Heal the Bay's Marine Protected Area Decadal Management Review Report

A Ten-Year Summary of Marine Protected Area Outreach, Education, Research, Monitoring, and Stakeholder Engagement in Los Angeles County

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Table of Contents

Executive Summary

Heal the Bay has been a proud Marine Protected Area (MPA) partner and stakeholder for the past decade. In this report, we present to the California Department of Fish and Wildlife (CDFW) relevant information for the 2022 MPA Decadal Management Review under the four pillars of management. For Research and Monitoring, we provide three data analyses: one of human activities and observed violations in Los Angeles MPAs based on MPA Watch, the second of MPA Watch program success based on volunteer retention and participation data, and the third of a tidepool visitation survey. Findings include statistically significant decreases in observed violations in two LA County MPAs, increased MPA Watch retention over time, and recommendations for effective tidepool outreach.

For Education and Outreach, we provide summary data on community members and students reached through our outreach program via events, Speaker's Bureau, Aquarium visitation and field trips, and LA MPA Collaborative partnerships. We provide data on outreach materials printed and distributed throughout LA County. For Policy and Permitting, we provide a summary of Heal the Bay involvement in MPA regulatory updates through public comment. For Enforcement and Compliance, we provide information on how Heal the Bay work has contributed to compliance efforts and trainings conducted with enforcement officers. We then offer challenges that we have perceived both for MPA management and for our own programming.

We conclude with recommendations for CDFW and managing agencies moving forward. These recommendations include specific needs for our local MPAs, broad recommendations to achieve just and equitable outreach and enforcement for California MPAs, and recommendations for improved stakeholder engagement for this and future management reviews.

Introduction

Heal the Bay is an environmental non-profit based on the unceded land of the Tongva people, also known as Los Angeles, with over 35 years of experience in keeping our local waters safe, healthy, and clean. We achieve our mission and work to close equity gaps in our communities through science, education, community action, and advocacy. Since the inception of California's Marine Protected Area (MPA) network through the passage of the Marine Life Protection Act (MLPA) in 1999, Heal the Bay has been consistently active in the management of our state's MPAs. During the designation process, Heal the Bay's team of scientists and advocates was heavily involved in stakeholder engagement in Southern California through garnering support letters from our community, developing educational materials and conducting community education and outreach on MPA science, and attending MLPA open meetings and workshops. Since the designation of the MPA Network was complete, Heal the Bay has remained an active partner in MPA management for the Los Angeles region.

As a co-leader of our local LA MPA Collaborative, Heal the Bay has worked to spearhead educational programs and outreach opportunities. We have collaborated across unique and diverse stakeholders to engage with the community, increase compliance, and contribute to enforcement activity. As a founding member of the MPA Watch Statewide Network and a continuing leader in MPA community science, Heal the Bay has contributed to research and monitoring of the human dimension of MPAs. As an individual organization, Heal the Bay staff scientists have conducted informative independent research, formed academic partnerships, developed ocean and coastal stewards, and continually advocated for the success of the MPA network.

In this report, we will provide an overview of the activities that Heal the Bay has conducted over the past ten years and the subsequent relevant information from those activities on California's MPA Management Program to inform the 2022 MPA Decadal Management Review (DMR). We will focus on the four pillars of MPA management: Research & Monitoring, Outreach and Education, Policy & Permitting, and Enforcement and Compliance.

Research and Monitoring

MPA Watch

Program Overview

Heal the Bay was a founding member of the MPA Watch program and subsequent MPA Watch Statewide Network. Since its start in 2011, Heal the Bay's staff, interns, and volunteers have collected thousands of human activity surveys that have helped to contribute to management and provide insight into compliance successes and challenges in each Los Angeles MPA. Heal the Bay conducts shore-based monitoring at monitoring at 22 total transect sites inside and outside four LA County MPAs: Point Dume State Marine Conservation Area (SMCA), Point Dume State Marine Reserve (SMR), Point Vicente No-Take State Marine Conservation Area (SMCA), and Abalone Cove State Marine Conservation Area (SMCA). In this section, we will highlight statistical trends and insights that 10 years of MPA Watch data have provided. Image 1, to the right, shows an infographic entitled "Heal the Bay MPA Watch 2011-2021 at a Glance". The graphic reads 983 volunteers trained, 55 interns trained, 22 transects established, 371,248 activities observed, 4,434 survey miles completed, and 6,540

Heal the Bay MPA Watch 2011-2021 at a Glance

983 Volunteers Trained
55 Interns Trained
22 Transects Established

371,248 Activities Observed

4,434 Survey Miles Completed
6,540 Surveys Collected

Image 1: Infographic showing MPA Watch statistics from 2011-2021

surveys collected. For more detailed information on the MPA Watch Network or MPA Watch data analysis, please reference the report "MPA Watch: Community Science for Stewardship of Ocean Resources", a DMR report submission prepared by WILDCOAST and the DMR report submission "Using MPA Watch Data to Analyze Human Activities Along the California Coast" prepared by UC Davis.

Data Highlights

Since 2011, through the MPA Watch program, Heal the Bay has trained over 1,000 community scientists as MPA Watch interns or volunteers, submitted over 6,500 MPA Watch surveys, submitted biannual MPA Watch data analysis reports to CDFW, and reported nearly 100 MPA violations to CalTIP. Across the four LA County MPAs, activities have varied in each of the four MPAs. The most common activities across all LA County MPAs were sandy beach recreation, offshore recreation, surfing, rocky beach recreation, and tidepooling. (Figure 1). Other top activities include boating, wildlife watching, and animals on leash for these four MPAs.

Top 5 MPA Watch Activity for LA County MPAs 2011-2021

● Beach Rec, Sandy (74%)
273,115
● Offshore Recreation (6%)
23,880
● Surfing (6%)
23,405
● Beach Rec, Rocky (6%)
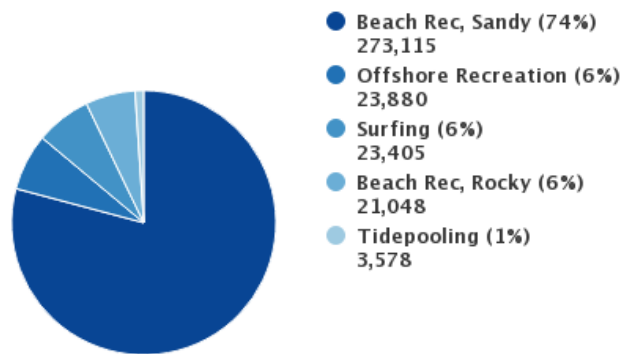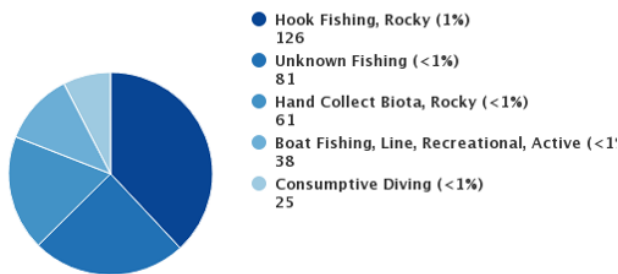21,048
● Tidepooling (1%)
3,578

Figure 1: Top 5 Overall Activities for All LA MPAs 2011-2021. This figure shows a pie chart with 273,115 counts of sandy beach recreation (74%), 23,880 counts of offshore recreation (6%), 23,405 counts of surfing (6%), 21,048 counts of rocky beach recreation (6%) and 3,578 counts of tidepooling (1%).

