



**FISH CONTAMINATION EDUCATION
COLLABORATIVE
ENFORCEMENT REPORT
July 2022 – June 2023**

**Palos Verdes Shelf Superfund Site
Los Angeles County, California**

**Contract No. 68HE0318D0005
Order No. 68HE0923F0023
Requisition No. PR-RAF9-23-00027**

Prepared for

U.S. Environmental Protection Agency Region 9
75 Hawthorne Street
San Francisco, California 94105

Prepared by

EA Engineering, Science, and Technology, Inc.
555 University Avenue, Suite 110
Sacramento, California 95825

September 2023
Revision: Final
EA Project No.: 1578538

This page intentionally left blank

TABLE OF CONTENTS

LIST OF TABLES ii

LIST OF FIGURES ii

ACRONYMS AND ABBREVIATIONS..... iii

1.0 INTRODUCTION 1

2.0 ENFORCEMENT INSPECTIONS 1

3.0 ENFORCEMENT INSPECTION RESULTS 2

 3.1 Recreational Fishing..... 2

 3.1.1 Awareness of Fish Contamination Issues 3

 3.1.2 Intentions to Keep White Croaker 3

 3.1.3 Do Not Consume Fish Observed and Seized 3

 3.1.4 Citations, Warning, and Violations..... 4

 3.1.5 Information Provision 4

 3.1.6 Contamination Awareness Source 4

 3.2 Commercial Fishing 5

 3.2.1 Awareness of Fish Contamination Issues 5

 3.2.2 White Croaker Identified..... 5

 3.2.3 Do Not Consume Fish Observed and For Sale 5

 3.2.4 Violations 5

 3.2.5 Information Provision 5

4.0 ENFORCEMENT INSPECTION RESULTS DISCUSSION..... 5

 4.1 Recreational Fishing..... 5

 4.2 Commercial Fishing 8

5.0 CONCLUSIONS..... 8

LIST OF TABLES

<u>No.</u>	<u>Title</u>
1	Reported Awareness of Fish Contamination by Fishing Mode
2	Intentions to Keep White Croaker
3	Fish Contamination Awareness Source
4	CDFW Recreational Inspections Summary
5	CDFW Commercial Inspections Summary

LIST OF FIGURES

<u>No.</u>	<u>Title</u>
1	Pier and Enforcement Patrol Areas

ACRONYMS AND ABBREVIATIONS

CDFW	California Department of Fish and Wildlife
City of Long Beach	City of Long Beach Department of Health and Human Services, Bureau of Environmental Health
DNC	Do Not Consume
EA	EA Engineering, Science, and Technology, Inc.
EPA	U.S. Environmental Protection Agency
FCEC	Fish Contamination Education Collaborative
LACDPH	Los Angeles County Department of Public Health

This page intentionally left blank

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) created the Fish Contamination Education Collaborative (FCEC) with representatives of federal, state, and local agencies, as well as community-based organizations that carry out various outreach and education activities. Enforcement represents one of the four Institutional Controls implemented to address the sediment contamination at the Palos Verdes Shelf Superfund Site. Enforcement consists of enforcing existing white croaker regulations for commercial and recreational anglers, along with inspections of retail food facilities and enforcement of market protocol under the California Health and Safety Code. Efforts also include monitoring and enforcing the daily catch limit and the commercial no-take zone for white croaker.

EPA, Los Angeles County Department of Public Health (LACDPH), and Orange County started collecting market data in 2004 to determine whether white croaker caught in and around the Palos Verdes Shelf Superfund Site were reaching local markets. Over time, anecdotal reports began to suggest that white croaker were no longer being found in the markets. In the past, the Orange County Health Care Agency, Environmental Health Division, conducted inspections of markets and restaurants in Orange County. Based on the data collected before 2015, Orange County determined that white croaker were not being sold in markets and discontinued their participation in the FCEC program prior to EA's involvement in the project.

