MPA Watch California Manual

Citizen science initiative to monitor human use of coastal natural resources

MARCH 2015

Table of Contents

Contents

Introduction

Over 10 organizations in California are mobilizing hundreds of volunteers to contribute valuable data to help to understand human uses of coastal natural resources in marine protected areas (MPAs). These MPA Watch programs are a citizen science initiative that trains and supports volunteers in the collection of relevant, scientifically rigorous, and broadly accessible data. By involving local communities in this important work, MPA Watch programs inspire and empower stewardship, and educate citizens about California's ocean ecosystems. Creating an MPA Watch program of your own will help the success of marine protected areas and help conserve California's coastal resources.

Purpose of the Manual

MPA Watch programs have been rapidly replicating throughout California since 2010. In past years, new programs borrowed materials from existing programs and adapted them for their region and local program. Since statewide MPA Watch coordination started in 2013, individual MPA Watch programs have banded together to unify survey methodology and other programmatic aspects. As a result, this master MPA Watch California Manual has been created as a guide for groups interested in starting up a new MPA Watch program, programs interested in refreshing their existing citizen science monitoring programs to align with statewide MPA Watch protocol, and for others interested to know what details are included in an MPA Watch monitoring program. This manual has been developed by the original two MPA Watch programs, The Otter Project and Heal the Bay, with technical support from California Ocean Science Trust, which leads the design and implementation of MPA monitoring for California. All existing MPA Watch programs, listed below, also contributed to development of this manual. This document contains all the information necessary to build a program that recruits, trains, and manages volunteers in the collection of data in and around marine protected areas, in order to contribute data that keeps with the standards adopted by the broader MPA Watch network. We hope that this MPA Watch California Manual is helpful as you create your volunteer citizen science program to help monitor marine protected areas.

Overview of MPA Watch

With the implementation of the Marine Life Protection Act (MLPA) and the required new network of MPAs, also came the task of monitoring if these areas are successfully meeting their goals. Organizations invested in the health of the California coastline began monitoring and collecting data in and around these areas. The MPA Watch program has been designed with the help of social and biological science experts throughout the state of California with the intention of collecting data on human activity and resource use. This data is meant to inform the management, enforcement, and science of California's marine protected areas (MPAs) and allow us to see how human uses are changing as a result of MPA implementation.

MPA Watch Statewide Program Goals:

1. To help determine how effective MPAs are at meeting their goal of enhancing recreational activities by tracking changes and trends of human use over time.
2. To provide contextual information on human use for interpretation of biological monitoring data.
3. To inform MPA enforcement and management decisions regarding human activity inside MPAs.

4. To train MPA Watch volunteers as stewards and effective public educators regarding MPAs.

Potential users of MPA Watch data include academia, natural resource management agencies, and local communities. A key focus for the program is to inform California's management of MPAs. In addition to data-oriented goals, MPA Watch programs aim to involve local communities in learning about marine and coastal resources, and to inspire and empower ocean stewardship. We always welcome new volunteers to experience California's beautiful coastline while collecting data that will help protect our precious resources.

Background on Marine Protected Areas

Marine protected areas (MPAs) are marine or estuarine waters set aside primarily to protect marine life and associated habitat. The network of MPAs along the coastline of California was required by the Marine Life Protection Act of 1999 (Appendix J-vi.). MPAs exist at all levels of government, from National to local. For the purposes of this manual "MPA" will refer to the state-level protected areas. MPAs have varying levels of protections and allowed uses, from "no-take" zones to those that allow some take of marine life. Just as parks on land are designed to protect special lands and wildlife from over-development and hunting, these underwater parks are designed to preserve complete marine ecosystems for future generations to observe and enjoy.

While each MPA has its own unique set of permitted and prohibited uses, most MPAs fit into three types:

1. State Marine Reserve (SMR) – Marine life completely protected in these no-take areas.
2. State Marine Park (SMP) – May allow some recreational take, but does NOT allow commercial take.
3. State Marine Conservation Area (SMCA) – May limit recreational and/or commercial take.

California's coast and ocean are among our most treasured resources. The productivity, wildness and beauty found here are central to California's identity, heritage and economy.

MPAs conserve biological diversity and protect a variety of marine habitats, communities and ecosystems for their intrinsic value, while allowing for human use of marine resources. By protecting sensitive ocean and coastal habitats, marine life flourishes and, in turn, creates a healthier system overall.

Statewide MPA Watch Coordination

Technical Coordination

While MPA Watch programs all take a similar approach to measuring human use of ocean resources, there are also some differences across programs as a result of program size, total area covered, variation in regional characteristics or specific questions that are of interest to individual programs. MPA Watch programs collaborated with the Ocean Science Trust to enhance and expand the relevance and utility of the data collected by exploring differences, and where possible, aligning methods and protocols. Best practices, guidelines, and protocols for current and future locally-organized MPA Watch programs were developed to support MPA assessments and adaptive management; inform enforcement, compliance, and education efforts; and build social capital through engagement of local communities in statewide MPA Watch efforts. In addition, the resulting statewide database of human use activity can inform a variety of academic studies and other data needs unrelated to MPAs.

Current MPA Watch programs

Organizations currently training MPA Watch volunteers (2015):

- California Academy of Sciences (Marin County)
- Farallones Marine Sanctuary Association (San Mateo and Mendocino Counties)
- Heal the Bay (Los Angeles County)
- Lighthawk, air-based only (Southern CA)
- Los Angeles Waterkeeper, boat-based only (Los Angeles County)
- Orange County Coastkeeper (Orange County)
- The Otter Project (San Mateo, Santa Cruz, Monterey, & San Luis Obispo Counties)
- Point Reyes National Seashore (Marin County)
- San Diego Coastkeeper (San Diego County)
- Santa Barbara Channelkeeper, boat and land based (Santa Barbara County)
- The Bay Foundation, air-based only (Southern CA)
- West Marin Environmental Action Committee (Marin County)
- WiLDCOAST (San Diego County)

Advisory Committee

MPA Watch programs believe that it is important to secure, and effectively implement, expert input to demonstrate that MPA Watch products are accurate, reliable, and unbiased, and to ensure that processes are put in place to link these products to potential users. To this end, MPA Watch California has an Advisory Committee of individuals that collaborate with MPA Watch program partners to provide objective and expert support on ongoing scientific, technical and management needs.

The Advisory Committee is working to:

1. Provide advice and review of requested scientific, technical and management questions pertaining to MPA Watch practices;
2. Identify opportunities for MPA Watch data to address scientific and management needs and link with other relevant initiatives;
3. Inform synthesis reports designed to present MPA Watch results to stakeholders;
4. Help raise awareness and facilitate communication of MPA Watch activities in their; and relevant disciplinary and institutional setting.

The Advisory Committee is composed of individuals from key user groups (e.g., social science, natural science, and resource managers) that represent the wide set of interests in MPA Watch products based on either disciplinary experience

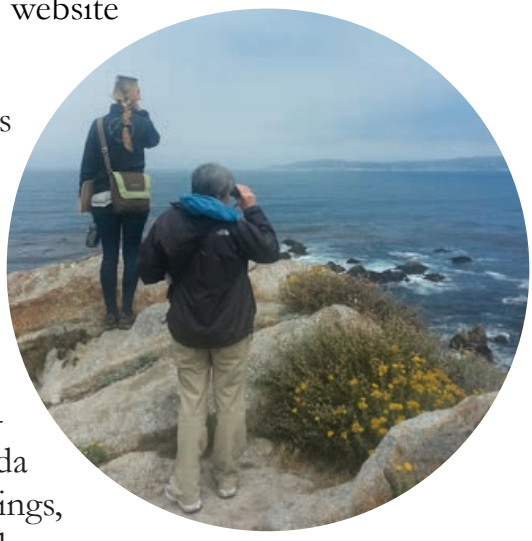
or institutional setting. This group has differentiated roles that map onto the questions which MPA Watch data are intended to answer, as well as the management needs they might fulfill. The MPA Watch network appoints representatives who staff the Advisory Committee and serve as a liaison between these experts and the MPA Watch programs.

Members as of January 2015 include:

1. Becky Ota, CDFW (natural resource manager)
2. Bob Puccinelli, CDFW (enforcement officer)
3. Cheryl Chen, Point97 (social scientist)
4. Christina Donehower, State Parks (natural resource manager)
5. Jenn Caselle, UCSB (biological scientist)
6. Ryan Vaughn, independent (social scientist)
7. Steve Murray, retired Cal State Fullerton (biological scientist)

To learn more about the Advisory Committee members visit the MPA Watch website (www.mpawatch.org).

The Advisory Committee has provided insightful feedback on a number of issues to date such as appropriate tools and standards for data analysis, and is poised to play an influential role in MPA Watch efforts. MPA Watch representatives work to set the agenda for Advisory Committee meetings, which take place approximately every three to four months.



Governance of the MPA Watch Network

Addressing issues such as communications, data analysis, QA/QC, branding and exploring partnerships is a daunting task for a single citizen science organization. While many agreements have been made regarding methods, QA/QC practices, and data management, among many other issues, there will be a need for continual adjustment and improvement over time. MPA Watch programs recognize these challenges and are working to put in place processes that can guide decision making in the future. Thus, one of the most important functions of a local MPA Watch program is participation in the wider statewide network. Solidifying this collaborative work, and sustaining the statewide network will require proactive communication and participation on the part of all programs, as well as leadership to ensure that the programs remain in alignment, and that they all have a voice in determining future adjustments and improvements to the MPA Watch approach.

Key Elements of an MPA Watch Program

While operating independently, California MPA Watch programs all collaborate on core elements and take a similar approach to measuring human use of ocean resources. All programs involve several key aspects such as carefully-designed survey sites and transect routes, volunteer classroom and field trainings, data collection and management, and standard quality assurance and quality control (QA/QC) practices. Inherent to any social science monitoring project is some level of error that affects the interpretation of the results. Researchers attempt to control for this error and enhance the confidence in their findings by introducing methods and protocols. Implementing technical strategies, such as QA/QC practices, can enhance the accuracy of monitoring outputs. Benefits gained must be weighed in the context other citizen science programmatic considerations such as the goals of the monitoring project and the availability of resources for implementation.

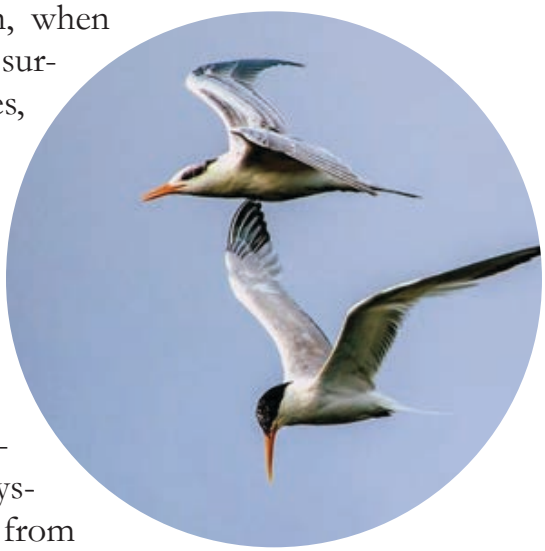
Key commitments of MPA Watch programs in California include:

1. Participation in the statewide MPA Watch Program
2. Data entry into the online database at mpawatch.org
3. Commitment to the goals outlined above
4. Commitment to follow the standards in this guide.

MPA Watch methods and protocols have been designed with these analytical and practical challenges in mind. The following sections address key issues for consideration when designing a strategy for collecting, recording and analyzing data. This knowledge comes from a range of sources, including literature in the social sciences, expert consultation including the MPA Watch Advisory Committee, application of these practices, and the resulting lessons learned by MPA Watch programs.

Designing Your Monitoring Program

MPA Watch program management takes place at the local level, administered by the local MPA Watch program. The considerations below offer guidance to programs in selection of transect routes, volunteer training, and program management. One of the first things a program should do is define their total coverage of the coast, understand where MPAs are, and make sure coordination is not overlapping with other MPA Watch programs. Defining sites, and transects within those sites, is a careful balance between practical and scientific considerations.



In addition, when scouting survey routes, program managers will need to map and define methods of conducting surveys- such as from a bluff, or walking along the beach. Program managers will also need to define transects with a specific start point and end point, and map them clearly in the local program's volunteer field guide so transect routes are easily findable, surveys can be completed accurately, and safety considerations such as tides are identified.

Where to Survey

A number of standard characteristics have been documented as important determinants in where people choose to go to the coast. These attributes can be used to understand the similarities and differences across potential survey sites. According to the social science literature, sites that

are similar in terms of the attributes listed in Table 1 will likely experience similar levels and types of human uses. It follows that the collection of data at one site can be extrapolated with the appropriate assumptions to estimate use at another site with similar characteristics.

This knowledge can help MPA Watch programs capitalize on effort by minimizing the collection of data at similar sites, with the acknowledgment that the activities and site attributes of interest may vary by program.

There are varying methods that can be used to identify the similarities and differences across survey sites. To date, existing MPA Watch survey sites have been evaluated for their similarities and differences using a method known as cluster analysis that attempts to group objects (site transects in this case) according to the similarity of the characteristics listed in Table 1 below.

Table 1. Key site attributes that influence coastal visitation patterns:

Attribute	Definition
Length	Length of site according to predefined values.
Width	Average width of the beach (back beach to the mean tide line).
Water Quality	Nearest Beach Report Card Grade on water quality.
Beach Type	Beach type (sandy/rocky).
Access	Type of access to beach.
Lot Parking	Presence or absence of lot parking.
Street Parking	Presence or absence of street parking.
Natural	Indicator of natural status. A natural beach is not groomed, and native vegetation is allowed to persist within the sandy area. Chosen from drop down.
Development	Indicator of development near the beach site. Development is indicated by the presence of residential or commercial construction visible from the shore.
Harbors/Marinas	Presence or absence of harbors and/or marinas in the site.
Jetties	Presence or absence of jetties in the site.
Camping	Presence or absence of camping availability at the site.
Boardwalk/Bike Path	Presence or absence of a beach boardwalk or bike path in the site.

Attribute	Definition
Lifeguard Stations	Presence or absence of lifeguard towers during the months of June - August.
Restrooms	Presence or absence or permanent bathrooms.
Surfing	Presence or absence of a well-known surfing destination in the site. If a report for a site is listed on surfline.com it is well known.
Diving	Presence or absence of a well-known diving location in the site.
Tide pooling	Presence or absence of well-known tide pooling location in the site.
Latitude/Longitude	Latitude and Longitude of the start and end points of the site, in decimal degrees.

Selecting Survey Sites & Transects

Once sites are identified, the path, or transect, on which volunteers will follow and record occurrences must be mapped. MPA Watch programs employ two basic approaches to defining these transects inside and outside MPAs.

1. Full coverage: Some groups divide entire MPAs into walkable transects that cover the entire MPA. Transects within the MPA may be defined by changes from rocky to sandy, or other features of the landscape that affect activity types.
2. Partial coverage: Other groups select one or more transects that cover only part of a given MPA.

When selecting survey sites for transects, it is important to take into account how existing MPA Watch programs have based their decisions, such as public access for volunteers, appeal to volunteers, length of survey route, terrain, likelihood of significant activity (or inactivity), and importance to local scientific researchers.