When looking at consumptive activity specifically, there is an interesting variation across the MPAs, indicating unique enforcement and compliance needs in these areas. For example, it appears that rocky hand collection of biota and hook and line fishing is the primary concern at Abalone Cove SMCA, a popular tidepooling location (Figure 2a), while boat-based fishing is more of a concern at Point Vicente SMCA, a known popular fishing spot for boat-based anglers (Figure 2b). We also found that consumptive activity makes up the highest percentage of total activity of all four MPAs in Point Vicente, a finding that aligns with our anecdotal knowledge of this MPA as a poaching hot spot, based on reports from local MPA users, NGOs, local rangers, and other MPA partners.

Top Consumptive Activity for
Abalone Cove SMCA 2011-2021

- Hook Fishing, Rocky (1%)
  126
- Unknown Fishing (<1%)
  81
- Hand Collect Biota, Rocky (<1%)
  61
- Boat Fishing, Line, Recreational, Active (<1%)
  38
- Consumptive Diving (<1%)
  25

Top Consumptive Activity for Point
Vicente SMCA 2011-2021

- Unknown Fishing (1%)
  179
- Hook Fishing, Rocky (1%)
  116
- Boat Fishing, Line, Recreational, Active (1%)
  95
- Spear Fishing Offshore (<1%)
  23
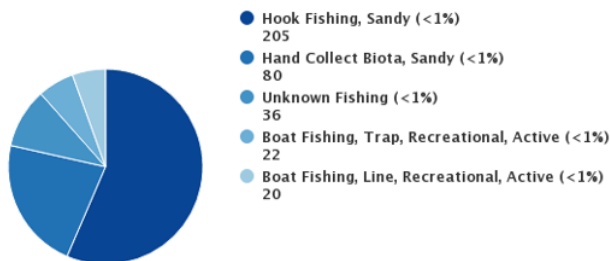- Boat Fishing, Trap, Unknown, Active (<1%)
  20
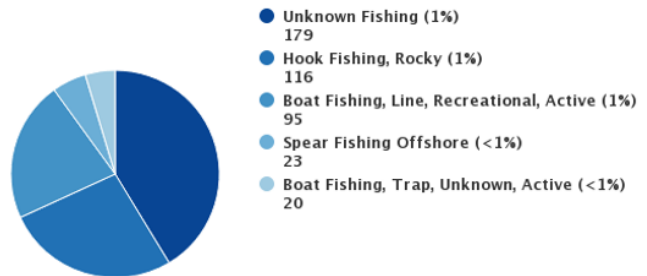
Figure 2a and 2b: Top Consumptive Activities for Palos Verdes MPAs. These figures are two pie charts, the first showing Abalone Cove SMCA to the left and the second showing Point Vicente SMCA to the right. The pie chart on the left shows 126 counts of rocky hook and line fishing (1%), 81 counts of unknown fishing (<1%), 61 counts of rocky hand collection of biota (<1%), 38 counts of active recreational hook and line fishing from a boat (<1%), and 25 counts of consumptive diving (<1%). The pie chart on the right shows 179 counts of unknown fishing (1%), 116 counts of rocky hook and line fishing (1%), 95 counts of active recreational hook and line fishing from a boat (1%), 23 counts of offshore spear fishing (<1%), and 20 counts of active trap fishing from a boat (<1%).

Whereas for the Malibu MPAs we see that the most common consumptive activities are shore-based sandy beach hook-and-line fishing and sandy beach hand collection of biota (Figure 3a and 3b). This indicates a need for more outreach on shore at these MPAs and a stronger focus on shore-based illegal take such as shore-based hook and line fishing and beach kelp collection for enforcement and compliance purposes in Malibu MPAs.

Top Consumptive Activity for Point
Dume SMCA 2011-2021

- Hook Fishing, Sandy (<1%)
  205
- Hand Collect Biota, Sandy (<1%)
  80
- Unknown Fishing (<1%)
  36
- Boat Fishing, Trap, Recreational, Active (<1%)
  22
- Boat Fishing, Line, Recreational, Active (<1%)
  20

Top Consumptive Activity for Point
Dume SMR 2011-2021

- Hook Fishing, Sandy (<1%)
  244
- Hand Collect Biota, Sandy (<1%)
  78
- Hand Collect Biota, Rocky (<1%)
  60
- Boat Fishing, Line, Recreational, Active (<1%)
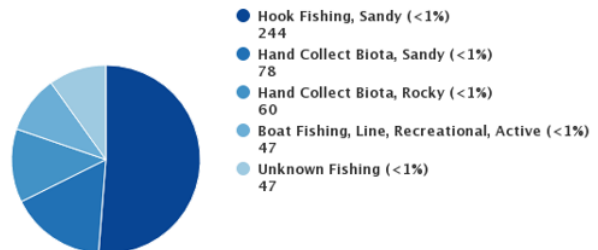 47
- Unknown Fishing (<1%)
  47

Figure 3a and 3b: Top Consumptive Activity for Malibu MPAs. This figure shows two pie charts, the first for Point Dume SMCA on the left and the second for Point Dume SMR on the right. The left chart shows 205 counts of sandy beach hook and line fishing (<1%), 80 counts of sandy beach hand collection of biota (<1%), 36 counts of unknown fishing (<1%), 22 counts of active recreational trap fishing from a boat (<1%), and 20 counts of active recreation hook and line fishing from a boat (<1%). The right chart shows 244 counts of sandy beach hook and line fishing (<1%), 78 counts of sandy beach hand collection of biota (<1%), 60 counts of rocky beach hand collection of biota (<1%), 47 counts of active recreational hook and line fishing from a boat (<1%), and 47 counts of unknown fishing (<1%).

Of the data our volunteers have collected, some of the most interesting data is on *observed potential violations.* These observations can provide an indication of how compliant MPA users are with the local regulations and where and what kind of compliance efforts are most needed. Over the past ten years, MPA Watch volunteers recorded a total of 1,646 potential violations across 4,434 survey miles, an average rate of 0.37 violations per mile surveyed. Over the past decade, however, that rate of violations has varied year to year.

