PALOS VERDES SHELF

Annual Enforcement Report

July 2023 – June 2024

United States Environmental Protection Agency

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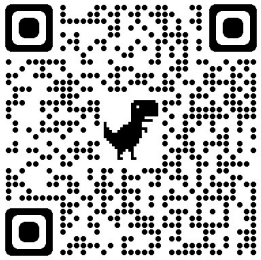
For more information about fish contamination from the Palos Verdes Shelf Superfund Site, please visit: www.pvsfish.org



For more information about California fish advisories, please visit: www.oehha.ca.gov/fish

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ACRONYMS AND ABBREVIATIONS

CDFW	California Department of Fish and Wildlife
DDT	Dichloro-Diphenyl-Trichloroethane
DNC	Do Not Consume
EPA	U.S. Environmental Protection Agency
FCEC	Fish Contamination Education Collaborative
PCB	Polychlorinated Biphenyl

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SUMMARY

The purpose of the U.S. Environmental Protection Agency (EPA) Palos Verdes Shelf Superfund Site institutional controls program is to protect Southern California's most vulnerable populations from the health risks associated with eating fish contaminated with polychlorinated biphenyls (PCBs) and dichloro-diphenyl-trichloroethane (DDT). One component of the institutional controls program is enforcement of the white croaker catch ban through inspections by the California Department of Fish and Wildlife (CDFW). This report presents data collected from July 2023 to June 2024 to evaluate enforcement program effectiveness and recommend program improvements. CDFW conducted inspections of recreational anglers on piers and jetties, beaches, and boats, as well as inspections of commercial fish markets and fishing vessels, to enforce the catch ban and to educate anglers about ways to reduce their exposure to PCBs and DDT by avoiding certain fish. Overall, the institutional controls program has been effective in reaching anglers and community members to increase awareness of fish contamination associated with the Palos Verdes Shelf Superfund Site.

CDFW encountered 1,712 anglers during 86 recreational and 7 commercial inspections during this reporting period. This is a substantially higher number of inspections and anglers contacted than during the last reporting period, but still lower than numbers prior to the COVID-19 pandemic, especially with regard to commercial inspections. None of the fish species identified as Do Not Consume (DNC) by the State of California were seized during this reporting period. Although the number of DNC fish observed during recreational inspections increased compared to the last reporting period, this is likely a result of CDFW conducting more inspections during the current reporting period. The percentage of inspections in which DNC fish were observed remained at a similar level. A total of 29 warnings, 51 citations, and two-bag limit violations were issued during this reporting period; however, none of the violations were related to DNC fish.

In 83 percent of the recreational inspections, at least one angler stated that they were aware of the fish contamination issues. This is an increase from the previous reporting period and suggests that angler awareness may be increasing. However, 13 percent of inspections recorded at least one angler who intended to keep white croaker if they caught it. While the format of the inspection forms prevents further analysis of these statements (for example, if the same angler(s) that intended to keep white croaker also reported being aware of contamination), these data suggest that anglers continue to catch and keep white croaker despite the increase in inspections reporting that at least one angler was aware of fish contamination. This indicates a need for outreach efforts to focus on educating anglers about safer fish preparation methods and the health risks of consuming contaminated fish.

Anglers who were aware of fish contamination issues most often attributed their awareness to the DNC signs posted at the piers and the Fish Contamination Education Collaborative tip cards handed out by both CDFW agents and angler outreach staff. Fewer anglers attributed their awareness to friends and family, outreach staff, or other warning materials. None of the anglers stated that they learned about fish contamination from the internet or other media. This is consistent with past reporting periods. In total, CDFW agents handed out 832 tip cards during

79 percent of inspections, an increase from previous reporting periods in both absolute numbers and percentages. Overall, the enforcement program has been an effective institutional control for educating the public about fish contamination from the Palos Verdes Shelf. It is recommended that these efforts continue to grow and that outreach focuses more heavily on the health effects of consuming contaminated fish to minimize the number of anglers that choose to keep and consume white croaker.

1. INTRODUCTION

The Palos Verdes Shelf Superfund Site is part of the Montrose Chemical Corporation Superfund Site, located in Los Angeles County, California (Figure 1). The Palos Verdes Shelf became contaminated with polychlorinated biphenyls (PCBs) and dichloro-diphenyl-trichloroethane (DDT) from the inland Montrose Chemical plant and other industries that discharged their waste into the ocean through the Los Angeles County sanitation sewer outfall pipes from 1953 to 1971 (Figure 1). Today, about 34 square miles (88 square kilometers; about half the size of Catalina Island) of ocean sediment on the Palos Verdes Shelf are contaminated with these legacy pollutants. Although the contaminated sediment is too deep for human contact, some fish in the area accumulate these organic pollutants at levels that make them unsafe to eat.