In February 2015, EPA contracted EA Engineering, Science, and Technology, Inc. (EA) to coordinate with enforcement agencies/inspectors to support enforcement activities, provide outreach materials as needed, and prepare annual reports summarizing enforcement data collected by California Department of Fish and Wildlife (CDFW), LACDPH, and the City of Long Beach Department of Health and Human Services, Bureau of Environmental Health (City of Long Beach). EA also conducted annual fish identification training for LACDPH and City of Long Beach inspectors. The grants for enforcement inspections expired for City of Long Beach in 2019 and LACDPH in 2022.

In March 2023, the EPA transitioned the project from the Remedial Action Contract to the Remedial Acquisition Framework and contracted EA to continue coordination with enforcement agencies and inspectors to support enforcement activities, provide outreach materials as needed, and prepare annual reports summarizing enforcement data collected by CDFW. During this reporting period, CDFW continued enforcement inspections and the data are summarized in this report.

2.0 ENFORCEMENT INSPECTIONS

CDFW staff conducts inspections of in-water commercial and recreational anglers, wholesale commercial (fish market or restaurant), and shoreline recreational anglers. CDFW reported recreational fishing inspections between July 2022 and June 2023, and commercial fishing inspections in January 2023 and May 2023. The inspections consisted of the following:

- Recreational (shoreline and in-water) anglers
- Commercial (wholesale) fishing operations

CDFW performed two commercial fishing inspections at fish businesses in January 2023 and three inspections at fish businesses in May 2023. As part of the commercial inspections, CDFW asks anglers where the fish are from, and verifies the invoice (if applicable). Retailers are required to purchase fish from licensed vendors. The fish businesses targeted for inspection sell seafood and/or have sold white croaker illegally in the past. CDFW has focused inspections of commercial vessels in the red zone, in particular the areas surrounding the white croaker catch ban off the coast at Palos Verdes and Fish Harbor, where many anglers dock their boats.

CDFW also conducted 43 recreational fishing inspections along the Palos Verdes Peninsula shoreline, including areas between Malaga Cove and Long Point, Abalone Cove and Inspiration Point, and Royal Palms and Cabrillo Beach Jetty (Figure 1). Recreational fishing inspections include inspecting piers, jetties, boats, and beaches. During recreational inspections, the wardens check bags for illegal fish and size limits and conduct outreach about the dangers of white croaker and other relevant topics. The bag limit for recreational and sport fishing is 10 white croaker. There is no commercial catch limit for white croaker.

3.0 ENFORCEMENT INSPECTION RESULTS

An analysis of the enforcement inspections was performed to summarize major findings from the inspections. The following sections address the recreational and commercial fishing inspections.

3.1 RECREATIONAL FISHING

CDFW wardens usually fill out one inspection form per fishing mode per day. However, during this reporting period, one recreation inspection form recorded two fishing modes on the same day. Based on communication with CDFW, EA assumes that this inspection form was used for two separate inspections. Because the form did not differentiate which information applied to each fishing mode, EA assumed all information collected (e.g., number of white croaker observed, number of FCEC tip cards distributed, etc.) to be split 50/50 between the fishing modes. CDFW agreed to continue providing separate inspection forms for separate fishing modes in future reporting periods.

Recreational inspection modes included piers and jetties, boat patrol, and beach and intertidal areas. The recreational inspection data were collected between July 2022 and June 2023. There were 43 recreational fishing inspections conducted in this reporting period. Out of those, 33 percent were pier and jetties inspections, 16 percent were boat patrols, and 51 percent were beach and intertidal inspections. A total of 577 anglers were contacted during the pier and jetties (224), boat patrols (89), and beach and intertidal (264) recreational inspections. On average, 13 anglers were interviewed per inspection. An average of 16 anglers were interviewed during pier and jetty inspections, 13 were interviewed during boat inspections, and 12 were interviewed during beach and intertidal inspections.