We calculated violations observed per survey mile by each specific transect for each of the four MPAs surveyed by Heal the Bay over the past 10 years to normalize the data (Figure 4). Across all four MPAs, violations observed peaks in 2012 at nearly 3 violations per survey mile mostly due to high rates in Abalone Cove SMCA. Over time, that total rate appears to decline and those declines are predominantly reflected in two of the four MPAs, indicating a possible **increasing rate of compliance in MPA regulations over time.** This raw data is, however, insufficient to support a significant trend.
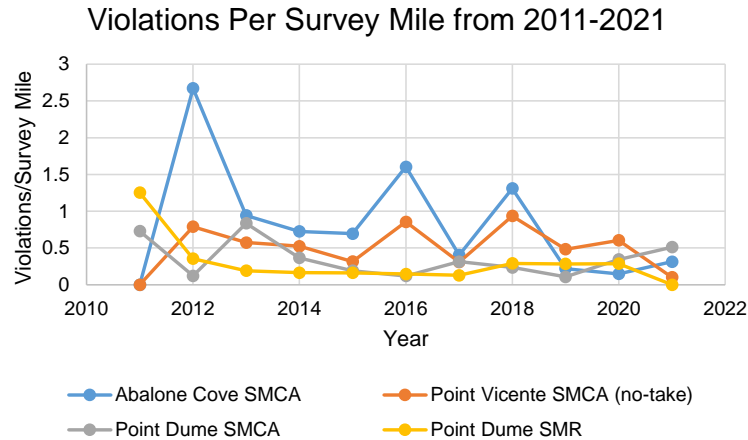

Figure 4: Violations per Survey Mile in the four Los Angeles County MPAs since 20ll. Violations per survey mile is calculated for each MPA as: observed violation total per year/total number of miles surveyed per year. Miles surveyed is calculated per transect and them summed across the MPA per year. This figure shows a line graph with years 2010-2022 on the x axis and violations per survey mile 0-3 on the y axis. There are 4 lines, the first in blue for Abalone Cove SMCA which shows a sharp increase from 0 to 2.5 in 2012, a steady decrease from 2012 to 2015, then small increases and decreases until 2019, then a steady decrease to almost 0 in 2021. The second line is grey for Point Dume SMCA and shows small increases and decreases from 2011 to 2014 then steady or small decreases under 1 until 2019, and a small increase up to 1 until 2021. The third line is orange for Point Vicente SMCA which shows small increases and decreases under 1 from 2012 through 2020 and a decrease to nearly 0 in 2021. The final line is yellow for Point Dume SMR and shows a steady decrease from just above 1 down to 0 from 2011 to 2021.

To verify any significant trends, we ran a logarithmic regression analysis on each of the four LA MPAs specifically. When looking more closely at the violations per survey mile in each MPA, there is a downard trend in observed violations in two of the four MPAs (Figures 5a and 5b). We calculated P-values for each of these regressions and **found downard trends for Abalone Cove SMCA** (P-value= 0.0118) **and Point Dume SMR** (P-value=0.0467). These P-values show statistically significant downward trends. **This indicates that fewer violations are observed by MPA Watch volunteers over time in these two MPAs** and that, as time
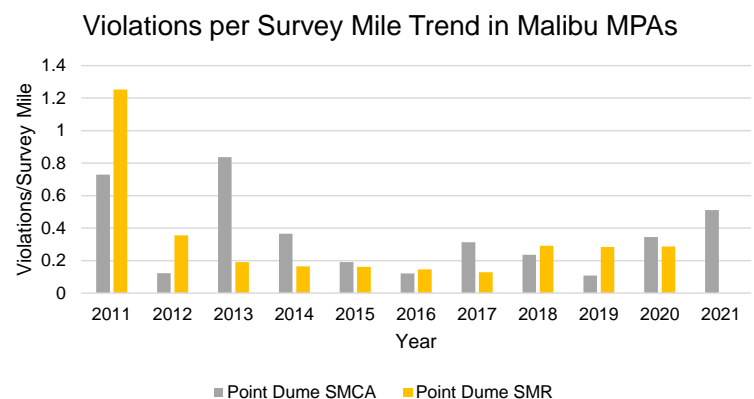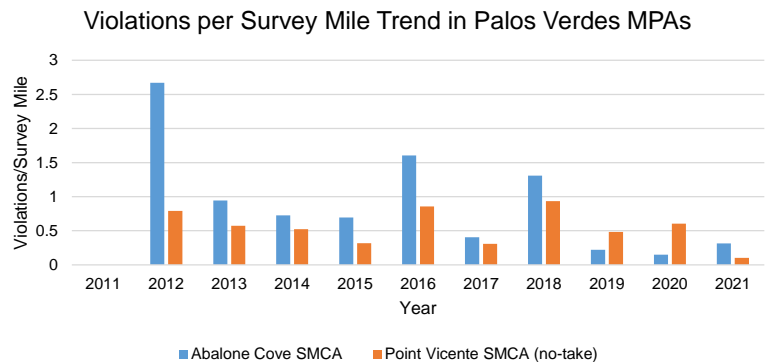
passes, **consumptive ocean users are may be better complying with MPA regulations.**

The two MPAs without a significant downward trend in MPA violations over the past decade are Point Vicente SMCA and Point Dume SMCA. These MPAs are anecdotally noted to have poaching hot spots. Based on this analysis of observed violations and the data presented above showing higher rates of consumptive activity in Point Vicente SMCA, it is clear that **increased compliance mechanisms are needed in the Point Vicente SMCA and Point Dume SCMA**, such as outreach and enforcement presence.

Volunteer Highlights

The MPA Watch program is about much more than the data we collect. While this data is invaluable and provides essential insights into the human dimension of MPAs, as the above analysis shows, **volunteer participation and ocean stewardship are also essential goals of MPA Watch**. As a part of this 10-year reflection on our MPA activities, Heal the Bay analyzed our volunteer participation to gain a better understanding of where we can improve retention, recruitment, and overall participation to increase community involvement in MPA management. We developed a Python workflow method to clean MPA Watch data and extract individual volunteer behavior data that was previously inaccessible.
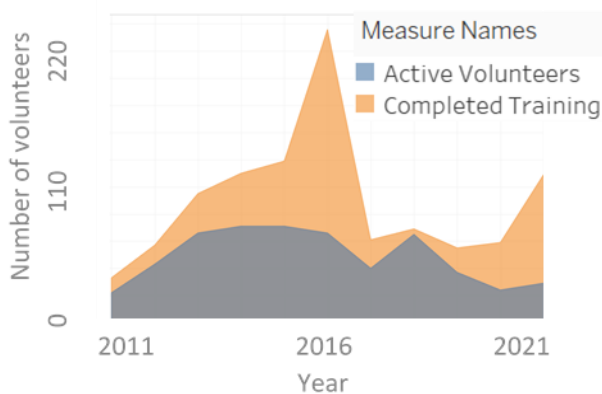

Figure 6: Conversion of trained MPA Watch volunteers to active volunteers. This figure is a line graph tracking two data metrics over time on the x axis between the years 2011 and 2021 with number of volunteers displayed on the y axis.