Because full MPA coverage is sometimes not achievable, MPA Watch programs may choose a subset of the MPA to sample. This choice is the first and most important choice you must make when designing a sampling program. Some programs have transects paired with ecological monitoring sites (such as those surveyed by PISCO and Reef Check) to support integration with biological data. Also important is the choice of control sites outside of the MPA, if your program hopes to make inferences about causal effects of the MPA designation and compare inside/outside results.

Control/Reference Sites:

In addition to sites within MPAs, most MPA Watch programs also monitor control or reference sites outside of MPAs, with the goal of comparing activities and trends inside and outside of MPAs. The site attribute information in Table 1 above can help to define control sites for broad recreational comparisons, but there other variables that programs may wish to consider. By surveying outside MPAs, control sites allow for useful comparisons of trends and changes in human use over time inside MPAs versus outside MPAs.

Considerations for reference site selection include:

1. Matching coastal use features: features similar to local MPAs such as public ac-

cess, parking lots, surfing spots, other infrastructure, or tidepools.

2. Candidate MPA sites not under protection: beaches and areas that were considered for placement of an MPA, but were not selected. Many of these sites have similar features and human use like nearby MPAs.
3. Matching other ecological research sites: Some programs have transects paired with PISCO and Reef Check monitoring sites to support integration with biological data.
4. Looking for edge effects: Some programs have transects abutting MPAs, which look for possible effects such as activities being "pushed out" of MPAs.

For now there is no standard protocol for defining MPA Watch reference sites. MPA Watch groups will continue to discuss these and other reference site options. The current goal is to agree on a few well-defined options for use of reference sites. If groups using reference sites have a very specific rationale, and a well-implemented approach, this will allow us to evaluate the efficacy of different approaches over time, and potentially move toward consistent, unified guidelines.

Additional Site Considerations:

Regardless of whether a program decides to have full or partial survey coverage of an MPA, a number of practical considerations should guide the definition of transects. Volunteers in citizen science include participants of different ages, and a range of fitness levels and physical attributes. With this in mind it is important to consider the accessibility to a site, terrain, and the distance covered. As a general rule, most MPA Watch programs design transects that can be covered by a volunteer in approximately an hour or less. Although spatial design of survey routes varies by program and geography, to standardize survey techniques and control effort along a variety of routes, volunteers are trained to walk at a steady, somewhat slow pace while completing their observational MPA Watch surveys.

Standardizing the survey with temporal parameters (in addition to standardized training efforts and monitoring protocol) is intended to balance some of the variations between observers, making results comparable across MPAs and control sites.

When to Survey

Just as it is important to consider what parts of the coast are sampled, it is also critical to consider the temporal coverage of sampling. The activities on a stretch of coast are likely to vary by season, day of the week, and time of day. They will also be influenced by weather, tides, and other shifting conditions.

Although volunteers are given flexibility in scheduling their surveys, they are encouraged to make an effort to cover a variety of times, weather conditions, and days of the week. It is likely that volunteer availability and preferences will provide initial results that are biased towards a certain time of day, day of the week, or weather conditions. Tide levels can influence activity, and seasons will also have to be considered, although this is relatively easy to incorporate into the data set after the fact. Open & closed fishing and harvesting seasons can also dramatically cause certain activities to increase or decrease.

Bias toward days with pleasant weather can diminish the credibility of statements about use over periods where there is variability in attributes contributing to selection. This bias can partial-

ly be addressed by collecting relevant meta-data (such as weather and tide conditions during the time of the survey which can be considered at later stages of data analysis), but sampling across the full range of conditions is also necessary. The most efficient method for securing this outcome is known as simple random sampling, whereby volunteers survey on a subset of days and times that have been selected at random. Random sampling can be conducted year-round or for the time periods that are considered most important. For example, is the weekend/weekday distinction most important to a program, or is the proportion of use within a specific season, say summer, the most important window?

While it is not a complicated matter to select this random subset of sampling times, many programs prefer to avoid specifying the exact dates and times that volunteers conduct their surveys, as it can deter volunteers from volunteering their time and create more work for the program manager. As an alternative approach to assigned or random sampling, some programs are monitoring submitted surveys to identify what times are overrepresented and/or underrepresented and where. Program managers are using this knowledge to identify where survey effort could be redirected or supplemented by more targeted MPA Watch surveys. Programs may supplement gaps in locations, dates, and times through more intensive MPA Watch surveys completed by interns, with the interns identifying temporal and spatial needs and targeting completing surveys then and there. All programs are encouraged to explore what works and share with the statewide MPA Watch Program for solutions and challenges on this front.

How Often to Survey

The goal of the MPA snapshot counts is to allow for significant and robust statistical inference on human uses. An approach to sampling that fails to account for a stratified population, and that depends only on simple random selection will very likely be biased. In order to translate the MPA Watch snapshot counts into credible statements about human uses it is critical that a sufficient number of surveys are conducted across each stratified observational windows.

Identifying the relevant observational windows, and determining survey targets (i.e., how often surveys should be conducted at a site across times, days and seasons) requires information on the user population. This is clearly "a chicken or the egg" dilemma as MPA Watch programs will generally have limited information on the user population at their survey sites at the start of their sampling program. To mitigate this MPA Watch programs should make educated assumptions about the user population by working with a qualified expert to analyze data across an initial calibration period (e.g., first six months of data collection).

In setting survey targets, MPA Watch programs must also consider the level of confidence they want an observer to have in a reported statistic. In general, the more surveys that are conducted across observational windows at a site, the more confidence one can place in the statistics generated from those data. Further, surveying at sites with large populations (total overall users overall or within a specific user group such as non-consumptive) is more likely to produce information that a researcher would have confidence in compared to surveying at sites with small popula-

[1] *See MPA Watch Sampling Design manual for an in depth discussion of margin of error and confidence levels.*

tions, ceteris paribus. At sites that may never yield information that is statistically significant it may be advisable to rededicate program resources away from these sites unless it is determined that anecdotal data is of value to end users like the Department of Fish and Wildlife.

As an example, consider setting survey targets at site X for weekdays and weekends over a one-year period. Assume that site X has a large number of visitors on the weekends with a small variance in counts from week to week, and a small number of visitors during the weekdays, with a large variance in the count from week to week. This would require a relatively larger weekday sample than weekend sample at site X to ensure confidence in any generated statistics. The larger relative variance on weekdays makes the true weekday average harder to measure, and thus requires more visits to support statistical confidence. Conducting this many at any one site may not be feasible, especially if (at a site like X) weekdays of are lesser importance to weekends for policy makers. The higher the desired confidence, the larger the required sample size to achieve significance. The standard measure of confidence is the 95% level. This can often be onerous. In such cases as the 95% significance level is unobtainable we suggest you reduce your margin of error and confidence level to levels no lower than 80% and 20%, respectively. [1]

As a resource, MPA Watch programs have access to an interactive table that they can use in Microsoft Excel to generate a simple random sampling plan, allowing the program manager to define observational window and confidence level of interest (see above). Because this table will depend on an estimate of the population size at each site, and most groups will not have access to this information prior to starting the surveying, at a minimum you should be able to sample a site four weekdays and two weekend days per month.

Volunteers also commit to completing surveys regularly, but specific time and survey commitments vary from program to program (commitments range from two to eight surveys a month, typically).

Volunteer Training

All programs provide periodic volunteer trainings to train new volunteers and bring in additional data, to compensate for volunteers who decide to not continue past their initial commitment, and to ensure each monitoring site is surveyed continuously throughout the year. MPA Watch programs are encouraged to require all volunteers to attend a classroom and field training session before beginning to survey any monitoring sites. Program managers and instructors provide resources, go over protocols and procedures, and make sure the volunteer understands MPA Watch, as well as how to conduct a survey and enter data. Volunteers then accompany managers on their first survey to ensure maximum volunteer confidence before data is collected. Many programs also recruit and train university-level interns to complete more surveys and create a more robust monitoring program.

Data Collection, Management, & Reporting

Data Collection

The predominant approach to gathering data is to have MPA Watch volunteers to walk steadily along a predefined transect with clearly defined starting and ending points. When conducting a survey, MPA Watch volunteers count every person they see. Each person counted gets a tally in only one category (see the Quick ID Field Guide in the appendix or the table on Page 19 for a list of categories). The one exception is in the case of boats where each boat gets only one tally regardless of the number of people aboard.

A majority of programs conduct boating and aerial surveys on the shoreline or a bluff-top trail, though a few programs also collect data by air and boat (see page 18 for more information). As volunteers walk along a transect, they record people or boats and their specific activities at the moment they pass them. In other words, people and activities occurring in front of or behind the surveyor are not counted. This helps to prevent double counting as people and boats are often not stationary. Volunteers walk at a relatively even speed, though this is not always possible as there may be some areas that have a high number of users making the recording of observations more time intensive. Maintaining as constant pace as possible allows for a more even distribution of observations across space and time.

In some cases limited public access can prevent MPA Watch volunteers from walking along the shoreline or bluff-top. In these cases, volunteers stop at pre-defined vista points and scan the coast to document activities occurring across the defined area of observation. For all vista point observations, volunteers take the smallest amount of time needed to count all activities.

When a person is observed, the activity they are engaged in at that moment is recorded. No judgment is made about what the person may have been doing, or intends to do. This avoids biasing the data. However, some data categories are observed as they begin or end such as someone just entering the water to dive, snorkel, kite-surf, or gearing up for these activities (see MPA Watch Core Definitions Table for further clarification). In those cases, the activity is counted if the person is actively getting ready to engage in the activity or coming out of the water. In other words, gearing up counts as part of the activity, but sitting on the beach next to the gear does not.

Activities are only recorded if the person or boat is inside the study area, or "countable" area. The countable area is defined by a shoreward boundary and seaward boundary, as well as the start- and end-points of the transect. The shoreward boundary is defined as the first occurrence of infrastructure or bluff/vegetation. Defining the seaward boundary is less straightforward. The seaward boundary is not uniform in distance across all MPAs (e.g., in some cases the MPA boundary is one mile offshore and in other cases it is three miles offshore) and there are fewer distinguishable markers like restrooms or lifeguard towers that can help orient the observer. The only outlier is rod/reel fishing, where the fisherperson is outside the countable area and their line is inside the countable area. Depending on the geography of your survey sites, this is an exception that needs to be taken into account for volunteer training and logging data.

Development of clear and consistent guidelines for establishing a seaward boundary for the countable area is a work in progress for the statewide MPA Watch network. Programs are de-

termining how to best train volunteers to visualize this boundary and tally data accordingly. Furthermore, some environmental conditions (e.g., marine layer, ocean swell) make it challenging to accurately record observations at certain times. For now the seaward boundary is defined based on what works best for a given site and volunteer training, among other factors. Regardless of the approach taken, it is critical that each program documents its decisions so that the countable area for each site is known and used consistently. In consultation with experts, MPA Watch programs are evaluating options to ground-truth offshore observations.

MPA Watch Data Portal

All MPA Watch groups share the use of an online MPA Watch Data Portal developed by GreenInfo Network, and accessible at www.mpawatch.org. The MPA Watch Data Portal reduces the costs associated with data management, enhances quality control, widens and improves access to MPA Watch data, and allows volunteers to see the results of their work in a broader context. MPA Watch programs collectively share responsibility for stewarding this technological resource.

MPA Watch volunteers have the option to deliver their completed survey to the program manager for data entry, or log-in to the online MPA Watch data portal and input their data themselves if they have been properly trained. When a volunteer submits data to the portal, a message is then sent to the program manager to review and approve the submission. Programs must secure the original hand-written survey from the volunteer to perform QA/QC. The original paper survey can be submitted to program managers through the data portal by uploading a photo of their survey and including it as part of the submission, or sending it to the program manager via email, fax, or postal mail.

Data Analysis & Reporting

MPA Watch programs currently develop their own reports, targeting key constituents. However, programs acknowledge that the credibility and utility of MPA Watch data hinge in large part on a common understanding about appropriate ways of analyzing, synthesizing, and communicating results, and that building capacity and a shared vision for regular analysis and standardized reporting of data is a crucial task in the near-term.

MPA Watch programs are working withthe Advisory Committee to identify what the data can tell us, and, just as important, what it can't tell us. The analysis and reporting of MPA Watch data can take many forms, depending on the audience. The current focus is to advance a web-map viewer and supporting reporting features on the MPA Watch website to allow for data to be analyzed for multiple factors in real-time.

There are also opportunities for MPA Watch data to be integrated with existing human use and biological assessments (e.g., MPA Baseline consumptive and non-consumptive use, NOAA Coastal Use Atlas, PISCO and Reef Check) to simultaneously advance area-based monitoring and management and further establish MPA Watch as a rigorous scientific approach to monitoring within the fabric of existing human use data collection methods. Collaborative efforts are underway to develop additional capacity for MPA Watch integrated assessments to be conducted and shared with persons involved with MPA enforcement, management, and the social and biological sciences.

MPA Watch Statewide Methodology

Methodology for conducting a survey ensures that any well-trained volunteer will conduct observations and gather data in the same manner. Existing MPA Watch programs have agreed upon standardized protocols that promote consistency across the state.

MPA Watch Survey Protocol

The following protocol is designed for MPA Watch citizen science volunteers as the audience. It details the steps required to complete a survey including preparation & materials required, alignment on the coast, how to count activities and when, ending a survey route, and entering data into the Statewide website.

How to Conduct a Survey

1. Have all required materials are on hand before conducting a survey. This includes:
    - MPA Watch field guide/maps (survey protocol and directions for conducting the survey)
    - Data Sheets (one for each survey)
    - Binoculars
    - Clipboard
    - Writing Utensil
    - Watch
    - Compass (can use on smart phone) or GPS
    - Digital camera (encouraged but optional)
2. Fill out the top portion of the data sheet, writing in some of the metadata (Name, Date, Transect ID/Site).
3. Walk to the designated start point.
4. Write in the existing metadata (Start Time, Weather, Tide, etc.)
5. To begin the survey accurately, use a compass or GPS unit to orient yourself in the correct direction of the MPA boundary or transect boundary (see program field guide for site specific orientation directions).
6. Start walking the specified route your survey protocol describes, usually along the mean high tide line, observing and recording all people and boats on the beach or in the water. Do not count people on bluffs, trails, roads, or parking lots. The first occurrence of infrastructure or bluff onshore constitutes the shoreward boundary. The only activities you can count on trails or bluffs are active shore-based hook and line fishing, where the fishing line is touching the waters of the MPA or control site. In some cases limited access prevents volunteers from moving steadily along a transect route. Instead, they must visit pre-defined vista points and scan the coast to document activities occurring across a wide area. For all vista points, the time spent observing at each vista point should be the smallest amount of time needed to count all activities across the defined transect.
7. As you walk, record any activity in the appropriate categories when you pass the people doing that activity. For example, if you see someone surfing 50 feet ahead of you, do not count that activity until you pass the person who is surfing. People's activities may change from the time you first see them until the time you pass them, so to maintain scientific consistency, you should only record the activity you see them doing when you pass them. Count every single person you see, except in the case of boats (a boat gets one tally regardless of the number of people aboard). Each person or boat counted gets a tally in only one category. Also, do-

mestic animals are tallied separately from their owner. For example, if a man is walking his leashed dog down the beach, this counts as one "Beach Recreation" and one "Domestic Animal".

