Asian (specify), Asian -Asian Indian, Asian –Chinese, Asian –Filipino, Asian –Japanese, Asian –Korean, Asian –Vietnamese, Asian -other (specify), Pacific Islander (specify), Pacific Islander -Native Hawaiian, Pacific Islander -Guamanian or Chamorro, Pacific Islander –Samoan, Pacific Islander -other (specify), other (specify), don't know, refused
Language interview was conducted in	S2	Language- English, Spanish, Vietnamese, Tagalog, Cantonese, Mandarin
Zipcode	Q22	What is your zipcode?
Number of family members living the same household	Q23	Including yourself, how many people are currently living in your household?
The following variables measure duration of exposure, mode type in the past year, consumption frequency, and consumption habits:		
Duration of exposure	Q1	How many years have you fished between Santa Monica Pier and Seal Beach Pier?
Mode of fishing	Q2_1 to Q2_9	In the past year and including this trip, have you fished in this region from a…pier, jetty, private boat, party boat, beach or intertidal zone, other (specify), don't know, refused
Consumption frequency	Q3	During the past four weeks, have you eaten fish caught in this region?
Consumption frequency	Q4	During the past four weeks, how many times have you eaten fish caught in this region?
Consumption of fish parts	Q5_1 to Q5_5	What parts of the fish you catch do you usually eat? whole with guts, whole without guts, as steaks or fillets without the skin, as steaks or fillets with the skin, other part(s) of fish, don't know, refused
Consumption of fish parts	Q5_a	Which way do you eat it most often?
Portion size	Q6	For fish caught in this region, how much do you usually eat at any one time compared to this model?
The following variables allow for measurement of the types of species caught and consumption habits:		
Survey instructions: Repeat Q9_FISH thru Q15 for each type of fish in angler's bucket, changing final letter as needed. For example, Q9_FISH_A thru Q15_A refer to the first fish type, Q9_FISH_B thru Q15_B refer to the second fish type, etc.		
Fish type caught	Q9_FISH_A	Name of fish type
Fish quantity	Q9_A	Number of fish in possession
Fish quantity	Q10_A	Total length of fish in inches

Fish type named	Q11_A	What do you call this fish?
Fish type named	Q11_A_Fish	Specify incorrect fish name
Frequency of consumption	Q12_A	In the past four weeks, how many times have you eaten this fish?
What is done with fish	Q13_A	What do you usually do with this fish?
Consumption of fish parts	Q14_A	What parts of the fish you catch do you usually eat?
Portion size	Q15_A	How much of this fish do you eat at any one time compared to this model?
The following variables allow for measurement of catch habits and consumption of the species of concern:		
Survey instructions: Repeat Q16 thru Q20 for each type of fish not in angler's bucket, changing final letter as needed. Q16_A thru Q20_A refer to White Croaker, Q16_B thru Q20_B refer to Barred Sand Bass, Q16_C thru Q20_C refer to Topsmelt, Q16_D thru Q20_D refer to Barracuda, and Q16_E thru Q20_E refer to Black Croaker.		
Fish type	Q16_A	Do you ever catch (FISH TYPE)?
Frequency of consumption	Q17_A	In the past four weeks, how many times have you eaten this fish?
What is done with fish	Q18_A	What do you usually do with this fish?
Consumption of fish parts	Q19_A	What parts of the fish you catch do you usually eat?
Portion size	Q20_A	How much of this fish do you usually eat at any one time compared to this model?
The following variables allow for measurement of awareness of the warnings and behavior:		
	Q21	Have you seen or heard any health warnings related to eating fish caught in this region?
	Q21a_1 to Q21a_99	What did this warning say? Do not eat . . . White Croaker, Barred Sand Bass, Black Croaker, Topsmelt, Barracuda, Protect your health, Fish are contaminated, Only eat small amounts, other, don't know, refused
Warnings awareness	Q21b_1 to Q21b_9	Where have you seen or heard this warning? Television, newspaper or magazine article, signs posted on the beaches or piers, other fishermen and/or friends, other (specify), don't know, refused
	Q21c	How has this warning changed your fishing or fish-eating habits? [open-ended text]
Warnings awareness	Q21d	Do you think these warnings are… very important, important, somewhat important, not important, don't know, refused

APPENDIX M

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* Tables that were not included in final report

Appendix M includes every table referenced in the report in the same order for ease of reference. It also includes additional tables not included in the report because the findings did not rise to the level of statistical significance.

Table 1. Seasonal survey collection days (per each of the four modes).

Summer (May – Aug)	**Non-Summer** (Sept – Apr)
2/month (8 total sessions/mode)	1/month (8 total sessions/mode)
2/month (8 total sessions/mode)	1/month (8 total sessions/mode)

Table 2. Angler rationale for declining to be interviewed by fishing mode.

Mode	Percent Declined	Declined	Approached	Reason for decline
Pier or Jetty	24.7%	111	449	Language difficult or lack of time.
Charter Boat	26.5%	68	257	Lack of time
Private boat	13.7%	22	161	Lack of time
Beach or Intertidal Zone	12.9%	4	31	Language difficulties
Total	22.8%	205	898	n/a

Table 3. Margin of error for each fishing mode.

Mode	Sample Size	Margin of Error (95% CI)
Pier or Jetty	338	±5%
Charter Boat	189	±7%
Private boat	139	±8%
Beach/Intertidal Zone	27	±18%
Total	693	±4%

Table 4. Population level angler characteristics (N=693).		
Gender	**Count**	**Percentage**
Male	653	94.2%
Female	40	5.8%
Total	693	100.0%
Anglers of Hispanic, Latino, or Spanish Origin (Q25)	**Count**	**Percentage**
No	406	60.4%
Yes	266	39.6%
Total	672	100.0%
Ethnicity (Q26)	**Count**	**Percentage**
Hispanic, Latino, Spanish	256	36.9%
White	167	24.1%
Asian	165	23.8%
Black or African American	43	6.2%
Other (including Mixed)	62	8.9%
Total	693	100.0%
Asian Ethnicity Specified	**Count**	**Percentage**
Filipino	63	40.9%
Japanese	24	15.6%
Korean	19	12.3%
Chinese	16	10.4%
Vietnamese	14	9.1%
Other	18	11.7%
Total (excluding 11 Asian anglers who declined)	154	100.0%
Language of Survey	**Count**	**Percentage**
English	644	92.9%
Spanish	48	6.9%
Vietnamese	1	0.1%
Total	693	100.0%
	Mean	**Median**
Age (Q24)	44 years	43 years

Table 5. Interview mode across summer and non-summer months (N=693).					
	Summer		**Non-Summer**		**Total**
Mode	**# interviews**	**% by season**	**# interviews**	**% by season**	**Count**
Pier or Jetty	146	39.9%	192	58.7%	338
Private boat	80	21.9%	59	18.0%	139
Charter boat	118	32.2%	71	21.7%	189
Beach/Intertidal zone	22	6.0%	5	1.5%	27
Total by count	366	100.0%	327	100.0%	693
Total by season	366	52.8%	327	47.2%	100.0%

Table 5.a. Percentage of interviews conducted by time of year.		
Time of Year	**Frequency**	**Percentage**
Summer	366	52.8
Non-Summer	327	47.2
Total	693	100.0

Table 6. Angler rationale for declining to be interviewed by fishing mode.				
Mode	**Percent Declined**	**Declined**	**Approached**	**Reason for decline**
Pier or Jetty	24.7%	111	449	Language difficult or lack of time.
Charter Boat	26.5%	68	257	Lack of time
Private boat	13.7%	22	161	Lack of time
Beach or Intertidal Zone	12.9%	4	31	Language difficulties
Total	22.8%	205	898	n/a

Table 7. Angler ethnicity (N=693)(Q26).		
Ethnicity	**Count**	**Percentage**
Hispanic, Latino, or Spanish	256	36.9%
White (non-Hispanic)	167	24.1%
Asian	165	23.8%
Black or African American	43	6.2%
Other (including individuals of Mixed ethnic background)	62	8.9%
Totals	693	100.0%

NOTE. Twenty-one respondents declined to answer and were included in *Other* if ethnicity was not readily

Table 8. Ethnic breakdown for anglers identifying as Asian (N=154)(Q26).		
Ethnicity	**Count**	**Percentage**
Filipino	63	40.9%
Japanese	24	15.6%
Korean	19	12.3%
Chinese	16	10.5%
Vietnamese	14	9.1%
Other	18	11.7%
Totals	154	100.0%

NOTE. Figures exclude 11 Asian anglers who declined to respond.

Table 9. Language used during interview (N=693).		
Language	Interviews	Percentage
English	644	93.0%
Spanish	48	6.9%
Vietnamese	1	0.1%
Totals	693	100.0%

NOTE. 11respondents declined to answer.