We first established a basic understanding of MPA Watch volunteer behavior by assessing metrics including the conversion of trained volunteers to active volunteers, annual active volunteer retention (volunteers who stay on from the previous year), and active volunteer duration. Our program has varied in the number of volunteers trained each year as well as the number of volunteers who subsequently became "active volunteers," otherwise known as trained volunteers who submitted at least one MPA Watch survey. The years 2016 and 2021 experienced unusually **high drop-offs of volunteers between the training and becoming an active volunteer**, losing 68 and 69% of volunteers respectively (Figure 6). The average loss of volunteers from trained to active status over 10 years is 33% with a strikingly large standard deviation of 22%. By tracking this metric, we can make **operational changes and assess whether they reduce the loss of trained volunteers who don't become active, increasing retention and subsequently increasing community involvement in MPAs**.

We next calculated our program's annual retention rate using the following formula: retention rate = active volunteer # retained from the previous year / active volunteer # from the year of interest x 100. **Our volunteer retention has increased from 14% in 2012 to 29% in 2021 with the average retention rate being 27%** (data not shown).

To understand how long a single volunteer stayed active in our program, we calculated the volunteer duration using the following formula: volunteer duration = (date of a volunteer's most recent survey submitted – the date of their first survey submitted) / 365 days per year. Many volunteers stay active for only 30 days or less, making this threshold the second distinct drop-off point for volunteers after the conversion from trained to active. However, **many dedicated volunteers stay for years with our current record-holder remaining active for 8.2 years** (Figure 7). Upon this discovery, we defined volunteers who stayed active for more than 30 days as "dedicated volunteers," and their average active duration is one year.

Opportunities for Ocean Stewardship in MPA Community Science
The MPA Watch program strives to cultivate and maintain informed and active ocean stewards. An ocean steward is someone who takes personal responsibly for the protection of our marine resources and dedicates some of their time and resources to the cause. The more personal experience and local knowledge a steward has with a cause, the more likely they are to be a strong advocate.[i] MPA Watch volunteers gain stewardship experience in four main ways: by **performing more surveys, visiting more transect sites, performing an MPA Watch internship, and participating in other Heal the Bay scientific collaborations.**

To better understand how MPA Watch could increase ocean stewardship in Los Angeles, we looked at experience gained through surveys and distinct transects. MPA Watch volunteers make up 90% of the program's active surveyors, while completing 64% of the total MPA Watch surveys. **Dedicated volunteers performed an average of 21 surveys on 9 fieldwork days at 5 distinct transect sites (Figure 8).** MPA Watch interns make up 10% of the program's active surveyors, while completing 36% of the total MPA Watch surveys. Interns completed more surveys per distinct day spent surveying than volunteers, averaging 50 surveys on 13 fieldwork outings across 10 distinct survey sites (Figure 8).
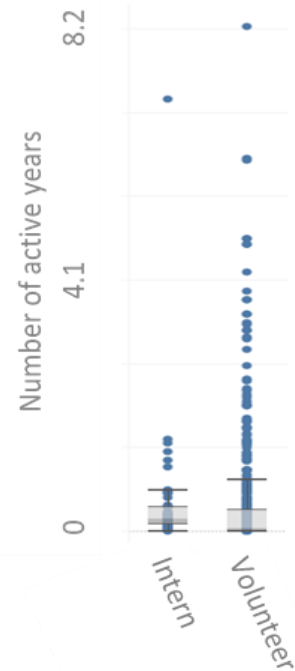
Figure 7: Duration of active survey collection by MPA Watch interns and volunteers. This figure is a box and whisker plot that highlights the median value and interquartile range in a box. Outside are the whiskers which highlight the minimum and maximum score excluding outliers. An outlier is defined as values that are at least 1.5 times outside the interquartile range. This plot is separated into to metrics on the x axis, interns and volunteers, and displays time on the y axis in units of years. This plot shows that the majority of volunteers remain active in our program for a year or less, with many outliers remaining between 1 and 4 years and several remaining between 4 and 8.2 years. In contrast, most interns stay for less than one year with few outliers remaining longer.
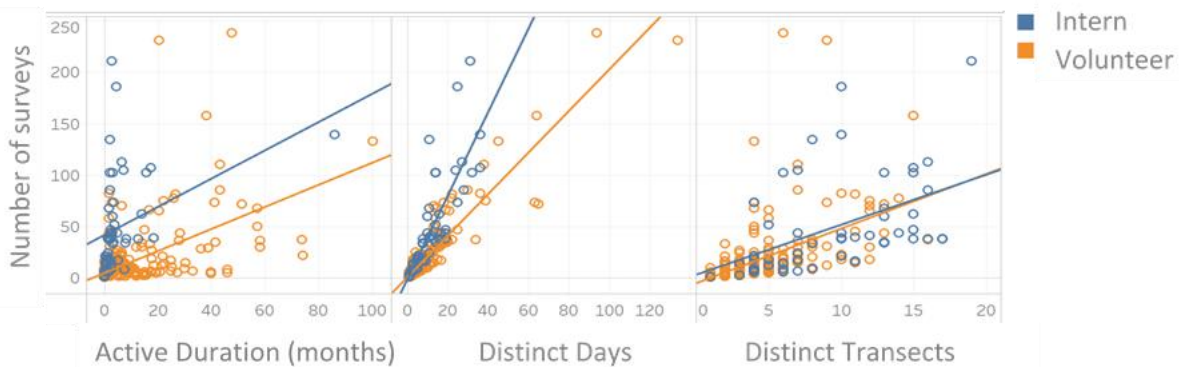
Figure 8: Intern and volunteer survey behavior. This figure is a series of 3 scatter plots with number of surveys displayed on the y axis. The x axis is different for each plot. Each dot on the plots represents a single volunteer or intern (the two are differentiated by the colors

Over the past decade, our MPA Watch interns and volunteers have gained a great deal of experience, as this analysis shows, in increased transects visited and surveys conducted over time. This connectedness with our local coasts and oceans increases stewardship, and shows how powerful this program is at connecting our community with their local MPAs.

Perhaps even more so than volunteering, our MPA Watch internship program has shown incredible success over the past decade. As a part of this seasonal program, our interns collect MPA Watch surveys, perform Quality Assurance Quality Control (QAQC) protocols on MPA Watch data and complete independent research projects related to marine conservation policy, science, or outreach. These independent research projects have resulted in fascinating deliverables that can be found in the appendix of this report, such as information posters, analysis of MPA awareness by visitors, and case studies on combining MPA management with sustainable fisheries management and water quality regulations.