8. Do not count any activity that is happening behind you. Only count activity that is happening between you and the stop point as you pass them. However, for example, if a person is running along the beach in the same direction you are walking and he passes you from behind, you should count that activity as running when he passes you (as long as you have not counted him earlier in the survey). Try not to double-count people if their activity changes.
9. All activities should be counted as you pass them and as they are happening. The only activities you can count if the person is not actively doing those activities in the water are surfing and SCUBA diving. If a person is in a wetsuit and is walking with his surfboard along the beach (and he has no other beach recreational items with him), it can be assumed that his only activity is or was surfing. The same can be assumed for a person walking along the beach in a wetsuit and SCUBA gear. However, if a person is next to a surfboard lying on the sand and he or she is in clothes or a bathing suit (NOT a wetsuit), you should count that activity as "beach recreation" because we cannot assume that his/her only activity is or was surfing.
10. Wildlife watching should only be counted if the activity is taking place on the beach or in the water- not on bluffs or trails. Wildlife watching is indicated by the use of binoculars or overt pointing and gesturing towards wildlife (such as whales, sea lions, etc.)
11. When recording consumptive boat fishing activities, make sure to properly mark if a person is inactive or active in the appropriate section of the data sheet. Active fishing is indicated by lines in the water, traps or nets set or pulled up from the water, and divers with fishing gear entering or exiting the water. Inactive fishing is when fishing gear is visible or present on board, but not baited, in the water, or being used. It is allowed for a person to transit through an MPA with fishing gear to areas where fishing is permitted as long as the gear is not baited or ready to be used to fish. Therefore, for example, we need to differentiate between a kayaker with a rod/reel on board who is legally transiting through an MPA, and a kayaker with a rod/reel that is actively fishing inside the MPA.
12. When you arrive at the end point, stand facing the ocean and use your compass or GPS to orient yourself in the accurate direction for the end of the survey. Imagine a line that extends out to the ocean as the border of the survey segment, and use this to accurately record only the activities within the survey area on your data sheet.
13. Write the end time at the top of the data sheet.
14. Total the tally marks in each individual box and circle the numbers when you finish your survey.
15. Begin your next survey on the next data sheet. You may survey the same area more than once a day, even immediately after your previous survey.
16. If you have been trained and approved for data entry, please log in to www.mpawatch.org/portal to enter your data, and attach a photo or PDF of your data sheet to the survey online.
17. If you have not been trained and approved for online data entry, send your

data sheet to the local MPA Watch program administrator via an email attachment, fax, mail, or in person.

Reminders:

1. Each survey should take no longer than one hour (one direction).
2. Only mark the activity the person is actively engaging in.
3. Some surveys may have no activity – fill out data sheet with zeros and write "no activity". These surveys are equally as important as ones that have plenty of activities recorded.
4. Fill out a separate data sheet for EACH transect surveyed.
5. **SAFETY FIRST!**
    - Do not compromise your safety to collect the data!
    - Be aware of people approaching you- be friendly, provide them with a general overview of what you are doing.
    - Do not approach people engaged in an activity- especially fishing, as you are taking observational surveys and do not want to influence behavior while conducting a survey, or put yourself in a controversial or dangerous situation.

MPA Watch Complementary Survey Protocols

While the majority of MPA Watch programs conduct surveys along the shoreline, there are a few programs that operate complimentary data collection programs by air and by water. These programs, which focus their data collection efforts on documenting ocean-going vessels, are able to cover more MPAs and reference sites in less time. They also provide the potential to validate land-based survey data when dates and times coincide. However, these programs are more resource intensive to operate, and as a result surveys are conducted at a lesser frequency than their shore-based counterparts. Currently aerial and boating programs are operating in the South Coast region, though existing or new MPA Watch programs may have an interest in exploring the adoption of these methods as well. Below is a description of the background and methods of the ongoing aerial and boating programs, and more information can be found in the appendices.

Aerial Surveys

Background

The Bay Foundation and LightHawk conduct aerial surveys of boating activities in state waters off of the mainland coast of Southern California, from Point Conception to the US-Mexico border. These surveys were initiated in 2008 by LightHawk and Santa Monica Baykeeper (now Los Angeles Waterkeeper), and contributed to the South Coast Marine Life Protection Act Initiative by providing stakeholders and decision makers with a spatially explicit, fishery- independent dataset to help determine the locations for a network of MPAs. The aerial surveys continued after the implementation of the South Coast MPA network in 2012, and can now help to describe trends and responses in boating activities to the MPA network, namely from the fishing communities that have been restricted due to the MPA network.

Methodology

Aerial surveys collect spatially specific data regarding the distribution, type and activity of vessels operating in state waters. Small aircraft capable of high maneuverability and low speeds are used to fly directly over vessels while survey personnel record the location, vessel type, activity, and when possible, document with photographs. Depending on weather conditions, aircraft fly at an altitude of 500 to 1000ft (average elevation for pre-MPA equaled approximately 650 feet) and travel at 100 to 120 knots. Although high-wing aircraft are preferred because they allow more visibility below the aircraft, low-wing aircraft work well. The collection of data from small fixed wing aircraft allow for a transect to be completed in approximately two to two and one half hours depending on number of vessels encountered.

The survey team consists of a pilot, spotter, GPS technician and photographer. Some of the planes are incapable of carrying a pilot plus three passengers; in this circumstance, the photographer role is adopted by the spotter. The spotter directs the pilots' flight path to intersect the vessels on the water, describes the type and activity of the vessel at time of contact and directs the GPS technician to enter a point and corresponding

Figure X. Survey team flying in a Piper Cherokee comprising; pilot (front left), spotter (front right), GPS technician (back right), Image collected courtesy of LightHawk.

information into the data capture system. When possible, the photographer captures a photograph of the vessel(s) to aid in post flight QA/QC, and for uploading observations to the project database. Due to the speed of the aircraft, rapid and accurate identification of vessels encountered on a transect is required. Therefore, the spotter, aided by binoculars or telephoto camera lens, must be familiar with the various boat types and boater activities in the south coast region.

This information is recorded by the GPS technician into one of the predefined categories (Commercial Fishing, Commercial Non-fishing or Recreational) in a GPS data dictionary (see appendices 2) along with observed vessel type and activity (underway, fishing or anchored/not fishing). Ideally, vessel positions are not logged until survey planes are directly overhead for highest spatial accuracy. In areas with high vessel density or restricted airspace, where logging vessels individually is infeasible, multiple boats may be logged to a single representative point and later extracted using GIS. After completion of the aerial survey, the GPS data are downloaded and exported into ArcGIS for analysis. Any photos taken of the vessels are linked to the corresponding data points collected and used for post-flight QA/QC and training purposes. Once these data have been verified as accurate through QA/QC processes, the information is updated to the entire dataset from which maps and summary statistics are derived.

Data Analysis and Reporting
Currently, data are recorded in a database unique to The Bay Foundation, and these data are used to analyze trends in fishing activities and compliance with MPA regulations in the South Coast. There are ongoing discussions on integrating these data products into the MPA Watch website.

Boating Surveys

Background

Boat-based surveys are currently conducted in the South Coast region by LA Waterkeeper, and have been since the South Coast MPA network of MPAs were established January 1, 2012. At this time, Santa Barbara Channelkeeper also conducts boat-based surveys. These surveys focus on capturing all boating activity and all fishing from shore activities in defined transects inside and outside of MPAs.

Survey Crew Positions and Equipment:

- Boat Operator
- Data Scribe – Data Sheet and Writing Instrument
- Distance Finder Operator – Distance Finder
- Spotter - Binoculars
- Photographer - Camera
- GPS Unit Operator – Handheld GPS
- IPad Data Scribe – IPad or Tablet

Methodology

Transects are run at a speed of approximately 10 knots and roughly a half-mile from shore, and observations are made at a safe, unobtrusive distance from an observed vessel, moving to position the observed vessel on a heading directly North, South, East, or West from your vessel.

Figure Y. Part of the survey team comprising: data scribe (far left), GPS operator (middle left), spotter and distance finder operator (middle right), and photographer (far right)

For each vessel or onshore fishers the following are documented in the data tally sheet:

- The time of sighting is noted
- Your vessel's GPS position is noted
- The compass heading direction of the observed vessel from your vessel is noted
- The distance of the observed vessel from your vessel is noted
- **MPA coverage area is to three miles off shore if visibility allows. It is suggested that if a violation is suspected, spending time and gas to get a closer look at vessel type, activity, and to possibly collect more accurate data be done on a case-by-case basis.*
- The observed vessel type is noted, commercial or recreational, as are any onshore fishers
- The activity on the observed vessel is noted, as are activities of any onshore fishers
- The quantity of observed vessels or onshore fishers is noted
- Two Photos are taken of the observed vessel or fishers and that is noted
- *These photos are taken for categorizing and clarifying activity and vessel type. Identifying characteristics should be obscured before any public posting.
- Any additional comments, including violations observed and reported, as well as other observations are noted

Data Analysis and Reporting

Currently, data are recorded in a database unique to LA Waterkeeper and represented in Google Earth and GIS mapping products to demonstrate the extent and location of observed boating and fishing activities. There is ongoing work to integrate these observations into the MPA Watch information management system and the webmapper.

Statewide MPA Watch Data Sheet

MPA Watch Core Tally Sheet

Name(s):		Date: ___/___/_____	Transect ID:
Start Time:	End Time:	Clouds: clear (0%)/ partly cloudy (1-50%)/ cloudy (>50%cover)	Precipitation: yes / no
Air Temperature: cold / cool / mild / warm / hot		Wind: calm / breezy / windy	Tide Level: low / med / high
Visibility: perfect / limited / shore only		Beach Status: open / posted / closed / unknown	

On-Shore Activities	Rocky	Sandy
Recreation (walking, resting, playing, etc. NOT tidepooling)		
Wildlife Watching		
Domestic animals on-leash		
Domestic animals off-leash		
Driving on the Beach		
Tide-pooling (not collecting)		
Hand collection of biota		
Shore-based hook and line fishing		
Shore-based trap fishing		
Shore-based net fishing		
Shore-based spear fishing		

Off-Shore Activities (Non-Boating)	
Offshore Recreation (e.g., swimming, bodysurfing)	
Board Sports (e.g., boogie boarding, surfing)	
Stand-Up Paddle Boarding (alternatively can tally in paddle operated boat below)	
Non-Consumptive SCUBA and snorkeling	
Spear Fishing (free diving or SCUBA)	
Other Consumptive Diving (e.g., nets, poles, traps)	

Boating	Recreational		Commercial		Unknown	
	Inactive	Active	Inactive	Active	Inactive	Active
Boat Fishing - Traps						
Boat Fishing - Line						
Boat Fishing - Nets						
Boat Fishing - Dive						
Boat Fishing - Spear						
Boat Kelp Harvesting						
Unknown Fishing Boat						
Paddle Operated Boat (can separately tally stand-up paddle boarding above under board sports)						
Dive Boat (stationary – flag up)						
Whale Watching Boat						
Work Boat (e.g., life-guard, DFW, research, coast guard)						
Commercial Passenger Fishing Vessel (5+ people)						
Other Boating (e.g., powerboat, sail boat, jet ski)						

Comments

Did you observe: ☐scientific research; ☐education; ☐beach closure; ☐large gatherings (e.g., beach cleanup); ☐enforcement activity

Describe below and provide counts of individuals involved where possible, and whether it took place on rocky or sandy or sandy substrate.

Did you report a violation: ☐yes ☐no If yes, how many violations did you report _____

Who did you report the violation to (mark all that apply): ☐DFW ☐State Parks ☐other entity (e.g., lifeguard, harbor patrol)

Which method did you use to report your violation (mark all that apply): ☐phone call ☐text ☐mobile app ☐website ☐email ☐in person

Statewide MPA Watch Data Definitions

Effective coordination requires that MPA Watch programs use consistent categories to collect data, and consistent definitions of those categories. In order to standardize MPA Watch throughout the state of California, MPA Watch programs have agreed to the following definitions of activities. Some definitions are self-explanatory and some are very specific (i.e.: wildlife watching requires possession of a spotting scope or binoculars, NOT a camera). Almost all activities need to be witnessed objectively, and in real time, with the exception of on-shore fishing, surfing, and diving. Volunteers should be trained appropriately in spotting these activities.

Metadata	Definition	Note
Name(s)	First and last name	
Date	Month / Day / Year	
Transect ID	Name of transect	
Start Time	Time data collection begins	This could be different from the time you make your first observation.
End Time:	Time data collection ends	This could be different from the time you make your last observation.
Clouds	Clear (0%)/ partly cloudy (1-50%)/ cloudy (>50%cover)	
Precipitation	Yes / no	If there is the presence of precipitation anytime during the survey indicate "yes."
Air Temperature	Cold / cool / mild / warm / hot	Automated temperature data from Weather Underground are linked to surveys submitted in the data portal.
Wind	Calm / breezy / windy	Automated wind data from Weather Underground are linked to surveys submitted in the data portal.
Tide Level	Low / med / high	Automated temperature data from Weather Underground are linked to surveys submitted in the data portal.
Visibility	Perfect / limited / shore only	
Beach Status	Open / posted / closed / unknown	

On-Shore Activities	Definition	Note
Rocky	If an activity occurs on a rocky shoreline.	Apply, where applicable, to ALL on-shore activities.
Sandy	If an activity occurs on a sandy shoreline.	Apply, where applicable, to ALL on-shore activities.
Recreation	Walking, hiking, running, resting, playing, sitting, camping, art, etc. Essentially anyone on the shore who does not fall into another category.	Does not include tide-pooling.
Wildlife Watching	Possession of binoculars or a spotting scope. NOT a camera. OR overt interaction with wildlife (e.g. pointing)	
Domestic animals on-leash	Dogs, horses	Count animals as individuals, and count people separately as recreation. Animals are assumed to be dogs. Note animals that are not dogs in the comments section.
Domestic animals off-leash	Mostly dogs	Count animals as individuals, and count people separately as recreation. Note animals that are not dogs in the comments section.
Driving on the Beach	Motorized vehicles, actively driving, or parked.	
Tide-pooling	Actively observing tide-pools -- standing on tide-pool areas is not enough.	Does not include collection of biota.
Hand collection of biota	Extraction into a bucket or other vessel of sand-crabs, kelp, or other tide-pool species.	
Shore-based hook and line fishing	Actively fishing with line in, casting, etc.	Including when fisherperson is outside of countable area, but fishing line is inside the countable area.
Shore-based trap fishing	Actively fishing with traps in, retrieving, etc.	
Shore-based net fishing	Actively fishing with net in, throwing, retrieving, etc.	
Shore-based spear fishing	Standing on-shore with a spear.	This includes poke-poling.

Off-Shore Activities (Non-Boating)	Definition	Note
Offshore Recreation	Swimming, wading, bodysurfing, etc. Essentially anyone in the water who does not fall into another category.	
Board Sports	Surfing/ Boogie Boarding, Kite Surfing/ Wind Surfing.	Does not include stand-up paddle boarding which is in paddle operated boats or separately tallied as its own off-shore non-boating activity.
Non-Consumptive SCUBA and snorkeling	Gearing up, entering or exiting the water.	This includes research, which can be noted in the comments field.
Do not count divers gearing up outside of the count area (e.g., the parking lot).		
Spear Fishing	Free diving or SCUBA gearing up, or coming out of the water.	
Other Consumptive Diving	Lobster, scallops, goodie bags. Observed take in bags as they come out of the water.	