Table 10. Mode of fishing in the past year by mode at time of interview (N=693)(Q2).					
		Mode at time of interview			
		Pier or Jetty	Private Boat	Charter Boat	Beach or Intertidal zone
Mode in past year (Q2)		N=338	N=139	N=189	N=27
Pier/Jetty	Interview Count	–	55	71	17
	% within Mode	–	39.6%	37.6%	63.0%
Private Boat	Interview Count	86	–	60	11
	% within Mode	25.4%	–	31.7%	40.7%
Charter Boat	Interview Count	87	71	–	8
	% within Mode	25.7%	51.1%	–	29.6%
Beach or Intertidal Zone	Interview Count	94	55	45	–
	% within Mode	27.8%	39.6%	23.8%	–

NOTE. Respondents could choose more than one mode in the past year. Results may sum to more than 100%.

Table 10.a. Percentage of interviews conducted across fishing mode.		
Mode	Frequency	Percentage
Pier or Jetty	338	48.8
Party or Charter Boat	189	27.3
Private boat	139	20.1
Beach or Intertidal Zone	27	3.9
Total	693	100.0

Table 11. Percentage of anglers who reported catching fish and had their catch identified by mode (N=220).					
		Mode			
Catch Examined? (Q8)		Pier or Jetty	Private boat	Charter boat	Beach or Intertidal zone
No	Angler Count	42	16	29	7
	% within Mode	34.4%	53.3%	50.9%	70.0%
Yes	Angler Count	80	14	28	3
	% within Mode	65.6%	46.7%	49.1%	30.0%
Total	Angler Count	122	30	57	10
	% within Mode	100.0%	100.0%	100.0%	100.0%

NOTE. There were 15 missing cases. A larger percentage of anglers are piers or jetties allowed surveyors to identify their catch than at other modes (65.6%, $p<0.05$).

Table 11.a. Percentage of anglers who fished at various fishing modes over the past year (N=693).		
Fishing Mode (Q2)	**Frequency**	**Percentage**
Pier	421	62.2
Party Boat	341	50.4
Private Boat	293	43.3
Jetty	225	33.2
Beach or Intertidal Zone	220	32.5
Other	10	1.5
Total	1510	223.0

NOTE. Respondents were asked to choose all that apply; therefore, percentage may sum to greater than 100%.

Table 12. Percentage of anglers with specific types of fish by fishing mode (N=125).

Common Name	**Scientific Name**		**Pier or Jetty**	**Private Boat**	**Charter Boat**	**Beach or Intertida l**	**Total**
			(N=75)	(N=12)	(N=24)	(N=2)	113
white croaker DNC	*Genyonemus lineatus*	Angler Count:	6	1	0	1	8
		% within Mode:	8.0%	8.3%	0.0%	50.0%	
barred sand bass DNC	*Paralabrax nebulifer*	Angler Count:	4	3	1	0	8
		% within Mode:	5.3%	25.0%	4.2%	0.0%	
black croaker DNC	*Cheilotrema saturnum*	Angler Count:	0	0	0	0	0
		% within Mode:	0%	0%	0%	0%	
topsmelt DNC	*Atherinops affinis*	Angler Count:	9	2	1	0	12
		% within Mode:	12.0%	16.7%	4.2%	0.0%	
Pacific barracuda DNC	*Sphryraena argentea*	Angler Count:	0	0	3	0	3
		% within Mode:	0.0%	0.0%	12.5%	0.0%	
barred surfperch	*Amphistichus argenteus*	Angler Count:	0	0	1	0	1
		% within Mode:	0.0%	0.0%	4.2%	0.0%	
sargo	*Anisotremus davidsonii*	Angler Count:	2	0	0	0	2
		% within Mode:	2.7%	0.0%	0.0%	0.0%	
jacksmelt	*Atherinopsis californiensis*	Angler Count:	5	0	0	0	5
		% within Mode:	6.7%	0.0%	0.0%	0.0%	
shark	*Chondrichthyes, unid.*	Angler Count:	0	0	1	0	1
		% within Mode:	0.0%	0.0%	4.2%	0.0%	
blacksmith	*Chromis punctipinnis*	Angler Count:	0	1	0	0	1
		% within Mode:	0.0%	8.3%	0.0%	0.0%	
sanddab	*Citharichthys spp.*	Angler Count:	0	3	0	0	3
		% within Mode:	0.0%	25.0%	0.0%	0.0%	
black perch	*Embiotoca jacksoni*	Angler Count:	0	0	2	0	2
		% within Mode:	0.0%	0.0%	8.3%	0.0%	
surfperch, unspecified	*Embiotocidae*	Angler Count:	0	1	0	0	1
		% within Mode:	0.0%	8.3%	0.0%	0.0%	
opaleye perch	*Girella nigricans*	Angler Count:	1	0	1	0	2

		% within Mode:	1.3%	0.0%	4.2%	0.0%	
zebra perch	*Hermosilla azurea*	Angler Count:	1	0	0	0	1
		% within Mode:	1.3%	0.0%	0.0%	0.0%	
walleye surfperch	*Hyperprosopon argenteum*	Angler Count:	1	0	0	0	1
		% within Mode:	1.3%	0.0%	0.0%	0.0%	
California corbina	*Menticirrhus undulatus*	Angler Count:	1	0	0	0	1
		% within Mode:	1.3%	0.0%	0.0%	0.0%	
lingcod	*Ophiodon elongatus*	Angler Count:	0	1	0	0	1
		% within Mode:	0.0%	8.3%	0.0%	0.0%	
senorita	*Oxyjulis californica*	Angler Count:	0	1	0	0	1
		% within Mode:	0.0%	8.3%	0.0%	0.0%	
kelp bass	*Paralabrax clathratus*	Angler Count:	0	2	1	0	3
		% within Mode:	0.0%	16.7%	4.2%	0.0%	
California halibut	*Paralichthys californicus*	Angler Count:	2	0	2	0	4
		% within Mode:	2.7%	0.0%	8.3%	0.0%	
ray, unspecified	*Rajiformes, unid.*	Angler Count:	1	0	0	0	1
		% within Mode:	1.3%	0.0%	0.0%	0.0%	
shovelnose guitarfish	*Rhinobatos productus*	Angler Count:	1	0	0	0	1
		% within Mode:	1.3%	0.0%	0.0%	0.0%	
spotfin croaker	*Roncador stearnsii*	Angler Count:	2	0	0	0	2
		% within Mode:	2.7%	0.0%	0.0%	0.0%	
Pacific sardine	*Sardinops sagax*	Angler Count:	26	0	0	0	26
		% within Mode:	34.7%	0.0%	0.0%	0.0%	
California scorpionfish	*Scorpaena guttata*	Angler Count:	1	2	8	0	11
		% within Mode:	1.3%	16.7%	33.3%	0.0%	
chilipepper rockfish	*Sebastes goodei*	Angler Count:	0	0	1	0	1
		% within Mode:	0.0%	0.0%	4.2%	0.0%	
vermilion rockfish	*Sebastes miniatus*	Angler Count:	0	1	1	0	2
		% within Mode:	0.0%	8.3%	4.2%	0.0%	
California sheephead	*Semicossyphus pulcher*	Angler Count:	0	0	2	0	2
		% within Mode:	0.0%	0.0%	8.3%	0.0%	
queenfish	*Seriphus politus*	Angler Count:	2	0	0	0	2
		% within Mode:	2.7%	0.0%	0.0%	0.0%	
California lizardfish	*Synodus lucioceps*	Angler Count:	5	1	0	0	6
		% within Mode:	6.7%	8.3%	0.0%	0.0%	
yellow croaker	*Umbrina roncador*	Angler Count:	2	0	0	0	2
		% within Mode:	2.7%	0.0%	0.0%	0.0%	
bass, unspecified		Angler Count:	2	0	6	0	8
		% within Mode:	2.7%	0.0%	25.0%	0.0%	
chub mackerel		Angler Count:	26	1	0	0	27
		% within Mode:	34.7%	8.3%	0.0%	0.0%	
perch, unspecified		Angler Count:	15	0	1	1	17
		% within Mode:	20.0%	0.0%	4.2%	50.0%	
		Angler Count:	1	2	6	0	9

rockfish, unspecified	% within Mode:	1.3%	16.7%	25.0%	0.0%	

NOTE. There are 12 missing cases.

Table 13. Angler common names for identified fish species (N=125).