3.1.1 Awareness of Fish Contamination Issues

At least one angler interviewed reported being aware of the fish contamination issues during 31 out of 43 inspections (72 percent). This includes 11 out of 14 pier and jetties inspections, 15 out of 22 beach inspections, and 5 out of 7 boat inspections. Additional information is included in Table 1.

Table 1. Reported Awareness of Fish Contamination by Fishing Mode

Fishing Mode	Reported Awareness					
	Yes	% Yes by Mode	% of Yes All Modes	No	% No by Mode	% of No All Modes
Piers and Jetties	11	79	35.5	3	21	25
Boat Patrol	5	71	16.1	2	29	16.7
Beach and Intertidal	15	68	48.4	7	32	58.3
Total	31	72	--	12	28	--

3.1.2 Intentions to Keep White Croaker

When asked about intentions to keep white croaker if they caught it, at least one angler responded “yes” in 5 of the 43 inspections (12 percent). Of inspections where at least one angler reported that they were aware of the fish contamination (n=31), 16 percent (n=5) had at least one angler who intended to keep white croaker. Inspections where at least one angler expressed an intention to keep white croaker occurred during 1 of 14 pier and jetty inspections, 0 of 7 boat inspections, and 4 of 22 beach inspections. Additional information is included in Table 2.

Table 2. Intentions to Keep White Croaker

Fishing Mode	Would fishermen keep White Croaker if they caught it?					
	Yes	% Yes by Mode	% of Yes All Modes	No	% No by Mode	% of No All Modes
Piers and Jetties	1	7	20	13	93	34.2
Boat Patrol	0	0	0	7	100	18.4
Beach and Intertidal	4	18	80	18	82	47.4
Total	5	12	--	38	88	--

3.1.3 Do Not Consume Fish Observed and Seized

There were 35 white croaker observed in three inspections (7 percent of all inspections). There were no white croaker seizures reported during recreational inspections. Multiple areas were patrolled during each inspection, and the specific location of white croaker was not recorded. All three inspections in which white croakers were observed took place at Davies Launch Ramp and South Shores Launch Ramp. One of these inspections also included San Pedro Launch Ramp. There were 29 topsmelt observed in 5 inspections (11.6 percent). There were no topsmelt seizures reported. Multiple areas were patrolled during each inspection and the specific location of topsmelt was not specified. Topsmelt was noted most frequently, and/or in larger quantities during patrols of South Shores Launch Ramp and Palos Verdes Beach. Other recorded locations included Davies Launch Ramp, San Pedro Launch Ramp, Manhattan Beach, Hermosa Beach, Redondo Beach, San Pedro, Long Beach, Alamitos Bay, Marina Drive Bridge, and the 72nd

Place Jetty (Figure 1).

There were 45 barred sand bass observed in nine inspections (21 percent). There were no barred sand bass seizures reported. Multiple areas were patrolled during each inspection and the specific location of barred sand bass was not specified. Barred sand bass was noted most frequently, and/or in larger quantities during patrol of Davies Launch Ramp, South Shores Launch Ramp, Long Beach, King Harbor, and Hermosa Beach. Other recorded locations included San Pedro Launch Ramp, Seal Beach, Redondo Beach, Marina del Rey, Port of LA, Alamitos Bay, the Brett Hall Show, and Shoreline Drive.

No black croaker or barracuda were observed or seized during any recreational inspections during this reporting period.

3.1.4 Citations, Warning, and Violations

There were no bag limit violations reported among the 43 inspections. A total of 22 warnings and 34 citations for fish violations were issued. Most citations and violations were not related to the Do Not Consume (DNC) fish. Common violations included fishing without a license, catching undersized fish, and fishing out of season lobster.