The MPA Watch internship program has consistently taken interns since 2011, resulting in 55 program alumni. Of these 55 program alumni, we were able to contact 38 past interns in December 2021 to collect information about their careers and distribute an evaluation survey. **We found that alumni of our program have found overall career successes in fields adjacent to marine conservation** (Figure 9). Of the 38 interns contacted, 14 responded to our survey about their experience with the MPA Watch program. In this survey, **57% expressed interest in helping in future MPA outreach with Heal the Bay** (data not shown). We also learned that the top perks of our program are the flexibility & opportunities for autonomy and gaining experience in outdoor field work.

MPA Watch has been at the core of Heal the Bay's involvement in MPA management, research and monitoring. For the past decade, our staff, interns, and volunteers have collected invaluable data that shows trends in human activity in our protected areas that the team at CDFW can use to increase compliance and improve outreach efforts. This program has also created a community of ocean stewards that are committed to ocean conservation, some of whom even now work for Heal the Bay full time. We are proud to contribute this data to the DMR and look forward to continuing this program for the next decade.
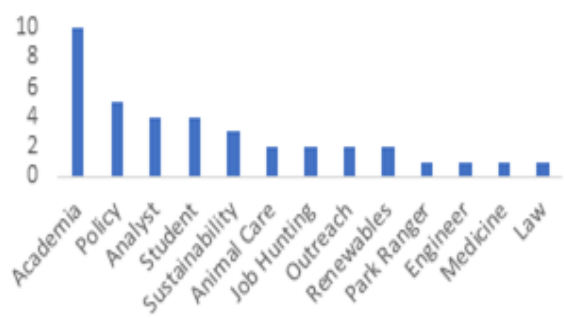
Figure 9: Current fields that previous MPA Watch interns occupy. This figure shows a bar chart with the number of interviewed MPA Watch intern alumni that responded to the survey on the y axis and the distinct professional fields displayed on the x axis. Responses ranged from highest to lowest in the following order: Academia (10), Policy (5), Analyst (4), Student (4), Sustainability (3), Animal Care (2), Job Hunting (2), Community Outreach (2), Renewables (2), Park Ranger (1), Engineer (1), Medicine (1), and Law (1).

2021 Tidepool Visitation Research Study

Study Overview

Starting in the spring of 2020, Los Angeles County, along with coastal communities statewide, experienced a massive uptick[ii] in consumptive activity in our rocky intertidal ecosystems. As a part of our response to this increase in activity (further described in

the challenges section), Heal the Bay scientists and interns developed a tidepool visitation survey with the intent to better understand the population of community members both visiting and collecting from tidepools so that appropriate management and education tools could be implemented. In the summer of 2021, staff, volunteers, and interns visited four different intertidal survey sites, two inside MPAs and two outside MPAs, and interviewed visitors for a total of 32 hours. The sites we surveyed were: Leo Carillo, Paradise Cove, Abalone Cove, and White Point Park. The survey methodology, questionnaire, and survey site map can be found in the appendix of this report.

Data Highlights

We conducted a total of 68 surveys and interviewed 204 people during the survey process using a randomized exit survey. We asked participants about where they were visiting from, what activities they were participating in, and what languages they spoke. If they indicated they were there to collect wildlife, then we asked additional questions about their collecting activity. Most visitors were there to observe wildlife in the tidepools or to recreate on the beach (81%) (Figure 10). Other activities included beachcombing, having a meal, or walking a pet. These activities vary by location, with tidepooling least common at Paradise Cove and most common at White Point Park (Figure 10).
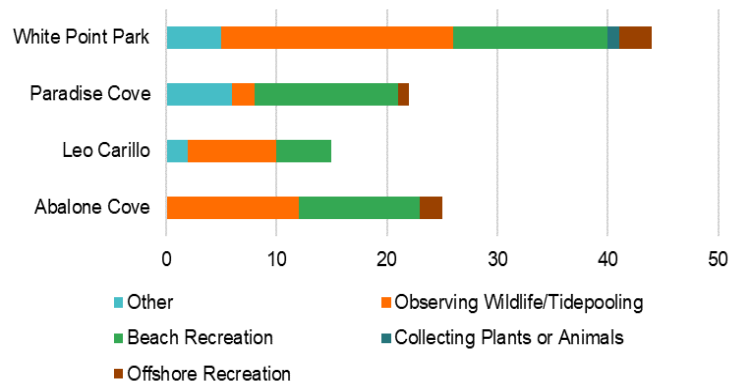

Figure 10: Tidepool Activity by Location across All 4 Survey Sites. This figure is a horizontal stacked bar graph with tidepool location on the y axis and response count on the x axis. The key at the bottom highlights 5 activities: beach recreation, offshore recreation, observing wildlife/tidepooling, collecting plants or animals, and other. The chart shows the most responses for White Point Park and the highest percentage of wildlife observation responses and the only collection responses. Beach recreation and offshore recreation don't show much variation across sites.
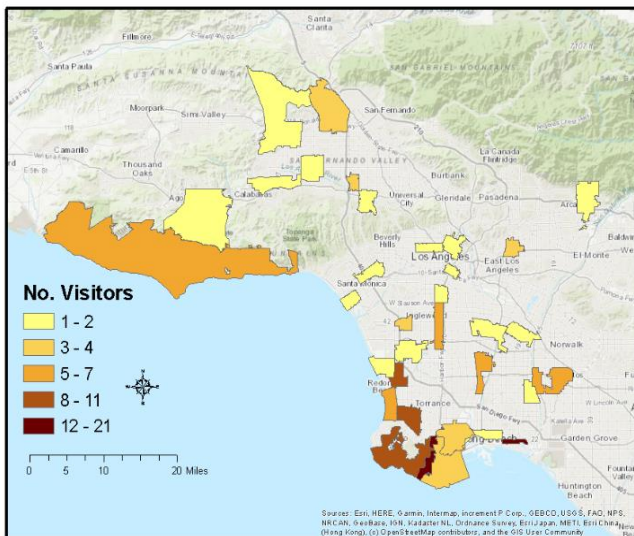

Figure 11: Heat Map Displaying Density of Tide Pool Visitor Zip Codes across all 4 survey sites for LA County, which comprised 88% of the zip codes obtained. This figure is a map of the Los Angeles Region and shows color variations for tidepool visitors by zip code. The map shows the darkest colors (highest number of visitors) in the San Pedro and Malibu areas with other pockets in South LA and the South Bay.

