

Regional Monitoring Program for Water Quality in San Francisco Bay



Sportfish Collection Report 2024



**Prepared for the
San Francisco Estuary Institute**

by

ICF

Table of Contents

Introduction.....	1
Methods	1
Collection Gear Types	1
Otter Trawl.....	1
Hook and Line.....	1
Poke Poling.....	1
Minnow Traps	2
Cast Nets	2
Sample Handling, Processing, and Delivery to SFEI.....	2
Data Collection and Management.....	2
Results	2
Notes and Observations.....	22
Tables	23
Figures	26

Introduction

This report provides information about sportfish monitoring collections conducted by ICF during 2024 for the San Francisco Estuary Institute (SFEI) as part of the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP). The RMP monitors spatial patterns and long-term patterns in contaminants in San Francisco Bay by sampling water, sediment, bird eggs, and fish. The 2024 effort was the ninth field collection of sportfish for the RMP. Previous collections occurred in 1994, 1997, 2000, 2003, 2006, 2009, 2014, and 2019. SFEI contracted ICF to collect individuals of 27 species at 11 sites for later contaminants testing. On 59 field days between 7/23/24 and 10/23/24, ICF collected a total of 987 fish from 14 species.

Methods

ICF was instructed by SFEI to collect up to 27 species of sportfish in 11 sites around the San Francisco Bay area (Table 1). Each site had a unique list of fish to collect, and each species had a unique size range and target geographic zone within each site. These target zones were uploaded digitally to a GPS unit to guide the location of the crew's effort and assist in data collection.

Collection Gear Types

ICF used a combination of five fishing gear types to catch target fish species: otter trawl, hook and line, poke poling, minnow traps, and cast nets.

Otter Trawl

The otter trawl targeted species at the bottom of the water column. Trawls lasted 5 to 10 minutes (min). The trawl net was held open by otter doors and had a trapezoidal mouth with a 6-meter (m) lead line, 4.5-m headrope, and 1.5-m tall wingwalls. The mesh near the front of the net had a 50-millimeter (mm) nominal opening, decreasing to 7-mm mesh forward of the codend. At times, mostly when targeting Shiner Surfperch and Jacksmelt, the water to be sampled was chummed before sampling with small pieces of anchovies and various other bait to attract these species. Upon completion of each tow, all fish were removed from the codend and identified. Trawl crews consisted of three personnel – one vessel operator and two deckhands.

Hook and Line

Two to three anglers fished for target species both from shore and vessel during daylight hours. Tackle was limited to spin rods and reels with live bait or artificial lures equipped with barbless hooks. Fish were landed with mesh landing nets.

Poke Poling

Two anglers targeted monkeyface prickleback along rock jetties and tide pools. Tackle consisted of a 7.5- to 10.5-foot (ft) rod made of bamboo or aluminum, tipped with heavy galvanized wire. Heavy snaps were used to attach 2/0 sized hooks to the galvanized wire, and hooks were baited with squid or shrimp. Sampling occurred during minus to low tides during daylight hours. Fish were landed with buckets.

Minnow Traps

Minnow traps were used to catch smaller fish species such as Shiner Surfperch and Pacific Staghorn Sculpin. Traps consisted of standard minnow traps with a conical shape and two cones to allow fish to enter the traps while making it difficult for them to escape. Traps were made of wire mesh with 0.25 inch (in) mesh size. Traps were typically unbaited with a light placed inside to help attract fish into the trap. Traps were tied to structures in the water or on the bank, or otherwise anchored to the bottom and marked with a buoy. Traps were set for up to 24 hours.

Cast Nets

Cast nets were used to target Jacksmelt, Shiner Surfperch and White Surfperch. The net was a circular net with a radius of 2 m and 3/8 in mesh size. The net was cast from shore or small vessels. This method was less effective at catching fish and was rarely used. A single Shiner Surfperch was captured using cast nets.

Sample Handling, Processing, and Delivery to SFEI

For all fishing gears, target species were measured, weighed, and descriptive data were recorded on condition of the fish. All bycatch were identified and recorded (per permit conditions), and then returned to the water after they had recovered.

Target fish were processed according to the methods described in the 2024 RMP Sport Fish Monitoring Sampling and Analysis Plan. Each fish was kept as whole fish, tagged with a unique ID, wrapped in regular aluminum foil, placed with the tag in a clean labeled Ziploc bag, and kept on ice until transferred to a -20°C freezer at the end of each field day. All fish were inventoried and cross-checked against the database for quality assurance and quality control (QA/QC). Fish were kept frozen at -20°C under ICF custody until transferred to SFEI after the end of the study.

Data Collection and Management

All field data were collected on a digital tablet using iForm software. All fish catches were georeferenced using a GPS unit mounted on the boat or using the tablet, with a target accuracy of 5-10 m. The start and stop times and locations were recorded for each method throughout the day. In addition, the time and location was recorded for each fish capture with one exception. For otter trawls, the start location was used as the location for where a fish was caught because actual fish capture location could have been anywhere along the path of the trawl.

Data were uploaded directly to the cloud at the end of each field day, minimizing the potential for data loss. Data were subsequently downloaded from the cloud into a database and then QA/QC'ed for accuracy. The database was formatted to be consistent with CEDEN and delivered to SFEI after fish delivery.

Results

Total catch for each species and location is provided in Table 2. On 59 field days between 7/23/24 and 10/23/24, ICF staff collected 987 fish from 14 species. Fish were collected on 54 of 59 field days¹. A total

¹ Days on which two field crews sampled in different locations were counted as two field days in this total

of 537 trawls, hook and line sessions, cast nets, or minnow trap sets were conducted or set during the season, of which 262 yielded target-sized fish. Figures 1 through 9 provide the locations of all sampling effort by gear type. Figures 10 through 15 show all catch by species at all locations.

This section provides daily synopses of sampling efforts, catch, and other pertinent information throughout the entire collection season.

7/23/24

Crew: Max Chesser, Mike Tillotson, Julien Scribner

After receiving the signed MOU from CDFW, we were finally able to put the boat in the water at the Richmond Marina. After setting up all of our gear and finalizing our guest slip, we left the Richmond Marina around 0930. We planned for a late start in hopes of catching the afternoon high tide at 1530. We headed to the inner harbor where we deployed minnow traps. This proved to be challenging with heavy industrial, commercial, and private boating activity in the area. We left the inner harbor and conducted several otter trawls near the harbor entrance to target Northern Anchovy and White Croaker. After catching anchovies, we headed to San Pablo Bay and deployed minnow traps to target Shiner Surfperch and Pacific Staghorn Sculpin. While processing anchovies, we conducted hook and line sampling and caught one Striped Bass. We did more hook and line sampling by drifting and trawling with no success. We tried to stay out as late as possible to target the high slack tide, but windy conditions made fishing challenging, so we headed back to the Richmond marina ending the day at 1700.

7/24/24

Crew: Max Chesser, Mike Tillotson, Julia Taylor

We left the Richmond Marina at 0720 and headed to the inner harbor to check minnow traps deployed the previous day. The traps only caught a few undersized Shiner Surfperch. We then conducted several trawls near the harbor entrance targeting Northern Anchovy and White Croaker. We caught anchovies, juvenile Pacific Herring, and juvenile White Croaker. We then headed to San Pablo Bay to check our traps, but they did not catch any target species. We conducted hook and line sampling and caught one Striped Bass. We conducted several trawls targeting California Halibut but only caught anchovies and juvenile White Croaker. We ended the day with hook and line sampling targeting structure around the Bay Bridge. We caught three undersized Striped Bass, then headed back to the Richmond Marina ending the day at 1500.

7/25/24

Crew: Max Chesser, Mike Tillotson, Julien Scribner

We left Richmond Marina at 0720 and headed to the inner harbor to check our traps, ending up with one undersized Shiner Surfperch and crabs. We went to San Pablo Bay to trawl. Our first trawl was in the southeast section of the region targeting a shallow flat and human-made structure. We caught 10 Bat Rays of a range of sizes, and many undersized flat fish including California Halibut and Starry Flounder. We anchored and conducted hook and line sampling while we processed the 5 Bat Rays in the target size range. After processing, we conducted more hook and line sampling near piers and pilings and while drifting towards the Marin Islands, but no target fish were caught. We reached the Marin Islands at 1014 and checked several traps that did not contain any target species. We then searched for new areas for trap deployment looking by the San Rafael Harbor and creek inlets but could not find suitable locations

that could be accessed without an extreme high tide. Instead, we deployed traps in open water near the Marin Islands. We also conducted a number of trawls and conducted hook and line sampling near the Marin Islands but did not catch any target species. We ended the day with more hook and line sampling by drifting live bait and casting at structures near the Bay Bridge with no success. We headed back to the Richmond Marina and ended the day at 1530.

7/26/24

Crew: Max Chesser, Mike Tillotson, Cole Anderson

We left Richmond Harbor at 0730 to recover minnow traps deployed near the Marin Islands. Our traps did not capture any Shiner Surfperch or Pacific Staghorn Sculpin. We then conducted three trawls, catching one California Halibut within the target size, two Pacific Staghorn Sculpin, two Diamond Turbot, and several other species. We anchored and conducted hook and line sampling while processing fish in between trawls. We caught Longin Smelt in our first and third trawls, with roughly 20 in the last trawl. As a result, we needed to change tactics. We attempted cast netting targeting rock structure and eel grass near the Marin Islands with no success. We left the Marin Islands and tried cast netting near piers and pilings in the southeast section of the region, but we again had no success. We switched to hook and line sampling near the Richmond Bridge for Striped Bass and Jacksmelt but also had no success. Again, muddy conditions this week made hook and line sampling difficult.

We left San Pablo Bay and headed to the inner Richmond Harbor to do more trawling and check the traps. We reached the inner harbor at 1200 and checked one minnow trap that had no target fish. We conducted two otter trawls, targeting the bottom on the edge of the channel. We caught over 50 Shiner Surfperch, as well as many undersized Shiner Surfperch, Silver Surfperch, Pacific Staghorn Sculpin, and Northern Anchovies. We then retrieved the remaining traps and headed back to the Richmond Marina, arriving at 1500. We processed Whiner Surfperch at Richmond Marina, cleaned the boat and gear, and ended the day at 1700.

7/29/24

Crew: Max Chesser, Rob Miller, Cole Anderson

With favorable tides this week, we planned to put in a strong effort targeting California Halibut with hook and line sampling since we had limited success catching them in the trawl the prior week. We left Richmond Marina at 0720 and headed to Richmond inner harbor to conduct a trawl targeting Shiner Surfperch and Pacific Staghorn Sculpin. The trawl was unsuccessful at catching any fish, having likely never reached the bottom in deep water. We decided to head to San Pablo Bay to catch the early morning high tide. We conducted a trawl on the channel edge that caught no target fish. We spent the rest of the day hook and line drift sampling for California Halibut. In four drifts, we caught one Bat Ray, so we spent some time redeploying traps and scouting new areas. We headed back to Richmond Marina and ended the day at 1500.

7/30/24

Crew: Max Chesser, Rob Miller, Lulu Soto

We left Richmond Marina at 0730 and started the day by trawling the Richmond inner harbor and collecting the remaining Shiner Surfperch needed for the inner harbor. We then headed to San Pablo Bay and began hook and line sampling for California Halibut while processing Shiner Surfperch. We targeted new areas, but muddy conditions again made hook and line sampling difficult. We stopped

California Halibut fishing around 1120 and checked the minnow trap, which had no target species. We spent the rest of the day scouting new areas and hook and line fishing for Striped Bass but did not retain any fish for the project. We ended the day back at the marina at 1430.

7/31/24

Crew: Max Chesser, Julia Taylor, Cole Anderson

After having poor results from hook and line fishing previously in the week we planned to mostly trawl today in San Pablo Bay. We rigged our otter trawl net in an attempt to avoid catching Longfin Smelt by keeping the cod end slightly open. We trawled the edge of the channel and shallow flats near the Marin Islands targeting California Halibut, Pacific Staghorn Sculpin, and Shiner Surfperch. We had consistent catches of Bat Rays, Starry Flounder, and juvenile California Halibut, and we retained one Diamond Turbot and a few Pacific Staghorn Sculpin. We hook and line fished while processing fish and caught a Brown Smooth-Hound Shark that was released. We also fished the rocks around the Marin Islands for Pacific Staghorn Sculpin and Shiner Surfperch but had no success. We retrieved and redeployed minnow traps, cast netted, and hook and line fished targeting Jacksmelt and Striped Bass but with no success. We also hook and line fished by drifting targeting California Halibut and Striped Bass in the afternoon with no success. We returned to the Richmond Marina and ended the day at 1445.

8/1/24

Crew: Max Chesser, Julien Scribner, Cole Anderson

We planned to spend most of the day trawling in San Pablo Bay targeting California Halibut, Shiner Surfperch and Pacific Staghorn Sculpin. We modified our otter trawl net in an attempt to avoid catching Longfin Smelt by having only large mesh in the cod-end. We started out the day by snagging the net in soft mud but were able to recover it without damage after substantial effort. We continued to trawl over a large area from around the Marin Islands to the southeast section of the region. We conducted several trawls that consistently caught fish including Bat Rays, Starry Flounder, and juvenile California Halibut. We also caught a few Pacific Staghorn Sculpin. On our last trawl near the Marin islands, we caught 6 Striped Bass, five of which were retained. We also retrieved minnow traps, but again only caught a few gobies and no target species.