Common Name	Scientific Name	Angler Common Names	# Anglers
white croaker [DNC]	*Genyonemus lineatus*	queen fish corbina	8
topsmelt [DNC]	*Atherinops affinis*	topsmelt jacksmelt	12
barred sand bass [DNC]	*Paralabrax nebulifer*	barred sand bass calico bass	8
Pacific barracuda [DNC]	*Sphryraena argentea*	barracuda	3
barred surfperch	*Amphistichus argenteus*	buttermouth perch	1
sargo	*Anisotremus davidsonii*	sargo	2
jacksmelt	*Atherinopsis californiensis*	jacksmelt topsmelt	5
shark	*Chondrichthyes, unid.*		1
blacksmith	*Chromis punctipinnis*	blacksmith	1
sanddab	*Citharichthys spp.*	sand dab	3
black perch	*Embiotoca jacksoni*	black perch	2
surfperch, unspecified	*Embiotocidae*	surfperch	1
opaleye perch	*Girella nigricans*	opal eye	2
walleye surfperch	*Hyperprosopon argenteum*	no answer	1
California corbina	*Menticirrhus undulatus*	no answer	1
lingcod	*Ophiodon elongatus*	lingcod	1
senorita	*Oxyjulis californica*	senorita	1
kelp bass	*Paralabrax clathratus*	calico bass white croaker	3
California halibut	*Paralichthys californicus*	halibut	4
ray, unspecified	*Rajiformes, unid.*	skate thornback	1
shovelnose guitarfish	*Rhinobatos productus*	guitar fish	1
spotfin croaker	*Roncador stearnsii*	yellow croaker	2
Pacific sardine	*Sardinops sagax*	sardine	26
California scorpionfish	*Scorpaena guttata*	sculpin scorpion scorpion fish	11
chilipepper rockfish	*Sebastes goodei*		1
vermilion rockfish	*Sebastes miniatus*	red snapper	2
California sheephead	*Semicossyphus pulcher*		2
queenfish	*Seriphus politus*		2
California lizardfish	*Synodus lucioceps*	topsmelt	6
yellow croaker	*Umbrinaroncador*	yellow croaker	2
Mackerel		mackerel topsmelt perch	27
perch, unspecified		perch	17

rock fish, unspecified	rock fish	9
bass unspecified	sand bass	8
smelt, unspecified		1

NOTE. All 125 anglers with fish in their bucket were asked what they called the fish but answers were not required.

Table 14. Fate of fish from angler's bucket by species (N=109 angler responses).

		Fate of Fish				
		Eat	**Give Away**	**Throw Back**	**Bait**	**Other**
Species		(N=99)	(N=25)	(N=12)	(N=34)	(N=2)
white croaker DNC	Angler Count	10	3	0	0	0
	% by Fate:	10.1%	12.0%	0.0%	0.0%	0.0%
barred sand bass DNC	Angler Count:	0	0	0	0	0
	% by Fate:	0.0%	0.0%	0.0%	0.0%	0.0%
black croaker DNC	Angler Count:	0	0	0	0	0
	% by Fate:	0.0%	0.0%	0.0%	0.0%	0.0%
topsmelt DNC	Angler Count:	19	7	2	6	0
	% by Fate:	19.2%	28.0%	16.7%	17.6%	0.0%
Pacific barracuda DNC	Angler Count:	5	2	0	0	0
	% by Fate:	5.1%	8.0%	0.0%	0.0%	0.0%
barred surfperch	Angler Count:	0	3	0	0	0
	% by Fate:	0.0%	12.0%	0.0%	0.0%	0.0%
sargo	Angler Count:	2	4	1	0	0
	% by Fate:	2.0%	16.0%	8.3%	0.0%	0.0%
jacksmelt	Angler Count:	5	0	0	4	0
	% by Fate:	5.1%	0.0%	0.0%	11.8%	0.0%
shark	Angler Count:	1	0	1	0	0
	% by Fate:	1.0%	0.0%	8.3%	0.0%	0.0%
blacksmith	Angler Count:	2	0	1	0	0
	% by Fate:	2.0%	0.0%	8.3%	0.0%	0.0%
sanddab, unidentified	Angler Count:	3	0	0	0	0
	% by Fate:	3.0%	0.0%	0.0%	0.0%	0.0%
black perch	Angler Count:	1	3	0	0	0
	% by Fate:	1.0%	12.0%	0.0%	0.0%	0.0%
surfperch, unidentified	Angler Count:	2	0	1	0	0
	% by Fate:	2.0%	0.0%	8.3%	0.0%	0.0%
opaleye perch	Angler Count:	2	3	1	0	0
	% by Fate:	2.0%	12.0%	8.3%	0.0%	0.0%
zebra perch	Angler Count:	0	1	0	0	0
	% by Fate:	0.0%	4.0%	0.0%	0.0%	0.0%
walleye surfperch	Angler Count:	0	0	0	1	0

	% by Fate:	0.0%	0.0%	0.0%	2.9%	0.0%
California corbina	Angler Count:	0	4	0	0	0
	% by Fate:	0.0%	16.0%	0.0%	0.0%	0.0%
lingcod	Angler Count:	3	0	0	0	0
	% by Fate:	3.0%	0.0%	0.0%	0.0%	0.0%
senorita	Angler Count:	2	0	1	0	0
	% by Fate:	2.0%	0.0%	8.3%	0.0%	0.0%
kelp bass	Angler Count:	6	2	1	0	0
	% by Fate:	6.1%	8.0%	8.3%	0.0%	0.0%
California halibut	Angler Count:	4	2	2	0	0
	% by Fate:	4.0%	8.0%	16.7%	0.0%	0.0%
ray, unidentified	Angler Count:	2	0	0	0	0
	% by Fate:	2.0%	0.0%	0.0%	0.0%	0.0%
shovelnose guitarfish	Angler Count:	0	0	1	0	0
	% by Fate:	0.0%	0.0%	8.3%	0.0%	0.0%
spotfin croaker	Angler Count:	3	4	0	0	0
	% by Fate:	3.0%	16.0%	0.0%	0.0%	0.0%
Pacific sardine	Angler Count:	21	4	0	16	0
	% by Fate:	21.2%	16.0%	0.0%	47.1%	0.0%
California scorpionfish	Angler Count:	14	3	1	2	0
	% by Fate:	14.1%	12.0%	8.3%	5.9%	0.0%
chilipepper rockfish	Angler Count:	2	0	0	0	0
	% by Fate:	2.0%	0.0%	0.0%	0.0%	0.0%
vermilion rockfish	Angler Count:	4	0	0	0	0
	% by Fate:	4.0%	0.0%	0.0%	0.0%	0.0%
California sheephead	Angler Count:	3	1	0	0	0
	% by Fate:	3.0%	4.0%	0.0%	0.0%	0.0%
queenfish	Angler Count:	0	1	2	0	1
	% by Fate:	0.0%	4.0%	16.7%	0.0%	50.0%
California lizardfish	Angler Count:	6	2	2	3	0
	% by Fate:	6.1%	8.0%	16.7%	8.8%	0.0%
yellow croaker	Angler Count:	3	5	0	0	0
	% by Fate:	3.0%	20.0%	0.0%	0.0%	0.0%
bass, unspecified	Angler Count:	12	2	3	0	0
	% by Fate:	12.1%	8.0%	25.0%	0.0%	0.0%
mackerel unspecified	Angler Count:	27	1	1	16	0
	% by Fate:	27.3%	4.0%	8.3%	47.1%	0.0%
perch unspecified	Angler Count:	19	3	3	7	1
	% by Fate:	19.2%	12.0%	25.0%	20.6%	50.0%
rock fish unspecified	Angler Count:	8	1	1	2	0
	% by Fate:	8.1%	4.0%	8.3%	5.9%	0.0%

NOTE. N=109 is the number of unique responses. Not all anglers responded.

Table 14.a. Fish Species Observed in Angler's Bucket (N=125).				
Common Name	**Scientific Name**	**Angler Common Names**	**No. Anglers**	**Percent**
barred surfperch	*Amphistichus argenteus*	buttermouth perch	1	0.8%
sargo	*Anisotremus davidsonii*	sargo	2	1.6%
topsmelt	*Atherinops affinis*	topsmelt jacksmelt	12	9.6%
jacksmelt	*Atherinopsis californiensis*	jacksmelt topsmelt	5	4.0%
shark	*Chondrichthyes, unid.*		1	0.8%
blacksmith	*Chromis punctipinnis*	blacksmith	1	0.8%
sanddab	*Citharichthys spp.*	sand dab	3	2.4%
black perch	*Embiotoca jacksoni*	black perch	2	1.6%
surfperch, unspecified	*Embiotocidae*	surfperch	1	0.8%
white croaker	*Genyonemus lineatus*	queen fish, king fish corvina	8	6.4%
opaleye perch	*Girella nigricans*	opal eye	2	1.6%
walleye surfperch	*Hyperprosopon argenteum*		1	0.8%
California corbina	*Menticirrhus undulatus*		1	0.8%
lingcod	*Ophiodon elongatus*	lingcod	1	0.8%
senorita	*Oxyjulis californica*	senorita	1	0.8%
kelp bass	*Paralabrax clathratus*	calico bass white croaker	3	2.4%
barred sand bass	*Paralabrax nebulifer*	barred sand bass calico bass	8	6.4%
California halibut	*Paralichthys californicus*	halibut	4	3.2%
ray, unspecified	*Rajiformes, unid.*	skate thornback	1	0.8%
shovelnose guitarfish	*Rhinobatos productus*	guitar fish	1	0.8%
spotfin croaker	*Roncador stearnsii*	yellow croaker	2	1.6%
Pacific sardine	*Sardinops sagax*	sardine	26	20.8%
California scorpionfish	*Scorpaena guttata*	sculpin scorpion scorpion fish	11	8.8%
chilipepper rockfish	*Sebastes goodei*		1	0.8%
vermilion rockfish	*Sebastes miniatus*	red snapper	2	1.6%
California sheephead	*Semicossyphus pulcher*		2	1.6%
queenfish	*Seriphus politus*		2	1.6%
Pacific barracuda	*Sphyraena argentea*	barracuda	3	2.4%
California lizardfish	*Synodus lucioceps*	topsmelt	6	4.8%
yellow croaker	*Umbrinaroncador*	yellow croaker	2	1.6%
chub mackerel		mackerel topsmelt perch	27	21.6%
perch, unspecified		perch	17	13.6%
rock fish, unspecified		rock fish	9	7.2%
bass unspecified		sand bass	8	6.4%
smelt, unspecified			1	0.8%

Table 15. Fish consumption by part and angler ethnicity (N=270)(Q19).