We also analyzed home zip codes of interviewees to get a better sense of where visitors were traveling from across LA County. We found that visitation varied greatly by site: Abalone Cove and Paradise Cove (both MPA sites) were more frequented by local residents while White Point Park and Leo Carillo (non-MPA sites) were more frequented by far-traveling visitors. Across the board, we found that **visitation to tidepool sites stretched far across LA County (Figure 11), indicating a need for increased MPA and tidepool outreach and education in communities both near and far from the coast.**

While we observed and recorded many collectors present during these surveys, we were only able to speak with one collector of the 204 people surveyed. This inability to survey collectors was due mostly to a disinterest or wariness in collectors to be interviewed by our surveyors.

Many of the collectors were anecdotally observed speaking languages other than English, which indicates a potential language barrier, even though 5 of our 6 surveyors were bilingual in English and either Spanish or Mandarin and surveys were available in all three of these languages. Only 4 of the respondents we interviewed indicated that their primary language was not English. However, the lack of collectors we spoke with combined with the anecdotal knowledge that many collectors were non-English speaking and scientific evidence that the majority of subsistence anglers in LA County do not speak English as a primary language[iii] indicates that there is a strong and immediate need for **outreach and education on both MPA and tidepool collection regulations in languages other than English.** The difficulty we had interviewing collectors also indicates **that outreach likely needs to happen at the community level before collectors are at the coast.** While boots on the ground outreach can be effective, the most effective outreach we can conduct is relationship building with diverse communities across LA County to increase regulation literacy and equitable enforcement at the root.

Heal the Bay has been dedicated to contributing strong science to the monitoring and research of our MPAs while also using these research opportunities to build stewardship inside our county's protected areas. MPA Watch data and the other studies we have conducted can help to provide localized and unique perspectives in the effectiveness of these MPAs and how we can improve compliance, awareness, and management into the next decade.

Outreach and Education

LA MPA Collaborative

Heal the Bay, along with LA Waterkeeper and USC Sea Grant, co-leads our local Los Angeles MPA Collaborative. In addition to the contributions being provided by the MPA Collaborative Network's DMR report, we'd like to offer some education and outreach highlights from our work as a collaborative over the past decade. The infographic on the following page (Image 2) shows a timeline of the work the LA MPA Collaborative and Heal the Bay has done. It begins in 2011 with the launch of MPA Watch, then to the complete of the MPA network in 2012, the establishment of the MPA Collaborative Network in 2013, the launch of a Heal the Bay MPA curriculum in 2014, the Beach Survey User Report in 2015, the first Honor the Ocean event in 2016, outreach projects in 2017, Heal the Bay's MPA virtual reality exhibit launch in 2018, the launch of a UCLA/Heal the Bay eDNA study partnership in 2019, impacts of the COVID-19 pandemic in 2020, and the Heal the Bay tidepool visitation study in 2021.

Honor the Ocean

In 2016, the Los Angeles MPA Collaborative hosted the very first Honor the Ocean Celebration and Cultural Event in Malibu, California at the Point Dume State Marine Conservation Area. This event brought together diverse community members and celebrated the importance of MPAs while highlighting indigenous MPA management and stewardship in partnership with the Wishtoyo Chumash Foundation. This event was hosted a second time in 2018, and **both events welcomed over 100 community members and students** and offered educational opportunities, surf lessons, and indigenous cultural traditions.

Brochures and Posters

Over the past decade, the LA MPA Collaborative developed a bilingual MPA Fishing Guide meant to inform local anglers and collectors of MPA boundaries and regulations and provide legal alternatives for certain consumptive activities outside MPAs. This guide can be found in both **brochure and poster form and over 8,000 have been printed and distributed** to local shops, nature centers, boat launches, visitor centers, and to allied agency members and local park rangers. These brochures can

be found in the appendix of this report along with **Heal the Bay's MPA Pocket Guide, of which over 2,500 have been printed and distributed.**

Signage

With the LA MPA Collaborative and the Statewide MPA Collaborative Network (MPACN), Heal the Bay has helped to install both regulatory and interpretive signs at the four LA County MPAs. The first regulatory sign was installed in Palos Verdes in 2013 and since then **we have helped install dozens of signs at all four MPAs.** These signs were most recently updated in November 2021 in the Abalone Cove SMCA with assistance from the Ranchos Palos Verdes Park Rangers and the MPACN. Heal the Bay will continue to work with local partners and the MPACN to update signs as needed to improve MPA awareness and compliance.

Heal the Bay Aquarium

The Heal the Bay Aquarium has been providing visitors with education, outreach, and the wonder of wildlife interaction for decades. MPAs have been an essential component to the Heal the Bay Aquarium visitor experience, with an MPA exhibit highlighting the importance of these protected areas for marine wildlife like the local animals on display. Over the past decade, our **Aquarium has had 719,767 visitors.**

Our Aquarium also hosts an annual **Underwater Parks Day, an event that attracts hundreds visitors each year, totaling 3,168 over the past decade.** This event features a Virtual Reality MPA experience, book readings, MPA video screenings, MPA presentations, and educational feedings and interpretive opportunities with guests. Heal the Bay staff scientists, aquarists, and volunteers are on site to educate the public about MPAs and California's unique network during this event.

Image 2: Infographic of a 10-year timeline of MPA work by Heal the Bay and partners.

Our Aquarium also has an impressive education department that hosts school groups and field trips almost daily during the school year. Our ocean curriculum includes MPA units for K-12 students. **Over the past decade, our Aquarium has educated 103,193 students in person and 3,439 virtually.**

Digital Outreach, Events, and Presentations

Social Media

A key way that Heal the Bay connects with our LA community is through social media. Our social media channels are a powerful tool to generate stewardship, educate the public on MPAs, tell success stories, teach regulations, and recruit new volunteers. Across our social media channels, we have **140,000 followers** and subscribers, so our content reaches a wide audience. Over the past decade, we have
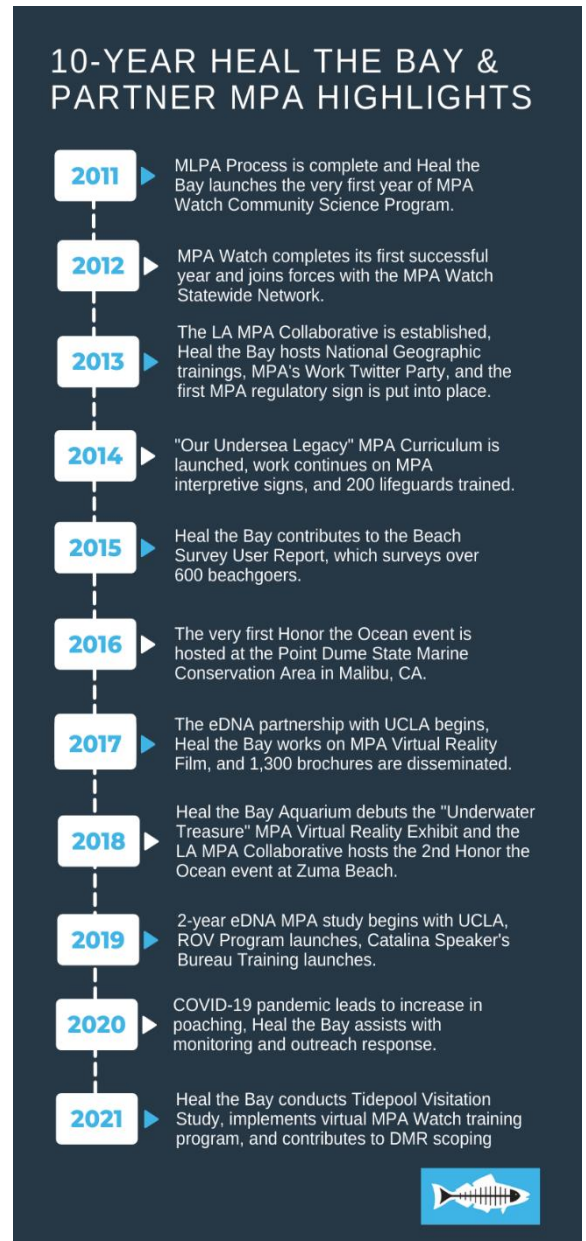
posted hundreds of tweets, Instagram posts, stories, and reels about MPAs. On Facebook alone, we published nearly 50 posts on MPA community science, regulations, and stewardship opportunities.

