FISH CONTAMINATION EDUCATION COLLABORATIVE

ANNUAL ANGLER OUTREACH REPORT

August 2019 –July 2020

Palos Verdes Shelf Superfund Site

Los Angeles County, California

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EXECUTIVE SUMMARY

The Palos Verdes Shelf Superfund Site is Operable Unit 5 of the Montrose Chemical Corporation Superfund Site, located in Los Angeles County, California. The Palos Verdes Shelf, a portion of the continental shelf off the coast of Los Angeles, became contaminated with dichloro-diphenyl-trichloroethane (DDT) and polychlorinated biphenyls (PCBs) from the Montrose Chemical plant and other industries that discharged their waste into the Los Angeles County sanitation system. Today, several square miles of sediment on the continental 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 for consumption. The U.S. Environmental Protection Agency's (EPA) initial response to the site was to focus on limiting consumption of these potentially contaminated fish. In February 2015, EPA contracted EA Engineering, Science, and Technology, Inc. (EA) to continue the community involvement activities. In order to re-establish the activities, EA discussed the outreach previously conducted with EPA and the past contractor, reviewed the Interim Record of Decision and Palos Verdes Shelf Superfund Site Institutional Controls (ICs) Program Implementation Plan, and contracted with past outreach community partners.

SUMMARY OF COMMUNITY INVOLVEMENT PROGRAM

The Community Involvement Program was designed to reduce risk exposure posed by contaminated fish through outreach and education. The program has three main activities: Angler Outreach, Community Outreach, and Enforcement. In support of these activities, EA collaborates and coordinates meetings with the Fish Contamination Education Collaborative (FCEC). The FCEC is a forum for the agencies, outreach groups, and other entities involved to share ideas, get updates on the project's progress, and maintain momentum for continued outreach work. This report will discuss the outreach activities performed during the reporting period. The annual enforcement and pier sign monitoring activities are documented in a separate report.

The purpose of the Community Involvement Program is the dissemination of educational material concerning consumption of contaminated fish focusing on specifically vulnerable ethnic communities. This report summarizes the extent of the outreach including:

1. Angler outreach conducted between August 2019 and March 2020.

2. Bait shop outreach conducted in December 2019 and January 2020.

3. Electronic outreach on the FCEC website and Facebook fan page conducted between August 2019 and July 2020.

4. Electronic outreach on the Heal the Bay (HTB) and FCEC websites (blogs and webinars) and social media postings (HTB's Twitter, Instagram, and Facebook) between May and July 2020.
5. Community events attendance between August 2019 and January 2020.

EA subcontracted HTB and Cabrillo Marine Aquarium (Cabrillo) to perform angler outreach; team subcontractor, HDR, Inc. (HDR), to complete the bait shop outreach and attend community events; and Chinese Christian Herald Crusade (CCHC) and Boat People SOS (BPSOS) to conduct outreach during community events for the Chinese and Vietnamese communities, respectively. Electronic outreach through the FCEC website and Facebook fan page was maintained by EA.

Due to the COVID-19 pandemic, in-person angler and community outreach activities were suspended in mid-March 2020 in compliance with State restrictions and closures of public spaces. Therefore, pier angler outreach was performed by HTB and Cabrillo between August 2019 and early-March 2020. Community outreach was performed by HDR, BPSOS, and/or CHCC between August 2019 and January 2020. The annual FCEC partners meeting was planned for April 2020; however, it was postponed due to the COVID-19 pandemic. Similarly, a planned fish identification training workshop for 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) was not held during the reporting period. Bait shop outreach that is normally conducted in the summer (June-July) was also not performed.

Enforcement and pier sign monitoring activities were also performed as part of the Community Involvement Program. Enforcement activities are performed by the Department of Fish and Wildlife (recreational and commercial fishing), City of Long Beach, and LACDPH. The enforcement activities are documented in the Annual Enforcement Report, submitted separately. The pier signs are monitored by HTB, Cabrillo, and City of Long Beach to assess the need for replacement or repair. Pier sign status is summarized in a separate report.

PROGRAM EFFECTIVENESS

The Community Involvement Program, through the various outreach activities at multiple locations, has been effective in reaching anglers and community members to increase awareness of the contamination issues associated with the Palos Verdes Shelf Superfund Site. The angler outreach is effectively reaching anglers, more specifically English and Spanish speaking communities, with a smaller minority of Chinese and Vietnamese communities.

During the reporting period, HTB and Cabrillo reached 5,130 and 1,491 anglers, respectively. On average, 55 percent of anglers were aware of the contamination, of which 96 percent spoke English, 3 percent spoke Spanish, and 1 percent spoke Chinese. On average, 48 percent of anglers were repeat respondents and 52 percent of anglers were new respondents at the piers. HTB and Cabrillo reported the anglers source of information for their awareness of the contamination (i.e., pier signs, information tip-cards, pier outreach team, internet, community events, media, friend/family, or other). Based on the results, the pier anglers outreach team (80.3 percent) and “Do Not Consume” fish signs at the piers (12.2 percent) were reported as the most influential sources of information. Less influential sources of awareness were internet (2.4 percent), tip-cards (1.0 percent), media (0.4 percent), friends/family (2.4 percent), community events (0.2 percent) and other sources, such as school (1.1 percent).

Outreach was conducted at 43 bait shop locations in Huntington Beach, Seal Beach, Long Beach, San Pedro, Redondo Beach, Hermosa Beach, Manhattan Beach, Hawthorne, Marina Del Rey, Venice, and Santa Monica. Bait shop outreach has also shown positive effectiveness in disseminating information. A total of 3,230 tip cards were distributed in December 2019 and January 2020 in English (41 percent), Spanish (22 percent), Chinese (22 percent), and Vietnamese (15 percent).

Thirteen community outreach events were performed by HDR (3), City of Long Beach (4), BPSOS (4), and CHCC (2). The outreach reporting indicated that the community events were effective at reaching the target communities handing out approximately 3,450 total outreach materials at events with themes dedicated to Hispanic culture, marine protection, environmental education, and health fairs. Of the outreach activities, electronic outreach has been the least effectiveness in reaching the communities based on the minimal traffic observed on the FCEC website and Facebook fan page.

PROGRAM RECOMMENDATIONS

Although outreach has been effective at communicating the issues to the public, several observations and recommendations were made that could improve the program. Due to the start of the COVID-19 pandemic in mid-March 2020, the dataset included for this reporting period is less than the previous years and should be noted for comparison to historical trends. Also to be noted is that outreach was ceased during the spring and summer months which tend to be the busiest and can account for discontinuity in the data for this reporting period.

Of the data collected for day angler outreach by HTB and Cabrillo, the results of the geographic distribution and demographic variability expose several interesting conclusions about the overall effectiveness of the Angler Outreach Program. Overall, the variability in the languages reported are consistent with the previous reporting periods (2018-2019). While English is the primary language spoken during both the day and evening angler outreach, more Spanish speakers, as a percent of the total, were observed during the day while more Chinese speakers were observed during the night. This is consistent with the previous reporting period. Continued monitoring of the night angler languages over future reporting periods is recommended to get better understanding of this trend. It was also noted that awareness in the Chinese speaking community was the lowest, indicating increased pier angler outreach to this community is warranted.

During the December 2019 bait shop outreach, there were four shops that still had materials from June 2019. It is recommended to monitor these bait shops to evaluate whether they need replacement by more popular locations in the area. One bait shop, M&P Liquor, specifically requested materials in Korean. During the previous reporting period, four shops in multiple cities requested tip cards in Korean. These requests represent a growing trend of Korean speaking anglers in multiple location groups. It is recommended in the next reporting period to evaluate printing and distributing bait shop outreach materials in Korean to reach this community. The shops that were familiar with and understood the importance of the tip cards were the smaller locally owned shops. Large shops like West Marine have more employee turnover and therefore needed more time spent explaining the program and the importance of

educating the public of the health risks. Additionally, of West Marine's clientele that fish, a large majority do so offshore, outside of the red and yellow zones. During the next round, it is recommended that West Marine shops be removed from the list.

Electronic outreach results show that it has been the least effective outreach mode. These results are similar to previous reporting periods. For this reason, enhancements to the FCEC website was completed during this reporting period. Although the results are similar to previous reporting periods, it is anticipated that the website improvements and resuming outreach activities once COVID-19 restrictions are lifted will increase public engagement in the next reporting period.

The community outreach events have been effective at distributing information materials to the target communities. Although this method of outreach has been highly effective, several observations and potential improvements to the community events and information materials have been identified.

The children's fishing game is a popular tool for outreach to families. Children often lead their parents to the FCEC booth to engage when they see the game. Previously, there were two fishing games that were shared amongst the partners (HDR, CHCC, BPSOS, City of Long Beach) for use at the events. This was challenging to event scheduling and increased shipping costs and general wear and tear of the game. During this reporting period, production and distribution of two new games was completed so that each partner has their own game. As part of the FCEC booth, the display board features outreach to fish markets and anglers. It is recommended to update technical information and graphics during the next reporting period.

The majority of community outreach events are typically held during the spring and summer. However, due to COVID-19 restrictions in mid-March 2020, no events were attended during that timeframe. Once in-person community outreach is resumed, it is recommended that community outreach partners continue to collaborate with other organizations and increase participation in order to diversify the community events and reach more anglers in the Los Angeles area, including Spanish, Chinese, and Vietnamese communities. It is also recommended to encourage community event attendees to use the sign-in sheets to indicate whether they are aware of the DDT/PCB fish contamination advisories and what is the awareness source (signs, tip-card, community event, outreach team, internet, media, friend/family, other). In this reporting period, there was less participation in the sign-in sheets than the previous years. Only one signature was obtained from an educator of the 13 community events attended. Community outreach partners should continue to encourage sign-in at the events, particularly focusing on engaging the visitors and educating them on the reason for the data collection.

The distribution of outreach materials during community events continues to be successful in providing education to the community. Based on the percentage of the types of materials distributed, the tip cards and "What's the Catch" comic book are still the most popular during community outreach. It is recommended to include these as key materials evaluated during the next round of revision to the outreach materials and printing. As mentioned previously, COVID-19 pandemic State restrictions on public gatherings were implemented during March 2020.

During this time, only essential businesses (e.g., medical facilities, grocery stores, restaurant food take-out/delivery) were open to the public. Outdoor activities (e.g., visits to the piers) were only again permitted toward the end of this reporting period. There remains a need to continue outreach education to pier anglers and the local community. It is recommended that the partners continue outreach activities, to the extent practicable and safe, as restrictions are lifted. Some activities may still be performed without in-person contact such as electronic outreach (e.g., blogs, webinars, social media postings, and virtual meetings). Virtual meetings (e.g., FCEC partners meeting, fish identification training) may be performed to regroup and train partners so that they are ready to resume outreach. Virtual outreach may also be performed to educate the local community and Los Angeles Unified School District about the FCEC program, fish contamination, and which fish are safe/not safe to eat. The monitoring and completing needed maintenance of the DNC fish signs (reported separately) at all piers and replenishing bait shop outreach materials may also be conducted. These activities may be performed to continue outreach and education activities during the COVID-19 pandemic and help to resume and accelerate activities once the State restrictions are lifted.

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ACRONYMS AND ABBREVIATIONS

BPSOS	Boat People SOS
Cabrillo	Cabrillo Marine Aquarium
CCHC	Chinese Christian Herald Crusade
City of Long Beach	City of Long Beach Department of Health and Human Services, Bureau of Environmental Health
DDT	Dichlorodiphenyltrichloroethane
EA	EA Engineering, Science, and Technology, Inc.
EPA	U.S. Environmental Protection Agency
FCEC	Fish Contamination Education Collaborative
HDR	HDR, Inc.
HTB	Heal the Bay
IC	Institutional control
LACDPH	Los Angeles County Department of Public Health
PCB	Polychlorinated biphenyl

1.0 INTRODUCTION

The Palos Verdes Shelf Superfund Site is Operable Unit 5 of the Montrose Chemical Corporation Superfund Site, located in Los Angeles County, California. The Palos Verdes Shelf, a portion of the continental shelf off the coast of Los Angeles, became contaminated with dichloro-diphenyl-trichloroethane (DDT) and polychlorinated biphenyls (PCBs) from the Montrose Chemical plant and other industries that discharged their waste into the Los Angeles County sanitation system. Today, several square miles of sediment on the continental 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 for consumption. The U.S. Environmental Protection Agency's (EPA) initial response to the site was to focus on limiting consumption of these potentially contaminated fish.