Parts consumed		Hispanic	White	Asian	Black	Other	All
Steak or fillets without skin	Angler Count:	53	51	39	18	5	166
	% within Ethnicity:	60.2%	77.3%	47.0%	81.8%	100.0%	61.5%
Steak or fillets with skin	Angler Count:	24	14	16	2	0	56
	% within Ethnicity:	27.3%	21.2%	19.3%	9.1%	0.0%	20.7%
Whole without guts	Angler Count:	15	6	31	4	0	56
	% within Ethnicity:	17.0%	9.1%	37.3%	18.2%	0.0%	20.7%
Whole with guts	Angler Count:	3	1	8	0	0	12
	% within Ethnicity:	3.4%	1.5%	9.6%	0.0%	0.0%	4.4%
Other	Angler Count:	1	0	2	0	0	3
	% within Ethnicity:	1.1%	0.0%	2.4%	0.0%	0.0%	1.1%

NOTE. Respondents were encouraged to choose all that apply. Percentages may sum to greater than 100%.

Table 15.a. Fish consumption four weeks prior to survey by part (N=270).

	Frequency	Percentage
Steak or fillets without skin	168	62.9
Whole without guts	58	21.7
Steaks or fillets with skin	55	20.6
Whole with guts	13	4.9
Other	4	1.5
Total	298	111.6

NOTE. Respondents were asked to choose all that apply; therefore, percentage may sum to greater than 100%.

Table 16. Reported consumption among anglers in the study region (N=693)(Q3 and Q7).

Survey question	Pier or Jetty	Charter Boat	Private Boat	Beach or Intertidal Zone	Full Sample
	(N=338)	(N=189)	(N=139)	(N=27)	(N=693)
During the past four weeks, have you eaten fish caught in this region (shown map)? (Q3) [Percent reporting "Yes"]	34%	44%	45%	41%	39%
Have you caught any fish today? (Q7) [Percent reporting "Yes"]	38%	34%	23%	37%	34%

Table 17. Quantitative measure of fish consumption by ethnicity (N=270 & N=693).										
	Consumption Rate (g/ind./day)									
	Angler Consumers (Q3, Q6)*					Anglers (all)**				
Ethnicity	**n**	**Mean**	**U.C.L.**	**Md**	**U.D.**	**n**	**Mean**	**U.C.L.**	**Md**	**U.D.**
Hispanic	80	16.41	20.69	10.71	41.79	258	5.09	6.76	0.00	16.07
Asian	76	20.76	26.36	10.71	64.29	162	9.74	12.95	0.00	25.18
White	54	19.25	29.31	9.38	42.86	164	6.34	9.86	0.00	16.07
Black	17	23.00	34.40	16.07	60.00	44	8.88	13.81	0.00	32.14
Other	22	12.78	20.98	6.70	36.43	51	5.51	9.72	0.00	16.07
TOTAL	270[a]	18.55	21.72	10.71	42.86	693[b]	6.88	8.47	0.00	21.43

NOTE: U.C.L. = Upper Confidence Limit (95%); Md = Median (50%); U.D. = Upper Decile (90%); *Angler-Consumers are defined as anglers who reported consuming fish in the 4 weeks prior to being surveyed – consistent with the 1994 study method; **Anglers (all) assumes that anglers who had not consumed a fish in the four weeks prior to being surveyed are not consumers of fish – this calculation underreports actual consumption rates; [a] there were 21 instances of missing data; [b] there were 14 instances of missing data; U.C.L. calculated using a bootstrapping technique applied to the mean.

Table 18. Fate of DNC fish for all anglers (N=693)(Q13 & Q18).										
Fish species	**white croaker**		**barred sand bass**		**black croaker**		**topsmelt**		**barracuda**	
Fate of fish	Count	%	Count	%	Count	%	Count	%	Count	%
Eat them	46	18.1%	110	41.2%	20	24.1%	35	14.0%	112	40.7%
Give away	26	10.2%	39	14.6%	7	8.4%	25	10.0%	59	21.5%
Throw back	169	66.5%	115	43.1%	54	65.1%	102	40.8%	98	35.6%
Bait	11	4.3%	1	0.4%	1	1.2%	87	34.8%	3	1.1%
Other	2	0.8%	2	0.7%	1	1.2%	1	0.4%	3	1.1%
TOTAL	254	100%	267	100%	83	100%	250	100%	275	100%

NOTE. There were 142 missing cases (27 missing white croaker, 37 missing barred sand bass, 11 missing black croaker, 32 missing topsmelt, and 35 missing barracuda).

Table 18.a. Fate of DNC for anglers who did not have species in their bucket.					
Q18 Usually do with fish…	**white croaker**	**barred sandbasss and bass**	**topsmelt**	**barracuda**	**black croaker**
	36	110	16	107	20
Eat them	14.9%	41.2%	7.4%	39.9%	24.1%
	23	39	18	57	7
Give away	9.5%	14.6%	8.3%	21.3%	8.4%
	169	115	100	98	54
Throw back	70.1%	43.1%	46.3%	36.6%	65.1%
	11	1	81	3	1
Bait	4.6%	.4%	37.5%	1.1%	1.2%
	2	2	1	3	1
Other	.8%	.7%	.5%	1.1%	1.2%
	241	267	216	268	83
	100.0%	100.0%	100.0%	100.0%	100.0%
TOTAL	27	37	32	35	11

Table 18.b. Fate of DNC fish for anglers who have species in their bucket (Identified by Interviewer - Q9).					
	Types of DNC Fish – Identified by Interviewer (Q9)				
Q13 Usually do with fish…	**white croaker**	**barred sandbass**	**topsmelt**	**barracuda**	**black croaker**
Eat them	3	5	5	2	-
	-	-	-	-	-
Give away	2	1	2	1	-
	-	-	-	-	-
Throw back	-	-	1	-	-
	-	-	-	-	-
Bait	-	-	2	-	-
	-	-	-	-	-
Other	-	1	-	-	-
	-	-	-	-	-
	5	7	10	3	-
TOTAL	-	-	-	-	-

NOTE. There were 5 missing cases.

Table 19. Fish consumption by angler ethnicity (N=661).											
Angler Ethnicity	**Hispanic**		**White**		**Asian**		**Black**		**Other**		**Total**
DNC Fish	Count	%	Count	%	Count	%	Count	%	Count	%	Count
White croaker	9	16.7%	4	14.3%	9	26.5%	4	40.0%	1	16.7%	27
Barred sand bass	21	38.9%	16	57.1%	10	29.4%	5	50.0%	2	33.3%	54
Black croaker	2	3.7%	1	3.6%	3	8.8%	0	0.0%	0	0.0%	6
Topsmelt	5	9.3%	0	0.0%	6	17.6%	0	0.0%	0	0.0%	11
Barracuda	17	31.5%	7	25.0%	6	17.6%	1	10.0%	3	50.0%	34
TOTAL	54	100%	28	100%	34	100%	10	100%	6	100%	132

NOTE. There are 32 missing cases. Count refers to the number of anglers observed.

The Study reports ethnicities in a fashion consistent with the U.S. Census. During interviews, however, additional races were identified. For the tables that did not rise to the level of statistical significance, analysis is shown for all races identified.

Table 19.a. Anglers who consumed any dnc fish in the four weeks prior to survey, by ethnicity (N=661).								
Count		**White**	**Black or African American**	**Hispanic or Latino**	**American Indian or AK Native**	**Asian**	**Pacific Islander**	**Mixed Race**
white croaker DNC	27	4	4	9	0	9	1	0
	%	2.4%	9.1%	3.5%	0.0%	5.6%	16.7%	0.0%
barred sand bass DNC	54	16	5	21	1	10	0	1
	%	9.8%	11.4%	8.1%	12.5%	6.2%	0.0%	5.3%
topsmelt DNC	11	0	0	5	0	6	0	0
	%	0.0%	0.0%	1.9%	0.0%	3.7%	0.0%	0.0%
barracuda DNC	34	7	1	17	1	6	0	2
	%	4.3%	2.3%	6.6%	12.5%	3.7%	0.0%	10.5%
black croaker DNC	6	1	0	2	0	3	0	0
	%	.6%	0.0%	.8%	0.0%	1.9%	0.0%	0.0%

NOTE. There were 32 missing cases.