We relocated to the Richmond inner harbor and began conducting trawls at 1241 to target Pacific Staghorn Sculpin. On our first trawl in the inner harbor, we snagged the net in 45 ft of water. Retrieving the net took some effort but we managed to recover all the gear. The net was damaged in the process and in need of mending, so we decided to call the day early and repair the net, pull the boat out of the water, and clean the boat and the rest of our gear. With the number of Longfin Smelt we encountered in the past two weeks, we decided that we would move the boat to Central Bay. We spent the end of the day preparing to move the boat to begin sampling San Leandro Bay and Oakland inner harbor the following week.

8/5/24

Crew: Max Chesser, Tim Carrara, Cole Anderson

We launched the boat in Alameda and made our way to San Leandro Bay. We conducted four trawls in San Leandro Bay and caught Northern Anchovy, juvenile California Halibut, Bay Pipefish, Bat Rays, and Pacific Sardine. We also caught many of Shiner Surfperch, but most were below the target size range. We retained 16 Shiner Surfperch for the project. We then moved to the Central Bay and conducted one

trawl in open water to catch White Croaker and possibly sardines and anchovies. The trawl caught only anchovies. We set up a drift and sampled by hook and line for Striped Bass during the peak tidal movement but had no success. We headed back into the Oakland inner harbor and ended the day at 1400. We chose to slip the boat in Alameda due to its central location, but because most of the inner harbor is a no wake zone, we spent excessive time moving from site to site. We will plan to avoid the inner harbor as much as possible to save time moving forward.

8/6/24

Crew: Max Chesser, Lulu Soto, Cole Anderson

We left Grand Marina in the Oakland inner harbor around 0720 and headed towards Central Bay. We conducted trolling for Jacksmelt in the Oakland region while passing through the inner harbor but had no success. We reached the harbor entrance and began trawling the shallow flats in the Berkeley/Central region near the Bay Bridge targeting California Halibut and Bat Rays. In four trawls, we caught substantial amounts of vegetation, Shiner Surfperch, Northern Anchovy, and juvenile flatfish but no target species for this location. We then changed strategies and conducted trawls in the San Francisco region near McCovey Cove. We consistently caught crabs, juvenile California Halibut, various flat fish, Pacific Staghorn Sculpin, and Shiner Surfperch. We trawled over the same area and retained multiple Shiner Surfperch on each trawl. Our final trawl had a similar route but ventured slightly closer to a human-made point where we encountered a snag. The net was freed easily, but we discovered metal debris in the net and severe damage was sustained. We anchored in McCovey Cove and fished with live bait while we processed Shiner Surfperch but had no success. We trolled for Jacksmelt in Oakland again on our way back to the Marina but had no success and ended the day around 1530.

8/7/24

Crew: Max Chesser, Rob Miller, Julien Scribner

We set up our backup net and headed through the Oakland inner harbor towards Central Bay and on to SF. We continued to trawl McCovey Cove retaining Shiner Surfperch on every trawl. When the Shiner Surfperch catch rate began to decline, we moved on to the two Hunters Point locations. We installed minnow traps and conducted trawling. Hunters Point B had many obstructions, and its very small area did not lend itself well to trawling. Hunters Point A had little to no underwater structure to target but few obstructions. However, each trawl at Hunters Point A plugged the net with algae almost immediately upon deployment and no fish of any species were caught. In addition, much time was spent cleaning and flushing algae from the net. With no success in our first attempt at Hunters Point, we headed back towards the Bay to fish a rocky area of Treasure Island targeting Striped Bass using hook and line. We encountered a substantial school of decent sized Striped Bass and retained two target-sized individuals. We stopped for the day at around 1530.

8/8/24

Crew: Rob Miller, Julien Scribner, Lulu Soto

We left Oakland Inner Harbor before 0800 and headed for Hunters Point B to collect minnow traps. There were no fish in the traps, only small crabs and shrimp. Traps were rebaited and reset. After setting the traps, we spoke with anglers at the nearby Sunrise Point Fishing Pier to inquire about what is regularly caught there. Although outside the target area for Shiner Surfperch, multiple anglers said that they catch them among the pier's pilings using shrimp-tipped sabiki rigs. Additionally, one legal-sized California Halibut was caught during the previous week near the pier.

We relocated to McCovey Cove at around 1000 to trawl the shallower areas (2 to 4 m) in S- and C-shaped tows so that prop wash would not scatter fish. We caught five Shiner Surfperch. We moved out to deeper water (6 to 11 m) to trawl the ledge of McCovey Cove and captured a California Halibut within the target size range. We tried a few more trawls along the ledge but caught only undersized California Halibut. We also caught two Shiner Surfperch. On the way back to Grand Marina, we stopped at the southwest side of Yerba Buena Island to target Striped Bass with hook and line. Swimbaits and jerkbaits were cast, while also drifting live anchovies. Some Striped Bass followed artificial lures to the boat, but none were caught. Live anchovy yielded one Striped Bass within the target range. We returned to Oakland at around 1530.

8/9/24

Crew: Max Chesser, Rob Miller, Cole Anderson

We left the marina just before 0800 and conducted one trawl in front of the marina, catching two Shiner Surfperch. We moved to Hunters Point to check the minnow traps, but they had no fish. We then trawled at McCovey Cove and just outside South Beach Harbor and caught a total of three Shiner Surfperch and three White Croaker in the first two trawls. After a third trawl was unsuccessful, we switched to hook and line in the same area for about an hour but had no bites. At around noon, we moved to Central Bay in between Yerba Buena Island and Treasure Island. We conducted one trawl but caught only undersized California Halibut and Jacksmelt, non-target fish, and invertebrates. We switched to hook and line sampling on the southwest side of Yerba Buena Island and caught four target-sized Jacksmelt. We headed back to the marina and ended the day near 1500.

8/12/24

Crew: Max Chesser, Lulu Soto, Cole Anderson

Hoping to target the early high tide, we left the marina at 0648 and heading straight to Central Bay where we targeted California Halibut, Striped Bass, and Bat Rays with hook and line and trolling with lures. We fished in the area south of the Bay Bridge on the east side of the channel but found heavy vegetation that made trolling ineffective. We moved to the other side of the channel and found less vegetation but caught no fish. We began trawling around the same area during low tide at 0930. We had issues with the net becoming fouled that we eventually resolved but we had poor catches prior to fixing the issue. After not doing well in the Central Bay zone, we moved to Hunters Point and deployed several traps. After Hunters Point, we stopped in San Francisco and trawled McCovey Cove. We caught a few Shiner Surfperch there. We then fished with hook and line in McCovey Cove to target California Halibut but had no success. We conducted another trawl in McCovey Cove with an improvement in Shiner Surfperch catch. When a sailing camp made its way into the cove, we decided to stop for the day and head back to Alameda, ending at 1500.

8/13/24

Crew: Max Chesser, Lulu Soto, Cole Anderson

We left the marina at 0721 and started the day by doing a trawl near the Encinal Basin in Oakland for Shiner Surfperch. We caught one Shiner Surfperch and one White Croaker on our way out of the inner harbor trawling the main channel heading towards Central Bay. We conducted a trawl near Treasure Island in deep water but caught no target fish. We began hook and line fishing targeting California Halibut near the south side of Treasure Island. After several drifts, we hooked what might have been a California Halibut, but it jumped off the hook. We also landed a very large Bat Ray, but we were slightly

out of the Bat Ray zone, so it was released. We then moved across the channel and continued fishing with hook and line in search of California Halibut. We caught one Bat Ray that we retained for the project. Bycatch included one Pacific Staghorn Sculpin and a very large and healthy Leopard Shark. This area had substantial amounts of vegetation and only a small area that was clear of vegetation and obstructions. We ended the day trawling in this same area targeting the edge of the channels but only caught Lizardfish, juvenile California Halibut and Northern Anchovy. We made our way back to the marina ending the day at 1545.

8/14/24

Crew: Max Chesser, Rob Miller, Julien Scribner

We left the marina at 0730 and made our way to San Francisco to purchase live bait from the bait receiver at Fisherman's Wharf. We then made out way to McCovey Cove and began fishing with hook and line for California Halibut, repeatedly drifting the small area but had no success. After San Francisco, we headed over to the south side of Treasure Island and did more hook and line fishing for California Halibut but also had no success. Feeling defeated we ran over to Hunters Point where we checked and removed our traps and did several trawls at Hunters Point B. The area is guarded by several submerged pilings and obstructions, which allow only a small area for trawling. Our first trawl was decent with several Shiner Surfperch and two Walleye Surfperch. Our second trawl was not as productive, likely due to trawling over the same very small area. After Hunters Point, we made our way back towards Alameda, stopping at the fuel dock and the Encinal Basin to deploy traps. We made it back to the marina and ended the day at 1430.

8/15/24

Crew: Max Chesser, Rob Miller, Julien Scribner

We left the marina at 0725 and started out by exploring some new areas in the Oakland inner harbor to target Shiner Surfperch. Our first trawl produced a lot of algae and only a few non-target fish on the northwest side of Coast Guard Island. As we worked our way south towards the main channel, we found less algae and more Shiner Surfperch. After mediocre catches, we headed to Central Bay. We conducted a trawl near the south side of Treasure Island targeting California Halibut, but only caught juvenile California Halibut and Northern Anchovies. We briefly fished with hook and line in shallow water near the south side of the entrance to the inner harbor for California Halibut, Striped Bass and Jacksmelt. No target species were caught but lost a hooked Jacksmelt at the boat. We also conducted a trawl in the same area and caught juvenile California Halibut, Northern Anchovy, and two large American Shad. The forecast was for high winds in the afternoon, so we made our way to San Leandro by taking the back route by Ballena Bay. We conducted several trawls in the constructed bay where we had been productive previously. We caught no Shiner Surfperch and a large amount of debris. We noted very high water temperatures today in the bay that may explain the low catches. We made our way back towards Oakland where we did several trawls in the Encinal Basin with decent catches of Shiner Surfperch. We also checked traps deployed in the basin on the prior day, but no fish were caught. We headed back to the marina, ending the day at 1530.

8/16/24

Crew: Rob Miller, Max Chesser, Julien Scribner

We started the day before 0800 conducting an otter trawl in Oakland inner harbor near the marina. We caught juvenile White Croaker, juvenile California Halibut, and juvenile Shiner Surfperch, but none

within the target size range. After one trawl, we headed to McCovey Cove to continue fishing for White Croaker and Shiner Surfperch. We trawled this area all morning until 1308, catching several Shiner Surfperch and two White Croaker. We headed back to Oakland inner harbor to check the minnow traps that we set the prior day, but no fish were caught. We headed back to the marina and ended the day after 1500.

8/19/24

For the first time, we had two crews conduct sampling on the same day in different areas. A boat-based crew focused on Shiner Surfperch and White Croaker. A shore-based crew focused on catching Monkeyface Prickleback.

Crew (Boat): Rob Miller, Cole Anderson, Calvin Lee

The boat-based crew conducted their first trawl just outside the marina in the Oakland inner harbor, catching four target-sized Shiner Surfperch. We then moved to San Leandro at just after 0900 to conduct two trawls. We caught a single target-sized Shiner Surfperch in the second trawl. Not having much luck, we moved back to San Francisco to target Shiner Surfperch and White Croaker in the McCovey Cove/South Beach Harbor area. We caught two White Croaker that were within the target size range. After the second trawl, we returned to Grand Marina, finishing the day near 1500.

Crew (Shore): Max Chesser, Lulu Soto

The focus of the shore-based crew was to catch Monkeyface Prickleback by poke-poling. We met at 0630 at Horseshoe Bay and targeted rock jetties and a rocky point near Yellow Bluff. We scoured the area and probed every crevice we could find, but there was limited suitable habitat. We caught one Monkeyface Prickleback and hooked but lost another that looked to be undersized. We also caught a variety of juvenile groundfish but did not retain any. Having worked over the most promising area thoroughly we explored around Horseshoe Bay but could not find additional suitable habitat and caught no more Monkeyface Prickleback. We then headed into San Francisco to fish the rock jetty near Crissy Field where Moss Landing Marine Lab had caught Monkeyface Prickleback previously. We found little suitable habitat with mostly rock boulders placed over sand and little to no hard bottom or reef. We caught no Monkeyface Prickleback after spending a substantial amount of time and covering a wide area. After Crissy field, hook and line fished at Pier 14 near the Bay Bridge for Jacksmelt, catching two individuals within the target size range. With substantial bridge traffic anticipated, we ended the day near 1500.