EPA signed an Action Memorandum for Institutional Controls (ICs) for the Palos Verdes Shelf in September 2001. "ICs" refers to non-engineered measures, such as site use restrictions, intended to prevent or reduce exposure to contaminants at a site. The Action Memorandum established ICs to reduce exposure to contaminated fish, particularly white croaker, from Palos Verdes Shelf. The program includes: (1) public education and outreach; (2) monitoring; and (3) enforcement. In 2003, EPA created the Fish Contamination Education Collaborative (FCEC) with representatives of federal, state and local agencies, and community-based organizations that carry out various outreach and education activities. Since then, each of these program facets has evolved and a fourth element, strategic planning, has been added to assess and calibrate the ICs program. In September 2009, EPA signed an Interim Record of Decision that selected as an interim remedy continuation and strengthening of the ICs program, monitored natural recovery, and placement of a cap over the area of the Palos Verde Shelf that contains the highest surface contaminant concentrations.

In February 2015, EPA contracted EA Engineering, Science, and Technology, Inc. (EA) to continue the community involvement activities. EA discussed the outreach previously conducted with EPA and the past contractor, reviewed the Interim Record of Decision and Palos Verdes Shelf Superfund Site ICs Program Implementation Plan, and contracted with past outreach community partners.

The Community Involvement Program was designed to reduce risk exposure posed by contaminated fish through outreach and education. The program has three main activities: Angler Outreach, Community Outreach, and Enforcement. In support of these activities, EA coordinated meetings with the FCEC. The FCEC is a forum for the agencies, outreach groups, and other entities involved to share ideas, get updates on the project's progress, and maintain momentum for continued outreach work. This report will discuss the outreach activities. The annual enforcement and pier sign monitoring activities are documented in a separate report.

The purpose of the Community Involvement Program is the dissemination of educational material concerning consumption of contaminated fish focusing on specifically vulnerable ethnic communities.

This report summarizes the extent of the outreach including:

1. Angler outreach conducted between August 2019 and March 2020.

2. Bait shop outreach conducted in December 2019 and January 2020.

3. Electronic outreach on the FCEC website and Facebook fan page conducted between August 2019 and July 2020.

6. Electronic outreach (blogs and webinars) on the Heal the Bay (HTB) and FCEC websites and social media postings (HTB's Twitter, Instagram, and Facebook) between May and July 2020.

4. Community events attendance between August 2019 and January 2020.

EA subcontracted Heal the Bay (HTB) and Cabrillo Marine Aquarium (Cabrillo) to perform angler outreach; team subcontractor, HDR, Inc. (HDR), to complete the bait shop outreach and attend community events; and Chinese Christian Herald Crusade (CCHC) and Boat People SOS (BPSOS) to conduct outreach during community events for the Chinese and Vietnamese communities, respectively. Electronic outreach through the FCEC website and Facebook fan page was maintained by EA.

Due to the COVID-19 pandemic, in-person angler and community outreach activities were suspended in mid-March 2020 in compliance with State restrictions and closures of public spaces. Therefore, pier angler outreach was performed by HTB and Cabrillo between August 2019 and early-March 2020. Community outreach was performed by HDR, BPSOS, and CHCC between August 2019 and January 2020.

EA typically facilitates a fish identification training workshop for 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). Additionally, EA coordinates an annual FCEC partners meeting. These events were planned for April 2020, however, due to the COVID-19 pandemic, they were postponed during the reporting period. Similarly, bait shop outreach that is normally conducted by HDR in the summer (June-July) was not conducted.

Enforcement and "Do Not Consume" fish pier sign monitoring activities were also performed during the reporting period as part of the Community Involvement Program. Pier sign monitoring activities are performed by LACDPH, City of Long Beach, HTB, and Cabrillo to assess the need for replacement or repair. Enforcement inspections are performed by the Department of Fish and Wildlife for recreational and commercial fishing. Additionally, the City of Long Beach and LACDPH perform enforcement inspections of local markets and restaurants. The pier signs condition and enforcement activities are further documented in the Annual Pier Sign Summary Report and Annual Enforcement Report, submitted separately.

2.0 OVERVIEW OF THE COMMUNITY INVOLVEMENT PROGRAM

The Community Involvement Program is one of three ICs designed to reduce risk exposure posed by the consumption of contaminated fish. The purpose of the Community Involvement Program is the dissemination of educational material concerning consumption of contaminated fish focusing on specifically vulnerable ethnic communities. This report summarizes the extent of the outreach including:

1. Angler Outreach
2. Bait Shop Outreach
3. Electronic Outreach
4. Community Event Outreach
5. FCEC Partners Meeting.

The following sections summarize each of these outreach subprograms.

2.1 ANGLER OUTREACH

HTB and Cabrillo continued the previous Angler Outreach activities. HTB contacted anglers at the following fishing piers located within the Palos Verdes Shelf Superfund Site contaminated sediment area between Santa Monica Pier and Seal Beach Pier (Figure 1): (1) Santa Monica; (2) Venice; (3) Hermosa Beach; (4) Redondo Beach; (5) Rainbow Harbor; (6) Pier J; (7) Belmont Pier; and (8) Seal Beach. Cabrillo contacted anglers at the Cabrillo Pier (Figure 1). HTB and Cabrillo staff educated anglers at the piers discussing the local contamination and distributing program materials 2 to 3 days per week, generally during day times of highest angler population on the piers. Pier angler outreach was conducted on Thursday or Friday, Saturday, and Sunday. HTB expanded the angler outreach program to include evening hours as a pilot program at Venice and Redondo Beach piers between August 2017 and October 2017. These two piers were chosen based on popularity and ease of access for the outreach team during the evening hours. Based on the success of the pilot program, evening outreach at these piers was implemented in October 2018. HTB conducted evening outreach on Saturdays between 4:00 and 8:00 P.M. Face-to-face conversations were held with anglers, in the angler's native tongue when possible. Similar to daytime outreach, HTB staff discussed the contamination in fish, distributed informational materials, and recorded outreach activity results.

As part of the angler outreach program, EA worked with HTB and Cabrillo to monitor pier signs and maintain a record of their condition. EA reported missing or damaged signs to EPA and coordinated with the LACDPH and City of Long Beach to complete sign removal and/or replacement. The summary of pier sign status is summarized in a separate report.

Due to the COVID-19 pandemic, in person outreach was suspended in early March 2020. HTB performed alternate outreach activities between March and July 2020 that did not involve staff being in direct contact with the public on the piers. The alternative activities performed during the reporting period included mapping where anglers are from for analysis of possible expansion of outreach, improved the education tally sheet and data quality protocols, and created monthly blogs and "Knowledge Drop" webinars and posts to social media (HTB's Twitter, Instagram,

and Facebook) to increase public awareness of the fish contamination for linkage through the FCEC website.

2.2 BAIT SHOP OUTREACH

HDR conducted outreach at 43 angler retail and bait shop locations in Huntington Beach, Seal Beach, Long Beach, San Pedro, Redondo Beach, Hermosa Beach, Manhattan Beach, Hawthorne, Marina Del Rey, Venice, and Santa Monica (Figure 2). HDR staff provided tip cards in English, Spanish, Vietnamese, and Chinese to bait shop managers and recorded the number of tip cards provided. Additionally, the contact email address (info@pvsfish.org) and website (http://pvsfish.org/) was left for bait shops to request additional materials or ask questions.

2.3 ELECTRONIC OUTREACH

Electronic outreach was completed by maintaining the FCEC website (http://www.pvsfish.org/), Facebook fan page (https://www.facebook.com/fcecprogram/), and disseminating an electronic newsletter. EA responded to questions emailed to the FCEC information account, posted the eNewsletter, FCEC reports, and upcoming events. EA also recorded user traffic such as the number of visitors and Facebook fan page "likes" (using Facebook Insights). The data collected (using Google Analytics) on the FCEC website included the number of visitors, page views, number of pages/session, average duration of visitor stay on the website, the bounce rate (percentage of visitors to a website who navigate away from the website after viewing one page), whether a visitor was new or a repeat, and page views by city.

Based on electronic outreach evaluations from previous reporting periods, it was recommended to improve the FCEC website and Facebook fan page to increase user traffic. In October 2018, EA worked with HDR and FCEC partners to begin improvements to the FCEC website and Facebook fan page. The FCEC website was migrated to a new platform and revised to incorporate FCEC partners' input, improve navigability, organization of content, and updates to outreach program information. It was also updated to increase compliance with Section 508 accessibility requirements and to be viewable on mobile devices. The migration was completed in May 2020.

HTB created monthly blogs and "Knowledge Drop" webinars in English and Spanish languages to increase public awareness of the fish contamination for linkage from the FCEC website. The webinars and blogs were posted on HTB's website (www.healthebay.org) and promoted through social media postings on HTB's Twitter (https://twitter.com/HealTheBay/), Instagram (https://www.instagram.com/healthebay/), and Facebook (https://www.facebook.com/HealtheBay) accounts during May through July 2020. The blogs and webinars were focused on educational topics about the FCEC angler outreach program and fish contamination.

2.4 COMMUNITY OUTREACH

A total of 13 community outreach events were attended by HDR, CHCC, BPSOS, and City of Long Beach. HDR attended 3 events with themes dedicated to Hispanic culture, marine protection, and environmental education. CHCC and BPSOS attended 2 Chinese and

4 Vietnamese community events, respectively. As part of enforcement activities, the City of Long Beach attended 4 events in the Long Beach community. Community outreach is provided to educate these specific communities on the fish contamination and "Do Not Consume" fish. During the events, outreach focused on distributing informational tip cards, comic books, and pamphlets as well as having one-on-one conversations with community members to provide fish contamination and consumption education. A children's fishing game is provided at the events as a tool for children and families to engage in learning about identification of contaminated fish species. Sign-up sheets are available for visitors to sign-up for the eNewsletter and indicate their awareness of the contamination (i.e., whether they are aware of the DDT/PCB fish contamination advisories before the community event, what is the awareness source ("Do Not Consume" fish signs, tip-card, community event, outreach team, internet, media, friend/family, other).

2.5 FCEC PARTNERS MEETING

The FCEC partners meeting is typically held annually in Long Beach, California. The meeting includes the angler outreach groups, agencies, and other entities to provide feedback and recommendations for program messaging, report on the condition of posted "Do Not Consume" pier signage, exchange information, and discuss any issues related to the program. The annual FCEC partner meeting was planned for April 2020 but was postponed during the reporting period due to the COVID-19 pandemic.

3.0 DATA COLLECTION AND ANALYSIS APPROACH

3.1 ANGLER OUTREACH

HTB and Cabrillo staff conducted angler outreach between August 2019 and early March 2020. In addition to angler outreach during the day, HTB performed evening outreach between October 2018 and early March 2020. Due to the COVID-19 pandemic, in person angler outreach was suspended in early March 2020 for both the daytime and evening outreach programs, the following data were recorded during the angler outreach efforts:

1. Whether an outreach angler was an adult or child.

2. Whether an outreach angler was a repeat or new respondent.

3. The number of information tip cards provided.

4. Whether the outreach angler is aware of the contamination.

5. The awareness source (i.e., pier signage, information tip-cards, outreach, community events, media, internet, friend/family, or other).

6. The language spoken during the angler outreach.

7. The zip code the angler lives in, if provided.

8. Any additional notes about the angler, such as type of fish caught, and other language(s) spoken if outreach was conducted in English.

The outreach data was analyzed to determine the effectiveness of the angler outreach activities. The total number of anglers reached at each pier was tracked on a monthly and annual basis to determine whether the numeric outreach objective was met. The overall outreach effectiveness was based on the percent of anglers aware of the fish contamination of those reached. Another measure of outreach effectiveness was based on the demographic variability of the anglers. The demographics were assessed by the total number of anglers reached in each zip code/county, and the languages spoken (English, Spanish, Chinese) by county. This analysis was possible because each record in the database that had zip code information also contained the language spoken. The demographic variability data was also used to identify potential gaps in outreach within the communities.