Figure 1. Map of Contaminated Sediment at the Palos Verdes Shelf Superfund Site

The U.S. Environmental Protection Agency (EPA) initiated institutional controls at the Palos Verdes Shelf Superfund Site in September 2001. Institutional controls refer to non-engineered measures, such as outreach and signage, that aim to prevent or reduce exposure to contaminants at a site. The purpose of the institutional controls program at Palos Verdes Shelf is to minimize human exposure to PCBs and DDT by reducing the consumption of contaminated fish, particularly white croaker. The institutional controls program includes public education and outreach, fish monitoring, and enforcement of white croaker catch bans. In 2003, the EPA established the Fish Contamination Education Collaborative (FCEC) with representatives from federal, state, and local agencies; non-government organizations; and community-based organizations to implement public outreach and education activities. In September 2009, the

EPA selected an interim remedy for the Palos Verdes Shelf Superfund Site that included the continuation and strengthening of the institutional controls program.

The institutional controls program aims to reduce human consumption of contaminated fish by increasing awareness and understanding of local contamination and fish consumption advisories. The program has the following three main components: angler outreach, community outreach, and enforcement. Enforcement is conducted by California Department of Fish and Wildlife (CDFW) agents to enforce the catch ban on white croaker and educate anglers most likely to catch and consume contaminated fish. In 2014, the EPA conducted the Palos Verdes Seafood Consumption Study to identify local demographic and subsistence subgroups within the general fishing population of the Palos Verdes Shelf area that may be disproportionately exposed to contaminants based on the types and quantity of fish species consumed, including consideration of cooking methods. The following four key communities were identified as more vulnerable to fish contamination from the Palos Verdes Shelf Superfund Site: Chinese community in San Gabriel Valley, Vietnamese community in Orange County, and Hispanic and African American communities in Los Angeles County.

PCBs and DDT pose a risk to public health and are listed on the EPA Integrated Risk Information System as probable human carcinogens and on the State of California's Proposition 65 list of pollutants known to cause cancer. Additionally, exposure to elevated levels of PCBs can result in skin irritation, liver disease, and endocrine disfunction. Exposure to elevated levels of DDT can negatively impact the nervous and endocrine systems, liver function, and child development. The EPA monitors PCB and DDT concentrations in white croaker and barred sand bass on the Palos Verdes Shelf to evaluate the effectiveness of natural recovery processes and improve modeling of contaminant fate and transport. While PCB and DDT concentrations in fish tissues have generally declined since the 1990s, concentrations in white croaker remain above the risk-based cleanup levels.

This Annual Enforcement Report summarizes enforcement activities conducted by CDFW agents between July 2023 and June 2024, including inspections of recreational anglers, commercial fish markets, and fishing vessels. Additionally, this report presents results from previous years to understand overall trends in the program's outreach efforts and effectiveness.

2. ENFORCEMENT INSPECTIONS

The purpose of the enforcement program is to minimize human exposure to contaminated fish by enforcing state white croaker catch and sale bans and educating anglers about the risks of consuming contaminated fish. Enforcement inspections are conducted along the Palos Verdes shoreline areas and landing locations within the California Office of Environmental Health Hazard Assessment's coastal area designated as the Red Zone (Figure 2). The Red Zone identifies the area in which some fish species are more likely to have higher concentrations of PCBs and DDT that pose a health risk to humans. Fish advisories for some fish extend to the north and south of this zone (Yellow Zones; Figure 2). CDFW aims to conduct a minimum of 20 in-ocean boat patrol inspections and 60 onshore inspections per reporting period. Recreational fishing inspections are conducted monthly, and commercial inspections are conducted every quarter as staffing allows.

CDFW wardens perform inspections of in-ocean commercial and recreational anglers as well as onshore recreational anglers and wholesale commercial operations (markets and restaurants). There is no specific goal for number of inspections, and inspection numbers depend on staff availability. Recreational fishing inspections include on-shore inspections of piers, jetties, and beaches, and in-ocean inspections of recreational boats. During recreational inspections, the wardens check bags for illegal fish and size limits, interview anglers about their awareness of local fish contamination, and educate anglers about the risks of eating contaminated fish, especially the white croaker. Wardens attempt to contact all anglers present at an inspected location, and move on quickly if no violations are discovered to prevent the possibility of violations being concealed. However, if a violation is discovered, wardens remain with the angler in question until all issues are addressed.

Commercial fishing inspections include on-shore inspections of fish businesses and in-ocean inspections of commercial fishing vessels. During the market inspections, CDFW checks for illegal sale of white croaker. The warden asks retailers where the fish were caught and verifies the invoice (if applicable). Retailers are required to purchase fish from licensed vendors. The primary goal of commercial inspections is to ensure that all fish sold at a given business are commercial in origin and no sport fish have been brought in for sale. The fish businesses targeted for inspection sell seafood and/or have sold white croaker illegally in the past. During commercial vessel inspections, CDFW wardens check for illegal catch of white croaker; commercial vessels are prohibited from fishing for white croaker off the coast at Palos Verdes and Fish Harbor (Figure 3). CDFW focuses inspections of commercial vessels fishing in the white croaker catch ban area. The California Code of Regulations Title 14, section 104 states that "It is unlawful to take white croaker under a commercial fishing license issued pursuant to section 7850 of the Fish and Game Code, in waters from 0 to 3 nautical miles from shore extending oceanward between a line extending 312 degrees magnetic from Point Vicente in Los Angeles County, and a line extending 166 degrees magnetic from Point Fermin in Los Angeles County. Pursuant to section 7715 of the Fish and Game Code, the provisions of this section shall become inoperative when the Director of the Department of Health Services determines that a health risk no longer exists and the Director of the Department of Fish and Game has been so

notified. The Department shall fully notify the public of the reopening of these waters." The bag limit for recreational and sport fish caught white croaker is 10 fish.