Boating	Definition	Note
Recreational		Apply, where applicable, to all boat fishing categories (i.e., traps, line, nets, dive, spear).
Commercial		Apply, where applicable, to all boat fishing categories (i.e., traps, line, nets, dive, spear).
Unknown		Apply, where applicable, to all boat fishing categories (i.e., traps, line, nets, dive, spear).
Inactive		Apply, where applicable, to all boat fishing categories (i.e., traps, line, nets, dive, spear) and boat kelp harvesting.
Active		Apply, where applicable, to all boat fishing categories (i.e., traps, line, nets, dive, spear) and boat kelp harvesting.
Boat Fishing - Traps	Traps are visible on the boat.	

Boating	Definition	Note
Boat Fishing - Line	Rods and lines are visible on the boat.	
Boat Fishing - Nets	Nets are visible on the boat.	
Boat Fishing - Dive	Dive gear is visible on the boat.	
Boat Fishing - Spear	Spears are visible on the boat.	
Boat Kelp Harvesting	Harvesting gear is visible on the boat.	Assumed to be commercial.
Unknown Fishing Boat	Must be visual evidence that the boat is a fishing boat, but be unable to discern a gear type and if it is recreational or commercial in nature.	
Paddle Operated Boat	On the water, launching, or pulling out of kayaks, paddleboards, dinghies, canoes, etc.	Can separately tally stand-up paddle boarding above under board sports if you create its own separate row.
Dive Boat	Stationary – flag up	
Whale Watching Boat	Self-explanatory	
Work Boat	Lifeguard boats, enforcement, research, military, coast guard, etc.	This may also include local knowledge of vessels.
Commercial Passenger Fishing Vessel	5+ people visible on board	This may also include local knowledge of vessels.
Other	Any powerboat, jet ski, or sailboat, which is not obviously a workboat.	

Comments	Definition	Note
Scientific research	Presence or absence of scientific research	Describe in comment field the nature of the activity and number of individuals involved where possible, and whether it took place on rocky or sandy or sandy substrate.
Education	Presence or absence of educational groups.	Describe in comment field the nature of the activity and number of individuals involved where possible, and whether it took place on rocky or sandy or sandy substrate.
Beach closure	Presence or absence of beach closure because of water pollution or some other issue like sensitive habitat.	Describe in comment field the nature of the activity, and whether it took place on rocky or sandy or sandy substrate.
Large gatherings	Presence or absence of large gatherings for a volleyball tournament, Junior Lifeguards, etc.	Describe in comment field the nature of the activity and number of individuals involved where possible, and whether it took place on rocky or sandy or sandy substrate.
Enforcement activity	Presence or absence of enforcement activity.	Describe in comment field the nature of the activity and number of individuals involved where possible, and whether it took place on rocky or sandy or sandy substrate.
Did you report a violation?	Yes, no	If yes, indicate number of violations reported.
Who did you report the violation to	DFW, State Parks, other entity (e.g., lifeguard, harbor patrol)	Mark all that apply.
Method for reporting violation	Phone call, text, mobile app, website, email, in-person	Mark all that apply.

Required and Recommended Practices

The reliability and credibility of MPA Watch data and analyses depend in part on the processes and protocols in place to ensure that all aspects of the program—especially those agreed upon by all members of the statewide network—are implemented correctly. Citizen science efforts stand to gain from adopting quality assurance and quality control (QA/QC) protocols that demonstrate to potential users the quality and reliability of the resulting data and analyses. However, these practices often need to be balanced with other considerations. For example, expert oversight of volunteers might improve the accuracy of observations, but would detract from the efficiency of the program and overall volunteer experience.

MPA Watch required and recommended practices (see Table 1) extend across most elements of the program, from training volunteers to producing and sharing results. All programs are required to do at a minimum some strategies, while other measures are recommended as good practice, when feasible. In determining what protocols are required vs. recommended, specific thought was given to the operational and organizational consequences of implementation. For example, required prior expertise may limit the pool of potential volunteers while in-person oversight may require significant investment of resources.

MPA Watch programs have agreed on required and recommended practices. To arrive at these decisions individual programs engaged in a series of discussions comparing current practices and considering the feasibility and desirability of particular requirements, given the range of programs currently operation. The Advisory Committee reviewed the results of these discussions and provided additional recommendations. Results of this process is reflected in Table 1. Those practices and others are discussed further below. The table is a living document, to be updated as programs evolve and learn from experience.

Table 3. A list of practices that, for citizen science in general, can contribute to increased accuracy and reliability of data and analyses. MPA Watch required (blue) and recommended (green) practices are indicated in the 3rd and 4th columns.

Strategy	Definition	Required	Recommended
Prior expertise	Particular knowledge or experience required in order for volunteers to participate	MPA Watch participants are not required to have any prior expertise as a prerequisite for participation.	There is no recommended prior expertise to participate in MPA Watch.
Training	Required formal instruction before participation in the activity	MPA Watch participants will be required to participate in a training session. The training session could be online, in the classroom, or in the field.	It is recommended that MPA Watch participants take part in either an online or classroom training, and field training.

Strategy	Definition	Required	Recommended
Science Advising	Recognized experts provide guidance on the project design and implementation		
Ranking System	Volunteers advance through a hierarchy of roles, as they demonstrate improvement in skills and knowledge	MPA Watch programs are not required to implement a ranking system.	There is no recommended ranking system to be implemented by MPA Watch programs.
In-Person Oversight	Professionals accompany volunteers in the field to keep an eye on data collection	MPA Watch programs are not required to implement in-person oversight practices.	It is recommended that where feasible, there are periodic in-person check-ins in the field.
Re-training	Instruction or testing for volunteers to refresh or gain skills	MPA Watch programs are required to retrain their volunteers when major protocol changes are made at the statewide level.	It is recommended that MPA Watch programs re-train their volunteers (via refresher courses in the classroom, online or in the field) periodically to limit protocol drift.
Technological aids	Technology that standardizes practices and/or reduces error	MPA Watch programs are required to upload their data in the information management system.	It is recommended that volunteers use binoculars and compasses to support data collection.
Data Entry	A professional validates data once they have been collected	MPA Watch program managers or identified volunteers will review and approve data logged into the IMS.	It is recommended that MPA Watch programs work with science advisors and identified qualified personnel to establish IMS outliers.
Cross-comparison	Compare program data with data generated by professionals	MPA Watch programs are not required to cross-compare their data.	It is recommended that MPA Watch programs cross-compare their data when feasible techniques are available and identified as credible and cost-effective by the Advisory Committee.

Strategy	Definition	Required	Recommended
Data Sharing and Publication	Transparency and accessibility of data, and technical review of data or results	MPA Watch programs are not required to have their data reviewed. When reporting results to managers and the public, programs will indicate whether their analyses have been reviewed and in what form.	It is recommended that MPA Watch programs have their analytical questions and framework reviewed by qualified experts, including the Advisory Committee.

Data Entry

Some MPA Watch programs allow volunteers to enter data into the database, and others only allow trained volunteers or interns, or program managers to enter this data. A professional validates data once it has been entered into the database and cross-references the entry with the original data sheet. MPA Watch managers or identified volunteers will review and approve data logged into the IMS. It is recommended that MPA Watch programs work with the Advisory Committee and identified qualified personnel to establish thresholds for IMS outliers (these are determined by individual programs because each site has unique characteristics). For instructions on entering survey data into the IMS, please see the Volunteer Field Manual in the Appendix.

Volunteer Training

Currently, there are few requirements as to how volunteers should be trained. Table 1 shows several aspects of volunteer training, what is currently required, what is recommended, and thoughts for the future of MPA Watch training.

Volunteer Supplies/Equipment

MPA Watch programs are open to the community and general public, although many programs have age restrictions. Because most monitoring sites require moderate hiking, volunteers must be able to spend at least one hour outdoors in unpredictable weather. Volunteers need to have access to public transportation or provide their own reliable transportation to get to and from survey sites. Volunteers are asked to use basic technology (i.e.: binoculars, GPS or compass, and digital cameras) and web tools to share and access materials and information. Volunteers are instructed on proper use of field technology and web tools in the MPA Watch volunteer training to ensure they are able to complete surveys, much of which is detailed in the Volunteer Field Manual.

Volunteer training on illegal activities

When a volunteer observes an illegal activity, they are discouraged from confronting the person due to both safety and influencing the data. Volunteers are giving their time to collect objective and accurate data; not to enforce regulations. A volunteer may decide to do nothing about an illegal activity. However, they can call the potential violation in to CalTIP, and individual MPA Watch programs can provide resources or local phone numbers in order to report violations.

To support programs in developing their own practices regarding violations, general guidelines, developed from discussions with enforcement officials at the CA Department of Fish and Wild-

life are provided below.

When you witness possible poaching or illegal activities in an MPA:

1. Do NOT confront the person
2. Position yourself in a safe place, or just continue with your survey (incognito-style)
3. Call 911 if a dangerous or emergency situation exists
4. The California Department of Fish and Wildlife (DFW) is the agency charged with management and enforcement of MPA regulations. It's up to you if you want to report poaching or polluting. If you feel comfortable, call 1-888-DFG-CalTIP (1-888-334-2258). CalTIP (Californians Turn In Poachers and Polluters) is a confidential witness program that encourages the public to provide Fish and Wildlife with factual information leading to the arrest of poachers and polluters.
5. Be prepared to give the fullest possible account of the incident including the name, address, age and description of the suspect, vehicle description, direction of travel, license number, type of violation and when and where it occurred.
6. For more information, go to: http://www.dfg.ca.gov/enforcement/caltip.aspx

Volunteers are also encouraged to take notes on any consumptive behaviors observed (e.g., a survey would include what was being collected and where [and potentially have a photo] if they observed "hand collection of biota").

Volunteer Field Manual

The Volunteer Field Manual is designed to be a resource for new MPA Watch programs to customize for volunteers being trained with MPA Watch. This manual (Appendix) contains materials such as activity identifications, volunteer responsibilities, equipment checklists, monitoring protocol, maps of the MPA Watch program's specific transects, and more. This is a neutral version of the manual, approved by all current organizations statewide. It includes the basic standardized requirements for volunteers, policies, and procedures. Each organization will need to input their location-specific maps, personalized forms, and procedures into their manual by spotting the highlighted areas and changing them to their specific organization's information.

Training PowerPoint

The Volunteer Training PowerPoint Presentation (Appendix) serves as a resource for MPA Watch programs when training their volunteers. It contains information on the Marine Life Protection Act, the science behind MPAs, where MPAs are in California, local MPA regulations, the goals of MPA Watch, the need for and purpose of human use data, the MPA Watch program protocol, identifying beach and ocean activities, and geographic training on local MPA Watch survey routes. Each organization will need to input their location-specific maps and volunteer requirements into the PowerPoint.

Transect/Map Design

In addition to selecting survey sites within MPAs, programs are also encouraged to design, using tools provided in the IMS, transect routes with detailed instruction for each route. Instructions are intended to provide every volunteer with a clear and concise, step-by-step protocol for each transect. These protocols should be easily avail-

able for volunteers to refer to. Elements needed to incorporate into every transect protocol include:

1. Name, location (GPS markers), and map of survey site (Ideally, maps include start point & end point or vista points, and detail the route a volunteer will be walking/driving/using public transportation).
2. Description of the boundaries & background information of the MPA or site (this includes when to survey and when not to survey if specific conditions are necessary to survey or the area is potentially dangerous at certain times).
3. Parking or public transportation options, beach access, and bathroom locations
4. Detail about the survey site (i.e., is it an MPA? What are the prohibited/permitted uses?)
5. The starting point of the survey
6. Field notes (i.e. length of walk, safety advice, proper attire & equipment, etc.)
7. Detailed instructions of how to walk/drive-and-scan the survey
8. Reminders of procedures throughout the survey (i.e. use of compass or GPS, survey techniques, or potential obstacles/hazards).
9. Any other important information the volunteer would need to properly conduct the survey
10. The end point of the survey

Please see an example of a Survey Route in the Appendix.

Volunteer Recruitment & Retention

The key to any successful MPA Watch program are volunteers. Recruitment strategies should be evaluated regularly, to identify potential improvements in recruitment and retention. Each organization will have a different strategy for recruitment, based upon regional considerations, types of volunteers, and values of your community. Knowing your audience and following up quickly with volunteers are keys to recruitment or retention strategies. Understanding why your volunteers are giving their time and providing incentives can dramatically increase your retention rates. If your program needs some new ideas, see the Volunteer Recruitment or Volunteer Retention sections in the Appendix.

Concluding Remarks

MPA Watch data are contributing to the understanding of human uses of MPAs and the adjacent coastlines of California. Since the inception of MPA Watch, thousands of surveys have been completed by volunteers throughout the state. This data is essential in the management and understanding of MPAs and the conservation and protection of our oceans. We hope this manual will aid you in creating an MPA Watch program of your own, fine-tuning a current program you have, or setting a standard for the data collected in surveys through this program.

Acknowledgements

- The MPA Watch California Master Manual was constructed, updated, reviewed, and improved with the contributions and suggestions of the following people and organizations:
- The Otter Project: Jeanée Natov, Steve Shimek, and Mark Welden-Smith
- Heal the Bay: Dana Roeber Murray and Sarah Abramson Sikich
- Ocean Science Trust: Aaron McGregor and Ryan Meyer
- Orange County Coastkeeper: Ray Hiemstra
- WiLDCOAST: Diane Castaneda and Zachary Plopper
- Santa Barbara Channelkeeper: Penny Owens
- LightHawk: Lee Pagni
- Farallones Marine Sanctuary Association
- Los Angeles Waterkeeper
- GreenInfo Network
- Resources Legacy Fund
- USC Sea Grant

Funding Provided By: Resources Legacy Fund

Photo Credits: *Ana Luisa Ahern, Mike Dooley, Bryan Murray, Dana Roeber Murray, Jeanee Natov, Penny Owens, Michael Quill, and others.*

Design Credits: *Sheana Brown*

Appendices

Core Data Sheet

Aerial Data Tally Sheet

Boating Data Tally Sheet

MPA Watch 2-page overview

Quick Field ID Reference Guide

Safety & Liability

Conducting & Submitting Surveys

Model Transects/Maps

Volunteer Recruitment & Retention

Sampling Strategy Design Manual

MLPA (1999)

*Volunteer Field Manual**

*Volunteer Training PowerPoint Presentation**

** For access to this content, visit http://www.mpawatch.org*

MPA Watch Core Data Sheet

Name(s):		Date: ___/___/_____	Transect ID:
Start Time:	End Time:	Clouds: clear (0%)/ partly cloudy (1-50%)/ cloudy (>50%cover)	Precipitation: yes / no
Air Temperature: cold / cool / mild / warm / hot		Wind: calm / breezy / windy	Tide Level: low / med / high
Visibility: perfect / limited / shore only		Beach Status: open / posted / closed / unknown	

On-Shore Activities	Rocky	Sandy
Recreation (walking, resting, playing, etc. NOT tidepooling)		
Wildlife Watching		
Domestic animals on-leash		
Domestic animals off-leash		
Driving on the Beach		
Tide-pooling (not collecting)		
Hand collection of biota		
Shore-based hook and line fishing		
Shore-based trap fishing		
Shore-based net fishing		
Shore-based spear fishing		

Off-Shore Activities (Non-Boating)	
Offshore Recreation (e.g., swimming, bodysurfing)	
Board Sports (e.g., boogie boarding, surfing)	
Stand-Up Paddle Boarding (alternatively can tally in paddle operated boat below)	
Non-Consumptive SCUBA and snorkeling	
Spear Fishing (free diving or SCUBA)	
Other Consumptive Diving (e.g., nets, poles, traps)	

Boating	**Recreational**		**Commercial**		**Unknown**	
	Inactive	Active	Inactive	Active	Inactive	Active
Boat Fishing - Traps						
Boat Fishing - Line						
Boat Fishing - Nets						
Boat Fishing - Dive						
Boat Fishing - Spear						
Boat Kelp Harvesting						
Unknown Fishing Boat						
Paddle Operated Boat (can separately tally stand-up paddle boarding above under board sports)						
Dive Boat (stationary – flag up)						
Whale Watching Boat						
Work Boat (e.g., life-guard, DFW, research, coast guard)						
Commercial Passenger Fishing Vessel (5+ people)						
Other Boating (e.g., powerboat, sail boat, jet ski)						

Comments

Did you observe: ☐ scientific research; ☐ education; ☐ beach closure; ☐ large gatherings (e.g., beach cleanup); ☐ enforcement activity

Describe below and provide counts of individuals involved where possible, and whether it took place on rocky or sandy or sandy substrate.