Table 19.b. Anglers who consumed any dnc fish in the four weeks prior to survey, by ethnicity – piers and jetties (N=338).

Consume	White	Black or African American	Hispanic or Latino	American Indian or Alaska Native	Asian	Pacific Islander	Mixed Race	Total
white croaker DNC	2	3	7	0	8	1	0	21
	5.6%	15.8%	4.1%	0.0%	8.7%	33.3%	0.0%	6.4%
barred sand bass DNC	2	2	12	0	1	0	0	17
	5.6%	10.5%	7.1%	0.0%	1.1%	0.0%	0.0%	5.2%
topsmelt DNC	0	0	5	0	6	0	0	11
	0.0%	0.0%	3.0%	0.0%	6.5%	0.0%	0.0%	3.4%
barracuda DNC	1	0	6	0	0	0	0	7
	2.8%	0.0%	3.6%	0.0%	0.0%	0.0%	0.0%	2.1%
black croaker DNC	1	0	1	0	2	0	0	4
	2.8%	0.0%	.6%	0.0%	2.2%	0.0%	0.0%	1.2%
TOTAL	36	19	169	2	92	3	6	327

NOTE. There were 11 missing cases.

Table 19.c. Anglers who consumed any dnc fish in the four weeks prior to survey, by ethnicity – private boats (N=139).

Consume	White	Black or African American	Hispanic or Latino	American Indian or Alaska Native	Asian	Pacific Islander	Mixed Race	Total
white croaker DNC	1	0	0	0	0	0	0	1
	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	.8%
barred sand bass DNC	5	1	2	0	2	0	0	10
	7.5%	9.1%	8.7%	0.0%	10.5%	0.0%	0.0%	7.6%
topsmelt DNC	0	0	0	0	0	0	0	0
	0%	0%						
barracuda DNC	5	0	1	1	0	0	0	7
	7.5%	0.0%	4.3%	50.0%	0.0%	0.0%	0.0%	5.3%
black croaker DNC	0	0	0	0	0	0	0	0
TOTAL	67	11	23	2	19	2	7	131

NOTE. There were 8 missing cases.

Table 19.d. Anglers who consumed any dnc fish in the four weeks prior to survey, by ethnicity – party boats (N=189).								
Consume	White	Black or African American	Hispanic or Latino	American Indian or Alaska Native	Asian	Pacific Islander	Mixed Race	Total
white croaker DNC	1 1.8%	0 0.0%	0 0.0%	0 0.0%	1 2.2%	0 0.0%	0 0.0%	2 1.1%
barred sand bass DNC	9 16.1%	2 18.2%	7 13.0%	1 25.0%	7 15.6%	0 0.0%	1 16.7%	27 15.3%
topsmelt DNC	0	0	0	0	0	0	0	0
barracuda DNC	1 1.8%	1 9.1%	9 16.7%	0 0.0%	6 13.3%	0 0.0%	2 33.3%	19 10.7%
black croaker DNC	0 0.0%	0 0.0%	0 0.0%	0 0.0%	1 2.2%	0 0.0%	0 0.0%	1 0.6%
TOTAL	56	11	54	4	45	1	6	177

NOTE. There were 12 missing cases.

Table19.e. Anglers who Consumed any DNC Fish in the Four Weeks Prior to Survey, by Ethnicity – Beaches and Intertidal Zones (N=27).								
Consume	White	Black or African American	Hispanic or Latino	American Indian or Alaska Native	Asian	Pacific Islander	Mixed Race	Total
white croaker DNC	0 0.0%	1 33.3%	2 16.7%	0	0	0	0	3 11.5%
barred sand bass DNC	0	0	0	0	0	0	0	0
topsmelt DNC	0	0	0	0	0	0	0	0
barracuda DNC	0 0.0%	0 0.0%	1 8.3%	0	0	0	0	1 3.8%
black croaker DNC	0 0.0%	0 0.0%	1 8.3%	0	0	0	0	1 3.8%
TOTAL	5	3	12	0	6	0	0	26

NOTE. There was 1 missing case.

Table 19.f. Percentage of Anglers Who Have Consumed Each of the DNC Fish in the Four Weeks Prior to Survey.

Fish	Reported eating in past 4 weeks (Q12, 17)	White	Black or African American	Hispanic or Latino	Asian
white croaker	27	4 2.2%	4 8.2%	9 3.4%	9 5.3%
barred sand bass	58	18 9.9%	5 10.2%	21 8.0%	10 5.8%
topsmelt	12	0 0.0%	0 0.0%	5 1.9%	6 3.5%
barracuda	35	8 4.4%	2 4.1%	18 6.9%	6 3.5%
black croaker	6	1 .6%	0 0.0%	2 .8%	3 1.8%
Total		181	49	262	171

Table 20. Reported fish preparation methods for consumption of DNC fish (N=110).

Q19	white croaker		barred sand bass		black croaker		barracuda		topsmelt	
Fish part	Count	%	Count	%	Count	%	Count	%	Count	%
Whole with guts	3	7.3%	4	3.4%	1	5.0%	1	0.9%	0	0.0%
Whole without guts	7	17.1 %	21	18.1 %	4	20.0 %	18	16.8 %	7	35.0 %
As steaks or fillets without the skin	21	51.2 %	62	53.4 %	12	60.0 %	62	57.9 %	5	25.0 %
As steaks or fillets with the skin	6	14.6 %	20	17.2 %	2	10.0 %	19	17.8 %	6	30.0 %
Other parts of fish	1	2.4%	0	0.0%	1	5.0%	1	0.9%	0	0.0%
Don't Know	3	7.3%	9	7.8%	0	0.0%	6	5.6%	2	10.0 %
TOTAL	41	100%	116	100%	20	100%	107	100%	20	100%

Table 21: Quantitative measure of fish consumption of the five DNC fish (N=106 & N=483).										
	Consumption Rate (g/ind./day)									
All Races/ Ethnicities	Angler-Consumers*					Those Who Catch (Q9, Q16)**				
Fish Type	n	Mean	U.C.L.	Md	U.D.	n	Mean	U.C.L.	Md	U.D.
white croaker DNC	23	8.73	11.10	5.36	19.29	263	0.76	1.17	0.00	0.00
barred sand bass DNC	56	9.04	13.39	5.36	17.67	299	1.69	2.42	0.00	5.36
black croaker DNC	6	10.27	17.41	8.04	--	94	0.66	1.42	0.00	0.00
topsmelt DNC	8	17.41	39.50	8.04	--	239	0.58	1.47	0.00	0.00
barracuda DNC	32	9.71	15.64	5.36	17.95	298	1.04	1.81	0.00	2.68
Total	106	11.50	16.54	5.36	24.11	483	2.52	3.52	0.00	5.36

NOTE. U.C.L. = Upper Confidence Limit (95%); Md = Median (50%); U.D. = Upper Decile (90%); *4 weeks; Total indicates combined consumption rates in g/ind/day across the five fish of interest. Consumers are anglers who reported eating the fish species in the past four weeks; N=106 represents number of anglers; n represents number of times the fish species was reported to be consumed. Anglers were asked to report all that applied

Table 21.a. Quantitative Measure of Fish Consumption of the Five DNC Fish by White Race.						
	Consumption Rate*					
White	Consumers g/ind/day			Those Who Catch (Q9, Q16) g/ind/day		
Fish Type	n	Mean	Md	n	Mean	Md
barred sand bass DNC	15	6.43	5.36	82	1.18	0.00
barracuda DNC	7	4.59	5.36	86	0.37	0.00
white croaker DNC	4	5.36	4.02	51	0.42	0.00
black croaker DNC	1	5.36	5.36	18	0.28	0.00
topsmelt DNC	0	--	--	52	0.00	0.00

NOTE. Md = Median (50%), * 4 weeks, there was 1 missing case.

Table 21.b. Quantitative Measure of Fish Consumption of the Five DNC Fish by Black or African-American Race						
	Consumption Rate*					
Black or African American	Consumers g/ind/day			Those Who Catch (Q9, Q16) g/ind/day		
Fish Type	n	Mean	Md	n	Mean	Md
barred sand bass DNC	5	9.64	10.71	210	2.41	0.00
white croaker DNC	4	8.04	5.36	23	1.40	0.00
barracuda DNC	1	5.36	5.36	21	0.26	0.00
topsmelt DNC	0	--	--	17	0.00	0.00
black croaker DNC	0	--	--	10	0.00	0.00

NOTE. Md = Median (50%), * 4 weeks, there were no missing cases.

Table 21.c. Quantitative Measure of Fish Consumption of the Five DNC Fish by Hispanic or Latino Race.						
	Consumption Rate*					
Hispanic or Latino	Consumers g/ind/day			Those Who Catch (Q9, Q16) g/ind/day		
Fish Type	n	Mean	Md	n	Mean	Md
barred sand bass DNC	19	9.87	5.36	105	1.79	0.00
barracuda DNC	15	11.25	5.36	103	1.64	0.00
white croaker DNC	8	12.39	10.71	106	0.94	0.00
topsmelt DNC	3	6.25	5.36	81	0.23	0.00
black croaker DNC	2	8.04	8.04	37	0.43	0.00

NOTE. Md = Median (50%), * 4 weeks, there were 7 missing cases.