Data collected during enforcement activities are recorded on inspection forms completed by CDFW (Appendix A). The form tracks the area patrolled, fishing mode (piers and jetties, beach and intertidal, or boat), number of anglers who are and are not aware of fish contamination issues, their source of awareness, the language(s) they spoke, the number of tip cards that CDFW wardens distributed, the species and number of any Do Not Consume (DNC) fish that were caught, the number of anglers who expressed an intention of keep white croaker if they caught it, and any warnings or citations issued to anglers by the CDFW wardens. Wardens are directed to fill out only one form per fishing mode.

If anglers indicate that they are aware of fish contamination, the CDFW warden asks how they first became aware of fish contamination. Multiple sources of awareness were often recorded for a single group of anglers within the same inspection. As a result, 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.

During this reporting period, an effort was underway to update the inspection form to address data gaps mentioned in prior annual enforcement reports, such as the number of anglers reporting individual awareness sources or the specific location where white croaker was observed. A new form was developed during this reporting period but was not approved until July 2024. Because the data presented in this reporting period was collected using the previous form version, the old form is presented in Appendix A; the form approved in July 2024 will be used for future data collection and presented in future reports.

Figure 2. Map of Red and Yellow Fish Advisory Areas and CDFW Enforcement Patrol Area (Red Zone)