Did you report a violation: ☐ yes ☐ no If yes, how many violations did you report _____

Who did you report the violation to (mark all that apply): ☐ DFW ☐ State Parks ☐ other entity (e.g., lifeguard, harbor patrol)

Which method did you use to report your violation (mark all that apply): ☐ phone call ☐ text ☐ mobile app ☐ website ☐ email ☐ in person

LOS ANGELES WATERKEEPER®

MPA Watch

Name | Date: _____/_____/_____ | Transect ID:

Start Time: | End Time: | Clouds: clear (0%)/ partly cloudy (1-50%)/ cloudy (>50%cover) | Precipitation: yes / no

Air Temperature: cold / cool / mild / warm / hot | Wind: calm / breezy / windy

Visibility: perfect (>1mile)/ limited (>200 yds<1mi) / poor (<200yds) | Sea State: Calm Sea (0-2 ft); 2-4ft swell; 4-6ft swell; Too rough to observe

MPA Watch Crew Names:

Vessel ID #	Time	Lat/Lon	Heading	Distance (yds)	Vessel Type	Vessel	Qty	Activity	# of Photos	Notes
1		N W								
2		N W								
3		N W								
4		N W								
5		N W								
6		N W								
7		N W								
8		N W								
9		N W								
10		N W								

Vessel Types

Commercial Fishing	Commercial Fishing: Net Boats	Comm Non-Fishing	Recreational
CPFV	Trawler	Passenger Boat (Ferry, Cruise ship)	Sport Fishing Boat
Lobster Boat	Purse Seiner	Oil Tanker	Power Boat
Trap Boat	Light Boat (squid)	Cargo Ship (Barge, Container)	Sailboat
Urchin Boat	Gillnet	Support Vessel (Tug, Tender)	Dive Boat
Other	Other	Res-Mil-Enf (Science or Gov or Enf)	Shore Diving
		Charter (Whale, Diving, Ecotour)	On Shore
		Other (Dredge, parasail, etc.)	Kayak
			Jet Ski
			Other (SUP, canoe, etc.)

Activity

Fishing
Not Fishing
Underway
Moored
Diving
Spearfishing
Other

Comments

Did you observe: ☐ scientific research; ☐ education; ☐ beach closure ☐ large gatherings; ☐ enforcement activity

Did you report a violation: ☐ yes ☐ no If yes, how many _____

Who did you report the violation to (mark all that apply):
☐ DFW ☐ State Parks ☐ other entity (e.g., lifeguard, harbor patrol)

Which method did you use to report your violation (mark all that apply):
☐ phone call ☐ text ☐ mobile app ☐ website ☐ email ☐ in person

Boat-based monitoring is currently being conducted by Los Angeles Waterkeeper. For information, visit https://lawaterkeeper.org/mpa-watch/

Aerial Survey Data Tally Sheet

		Vessel Type
Vessel Categories	Commercial Fishing	CPFV
		Lobster Boat
		Trap Boat
		Urchin Boat
		Other
	Recreational	Sport Fishing Boat
		Power Boat
		Sailboat
		Dive Boat
		Kayak
		Jet Ski
		Other (outrigger, row boat, etc.)
	Commercial Non-Fishing	Passenger Boat (Ferry, Cruise ship, Party cruise)
		Tanker
		Cargo Ship (Barge, Container)
		Support Vessel (Tug, Tender)
		Res-Mil-Enf (All Science and Gov't Boats)
		Charter (Whale watching, Diving)
		Other (Dredge, parasail, etc.)
	Commercial Fishing Net Boat	Trawler
		Purse Seiner
		Light Boat
		Gillnet
		Other
Activity	Fishing	
	Underway	
	Not Fishing/ Moored	

The aerial monitoring project is a partnership between The Bay Foundation and LightHawk. For more information, visit www.santamonicabay.org.

MPA Watch 2-Pager

Background on MPAs

California's marine ecosystems are stressed and continue to face many threats such as habitat destruction, fishing pressure, and pollution. Several fish stocks have crashed statewide, causing many fisheries to be closed or severely limited. As a valuable tool for both ecosystem protection and fisheries management, Marine Protected Areas (MPAs) will help replenish these depleted populations. MPAs have shown to be effective in parts of California, the Florida Keys, New Zealand, and other areas of the world. In 1999, California adopted the Marine Life Protection Act (MLPA) requiring the implementation of a science-based statewide network of MPAs implementation. This law includes conservation goals focused on ecosystem protection, natural diversity and habitat protection.

What is MPA Watch?

MPA Watch is a citizen science monitoring program that trains volunteers to monitor human uses of coastal natural resources by training and supports volunteers in the collection of relevant, scientifically rigorous, and broadly accessible data. Data are meant to inform the management, enforcement, and science of California's marine protected areas (MPAs) and allow us to see how human uses are changing as a result of MPA implementation. By involving local communities in this important work, MPA Watch programs inspire and empower stewardship, and educate individuals about California's ocean ecosystems. MPA Watch volunteers collect data from both within and outside MPAs, allowing for useful comparisons. The California Ocean Science Trust (OST) is collaborating with MPA Watch programs throughout California to enhance and expand the relevance and utility of the data collected by MPA Watch programs, and coordinate between programs and regions.

Goals

1. To help determine how effective MPAs are at meeting their goal of enhancing recreational activities by tracking changes and trends over time.
2. To provide contextual information on human use for interpretation of biological monitoring data.
3. To inform MPA enforcement and management decisions regarding human activity inside MPAs.
4. To train MPA Watch volunteers as effective public educators regarding MPAs.

Methods

MPA Watch volunteers walk along California's beaches and bluffs surveying and recording all offshore and onshore coastal activities within and outside MPAs. Volunteers are trained to recognize different types of activities, using binoculars to view activities offshore, and to record what they see on data sheets. Examples of activities that volunteers record include consumptive activities such as commercial lobster fishing and shore fishing, and non-consumptive activities such as swimming, SCUBA diving, and wildlife watching. Volunteers are trained to use compasses to accurately begin and end their surveys, as well as to identify MPA boundaries. All data that is collected undergo rigorous quality assurance and quality control protocols by coordinating organizations before being accepted and shared.

MPA Watch Data

Potential users of MPA Watch data span academia, natural resource management agencies, and local communities. A key focus for the program is to inform California's management of MPAs. Data are meant to inform:

- Management
- Enforcement
- MPA Science
- How are human uses changing as a result of MPA implementation?

Growing Statewide Network

Groups that are currently training MPA Watch volunteers:

- Heal the Bay
- Los Angeles Waterkeeper
- Marin Environmental Action Committee
- Orange County Coastkeeper
- The Otter Project
- San Diego Coastkeeper
- Santa Barbara Channelkeeper
- WiLDCOAST

For more information, visit www.mpawatch.org.

Shore Fishing

Rules of thumb

Remember the following rules:

- Only record ACTIVE fishing
- People carrying fishing equipment that is not in active use are recorded in another category (beach recreation)

Classification: Shore-based trap fishing
Common types: Crab, lobster, & fish traps
What to look for:

- People setting enclosed mesh systems (may be a cube, cylinder or other shape) into shallow water

Classification: Shore-based spear fishing
Common types: Pole spear, spear gun, poke polling, clam digging
What to look for:

- Hand-held equipment used to spear/dig in both the sandy & rocky intertidal areas
- SCUBA or freediving equipment (wetsuits, fins, etc.)

Classification: Shore-based net fishing
Common types: Cast nets
What to look for:

- People throwing a net by hand into a body of water

Boat Fishing

Rules of thumb

Look for indicators that the vessel is actively fishing:

- Make sure to properly mark if active or inactive fishing
- Active fishing: lines in the water, Davit arms lowered, traps being set or pulled up
- Sea birds in great numbers following a vessel
- Equipment being let out or retrieved either by deck hands, onboard systems or small support boats

Classification: Boat fishing-Traps
Common types: Lobster, Crab
What to look for:

- Pots or cages stacked onboard the vessel with fluorescent marker buoys
- A block system on the side of the boat used to haul the traps out of the water

Classification: Boat fishing-Nets
Common types: Squid, Purse Seiner, Trawler
What to look for:

- Large spools of netting
- Small support boats helping draw out long, fluorescent lines that float on top of the water
- Davit arms in a lowered position on either side of the vessel with nets hanging in the water
- 'V' shaped wake lines occurring separate from the vessel

Classification: Boat fishing-Lines
Common types: Troller, Long Line
What to look for:

- Surface floats trailing out behind the vessel along trailing lines
- Long davit arms with trailing lines attached to surface floats
- Multiple pulley block systems & lines looped together

Classification: Boat fishing-Dive
Common types: Urchin, cucumber, lobster
What to look for:

- Divers bringing traps, nets, or single catches to the surface
- Collection bags, big buoy, divers on a dive boat or fishing boat
- A dive flag (reddish/orange with white diagonal stripe)
- Coiled air supply line on vessel– yellow, orange, or black

Classification: Whale Watching boats
Common types: Depends on region
What to look for:

- Breaching whales, spouts, etc.
- Groups of sightseers onboard, often with cameras and binos

Classification: Commercial Passenger Fishing Vessel (5+ people)
Common types: Charter/Sport fishing boat
What to look for:

- Vessel ID # and signage on the sides of the boat
- Multiple people on board (5+) with rod/reel fishing gear
- Birds often following vessel


Shore-based trap fishing


Shore-based spear fishing (pole spear)


Shore-based spearfishing


Shore-based spear fishing

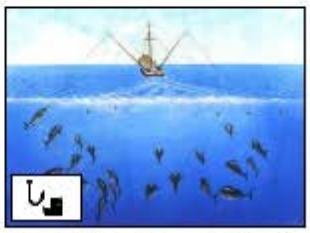

Shore-based net fishing


Boat Fishing-Traps (Crabs)


Boat Fishing-Traps (Lobster)


Boat Fishing-Nets


Boat Fishing– Nets (Trawl)


Boat Fishing-Lines (Trolling)


Boat Fishing-Lines (Trolling)


Boat Fishing-Dive (Cucumber)


Dive boat flag


Other Consumptive Diving


Boat fishing—Dive (urchin)


Whale watching Boat


Whale watching


Commercial Passenger Fishing Vessel


Hand Collection of Biota (note use of bucket or bag)


Tidepooling (NO collecting)

MPA WATCH—QUICK FIELD REFERENCE GUIDE

Onshore Activities		What to look for
	Recreation	Walking, hiking, running, resting, playing, sitting, camping, art (NOT TIDEPOOLING)
	Wildlife Watching	Possession of binoculars or a spotting scope OR overt interaction with wildlife (e.g. pointing)
	Domestic animals on-leash	Dogs, horses, etc. Count animals as individuals, and count people separately in recreation
	Domestic animals off-leash	Mostly dogs, but could apply to other domestic animals. Note non-dogs in the comments section.
	Driving on the Beach	Motorized vehicles, actively driving, or parked on the sand. (Lifeguards, Beaches & Harbors vehicles)
	Tidepooling	Actively observing or non-collecting interaction with tidepools
	Shore-based hook and line fishing	Actively fishing. Line in the water, casting, etc.
	Shore-based trap fishing	Actively fishing. Hoop nets being deployed from shore (rocks, likely)
	Shore-based net fishing	Actively fishing. Net in, throwing, etc. See reverse for a picture reference
	Shore-based spear fishing	Spear fishing from shore (includes poke-poling & clam digging). See reverse for a picture reference
	Hand Collection of biotic material	Extraction into a bucket or net– may typically occur on rocks, tidepools, or for sand crabs
Offshore Activities (Non-Boating)		
	Board Sports	Surfing, Boogie Boarding, Kite Surfing, Wind Surfing
	Stand-up Paddle Boarding	Stand-up Paddle Boarding
	Swimming/Bodysurfing	Swimming, wading (knees or deeper), bodysurfing, etc.
	Non-Consumptive SCUBA and snorkeling	In water, gearing up, entering or exiting the water– no collection of biota and no fishing gear
	Spear Fishing (free diving or SCUBA)	In water, or gearing up, entering or exiting the water with observed spear gun
	Other Consumptive Diving	Possession of marine life (lobster, scallops, etc.) and/or presence of goodie/net bags.
Boating		
	Boat Fishing - Traps	Boat with occupants setting or hauling in traps. Can be square traps (commercial) or hoop nets.
	Boat Fishing - Line	Boat with occupants using rod/reel systems. See reverse for a picture reference
	Boat Fishing - Nets	Boat using net system to fish. Davit arms at 45 degree angle, tow lines, 2 boats setting purse seine
	Boat Fishing - Dive	Boat with occupants collecting resources from dive operations. Big buoy, round nets, coiled air lines
	Boat Fishing - Spear	Boat with occupants collecting resources using spear equipment. See reverse for a picture reference
	Boat Kelp Harvesting	Boat with occupants harvesting kelp. See reverse for a picture reference
	Unknown Fishing Boat	Visual evidence that boat is fishing, but unable to discern gear type– try to get vessel ID #
	Commercial Passenger Fishing Vessel	5+ people visible on board, look for vessel ID # (or local knowledge of vessels).
	Paddle Operated Boat	On the water, launching, or pulling out. (includes kayaks, dinghies, canoes, etc.)
	Dive Boat	Stationary with a flag up. No presence of fishing gear (nets, traps, etc.)
	Whale Watching Boat	Passengers observing marine life (dolphins, whales) - can be 2 levels or 1 on boat, binos, cameras
	Work Boat	Including lifeguard boats, enforcement, research, military, coast guard
	Other Boating	Any powerboat, jet ski, or sailboat, which is not obviously a work-boat
?	Other	This is for things volunteers note as important, but which are not accommodated by the data sheet

The Otter Project
www.otterproject.org

MPA WATCH VOLUNTEER COMMITMENT AGREEMENT

Personal Information				
Full Name				
Street				
City		State		Zip
Phone		Alt. Phone		
Email		Birth Date		
Emergency Contact				
Full Name				
Phone		Alt. Phone		
Email		Relationship		

Availability							
Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
AM							
PM							

MPA Watch Terms & Conditions

We at The Otter Project hope your time involved in the MPA Watch program will be beneficial and fun. One of the greatest challenges in a volunteer-based organization is setting expectations for volunteers when they first begin their service. Here, we would like to optimize your experience and time by outlining areas in which we would like to see you strive to the best of your ability.

