



**FISH CONTAMINATION EDUCATION COLLABORATIVE
ENFORCEMENT REPORT**

August 2018 – July 2019

Palos Verdes Shelf Superfund Site

Los Angeles County, California

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EXECUTIVE SUMMARY

The United States Environmental Protection Agency (EPA) created the Fish Contamination Education Collaborative 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 (the 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.

In February 2015, the EPA contracted EA Engineering, Science, and Technology, Inc. (EA) to coordinate with enforcement agencies/inspectors to support enforcement activities and provide outreach materials as needed. Additionally, EA conducted fish identification training to Los Angeles County Department of Public Health (LACDPH) and City of Long Beach Department of Health and Human Services, Bureau of Environmental Health (City of Long Beach) inspectors in September 2015, July 2017, and August 2018.

Enforcement inspection data (markets and restaurants) was collected by the City of Long Beach and LACDPH. The inspections were performed at restaurants and markets that are primarily located in east and downtown Los Angeles. Markets and restaurants targeted for inspections were identified by EPA and stakeholder input. Some of these restaurants and markets previously sold white croaker illegally. The City of Long Beach conducted 62 market and restaurant inspections; 4 were conducted in November 2018 and the rest were conducted in February 2019. LACDPH conducted 31 market and restaurant inspections in January 2019. No commercial violations of white croaker were found during these inspections. The City of Long Beach and LACDPH reported that 35 percent and 6 percent of markets and restaurants were aware of the contamination, respectively. The Long Beach markets and restaurants reported that health inspectors were the primary source of their awareness. Only two restaurants/markets in the LACDPH enforcement area were aware of contamination and they cited “Do Not Consume” (DNC) pier signage and “other sources” as the awareness sources. This, paired with a decrease in awareness compared to last year’s inspections (55 percent aware from Long Beach [n=33] and 33 percent aware from LACDPH [n=58]), suggests that the enforcement awareness could be improved by additional and/or more frequent outreach.

Recreational and commercial fishing enforcement data was collected by the California Department of Fish and Wildlife (CDFW) who conducted 150 recreational inspections between July 2018 and June 2019 with an average of 42 anglers present per inspection. Because CDFW reports data quarterly, recreational data from July 2018 that would have been included in the previous report is included here. CDFW also conducted 11 commercial inspections, which included 9 fish businesses and 2 commercial fishing vessels, between March 2019 and May 2019. The following tables summarize the results of the CDFW enforcement inspections.

CDFW Recreational Fishing Inspections Overview: July 2018 - June 2019

CDFW Recreational Inspections	
# of inspections	150
# of pier and jetty inspections	86
# of boat patrol inspections	41
# of beach and intertidal inspections	23
# of inspections where at least one fisherman reported awareness of contamination	82
# inspections where at least one fisherman reported that they would keep white croaker if caught	48
# of inspections with white croaker observed	41
# of white croakers seized	0
# of inspections with barracuda observed	4
# of barracudas seized	0
# of inspections with topsmelt observed	37
# of topsmelt seized	0
# of inspections with barred sand bass observed	43
# of barred sand bass seized	0
# of inspections: black croaker observed	6
# of black croaker seized	0

CDFW Commercial Fishing Inspections Overview: March 2019 – May 2019

CDFW Commercial Inspections	
# of inspections	11
# aware of white croaker catch ban area	2
# with intent to catch/buy/sell white croaker	0
# of white croaker observed	0
# of white croaker seized	0
# of violations reported	1
# of informational sheets provided	5

Based on the inspection data, DNC fish, specifically the white croaker, were not observed during the commercial inspection and no commercial inspections revealed intent to catch, buy, or sell white croaker. However, awareness of the white croaker catch ban area was only 18 percent (n=2). No other DNC fish were observed during commercial inspections. White croaker were found among recreational fishermen in 27 percent of the inspections. Other DNC fish, topsmelt and barred sand bass were observed with similar frequency in recreational inspections. At least one angler interviewed stated that they were aware of the fish contamination issues in approximately 55 percent of the recreational inspections. This is down from 65 percent during the last reporting period. More anglers reported awareness during piers and jetty inspections (62 percent, n=86) compared to boat inspections (46 percent, n=41) and beach inspections (44 percent, n=23). Inspections where at least one angler expressed an intention to keep white

croaker if they caught it occurred during 32 percent of the total inspections (48 of 150). The intention to keep white croaker was found more often during beach inspections (48 percent, n=23) than during boat inspections (29 percent, n=41) and pier and jetty inspections (29 percent, n=86). This indicates that while anglers on piers and jetties are most aware of contamination issues, they are also most likely to keep white croaker. The results suggest there may be need for more outreach about the health effects of consuming contaminated fish.