3.1.5 Information Provision

A total of 101 FCEC tip cards were distributed during 29 of 43 inspections (67 percent). During the inspections, outreach materials were sometimes provided in multiple languages. An English language tip card was provided for approximately 61 percent of inspections (n=26). In addition, a Spanish tip card was provided 21 percent of the inspections (n=9). No Chinese or Vietnamese tip cards were provided in recreational inspections during this reporting period.

3.1.6 Contamination Awareness Source

CDFW inspection forms include a question for anglers who were aware of fish contamination issues that allows them to indicate the source of their awareness including DNC pier signage, outreach materials FCEC tip cards, outreach workers, warnings, internet, community events, media, friend/family, and/or another source. In most inspection forms in which at least one angler reported awareness of fish contamination issues (n=31), multiple sources of awareness were recorded for a single group of anglers in a single fishing mode. Therefore, there is a greater number of awareness sources than the number of inspections in which at least one angler reported being aware of fish contamination issues for each fishing mode.

The most influential fish contamination awareness sources for all fishing modes was 36.5 percent from the FCEC tip cards, followed closely by 34.6 percent from DNC fish pier signs, then 19.2 percent from outreach workers, and 9.6 percent from warnings. The recreational anglers were most aware during beach and intertidal inspections with the boat patrol inspections being the least aware. The most popular sources of awareness reported during inspections in all fishing modes were FCEC tip cards and signage, followed by outreach workers and warnings. The percent breakdown of awareness source by fishing mode and total of all fishing modes is

included in Table 3.

Table 3. Fish Contamination Awareness Source

Fishing Mode	Source of Awareness (%)								
	DNC Signs	Outreach Material	Outreach Team	Warnings	Internet	Community Events	Media	Friends/Family	Other
Piers and Jetties (n=11)	40	40	6.7	13.3	0	0	0	0	0
Boat Patrol (n=5)	37.5	37.5	25	0	0	0	0	0	0
Beach and Intertidal (n=15)	31	34.5	24.1	10.4	0	0	0	0	0
All Fishing Modes (n=31)	34.6	36.5	19.2	9.6	0	0	0	0	0

3.2 COMMERCIAL FISHING

Commercial fishing inspection data was collected by CDFW in January and May 2023. Two fish markets in Arcadia and Monterrey Park were inspected in January and three fish markets in El Monte and West Covina were inspected in May.

3.2.1 Awareness of Fish Contamination Issues

Among the five commercial fishing inspections, three fish markets (60 percent) reported that they were unaware of the fish contamination. The two remaining fish markets were aware of fish contamination and reported that their vendors were their sources of awareness.

3.2.2 White Croaker Identified

No white croaker were identified during commercial inspections in this reporting period.

3.2.3 Do Not Consume Fish Observed and For Sale

During commercial inspections, there were no other DNC fish observed or intended for sale.

3.2.4 Violations

No violations were issued by CDFW during commercial inspections in this reporting period.

3.2.5 Information Provision

No FCEC tip cards were distributed to fish businesses during commercial inspections in this reporting period.

4.0 ENFORCEMENT INSPECTION RESULTS DISCUSSION

4.1 RECREATIONAL FISHING

A summary of the CDFW recreational fishing inspections between July 2022 and June 2023 is

presented in Table 4.

Table 4. CDFW Recreational Inspections Summary

Inspection Activity and Fish Seized	Number
Total inspections	43
Pier and jetty inspections	14
Boat patrol inspections	7
Beach and intertidal inspections	22
Inspections where at least one angler reported awareness of contamination	31
Inspections where at least one angler reported that they would keep white croaker if caught	5
Inspections with white croaker observed	3
White croakers seized	0
Inspections with barracuda observed	0
Barracudas seized	0
Inspections with topsmelt observed	5
Topsmelt seized	0
Inspections with barred sand bass observed	9
Barred sand bass seized	0
Inspections with black croaker observed	0
Black croaker seized	0

Recreational fishing inspections (43) were significantly less than compared to the previous reporting periods (133 inspections in 2021-2022 and 177 inspections in the 2020-2021 reporting period), despite inspections having been paused in early 2020 due to the COVID-19 pandemic. Inspections during the current reporting period were also slightly lower than during the 2019-2020 reporting period (47 inspections) during which inspections were first paused due to the pandemic. On average, 11.1 inspections were performed each month during the previous reporting period and an average of 3.6 inspections were performed each month during this reporting period.