Volunteer Responsibilities:

- Actively engage and complete training requirements.
- Conduct at least 2 surveys per week for duration of three (3) months (approx. 24 surveys)
- Coordinate personal monitoring schedule so that ½ of surveys are before 12 noon and ½ are after.
- Coordinate personal monitoring schedule so that ½ of surveys are mid-week and ½ on weekends.
- Follow all general instructions for monitoring and ensure that data is as accurate as possible.
- Submit electronic data entry within 48 hours of conducting Survey
- Mail all surveys to: PO Box 269, Monterey, CA 93942
- Attend group debriefing meetings approximately every 6 weeks.
- Represent The Otter Project and promote behaviors that support environmental stewardship.
- Be knowledgeable about assigned MPA Watch monitoring site and applicable regulations.
- Follow all posted rules and regulations, especially those related to safety.
- Routinely check updates, actively participate and contribute to meetup.com/mpawatch.
- Seek support/inform Volunteer Coordinator when you require assistance.
- Provide feedback and request resources you may require to succeed.
- Return binoculars, GPS and any other equipment borrowed from The Otter Project upon completion of volunteer tenure.

The Otter Project's Responsibilities:

- Communicate with you concerning MPA Watch initiatives, changes in monitoring protocols, procedures and programs, etc.
- Properly plan and execute meetings and events to use volunteer's time efficiently & effectively.
- Provide support to help you reach your personal goals as an MPA Watch volunteer.
- Provide ongoing volunteer development programming and training to optimize your experience.
- Answer any and all questions that you may have.
- Provide feedback on monitoring surveys and data submissions.
- Provide periodic reports on data collected during MPA Watch surveys.

I, _____ have read the MPA Watch Volunteer Commitment Agreement form and my job description and fully understand my responsibilities as a volunteer. I agree to fulfill my commitment.

Signature: _____

Date: _____

VOLUNTEER AGREEMENT AND RELEASE FROM LIABILITY

1. I, _____ ("Volunteer"), desire to provide volunteer services for The Otter Project, Inc. located at PO Box 269, Monterey, CA 93942 ("TOP") as a volunteer on MPA Watch program starting on: _____

2. As a volunteer, I understand that I control the dates and times when I do the work and that TOP is not responsible for scheduling my volunteer work. I also understand that I will not be compensated for any time spent volunteering, nor am I entitled to benefits, including employment insurance benefits upon the termination of this agreement or as a result of this service.

3. I am aware that participation as a volunteer may require driving to and from survey locations, continuous walking for 60 minute periods on varying coastal terrain and will require the exercise of reasonable care to avoid injury. I am voluntarily participating in this activity with knowledge of the hazards and potential dangers involved, and agree to accept any and all risks of personal injury and property damage.

4. As consideration for volunteering for TOP, I hereby agree that I, and my assignees, heirs, guardians, and legal representatives, will not make a claim against or sue TOP or its employees, agents or contractors for injury or damage resulting from the negligence, whether active or passive, or other acts, however caused, by any of its officers, employees, agents, or contractors of TOP as a result of my volunteering. I HEREBY RELEASE AND DISCHARGE TOP AND ITS OFFICERS, EMPLOYEES, AGENTS AND CONTRACTORS FROM ALL ACTIONS, CLAIMS, OR DEMANDS THAT I, MY HEIRS, GUARDIANS, AND LEGAL REPRESENTATIVES NOW HAVE, OR MAY HAVE IN THE FUTURE, FOR INJURY OR DAMAGE RESULTING FROM MY PARTICIPATION IN THE PROJECT.

5. I UNDERSTAND THAT IF I AM INJURED IN THE COURSE OF THE PROJECT, I AM NOT COVERED BY TOP's WORK- ERS' COMPENSATION PROGRAM. I authorize TOP to seek emergency medical treatment on my behalf in case of injury, accident or illness to me arising from my involvement as a volunteer. I understand that I will be responsible for medical costs incurred by such accident, illness or injury.

6. I UNDERSTAND THAT MONITORING SITES ARE LOCATED ALONG A DYNAMIC AND POTENTIALLY HAZARDOUS COASTLINE, AND I RECOGNIZE THAT PARTICIPATION IN THE MPA WATCH PROGRAM POSES INHERENT RISKS TO VOLUNTEERS AND PARTICIPANTS. I acknowledge that MPA Watch activities and events may involve a test of a persons' physical and mental limits and may carry with it the potential for death, serious injury, and property loss. The risks may include, but are not limited to, those caused by terrain, poison oak, wildlife, temperature, weather, condition of participants, equipment, vehicular traffic, actions other people including, but not limited to, participants, volunteers, members of the public, and event monitors and or producers of the event, and lack of hydration.

7. I expressly agree and promise to accept and assume all of the risks existing in this activity. My participation in this activity is purely voluntary, and I elect to participate in spite of the risks.

8. I understand that the materials and tools provided by TOP are and remain the property of TOP, and I agree to return these tools and any remaining materials to TOP at the end of my volunteer service.

9. I HAVE CAREFULLY READ THIS AGREEMENT AND FULLY UNDERSTAND ITS CONTENTS. I AM AWARE THAT THIS IS A RELEASE OF LIABILITY, AND SIGN IT OF MY OWN FREE WILL.

Volunteer Signature		**TOP Signature**	
Printed Name		**Printed Name**	
Date		**Date**	

Heal the Bay | MPA Watch Volunteer Application

Full Name		Today's Date	

Are you currently a Heal the Bay member or volunteer?	YES	NO	If so, in what capacity?

Contact Information

Cell Phone	( )	Address				
Home Phone	( )	City		State	CA	Zip
Work Phone	( )	**Birth Date**				
E-mail						

Emergency Contact Information

Contact		Home Phone	( )
Relationship		Cell or Work Phone	( )

Place of Employment / School

Place of Employment / School & Profession	
Are you currently in school?	**High School** **College**
If so, what level?	**9 10 11 12 Fr So Jr Sr Grad**

❶ How did you hear about Heal the Bay and MPA Watch?

❷ Why would you like to volunteer with MPA Watch and Heal the Bay?

❸ Please list your availability and preferred MPA Watch survey times. (Bolded days/times are priority).

Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday

6-9 AM, 9 AM-Noon, Noon-3 PM, 3-6PM, **6PM-Sunset**

Volunteer Commitment Agreement. *(Please initial next to each statement)*

	As a volunteer, I will be dependable, reliable, respectful, and professional while representing Heal the Bay.
	As a volunteer, I will be responsible for arriving on time, following directions, and completing assigned tasks.
	I understand that if I do not act with proper conduct while volunteering, I will be asked to discontinue my volunteer service.
	I commit to completing a minimum of four (4) surveys a month for MPA Watch for six (6) months.
Applicant's Signature	X
Parent's Signature (if under 18)	X

MPA WATCH WAIVER OF LIABILITY AND EXPRESS ASSUMPTION OF RISK
(PLEASE READ CAREFULLY)

I, _____, HEREBY CERTIFY THAT I AM AWARE OF THE INHERENT HAZARDS OF VOLUNTEERING FOR MPA WATCH.

I agree as follows: 1. I am volunteering my services for the MPA Watch program on a voluntary basis without anticipation of payment of any kind; 2. I will perform assigned tasks that are within my physical capability to the best of my ability, and I will not undertake tasks that are beyond my ability; 3. I am familiar with the safe operation and use of equipment and tools that I may utilize in connection with this volunteer activity, and I will not undertake to use any equipment or tools with which I am unfamiliar or do not know how to operate safely; 4. I acknowledge that I have received and read appropriate instruction regarding this program, including appropriate safety and emergency procedures, and that I fully understand those instructions and that I agree, after proper inspection, to use only the supplies, tools and equipment provided by the program organizers; 5. I will perform only those tasks assigned, observe all safety rules, and use care in the performance of my assignments; 6. I specifically acknowledge that I am engaging in this activity as a volunteer, at my own request and risk, and not as a State of California or Foundation employee, agent, official, officer or representative, and further acknowledge that I am not entitled to any compensation, benefit or insurance coverage from the State of California, the Department of Parks and Recreation, the California Coastal Commission, the California State Parks Foundation, Los Angeles County Department of Beaches and Harbors, Heal the Bay or any promoter or sponsor, nor will I make any such claim.

I understand and agree that neither the State of California, California Coastal Commission, California Department of Parks and Recreation, California State Parks Foundation, Los Angeles County Department of Beaches and Harbors, Heal the Bay, nor any other organizers or promoters or sponsors or property owners involved in this program, nor any of their respective employees, officers, agents or assigns, (hereinafter collectively referred to as "Released Parties"), may be held liable or responsible in any way for any injury, death or other damages to me or my family, heirs, or assigns that may occur as a result of my participation in this activity, or as a result of product liability or the negligence of any party, including Released Parties, whether passive or active.

I understand that walking along beaches, rocks, streams, and waterfront areas involves certain inherent risks, including but not limited to, the risks of possible injury, infection or loss of life as a result of contact with needles, condoms, metal objects, burning embers or other hazardous materials found on the beach, or from over-exertion or environmental conditions. Despite these risks, I still choose to proceed in such activity. I know of no physical limitation which should keep me from undertaking the activities associated with this program. In Consideration for being allowed to participate in this activity, I hereby personally assume all risks in connection with the program for any harm, injury or damage that may befall me as a participant, including all risks connected therewith, whether foreseen or unforeseen. I further save and hold harmless said activity and Released Parties from any claim or lawsuit for personal injury, property damage, or wrongful death, by me, my family, estate, heirs, or assigns, arising out of participation in this activity, including both claims arising during the activity and after I complete the activity.

If I should become injured while participating in the program, I authorize any physician or surgeon licensed in the State of California to perform emergency or surgical treatment as in his or her sole judgment may be necessary. I further declare that I am eighteen and legally competent to sign this liability release, or that I have acquired the written consent of my parent or guardian. I understand that the terms herein are contractual and not a mere recital, that this instrument is a legally binding, and that I have signed this document of my own free act.

I agree to allow my image to be used in published materials and web sites that promote the programs of Heal the Bay.

BY THIS INSTRUMENT I DO HEREBY EXEMPT AND RELEASE ALL "RELEASED PARTIES," AS DEFINED ABOVE, FROM ALL LIABILITY OR RESPONSIBILITY WHATSOEVER FOR PERSONAL INJURY, PROPERTY DAMAGE OR WRONGFUL DEATH, HOWEVER CAUSED, INCLUDING NEGLIGENCE OF THE RELEASED PARTIES, WHETHER PASSIVE OR ACTIVE.

I HAVE FULLY INFORMED MYSELF OF THE CONTENTS OF THIS LIABILITY RELEASE AND ASSUMPTION OF RISK BY READING IT BEFORE I SIGNED IT ON BEHALF OF MYSELF AND MY HEIRS.

_____	_____	_____	_____
Spelling of Participant's Name	Date	Street Address	Phone
			_____
_____		_____	@_____
Signature of Participant		City, State, Zip	E-mail Address

IF PARTICIPANT IS UNDER 18, THE PARENT(S) (OR GUARDIAN(S), IF ANY) MUST SIGN.

The above participant has my permission to participate in the MPA Watch program. I have read and agree to the provisions stated above. I know of no health limitations which may restrict this volunteer's participation in this activity.

_____	_____	_____	_____
Signature of Parent(s) or Legal Guardian(s)	Date	_____	Phone
		Address	

Conducting & Submitting Surveys

How to complete a survey

Step-by-step guide

1. Walk to the beginning location (either the play button or stop symbol) indicated on the site map
2. Take note of the time and complete the indicated fields (name, date, time, beaufort scale, cloud cover). Leave tide information blank
3. Stand side on to the ocean and begin to walk the survey route indicated on the site protocol
4. As you walk, look for activities that are occurring adjacent to your present location. (Remember the 'search beam' technique referenced during field training)
5. Mark activities on the data sheet map, using the provided activity codes. Remember to mark the activity code and the number of people/boats/animals represented by that code on the data sheet
6. Continue to record activities until the route is completed or 60 minutes is reached

Golden rules for conducting surveys

- Carry a copy of your monitoring protocol, data sheet, binoculars, GPS (as needed), pen, clipboard, digital camera (if available) and dress appropriately
- Fill out a separate data sheet for EACH survey you conduct; make note of your partner if you are working in pairs but submit only one data sheet
- Use your best judgment to place activity codes and numbers in accurate locations on the data map
- Only survey in one direction at a time. NOTE: If you would like to conduct another survey in the reverse direction you may do so.
- Please ensure that you are starting survey #2 more than 1 hour after you began your first survey. You may survey more than once each day
- Only record activity on beaches/rocky intertidal, in the water, and offshore. Do NOT record activity on adjacent trails, roads or paths
- When recording activities, only record the activity people are engaging in when you first observe them, even if they have equipment for multiple activities
- Some surveys may have no activity. It still counts as a survey; fill out a data sheet, and mark no activity
- Safety first! Paths may be muddy, slippery, eroding, etc. Some surveys require getting out on busy roads or highways. DO NOT compromise your safety in order to stick to monitoring protocol; if conditions require you to deviate from the protocol, simply make a note of the condition and your alternate route
- Do NOT interact with people you think are not following regulations. You are only monitoring activity

How to submit data

Step-by-step guide

1. Take your completed survey map and record your totals on the data compilation sheet
2. Go to www.meetup.com/mpawatch
3. Go to "Pages" in the top menu
4. Click on the "MPA Watch - California Tide Chart" and complete the tide information on your data sheets
5. Return to "Pages" and click on "MPA Watch - Submit Data HERE".
6. Please fill out the Google Docs online form in its entirety.
7. After completing the online form, make sure to click SUBMIT before closing the screen

Golden rules for data submission

- If you are surveying at multiple locations, make sure to use a different compilation sheet for each site
- Always upload your data within 48 hours
- Make sure to keep your data and compilation sheets in a secure place - you are required to hand them into your regional Volunteer Coordinator every few months
- Remember: Zero IS a number! Make sure to put '0' in any blank fields

Important Numbers

MPA Watch Volunteer Coordinator: 530-304-3243
Jeanée Natov, jeanee@otterproject.org
Holly Sletteland (San Luis Obispo) - holly@otterproject.org
CalTIP: (Otter abuse, Poachers, or Polluters) 1-888-334-2258
Report Polluters: 831-646-8840 (Monterey Coastkeeper Hotline)
Sick/Injured Marine Mammals: 831-633-6298 (Marine Mammal Center)
Dead or Stranded Otter: 831-648-4840 (Monterey Bay Aquarium)
Injured Bird: 831-373-2631 (Monterey), 831-462-0726 (Santa Cruz)
Oil Spills: 1-800-424-8802 (OSPR 24 hr hotline)
Cal. Dept. Fish and Game: 831-649-2870 (Public Switch)

The Otter Project

www.otterproject.org

Point Lobos State Marine Reserve (SMR)
***all coordinates are in the format ready to be plugged into Google Maps**

Permitted/Prohibited Uses: Take of all living marine resources is prohibited.

Additional Restrictions: Within the portion of the Point Lobos State Marine Reserve which also falls within the boundary of the Point Lobos State Reserve (State Park Unit), restrictions on boating and diving activities exist. Contact the California Department of Parks and Recreation for current restrictions.