Digital Outreach

Heal the Bay's blog receives thousands of visitors a year, and over the past decade we have **published 83 total blog posts on MPAs**. These blogs have ranged from updates on our local MPAs, advocacy for strong MPA protections, education on MPA science, and explaining the Decadal Management Review.

10 Years of MPA Outreach

83 — MPA Related Blog Posts Published on Heal the Bay Blog

Students Educated on MPAs — 106,000

10,500+ — MPA Fishing Brochures, Posters, and Pocket Guides Printed and Distributed

People reached during Heal the Bay Speaker's Bureau Presentations — 360,000
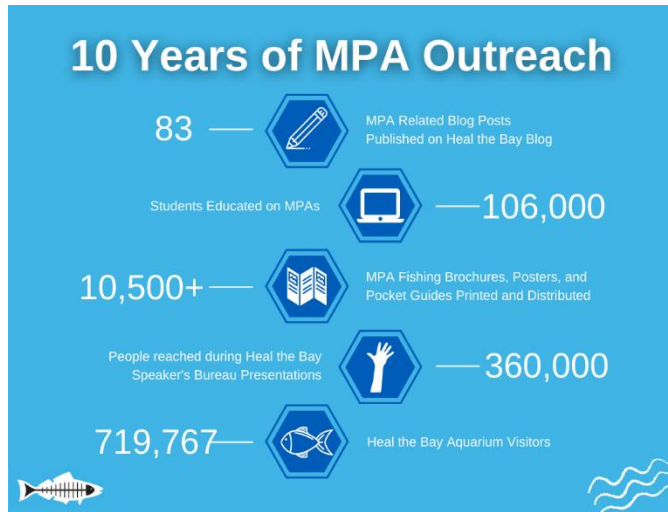
719,767 — Heal the Bay Aquarium Visitors

Image 3: This image shows an infographic highlighting 10 years of MPA Outreach: 83 blogs, 106,000 students educated, 10,500+ brochures and posters, 360,000 people reached through Speaker's Bureau, and 719,767 Aquarium visitors.

Docent Trainings and Events

Heal the Bay hosts docent trainings as a part of our MPA Watch program. These "MPA Watch Lite" trainings are specifically designed for docents, volunteers, and community members who are already in the field in and around MPAs and are designed to provide localized information on MPAs and how to spot and report illegal activity. We also host guest lectures on MPAs to community groups and partners. We have provided around a dozen of these talks over the past decade and intend to increase these in the coming years.

Events and Speaker's Bureau

As part of Heal the Bay's traditional outreach programming, we attend events where we "table" by setting up an educational booth and conducting outreach with event attendees. At these events, we educate on MPAs, water quality, plastic pollution, and much more. MPAs have been a central component to these "tablings" since the MLPA implementation process and are an opportunity to distribute MPA brochures and other educational material. **Over the past decade, we attended 642 tabling events.**

Heal the Bay's Speaker's Bureau Program offers free educational presentations to groups including corporations, community groups, and schools throughout Los Angeles County. The talks are given by trained volunteers and cover ocean pollution. MPAs are a key part of these presentations, showcased as a method to conserve and protect coastal habitat. **Over the past decade, Heal the Bay has provided Speaker's Bureau presentations to 360,000 individuals.**

Policy and Permitting

Since the passing of the MLPA and subsequent implementation process of developing and establishing California's network of MPAs, Heal the Bay has been deeply involved as a stakeholder in MPA policy and permitting. During the MLPA implementation process, our team remained integrally involved in the Southern California MPA campaign and garnered public support for the MPA network through support letters, lobby packets and advocacy press pieces, and public outreach. Since our local MPAs were established, we maintained that level of engagement in policy and permitting. Our staff scientists regularly attend and advocate at meetings of the California Fish and Game Commission and their Marine Resources Committee, the Ocean Protection Council, and the California Coastal Commission. We have given countless oral comments and submitted hundreds of written comments, at least a dozen

of which have been associated with MPA management and policy. **Our staff scientists have contributed to MLPA regulatory updates, MPA management and programmatic updates, and provided support for MPA long-term monitoring projects.**

Enforcement and Compliance

LA MPA Collaborative Compliance Efforts

The work that Heal the Bay, MPA Watch, and the LA MPA Collaborative has done over the past decade has had a direct impact on enforcement and compliance. In collaboration with the Collaborative Statewide network, we have hosted enforcement and compliance trainings and have **trained hundreds of LA County lifeguards, LA County Sheriff's department officers, CDFW wardens, Coast Guard personnel,** and other authorized personnel in MPA regulations and enforcement action. Our team has also assisted in emergency actions to improve compliance during the COVID-19 pandemic and increased non-compliant take in our local MPAs by partnering with LA MPA Collaborative members, local docent teams, and park rangers to increase boots-on-the-ground outreach to address compliance concerns. We are now co-leading an MPA Compliance project informed by needs of the last few years that will build relationships with previously unreached members of the LA community to engage in MPA management.

MPA Watch & Compliance

Our MPA Watch data can not only be used to help inform compliance, but **MPA Watch volunteers also received in-depth training on identifying and report poaching activity and have had success in contacting and assisting wardens.** In 2020, a dedicated volunteer not only reported illegal fishing activity via CalTIP in the Point Vicente SMCA, but was subsequently joined on the scene by a local CDFW warden, an experience that built connection between ocean users and enforcers and continued stewardship while helping ensure MPA compliance. While is an excellent example of how MPA Watch has assisted with MPA compliance, we have documented a discrepancy between the number of violations observed by MPA Watch volunteers and those that are reported. We are working to close that gap in coming years to increase the number of observed violations that are reported and even further enhance MPA compliance in LA County.