Inspections reported white croaker in 7 percent of inspections, topsmelt in 12 percent, and barred sand bass in 21 percent. No barracuda or black croaker were observed in inspections during this reporting period. In 72 percent of the recreational inspections, at least one angler interviewed stated that they were aware of the fish contamination issues. This is up from 51 percent during the previous reporting period and 67 percent during the reporting period prior to that. Anglers reported similar levels of awareness during beach and intertidal inspections (68 percent), piers and jetties inspections (72 percent), and boat inspections (71 percent). These results indicate that there continues to be a long-term trend of increasing awareness of fish contamination issues among anglers in all modes, and that differences in awareness observed in prior reporting periods indicating lower levels of awareness among boat anglers, may be decreasing.

In response to recommendations made by EA in previous reports, CDFW began using a new inspection form during the previous reporting period that included an additional question asking the source of anglers' awareness of fish contamination issues. This information is useful to evaluate which modes of outreach are more effective at increasing awareness of fish

contamination. The current reporting period represents the first time that all inspection reports were provided using the new inspection forms, indicating that CDFW has completely transitioned to the new format. During this reporting period, the most influential sources of awareness were the FCEC tip card and DNC fish pier signage; outreach workers and warnings were also reported as sources of awareness. Contrary to prior reporting periods, these were the only reported sources of awareness, and no recreational anglers reported their awareness sources as friends/family, media, community events, the internet, or any other sources not listed on the form. As more awareness source data is collected by CDFW, the trends will be evaluated in the next reporting periods.

In 12 percent of the total inspections (5 of 43), at least one angler expressed an intention to keep white croaker if they caught it. Per fishing mode, 7 percent of anglers intended to keep white croaker during piers and jetties inspections, 18 percent during beach and intertidal inspections, and 0 percent during boat inspections. Although anglers showed similar levels of awareness for each fishing mode, no boat anglers reported an intention to keep white croaker if they caught it. The results suggest there may be need for more outreach about the health effects of consuming contaminated fish among pier and beach anglers.

Data from multiple anglers are included for each inspection which limits data evaluation on an individual level. The inspections did not collect information on each of the anglers interviewed; therefore, it could not be determined whether there is a bias in the data due to repeat anglers being interviewed. Since the inspection form does not provide additional information with respect to new or repeat anglers on an individual basis, there is no way to develop and apply a weighting factor to diminish the effects of the unidentified bias impacts to the response counts for the different fishing modes. With multiple locations per inspection form, it is unclear where DNC fish are caught most frequently. Additionally, given this reporting format, the percent of anglers who are aware of contamination is dramatically skewed upward; if just one angler is aware of contamination (average of 13 anglers interviewed per inspection), the data will indicate that all interviewed anglers were aware. Furthermore, a selection bias could have occurred if the subset of anglers were selected for repeated inspections due to a specific reason, which could limit the broader applicability of the results. Another limitation to the datasets is the small sample size. Due to limited sample size, findings generated from the dataset may only apply for the specific sample population and may not be applicable to the entire population. To address some of these issues, the Recreational Fishing inspection form could be improved by collecting data per angler rather than per inspection. EA also recommends that CDFW wardens use only one inspection form per fishing mode, a recommendation which CDFW followed in all but one inspection during this reporting period.

Outreach materials in English and Spanish were distributed during 67 percent of the recreational inspections. This is up from the last reporting period in which materials were distributed in 51 percent of inspections, and from the prior reporting period in which materials were distributed in 40 percent of inspections. No outreach materials were distributed in Chinese or Vietnamese during this reporting period. Continuing to increase the distribution of materials during the inspections is recommended, since it is the most influential awareness source, and particularly when inspections find white croaker and/or angler intending to keep white croaker.