Table 21.d. Quantitative Measure of Fish Consumption of the Five DNC Fish by American- Indian or Alaska-Native Race.						
	Consumption Rate*					
American Indian or Alaska Native	Consumers g/ind/day			Those Who Catch (Q9, Q16) g/ind/day		
Fish Type	n	Mean	Md	n	Mean	Md
barred sand bass DNC	1	2.68	2.68	5	0.54	0.00
barracuda DNC	1	2.68	2.68	4	0.67	0.00
white croaker DNC	0	--	--	3	0.00	0.00
topsmelt DNC	0	--	--	4	0.00	0.00
black croaker DNC	0	--	--	2	0.00	0.00

NOTE. Md = Median (50%), * 4 weeks, there were no missing cases.

Table 21.e. Quantitative Measure of Fish Consumption of the Five DNC Fish by Asian Race.						
	Consumption Rate*					
Asian	Consumers g/ind/day			Those Who Catch (Q9, Q16) g/ind/day		
Fish Type	n	Mean	Md	n	Mean	Md
barred sand bass DNC	9	11.61	5.36	61	1.71	0.00
white croaker DNC	7	6.89	5.36	61	0.79	0.00
barracuda DNC	6	15.18	5.36	55	1.66	0.00
topsmelt DNC	5	24.11	10.71	66	1.83	0.00
black croaker DNC	3	13.39	10.71	17	2.36	0.00

NOTE. Md = Median (50%), * 4 weeks, there were 4 missing cases.

Table 21.f. Quantitative Measure of Fish Consumption of the Five Fish of Interest by Pacific Islander Race.						
	Consumption Rate*					
Pacific Islander	Consumers g/ind/day			Those Who Catch (Q9, Q16) g/ind/day		
Fish Type	**n**	**Mean**	**Md**	**n**	**Mean**	**Md**
white croaker DNC	0	--	--	0	--	--
barred sand bass DNC	0	--	--	3	0.00	0.00
topsmelt DNC	0	--	--	1	0.00	0.00
barracuda DNC	0	--	--	2	0.00	0.00
black croaker DNC	0	--	--	0	--	--

NOTE. Md = Median (50%), * 4 weeks, there was 1 missing case.

Table 21.g. Quantitative Measure of Fish Consumption of the Five Fish of Interest by Mixed Race.						
	Consumption Rate*					
Mixed Race	Consumers g/ind/day			Those Who Catch (Q9, Q16) g/ind/day		
Fish Type	**n**	**Mean**	**Md**	**n**	**Mean**	**Md**
barred sand bass DNC	1	21.43	21.43	9	2.38	0.00
barracuda DNC	1	5.36	5.36	10	0.54	0.00
white croaker DNC	0	--	--	9	0.00	0.00
topsmelt DNC	0	--	--	8	0.00	0.00
black croaker DNC	0	--	--	4	0.00	0.00

NOTE. Md = Median (50%), * 4 weeks, there was 1 missing case.

Table 22: Quantitative measure of fish consumption by mode (N=270 & N=693).										
	Consumption Rate (g/ind./day)									
All Races/ Ethnicities	Angler-Consumers*					Full Sample**				
Mode	**n**	**Mean**	**U.C.L.**	**Md**	**U.D.**	**n**	**Mean**	**U.C.L.**	**Md**	**U.D.**
Pier or Jetty	102	19.22	24.11	10.71	61.07	338	5.80	7.59	0.00	16.07
Charter Boat	82	16.69	21.85	10.71	32.14	189	7.24	9.79	0.00	21.43
Private Boat	55	19.48	28.49	10.71	42.86	139	7.71	11.81	0.00	21.43
Beach/Intertidal Zone	10	20.09	28.92	16.07	42.86	27	7.44	12.60	0.00	30.00
Total	270[a]	18.55	21.41	10.71	42.86	693	6.64	7.95	0.00	21.43

NOTE. U.C.L. = Upper Confidence Limit (95%); Md = Median (50%); U.D. = Upper Decile (90%); *4 weeks; [a] there were 21 instances of missing data. N=270 represents number of anglers; n represents number of times the fish species was reported to be consumed. Anglers were asked to report all that applied.

Table 23. Comparison across Seafood Consumption Studies 1994 vs 2014.		
Study	**1994 Study (SMBRP 1994)**	**2014 Seafood Consumption Study**
Surveying days	99	128
Fishing sites	29	61
Anglers counted	2376	1449
Anglers approached	1751	888
Angler responses	1243	693
Response rate	71%	78%

Table 24: Comparison of Palos Verdes Shelf vs San Francisco consumption report.					
	Consumption Rate (g/ind./day)				
	Palos Verdes Shelf 2014 Study			San Francisco 2000 Study	
Ethnicity	**n**	**Mean**	**Median**	**Mean**	**Median**
Hispanic	80	16.41	10.71	16.6	16.0
Asian	76	20.76	10.71	17.8	16.0
White	54	19.25	9.38	14.4	16.0
Black	17	23.00	16.07	19.4	16.0
Other	22	12.78	6.70	-	-
Total	270[a]	18.55	10.71	16.5	16.0

Table 25: Advisory Awareness and Behavior Change by Ethnicity and Mode (N=425).							
			Fishing Mode				
Ethnicity			**Pier or Jetty**	**Private boat**	**Party or Charter boat**	**Beach or Intertidal zone**	**Total**
White	Avoids some fish species		2	7	3	0	12
			6.7%	15.9%	10.7%	0.0%	11.3%
	Reduced consumption		1	2	1	1	5
			3.3%	4.5%	3.6%	25.0%	4.7%
	Doesn't eat fish		10	2	7	3	22
			33.3%	4.5%	25.0%	75.0%	20.8%
	Changed fishing locations		0	1	0	0	1
			0.0%	2.3%	0.0%	0.0%	.9%
	No change		17	30	16	0	63
			56.7%	68.2%	57.1%	0.0%	59.4%
	More cautious		0	2	1	0	3
			0.0%	4.5%	3.6%	0.0%	2.8%

	Other					
		30	44	28	4	106
	Total	100.0%	100.0%	100.0%	100.0%	100.0%
Black or African American	Avoids some fish species	1	3	0	0	4
		12.5%	42.9%	0.0%	0.0%	19.0%
	Reduced consumption	0	0	0	1	1
		0.0%	0.0%	0.0%	50.0%	4.8%
	Doesn't eat fish	0	1	0	0	1
		0.0%	14.3%	0.0%	0.0%	4.8%
	Changed fishing locations	1	0	2	1	4
		12.5%	0.0%	50.0%	50.0%	19.0%
	No change	5	1	2	0	8
		62.5%	14.3%	50.0%	0.0%	38.1%
	More cautious	0	2	0	0	2
		0.0%	28.6%	0.0%	0.0%	9.5%
	Other	1	0	0	0	1
		12.5%	0.0%	0.0%	0.0%	4.8%
	Total	8	7	4	2	21
		100.0%	100.0%	100.0%	100.0%	100.0%
Hispanic or Latino	Avoids some fish species	15	2	6	1	24
		13.6%	14.3%	25.0%	20.0%	15.7%
	Reduced consumption	8	0	1	0	9
		7.3%	0.0%	4.2%	0.0%	5.9%
	Doesn't eat fish	33	3	8	2	46
		30.0%	21.4%	33.3%	40.0%	30.1%
	Changed fishing locations	0	0	1	0	1
		0.0%	0.0%	4.2%	0.0%	.7%
	No change	43	9	8	2	62
		39.1%	64.3%	33.3%	40.0%	40.5%
	More cautious	3	0	0	0	3
		2.7%	0.0%	0.0%	0.0%	2.0%
	Other	8	0	0	0	8
		7.3%	0.0%	0.0%	0.0%	5.2%
	Total	110	14	24	5	153
		100.0%	100.0%	100.0%	100.0%	100.0%
American Indian or Alaskan Native	Avoids some fish species					
	Reduced consumption					

	Doesn't eat fish					
	Changed fishing locations					
	No change	1	1	4		6
		100.0%	100.0%	100.0%		100.0%
	More cautious					
	Other					
	Total	1	1	4		6
		100.0%	100.0%	100.0%		100.0%
Asian	Avoids some fish species	6	3	1	3	13
		10.0%	37.5%	3.3%	75.0%	12.7%
	Reduced consumption	3	1	1	0	5
		5.0%	12.5%	3.3%	0.0%	4.9%
	Doesn't eat fish	14	3	3	0	20
		23.3%	37.5%	10.0%	0.0%	19.6%
	Changed fishing locations					
	No change	34	1	22	1	58
		56.7%	12.5%	73.3%	25.0%	56.9%
	More cautious	0	0	3	0	3
		0.0%	0.0%	10.0%	0.0%	2.9%
	Other	3	0	0	0	3
		5.0%	0.0%	0.0%	0.0%	2.9%
	Total	60	8	30	4	102
		100.0%	100.0%	100.0%	100.0%	100.0%
Pacific Islander	Avoids some fish species	0	0	1		1
		0.0%	0.0%	100.0%		20.0%
	Reduced consumption					
	Doesn't eat fish	0	1	0		1
		0.0%	50.0%	0.0%		20.0%
	Changed fishing locations					
	No change	2	1	0		3
		100.0%	50.0%	0.0%		60.0%
	More cautious					
	Other					
	Total	2	2	1		5

		100.0%	100.0%	100.0%		100.0%
Mixed Race	Avoids some fish species	0	0	1		1
		0.0%	0.0%	33.3%		8.3%
	Reduced consumption					
	Doesn't eat fish	1	1	1		3
		25.0%	20.0%	33.3%		25.0%
	Changed fishing locations					
	No change	3	4	1		8
		75.0%	80.0%	33.3%		66.7%
	More cautious					
	Other					
	Total	4	5	3		12
		100.0%	100.0%	100.0%		100.0%
Total		215	81	94	15	405
		100.0%	100.0%	100.0%	100.0%	100.0%

NOTE. There were 20 missing cases.