As mentioned previously, in person outreach was suspended in early March 2020 due to the COVID-19 pandemic. HTB performed alternative outreach activities between March and July 2020 that did not involve staff being in direct contact with the public on the piers. The alternative activities performed during the reporting period are discussed in the bullets below.

- Mapping where anglers are from – HTB used 2018 and 2019 angler zip code data from Education Tally Sheets to assess the overall distribution of where pier anglers are from in and around Los Angeles County. The zip code data was compared to 2017 outreach data to determine potential new areas of opportunity to outreach to communities where anglers are from.

- Improved the education tally sheet – HTB re-formatted the education tally sheet so that individual fish data can be recorded and used for analysis of the type and frequency of fish caught at piers throughout the year.

- Improved data quality protocols – HTB began refining the protocols for training, data collection, and data entry. They began development of a new Excel database structure to make data entry and analysis easier. They also began on preparation of a Quality Assurance Project Plan document.

- Created blogs and "Knowledge Drop" webinars – HTB created monthly blogs and "Knowledge Drop" webinars in English and Spanish languages to increase public awareness of the fish contamination for linkage from the FCEC website (Section 3.3). The webinars and blogs were posted on HTB's website and promoted through social media postings on HTB's Twitter, Instagram, and Facebook accounts between May and July 2020. The blogs and webinars were focused on educational topics about the FCEC angler outreach program and fish contamination.

3.2 BAIT SHOP OUTREACH

HDR conducted bait shop outreach to 43 bait shops in December 2019 and January 2020. During each visit, HDR collected qualitative data including turn-over, how many bait shops took outreach materials, and how many of the materials were distributed in each language. Since the last reporting period, no bait shops were removed or added to the outreach list. Figure 2 presents the locations of bait shops.

In-person bait shop outreach that is normally conducted in the summer (June-July) was not performed due to COVID-19 pandemic State restrictions. HDR conducted telephone interviews to the bait shops to assess their outreach material inventory and identify bait shops that need materials in the next reporting period.

3.3 ELECTRONIC OUTREACH

Data collection for the electronic outreach was performed using Google Analytics, which recorded information such as the various visitor types to the FCEC website, visitor activity on the website, and the method used to reach the website. The Google Analytics data were analyzed to determine the total number of visitors to the website, number of page views, number of pages viewed per session, the bounce rate (the percentage of visitors to a website who navigate away from the site after viewing one page), the number of new or repeat visitors, and page views by city. The combined information from these datasets enabled a qualitative-quantitative analysis of the outreach effectiveness of the FCEC website. In addition, analytic data from Facebook Insights, such as the number of likes, fans reached, and user engagement provided additional data to assess outreach effectiveness. Heal the Bay also tracked website analytics for the blogs and webinars posted on their website and promotions through social media postings to assess electronic outreach effectiveness between May and July 2020.

During last year's FCEC Partners meeting on 23 April 2019, FCEC partners were asked to participate in review of the updates and provide graphics, information, and/or recommendations to improve the FCEC website. EA worked with HDR and FCEC partners to update the FCEC website to address FCEC partners' feedback, increase user traffic, achieve compliance with Section 508 accessibility requirements, and be viewable on mobile devices. The migration of the FCEC website to the new format was completed in May 2020.

3.4 COMMUNITY EVENT OUTREACH

HDR, CHCC, BPSOS, and City of Long Beach attended a total of 13 community events. During each community event, the estimated number of attendees and/or tip cards distributed (English, Spanish, Chinese, and/or Vietnamese) were recorded. Similar to the other outreach datasets, the community event outreach data were analyzed to determine and compare the outreach effectiveness within each of the target communities. Based on community outreach evaluations from the previous reporting periods, the children's fishing game continues to be a popular and successful tool to educate families. It was recommended in the last reporting period to fix and/or replace the fishing games so that they can continue to be utilized by FCEC partners during the community events.

4.0 RESULTS

4.1 DAY ANGLER OUTREACH

4.1.1 DAY ANGLERS CONTACTED DURING OUTREACH PERIOD

Table 1 summarizes the total number of anglers contacted between August 2019 and March 2020. The table presents the following total values: (1) total per month; (2) total in 2019; (3) total in 2020; and (4) total for the outreach period. During the reporting period, the numeric objective of the HTB and Cabrillo outreach was to contact a minimum of 11,000 and 1,600 anglers, respectively. However, due to the COVID-19 pandemic, angler outreach was suspended after the first week of March 2020. This prevented HTB and Cabrillo from collecting outreach data through the end of the reporting period in July 2020, which is typically the busier outreach period of the year (spring and summer). As a result, HTB reached only 5,130 anglers and Cabrillo reached 1,491 anglers, much fewer than previous reporting periods.

Based on the monthly trends in the data, as shown in Figure 3, a similar seasonal trend was observed compared to previous reporting periods with the numbers of anglers generally decreasing between August 2019 and February 2020. The greatest outreach occurred in August 2019. The most popular piers for angler outreach were Cabrillo and Belmont piers, making up approximately 40 percent of the total anglers reached. The Rainbow Harbor and Hermosa Beach piers were the least frequented by anglers (approximately 12 percent). Excluding March 2020, which only has data for one week of outreach, Belmont Pier had the greatest variability, with peak anglers ranging from 46 (December 2019) to 437 (August 2019). Cabrillo Pier and Redondo Beach locations had the next greatest variability, with angler outreach ranging from 133 (December 2019) to 340 (September 2019) and 50 (January 2020) to 181 (August 2019), respectively.

4.1.2 Day Angler Outreach Effectiveness (Contamination Awareness)

Angler awareness of the contamination and “Do Not Consume” warnings was collected during the outreach sessions from August 2019 to early March 2020. Anglers were additionally asked about the source that they learned of the information. Table 2 summarizes the percent of anglers who responded that they were aware of the contamination and “Do Not Consume” warnings. On average for all the piers monitored, angler awareness during the reporting period was 55 percent (3,642 of 6,621). The anglers reached at Cabrillo Pier had the most awareness with 65 percent of anglers aware of the contamination issues. Venice Beach (60 percent) and Santa Monica (57 percent) followed. Angler awareness was lowest at Seal Beach at 44 percent of anglers; however, Seal Beach also had the highest fraction of new anglers at 63 percent.

Of the anglers contacted at the piers who were aware of the contamination, on average, 96 percent spoke English, 3 percent spoke Spanish, and 1 percent spoke Chinese. Within each language group, English-speakers were the most aware of contamination (55 percent), followed by Spanish-speakers (51 percent), and Chinese-speakers (0 percent).

Anglers were asked whether they were a new or repeat outreach respondent. Tables 3 and 4 summarize the percent of respondents who were repeat or new respondents for the outreach period. Among all fishing locations, 48 percent of anglers were repeat respondents and 52 percent of anglers were new respondents. Venice Pier had the highest fraction of repeat respondents (58 percent) while Seal Beach had the lowest repeat respondents (37 percent). The remaining piers averaged between 40 percent (Belmont Pier) and 54 percent (Santa Monica Pier) for repeat respondents.

HTB and Cabrillo asked anglers that reported awareness of the contamination to provide the source of their information (i.e., pier signs, information tip-cards, pier outreach team, internet, community events, media, friend/family, or other). Table 5 summarizes pier angler's source of awareness. Based on the results, the pier angler outreach teams (57.9 percent) and pier signage (33.8 percent) were reported as the most influential sources of information. Compared to the previous reporting period, pier sign awareness increased from 19.4 percent. Less influential sources of awareness that were reported were media (3.1 percent), friends/family (1.6 percent), internet (0.8 percent), FCEC tip-cards (0.1 percent), and other sources, such as school (2.1 percent).

4.1.3 Day Angler Outreach Effectiveness (Geographic Distribution/Demographic Variability)

During the angler outreach, anglers were asked to provide the zip code where they live. Of the 6,621 anglers reached between August 2019 and early March 2020, 55 percent (3,642 anglers) provided their zip code. Of note, anglers at Cabrillo Pier provided their zip code much more frequently compared to other piers (97 percent). Of the anglers who provided their zip code, 85.4 percent were from Los Angeles County, 8.1 percent were from Orange County, 2.5 percent from San Bernardino County, and 2.2 percent from Riverside County. As approximately 98 percent of the angler outreach respondents who provided zip codes were from the four surrounding counties, the analysis focused on these geographic areas.

Figure 4 depicts the distribution and concentration of zip codes for Los Angeles, Orange, San Bernardino, and Riverside counties. The highest zip code concentration occurs within the Cabrillo zip code of 90731 with 342 respondents. The highest concentrations appear to occur within the area bound by Interstate-110 to the west, Interstate-605 to the east, and Interstate-10 to the north.

Demographic variability was determined using the language data collected during the angler outreach. The efficiency of the outreach to various communities actively fishing the Palos Verdes Shelf Superfund Site was assessed by evaluating the different languages spoken geographically. Only responses of English, Spanish, and Chinese were reported in the data provided by HTB and Cabrillo. While the data may indicate that many of the anglers responded in English, bi- or multi-language responses may not have been recorded by the anglers.

Table 6 summarizes the language distribution spoken by the anglers. The results indicate that 95.6 percent of the respondents within Los Angeles, Orange, San Bernardino, and Riverside

counties spoke English and 4.4 percent were non-English speakers. Of the non-English speakers, 3.3 percent of respondents were Spanish speakers, and 1.1 percent spoke Chinese. These results do not indicate if the English responders speak only English or if they are bi- or multi-lingual. Based on the data provided, the demographic groups that are likely effectively being reached through the Angler Outreach Program include English speaking, Spanish speaking, with a smaller minority of Chinese speaking anglers.

4.2 NIGHT ANGLER OUTREACH

Between August 2018 and March 2020, HTB performed angler outreach on Saturday evenings at Venice and Redondo Beach piers. These piers were chosen based on previous observations of night anglers at these piers and night access for the angler outreach team. As with daytime angler outreach, activities were planned through the end of the reporting period in July 2020, but night outreach was suspended in early March 2020 due to the COVID-19 pandemic.

Table 7 summarizes the total number of anglers contacted. The table presents the following total values: (1) total per month; (2) total for the program; and (3) total for each pier location. Based on the data, the evening outreach program reached a total of 1,337 anglers. The highest evening angler outreach occurred in August 2019 with 402 respondents. The next highest evening outreach was in October 2019 (n=227). Excluding March 2020, for which there was only one week of outreach before activities were ceased, the lowest evening outreach occurred in December 2019 with 78 respondents. Overall, both locations observed a general seasonal decrease after August 2019 through the winter. Respondents increased in February 2020, but no increasing trend was observed because activities were suspended. This data is shown in Figure 3.

Table 8 summarizes the percent of anglers who responded that they were aware of the contamination and "Do Not Consume" warnings. On average, 49 percent of anglers reached exhibited awareness (51 percent at Venice Beach [n=606] and 47 percent at Redondo Beach [n=731]).

Tables 9 and 10 summarize the percent of respondents who were repeat or new respondents, respectively. An average of 41 percent of anglers were repeat and 59 percent of anglers were new respondents. Venice had 44 percent repeat respondents and Redondo Beach had 38 percent repeat respondents.

Table 11 summarizes the awareness source from the night responders. Pier outreach team (77.8 percent) and the pier signage (11.6 percent) are reported as the most influential sources of information. Less influential sources of awareness were internet (4.5 percent), friends/family (3.3 percent), events (1.1 percent), media (0.9 percent), and "other" (0.7 percent).

During the night angler outreach pilot program, anglers were asked to provide the zip code where they live. Of the 1,337 anglers reached, 47 percent (627 anglers) provided their zip code. Of the anglers who provided their zip code, 90.1 percent were from Los Angeles County, 8.0 percent from Orange County, 0.5 percent from San Bernardino County, and 0.2 percent from Riverside County. Figure 5 depicts the distribution and concentration of zip codes for Los Angeles,

Orange, San Bernardino, and Riverside counties. No individual zip code had greater than 15 respondents, 16 zip codes had between 10 and 15 respondents. The highest concentrations appear to occur within the area bound by Interstate-110 to the west, Interstate-605 to the east, and Interstate-10 to the north. See Figure 5 for the graphical distribution of where anglers are from.