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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	United States Environmental Protection Agency
FCEC	Fish Contamination Education Collaborative
LACDPH	Los Angeles County Department of Public Health
MPA	Marine Protected Area
SGA	S. Groner Associates
Site	Palos Verdes Shelf Superfund Site

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1.0 INTRODUCTION

The United States 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 (the 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 Site were reaching local markets. Over time, anecdotal reports began to suggest that white croaker was no longer being found in the markets. In 2012, EPA's previous contractor, S. Groner Associates (SGA), compiled a report analyzing the data collected between 2008 and June 2011 with the purpose of providing a basic status report and to describe general observations related to white croaker. In May 2013, SGA compiled a report analyzing the data collected between July 2011 and September 2012. Additionally, SGA prepared a report in April 2014 summarizing data collected by California Department of Fish and Wildlife (CDFW) between October 2012 and September 2013 and the data collected through market inspections between September 2012 and September 2013, with the scope of providing observations related to white croaker.

In February 2015, EPA contracted EA Engineering, Science, and Technology, Inc. (EA) to coordinate with enforcement agencies/inspectors to support enforcement activities and provide outreach materials as needed. Additionally, EA conducted fish identification training for LACDPH and City of Long Beach Department of Health and Human Services, Bureau of Environmental Health (City of Long Beach) inspectors in September 2015, July 2017, and August 2018. Previous enforcement reports were prepared by EA for the periods between February 2015 and July 2016, February 2016 and July 2017, and August 2017 and July 2018. The reports included enforcement data collected by CDFW recreational and commercial enforcement inspections and the City of Long Beach, when available. This enforcement report covers the period of August 2018 through July 2019. LACDPH and City of Long Beach provided data for inspections they performed within this period. CDFW inspection data is reported quarterly; therefore, this report includes July 2018 that was not included in the previous report. Similarly, the July 2019 data for CDFW will be included in the next reporting period.

2.0 ENFORCEMENT INSPECTIONS

CDFW staff conducted inspections of in-water commercial and recreational anglers, and shoreline recreational anglers. LACDPH staff conducted market inspections in Los Angeles County and the City of Long Beach conducted inspections of markets and restaurants in Long Beach. In the past, the Orange County Health Care Agency, Environmental Health Division conducted the inspections of markets and restaurants in Orange County. Based on the data

collected prior to EA's involvement in the project, Orange County determined that white croaker was not being sold in markets and declined to continue involvement in this program.

Market/restaurant inspections were conducted by the City of Long Beach in November 2018 and February 2019. LACDPH conducted market/restaurant inspections in January 2019. CDFW reported recreational fishing inspections between July 2018 and June 2019, and commercial fishing inspections between March and May 2019. As mentioned above, July 2018 data that was not available in the previous reporting period is included here. The inspections consisted of the following:

- Market and restaurants (City of Long Beach and LACDPH)
- Recreational (shoreline and in-water) fishermen (CDFW)
- Commercial (in-water and wholesale) fishing operations (CDFW).

The City of Long Beach conducted 19 market and 43 restaurant inspections; four inspections were conducted in November 2018 and the rest were conducted in February 2019. LACDPH conducted 13 market and 18 restaurant inspections in January 2019. The restaurants and markets targeted are primarily located in east and downtown Los Angeles. As part of the inspections, the market or restaurant is asked where the fish is from and the invoice is checked. Retailers are required to purchase fish from licensed vendors. The markets and restaurants targeted are ethnic, sell seafood, and/or have sold white croaker illegally in the past.

CDFW conducted 11 commercial fishing inspections, which included 9 fish businesses and 2 commercial fishing vessels. Additionally, 150 recreational inspections were conducted 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). 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 fishing is 10 white croakers. CDFW wardens fill out one inspection form per fishing mode a day. CDFW has focused inspections of commercial vessels in the red zone, in particular the areas surrounding the white croaker catch ban off of Palos Verdes and Fish Harbor where a large number of anglers dock their boats.