8/20/24

Crew (Boat); Rob Miller, Cole Anderson, Rita Wilson

We began the day with an otter trawl in front of the Grand Harbor in Oakland inner harbor just past 0800, but no fish were caught. We then headed to San Leandro to target Shiner Surfperch. We caught two Shiner Surfperch in three tows. On the third tow, the net got snagged badly within the first minute. We eventually got the net unsnagged and it was in good enough shape to continue trawling. To avoid further snags, we decided to leave San Leandro after the incident. We moved location to San Francisco and arrived there at around 1330. We conducted two trawls in the McCovey Cove area, catching a single target-sized Shiner Surfperch. We also caught several undersized Shiner Surfperch and California Halibut, as well as an oversized White Croaker, all of which were released after they recovered. We returned to Grand Harbor and ended the day after 1500.

Crew (Shore): Max Chesser, Lulu Soto

After having only limited success on the prior day, we poke-poled again in the Central Bay and San Francisco regions. We started the day at 0630 at Fort Point in San Francisco. This area was similar to Crissy field in that it was mostly sandy bottom and provided little suitable habitat/crevices. We found a few good holes near the most exposed end of the jetty but accessing this area was challenging. We caught one Monkeyface Prickleback that we retained for the project. After Fort Point, we headed to Black Point near the Aquatic Park, which appeared to have suitable habitat. We were able to access the water at Black Point and found ample crevices but few Monkeyface Prickleback. We caught an undersized individual and several of juvenile groundfish. After Black Point, we returned to Pier 14 and hook and line fished and caught five Jacksmelt. We next headed over the Bay Bridge and hook and line fished at the Berkeley Marina but had no success. We ended the day at 1545.

8/21/24

Crew: Rob Miller, Julien Scribner, Cole Anderson

The focus for today was on Oakland inner harbor. We started in Encinal Basin and conducted six trawls between 0800 and 1200. We caught 16 target-sized Shiner Surfperch and one White Croaker. We also caught around 200 juvenile White Croaker, around 10 juvenile California Halibut, and several other undersized target species. At around 1200, we moved to Yerba Buena Island to hook and line fish with lures and live bait along the steep bank of the southwest end. Conditions were suboptimal with high turbidity, and few fish were observed by sonar. No fish were caught. To finish the day, we moved half a mile east of Yerba Buena Island, anchored, and hook and line sample the open water using live bait and sabiki rigs. After nearly an hour with only one bite and no captures, we called it a day and returned to the marina, ending the day near 1500.

8/22/24

Crew: Max Chesser, Tim Carrara, Lulu Soto

We left the marina at 0731 and began a trawl right in front of the marina to target Shiner Surfperch. We caught 18 Shiner Surfperch. Around midday, we moved to the Oakland Jacksmelt zone and fished with hook and line briefly with no success. At around 1330, we moved to Central Bay to fish with hook and line for Jacksmelt and Bat Rays with no success. Windy conditions made fishing challenging in the Central Bay, so we headed back towards the marina stopping to try again for Jacksmelt in the Oakland zone but still had no luck. We ended the day at 1450.

8/23/24

Crew: Max Chesser, Matt Unyi, Cole Anderson

We left the marina at 0724 and began trawling the Oakland zone but catches were drastically lower than yesterday. We moved quickly to McCovey Cove in San Francisco. We caught a small number of Shiner Surfperch in the trawls there. We then headed to Treasure Island to fish for Striped Bass and Jacksmelt during the peak of the tide change. We did not catch any Striped Bass after several drifts, but we eventually found four Jacksmelt, nearly completing the Jacksmelt quota for the Berkeley/Central Bay zone. We headed back to the marina ending the day at 1515.

8/26/24

Crew: Max Chesser, Julien Scribner, Cole Anderson

We left the marina at 0723 and headed to San Leandro. We began by trawling a new area near the eastern edge of the Shiner Surfperch zone past the airport channel. We conducted three trawls and caught a small number of Shiner Surfperch and several non-target species including a Striped Kelpfish. We then made our way to the human-made cove in the northern portion of the Shiner Surfperch zone. We conducted several trawls in this area, starting off with a very productive trawl that caught 18 target-sized Shiner Surfperch, numerous undersized Shiner Surfperch, and a large, submerged tree that fortunately did not damage the net. We eventually moved to Hunters Point. We arrived at Hunters Point around 1300 and began by chumming the area with various bait to try to concentrate more Shiner Surfperch into our small zone. We conducted three trawls and caught two Shiner Surfperch. After Hunters Point, we went back to the Marina. Having caught several mussels in San Leandro, we decided to give our traps a try again baiting them with crushed mussels and deploying them in our slip. After speaking to a commercial fisher, I decided to readjust the traps closer to the surface and found that one had two Shiner Surfperch of project size after a 15 min soak. We ended the day at 1600.

8/27/24

Crew: Max Chesser, Julien Scribner, Cole Anderson

We left the Marina at 0728 and made our way to Central Bay. We had planned to head to the far northwest corner of the Bat Ray zone but, due to heavy fog, we stopped near the end of the old Berkeley Pier. Our first trawl produced two California Halibut. We conducted several more trawls and caught Shiner Surfperch, Lizardfish, a Midshipman, and one target-sized Bat Ray. We left Central Bay around 1045, stopping at McCovey Cove to conduct trawling. We caught a small number of Shiner Surfperch, many of which were undersized. We then went to Hunters Point where we chummed, deployed two traps, and conducted a number of trawls. The target zone at Hunters Point is very small, so we had to trawl the same track repeatedly. We caught no target species in either the traps or the trawls. It seemed unlikely that, after two or three trawls, many fish would still be in the area. After Hunters Point, we relocated to San Leandro Bay. We deployed one trap and did several trawls. We retained a small number of Shiner Surfperch. We made our way back to the Alameda, reaching the marina and ending the day at 1530.

8/28/24

Crew: Max Chesser, Donna Maniscalco, Cole Anderson

We checked traps we had left at the marina and caught one Shiner Surfperch. We left the marina at 0736, conducting a trawl on our way through Oakland but did not catch any Shiner Surfperch within the target range. We then went back to the Berkeley flats near where we had caught two California Halibut the day prior. We started out the morning trolling around several areas including where we had caught California Halibut in the trawl yesterday, eventually catching one target-sized California Halibut and one undersized California Halibut. We went over to McCovey cove to conduct several trawls. We caught a small number of Shiner Surfperch. We then went to Hunters Point to check our traps and conducted several trawls. We caught a small number of Shiner Surfperch, one Sculpin, Bat Rays, a Leopard Shark, gobies, and a California sea hare. We left Hunters Point at 1323 and made our way across the Bay to San Leandro. In San Leandro, we checked our trap and conducted trawls, but we did not catch any target species. We headed back to the marina and ended the day at 1500.

8/29/24

Crew: Max Chesser, Matt Unyi, Cole Anderson

Today we left the Marina at 0725 and headed for San Leandro thinking we might find more Shiner Surfperch first thing in the morning with low light. We did several trawls in the human-made cove but caught no target fish. We explored a few new areas and did several trawls in the channel near the Airport channel but did not find many Shiner Surfperch. We left San Leandro around 1015 for Hunters Point to do multiple trawls but caught very few Shiner Surfperch. After Hunters Point, we trolled at McCovey Cove and caught one Bat Ray. We conducted a few trawls in McCovey Cove and caught a small number of Shiner Surfperch. We then went to the inner harbor and fished with hook and line for Jacksmelt but caught none. We reached the marina and ended the week's field effort at 1425. The boat was pulled in preparation for moving it to a new marina in the South Bay the following week.

9/3/24

Crew: Max Chesser, Matt Unyi, Lulu Soto

We brought the boat down to Westpoint Harbor Marina in Redwood City. We started the day by taking advantage of the extreme low tide and did some poke poling for Monkeyface Prickleback near the marina. We fished along rock jetties near the quarry hoping to find rock outcroppings, but we only found shallow mudflats with little habitat for Monkeyface Prickleback. We did not catch any for Monkeyface Prickleback or any other fish and we only observed what appeared to be small gobies. Once the tide was high enough to launch the boat, we launched out of Westpoint Harbor and headed out the channel into the bay to trawl for Bat Rays. Our first trawl caught one Bat Ray. Because this area appeared to be over a substantial shell bank and not wanting to damage the net, we moved trawling to deeper water. On these subsequent trawls, we caught four Leopard Sharks but no Bat Rays. We then went back into the channel and into the harbor to trawl for Shiner Surfperch and Pacific Staghorn Sculpin. We deployed traps and did several trawls in the inner channel, catching a moderate number of Shiner Surfperch but no Pacific Staghorn Sculpin. We headed back to the marina and ended the day at around 1430.

9/4/24

Crew: Max Chesser, Matt Unyi, Julien Scribner

We left the Westpoint Harbor Marina at 0723 and trawled for Shiner Surfperch in the inner harbor, targeting deeper water near the ship receiving docks. Several Shiner Surfperch were caught in every trawl. We checked our traps that were placed on the edge of the channel, but only caught gobies. After trawling all morning, we conducted Jacksmelt fishing with hook and line. We anchored the boat in several locations and drifted most of the channel, but we did not catch any Jacksmelt. We made our way back to the Westpoint Harbor Marina while fishing for Jacksmelt along the way. We ended the day at around 1500.

9/5/24

Crew: Max Chesser, Julien Scribner, Cole Anderson

We left the Westpoint Harbor Marina at 0733 and headed for the inner harbor to trawl new areas for Pacific Staghorn Sculpin. We trawled nearly the entire Pacific Staghorn Sculpin target area including shallow mud and sandy areas, the deep channel and channel edges, but we did not catch any. We did catch our remaining Shiner Surfperch for South Bay. Shiner Surfperch were caught in nearly every trawl, as were undersized juvenile California Halibut, but no other species. We then switched over to targeting

Jacksmelt with hook and line. We anchored, drifted, and chummed with anchovies but, similar to the prior day, we never hooked or observed a single Jacksmelt. We headed back to the Westpoint Harbor Marina and ended the day around 1430.

9/6/24

Crew: Max Chesser, Lulu Soto, Cole Anderson

We left the marina at 0725 and headed out the channel into the bay to target Bat Rays. We started the day by fishing with hook and line over shell banks while drifting. We did not succeed in catching Bat Rays, but we did catch one Leopard Shark. We then began otter trawling over a wide area. We caught several Bat Rays, two of which were within the target range. While also caught several sharks, Shiner Surfperch, and California Halibut. Unfortunately, our winch stopped working at 1321 and, realizing that it was not repairable on the water, we were forced to stop trawling. We headed into the Jacksmelt zone to fish with hook and line for the remainder of the day. As with previous days, did not catch any Jacksmelt and it appeared that they were just not present in our target zone. We headed back to the marina and pulled the boat out, preparing for heading back to San Pablo Bay next week. We ended field sampling at 1430.

9/10/24

There were two crews that sampled simultaneously by boat during the week of 9/10/24. One crew was dedicated to Artesian Slough while the other was based in San Pablo Bay.

Crew (San Pablo Bay): Max Chesser, Matt Unyi, Julien Scribner

We launched the boat in San Rafael out of Loch Lomond Harbor. We left the marina at 0742 and began by trawling the channel leading out of San Rafael Bay near the Marin Islands to target Shiner Surfperch. We caught large numbers of undersized juvenile California Halibut in every trawl, but few Shiner Surfperch were caught. After trawling all morning, we retained three target-sized Shiner Surfperch and one Pacific Staghorn Sculpin. We switched from trawling to hook and line sampling for Jacksmelt at 1223 in likely areas near Richmond Bridge. We also drifted a large area near the edge of the deep channel and caught one Jacksmelt. We headed back to the marina, ending the day at 1525.

Crew (Artesian Slough): Rob Miler, Brandon Schinina

We arrived in the Santa Clara area and launched the boat at Alviso Marina County Park at 1400. This was the first day of a 4-day trip targeting Striped Bass, Largemouth Bass, and Common Carp in the Artesian Slough area of South Bay using hook and line sampling. We spent the morning traveling and staging and spent the afternoon scouting areas to sample for the next few days. We first went up near the wastewater treatment effluent/weir to target Largemouth Bass with hook and line sampling, using caution when transiting because these waters are poorly charted. Using a variety of lures, we hooked and lost a few Largemouth Bass. We caught two undersized Largemouth Bass and one undersized Striped Bass, although we were outside the target area for Striped Bass. By this time, the afternoon wind was making navigation and fishing difficult, so we headed back to the boat ramp. On the way back, we threw a few casts in the Striped Bass zone in Coyote Creek near Mud Slough but had no bites. We pulled the boat out at the boat ramp at around 1700 and ended the day.

9/11/24

Crew (San Pablo Bay): Max Chesser, Matt Unyi, Cole Anderson

We left the Loch Lomond Harbor Marina at 0701 and began by trawling the channel leading out from San Rafael Bay targeting Shiner Surfperch. We trawled in the channel, around the channel, and near the southeast side of the Marin Islands. We caught a small number of Shiner Surfperch and two Diamond Turbot. We trawled the edge of the deep channel and caught many undersized juvenile California Halibut, and several Pacific Staghorn Sculpin, several of which were target-sized. After trawling, we switched to hook and line fishing for Jacksmelt, which yielded one Jacksmelt. We headed back to the marina and ended the day at 1500.