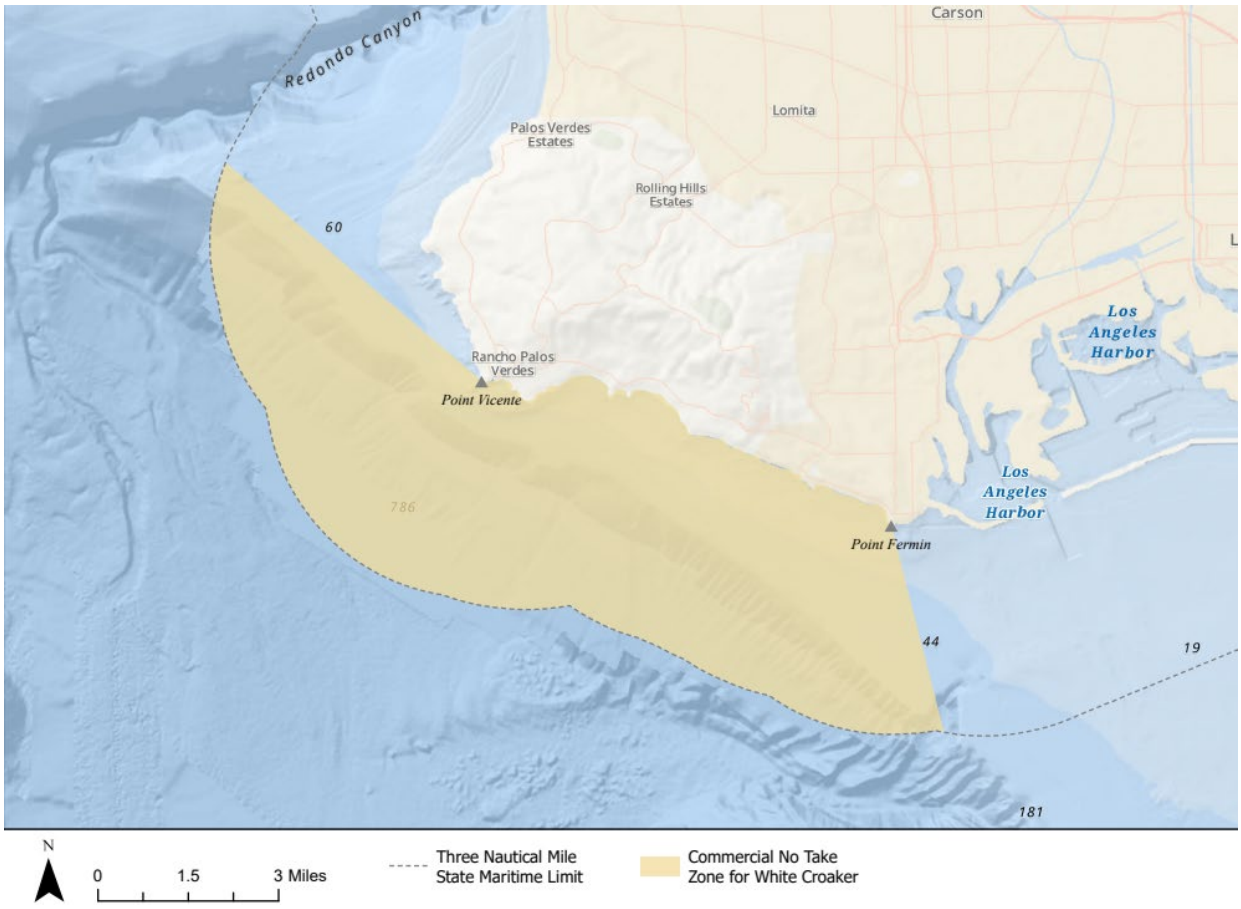

Figure 3. Map of the White Croaker Commercial Fishery Closure Area

3. ENFORCEMENT INSPECTION RESULTS

CDFW conducted 86 recreational fishing inspections between July 2023 and June 2024, and 7 commercial fishing inspections in November 2023 and February, March, May, and June 2024. The following sections summarize the major findings from commercial and recreational fishing inspections performed by CDFW.

3.1 RECREATIONAL FISHING

A total of 86 recreational fishing inspections were conducted between July 2023 and June 2024 at the following three fishing modes: piers and jetties, boat patrol, and beach and intertidal areas. CDFW wardens typically completed one inspection form per fishing mode per day. However, on six occasions, the same form was used to record data from two separate inspections (e.g., one form was used to report data for both piers and jetties and boat patrols). Of the total 86 inspections, 80 forms included data from only one fishing mode and 6 forms included data from multiple fishing modes. Because it is not possible to differentiate the data reported on the six forms with multiple fishing modes, these data are presented separately for analyses comparing fishing modes and for reporting purposes, each form is considered to be one inspection.

CDFW wardens contacted a total of 1,712 anglers during this reporting period. On average, 19 anglers were interviewed per inspection. Of the 80 inspections with individual fishing mode data, 36 percent were pier and jetties inspections, 23 percent were boat patrols, and 41 percent were beach and intertidal inspections. A total of 1,438 anglers were contacted during inspections in which only one fishing mode was specified, including pier and jetties (569), boat patrols (354), and beach and intertidal (515) inspections. An average of 20 anglers were interviewed during pier and jetty inspections, 20 were interviewed during boat inspections, and 16 were interviewed during beach and intertidal inspections.

A total of 274 anglers were contacted during inspections for which more than one fishing mode was specified, including 57 during the combined boat patrol/beach and intertidal inspection, 67 during the combined pier and jetty/boat patrol inspection, and 150 during combined pier and jetty/beach and intertidal inspections. On average, 46 anglers were interviewed during inspections in which multiple fishing modes were reported.

3.1.1 Awareness of Fish Contamination Issues

At least one angler interviewed reported being aware of the fish contamination issues during 71 out of 86 inspections (83 percent). This includes 24 out of 29 pier and jetties inspections (83 percent), 13 out of 18 boat inspections (72 percent), 28 out of 33 beach and intertidal inspections (85 percent), and 6 out of 6 multiple fishing mode inspections (100 percent). Additional information on single fishing mode inspections is included in Table 1, and additional information on multiple fishing mode inspections is included in Table 2.

Table 1. Reported Awareness of Fish Contamination for Single Fishing Mode Inspections

Fishing Mode	Total number of inspections	Reported Awareness [1]	
		Number of inspections with at least one angler aware	Number of inspections with no anglers aware
Piers and Jetties	29	24 (83%)	5 (17%)
Boat Patrol	18	13 (72%)	5 (28%)
Beach and Intertidal	33	28 (85%)	5 (15%)
Total	80	65 (81%)	15 (19%)

Note:
[1] Due to rounding the total percentage for modes may not add up to 100%.

Table 2. Reported Awareness of Fish Contamination for Multiple Fishing Mode Inspections

Fishing Mode	Total number of Inspections	Reported Awareness	
		Number of Inspections with at Least One Angler Aware	Number of Inspections with No Anglers Aware
Piers and Jetties + Boat Patrol	1	1 (100%)	0
Boat Patrol + Beach and Intertidal	1	1 (100%)	0
Piers and Jetties + Beach and Intertidal	4	4 (100%	0
Total	6	6 (100%)	0

3.1.2 Intentions to Keep White Croaker

At least one angler stated that they intended to keep white croaker in 11 of the following 86 inspections (13 percent): 5 of 29 pier and jetty inspections, 1 of 18 boat inspections, 2 of 33 beach inspections, 0 of 1 combined pier and jetty/boat patrol inspections, 0 of 1 combined boat patrol/beach and intertidal inspections, and 3 of 4 combined pier and jetty/beach and intertidal inspections. During each these inspections, at least one angler reported that they were aware of local fish contamination issues. Additional information on single fishing mode inspections is included in Table 3, and additional information on multiple fishing mode inspections is included in Table 4.