3.0 ENFORCEMENT INSPECTION RESULTS

An analysis of the enforcement inspections was performed to summarize major findings from the inspections. The analysis focused on providing a general descriptive summary (or descriptive statistics) of the inspections. In some cases, there were repeat inspections done at the same sites during the year. As a result, some observations were correlated, and thus inferential statistics could not be calculated.

3.1 MARKETS AND RESTAURANTS

The City of Long Beach performed 62 enforcement inspections (19 markets and 43 restaurants); four were conducted in November 2018 and the rest were conducted in February 2019. The City of Long Beach targeted ethnic restaurants and markets (e.g., Mexican, Chinese, Vietnamese) in the Long Beach area. Informational brochures and tip cards were distributed to each of the markets and restaurants. Five informational topics were covered during the inspections including reminders to buy from reputable sources, health effects and at-risk populations, reminders to keep and file all invoices, identification of white croaker and reasons for concern, and locations of catch ban and contaminated zones. Based on the reported results, 22 businesses (35 percent) were aware of the contamination. Of those aware, 19 businesses cited their source of their awareness as health inspectors (86 percent), 1 business cited “Do Not Consume” (DNC) pier signage (5 percent), and 2 businesses cited “other sources” (9 percent). During these inspections, 2 markets and 5 restaurants (11 percent) stated that they had been offered fish by an unpermitted vendor, but none purchased from them. No white croaker was identified during these inspections

LACDPH performed 31 enforcement inspections (13 markets and 18 restaurants) in January 2019. LACDPH targeted ethnic restaurants and markets in the Los Angeles area (i.e., Burbank, Carson, Culver City, Glendale, Los Angeles, Marina del Rey, North Hollywood, San Pedro, Santa Monica, and Torrance). Informational brochures and tip cards were distributed to 29 of the 31 markets and restaurants. The informational topics, mentioned above, were covered during inspections. The inspection data indicated that only 1 market and 1 restaurant (6 percent) were aware of the contamination. The source of awareness included DNC pier signage and “other sources”. During the inspections, 3 markets and 1 restaurant (13 percent) reported that they had been offered white croaker fish by an unpermitted vendor, but none purchased from them. No white croaker was identified during the inspections.

As part of the commercial fishing inspections, CDFW inspected commercial fish businesses, as furthered discussed in Section 3.3.

3.2 RECREATIONAL FISHING

Inspection modes included piers and jetties, boat patrol, and beach and intertidal areas. The recreational inspection data was collected between July 2018 and June 2019 using one data sheet per inspection. There were 150 recreational fishing inspections conducted in this time period. Out of those, 57 percent were pier and jetties inspections, 27 percent were boat patrols, and 15 percent were beach and intertidal inspections. A total of 6,235 anglers were reached during the pier and jetties (4,066), boat patrols (1,465), and beach and intertidal (704) recreational inspections. On average, 42 anglers were interviewed per inspection.

3.2.1 Awareness of Fish Contamination Issues

At least one angler interviewed reported being aware of the fish contamination issues during 82 out of 150 inspections (55 percent). This includes 53 out of 86 pier and jetties inspections, 10 out of 23 beach inspections, and 19 out of 41 boat inspections. Additional information is included in the following table.

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	53	62%	65%	33	38%	49%
Boat Patrol	19	46%	23%	22	54%	32%
Beach and Intertidal	10	43%	12%	13	57%	19%
Total	82	55%	-	68	45%	-

3.2.2 Intentions to Keep White Croaker

When asked about intentions to keep white croaker if they caught it, at least one angler responded “yes” on 48 of the 150 inspections (32 percent). Of those that reported that they were aware of the fish contamination, 30 percent (n=25) intended to keep white croaker. Inspections where at least one angler expressed an intention to keep white croaker occurred more often during pier and jetty inspections (25 of 86) than boat inspections (12 of 41) and beach inspections (11 of 23). Additional information is included in the following table.