Table 25.a. Importance of Warnings by Ethnicity and Fishing Mode (N=420).

		Fishing Mode				
Ethnicity		**Pier or Jetty**	**Private boat**	**Party or Charter boat**	**Beach or Intertidal zone**	**Total**
White	Very important	16	17	12	1	46
		53.3%	37.8%	40.0%	25.0%	42.2%
	Important	6	19	13	2	40
		20.0%	42.2%	43.3%	50.0%	36.7%
	Somewhat important	5	8	4	0	17
		16.7%	17.8%	13.3%	0.0%	15.6%
	Not important	3	1	1	1	6
		10.0%	2.2%	3.3%	25.0%	5.5%
	Total	30	45	30	4	109
		100.0%	100.0%	100.0%	100.0%	100.0%
Black or African American	Very important	4	4	3	1	12
		50.0%	57.1%	75.0%	50.0%	57.1%
	Important	2	0	1	0	3
		25.0%	0.0%	25.0%	0.0%	14.3%
		1	2	0	1	4

	Somewhat important	12.5%	28.6%	0.0%	50.0%	19.0%
	Not important	1	1	0	0	2
		12.5%	14.3%	0.0%	0.0%	9.5%
	Total	8	7	4	2	21
		100.0%	100.0%	100.0%	100.0%	100.0%
Hispanic or Latino	Very important	73	7	14	4	98
		65.8%	50.0%	56.0%	80.0%	63.2%
	Important	24	5	7	1	37
		21.6%	35.7%	28.0%	20.0%	23.9%
	Somewhat important	9	1	3	0	13
		8.1%	7.1%	12.0%	0.0%	8.4%
	Not important	5	1	1	0	7
		4.5%	7.1%	4.0%	0.0%	4.5%
	Total	111	14	25	5	155
		100.0%	100.0%	100.0%	100.0%	100.0%
American Indian or Alaskan Native	Very important	0	0	2		2
		0.0%	0.0%	50.0%		33.3%
	Important	1	1	1		3
		100.0%	100.0%	25.0%		50.0%
	Somewhat important	0	0	1		1
		0.0%	0.0%	25.0%		16.7%
	Not important					
	Total	1	1	4		6
		100.0%	100.0%	100.0%		100.0%
Asian	Very important	22	3	12	1	38
		37.3%	37.5%	40.0%	25.0%	37.6%
	Important	25	5	15	2	47
		42.4%	62.5%	50.0%	50.0%	46.5%
	Somewhat important	2	0	3	1	6
		3.4%	0.0%	10.0%	25.0%	5.9%
	Not important	10	0	0	0	10
		16.9%	0.0%	0.0%	0.0%	9.9%
	Total	59	8	30	4	101
		100.0%	100.0%	100.0%	100.0%	100.0%
Pacific Islander	Very important	0	2	1		3
		0.0%	100.0%	100.0%		60.0%
	Important	2	0	0		2
		100.0%	0.0%	0.0%		40.0%
	Somewhat important					

	Not important					
	Total	2 100.0%	2 100.0%	1 100.0%		5 100.0%
Mixed Race	Very important	2 50.0%	1 20.0%	2 66.7%		5 41.7%
	Important	0 0.0%	1 20.0%	1 33.3%		2 16.7%
	Somewhat important	1 25.0%	3 60.0%	0 0.0%		4 33.3%
	Not important	1 25.0%	0 0.0%	0 0.0%		1 8.3%
	Total	4 100.0%	5 100.0%	3 100.0%		12 100.0%
	Total	215 100.0%	82 100.0%	97 100.0%	15 100.0%	409 100.0%

NOTE. There were 11 missing cases.

Table 25.b. Importance of the warnings (N=425).

	Frequency	Percentage
Very important	210	50.0
Important	138	32.9
Somewhat important	45	10.6
Not important	27	6.0
Don't know/refused	4	.5
Total	424	100.0

NOTE. There was 1 missing case.

Table 25.c. Percentage of anglers who had seen or heard any health advisory warnings.

	Frequency	Percentage
Yes	425	61.3
No	264	38.1
Don't know	4	.6
Total	693	100.0

Table 25.d Awareness of what the warning said (N=425).		
	Frequency	**Percentage**
Fish are contaminated	214	53.8
Do not eat white croaker	151	37.9
Do not eat barred sand bass	61	15.3
Do not eat barracuda	57	14.3
Do not eat black croaker	47	11.8
Only eat small amounts	39	9.8
Do not eat topsmelt	35	8.8
Protect your health	20	5.0
Other	12	3.0
Don't know	20	5.1
Total	656	164.8

NOTE. Respondents could choose more than one answer; therefore, percentage may sum to more than 100%

Table 25.e. Where anglers had seen or heard the warnings (N=425).		
	Frequency	**Percentage**
Signs on beach or pier	320	75.7
Other fishermen or friends	48	11.3
Brochures (including Department of Fish and Game)	32	7.6
Television	31	7.3
Online (including Department of Fish and Game)	30	7.1
Newspaper or magazine	24	5.7
Other	7	1.7
Don't know	5	1.2
Total	497	117.5

NOTE. Respondents could choose more than one answer; therefore, percentage may sum to more than 100%.

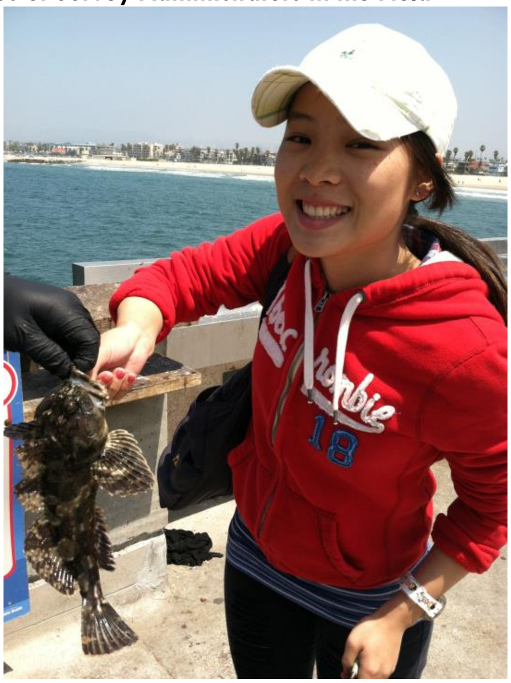
Table 25.f. How anglers changed fishing or fish-eating habits (N=425).		
	Frequency	**Percentage**
No change	212	50.8
Doesn't eat fish	96	23.0
Avoids some fish species	57	13.7
Reduced consumption	22	5.3
More cautious	11	2.6
Changed fishing locations	6	1.4
Other	13	3.1
Total	417	100.0

NOTE. There were 8 missing cases.

APPENDIX N

PHOTOS OF SURVEY ADMINISTRATORS IN THE FIELD

Photos of Survey Administrators in the Field



Surveyor Jasmine Yeh helping an angler with his catch.