Table 3. Intentions to Keep White Croaker in Single Fishing Mode Inspections

		Angler Intention to Keep White Croaker [1]	
Fishing Mode	Total number of inspections	Number of inspections with at least one angler intending to keep white croaker	Number of inspections with no anglers intending to keep white croaker
Piers and Jetties	29	5 (17%)	24 (83%)
Boat Patrol	18	1 (6%)	17 (94%)
Beach and Intertidal	33	2 (6%)	31 (94%)
Total	80	8 (10%)	72 (90%)

Note:
[1] Due to rounding the total percentage for modes may not add up to 100%.

Table 4. Intentions to Keep White Croaker in Multiple Fishing Mode Inspections

		Angler Intention to Keep White Croaker [1]	
Fishing Mode	Total number of inspections	Number of inspections with at least one angler intending to keep white croaker	Number of inspections with no anglers intending to keep white croaker
Piers and Jetties + Boat Patrol	1	0 (0%)	1 (100%)
Boat Patrol + Beach and Intertidal	1	0 (0%)	1 (100%)
Piers and Jetties + Beach and Intertidal	4	3 (75%)	1 (25%)
Total	6	3 (50%)	3 (50%)

Note:
[1] Due to rounding the total percentage for modes may not add up to 100%.

3.1.3 Do Not Consume Fish Observed and Seized

CDFW wardens patrolled multiple locations during each inspection. The CDFW inspection forms include a list of all areas patrolled during the inspection but do not include information on the specific location(s) where DNC fish were observed. For each DNC species, the full list of areas patrolled during inspections is presented below.

CDFW wardens observed a total of 57 white croaker during 6 inspections (7 percent of all inspections), with 4 of these being single mode inspections and 2 being multiple mode inspections. There were no white croaker seizures reported during recreational inspections. White croaker were noted in inspections that included patrols of Marina del Rey Jetty and

Launch Ramp, Santa Monica Pier, Venice Pier, Long Beach Jetties and Pier, Davies Launch Ramp, Pier Point Landing, Seal Beach Pier, Los Alamitos Bay Jetty, Belmont Pier, Huntington Harbor, San Pedro, Palos Verdes, 72nd Place Jetty, South Shore Launch Ramp, Pier J, and Cabrillo Beach.

A total of 55 topsmelt were observed during 15 inspections (17 percent). There were no topsmelt seizures reported. Topsmelt was noted during inspections that included patrols of Marina del Rey Bridge, Davies Launch Ramp, 72nd Place Jetty, Belmont Pier, South Shore Launch Ramp, Pier J, Cabrillo Beach, and Pier Point Landing.

A total of 42 barred sand bass were observed during 14 inspections (16 percent). There were no barred sand bass seizures reported. Barred sand bass was noted during inspections that included patrols of Long Beach, Terminal Island, and San Pedro.

A total of 11 black croaker were observed during 2 inspections (2 percent). There were no black croaker seizures reported. Black croaker was noted during inspections that included patrols of Long Beach, Sunset Beach, Terminal Island, Rancho Palos Verdes, and Palos Verdes Estates.

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

3.1.4 Citations, Warning, and Violations

There were two-bag limit violations reported among the 86 inspections. A total of 29 warnings and 51 citations for fish violations were issued. None of the citations and violations were related to the DNC fish. Warnings refer to violations that are not at the level where a citation was issued. Common violations that may result in warnings or citations include fishing without a license, catching too many or undersized fish, gear/harvest restrictions, and fishing out of season.

3.1.5 Outreach Material Distribution

CDFW wardens distributed a total of 832 FCEC tip cards during 68 of 86 inspections (79 percent), including 64 of 80 single fishing mode inspections and 4 of 6 multiple fishing mode inspections. During the inspections, outreach materials were sometimes provided in multiple languages. An English language tip card was provided for 77 percent of inspections (n=66). Spanish tip card(s) were provided in 30 percent of the inspections (n=26). Chinese tip card(s) were provided in 7 percent of inspections (n=6). Vietnamese tip card(s) were provided in 4 percent of inspections (n=3).

3.1.6 Contamination Awareness Source

The FCEC tip card and DNC signs were the most identified sources of awareness during CDFW inspections. At least one angler attributed their awareness to the following: the tip card in 36 percent of inspections, DNC signs in 34 percent of inspections, warnings in 17 percent of inspections, community events in 4 percent of inspections, and friends and family in 1 percent of inspections. Inspections conducted on the beach and intertidal areas had the highest rate of

awareness (85 percent) while boat patrols had the lowest rate (72 percent). The percent breakdown of awareness source by fishing mode is included in Table 5 for inspections in which a single fishing mode was specified, and in Table 6 for inspections in which multiple fishing modes were specified.