Crew (Artesian Slough): Rob Miler, Brandon Schinina

After launching the boat at Alviso Marina County Park, we headed for the Striped Bass target area in Coyote Creek. We fished with lures for about 30 minutes but left for the Largemouth Bass zone because we had no action; there were baitfish throughout the Striped Bass area, but no sign of predatory fish eating or harassing them. We also wanted to get to the wastewater outfall and weir during the ebb tide, on the assumption that ebb flows would be more favorable than the previous day's flood tide. After arrival, we consistently caught Largemouth Bass on a variety of lures. By midafternoon we captured all 16 Largemouth Bass for the project (six fish between 200-305 mm; ten fish >305 mm). We anchored nearby in still water to process the catch while concurrently soaking bait for Common Carp. We used dough tipped with corn for carp bait, but did not catch any in the 1.5 hours it took to process our catch. A few large Common Carp were seen jumping in the Regional Wastewater Facility Outfall Channel, but this area did not seem accessible by boat or on foot. We planned on a more intensive Common Carp effort on Friday, so we headed back to the boat ramp and pulled the boat around 1630.

9/12/24

Crew (San Pablo Bay): Max Chesser, Matt Unyi, Cole Anderson

We left the Loch Lomond Harbor Marina at 0706 and made our way across the channel to a new area in San Pablo Bay to target California Halibut and possibly Striped Bass. We sampled with hook and line for most of the morning, catching several Striped Bass and fulfilling our Striped Bass catch for San Pablo Bay. We trawled several times in the same area for California Halibut and covered most of the target zone but caught only undersized juvenile California Halibut and one Diamond Turbot. We headed back across the channel to trawl where we had trawled on the previous day for Shiner Surfperch, but did not catch any fish. We ended the day by deploying traps and returned to the marina at 1501.

Crew (Artesian Slough): Rob Miler, Brandon Schinina

On the way to launch the boat at Alviso Marina County Park, we stopped at Laine's Bait and Tackle in Alviso to buy bait and get some Striped Bass and Common Carp fishing tips from the shop owner, who incidentally had collected Leopard Shark individuals for a previous SFEI project. He did not think we would be successful catching Striped Bass at this time of year. However, we started hook and line fishing with lures and caught one target-sized Striped Bass right away. We continued to throw lures and troll Coyote Creek and Mud Slough until around 1300 but did not have any more success. Again, there were plenty of bait fish seen in the area, but we did not observe any fish preying on them, and we never had another bite. We switched to bait fishing at around 1300, although Laine warned us that sharks and Bat Rays can be a nuisance at this time of year and would likely get to our bait (Northern Anchovy and ghost shrimp) before Striped Bass would. He was correct; we caught two Leopard Sharks, two Bat Rays, and

lost a few of each species near the boat in 1.5 hours of bait fishing. We went back to lures but for the rest of the day but had no hist from Striped Bass the rest of the day. We headed back to the boat ramp at 1508 and ended the day.

9/13/24

Crew (San Pablo Bay): Max Chesser, Lulu Soto

We left the Loch Lomond Harbor Marina at 0709 and started out by checking traps, catching one target-sized Shiner Surfperch and several undersized individuals. We then hook and line sampled near the Marin Islands to target California Halibut. We covered a large area across the California Halibut target zone but caught only one Striped Bass that was released. We switched over to hook and line fishing for Jacksmelt, hooking several but losing them before landing. We headed back to the marina at 1426.

Crew (Artesian Slough): Rob Miler, Brandon Schinina

We launched the boat and left the Alviso Marina County Park boat ramp around 0730, then headed for the carp zone of Artesian Slough near the wastewater outfall. Along the way, we gave a few casts at two locations within the target zone for Striped Bass: (1) the location of the previous day's Striped Bass capture, and (2) near the railroad bridge. No Striped Bass were caught at either location. Once at the target zone for Common Carp, we anchored in what appeared to be good habitat and chummed with canned corn. We then set out four rods baited with a variety of baits: bread rolled into dough balls, store bought carp bait (colored dough), and corn. After no action for over an hour, we relocated a bit downstream but also had poor results there. With catch and no evidence of Common Carp in this area, we headed back to the boat ramp around 1230, arriving there at 1300. We pulled the boat and headed back to the Sacramento area.

9/16/24

Crew: Max Chesser, Tim Carrara, Lulu Soto

We left the marina at 0647 and headed out towards the Marin Islands. We trawled the shallows targeting California Halibut and Shiner Surfperch. We found large densities of flat fish of varying species, but target-sized California Halibut or Shiner Surfperch. We conducted trawls across the channel, near the Richmond Bridge, and on the edge of the channel surrounding the Marin Islands. We caught a small number of Diamond Turbot and Pacific Staghorn Sculpin. We switched over to Jacksmelt fishing with hook and line at 1045. We drifted a wide area but could not locate any Jacksmelt. We finished the day with more trawls in the channel leading out of San Rafael Bay for Shiner Surfperch but did not catch any. We headed back to the marina at 1430 and pulled the boat, preparing to head back to Central Bay later this week.

9/18/24

Crew: Max Chesser, Matt Unyi, Rob Miller

We started the day at 0742 leaving from the Berkeley Marina and heading out to the northwestern edge of the Bat Ray target zone to trawl for Bat Rays and White Croaker. We caught several Bat Rays, White Croaker, and a large California Halibut. Bycatch included large numbers of undersized California Halibut, Pacific Staghorn Sculpin, and Shiner Surfperch. We also caught a small number of Longfin Smelt, requiring us to stop trawling and move to a new location. We arrived at Treasure Island at 1021 to conduct hook and line sampling for Striped Bass. We fished several areas using a variety of tactics but did not catch any Striped Bass. We next moved to San Francisco conduct trawling for Shiner Surfperch.

On our first trawl we caught several large Shiner Surfperch, but again caught a Longfin Smelt forcing us to leave the location. We headed back towards Berkeley and did one last trawl on our way to target White croaker with no success. We returned to Berkeley Marina and ended the day at 1523.

9/19/24

Crew: Max Chesser, Matt Unyi, Rob Miller

We left the Berkeley Marina at 0721 for the northwestern edge of the Central Bay Bat Ray zone. We conducted several trawls targeting White Croaker. We caught a couple large White Croaker. At 0913, we switched to target Striped Bass with hook and line. We checked the usual spots but did not find any, so we moved on to San Francisco at 1041. We did a few trawls on the edge of the channel in deep water targeting White Croaker and Shiner Surfperch. We caught the remaining number of Shiner Surfperch and California Halibut needed for the project. We left McCovey cove at 1330, and hook and line fished for Jacksmelt in the San Francisco zone while we processed fish and on our way to the fuel dock. We caught two Jacksmelt while processing fish. We headed back to the Central Bay zone to do a final trawl, but deteriorated conditions prevented us from putting the net in the water. Instead, we headed back to the Berkeley Marina and ended the day at 1500.

9/20/24

Crew: Rob Miller, Julien Scribner, Cole Anderson

We started the day trawling the western and southern portions of the Central Bay Bat Ray zone in an attempt to capture White Croaker. In three trawls, we did not catch target-sized White Croaker. We did catch several juveniles, along with flatfish (juvenile California Halibut, English Sole, Diamond Turbot, and Starry Flounder), sharks (Leopard and Brown Smooth-hound Shark), Bat Rays, California Lizardfish, Staghorn Sculpin, Shiner Surfperch, and a large unidentified elasmobranch egg case. We relocated to the San Francisco area to try to catch the remaining Jacksmelt needed from there using hook and line, but we did not catch any fish. We then moved to Oakland and started hook and line sampling at 1255. We did not catch any fish in the hour we sampled. Overall, this was not a successful day. In addition, we were boarded by the US Coast Guard in a routine check to ensure we were boating legally and safely and being protective of the environment. We passed the inspection, but the hour and a half needed for the inspection reduced our sampling time.

9/23/24

Crew: Max Chesser, Matt Unyi, Julien Scribner

We left the Berkeley Marina at 0721 and headed to San Leandro. Heavy fog in the morning made progress slow, but we eventually reached San Leandro and began conducting otter trawls. We conducted numerous short trawls in the human-made cove in the northern region of the target zone. We had decent catches of Shiner Surfperch that remained relatively consistent throughout the morning. We eventually caught the remaining 35 Shiner Surfperch needed for the project in the San Leandro region, so we headed back towards the Central Bay at 1236. We tried trawling for Pacific Staghorn Sculpin outside of the Berkeley Marina, but because rough conditions made trawling difficult, we ended the day early at 1528.

9/24/24

Crew: Max Chesser, Matt Unyi, Julien Scribner

We left the Berkeley Marina at 0728 and headed to Hunters Point to look for new areas to trawl for Shiner Surfperch. We searched around the pier at the southern zone and attempted numerous trawls targeting the shoreline and human-made structure. We found better catch of Shiner Surfperch in Hunters Point A than Hunter Point B. We spent the day moving between the two locations, conducting a few trawls at each site. After many trawls, we ended up with around a dozen Shiner Surfperch from each site. We headed back to the Berkeley Marina, ending the day around 1600.

9/25/24

Crew: Max Chesser, Rob Miller, Cole Anderson

We began the day at 0731 trawling in the Berkeley Marina to target Shiner Surfperch and Pacific Staghorn Sculpin. We caught a small number of Shiner Surfperch but plugged the net with mud requiring that we stop trawling to clean it out. We then moved south towards the Berkeley/Central Striped Bass zone and fished with hook and line while processing fish. We caught three target-sized Striped Bass quickly. We searched the area for the school but could not locate it. We then made our way to near the Encinal Basin in the Oakland inner harbor to otter trawl. The first trawl caught 35 Shiner Surfperch, Northern Anchovy, undersized White Croaker, undersized Brown Rockfish, and undersized California Halibut. After filling the Shiner Surfperch catch needed for the project, conducted a trawl in the inner harbor targeting White Croaker. The trawl caught no fish, likely due to the net not making bottom contact. We headed north at 1323, and hook and line fished for Striped Bass near Emeryville while processing fish. We caught one undersized Striped Bass and then ended the day at 1612.

9/26/24

Crew: Max Chesser, Rob Miller, Cole Anderson, Martin Trinh (SFEI)

We left the Berkeley Marina at 0734 for Hunters Point to trawl for Shiner Surfperch and Pacific Staghorn Sculpin. We spent the day toggling between Hunters Point A and Hunters Point B, conducting three to four trawls per visit and processing fish in transit and while trawling. The Shiner Surfperch catch was relatively consistent with previous days spent at Hunters Point. After a full day of trawling, we retained around a dozen Shiner Surfperch from Hunters Point A and half a dozen Shiner Surfperch from Hunters Point B. We returned to Berkeley Marina at 1545.

9/27/24

Crew: Rob Miller, Julien Scribner, Cole Anderson

We left Berkeley Marina around 0700 and headed to Central Bay about 2 km ESE of Angel Island, where we found a steady catch in otter trawls of target-sized White Croaker in moderately deep water (9-11 m). It took considerable time to sort through the bycatch of juvenile California Halibut, other non-target fish species, and invertebrates. On the fourth trawl, we captured a Longfin Smelt requiring us to move to a different region per our SCP. We moved to the ledge at McCovey Cove in the San Francisco region and captured two more target-sized White Croaker on the first and only trawl, bringing the day's tally to 14 individuals. On the way back to Berkeley Marina, we did an experimental trawl in deep water (~15 m) at the mouth of the Oakland Inner Harbor. We determined that was too deep for our gear and only caught juvenile croakers and a lot of vegetation. We headed to Berkeley Marina at 1420 and arrived at 1445, ending the day and week shortly thereafter.

9/30/24

Crew: Max Chesser, Matt Unyi, Taryn Mitoma

We left the Berkeley Marina at 0732 and trawled in front of the marina for Shiner Surfperch and Pacific Staghorn Sculpin. Our first trawl caught a number Shiner Surfperch but was also full of mud. Recent dredging likely caused highly variable bathymetry, making otter trawling difficult. After spending time cleaning the net, we explored the other side of the pier near the southern edge of the target zone. We caught a small number of Shiner Surfperch, but eel grass caught in the net forced us to move to a different area, although no suitable area was found. Therefore, we moved at 1043 to target White Croaker on the edge of the deep channel near Berkeley Flats, trawling in deep water. After several trawls, we caught only undersized juvenile White Croaker. We also caught Pacific Staghorn Sculpin, California Halibut, Shiner Surfperch, Bat Rays, and a large Shovelnose Guitarfish. We sampled over a large area but could not find White Croaker. We conducted a trawl near the northern rocky shore of Treasure Island to target other surfperch species but did not catch any. We left the open water at 1335 and headed back to the Berkeley Marina where we trawled for Shiner Surfperch near the marina entrance. By keeping our trawls near the outside edge of the zone, we were able to avoid the recently dredged areas. Although the area sampled was limited, we consistently caught Shiner Surfperch. We headed back to the slip and ended the day at 1620.

10/2/24

Crew: Max Chesser, Lulu Soto, Taryn Mitoma

We left the Berkeley Marina at 0721 and trawled the marina entrance, consistently catching Shiner Surfperch. After trawling the marina for most of the morning we went out to deep water for White Croaker, similar to the prior day. We only caught undersized juvenile White Croaker in several trawls. We left the Berkeley Flats area at 1225 for San Francisco. After fueling up, we went to McCovey Cove to trawl for White Croaker. We caught only undersized juvenile White Croaker. We went back to Berkeley and continued trawling the marina entrance, consistently catching Shiner Surfperch. We ended the day at 1630.