Pt Lobos SMR is a reserve with a sizable coastline. Approximately half of the reserve lies within Pt. Lobos State Park. This provides ideal access for much of the reserve; coastal trails provide good visibility for both on and offshore uses. From Granite Point, in the northern part of the park, observers will be able to see offshore uses up to the southern boundary of Carmel SMCA.

Monastery Beach

NOTE: Monastery Beach is known for dangerous surf conditions. Follow all posted instructions and safety warnings, and avoid getting too close to the water, esp. if you are surveying, and not paying attention to the tide.
Drive South on HWY 1. About 1.25 miles south of Carmel, you will see a large dirt pullout on your right (36.522478, -121.927304).

Park in the center of the beach. **Do NOT start your survey.** Walk along the dirt pullout to the trail head, just beyond Bay School. Go down the school's driveway where there is an access gate just north of the school. Take the trail marked "State Park Property". Follow the trail until you reach the large rock formation (36.528269, -121.926119).

Note the exact time on your datasheet & **Begin Survey**. Walk along the trail that runs along the edge of the bluff closest to the water. This provides full visibility of all the coves, tide pools, and beaches. **Do not record activities occurring on the trail; only record activities in or abutting the water.** Follow the fork in the trail down to the beach and walk along the beach continuing your survey of the beach and offshore as you return to your car.

NOTE: Most of the year, the nearby river has low enough flow to allow beach crossing but if the river is flowing, DO NOT attempt to cross it. If you have to leave the beach, stop recording activities until you are back at the beach. Survey the beach, especially the southern area and offshore.

Drive to Pt. Lobos State Park. You may enter the park with your permit (if not, entrance fees will be reimbursed) and drive to the Whaler's Cove Parking Lot (36.520267, -121.940800) or park on the dirt pullout before the park entrance and walk in.

If you drive in, from Whalers Cove parking lot take the road back around the cove to reach Granite Point Trail head (36.518983, -121.940200).

If you walk in, you will take Carmelo Meadow Trail to Whalers Cove. Begin your survey once you reach the cove. (**NOTE:** Make sure to survey the parking lot for divers as they do count.)

Follow the Granite Point trail around Whalers Cove to the Pit. Veer right at the bench and continue along Granite Point trail. Before Granite Point Trail and Moss Cove Trail intersect, take the steps to your left that climb up to the top of Granite Point.

At the top of Granite Point (36.522912, -121.936701), you will have a good view south past Whalers Cove, offshore, and of Moss Cove. Survey the shoreline of these areas and offshore with binoculars, recording all activity past Moss Cove up to Monastery Beach. This is the end of your survey.

NOTE: If you would like to conduct another survey in the reverse direction at this time you may do so. Please ensure that you are starting survey #2 more than 1 hour after you began your first survey.

MPA WATCH

VOLUNTEER RECRUITMENT STRATEGY GUIDE

Complied by

Mark Welden-Smith (*The Otter Project*)

Recruiting MPA Watch Volunteers: An Overview

The purpose of this training document is to provide an overview of the volunteer recruitment process from beginning to end. No assumptions have been made about the levels of expertise a volunteer coordinator may or may not have in relation to the recruitment process, and as such, it is intended to be a 'kitchen sink' model with as much detail as possible.

If you've never run a volunteer recruitment program before, then this document is a great place to start. For those that already have a background in recruitment, it will also serve as a useful tool for cataloging approaches you may already be familiar with and, hopefully, some that are new. All the techniques mentioned are field tested and have been proven to consistently help find and retain volunteers.

It bears mentioning at the outset that there is not a one-size-fits-all model of recruitment. While many of the applications outlined in the document are universal, differences in regional topography, population density, community event regularity and transport infrastructure will impact the volunteer recruitment and retention process and require careful thought and planning.

Adapting this document to suit the needs of both your region and organization will ensure that the approaches outlined in the following pages are useful to your program. To this end, we recommend that you keep the following points front of mind when reading this document:

- Does this serve our organization's mission?
- Do we have the capacity to achieve this or can we outsource it?
- Does the approach need to be modified to suit our region/organizational approach? And if so, how?

Using these questions to test the assumptions outlined in this document will ensure your final strategy document is tightly aligned with both your program goals and region.

What this document covers

The purpose of this document is to help organizations develop, implement and maintain an MPA Watch volunteer program in their region. To this end, it covers:

- How to structure an initial discussion to establish the scope of the program and develop a roadmap for volunteer recruitment
- How to write a volunteer recruitment plan, including development of a budget and volunteer retention strategy
- Factors that will contribute to the success of your program
- Technology considerations for running the program &
- Final thoughts on the challenges of running an MPA Watch program.

Before you begin to read this document…

If you are starting front scratch or have no previous expertise in recruiting volunteers, I suggest working through the scooping exercises in Step 1. For those experienced in recruiting volunteers, if may be more useful to skip Step 1 and go straight to Step 2.

Step 1: Initial discussion

Although it can be tempting to jump in with both feet and start rounding up volunteers, an organization without a robust strategy and engagement framework may burden itself with an inefficient program that wastes both resources and time. Before you begin recruitment efforts, take the time to work through the exercises below and meet with other program stakeholders.
Note: Throughout this document you will see tables like the one below titled "Action Item". The contents of these tables suggest activities for your organization to work through in the development and implementation of your volunteer program.

Action item: Test your assumptions

Note: It is highly recommended that everyone attending the meeting in the scoping exercise mentioned in the next action item run through this exercise

- Before meeting with staff/stakeholders, take 15 minutes to write down your own basic assumptions about the program.
- Make sure to answer the following questions:
    - In your opinion, what are the goals of the MPA Watch Volunteer Program?
    - What will the MPA Watch volunteer program have achieved in one year?
    - What is your definition of program success?
    - How many volunteers do you want after 1 month? 3 Months? 6 months? A year?
- Include any other questions that are relevant to your organization.

Following your initial writing exercise, it's time to gather staff/stakeholders for a scoping meeting. The aim of this meeting is to think about the resources it will take to start an MPA Watch volunteer program and to define the basic goals of the program. *Note: You will find suggested questions for your scoping meeting on the next page.*

Action item: Scoping Meeting

1. Gather staff/stakeholders for a round table discussion about the MPA Watch Volunteer Program
2. The answers from the previous discussion will help test the basic assumptions of the group. It is at the discretion of the organization whether these answers will be shared between participants or simply used to help inform their answers during the group discussion
3. Remember that the purpose of the discussion is to achieve the following:
    a. Setting timelines for the development, implementation and review of your volunteer program
    b. Setting specific goals for recruitment targets
    c. Defining what 'success' means for your program (is it a specific number of volunteers? Is it increased community engagement?)
    d. Identifying staff responsibilities, ongoing resource use and other startup costs (*Note: a more thorough budgeting tool is outlined later in the document, so don't get too bogged down in trying to identify every line-item expense*)
    e. Getting "buy-in" from management and building consensus between stakeholders early in the process
4. Following the meeting, ensure that you condense your answers down to a 1 or 2 page document. This will be used as a guide for the development of your recruitment strategy.

If there is considerable disagreement between parties at the meeting, you may wish to reconvene at a later date with the aid of an impartial moderator. Reaching a consensus between stakeholder groups before writing the plan should be considered a priority. Remember, focus on mutuality agreed definition of what 'success' means for your program.

MPA WATCH - SCOPING QUESTIONS

The goal(s) of the MPA Watch Volunteer Program:

After 1 year the volunteer program will have achieved:

Opening Questions

- What is your organization's definition of program success? (X amount of volunteers by X date?)
- How will this program be funded? (Grants, existing budget, membership? think about setup and ongoing costs.)
- Who will develop the program budget? (By what date will it be ready?)
- How many existing staff will manage the program? (Is it a part-time/full-time roll? Will staff need to be hired?)
- Will staff need training? (Have they run a volunteer program before?)
- Does management have buy-in to the program? (Will a presentation need to be made? By whom?)

Developing a Recruitment Plan

- Who will write the plan? (Can it be done in-house or will it need to be outsourced?)
- What stakeholders need to be involved in the creation of the plan? (Internal and external)
- What is the projected completion date of the plan?
- Who will review the plan before implementation? (Will it need management or board approval?)

Regional considerations

- What are the major community events in your area in a calendar year?
- List all the major universities/community colleges in your area
- List all other major community groups/organizations in your region (Churches, social groups, etc.)
- What existing media relationships can your program leverage to get word out? (Local radio, newspapers, etc.)
- What other relationships does your organization have that can be leveraged to help recruitment efforts?

Starting Recruitment (include desired outcomes and hard targets)

- What are the objectives for the first week of recruitment?
- What are the objectives for the first month of recruitment?
- What are the objectives for the first 3 months of recruitment?
- What are the objectives for the first 6 months of recruitment?
- What are the objectives for the first year of recruitment?

Program Management

- What does the average day of the volunteer manger's role involve? (Remember to include tasks outside recruitment)
- How will success within the volunteer manager's role be defined? (Recruitment numbers only or other factors?)
- What systems are in place to deal with volunteer emergencies? (Insurance/first aid/family contact numbers)
- What tools will the organization use to manage the program? (Are they free or fee based?)
- How will volunteers be trained and who will run the training sessions? (Who will develop the training materials?)

Program Review

- Who will be responsible for reviewing the program? (Will it be an external organization? An internal committee?)
- How will feedback from volunteers be handled? (Through informal communication or a website survey?)
- Who will update program procedures and documents following a review process? (When will it be completed?)

Misc

- Other questions/considerations specific to your organization/region not included above.

Step 2: Identifying your recruitment demographic

As an extension of your initial scoping discussion, it is worthwhile considering who your ideal recruitment target will be. This can be done with the same group from the last activity or with a smaller working group.

There are many reasons volunteers give their time to a cause or organization. It can be driven by wanting to belong to a tightknit community working towards a specific goal or simply a requirement for graduation.

The purpose of this action item is to develop a composite of the types of volunteers that you want to recruit for your program. Identifying different types of individuals and their interests will help focus your recruitment efforts and aid the creation of targeted promotional materials.

Who is your ideal volunteer?

Questions	Examples
What type of non-volunteer activities are ocean loving individuals likely to be involved with?	Local outdoors groups involved with hiking, diving, surfing, kayaking, swimming, etc.
What type of volunteer activities are ocean loving individuals likely to be involved with?	Other ocean groups in your region, trail restoration or native planting groups, community service organizations, wildlife care networks, etc.
What kinds of events are ocean loving or environmentally conscious individuals likely to attend?	Farmers markets, community fairs, ocean sports events (surfing, triathlons, running), etc.
What kinds of places are ocean loving or environmentally conscious individuals likely to frequent?	Local cafes, universities/community colleges/adult education centers, community notice boards, etc.
What kinds of local businesses does you're ideal volunteer frequent?	Grocery stores (Whole Foods, Henry's, etc.), businesses with handmade goods, nurseries, sporting goods (REI, Patagonia, etc.)
What events occurring in your area during a calendar year is your volunteer likely to attend?	Food/wine festivals, sports events, volunteer fairs (usually run through local universities/community colleges)
What kinds of organizations/individuals does your ideal volunteer likely know?	Professors/teachers, local business owners, Politicians/celebrities in your area, etc.
Think about the towns/cities in your region. What kinds of people live there?	A student housing area, retirement community, military families, etc.
What kinds of people visit the survey areas where you program will take place?	Tourists, wildlife enthusiasts, runners, etc.
What other kinds of groups are specific to your region?	Local state parks docents, unique animal groups in your region, etc.

Step 3: Writing a recruitment strategy

A recruitment strategy should be thought of as a living document. It is highly unlikely that you will have a perfect strategy after the first, or even second and third draft.

As your program evolves, volunteer feedback, ongoing challenges and new opportunities will present themselves. Having a formal process for reviewing these changing variables, testing new ideas against your initial assumptions and incorporating new ideas from lessons learned should be considered essential.

A program can certainly succeed without going through the exercises on the following pages, although streamlining your approaches and systemizing your thoughts will greatly reduce your administrative overhead in the long term.

In order to make your recruitment strategy useful (and one your staff will actually use and not just leave to gather dust in a drawer), keep the document brief and to the point. Focus on actions that support the program's mission, recruitment targets, deadlines and expenses.

During the development of your recruitment strategy, remember to refer to the answers from the scoping discussion in step 1. It will provide many of the deadlines and targets for your recruitment strategy, and help focus your writing.

In addition to the answers from the initial scoping meeting, the pages in the following section will help inform your thought process in the creation of the recruitment strategy document. It will cover:

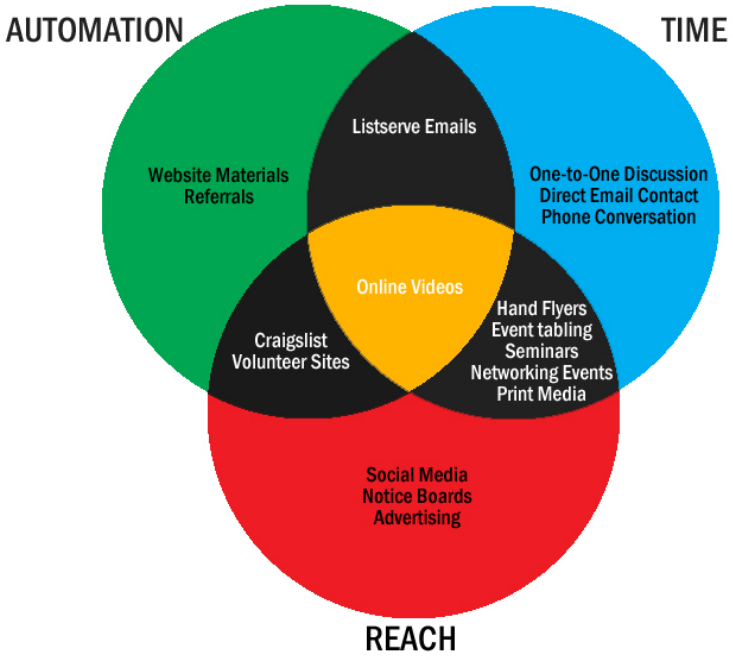
- Assessing different recruitment approaches
- Developing strategies for volunteer retention & attrition
- Organizing events that encourage social interaction &
- Developing a realistic operations budget

After completing the action item at the end of this section, your recruitment strategy should contain the following checklist of items:

- A position description for the Recruitment Manager (plus any support staff)
- A plan for hiring additional staff (if needed)
- Recruitment targets
- A daily/monthly/weekly/quarterly/yearly calendar of key recruitment events
- A plan for developing recruitment materials
- A budget outlining setup costs, and ongoing expenses for the first year of the program
- A condensed 'dashboard' view of your program goals (like an executive summary)
- Deadlines for reviewing the recruitment strategy, recruitment targets & program performance

Assessing different recruitment approaches

Much like an investment portfolio, a recruitment strategy should be diversified and incorporate a number of different approaches. The following chart represents a way of looking at recruitment approaches across three different categories: quality, reach & automation.



Automation

The circle in green represents tasks that require less input from the volunteer manager. Aside from an initial input of time to write or produce the material, approaches in this circle are largely self-governing or take relatively small amounts of time to maintain.

Time

The circle in blue represents tasks that are typically time intensive. Tasks in this circle require the volunteer manager to be physically present or invest hours at a time.

Reach

The circle in red represents tasks that allow a recruitment message to connect with many individuals at a time.

Use the graphic above as a tool to think about the recruitment efforts that may be relevant to your program and the time, reach and automation factors of these approaches. Think about the opportunities/challenges in your region/organization and modify or add different items as you see fit. Remember, there is no one-size-fits-all approach to recruitment efforts.