Table 5. Fish Contamination Awareness Source in Single Fishing Mode Inspections

Fishing Mode	Total Number of inspections	[1] Source of Awareness (%)								
		DNC Signs	FCEC Tip Card	FCEC Outreach Team	Warnings	Internet	Community Events	Media	Friends/ Family	Other
Piers and Jetties	29	36	36	8	16	0	3	0	0	0
Boat Patrol	18	22	41	9	14	0	14	0	0	0
Beach and Intertidal	33	36	35	5	18	0	2	0	3	0
Total	80	34	36	7	17	0	4	0	1	0

Note:
[1] Due to rounding the total percentage across each row may not add up to 100%.

Table 6. Fish Contamination Awareness Source in Multiple Fishing Mode Inspections

Fishing Mode	Total Number of Inspections	Source of Awareness (%)								
		DNC Signs	FCEC Tip Card	FCEC Outreach Team	Warnings	Internet	Community Events	Media	Friends/ Family	Other
Piers and Jetties + Boat Patrol	1	--	--	--	--	--	--	--	--	--
Boat Patrol + Beach and Intertidal	1	100	0	0	0	0	0	0	0	0
Piers and Jetties + Beach and Intertidal	4	50	50	0	0	0	0	0	0	0
Total	6	56	44	0	0	0	0	0	0	0

3.2 COMMERCIAL FISHING

CDFW conducted a total of 7 inspections at fish markets and on commercial fishing vessels. Six fish markets were inspected during the reporting period, as follows: one in City of Industry in November 2023, one in Rosemead in February 2024, one in Santa Fe Springs in March 2024, one in Los Angeles City in May 2024, and two in Los Angeles City and Santa Monica in June 2024. One commercial fishing vessel was inspected in Marina del Rey in June 2024.

3.2.1 Awareness of Fish Contamination Issues

Among the seven commercial fishing inspections, four fish markets (57 percent) reported that they were unaware of the fish contamination. One fishing vessel and two fish markets reported that they were aware of fish contamination. Anglers on the vessel reported that they were aware of fish contamination from the FCEC tip card. Staff at fish markets reported that they were aware of fish contamination from the FCEC tip card, internet, warnings, other fish

businesses, and prior contacts with CDFW.

3.2.2 White Croaker Identified

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

3.2.3 Do Not Consume Fish Observed and For Sale

No other DNC fish were observed or intended for sale during commercial inspections.

3.2.4 Violations

One violation was issued by CDFW during commercial inspections, but it was not related to the DNC fish (violation of FGC 8035 – wholesaler's license required).

3.2.5 Outreach Material Distribution

A total of 16 FCEC tip cards were distributed to fish businesses during commercial inspections in this reporting period, as follows: 15 were in English and 1 inspection form did not specify the language of the tip card.

4. ENFORCEMENT INSPECTION DISCUSSION

4.1 RECREATIONAL FISHING

A summary of the CDFW recreational fishing inspections between July 2023 and June 2024 is presented in Table 7.

Table 7. CDFW Recreational Inspections Summary

Inspection Activity and Fish Seized	Number
Total inspections	86
Pier and jetty inspections	29
Boat patrol inspections	18
Beach and intertidal inspections	33
Pier and jetty + boat patrol inspections	1
Boat patrol + beach and intertidal inspections	1
Pier and jetty + beach and intertidal inspections	4
Inspections where at least one angler reported awareness of contamination	71
Inspections where at least one angler reported that they would keep white croaker if caught	11
Inspections with white croaker observed	6
White croaker observed	57
White croaker seized	0
Inspections with barracuda observed	0
Barracudas observed	0
Barracudas seized	0
Inspections with topsmelt observed	15
Topsmelt observed	55
Topsmelt seized	0
Inspections with barred sand bass observed	14
Barred sand bass observed	42
Barred sand bass seized	0
Inspections with black croaker observed	2
Black croaker observed	11
Black croaker seized	0

More inspections were conducted in this reporting period than in the last period, but the numbers have fluctuated greatly between years. Between the first reporting period (2015-2016) and the present reporting period (2023-2024), the maximum number of inspections completed in a single reporting period was 177 and the minimum was 43. The number of recreational fishing inspections (86) was higher than the previous reporting period (43) but remained lower than prior 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. The number of inspections during the current reporting period was higher than during the 2019-2020 reporting period (47 inspections), although this is likely a result of the suspension of enforcement activities at the start of the COVID-19 pandemic. On average, 4 inspections were performed each month during the previous reporting period and an average of 7 inspections were performed each month during this reporting period.

CDFW reported white croaker in 7 percent of inspections, topsmelt in 17 percent, barred sand bass in 16 percent, and black croaker in 2 percent. No barracuda were observed during this reporting period. During the CDFW recreational inspections, DNC fish species were observed and documented as follows:

- A total of 57 white croaker were observed among recreational anglers in 6 inspections in this reporting period (7 percent of total inspections). This is an increase in total observed numbers of white croaker from the 2022-2023 reporting period, in which 35 white croaker were found; however the percent of total inspections was the same (7 percent) in these two reporting periods. This is a decrease from the reporting period prior to that (2021-2022), in which white croaker were found in 10 percent of inspections, as well as a decrease from previous reporting periods from 2016 to 2020.