10/3/24

Crew: Max Chesser, Mike Tillotson, Taryn Mitoma

After gathering mussels at Berkeley Marina, we headed out to Hunters Point. Upon arrival, the tide was too low to trawl Hunters Point B, so we began by trawling at Hunters Point A to target Shiner Surfperch. We had modest but consistent catches of Shiner Surfperch for most of the morning. We caught some garbage that needed to be cleaned from the net including several tires. We also snagged the net on the bottom, which required a bit of work to free it. We spent most of the day toggling between Hunters Point A and Hunters Point B. Catches in Hunter Point B were low, consistent with prior patterns. There appears to be limited structure and, therefore, Shiner Surfperch habitat. Hunter Point A appears to have better habitat with more structure from the pier and the rocky point, and catches reflected this. We left Hunters Point at 1310 for Berkeley to target White Croaker in deep water. Rough conditions hindered our ability to sample properly, and we caught only one undersized White Croaker. We moved to Emeryville at 1523 and quickly caught the three Striped Bass needed for the project using hook and line. We then headed back to the Berkeley Marina and ended the day at 1615.

10/4/24

Crew: Max Chesser, Matt Unyi, Taryn Mitoma

We left Berkeley Marina at 0726 and went to Hunters Point A to trawl for Shiner Surfperch, catching a small number of them. We again snagged the net on the bottom but managed to free it easily and continued our trawl. We then anchored at Hunters Point B to try hook and line sampling for Shiner Surfperch while we processed fish. We also spent some time making repairs to the net after our snag earlier in the morning. We were not successful in catching any Shiner Surfperch using hook and line. We switched to trawling at Hunters Point B with little success. We toggled between the two Hunters Point locations for the rest of the day. We fulfilled our Shiner Surfperch catch for the project at Hunters Point A and caught a modest number at Hunters Point B. We left Hunters Point at 1530 and returned to Berkeley Marina, ending the day at 1628.

10/7/24

Crew: Max Chesser, Lulu Soto, Cole Anderson

We left Berkeley Marina at 0721 and made our way out to the Berkeley flats where we hook and line sampled, and otter trawled targeting White Croaker. We searched intently over a large area for signs of White Croaker, but none were found. We did not catch any fish with hook and line sampling or any adult White Croaker in the trawl. We then targeted White Croaker in the Oakland area while hook and line fishing for Rubberlip Surfperch and Brown Rockfish. We ended up landing Jacksmelt and Walleye Surfperch. Not having any luck catching White Croaker, we finished the day conducting multiple otter trawls catching Shiner Surfperch in the Berkeley/Central Bay zone. We had decent catches of Shiner Surfperch, but conditions were rough, forcing us to end the day a bit early at 1503.

10/8/24

Crew: Max Chesser, Matt Unyi, Taryn Mitoma

We left Berkeley Marina at 0723 and, due to our success the previous day, we started the day out otter trawling for Shiner Surfperch again in Berkeley/Central Bay. We caught a small number of Shiner Surfperch early but needed to move to a different area due to dredging occurring in the target zone. We explored new areas but found few Shiner Surfperch. Dredging activity eventually calmed down and we continued trawling in our most productive area close to the dredging but far enough to stay out of the way. We had a steady catch of Shiner Surfperch and were able to quickly achieve our target catch. We left Berkeley 1103 and conducted hook and line sampling near Treasure Island to target Brown Rockfish and Rubberlip Perch. We caught Walleye Surfperch, Jacksmelt and one undersized Rubberlip Perch. We finished the day conducting otter trawls in McCovey Cove to target White Croaker. We caught one target-sized White Croaker and numerous undersized White Croaker. We headed back to Berkeley Marina and ended the day at 1637.

10/9/24

Crew: Max Chesser, Rob Miller, Charlie Norton

Because we were asked to prioritize catching the remaining Shiner Surfperch for the project, we focused on San Pablo Bay today. We arrived in San Pablo Bay at 0829 and began by deploying minnow traps in the area we felt was most suitable to catch Shiner Surfperch. We then conducted a trawl targeting large Pacific Staghorn Sculpin. We caught two Pacific Staghorn Sculpin within the larger size range (>150 mm)

as well as numerous smaller Pacific Staghorn Sculpin and various other species. We also caught an adult Longfin Smelt, requiring that we change locations to avoid further Longfin Smelt catch. We spent the rest of the day trawling closer to where the minnow traps were deployed and caught five target-sized Shiner Surfperch. We headed back to Berkeley and ended the day at 1641.

10/10/24

Crew: Rob Miller, Matt Unyi, Charlie Norton

After collecting mussels from nearby docks, we again headed to San Pablo Bay to target Shiner Surfperch. We put out a line of bait along the San Rafael approach channel and started our first of eight trawls at 0910. We captured two target-sized Shiner Surfperch and two target-sized Staghorn Sculpin, although bycatch was large including undersized Shiner Surfperch and Staghorn Sculpin, various flatfish, Pacific Herring, a large Jacksmelt (330 mm TL), and a Shovelnose Guitarfish. At approximately 1500, we started to collect minnow traps that were set the previous day, but they only contained gobies and small crabs. We then headed back to the marina, ending the day at 1600.

10/11/24

Crew: Rob Miller, Matt Unyi, Julien Scribner

Focusing on Shiner Surfperch, we again gathered mussels for bait then headed for Hunters Point B. Once at Hunters Point B, we checked the minnow traps set the previous day, but no target fish were caught. We then spread bait out in a circular pattern approximately 250 m in diameter, roughly the entire sampling zone. We extensively trawled the entire area in circles. This method worked well, and we retained 24 target-sized Shiner Surfperch and one Staghorn Sculpin >150 mm. The usual bycatch was caught and released, including a large number of undersized Shiner Surfperch and a few Pacific Staghorn Sculpin <150 mm. We headed back to Berkeley Marina and ended our day at 1530.

10/14/24

Crew: Max Chesser, Matt Unyi, Cole Anderson

We left Berkeley Marina at 0726 and headed to Hunters Point. We arrived at Hunters Point B and conducted numerous otter trawls. We had a steady catch of Shiner Surfperch catching one or two in each trawl. Shiner Surfperch catch dropped off at 1018. As a result, we switched gears to hook and line sampling, targeting Rubberlip Perch and Brown Rockfish, but we only caught two Striped Bass. We switched back to otter trawling at 1112, but Shiner Surfperch catch was still zero. We then conducted some hook and line sampling again in a different area but had no success. Later in the afternoon, we again switched to otter trawling in the target zone and caught four to five Shiner Surfperch per trawl. Although it was late in the afternoon, we continued sampling until we fulfilled our target catch of Shiner Surfperch at Hunters Point B, returning to Berkeley Marina and ending the day at 1638.

10/15/24

Crew: Max Chesser, Eric Chapman, Taryn Mitoma

On our last (55th) day of otter trawling per permit terms, we returned to San Pablo Bay to attempt to fulfill our target catch of Shiner Surfperch there. We left Berkeley Marina at 0718 and headed to the location in San Pablo Bay where we have conducted numerous trawls. We caught the greatest number of Shiner Surfperch in the channel where we had found them previously but also found them out on the shoals in an area that we had trawled extensively but never seen them. We continued to trawl

repeatedly over a very small, yet productive, area, catching Shiner Surfperch on many trawls. We caught a total of 12 individuals, represented our best day of catching them in San Pablo Bay so far. We left San Pablo Bay and returned to Berkeley Marina, ending the day at 1631.

10/16/24

Crew: Max Chesser, Taryn Mitoma

The strategy for the day was to focus on hook and line sampling, targeting mostly White Croaker, but also Rubberlip Perch and Brown Rockfish. We left the marina at 0728 and headed out to the Berkeley flats. We sampled over a large area, searching for White Croaker but were unsuccessful and saw no sign of them in the area. We continued to hook and line sample, covering an area from Berkeley to SF and near Oakland with no success. High winds and currents made for rough conditions and hook and line sampling was challenging. As a result, we ended the day early and headed back to Berkeley Marina. We moved the boat to Emeryville due to reaching the limit for guest dockage in Berkeley.

10/21/24

Crew: Max Chesser, Rob Miller, Matt Unyi

The plan for the week was to fish South Bay/Artesian Slough to catch the remaining Striped Bass. We started the day at 0645 by leaving from Emeryville Marina, stopping on the way for fuel and live bait in SF. We made our way to Redwood City and headed towards Coyote Creek to the target zone for Striped Bass. We arrived in Coyote Creek at 0912 and started hook and line sampling using various methods. We covered every accessible part of the Striped Bass target zone including all of Mud Slough. Aside from one bite in the morning, we found no evidence of Striped Bass in the zone. In the late afternoon, we headed back to the Westpoint Harbor Marina in Redwood City, arriving at the marina and ending the day at 1645.

10/22/24

Crew: Max Chesser, Rob Miller, Matt Unyi

We left the marina at 0702 and returned to Coyote Creek. After getting the approval to target fish outside of the zone but within Coyote Creek, we focused just downstream of our original zone at the confluence of Alviso Slough, which seemed to be the most promising for Striped Bass. We had numerous bites immediately within a small area and caught two Striped Bass within the target size range during the morning. We tried various other methods of hook and line sampling and searched across a wide area but could not catch any more Striped Bass. We did catch numerous Leopard sharks in several locations. We left Coyote creek after a long day of sampling, reaching the Westpoint Harbor Marina and ending the day at 1723.

10/23/24

Crew: Max Chesser, Rob Miller, Matt Unyi

We started the day at 0708, leaving Westpoint Harbor Marina and heading to Coyote creek to again hook and line sample targeting Striped Bass. We had a good catch of Striper starting early in the day and found fish throughout the area, including within the target zone and just downstream. Things started to slow down around midday, but we did catch an unexpected Chinook salmon that was released in good condition. We had noted on Monday, 10/21/24 that a sea lion was carrying a Chinook salmon in its

mouth, suggesting there were a few in the area. We continued to sample with hook and line for Striped Bass but caught only one undersized individual. We ended the day at 1521 and returned to the marina with a total of five Striped Bass.

Notes and Observations

While fish collections in 2024 were quite successful overall, our efforts were hampered by several factors. The most notable factor was seasonality and a substantial delay in the start date due to problems associated with the California Department of Fish and Wildlife's scientific collection permitting (SCP) process.

Due to a long delay in securing our SCP, fish collections did not begin until late July after conditions in San Francisco Bay had begun to transition to summer-time patterns and many species were difficult to locate and collect. We believe that sampling in the springtime for species such as California Halibut, Jacksmelt, White Croaker, and Pacific Staghorn Sculpin would have yielded greater catches, especially for many of the less productive zones.

Among fishing gears used this year, we found the otter trawl to be our most effective tool in collecting most of the target species. However, larger and fast-swimming species such as Striped Bass, Jacksmelt, and adult California Halibut were not often caught by the trawl net. Instead, hook and line sampling was most effective for these species when physical conditions were favorable and the species were present. Minnow traps had limited effectiveness, although through several iterations of trial and error, we refined our techniques to improve trapping success. Due to the passive nature and low time investment, we ran traps through most of the project, but catch rates were inconsistent. Cast netting was attempted at times but was mostly ineffective; only a single Shiner Surfperch was caught in eight separate casts. Although we originally prepared to sample using beach seines, the vast majority of the region was not conducive to beach seining. Most target zones lacked beaches or were not adjacent to shore and had less than ideal depths. Therefore, beach seining was not attempted during the entire field season.

Catch of Longfin Smelt in many target zones also limited our effectiveness. Trawling gear was modified early in the season to be size-selective to limit the catch of Longfin Smelt. However, although this modification substantially reduced Longfin Smelt catch, occasional catches still occurred, requiring us to change locations or gear types. However, we caught Longfin Smelt well into the fall, and in nearly all areas excluding the South Bay/Artesian Slough, reducing our effort.

Tables

Table 1. Target Size and Number of Fish by Species Collected at Each Site.