Outreach material tracking on the CDFW inspection forms indicates a total of 101 FCEC tip cards were distributed during inspection activities. In some inspections, FCEC tip cards were distributed but actual numbers of tip cards handed out were not reported, indicating that the total number of tip cards distributed is somewhat higher than 101. EA recommends that CDFW wardens consistently record the amount of outreach materials distributed in each language to aid in analysis of community outreach.

4.2 COMMERCIAL FISHING

A summary of the CDFW commercial fishing inspections between April and May 2022 is presented in Table 5.

Table 5. CDFW Commercial Inspections Summary

Inspections and Inspection Outcomes	Number
Total inspections	5
Aware of white croaker catch ban area	2
Intent to catch/buy/sell white croaker	0
White croaker observed	0
White croaker seized	0
Violations reported	0
Informational sheets provided	0

CDFW performed five fish market inspections during the reporting period. No white croaker were observed and no violations were issued during these inspections. Of the commercial anglers who responded, 60 percent reported that they were unaware of the fish contamination. This is a 10 percent increase compared to responses recorded by CDFW in the last reporting period. The commercial fishing operations are largely in compliance with white croaker regulations, but awareness remains fairly low, allowing for potential violations due to lack of awareness. However, due to a limited sample size, findings generated from the dataset may only apply for the specific sample population and may not be applicable to the entire population. The commercial fishing inspection frequency could be increased to better address awareness. Additionally, the commercial fishing inspection form could benefit from tracking of the amount of outreach materials provided in each language (like the Recreational Fishing form), to better track demographics.

5.0 CONCLUSIONS

Based on the inspection data, DNC fish, specifically white croaker, were not observed during any commercial inspections, and 35 white croaker were found among anglers in 7 percent of recreational fishing inspections. This is a decrease from the last reporting period, in which white croaker were found in 9.8 percent of inspections, as well as from previous reporting periods from 2016 to 2020 in which white croaker were found in 14 to 58 percent of inspections. The total number of white croaker found was also lower than in the previous reporting period (44), and significantly lower than in earlier reporting periods. Significantly fewer topsmelt were observed in this reporting period (29) compared to the previous reporting period (164), although this may be related to the significantly lower total number of inspections conducted during this period. It should also be noted that in the last reporting period, a larger number of topsmelt was observed than in any prior reporting periods. However, a larger number of barred sand bass were observed

during this reported period (45) compared to the last reporting period (30) despite the lower number of total inspections. This indicates that although there has been a consistent trend of declining white croaker catch since reporting began, the same trend is not occurring for other DNC fish, and it may be valuable to increase outreach regarding the health risks of DNC fish other than white croaker.

During this reporting period, significantly fewer inspections were conducted than in the last period. Awareness of fish contamination increased for recreational fishing inspections conducted by CDFW compared to the last reporting period, reflecting a consistent trend of increasing awareness. Similar levels of awareness were reported across all fishing modes, although significantly fewer boat inspections were conducted than beach and pier and jetty inspections. Intent to keep white croaker declined slightly from previous reporting periods, also reflecting a consistent trend of decreasing intent to keep white croaker since reporting began. These results indicate that outreach concerning the health effects of consuming contaminated fish has been successful, but that there is a need for outreach to continue. Commercial inspections were limited during this reporting period. Among five commercial inspections, 60 percent were unaware of the fish contamination, and none intended to buy or sell white croaker.

FIGURES

This page intentionally left blank



- ◆ Pier/Coastal Structure
- Patrol Areas



Palos Verdes Shelf Superfund Site
Los Angeles County, California

September 2023
Data Sources: Esri, Los Angeles County, US Census Bureau



Figure 1
Piers and Enforcement Patrol Areas