Table 12 summarizes the language distribution spoken by the anglers reached during the evening outreach. The results indicate that 97.8 percent of the respondents within Los Angeles, Orange, San Bernardino, and Riverside counties spoke English and that 2.2 percent were non-English speakers. Two percent of respondents were Chinese speakers and 0.2 percent were Spanish speakers; all non-English speakers who provided zip codes resided in Los Angeles county.

4.3 BAIT SHOP OUTREACH

In December 2019 and January 2020, HDR conducted outreach to 43 bait shops in the California cities of Huntington Beach, Seal Beach, Long Beach, San Pedro, Redondo Beach, Hermosa Beach, Manhattan Beach, Hawthorne, Marina Del Rey, Venice, and Santa Monica (Figure 2). Prior to these events, the bait shops were last contacted in June 2019. One shop changed hands; Magnolia Liquor Jr. Mart is now Supreme Liquor Market.

During bait shop outreach, tip cards were provided in English, Spanish, Vietnamese, and Chinese. Most shop owners requested tip cards in English and Spanish. A total of 3,230 tip cards were distributed with 41 percent English, 22 percent Spanish, 22 percent Chinese, and 15 percent Vietnamese. English and Spanish language "What's the Catch" comic books were also provided to store managers and clerks to help educate about the program. Most shops had distributed the materials that were previously left. However, the four shops bulleted below, all four of which are in the city of San Pedro, still had materials from the June 2019 outreach.

- Family Deli and Grocery
- Kelly Marine
- M&P Liquor
- Mr. C's Liquor.

Overall, the outreach effort was well-received by shop owners. The majority of the shop managers remembered FCEC program and the tip cards. A few shops re-located the plastic tip card holders to be more visible and accessible near the bait. They indicated appreciation of the comic books and the FCEC outreach materials to help explain the health risks to their clientele. When asked about changing dynamics and clientele, many shops in San Pedro, Long Beach, and Seal Beach expressed that there was an increase in Spanish speaking clientele. Shops in Orange County reported a large, stable Vietnamese angler community.

The current Bait Shop list catalogues more than 40 shops in the event that a shop goes out of business or is closed. While there is an attempt to contact the bait shops prior to the scheduled visit, only a small percentage answer the phone. The shops that were familiar with and understood the importance of the tip cards were the smaller locally-owned shops. Shops like

West Marine have more employee turnover and therefore needed more time spent explaining the program and the importance of educating the public of the health risks.

A majority of the shops in Areas 3 and 4 lost or re-appropriated their card holders. In general, the stores were enthusiastic about using a dedicated display. However, two shops declined the card holders instead opting for pre-existing displays to limit use of counter space.

One bait shop, M&P Liquor, specifically requested materials in Korean. During the previous reporting period, four shops in multiple cities requested tip cards in Korean. These requests represent a growing trend of Korean speaking anglers in multiple location groups.

In -person bait shop outreach that is normally conducted in the summer (June-July) was not performed due to COVID-19 pandemic State restrictions. HDR conducted telephone interviews to the bait shops to assess their outreach material inventory and identify bait shops that need materials. Of the 43 bait shops contacted, 4 indicated the need of additional outreach materials that will be delivered in the next reporting period. The four bait shops include Big 5 Sporting Goods, Del Rey Landing, Bay Market, and Dawn to Dusk Liquor.

4.4 ELECTRONIC OUTREACH

Figures 6 and 7 and Table 13 summarize the Google Analytics datasets that were collectively used to quantify electronic outreach effectiveness. Based on the data, the website experienced a decrease in visitors, measured by the number of sessions or visits to the webpage, unique users, and page views between August 2019 and July 2020. During this time, the bounce rate and percent of new users to the website remained fairly constant on average of 88 percent and 99 percent, respectively. Between August 2019 and July 2020, the number of sessions, users, and page views was highest in August 2019 (207 users, 253 page views), January 2020 (199 users, 277 page views), and February 2020 (204 users, 284 page views). In March 2020 there were only 141 users, but total page views were the highest at 302. In June and July 2020 there was almost no activity on the page which may be attributed to the decrease in outreach after March 2020 due to COVID-19. The bounce rate remained fairly constant during this time with an average of 88 percent. The New Users averaged >99 percent for the majority of this time period. The pages per session data remained fairly constant but was higher in both November 2019 and March 2020 from an average of 1.15 pages per session to a 1.41 and 1.92 pages per session, respectively. Average session duration remained consistently low (45 seconds or less each month), except in March 2020 when average session duration was 2 minutes and 28 seconds. In addition to overall website usage, Google Analytics tracks demographic data, specifically country, region/state, and city, and metro area. For the purposes of this analysis, the city level data was evaluated. Similar to the angler outreach analysis, visitors to the website were primarily from California (57 percent of users with geographic tracking turned on). In California, the top five cities with visitors to the website include Los Angeles, San Diego, San Francisco, Long Beach, and Irvine. Approximately 19 percent of visitors to the website were from Los Angeles (289 users), followed by 4 percent from San Diego (61 users), 2 percent from

San Francisco (35 users), 2 percent from Long Beach (26 users), and 1.5 percent from Irvine (23 users).

The Facebook Insights data are presented in Figures 8 and 9. Figure 8 depicts the number of likes the Facebook fan page received from August 2019 to July 2020. Figure 9 presents the number of fans (users who like the Facebook fan page) reached and percent of users engaged during the outreach period for each post to the Facebook fan page. As of July 2020, the Facebook fan page has 4,462 likes from fans. The Facebook fan page likes had a steady decrease in overall likes throughout the year. The number of likes shows a declining trend of approximately eight likes per month; this is consistent with last year's Facebook Insights data. The first graph of Figure 9 shows an increase in users reached during December 2019 and the second graph shows increased engagement during that same period. This spike is correlated to postings (e.g., upcoming community events and photographs) on the Facebook fan page.

To evaluate the reach and engagement of posting information on the Facebook fan page, Facebook Insights data provide the total number of fans reached, the total number of fans reached who also liked the Facebook fan page, the percent of engaged users relative to the fans reached, and the percent of engaged users relative to the number of fans reached who also like the Facebook fan page. During this reporting period, there have been 9 posts to the Facebook fan page, with an average total fan reach of 72 and <1 percent engagement. Of the fans reached, on average 460 (71 percent) also liked the Facebook fan page. Posts received little to no fans engaged.

HTB began posting monthly blogs and educational webinars on their website for linkage from the FCEC website in May 2020. HTB tracked website analytics for the blogs and webinars posted on their main website and social media posts to assess electronic outreach. The blogs reached an average of 60 users per blog with an average of 2.5 minutes per page. The webinars reached 3 people each with an average attentiveness of 87%. Table 14 presents HTB's website analytics data for the blogs and webinars. Social media postings in both English and Spanish languages averaged 5-7 likes per post.

4.5 COMMUNITY OUTREACH

HDR attended three events with themes dedicated to Hispanic culture, marine protection, and environmental education. Below is the list of community events attended by HDR during the reporting period:

1. Aquarium of the Pacific Baja Splash Cultural Festival (28 September 2019)
2. Aquarium of the Pacific Underwater Parks Day (11 January 2020)
3. Cabrillo Marine Aquarium Whale Fiesta (26 January 2020).

In total, an estimated 4,900 people attended the events with approximately 850 attendees visiting the outreach booth. HDR distributed 1,100 informational outreach materials during the events consisting of tip cards (50.9 percent), "What's the Catch" comic books (31.2 percent), informational brochures (14.4 percent), fish identification cards (3.2 percent), and "What's the Catch" curriculum guide (0.3 percent). Of the 565 tip cards distributed, 78 percent were English,

18 percent were Spanish, and 4 percent were Chinese. The "What's the Catch" comic books (346) for children were distributed in English (54 percent), Spanish (37 percent), and Chinese (9 percent). English language curriculum guides (3) were given to educators during the Underwater Parks Day. Additional outreach materials distributed included 36 fish identification cards and 160 informational brochures in English (86 percent) and Spanish (14 percent).

CCHC attended two community events during the outreach period, targeted primarily at Chinese community members. Below is the list of community events attended by CCHC during the outreach period:

1. 6th Annual Rosemead Annual Moon Festival (14 September 2019)
2. Rowland Heights Community Health Fair (26 October 2019).

In total, an estimated 3,310 people attended the events with 21 percent of attendees (696 people) receiving Chinese tip cards and brochures.

BPSOS attended four community events during the outreach period; the events targeted primarily Vietnamese communities. Below is the list of community events attended by BPSOS during the outreach period:

3. Mid-Autumn Festival (7 September 2019)
4. Nhan Hoa Annual Health Fair (12 October 2019)
5. Clinton Corner Family Campus Yearly Community Resources and Health Fair (23 October 2019)
6. Vietnamese Community Health at UCLA Winter Health Fair (23 February 2020).

In total, an estimated 2,805 people attended the events with 52 percent (1,472 people) of attendees receiving outreach materials from BPSOS staff. Of the 1,145 tip cards and brochures distributed (to 41 percent of attendees), 57 percent were Vietnamese and 43 percent were English. In addition, English language "What's the Catch" comic books (327) were given to 13 percent of attendees.

The City of Long Beach attended 4 community events during the outreach period; the events targeted the Long Beach community. A total of 170 English tip cards were distributed during the events. Below is the list of community events attended by City of Long Beach during the outreach period:

7. 6th Annual READY Long Beach Community Preparedness Expo (28 September 2019)
8. Long Beach Development Services Outdoors Community Resources Fair (26 October 2019)
9. Long Beach Unified School District Green Summit (16 November 2019)
10. Filipino Festival (15 December 2019).

During this reporting period, there was less participation from visitors on the sign-in sheets. Only one signature was obtained from an educator to receive additional information about the FCEC program and to record their awareness of contamination. To address the recommendation

to fix and/or replace the fishing games, two new games were produced and distributed to partners for use at community outreach events during the reporting period.

5.0 DISCUSSION AND RECOMMENDATIONS

The Community Involvement Program, through the various outreach activities at multiple locations, has been effective in reaching anglers and community members to increase awareness of the contamination issues associated with the Palos Verdes Shelf Superfund Site. The following sections discuss conclusions and recommendations for each aspect of the outreach program.

Due to the COVID-19 pandemic and suspension of outreach activities in mid-March 2020, the dataset included for this reporting period is less than the previous years. This is noted for comparison to historical trends. Additionally, the outreach was ceased during the spring and summer months which tend to be the busiest. Therefore, there is discontinuity in the data for this reporting period.

5.1 ANGLER OUTREACH

The outreach objectives for HTB and Cabrillo outreach were to contact a minimum of 11,000 and 1,600 anglers, respectively. However, due to the COVID-19 pandemic, angler outreach was suspended after the first week of March 2020. This prevented the pier angler outreach teams from collecting outreach data through the end of the reporting period in July 2020. However, when comparing the outreach period of August 2019 – February 2020 to August 2018 – February 2019, both HTB and Cabrillo were significantly outpacing the previous year's numbers and were doing so at the majority of piers. No piers had fewer total respondents between August 2019 and February 2020 than between August 2018 and February 2019. Additionally, based on historical data trends, the spring and summer period is the busiest time of year on the piers. This indicates that both HTB and Cabrillo were on track to exceed last year's outreach totals and meet this year's outreach objectives if activities were not suspended.

Daytime awareness data collected for this reporting period indicated that 55 percent were aware of contamination. This is down from the last reporting period, which indicated that, on average, 61 percent were aware of the contamination and down from the approximately 84 percent that reported being aware reported during the previous two periods between July 2016 and July 2018. While the awareness percentage decreased, the percent of new anglers (52 percent) increased slightly from the previous reporting period (51 percent) and from the average of 47 percent new from the three reporting periods prior to that. Compared to the day angler outreach, the evening angler outreach data show an average of 49 percent aware of the contamination and 59 percent new anglers. This is in line with data from the last reporting period that showed that 46 percent of night angler respondents were aware of the contamination and 60 percent were new anglers.