- A total of 11 black croaker were observed among recreational anglers in 2 inspections (2 percent of all inspections). No black croaker were observed in the last reporting period.

- A total of 55 topsmelt were observed among recreational anglers in 15 inspections (17 percent of total inspections). There were more topsmelt observed in inspections conducted during this reporting period than in the previous reporting period (29 topsmelt), and fewer than in the 2021-2022 reporting period (164 topsmelt) when inspection numbers were far higher (133 inspections).

- A total of 42 barred sand bass were observed among recreational anglers in 14 inspections (15 percent of total inspections). This is comparable to the number of barred sand bass observed in the last reporting period (45 barred sand bass), and is higher than the number observed in the 2021-2022 reporting period (30 barred sand bass) despite the lower number of total inspections.

In 83 percent of the recreational inspections, at least one angler interviewed stated that they were aware of the fish contamination issues. This is up from 72 percent during the previous reporting period and 51 percent during the reporting period prior to that. The rate of inspections indicating awareness of fish contamination was highest for beach and intertidal inspections (85 percent) and pier and jetty inspections (83 percent). In the last reporting period, anglers in all fishing modes showed very similar rates of inspections indicating awareness; however, in most reporting periods prior to that, boat anglers showed a somewhat lower rate than anglers in other fishing modes. These results suggest that the number of inspections in which anglers report awareness is generally increasing. However, because data is not collected on individual anglers, it is not possible to discern if awareness is increasing among individuals. For example, it is equally possible that only one angler was aware during an inspection of 20 anglers (5 percent of anglers were aware) or that all 20 anglers were aware during the inspection (100 percent of anglers were aware). Because awareness is marked per inspection and not per angler, data interpretation is limited to understanding how frequently at least one angler reported awareness during inspections and cannot be used to determine trends in angler awareness. Angler awareness is tracked as part of the FCEC Angler Outreach Program, which conducts outreach at 9 piers along the Red Zone. More information about the Anger Outreach

Program is provided in the Annual Angler Outreach Report and can be found at www.pvsfish.org/partner-documents.

During this reporting period, the most frequently reported sources of awareness were the FCEC tip card and DNC fish pier signage. These two sources have been the most frequently reported in every reporting period in which this information was collected. Information on awareness source first began to be collected for recreational inspections in the 2019-2020 reporting period (prior to this it was only collected for commercial inspections). As in the last several reporting periods, no anglers listed the internet or other media such as radio and newspapers as their sources of awareness. This reflects an ongoing trend of internet and media sources being rarely, if ever, listed as a source of awareness for anglers in any fishing mode.

In 13 percent of inspections (11 of 86), at least one angler expressed an intention to keep white croaker if they caught it. Per fishing mode, 17 percent of anglers intended to keep white croaker during pier and jetty inspections, 6 percent during boat inspections, 6 percent during beach and intertidal inspections, 75 percent during combined pier and jetty and beach and intertidal inspections, and 0 percent during the other multiple fishing mode inspections. The high percentage during combined pier and jetty and beach and intertidal inspections is likely due to the small sample size of that group. Nevertheless, in both pier and jetty and beach and intertidal individual mode inspections, the percentage of anglers expressing the intention to keep white croaker increased compared to the last reporting period. Both of these fishing modes have also had a higher percentage of inspections with at least one angler expressing an intent to keep white croaker than did boat inspections in prior reporting periods. Additionally, in all inspections in which at least one angler expressed an intent to keep white croaker, at least one angler expressed an awareness of fish contamination issues. Because data was not collected on individual anglers, it is not possible to determine if the same anglers who indicated that they were aware of contamination also indicated that they intended to keep white croaker. However, this result may suggest the need for more emphasis in outreach efforts about the health risks on consuming contaminated fish, since anglers may be choosing to keep white croaker despite knowing that they may be contaminated. As in prior reporting periods, the results also suggest that outreach efforts may be more beneficial to people fishing from piers and beaches than from boats.

Data from multiple anglers are included for each inspection that 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, it is not possible 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. Additionally, CDFW wardens indicate overall fish contamination awareness for each inspection. This means that if just one angler was aware of fish contamination during the inspection, the inspection form will indicate angler awareness. This prevents further analysis and evaluation of angler awareness. While collecting data on individual anglers is outside the scope of the enforcement outreach goals, it is recommended that the FCEC

continue to collect overall awareness data to track the rate of awareness per inspection as a gross indicator of trends in angler awareness.

Additionally, a selection bias could have occurred if the subset of anglers was selected for repeated inspections due to a specific reason such as being recognized by wardens as having received a warning or citation in the past, which could limit the broader applicability of the results.

There are also considerations for how a subset of data (the multiple fishing mode datasets), limit data analytics. There are a small number of multiple fishing mode inspections, and data from them may only apply for the specific sample population and may not be applicable to the entire population. To address some of these issues, it is recommended that the EPA reiterate to CDFW the importance of completing separate forms for each fishing mode to allow for in-depth analyses of the intended entire data set.