		Target Number of Fish to Collect at each Site												Total # of Fish
		STATUS AND TRENDS								PCB PMU STUDY				
Species	Target Size (mm TL)	South Bay	Oakland	San Francisco	Berkeley/ Central Bay	San Pablo Bay	Artesian Slough	Suisun Bay	San Leandro	Richmond	Hunters Point A	Hunters Point B		
White Croaker ¹	200-300	wherever available												60
Shiner Surfperch ¹	100-150	85	75	85	85	85			85	75	75	75	725	
Striped Bass ¹	≥450				9	9	9						27	
California Halibut ¹	≥558			3	3	3							9	
Northern Anchovy ¹	37-131	120 total, wherever available												120
Jacksmelt ¹	200-300	10	10	10	10	10							50	
Pacific Herring ¹	≥170	40			40	40							120	
Pacific Sardine ¹	≥195	20			20	20							60	
Pacific Staghorn Sculpin ¹	80-150	10			10	10				10	10	10	60	
	>150	10			10	10				10	10	10	60	
Brown Rockfish ¹	≥250	15 total, wherever available												15
Barred Surfperch ²	≥160	15 total, wherever available												15
Bat Rays ¹	≥610	5			5	5							15	
Rubberlip Perch ²	≥300	15 total, wherever available												15
Largemouth Bass ¹	200-305						6						6	
	>305						10						10	
Common Carp ¹	≥450						10						10	
Walleye Surfperch ¹	≥115	15 total, wherever available												15
Blue Rockfish ²	≥200	5 total, wherever available												5
Black Perch ²	≥150	5 total, wherever available												5
Cabazon ²	≥381	5 total, wherever available												5
Pacific Sanddab ²	≥190	10 total, wherever available												10
Diamond Turbot ²	≥165	10 total, wherever available												10
Petrale Sole ²	≥330	5 total, wherever available												5
English Sole ²	≥330	5 total, wherever available												5
Starry Flounder ²	≥365	5 total, wherever available												5
Chub Mackerel ²	≥260	5 total, wherever available												5
Lingcod ²	≥559	5 total, wherever available												5
Monkeyface Prickleback ¹	≥360	5			5	5							15	
Total Fish													1,467	

¹ Target species² Keep as bycatch

Table 2. Fish Catch by Species at Each Site.

Species	Number of Fish Collected at each Site											Total # of Fish
	STATUS AND TRENDS							PCB PMU STUDY				
	South Bay	Oakland	San Francisco	Berkeley/Central Bay	San Pablo Bay	Artesian Slough	Suisun Bay	San Leandro	Richmond	Hunters Point A	Hunters Point B	
White Croaker	0	2	10	17	0	0	0	0	0	0	0	29
Shiner Surfperch	85	75	85	85	24	0	0	85	85	75	75	674
Striped Bass	0	0	0	9	9	8	0	0	0	0	0	26
California Halibut	0	0	3	3	1	0	0	0	0	0	0	7
Northern Anchovy	0	0	0	104	17	0	0	0	0	0	0	121
Jacksmelt	0	0	9	10	2	0	0	0	0	0	0	21
Pacific Herring	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Sardine	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Staghorn Sculpin, 80 - 150 mm	0	0	0	3	10	0	0	0	4	10	10	37
Pacific Staghorn Sculpin, >150 mm	0	0	0	2	5	0	0	0	0	0	5	12
Brown Rockfish	0	0	0	0	0	0	0	0	0	0	0	0
Barred Surfperch	0	0	0	1	0	0	0	0	0	0	0	1
Bat Rays	3	0	0	5	5	0	0	0	0	0	0	13
Rubberlip Perch	0	0	0	0	0	0	0	0	0	0	0	0
Largemouth Bass, 200 - 305 mm	0	0	0	0	0	6	0	0	0	0	0	6
Largemouth Bass, >305-mm	0	0	0	0	0	10	0	0	0	0	0	10
Common Carp	0	0	0	0	0	0	0	0	0	0	0	0
Walleye Surfperch	0	0	0	7	0	0	0	0	0	5	3	15
Blue Rockfish	0	0	0	0	0	0	0	0	0	0	0	0
Black Perch	0	0	0	0	0	0	0	0	0	0	0	0
Cabazon	0	0	0	0	0	0	0	0	0	0	0	0
Pacific Sanddab	0	0	0	0	0	0	0	0	0	0	0	0
Diamond Turbot	0	0	0	0	10	0	0	0	0	0	0	10
Petrale Sole	0	0	0	0	0	0	0	0	0	0	0	0
English Sole	0	0	0	0	0	0	0	0	0	0	0	0
Starry Flounder	0	0	0	2	1	0	0	0	0	0	0	3
Chub Mackerel	0	0	0	0	0	0	0	0	0	0	0	0
Lingcod	0	0	0	0	0	0	0	0	0	0	0	0
Monkeyface Prickleback	0	0	0	2	0	0	0	0	0	0	0	2
Total Fish												987

Figures

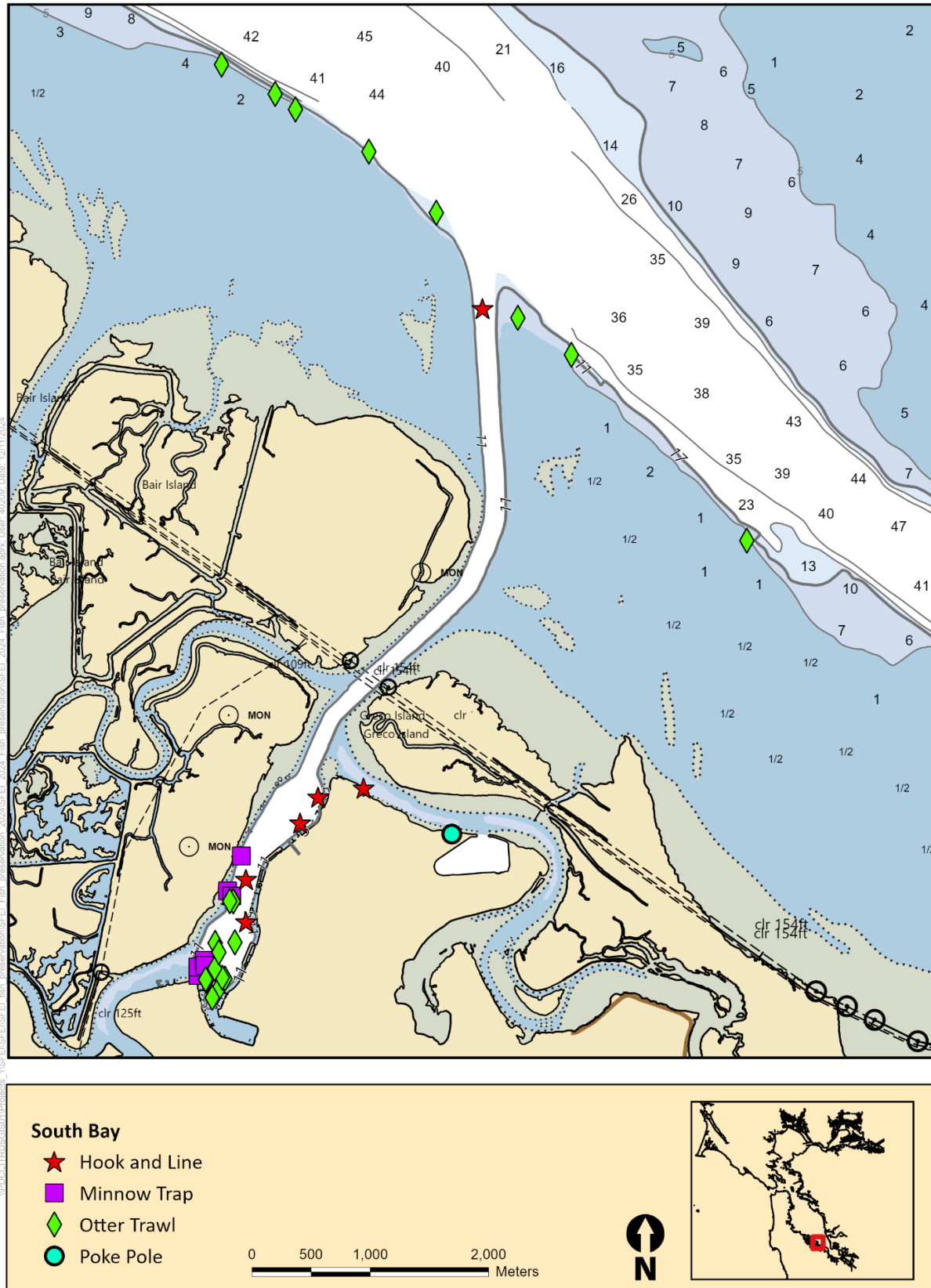


Figure 1. Fishing Effort in South Bay. Note: Only start locations are shown for otter trawls.



Figure 2. Fishing Effort in Oakland. Note: Only start locations are shown for otter trawls.

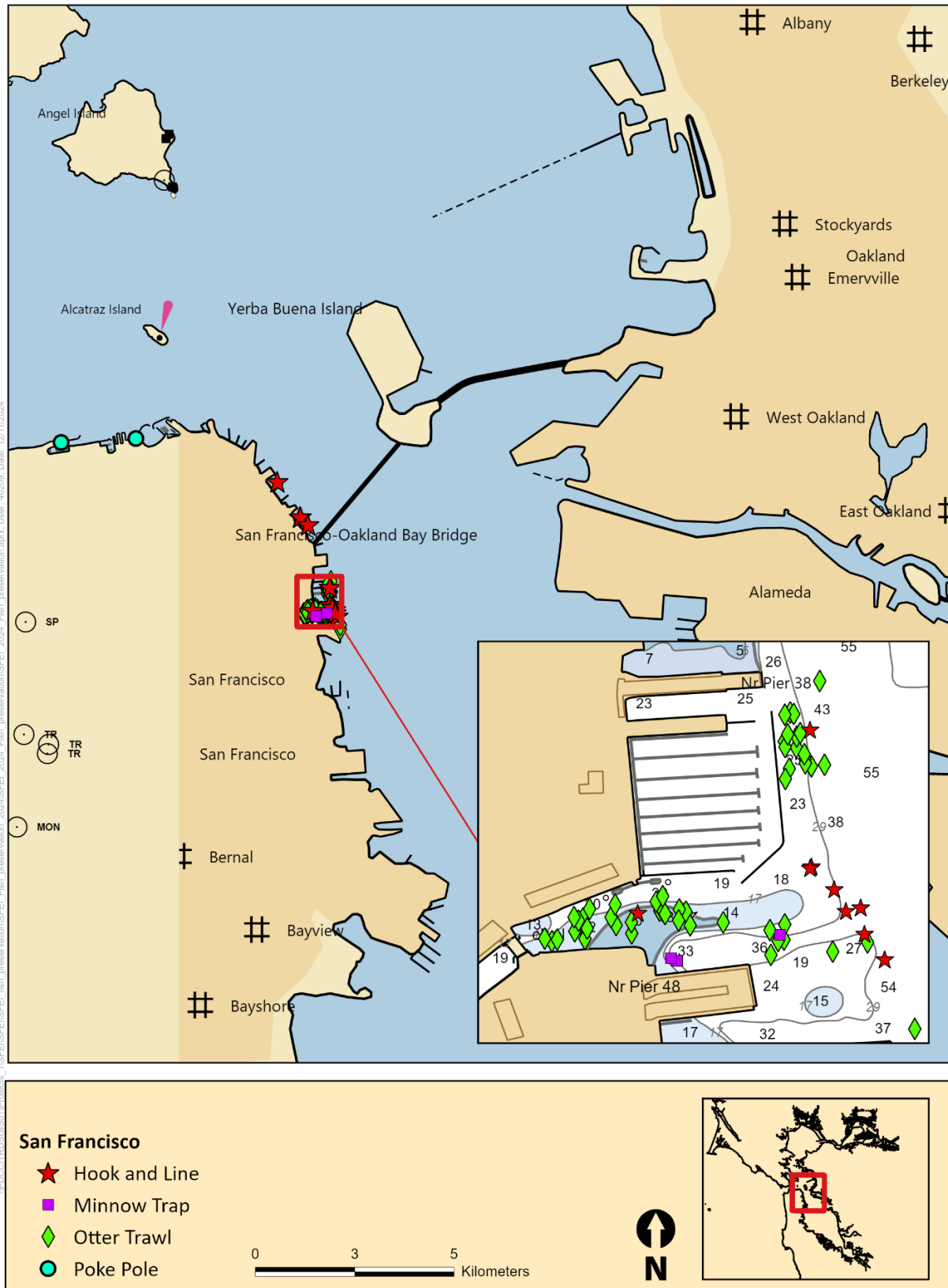


Figure 3. Fishing Effort in San Francisco. Only start locations are shown for otter trawls.