Of the data collected for day angler outreach by HTB and Cabrillo, the results of the geographic distribution and demographic variability expose several interesting conclusions about the overall effectiveness of the Angler Outreach Program. Overall, there variability in the languages reported are consistent with the previous three reporting periods (2016-2019), which was less

variability in language compared to 2015-2016 reporting. While English is the primary language spoken during both the day and evening angler outreach, more Spanish speakers were observed during the day while more Chinese speakers were observed during the night. This is opposite of the results recorded during the pilot night angler program in 2017 which indicated more Spanish than Chinese language speaking anglers. Continued monitoring of the night angler languages over future reporting periods is recommended to get better understanding of this trend. It was also noted that awareness in the Chinese speaking community was the lowest, indicating increased pier angler outreach to this community is warranted.

The geographic distribution of the outreach data shows the program is effectively reaching the local communities in the greater Los Angeles area potentially affected by the consumption of fish from the Palos Verdes Shelf Superfund Site. The demographic variability data, as measured through the angler languages spoken, presents a more limited variety of ethnicities and cultures being reached through the outreach program; however, responses to languages are limited to single answers, and may not accurately reflect the demographics reached through the program.

The sources of awareness that anglers cited for how they learned of the contamination were primarily the pier angler outreach team and "Do Not Consume" fish pier signage. These results are similar to the previous reporting periods which indicates continued successful implementation of the pier angler program outreach.

5.2 BAIT SHOP OUTREACH

Overall, the December 2019 and January 2020 bait shop outreach events were successful. The majority of shops remembered the FCEC program and most of the outreach materials were distributed. There were four shops that still had materials from June 2019. This is down by half compared to the last reporting period. It is recommended to monitor these bait shops to evaluate whether they need replacement by more popular locations in the area. No bait shops were replaced during this reporting period. This suggests that the identification and tracking of bait shop turn-over continues to be effective and improving over the reporting periods.

A majority of shops in San Pedro, Long Beach, and Seal beach lost or re-appropriated their card holders. Replacement plastic tip card holders should be considered for distribution to these shop locations in the next reporting period.

Requests for Korean outreach materials at a San Pedro bait shop during this reporting period is consistent with the previous reporting period where materials in Korean were requested in four areas (San Pedro, Long Beach, Seal Beach, and Huntington Beach). This represents a growing trend of Korean speaking anglers in multiple locations. It is recommended in the next reporting period to evaluate printing and distributing bait shop outreach materials in Korean to reach this community.

Based on previous bait shop outreach efforts, it is recommended to remove the West Marine stores with smaller community-based bait shops. West Marine is a large specialty store devoted to boating, and not all locations sell bait. Of West Marine's clientele that fish, a large majority do so offshore, outside of the red and yellow zones.

5.3 ELECTRONIC OUTREACH

The Google Analytics for the FCEC website and Facebook Insights data present the effectiveness of the two media in reaching the public.

The Google Analytics data indicate that since August 2019, visits to the FCEC website have been relatively minimal, and even when the website receives visitors, there is little to no engagement, as reflected by the bounce rate, page views per session, and average session duration. A deeper look at the top four pages visited after August 2019 showed that the pages visited were not the main pages of the website providing information on the contamination, fishing piers, or fish, but rather to blog posts from 2010 and 2011. The fifth-most visited page (85 pageviews) was a page on how to reduce risk. Based on these results, the website is not effectively reaching the public, but is more likely acting solely as a resource in the event people need additional information.

The Facebook Insights data evaluated suggest similar outreach effectiveness as the FCEC website. Since August 2019, the Facebook fan page has seen a steady drop in the number of users who like the page, which is likely due to the lack of activity on the Facebook fan page, such as posts, comments, and or responses to posts and comments. When posts were published on the FCEC Facebook fan page, the data indicated that the posts did not effectively reach or engage the general Facebook population or users who liked the page. Overall, the Facebook fan page does not appear to be effectively reaching the public.

Enhancements to the FCEC website and Facebook fan page content were recommended during the last reporting period to improve effectiveness of electronic outreach. Enhancements to the FCEC website were completed in May 2020. A reorganization of the content and visual layout of the FCEC website was completed to improve the ability for people to navigate and find specific links or additional pages they would like to visit. FCEC partner organizations participated in the updates by providing feedback during the migration. Additionally, HTB began posting blogs and educational webinars on their website in May 2020 to increase public outreach. It is recommended to continue these activities and track the results during the next reporting period to evaluate its influence on electronic outreach.

Although, the results are similar to previous reporting periods, it is anticipated that the website improvements and resuming outreach activities will increase public engagement in the next reporting period.

5.4 COMMUNITY EVENT OUTREACH

The community outreach events have been effective at distributing information materials to the target communities. Although this method of outreach has been highly effective, several observations and potential improvements to the community events and information materials have been identified.

The children's fishing game is a popular tool for outreach to families. Children often lead their parents to the FCEC booth to engage when they see the game. Previously, there were two

fishing games that were shared amongst the partners (HDR, CHCC, BPSOS, City of Long Beach) for use at the events. This was challenging to event scheduling and increased shipping costs and general wear and tear of the game. During this reporting period, production and distribution of two new games was completed. As part of the FCEC booth, the display board features outreach to fish markets and anglers. It is recommended to update technical information during the next reporting period.

The majority of community outreach events are typically held during the spring and summer. However, due to COVID-19 restrictions in mid-March 2020, no events were attended during the timeframe. Once in-person community outreach is resumed, it is recommended that community outreach partners continue to collaborate with other organizations and increase participation in order to diversify the community events and reach more anglers in the Los Angeles area, including Spanish, Chinese, and Vietnamese communities. It is also recommended that partners encourage community event attendees to use the sign-in sheets to indicate whether they are aware of the DDT/PCB fish contamination advisories and what is the awareness source (signs, tip-card, community event, outreach team, internet, media, friend/family, other). In this reporting period, there was less participation in the sign-in sheets. Only one of the community events had a signature. Community outreach partners should continue to encourage sign-in at the events, particularly focusing on engaging the visitors and educating them on the reason for the data collection.

The distribution of outreach materials during community events continues to be successful in providing education to the community. Based on the percentage of the types of materials distributed, the tip cards and "What's the Catch" comic book are still the most popular during community outreach. It is recommended to include these as key materials evaluated during the next round of revision to the outreach materials and printing.

5.5 FCEC PARTNERS MEETINGS

A FCEC Partners Meeting was planned for April 2020 for stakeholders to discuss the angler, community, and enforcement outreach activities. However, due to the COVID-19 pandemic, the meeting was not held during the reporting period.

5.6 RESUMING OUTREACH ACTIVITIES

As mentioned previously, COVID-19 pandemic State restrictions on public gatherings were implemented during March 2020. During this time, only essential businesses (e.g., medical facilities, grocery stores, restaurant food take-out/delivery) were open to the public. Outdoor activities (e.g., visits to the piers) were only again permitted toward the end of this reporting period. There remains a need to continue outreach education to pier anglers and the local community. It is recommended that the partners continue outreach activities, to the extent practicable and safe, as restrictions are lifted. Some activities may still be performed without in-person contact such as electronic outreach (e.g., blogs, webinars, social media postings, and virtual meetings). Virtual meetings (e.g., FCEC partners meeting, fish identification training) may be performed to regroup and train partners so that they are ready to resume outreach.

Virtual outreach may also be performed to educate the local community and Los Angeles Unified School District about the FCEC program, fish contamination, and which fish are safe/not safe to eat. The monitoring and completing needed maintenance of the DNC fish signs (reported separately) at all piers for returning users and replenishing bait shop outreach materials may also be conducted. These activities may be performed to continue outreach and education activities during the COVID-19 pandemic and help to resume and accelerate activities once the State restrictions are lifted.

FIGURES

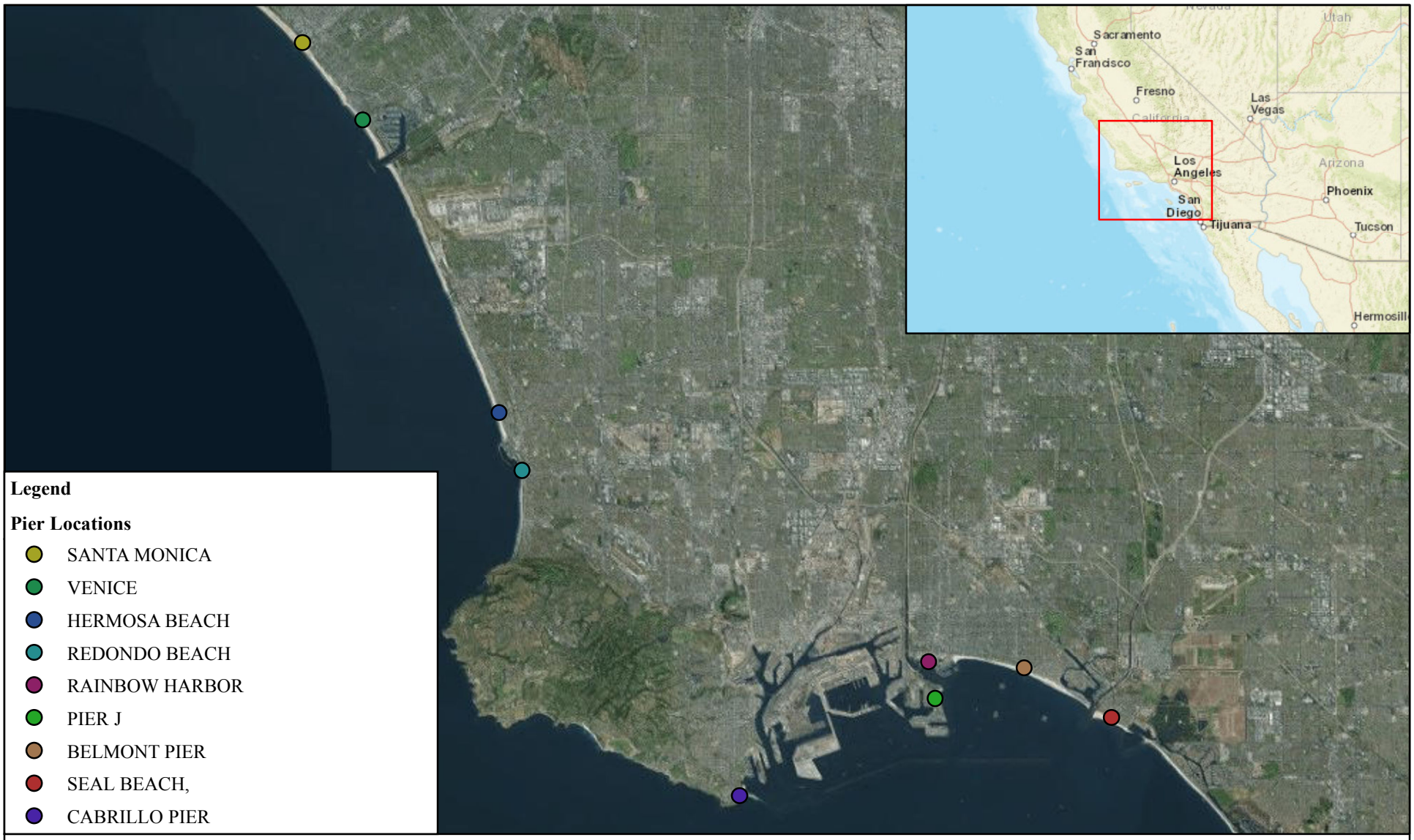

Figure 1. Pier Locations Map

Palos Verdes Shelf Superfund Site
Los Angeles County, Calaifornia

Legend

- Bait Shop Location
- Pier/Coastal Structure

December 2020

Data Sources: CSMW, 2007; esri, 2006, 2017; Los Angeles County, 2016; US Census Bureau, 2016