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	25	29%	52%	61	71%	60%
Boat Patrol	12	29%	25%	29	71%	28%
Beach and Intertidal	11	48%	23%	12	52%	12%
Total	48	32%	-	102	68%	-

3.2.3 Do Not Consume Fish Observed and Seized

Approximately 317 total white croaker were observed in 41 inspections (27 percent). No white croaker were seized during the inspections. Multiple areas were patrolled during each inspection and the specific location of white croaker was not recorded. White croaker was found most frequently and/or in larger quantities during patrol of the Long Beach Pier, Los Angeles Harbor, Cabrillo Pier, Marina Del Rey Launch Ramp, and Seal Beach Pier areas. Other recorded locations included Marina Bridge, Alamitos Jetties, 72nd Place Jetty, Los Alamitos Bay, Belmont Pier, Pier J, Queensway Bridge and Bay, Redondo Pier, Anaheim Bay, Santa Monica Pier, Manhattan Pier, Venice Pier, Hermosa Beach, Abalone Marine Protected Area (MPA), Shoreline Drive, Vicente MPA, San Pedro Beach, Redondo Beach, Davies and South Shore Launch Ramp, Dockweiler State Beach, San Gabriel River, Rancho Palos Verdes coastline, and Huntington Harbor.

Approximately 20 total barracuda were observed in 4 inspections (3 percent). No barracuda were seized during inspections. Multiple areas were patrolled during each inspection and the specific location of barracuda was not recorded. Barracuda was reported most frequently found and/or in larger quantities during patrol of Belmont Pier, Seal Beach Pier, and 72nd Place Jetty areas. Other recorded locations included Hermosa Pier, Redondo Pier, Cabrillo Pier, Shoreline Drive, Queensway Bridge, Long Beach, South Shore and Davies Ramp, San Gabriel River, and Alamitos Bay.

Approximately 403 topsmelt were observed in 37 inspections (25 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 most frequently found and/or in larger quantities during patrol of Long Beach Pier, Cabrillo Pier, Belmont Pier, and 72nd Place Jetty areas. Other recorded locations included Marina Bridge, San Gabriel River, Los Angeles Harbor, Abalone MPA, Vicente MPA, Palos Verdes, Manhattan Pier, Hermosa Pier, Dockweiler State Beach, Shoreline Drive, Shoreline Marina, Harbor Scenic Drive, Queensway Bridge, Seal Beach Pier, Redondo Pier and Beach, King Harbor, Davies and South Shore launch ramp, Alamitos Bay, and San Pedro Pier.

Approximately 192 barred sand bass were observed in 43 inspections (26 percent). No barred sand bass were seized during inspections. Multiple areas were patrolled during each inspection and the specific location of barred sand bass was not specified. Barred sand bass was found most frequently and/or in larger quantities during patrol of Long Beach Pier and Cabrillo Pier areas. Other recorded locations included Marina Bridge, 72nd Place Jetty, Belmont Pier, Shoreline Drive, Redondo Pier, Seal Beach Pier, San Gabriel River, Alamitos Bay, Abalone MPA, Vicente MPA, Pier J, Alamitos Bay, Golden Shores, Harbor Scenic Drive, Queensway Bridge, Davies Ramp, Redondo Pier, Playa Del Rey, Santa Monica Pier, Venice Pier and beach, El Segundo, Marina Del Rey Jetty and launch ramp, Manhattan Beach Pier, San Pedro ramp, and Palos Verdes coastline.

Approximately 7 black croaker were observed in 6 inspections (4 percent). There were no black croaker seizures reported. Multiple areas were patrolled during each inspection and the specific location of black croaker was not specified. Black croaker was most frequently found during patrol of Belmont Pier, San Gabriel River, and Alamitos Bay areas. Other recorded locations included Redondo Beach and Pier, Manhattan Pier, Cabrillo Piers, Dockweiler State Beach, Abalone MPA, Vicente MPA, Belmont Pier, 72nd Place Jetty, Shoreline Drive, Harbor Scenic Drive, Queensway Bridge, Los Angeles Harbor, and Long Beach Harbor and coast.

3.2.4 Citations, Warning, and Violations

There were no bag limit violations among the 150 inspections nor were there citations or warnings related to white croaker. There were a total of 64 warnings and 92 citations for other fish violations issued. Citations and violations were generally not related to the DNC fish and were most often for violations relating to possession of undersized fish, and fishing without a license.