In the current reporting period, six forms reported data from multiple fishing modes. This is an increase in the number of multiple fishing mode inspections, from one during the last reporting period. The use of one form for multiple fishing modes limits the extent to which data from these inspections can be used in analysis of angler behavior by fishing mode, as there is no way to tell what information on the form applies to one fishing mode as opposed to the others. Because CDFW may continue to provide forms with multiple fishing modes, it is recommended that this type of data be consistently evaluated in reporting as follows:

- Each inspection form is considered one inspection.
- To maintain the single mode data quality when comparing data by fishing mode, the multiple mode data is presented separately from the single mode forms/inspections.

Outreach material tracking on the CDFW inspection forms indicates a total of 832 FCEC tip cards were distributed during inspection activities. This is much higher than the 101 FCEC tip cards distributed in the last reporting period. 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 832. It is recommended that CDFW wardens consistently record the amount of outreach materials distributed in each language to aid in analysis of community outreach.

Outreach materials were distributed during 79 percent of the recreational inspections. This is up from the last reporting period in which materials were distributed in 67 percent of inspections, and from the prior reporting period in which materials were distributed in 51 percent of inspections. English and Spanish materials continue to be the most common languages distributed. The current reporting period also distributed materials in Chinese and Vietnamese languages, which were not distributed in the last reporting period. Continuing to increase the distribution of educational materials during the inspections is recommended, since it is the most reported source of awareness.

4.2 COMMERCIAL FISHING

The first commercial inspection in this reporting period was in November. A summary of the CDFW commercial fishing inspections between November 2023 and June 2024 is presented in Table 5.

Table 8. CDFW Commercial Inspections Summary

Inspections and Inspection Outcomes	Number
Total inspections	7
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	1
Informational sheets provided	16

The number of commercial inspections completed was low (7) during this reporting period, although it increased from the last reporting period. CDFW performed six fish market inspections and one in-ocean fishing vessel inspection. DNC fish species were not observed during any commercial inspections, and one violation unrelated to DNC fish was issued during these inspections. Of the commercial anglers who responded, 57 percent reported that they were unaware of the fish contamination. This is a 3 percent decrease compared to responses recorded by CDFW in the last reporting period. Among the seven commercial inspections, 71 percent reported being unaware of local fish contamination and none intended to buy or sell white croaker. This is reflective of an ongoing trend of commercial compliance with the white croaker catch and market bans, indicating that enforcement has been successful in minimizing public exposure to contaminated white croaker.

The results suggest that 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. CDFW conducted two additional inspections during this reporting period than during the last one, however the commercial fishing inspection frequency could be increased to better address awareness.

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Appendix A
CDFW Enforcement Inspection Reporting Form

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Fill out a new form for each fishing mode

Recreational Fishing / Fisher Inspection Form for Palos Verdes Shelf Superfund Project
California Department of Fish and Wildlife

Patrol Date: _____ **Hours spent on WC patrol**: _____

Warden Names **WC Overtime Hours Claimed**

1. _____ _____
2. _____ _____
3. _____ _____
4. _____ _____

Area Patrolled: _____
_____

Fishing Mode (Select one by "X" the appropriate mode):

Piers & Jetties ___ Boat Patrol___ Beach & Intertidal___

Number of anglers present for selected fishing mode: _____

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1. **Did any fishermen report awareness of "Fish contamination issues" off the coast of Orange / Los Angeles County?** Yes___ No___
2. **Did any fishermen state that they would keep white croaker if they caught it?** Yes___ No___

3. **Source of Fish Contamination Awareness** (Mark with an "X")

Warnings ___.	Radio ___.	Outreach Worker ___.
Newspaper ___.	Signs___.	Television ___.
Internet ___.	Friends/ Family___.	Trifold Pamphlet___.
Community Outreach ___.		

Other Source: _____

4. **Number of Fish** (Mark Yes or No with an "X")

Species.	Observed.	Number Observed.	Number Seized.
Barracuda.	Yes ___ No___		
Barred Sand Bass.	Yes___ No___		
Black Croaker.	Yes___ No___		
Topsmelt.	Yes___ No___		
White Croaker.	Yes___ No___		

***If any of the listed species are seized as evidence, please retain them in an evidence freezer for contamination testing, and contact Lt. Mike Vicknair**.

5. **Were any fishermen not adhering to the prescribed daily bag limit.** Yes____ No____

6. **Violations Observed:**

	Number	Cite Section & Description	Number Seized*
White Croaker related warnings			
White Croaker related citations			
Warnings for other violations			
Citations for other violations			

7. **Specific location of where white croaker were observed during Patrol:**

Location: _____

8. **Number of Trifold handouts distributed to the public**

English: _____ Spanish: _____ Chinese: _____ Vietnamese: _____ None: _____

Updated October 2021