Miles: 0 2.5 5 10

Palos Verdes Shelf Superfund Site

Los Angeles County, California

Figure 2
Bait Shops and Piers

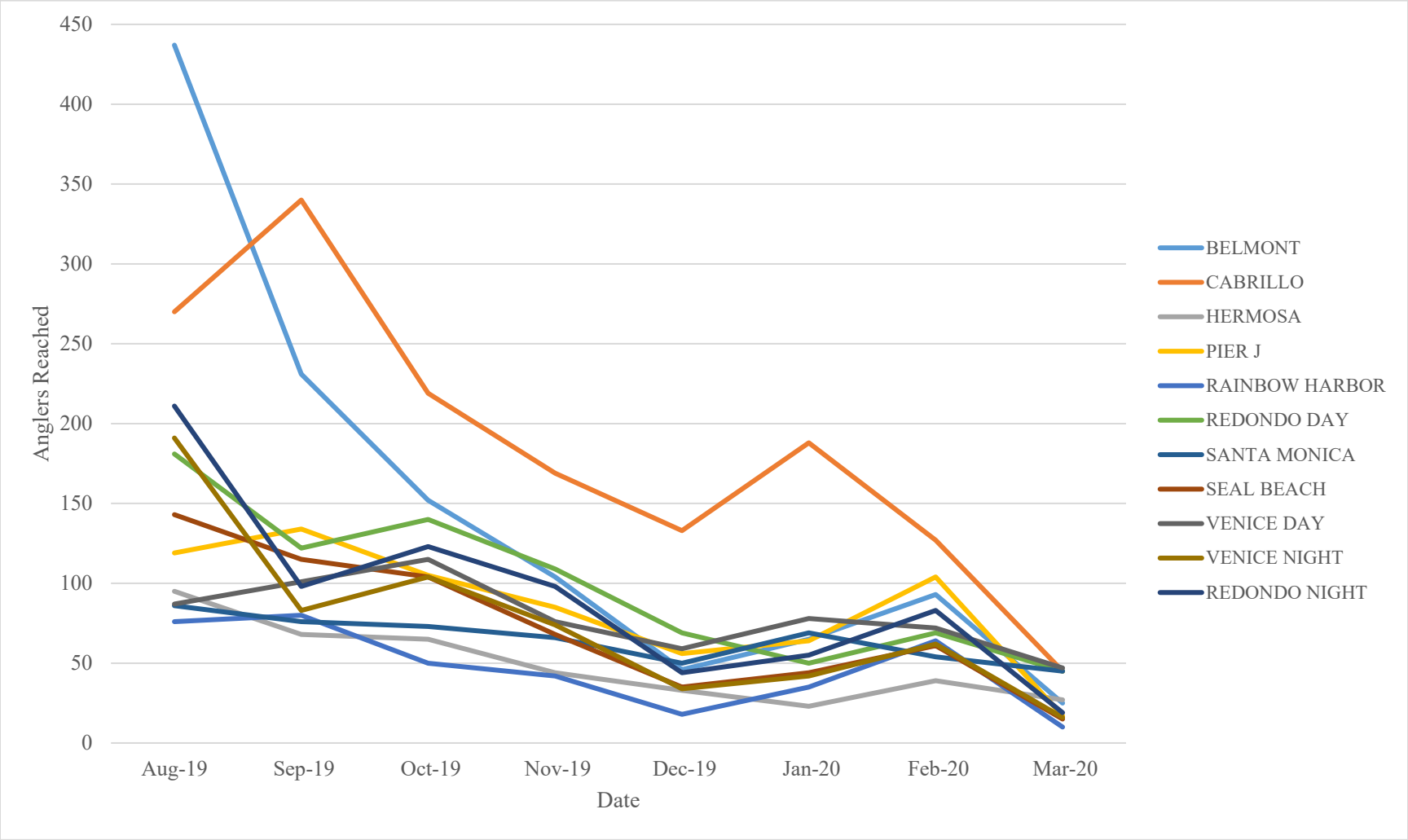

Figure 3. Seasonal Fluctuation in the Number of Anglers Contacted

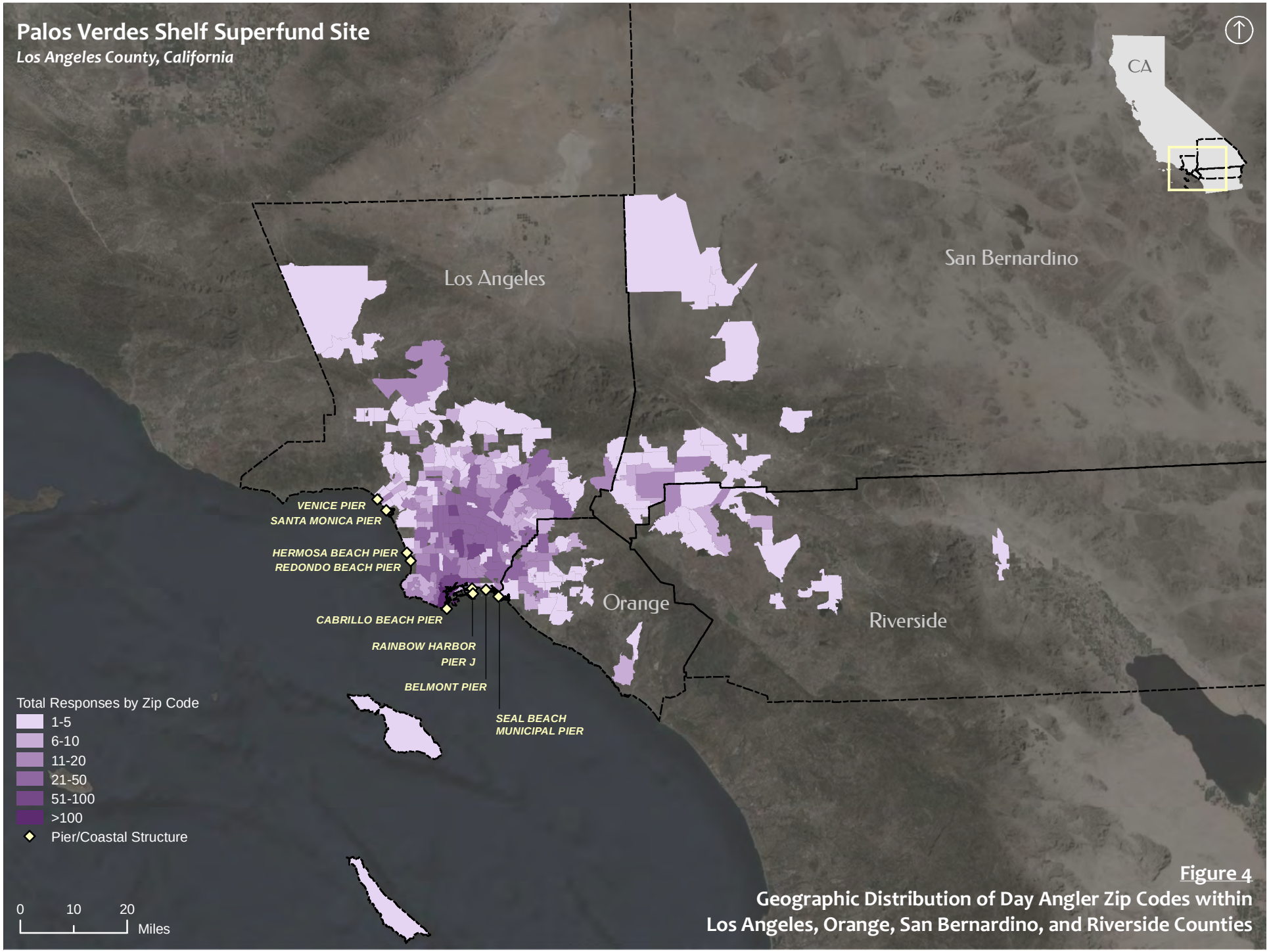

Figure 4
Geographic Distribution of Day Angler Zip Codes within Los Angeles, Orange, San Bernardino, and Riverside Counties

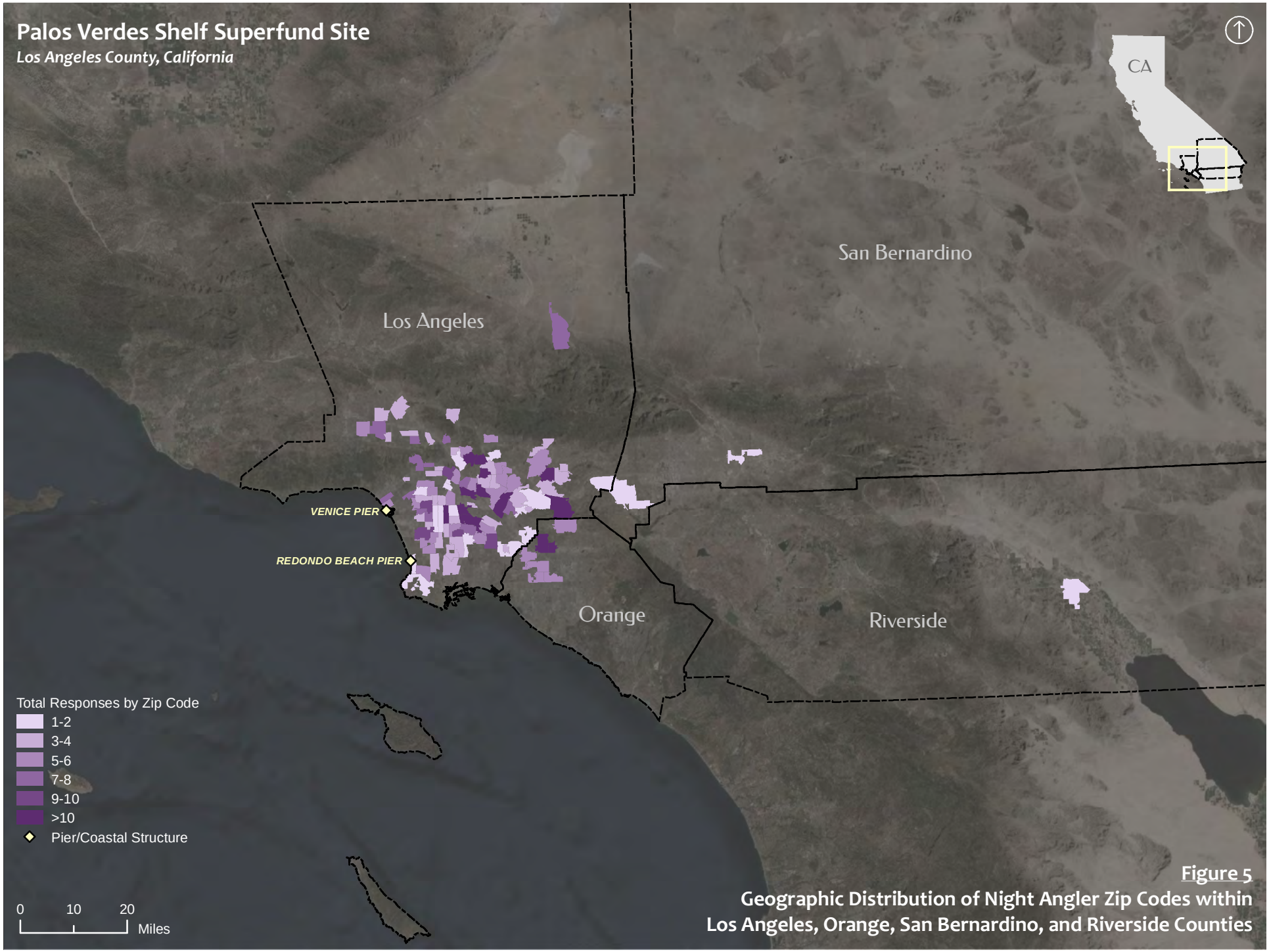

Figure 5
Geographic Distribution of Night Angler Zip Codes within Los Angeles, Orange, San Bernardino, and Riverside Counties