Challenges

Over the past 10 years, the greatest challenge we have faced outside of the COVID-19 pandemic has been **achieving far-reaching and accessible outreach to the diverse communities of Los Angeles**. The Los Angeles region, with a population of over 10 million people, is the most densely populated and diverse MPA region across the entire statewide network. Our ocean users and MPA visitors come from far and wide, across the county, state, and even nation and vary greatly in outreach needs. Developing and utilizing outreach materials, installing interpretive and regulatory signs, and generally connecting with the public in **methods and languages that are both effective and equitable has been a great challenge** not only for Heal the Bay but for all MPA partners in the region.

As can be expected, our other greatest challenge was the COVID-19 pandemic, which not only increased non-compliance, but also cut off safe access to the coast for our staff and volunteers, limited our ability to conduct in-person education and outreach, and generally put great strain on our staff and volunteers. Our MPA Watch program was greatly impacted, reducing our volunteer base and the amount of data we were able to collect. Our inter-tidal systems were inundated with unprecedented levels of take and we were ill-equipped with education and outreach that was language accessible and effective at increasing compliance. Fortunately, our team is resilient and we met these challenges with

innovative solutions, however, the past two years have been difficult for MPA work across the LA region.

Knowledge Gaps and Recommendations

Recommendations for MPA Management

A key theme throughout this report has been a need for better outreach that is effective, equitable, and far-reaching. In Los Angeles, that means **outreach in many languages to diverse groups across the region that incorporates an understanding of cultural differences** and utilizes varied methods to connect folks with the coast and ocean and encourage stewardship and regulatory compliance. We strongly recommend that **CDFW prioritize both developing and funding projects that create outreach materials, signage, and educational programs in many languages.** Language justice is an essential component to successful MPA management and must be prioritized as we move into the next decade of our state's MPA Network.

While we are well aware that funding and resources are perpetually limited at CDFW and across the MPA managing agencies, the four pillars of MPA Management cannot be upheld without it. We are thrilled to see that CDFW's budget has been increased this past year and we strongly recommend that prioritized **funding be allocated to recruiting and training southern California wardens, employing and deploying increased in-person MPA outreach personnel, developing multi-lingual outreach, improving MPA access, and building MPA resilience in the face of climate change.**

Based on our violations and consumptive activity analysis of MPA watch data, we would also **recommend specifically targeting increased offshore outreach and enforcement efforts in the Point Vicente SMCA and increased onshore outreach and enforcement efforts in the Point Dume SMCA**. Point Vicente SMCA had the highest rates of consumptive activity over the past decade and both of these MPAs did not show a significant decline in violations observed by MPA Watch volunteers. Data analyses like these have been and will continue to be shared with CDFW and partner agencies and we strongly recommend using them to help inform outreach and enforcement efforts in the field.

Recommendations for the Decadal Management Review

As this is the first ever 10-year review of California's MPA Network, there is much that can be learned and applied to this review and future reviews processes. While we recognize that conducting in-depth stakeholder engagement is no easy task, the MLPA implementation process is evidence to the MPA managing agencies' ability to incorporate and uphold the voices of many different ocean users and MPA stakeholders. Thus far in this review process, the stakeholder engagement process has been too limited. There are a number of Los Angeles-based groups doing important MPA work who were not given the opportunity to submit a report for the DMR, including many members of the LA MPA Collaborative. The stakeholder listening sessions hosted in the fall of 2021 were also insufficient in allowing all interested parties to contribute invaluable information to this review. **We strongly recommend that CDFW and all managing agencies conduct more intentional stakeholder engagement for both this 2022 management review and for all future reviews.**

Finally, **we recommend connecting directly with local agency partners, such as the Ranchos Palos Verdes Park Rangers** who have been collecting data and compiling weekly, quarterly, and annual reports on MPA tidepool visitation, take, and outreach efforts that could provide a great deal of information and insight and act as a model for other outreach teams to follow across the state.

Conclusion

For 10 years, Heal the Bay has been committed to the four pillars of MPA Management. We have contributed critical community science data on the human dimension of MPAs in Los Angeles County, trained and supported hundreds of volunteers and stewards, educated thousands of community members and students on MPAs, developed MPA outreach materials and MPA signage, advocated for strong MPA management, and acted as supporters of a community led, science-based, equitable and adaptive MPA network. We are looking forward to continued partnership with the MPA managing agencies and contributing to MPA data, outreach, and collaborative measures.

References

[i] Charles, A., Loucks, L., Berkes, F., & Armitage, D. (April 2020). Community science: A typology and its implications for governance of social-ecological systems. *Environmental Science & Policy*, *106*, 77–86. https://doi.org/10.1016/j.envsci.2020.01.019

[ii] Sahaguan, Louis. (July 2020). Crowds removing sea creatures from San Pedro tide pools put delicate ecosystem at risk. *L.A. Times.* https://www.latimes.com/environment/story/2020-07-17/unprecedented-crowds-are-harvesting-sea-creatures-from-san-pedros-famous-tide-pools

[iii] Stevenson, C., Sikich, S. A., & Gold, M. (2012). Engaging Los Angeles County subsistence anglers in the California Marine Protected Area Planning Process. *Marine Policy*, *36*(2), 559–563. https://doi.org/10.1016/j.marpol.2011.08.001

Appendices

Appendices to this report can be found in this publically accessible google drive folder: https://drive.google.com/drive/u/1/folders/1YgKjHRvpgbXsOnvqej_9RIMquU8kOmG7

The included appendices are listed and linked separately below:

1) Heal the Bay MPA Watch Intern Independent Research Projects
   — MPA Watch Awareness in Beach Visitors (2019)
   — Poaching Trends in Palos Verdes Peninsula MPAs (2020)
   — Sea Level Rise Impacts on MPA Watch in Malibu (2020)
   — MPAs and Habitats of the Santa Monica Bay Brochure (2020) and Poster (2020)
   — Incorporation of MPAs into the Magnuson-Stevens Act: A case study (2020)
   — Violation Trends in the Point Dume SMR (2020)
   — Chinese Social Media Influence on Tidepooling (2021)
   — Tribal Marine Protected Areas: TEK & Tribal Co-Management of SoCal MPAs (2021)
   — MPA Network and ASBS Program Analysis and Recommendations (2021)

2) Outreach and Education Materials
   — Southern California MPAs Pocket Guide
   — Fishing in MPAs Brochure in English and Spanish
   — Heal the Bay Southern California MPAs Infographic
   — Heal the Bay Southern California MPAs Fact Sheet
   — "Our Undersea Legacy" MPA Curriculum

3) Reports and Studies
   — Tidepool Survey Study Design (2021)
   — Beach User Survey (2015)