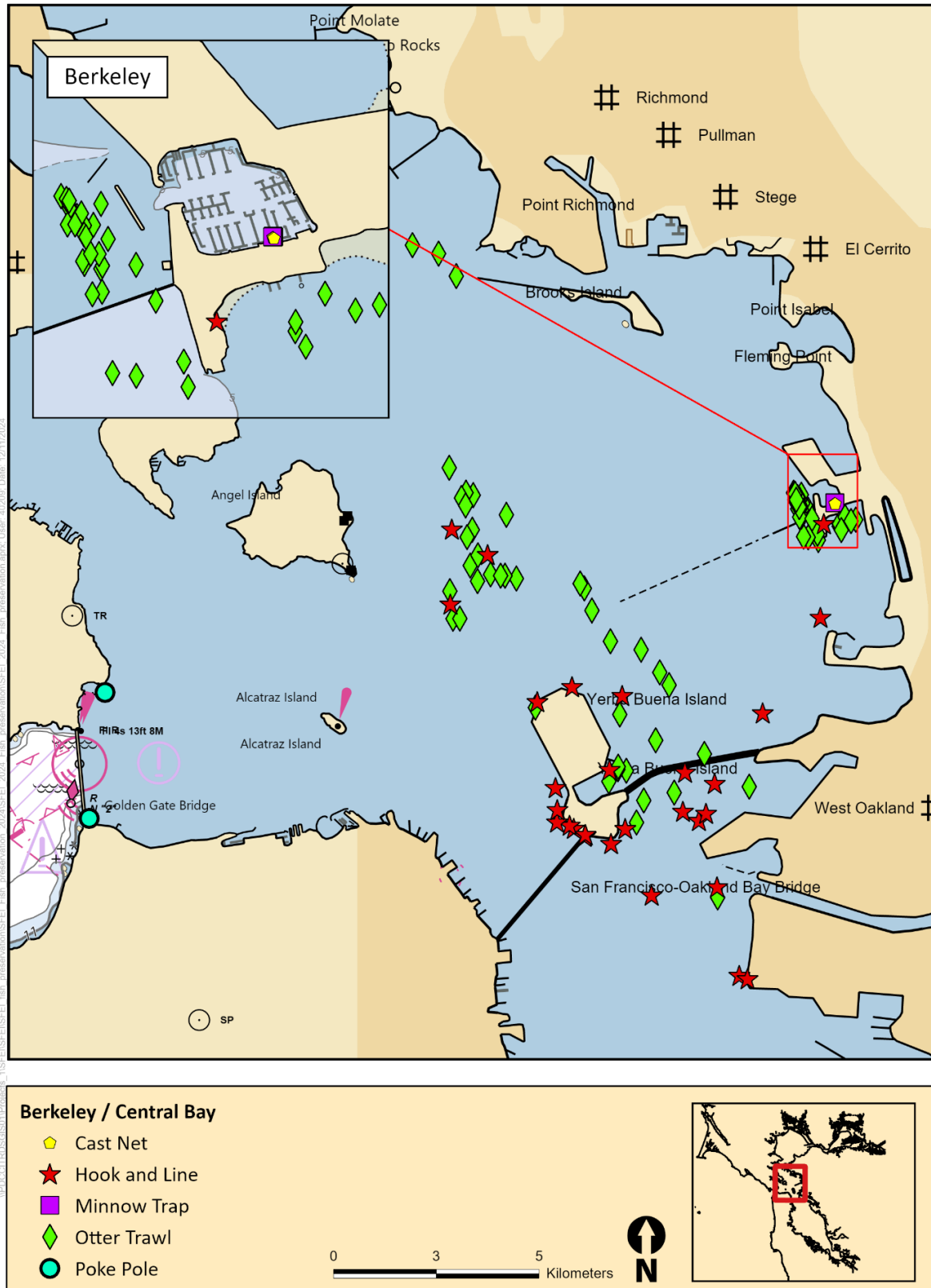


Figure 4. Fishing Effort in Berkeley/Central Bay. Only start locations are shown for otter trawls.

31

32





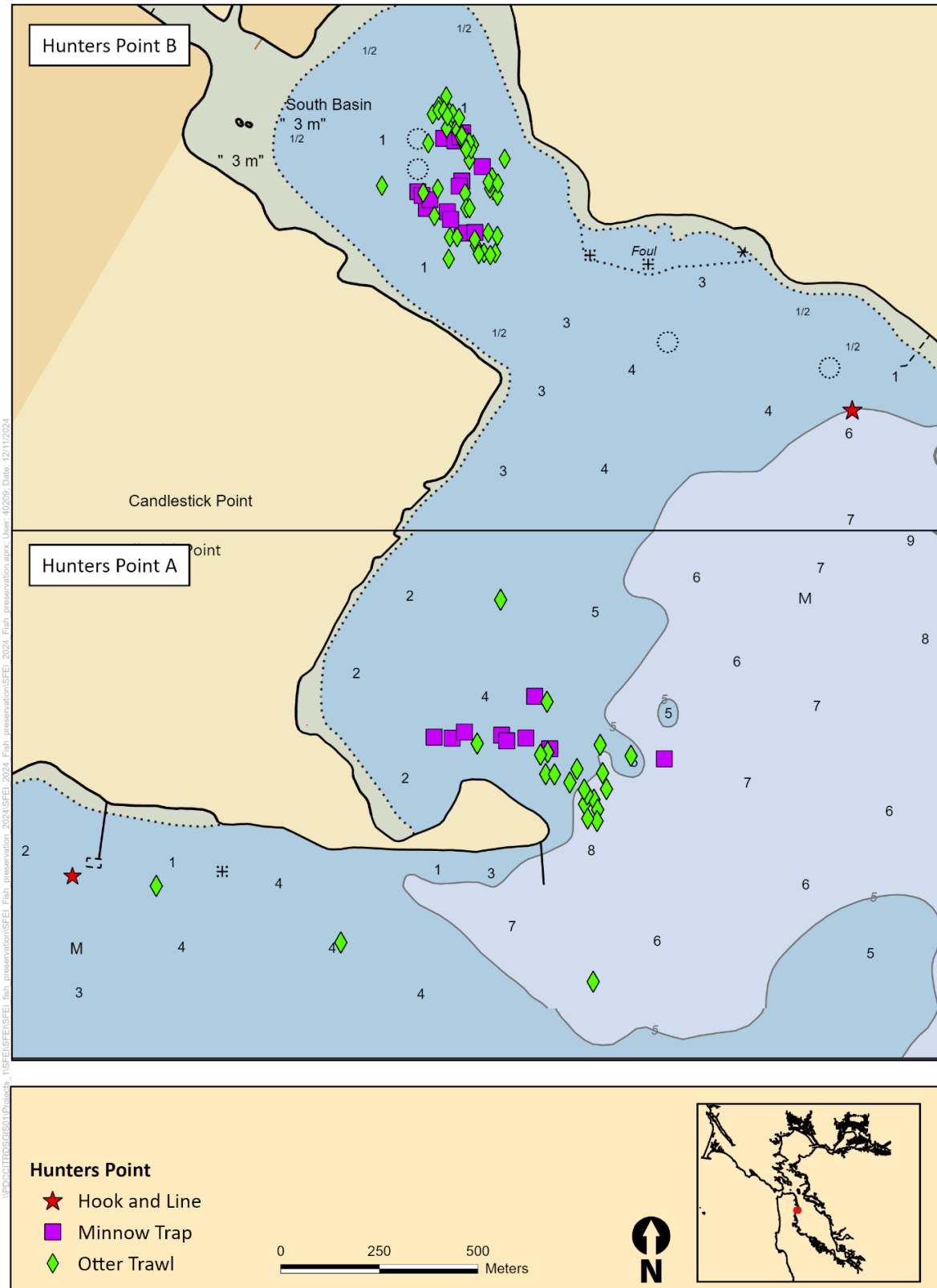
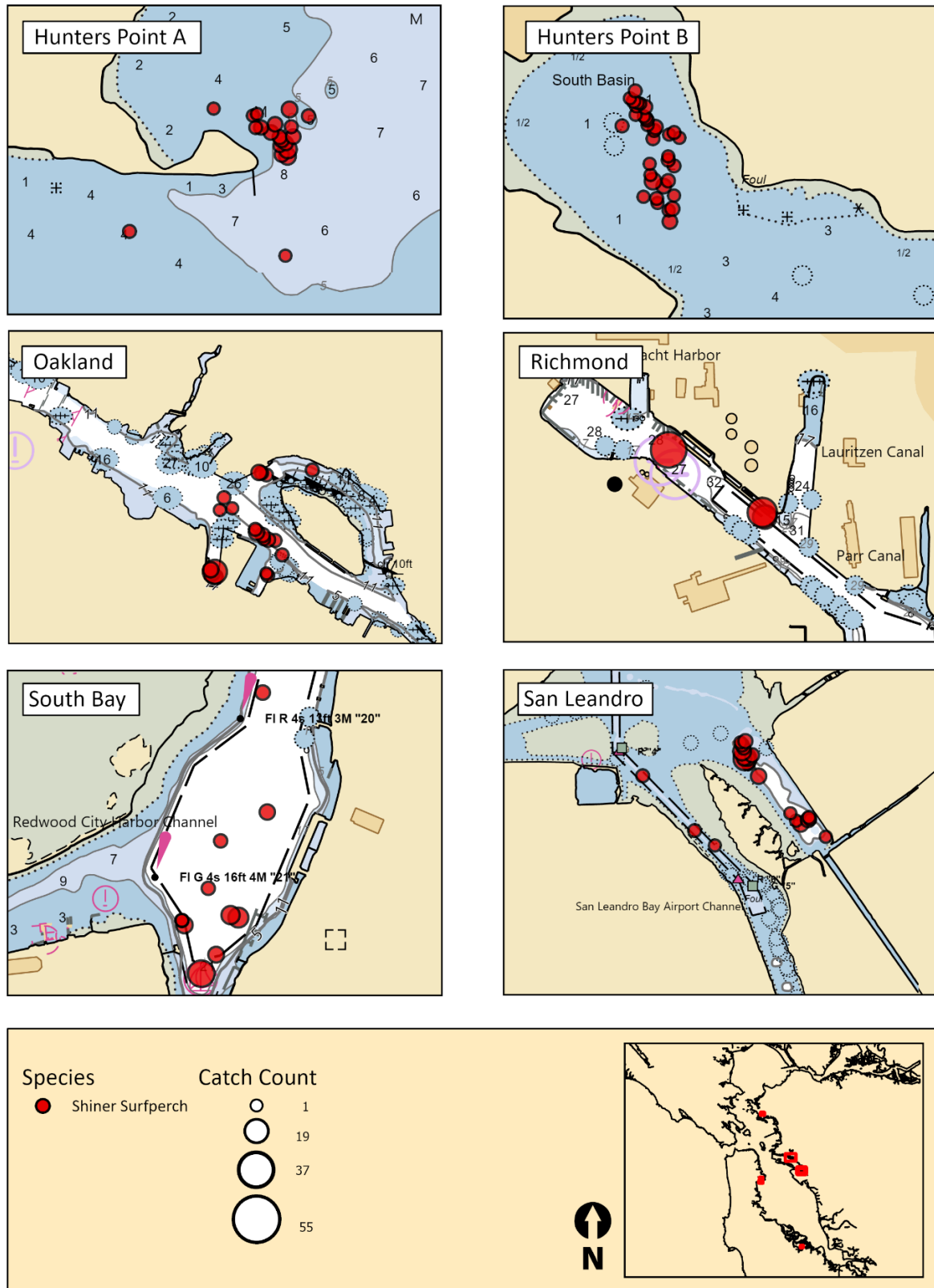


Figure 9. Fishing Effort at Hunters Point A and B. Only start locations are shown for otter trawls.



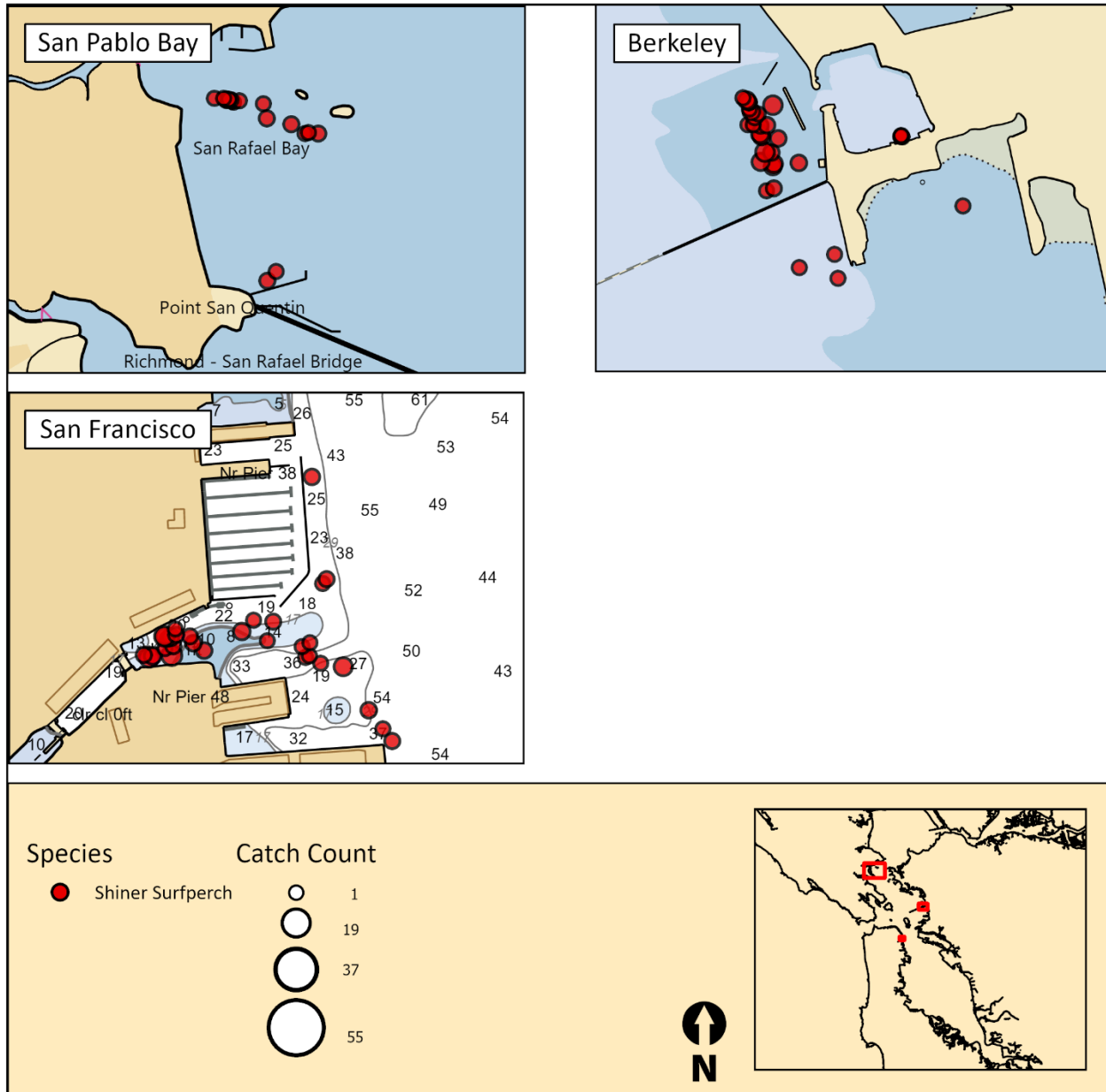


Figure 11. Fish Collections of Shiner Surfperch in San Pablo Bay, Berkeley, and San Francisco.