3.2.5 Information Provision

Tip cards and/or enforcement brochures were distributed during 133 of 150 inspections (89 percent). During the inspections, the materials were sometimes provided in multiple languages. The materials were provided in English (98 percent [n=130]), Spanish (43 percent [n=57]), and Vietnamese (3 percent [n=4]).

3.3 COMMERCIAL FISHING

Commercial fishing inspection data was collected by CDFW between March and May 2019. There were 11 commercial inspections that included 9 fish businesses and 2 commercial fishing vessels.

3.3.1 Awareness of Fish Contamination Issues

Among the commercial fishing inspections, only two entities (18 percent) were aware of the fish contamination issues and catch ban area. In both cases the awareness was reported from a fish business and DNC fish signage was the cited source of information. Among the commercial fishing inspections, all respondents indicated that they had no intention of catching, buying, or selling white croaker.

3.3.2 White Croaker Identified

During commercial inspections, no white croakers were observed, seized, or collected.

3.3.3 Do Not Consume Fish Observed and For Sale

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

3.3.4 Violations

During commercial inspections, there were no violations reported regarding white croaker. There was one violation reported requiring that all records be available in English.

3.3.5 Information Provision

Catch ban informational sheets were provided during 45 percent of the inspections (5 of 11).

4.0 ENFORCEMENT INSPECTION RESULTS DISCUSSION

4.1 MARKETS AND RESTAURANTS

No commercial white croaker violations were found during inspections performed by the City of Long Beach, LACDPH, and CDFW. This suggests that the enforcement inspections and informational materials are generally successful at educating the markets and restaurants about the fish contamination. However, awareness of contamination decreased compared to the last

reporting period for all inspecting entities. During the last reporting period, the City of Long Beach reported that 55 percent of markets and restaurants were aware of the contamination (n=33) and LACDPH reported 33 percent (n=58). During the current reporting period, the City of Long Beach reported that 35 percent of markets and restaurants were aware of contamination (n=62) and LACDPH reported that 6 percent were aware of contamination (n=31). During the reporting period, CDFW reported that only 22 percent (2 of 9 restaurants) were aware of the contamination. Health inspectors and DNC fish signs were the most cited sources of awareness.

These results suggest that awareness could be improved by additional and/or more frequent health inspections and continued monitoring and maintenance of the DNC fish signs (reported separately in the Annual Pier Sign Summary Report). During the FCEC meeting on 23 April 2019, LACDPH mentioned that there is frequent staff turn-over or closure of markets and restaurants. The list of markets and restaurants is periodically evaluated and updated to replace closed businesses. Approval of a replacement business takes time which affects the inspection schedules. High staff turn-over rates may affect the continuity of knowledge of the fish contamination information. In addition to more frequent health inspections, follow-up outreach to contacts at the markets and restaurants could be considered to facilitate the continuity of knowledge. LACDPH and City of Long Beach perform community outreach activities, included in the Annual Outreach Report, submitted separately.

LACDPH and City of Long Beach recorded instances of markets and restaurants being offered fish by nonpermitted vendors during 13 percent of the total inspections (12 of 93 inspections). Of the 12 reported, 3 were markets (27 percent) and 8 were restaurants (73 percent). While none of the markets or restaurants purchased from the unpermitted vendors, continued education and tracking is recommended.

4.2 RECREATIONAL FISHING

Inspections reported white croaker in 27 percent of inspections, barracuda in 3 percent, topsmelt in 25 percent, barred sand bass in 29 percent, and black croaker in 4 percent. At least one angler interviewed stated that they were aware of the fish contamination issues in approximately 55 percent of the recreational inspections. This is down from 65 percent during the last reporting period. More anglers reported awareness during piers and jetty inspections (62 percent, n=86) compared to boat inspections (46 percent, n=41) and beach inspections (44 percent, n=23). Inspections where at least one angler expressed an intention to keep white croaker if they caught it occurred during 32 percent of the total inspections (48 of 150). The intention to keep white croaker was found more often during often during beach inspections (48 percent, n=23) than during boat inspections (29 percent, n=41) and pier and jetty inspections (29 percent, n=86). This indicates that while anglers on piers and jetties are most aware of contamination issues they are also most likely to keep white croaker. The results suggest there may be need for more outreach about the health effects of consuming contaminated fish.