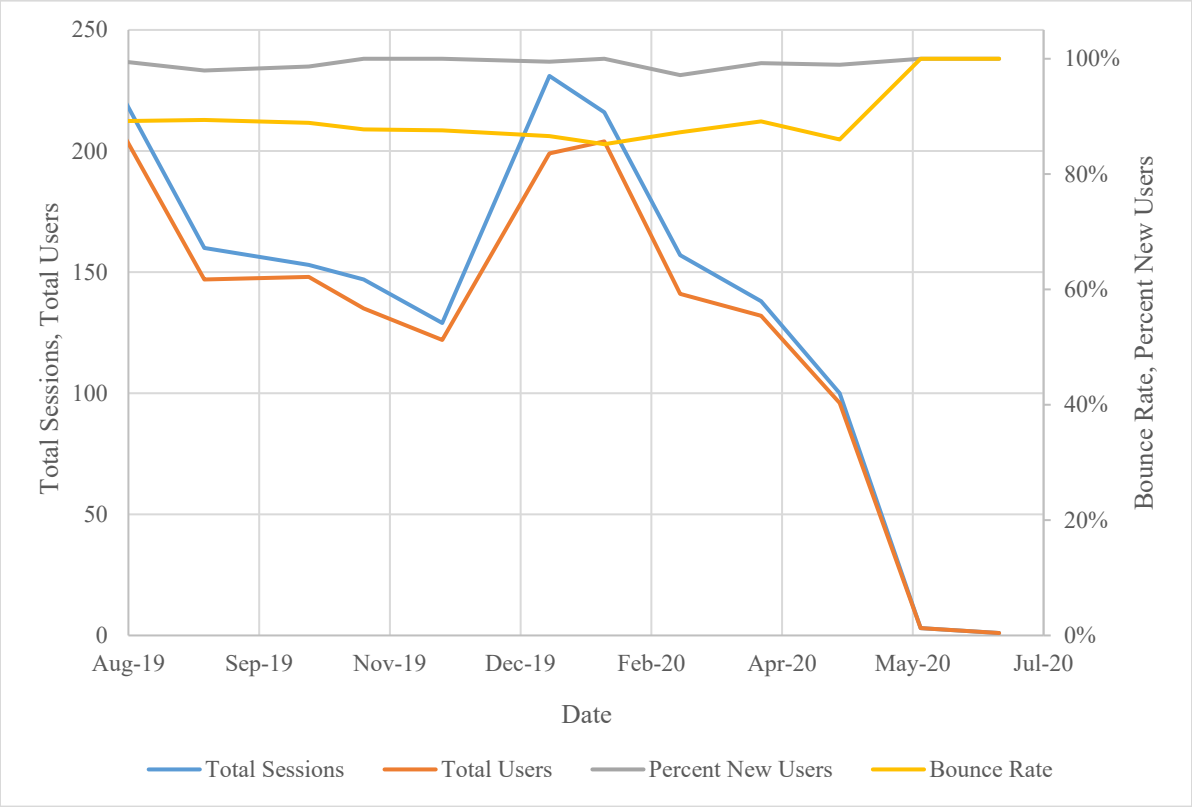

Figure 6. Total Sessions, Users, Page Views, Bounce Rate, and New Users

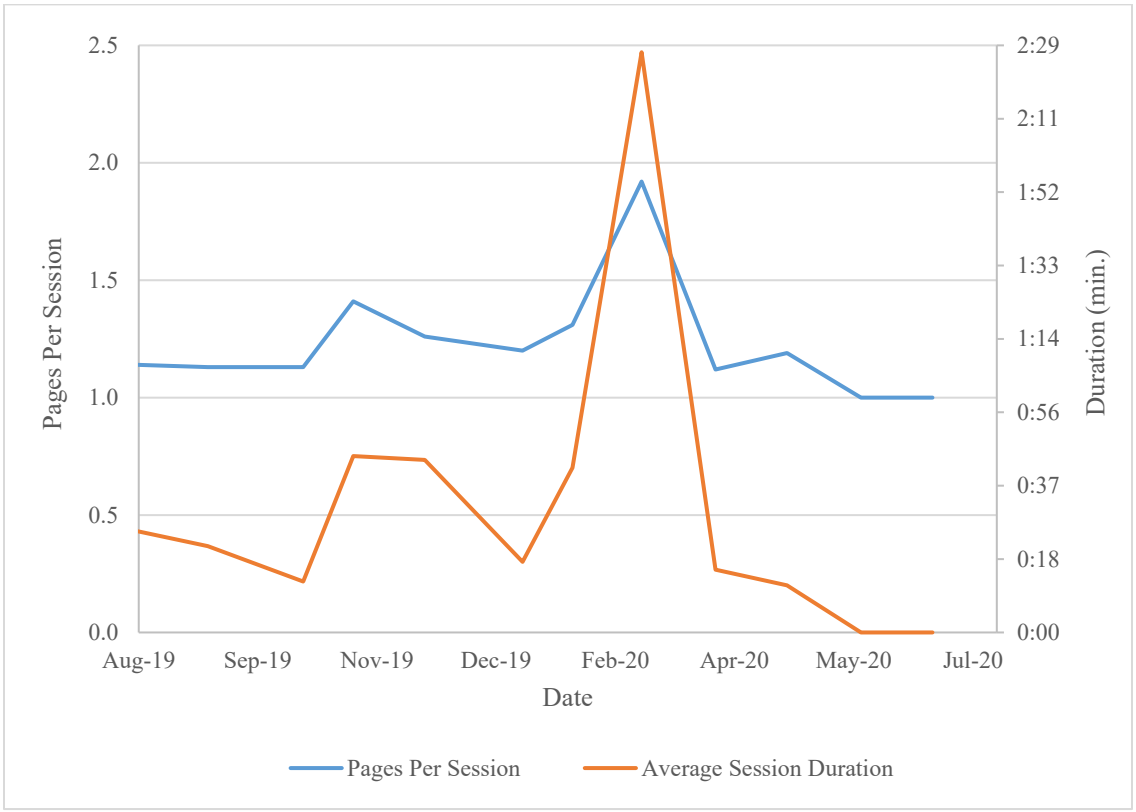

Figure 7. Pages per Session and Average Session Duration

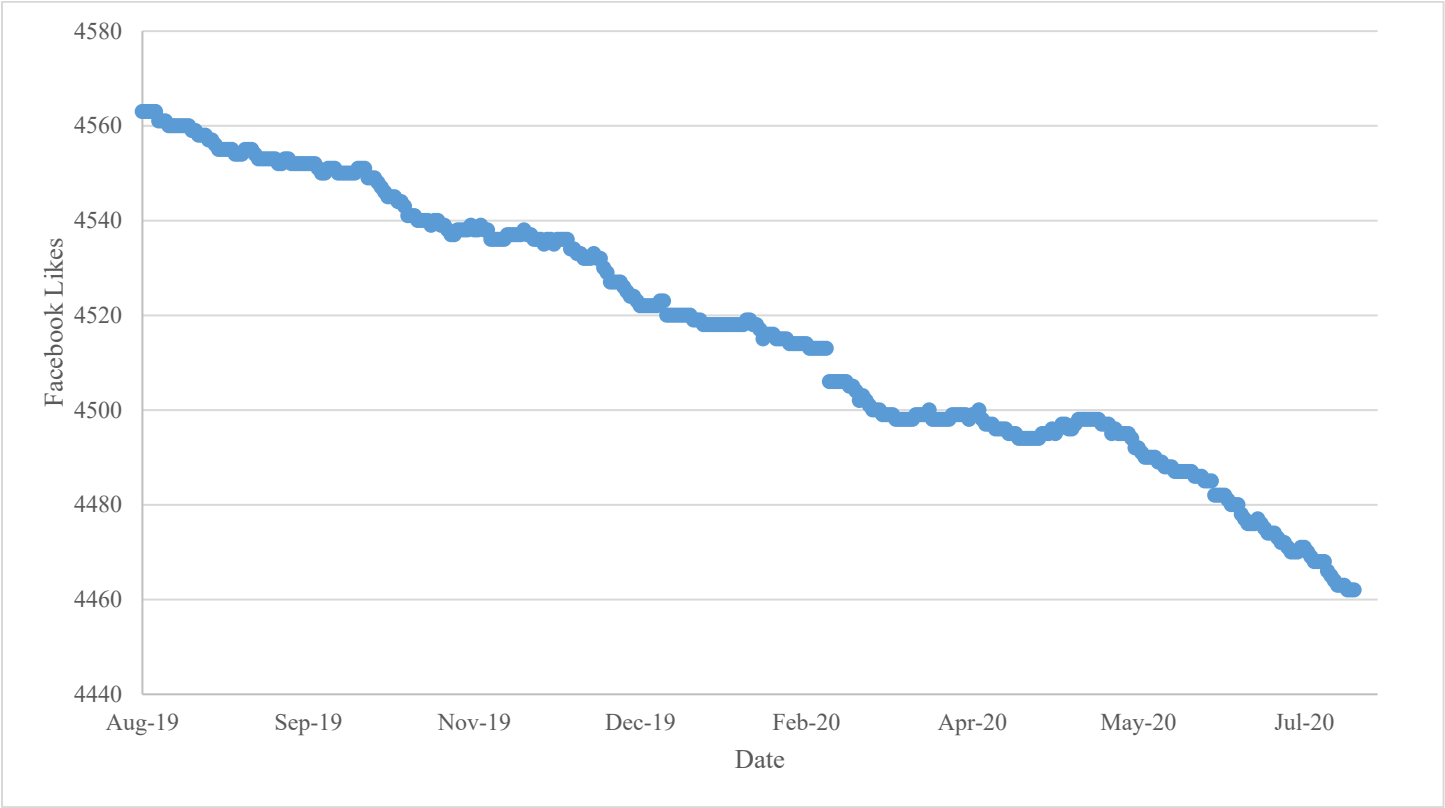

Figure 8. Number of "Likes" Received by the FCEC Facebook Fan Page

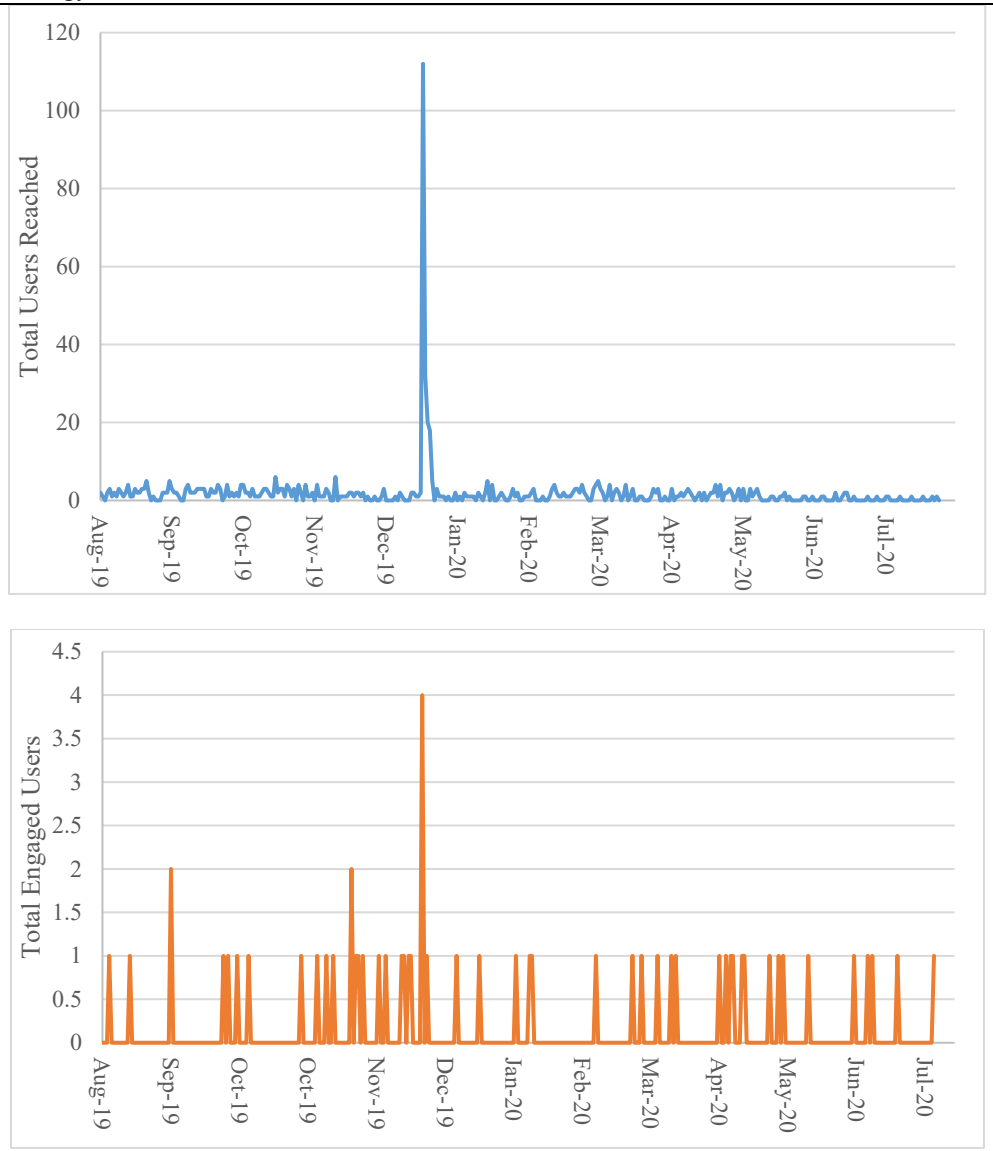

Figure 9. Total Number of Users Reached and Engaged by Posts to FCEC Facebook Fan Page