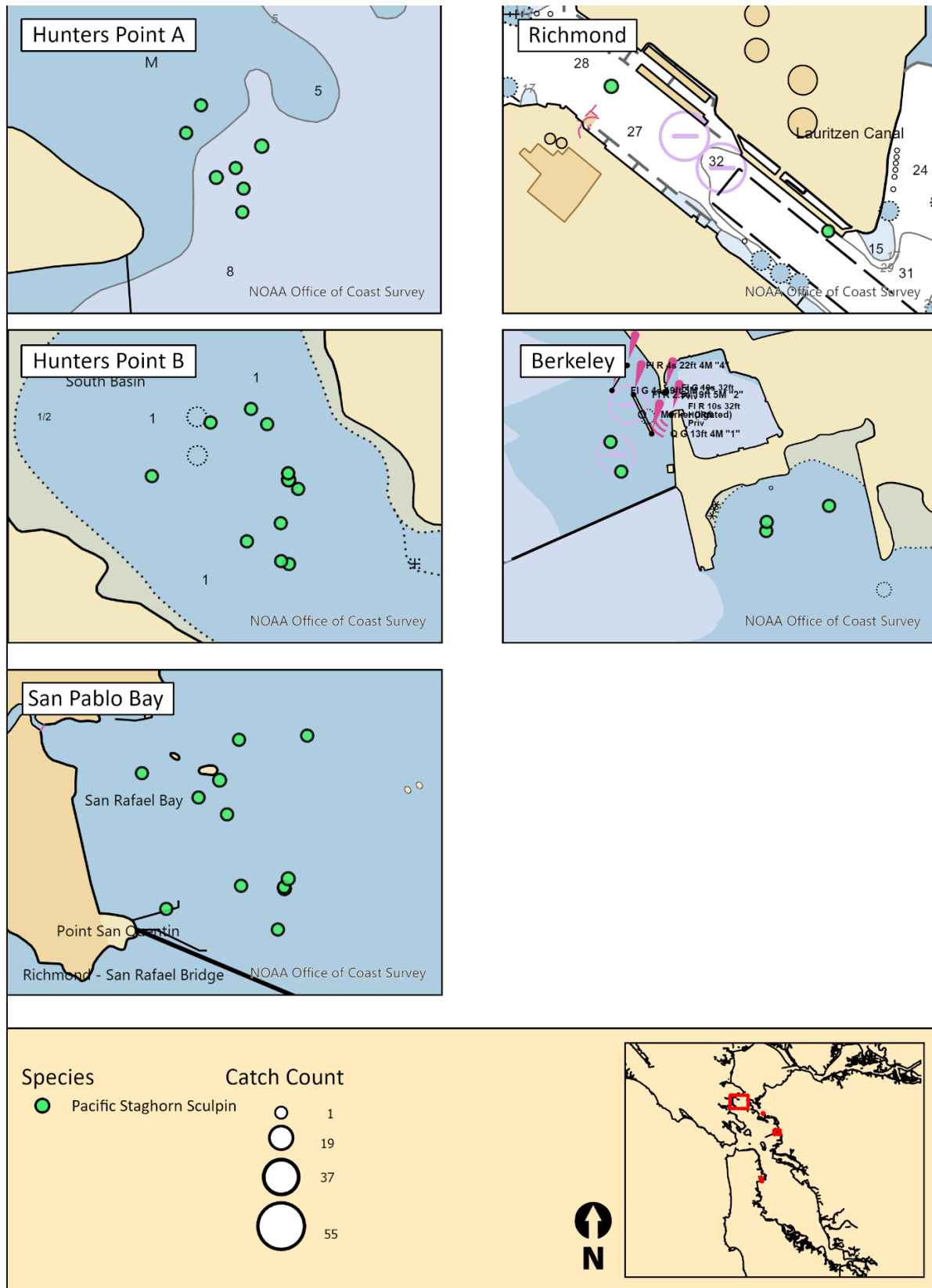


Figure 12. Fish Collections of Pacific Staghorn Sculpin.

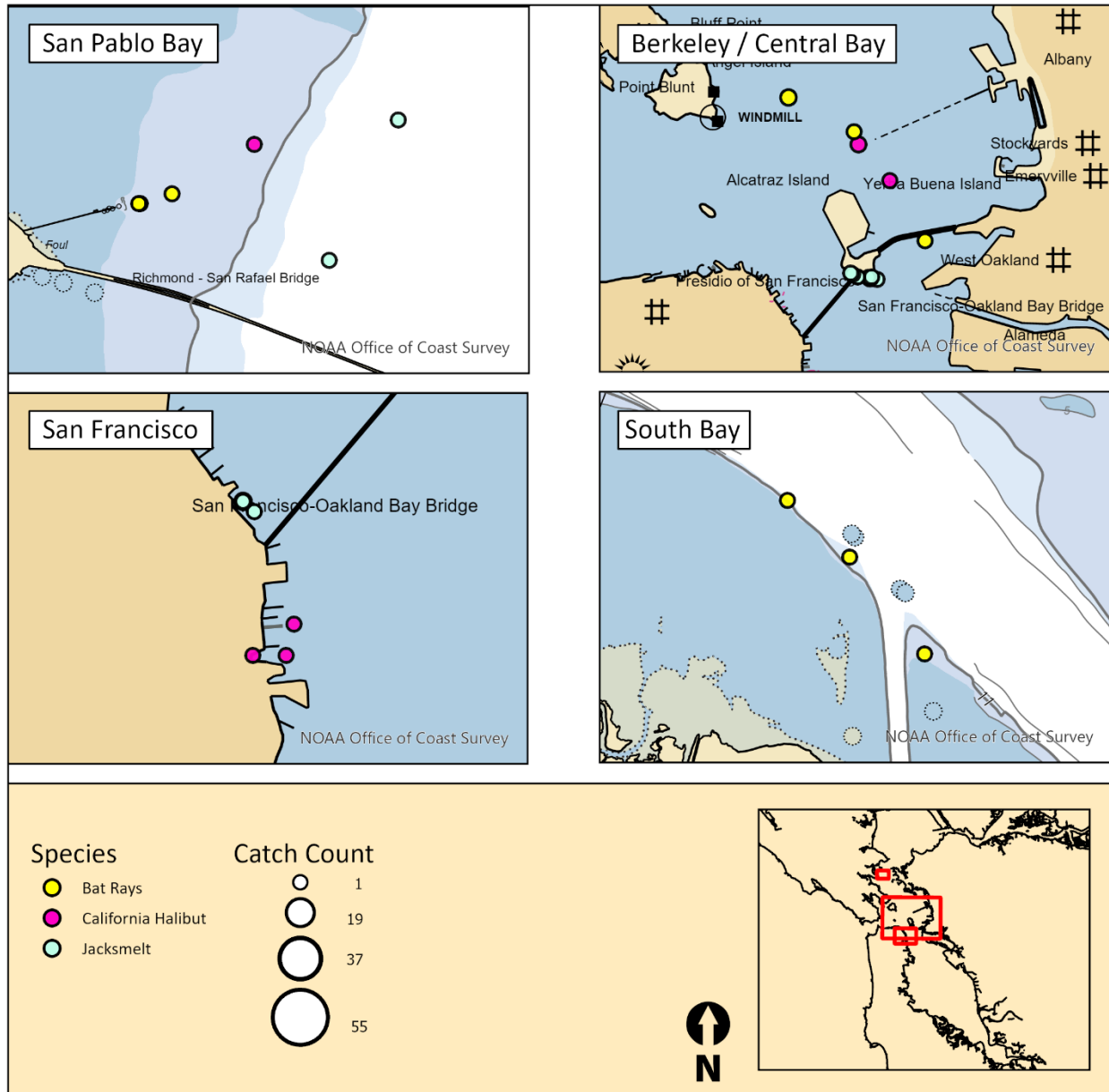


Figure 13. Fish Collections of Bat Rays, California Halibut, and Jacksmelt.

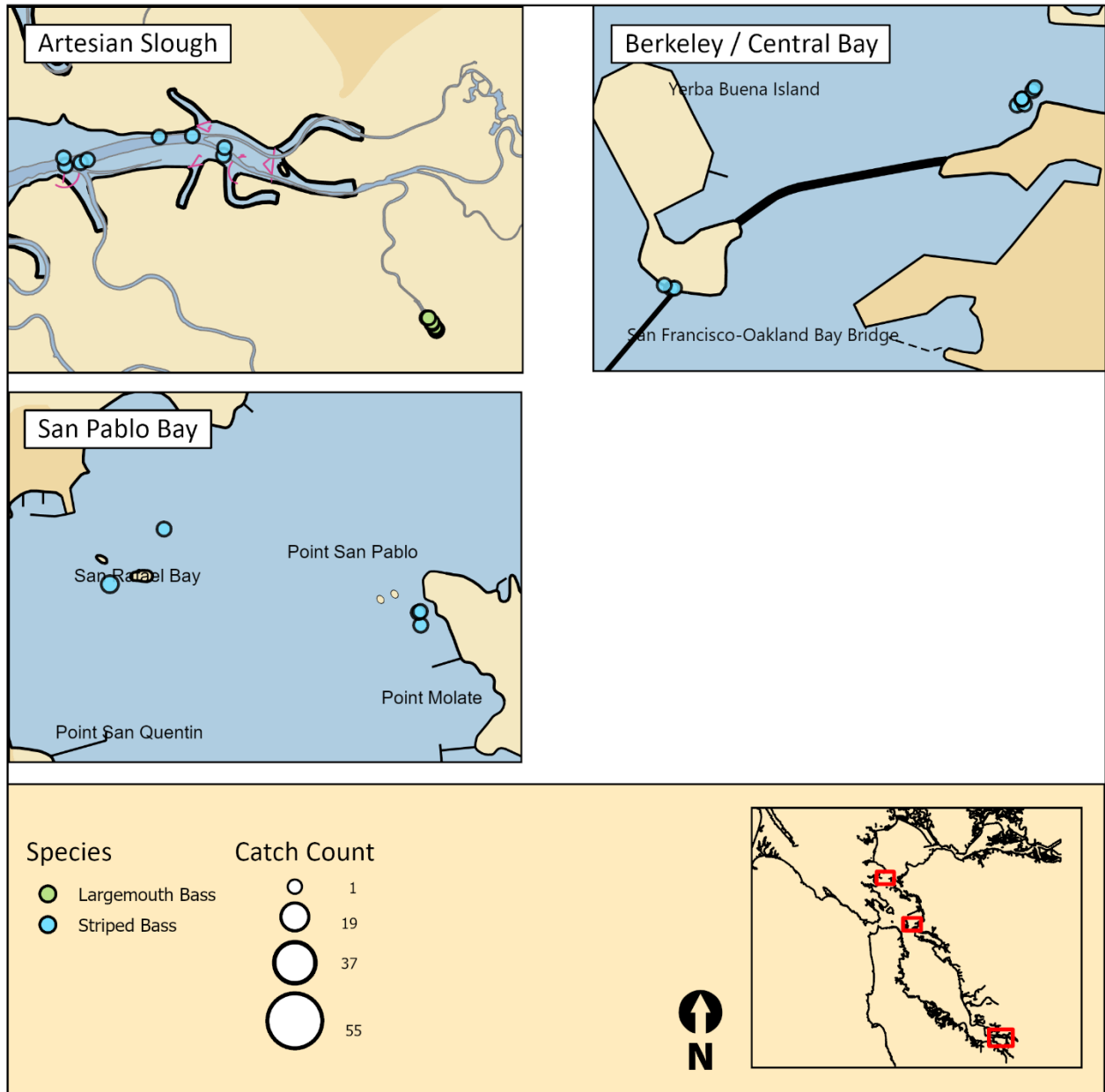


Figure 14. Fish Collections of Largemouth Bass and Striped Bass.

41