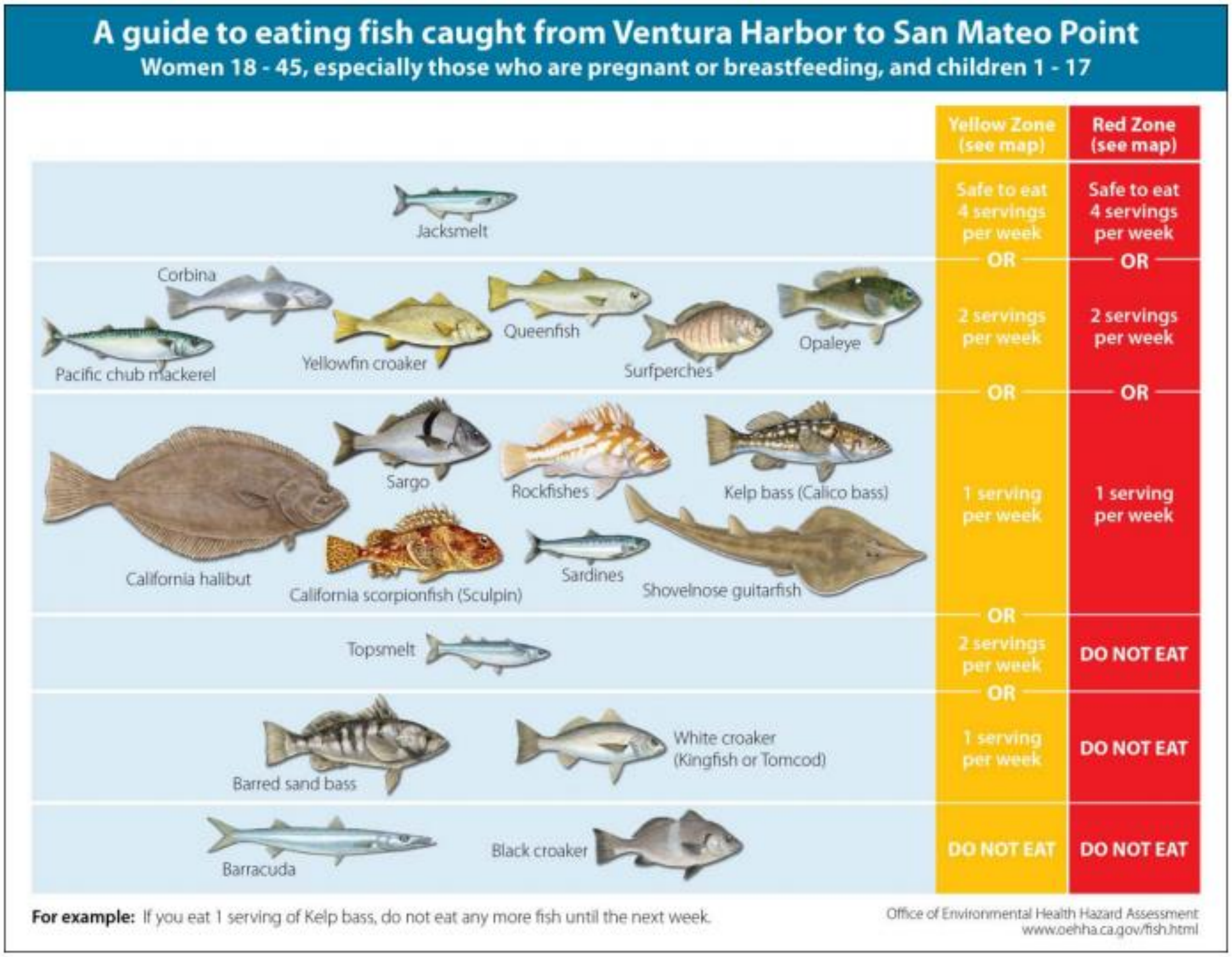
Surveyor Lucia Phan with an angler from Redondo Sportsfishing.

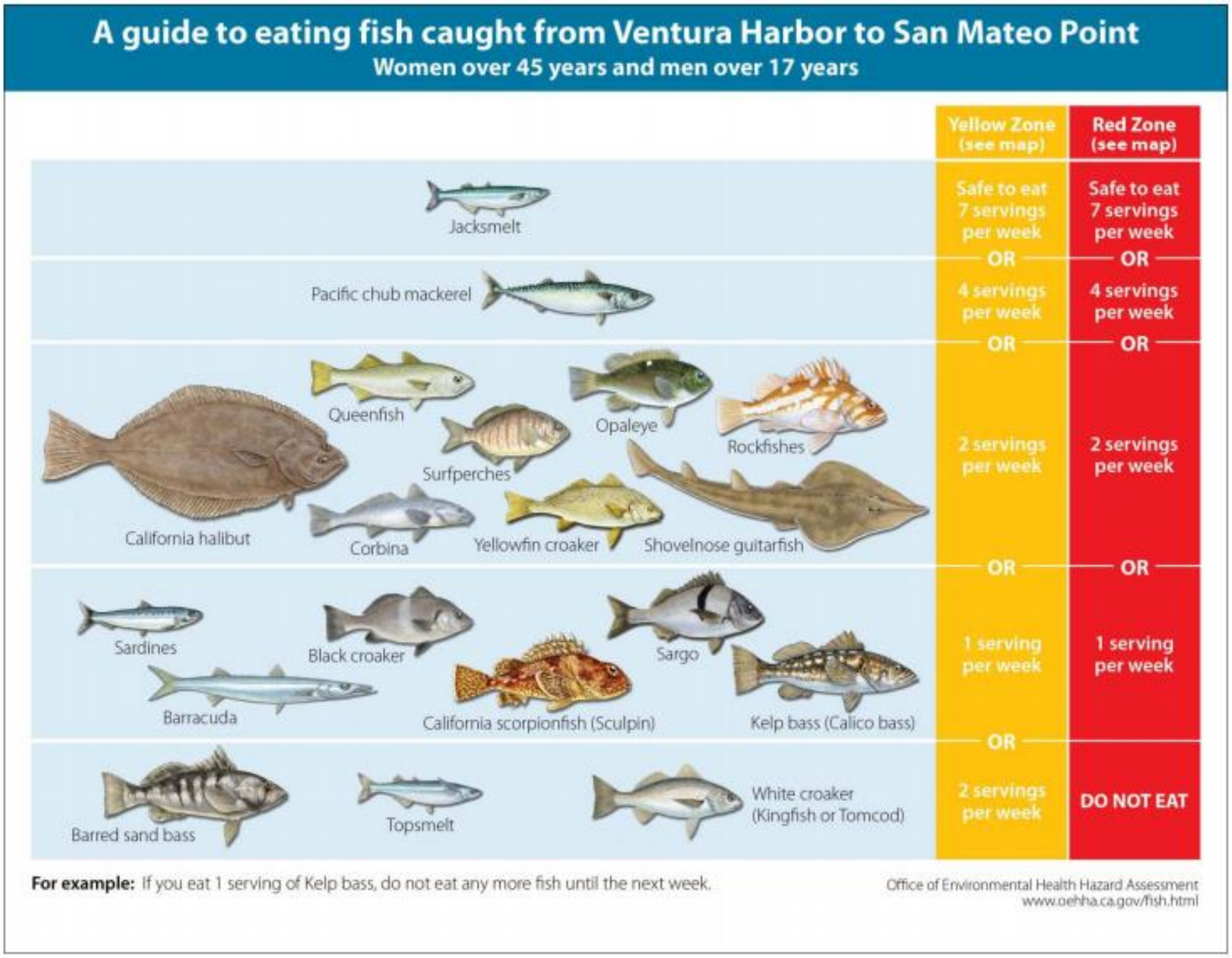
Surveyor Citadel Casbag interviewing an angler at Pier J.

The last day of surveying for the team.

APPENDIX O

FISH ADVISORY


A guide to eating fish caught from Ventura Harbor to San Mateo Point
Women 18 - 45, especially those who are pregnant or breastfeeding, and children 1 - 17
Yellow Zone (see map)
Red Zone (see map)
Jacksmelt
Safe to eat 4 servings per week
Safe to eat 4 servings per week
OR
OR
Corbina
Pacific chub mackerel
Yellowfin croaker
Queenfish
Surfperches
Opaleye
2 servings per week
2 servings per week
OR
OR
California halibut
Sargo
Rockfishes
Kelp bass (Calico bass)
California scorpionfish (Sculpin)
Sardines
Shovelnose guitarfish
1 serving per week
1 serving per week
OR
Topsmelt
2 servings per week
DO NOT EAT
OR
Barred sand bass
White croaker (Kingfish or Tomcod)
1 serving per week
DO NOT EAT
Barracuda
Black croaker
DO NOT EAT
DO NOT EAT
For example: If you eat 1 serving of Kelp bass, do not eat any more fish until the next week.
Office of Environmental Health Hazard Assessment www.oehha.ca.gov/fish.html


A guide to eating fish caught from Ventura Harbor to San Mateo Point
Women over 45 years and men over 17 years
Yellow Zone (see map)
Red Zone (see map)
Jacksmelt
Safe to eat 7 servings per week
Safe to eat 7 servings per week
OR
OR
Pacific chub mackerel
4 servings per week
4 servings per week
OR
OR
Queenfish
Opaleye
Rockfishes
Surfperches
California halibut
Corbina
Yellowfin croaker
Shovelnose guitarfish
2 servings per week
2 servings per week
OR
OR
Sardines
Black croaker
Sargo
Barracuda
California scorpionfish (Sculpin)
Kelp bass (Calico bass)
1 serving per week
1 serving per week
OR
Barred sand bass
Topsmelt
White croaker (Kingfish or Tomcod)
2 servings per week
DO NOT EAT
For example: If you eat 1 serving of Kelp bass, do not eat any more fish until the next week.
Office of Environmental Health Hazard Assessment
www.oehha.ca.gov/fish.html