TABLES

Table 1. Anglers Contacted During Outreach Period

Date	BELMONT PIER	CABRILLO PIER	HERMOSA BEACH	PIER J	RAINBOW HARBOR	REDONDO BEACH	SANTA MONICA	SEAL BEACH	VENICE	Grand Total
Aug-2019	437	270	95	119	76	181	86	143	87	1,494
Sep-2019	231	340	68	134	80	122	76	115	101	1,267
Oct-2019	152	219	65	105	50	140	73	104	115	1,023
Nov-2019	104	169	44	85	42	109	66	68	76	763
Dec-2019	46	133	33	56	18	69	50	35	59	499
Jan-2020	65	188	23	64	35	50	69	44	78	616
Feb-2020	93	127	39	104	64	69	54	61	72	683
Mar-2020	25	45	27	17	10	45	45	15	47	276
Total (2019)	970	1,131	305	499	266	621	351	465	438	5,046
Total (2020)	183	360	89	185	109	164	168	120	197	1,575
Total (Outreach Period)	1,153	1,491	394	684	375	785	519	585	635	6,621

Table 2. Anglers Aware of Contamination and "Do Not Consume" Warnings

Date	BELMONT PIER	CABRILLO	HERMOSA	PIER J	RAINBOW HARBOR	REDONDO	SANTA MONICA	SEAL BEACH	VENICE	Average
Aug-2019	43%	64%	44%	41%	45%	50%	51%	45%	70%	50%
Sep-2019	53%	66%	62%	49%	55%	51%	61%	48%	57%	57%
Oct-2019	51%	55%	49%	41%	50%	54%	59%	39%	52%	51%
Nov-2019	54%	70%	57%	49%	52%	55%	65%	43%	66%	58%
Dec-2019	50%	69%	76%	66%	94%	61%	54%	31%	64%	63%
Jan-2020	45%	60%	74%	52%	71%	50%	54%	59%	50%	56%
Feb-2020	47%	67%	49%	48%	50%	51%	69%	41%	69%	55%
Mar-2020	32%	87%	56%	59%	100%	64%	42%	33%	57%	59%
Average	**48%**	**65%**	**55%**	**48%**	**56%**	**53%**	**57%**	**44%**	**60%**	**55%**

Table 3. Repeat Respondents to Angler Outreach

Date	BELMONT PIER	CABRILLO	HERMOSA	PIER J	RAINBOW HARBOR	REDONDO	SANTA MONICA	SEAL BEACH	VENICE	Average
Aug-2019	38%	48%	41%	41%	37%	43%	43%	29%	70%	42%
Sep-2019	44%	57%	49%	49%	48%	43%	59%	47%	53%	50%
Oct-2019	43%	43%	43%	42%	50%	46%	59%	32%	51%	45%
Nov-2019	40%	50%	48%	47%	48%	50%	65%	43%	66%	50%
Dec-2019	41%	59%	70%	63%	61%	61%	54%	29%	64%	57%
Jan-2020	42%	45%	74%	52%	63%	50%	48%	55%	50%	49%
Feb-2020	38%	46%	41%	48%	48%	51%	59%	36%	63%	47%
Mar-2020	32%	71%	44%	59%	60%	49%	42%	20%	49%	49%
Average	**40%**	**51%**	**48%**	**48%**	**48%**	**47%**	**54%**	**37%**	**58%**	**48%**

Table 4. New Respondents to Angler Outreach

Date	BELMONT PIER	CABRILLO	HERMOSA	PIER J	RAINBOW HARBOR	REDONDO	SANTA MONICA	SEAL BEACH	VENICE	Average
Aug-2019	62%	52%	59%	59%	63%	57%	57%	71%	30%	58%
Sep-2019	56%	43%	51%	51%	53%	42%	41%	53%	47%	50%
Oct-2019	57%	57%	57%	58%	50%	15%	41%	68%	49%	55%
Nov-2019	60%	50%	52%	53%	52%	50%	35%	57%	34%	50%
Dec-2019	59%	41%	30%	38%	39%	39%	46%	71%	36%	43%
Jan-2020	58%	55%	26%	48%	37%	50%	52%	45%	50%	51%
Feb-2020	62%	54%	59%	52%	52%	49%	41%	64%	38%	53%
Mar-2020	68%	29%	56%	41%	40%	51%	58%	80%	51%	51%
Average	**60%**	**49%**	**52%**	**52%**	**52%**	**53%**	**46%**	**63%**	**42%**	**52%**

Table 5. Source of Angler Awareness

	AWARENESS SOURCE								
	PIER SIGNAGE	**TIP CARD**	**PIER OUTREACH TEAM**	**INTERNET**	**EVENTS**	**MEDIA**	**FRIENDS/ FAMILY**	**OTHER**	**TOTAL**
Belmont	68	0	455	25	3	5	18	11	585
Cabrillo	234	15	748	18	0	1	42	12	1070
Hermosa	30	21	167	10	0	0	2	2	232
Pier J	4	0	326	1	0	0	3	4	338
Rainbow Harbor	35	0	181	3	0	2	3	0	224
Redondo	37	2	363	12	1	4	8	2	429
Santa Monica	19	0	275	11	0	0	0	2	307
Seal Beach	32	0	215	7	2	4	12	11	283
Venice	11	0	368	5	2	0	3	0	389
Total	470	38	3098	92	8	16	91	44	3857
Percent (total Sources)	**12.2%**	**1.0%**	**80.3%**	**2.4%**	**0.2%**	**0.4%**	**2.4%**	**1.1%**	--

Table 6. Languages Spoken by Anglers from Los Angeles, Orange, San Bernardino, and Riverside Counties

Language Spoken	Los Angeles	Orange	Riverside	San Bernardino	Total Non-English
English	95.9%	95.2%	90.0%	94.4%	NA
Spanish	3.1%	4.1%	10.0%	0.0%	3.3%
Chinese	1.0%	0.7%	0.0%	5.6%	1.1%

Table 7. Night Anglers Contacted

Date	REDONDO	VENICE	Total
Aug-19	211	191	402
Sep-19	98	83	181
Oct-19	123	104	227
Nov-19	98	74	172
Dec-19	44	34	78
Jan-20	55	42	97
Feb-20	83	62	145
Mar-20	19	16	35
Total (Night Outreach)	**731**	**606**	**1337**

Table 8. Night Anglers Aware of Contamination and "Do Not Consume" Warnings

Date	REDONDO	VENICE	Average
Aug-19	50%	46%	48%
Sep-19	43%	67%	54%
Oct-19	41%	54%	47%
Nov-19	39%	57%	47%
Dec-19	55%	44%	50%
Jan-20	55%	52%	54%
Feb-20	37%	48%	42%
Mar-20	21%	50%	34%
Average	**47%**	**51%**	**49%**

Table 9. Repeat Respondents to Night Angler Outreach

Date	Redondo	Venice	Average
Aug-19	36%	40%	38%
Sep-19	37%	49%	43%
Oct-19	30%	41%	35%
Nov-19	39%	47%	33%
Dec-19	55%	44%	50%
Jan-20	53%	48%	51%
Feb-20	37%	45%	41%
Mar-20	21%	50%	34%
Average	**38%**	**44%**	**41%**

Table 10. New Respondents to Night Angler Pilot Outreach

Date	Redondo	Venice	Average
Aug-19	64%	60%	62%
Sep-19	63%	51%	57%
Oct-19	70%	59%	65%
Nov-19	61%	53%	67%
Dec-19	45%	56%	50%
Jan-20	47%	52%	49%
Feb-20	63%	55%	59%
Mar-20	79%	50%	66%
Average	**62%**	**56%**	**59%**

Table 11. Source of Night Angler Awareness

	AWARENESS SOURCE								
	PIER SIGNAGE	**TIP CARD**	**PIER OUTREACH TEAM**	**INTERNET**	**EVENTS**	**MEDIA**	**FRIENDS/ FAMILY**	**OTHER**	**TOTAL**
Venice	44	0	265	20	4	3	9	1	346
Redondo	38	0	283	12	4	3	14	4	358
Total	82	0	548	32	8	6	23	5	704
Percent (total Sources)	**11.6%**	**0.0%**	**77.8%**	**4.5%**	**1.1%**	**0.9%**	**3.3%**	**0.7%**	--

Table 12. Languages Spoken by Night Anglers from Los Angeles, Orange, San Bernardino, and Riverside Counties

Language Spoken	Los Angeles	Orange	Riverside	San Bernardino	Total Non-English
English	91.5%	100%	100%	100%	NA
Spanish	0.6%	0%	0%	0%	0.5%
Chinese	7.8%	0%	0%	0%	6.5%

Table 13. Summary of Google Analytics Data

Date	Total Sessions	% Change from Previous Month	Users	Page Views	Pages/ Session	Avg. Session Duration (min.)	Bounce Rate	New Users	Returning Users
Aug-2019	222		207	253	1.14	0:26	89.19%	99.5%	0.5%
Sep-2019	160	-28%	147	181	1.13	0:22	89.38%	98.0%	2.0%
Oct-2019	153	-4%	148	173	1.13	0:13	88.89%	98.6%	1.4%
Nov-2019	147	-4%	135	207	1.41	0:45	87.76%	100.0%	0.0%
Dec-2019	129	-12%	122	162	1.26	0:44	87.60%	100.0%	0.0%
Jan-2020	231	79%	199	277	1.20	0:18	86.58%	99.5%	0.5%
Feb-2020	216	-6%	204	284	1.31	0:42	85.19%	100.0%	0.0%
Mar-2020	157	-27%	141	302	1.92	2:28	87.26%	97.2%	2.8%
Apr-2020	138	-12%	132	155	1.12	0:16	89.13%	99.2%	0.8%
May-2020	100	-28%	96	119	1.19	0:12	86.00%	99.0%	1.0%
Jun-2020	3	-97%	3	3	1	0:00	100.00%	100.0%	0.0%
Jul-2020	1	-67%	1	1	1	0:00	100.00%	100.0%	0.0%

Table 14. Summary of Heal the Bay Website Analytics Data

Blogs				
Title	**Date**	**Page Views**	**Unique Page Views**	**Average Time on Page**
Angler Outreach Program	5/29/20	82	67	3:01
17 Años de Éxito del Programa Educacional Pesquero	5/29/20	19	18	2:43
Healthy & Sustainable Seafood	6/25/20	94	84	2:47
Pescado Saludable	6/25/20	48	46	1:05
Webinars				
Title	**Date**	**Attendees**	**Recorded Views**	**Average Attentiveness**
Gotitas Del Saber- Pescado Contiminados	5/27/20	3	4	81%
Heal the Bay Gotitas del Saber: Sitio Superfund	6/17/20	3	0	96%
Heal the Bay Gotitas del Saber: Tiburones y Mantarrayas	7/29/20	3	0	83%