It is recommended to add a question to CDFW's Recreational Fishing inspection form to gauge the source of awareness of the fish contamination (e.g., DNC fish signs, community based organizations, media), similar to CDFW's Commercial Inspection form, which asks the source of

awareness of the commercial catch ban. This information is useful to evaluate how to better improve what modes of outreach can be performed to increase recreational fishing awareness.

Data from multiple anglers are included for each inspection which presents potential limitations on the data evaluation. 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 the a repeat angler being interviewed. Alternatively, because the statistics are being generated for each inspection event rather than for each angler interviewed, without a better understanding of the variability in responses per inspection event, there is no way to develop and apply a weighting factor to the response counts for the different fishing modes. With multiple locations per form, it is unclear where, precisely, DNC fish are being identified most frequently. Additionally, given this reporting format, the actual percent of anglers who are aware of contamination is dramatically skewed upward; if even one angler is aware of contamination (average of 40 anglers interviewed per inspection), data will indicate that all interviewed anglers were aware. Additionally, a selection bias could have occurred if the subset of fishermen 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 population of the counties. To address some of these issues, an improvement to the Recreational Fishing inspections form may include collection of this more detailed data.

Outreach materials in English, Spanish, and/or Vietnamese were distributed during 89 percent of the inspections. Since the last reporting period, CDFW improved tracking of the distribution of outreach materials and quantities in each language during the recreational inspections. It is recommended to increase distribution of materials during the inspections, particularly when inspections find white croaker and/or angler intent of keep white croaker.

4.3 COMMERCIAL FISHING

In the inspections performed, there were no white croakers observed and there were no white croaker violations issued. This suggests that commercial fishing operations were in compliance with white croaker regulations. However, only 18 percent of inspections reported awareness of the white croaker catch ban area. In both cases, the DNC fish signs were cited as the awareness source. The data suggests that awareness could be improved by additional and/or more frequent outreach. As mentioned above, with multiple locations per form, it is unclear where, precisely, DNC fish are being identified most frequently. Also, 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 population of the counties. The commercial fishing inspection amounts and frequency could be increased to address awareness. Additionally, the Commercial Fishing inspection form could benefit from better tracking of the specific location, outreach materials in each language (similar to the Recreational Fishing form), to better track angler demographics.

5.0 FISH IDENTIFICATION TRAINING

EA facilitated fish identification training for the City of Long Beach and Los Angeles County inspectors on 8 August 2018 with 16 attendees. EA subcontractor Dr. Michael Franklin (California State University – Northridge) performed the training. EA provided information about the site, including discussion of the sediment contamination, remedy components, California Office of Environmental Health Hazard Assessment fish advisory areas and purpose of the FCEC program and enforcement activities. LACDPH and City of Long Beach provided the inspectors instruction on their role and responsibilities including the recreational advisory and catch band, enforcement, embargo, inspection forms, and inspector tools. Additionally, inspectors learned how to identify the white croaker using fresh fish specimens.

6.0 CONCLUSIONS

Enforcement is a key Institutional Control as part of FCEC program. Based on the inspection data, DNC fish, specifically the white croaker, was not observed during restaurant/market or commercial inspections. However, approximately 317 white croaker were found among fishermen in 27 percent of recreational fishing inspections. This is generally consistent with the previous reporting periods (2016-2018) in which white croaker was found in approximately 30 percent of inspections, and down from 58 percent since the 2015-2016 reporting period. Other DNC fish were less frequently observed which is also consistent with the previous reporting periods. During this reporting period, awareness of fish contamination issues appears to have decreased for all inspection types (markets and restaurants, recreational fishing, commercial fishing) compared to the last reporting periods. The awareness during market and restaurant inspections decreased for the City of Long Beach (35 percent) and LACDPH (6 percent) compared to the previous reporting period of 55 percent and 33 percent, respectively. Additionally, the recreational and commercial fishing inspections decreased to approximately 50 percent, down from approximately 60 to 80 percent during the previous reporting periods. More anglers reported awareness during piers and jetty inspections compared to boat and beach inspections but intentions to keep white croaker were more often reported during piers and jetty inspections compared to boat and beach inspections. In 32 percent of recreational inspections fishermen reported they would keep white croaker if they caught it. This is down from 40 percent during the last reporting period but generally consistent with previous reporting periods (approximately 30 percent). These results indicate there is still be need for more outreach concerning the health effects of consuming contaminated fish.

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