Use the table on the following page as a reference guide for assessing different approaches that may be suitable for your region. Keep in mind that excellent, long term volunteers do not come from any one approach and often from the most unlikely of sources. Utilizing a mix of the approaches outlined below will ensure that your program has the greatest opportunity for success.

Approach	Pros	Cons
University/Community college lecture hall announcements	• Highly targeted • Potential to reach many people at once	• Time intensive • University/college may have a no announcement policy in classrooms
Emails through Professors (Listserv)	• Highly targeted • Potential to reach many people at once • Saves costs on printed materials	• Can be difficult to reach Professors • No guarantee of endorsement from a professor
One-to-one Discussions/Email/Phone contact	• Highly targeted • Increased rate of conversion	• Time intensive • Administrative burden
Advertising	• Potential to reach many people at once • Increased brand recognition	• Potentially expensive • Low conversion rate
Networking events	• Helps build regional partnerships	• Time spent building the relationship may not yield desired results
Social Media	• Potential to reach many people at once • Increased online brand awareness • Great for engaging a younger demographic	• Low conversion rate • Administrative burden

Online Videos	• Highly targeted • Great brand awareness • Potential for video to go viral if engaging	• Requires in-house technical knowledge or money to outsource development
Traditional Media (Print/Radio/TV)	• Potential to reach many people at once • Great for engaging an older demographic • Helps build program credibility • Public Service Announcements are free for non-profits	• Low conversion rate • Administrative burden (if media relationships do not already exist) • Less control over messaging
Website Materials	• Automated (after initial development) • Provides a complete and succinct resource for potential volunteers • Increased brand awareness	• Impersonal • May lead to an administrative burden if updated regularly
Craigslist/General Classified Sites/Online Social Groups	• Potential to reach many people at once • Saves costs on printed materials	• The activity rates of volunteer/social group pages can vary from region to region • Follow-thru can be unpredictable
Volunteer Sites	• Highly targeted • Increased brand awareness • Saves costs on printed materials	• Increased competition with other programs
Community Notice Boards	• Potential to reach many people at once • Potential for local word-of-mouth	• Printed material costs • Untargeted
Flyering	• Increased chance of one-to-one conversation • Increased brand awareness	• Printed material costs • Untargeted • Low conversion rate • Time intensive
Tabling Events	• Highly targeted • Increased chance of one-to-one conversation • Ability to talk in-depth about the program	• Weather conditions may impede success rates • Increased competition with other programs
Joint Partnerships	• Highly targeted • Ability to leverage another organization's resources • Helps build regional partnerships	• Potential for fallout between organizations • Time spent building the relationship may not yield desired results
Referrals	• Highly targeted • Ability to leverage existing volunteers/organizations to pre-sell the program • No cost • High conversion rate	• Less control over messaging
Seminars/Talks	• Highly targeted • Potential to reach many people at once • Ability to talk in-depth about the program • High conversion rate	• No attendance guarantee • Time intensive
Phone/Email Prospecting/Solicitation	• Highly targeted • Useful when the lead is a referral	• Time intensive • Success contingent on the ability of staff • Hard sell, high pressure approach • Potential for negative brand associations • Potential legal issues (i.e. SPAM)

There are many types of organizations, individuals and groups that can be useful sources of volunteers.

- Advocacy groups
- AmeriCorps programs
- Business and professional organizations
- Chambers of Commerce
- Churches and religious groups
- Community service restitution programs
- Conferences/special events
- Corporations and small businesses
- Employment assistance programs
- Families
- Job seekers
- JTPA and other job training programs
- Members of your organization
- Military units and retired military personnel
- New residents of the community
- Rehabilitation agencies/programs
- Retired executives, teachers (associations of)
- Schools, especially service-learning programs
- Scout troops or other youth groups
- Senior citizen groups
- Senior Corps programs
- Service organizations such as Kiwanis, Rotary Clubs and Junior Leagues
- Sororities and fraternities
- Students seeking internships and service opportunities
- Student vocational training programs
- Unions and trade associations
- United Way
- University/college/community college organizations
- VISTA volunteers

- Parent groups
- Public agencies and retired personnel
- Realtors (welcome wagon packages often include volunteer information)
- Volunteer centers

Source: www.aact.org

A great way to jumpstart the recruitment numbers for your program is to look at the social networks that are closest to your organization and employees.
Start by contacting people you know in the area and ask if they can pass on information to their networks, friends and family. This initial push of volunteers can help build momentum as your recruiting efforts expand.

Golden rules for assessing recruitment opportunities:

- Great, long-term volunteers can come from the most unlikely of sources. Keep an open mind and test your assumptions
- There is no way to tell whether a volunteer will be effective until they have begun conducting surveys. Don't rule out potential volunteers because of bias. Cast a wide net and cultivate the best volunteers from each approach
- Your program will gain more volunteers, regardless of age or demographic, if leads are followed up in a timely and professional manner. This understanding should extend to all your recruitment approaches whether they are online, in-person or over the phone
- Find out how volunteers like to be contacted when they sign-up for the program. This factor alone can have a huge impact on your conversion rates
- If you are struggling to find new leads or volunteers don't follow through, don't be afraid to contact them and ask why they decided not to be involved with the program. You may find there is a problem with your approach that needs fixing.

Developing strategies for volunteer retention & attrition

An important point to remember for any volunteer manager is that despite your best efforts, some of your volunteers will eventually move on to other organizations or opportunities.

Provided you're running a dynamic program and engaging your volunteers on a regular basis, this should not be considered a failing on the part of the volunteer manager or the MPA Watch organization. As Table A below illustrates, there are factors that affect volunteer attrition rates that are both in and out of your organization's control.

TABLE A	Reasons volunteers stay with MPA Watch	Reasons volunteers leave MPA Watch
Manageable factors	• Volunteers feel a sense of common purpose and solidarity with the organization and other volunteers in the program • The program builds a sense of community and facilitates an important social function in their lives • They are looking for a volunteer experience that is self-directed, and doesn't lock them into set hours	• The volunteer did not understand the goal of the MPA Watch program • The volunteer did not feel valued for the hours they put into the program • The training did not prepare them adequately for undertaking surveys • Lack of flexibility around survey schedules from the MPA Watch organization • There was a lack of variety in the program
Unmanageable factors	• They are personally interested in ocean/environmental issues • They are a student looking to add activities to their college applications or it is a requirement for graduation • They live close to the survey site and it is easy for them to incorporate the surveys into their daily lives	• The volunteer is leaving the area • Competing commitments to work, study or family • Financial strain (particularly the cost of gas to reach more remote survey locations) • Despite the best efforts of the program, the volunteer experience was not what they expected or was not personally rewarding • They have a physical aliment or recent surgery that prevents them walking for prolonged periods

Table B below illustrates the lifecycle of a volunteer from first contact through to retirement.

TABLE B	Things that re-enforce a positive volunteer experience	Things that re-enforce a negative volunteer experience
First Contact	• Quick follow-up after initial contact (within 24 hours) • Clear information about the volunteer program, the training process and the requirements for volunteers to be involved	• Not being thanked for taking the time to enquire about the volunteer program • Lack of patience in answering questions • Not being knowledgeable about the MPA Watch program and MPAs in general
Training	• Providing concise and timely information about the training session at least 24 hours before the event • Instructing volunteers about the sequence of events during the training session and how long they will take • Encouraging volunteers to ask questions at appropriate times	• Lack of enthusiasm on the part of training staff • Not being clear and concise during the training • A training group of more than 10 people in an uncontrolled, outdoor environment • Allowing (or not controlling) too many disruptive/off-topic questions during the training process
First Two Weeks	• Following up with volunteers within 3 days of the training event by email or phone	• Not correcting misunderstandings from the training session
First 3 Months	• Organizing an event where volunteers can meet each other in a social setting	• Lack of contact with the volunteer either by email or phone
6 Months & beyond	• Asking volunteers for their feedback about the MPA Watch program • Asking long term volunteers if they would like to be involved in the training process or in some other capacity that uses their expertise	• Taking long-term volunteers for granted by not recognizing their efforts publicly (at meetings, through your website, newsletters, etc.)
Retirement	• Making a point of thanking the volunteer for their service with a personal note and a small gift	• Not having systems in place that recognize a volunteer has stopped submitting surveys

When thinking about activities for volunteers in your region, think carefully about the time commitment for staff, the appropriateness of the activity to your region and the expenses that will be incurred.

Here is a list of suggestions for valuing and engaging the volunteers in your program:

- Write letters periodically to express your thanks for their involvement
- Call volunteers on the phone semi-regularly to see how they are enjoying the program and answer any of their questions
- Write about your volunteers on your website, social media and blogs
- Consider providing volunteers with clothing or branded merchandise related to your program
- Send volunteers certificates of appreciation for their efforts
- Provide volunteers with discount vouchers or coupons (coffee cards, movie tickets, etc.)
- Send annual Christmas or Birthday cards
- For long term service, honor volunteers at a special gathering
- Acknowledge new volunteers in your organization's newsletter
- Respond quickly to feedback from volunteers, incorporate their ideas where possible and report back to them about their contribution to improving the program
- Conduct casual social events (bar meet ups, movie nights, etc.)
- Display photos of volunteers in your office and online materials
- Invite volunteers to be involved with other aspects of your organization (helping with events, tabling, etc.)
- Hold potluck picnic events in a local park or beach area
- Run a games night at your office or a local café
- Provide opportunities for volunteers to receive skills training (CERT, HASWOPER, etc.)
- Organize a weekend event to remove invasive species and restore local trail areas
- Participate in or run a beach cleanup day
- Participate in local bird/animal count initiatives run by other groups
- Have volunteers participate in a fundraising effort for your organization or another local charity
- Look for other volunteer organizations in your region and develop a co-sponsored event that volunteers can be involved with (ocean film festival, sustainable seafood fair, etc.)

Three golden rules to remember when considering retention and attrition rates:

- Due to the solo nature of MPA Watch survey work, a volunteer manager should seek to create a sense of community to bond their volunteers together (picnics, social events, one-day projects, etc.)
- Volunteers join MPA Watch for a number of different reasons, but they stay because they are valued and recognized for their efforts
- Volunteers will leave your program at unexpected times and for different reasons. A recruitment strategy needs to be ongoing and diversified to ensure a critical mass of active volunteers.

Developing a realistic operations budget

This section will provide some insight into many of the ongoing costs you'll need to consider when running an MPA Watch program. Feel free to add line items relevant to your organization and program focus.

As operational budgets, overheads, and staff salaries can vary greatly between organizations, the table below avoids attaching a fixed cost to each line item. The table should be used as a guide for identifying ongoing costs that will need to be considered within the context of your organization's available budget and program goals.

Item	Considerations	Occurrence
Volunteer Manager (VM) Hours	• Will the VM work full-time or part-time on MPA Watch? • Will the VM's work hours include managing social media (Facebook, Twitter, etc.)?	Daily/Weekly
Travel	• Are your training/survey locations close to the office? • Will the VM be required to drive more than an hour each way to train volunteers and if so how often? • Will the VM be using a company vehicle or their own? • Will the VM attend any conferences during the year? Is there a budget to fly them there if it is out-of-state? • Will the VM require professional development training?	Weekly/Monthly/ Quarterly/Annually
Accommodation	• Are there training events or conferences where the VM will need to stay overnight?	Monthly/Annually
Training Materials	• What technical equipment will be provided to your volunteers? (GPS units, binoculars) • Will you print your training materials or make them available online for volunteers to download and print? • Do you have the in-house capability to create multimedia/video presentations or will it need to be outsourced? • How many hours need to be allocated to amend/add to the MPA Watch materials to make them relevant to your region? • Who will develop the printed materials tracking volunteer details & liability waivers?	Monthly/Quarterly/ Annually
Website	• Do you have the in-house capability to create a website for your MPA Watch program or add a new section to your existing website? Will it need to be outsourced? • Will the VM be responsible for updating the website?	Daily/Weekly
Software ***(see page 17 for more information)***	• Outside of the statewide web tool developed for MPA Watch, do you have any other requirements for managing volunteer contacts? • Are these tools free or will the cost money?	Monthly/Annually
Office Supplies	• Will your organization print out survey materials (Data maps, site protocols, etc.) for volunteers to use during training? • Can volunteers drop into your office to pick up new printed materials, clipboards or other sundry items for use in their survey work?	Weekly/Monthly
Volunteer Events/Trainings	• Does your organization have facilities to host volunteer trainings or meet-up events? • Will events with volunteers be catered with food and drink? • What are to costs involved to rent a room/training location for meeting/training purposes in your area? • Can these costs be offset through the use of a local community or university room?	Monthly/Quarterly
Recruitment Materials	• Does your organization have promotional signage that can be used at tabling events? Will a new sign for the MPA Watch program need to be made? • Does your organization have a table and chair(s) with folding legs that can be used at outdoor tabling events? • Is there a portable shade cover for your table during the summer months? • Will your promotional flyers be designed/printed in-house with existing tools or outsourced?	Weekly/Monthly/ Annually
Volunteers	• Does your MPA Watch program offer incentives or rewards for completed survey work? (coffee cards, t-shirts, jackets, etc.) • Are there remote survey locations that would require a fuel stipend for volunteers?	Monthly/Quarterly

Golden rules to remember about writing an effective recruitment plan:

- Make the document as concise as possible. A well-structured document will be easier to modify and review at a later date
- Make a point of defining what the term 'success' means before writing the plan. Different organizations have different goals and objectives. Identifying what your program is trying to achieve in the most basic terms before writing the document will ensure that your strategies are focused and on mission
- You will always need more resources/staff/time/money than you think. Build in padding to account for the unknown events/variables that you will encounter during the course of your program
- Refer to volunteer recruitment documents from other organizations if you get stuck. They can be found easily online through a Google search.

Action item: Writing a Recruitment Plan

- Look at the answers from the scoping exercise regarding staff hiring needs. Write a job description for the Volunteer Management role and include their tasks and areas of responsibility
- Developing a calendar that breaks recruitment tasks into daily/weekly/monthly/quarterly/yearly activities.
- Looking at your answers from the scoping exercise, write down a calendar of events in your region that you will attend (include tabling, networking, seminars, etc.). *Note: This list can be modified later as more events become available*
- Take the monthly recruitment targets from the scoping exercise and write them down. Make sure to include 1 month, 3 month, 6 month and 1 year goals
- Taking into consideration your available resources, the events in your region at the time of the program launch and the available staff to help with recruitment efforts, identify the recruitment approaches that will be used to achieve these goals. Remember, think about approaches that will work well in your region and customize or add items as you see fit
- Referring to notes from your scoping meeting, identify the written materials that will need to be developed (i.e. website, training materials, flyers, etc.), who will develop them (in-house or outsourced) and by what date
- Identify the activities that the program will undertake to help build a sense of community amongst volunteers
- Using spreadsheet software, refer to the answers from the scoping session and the suggestions from the preceding section to attribute costs to your program. Try and be as specific as possible, providing line item details for each aspect of your program
- Make a 'dashboard' view of your plan that can be printed out and displayed at your desk or in the office. A dashboard view is usually a one page document that allows you to see your fundamental goals, demographics, targets and calendar events at a glance. It is useful for keeping track of your upcoming recruitment efforts and for having a boilerplate against which new ideas and opportunities can be tested
- Remember to calendar any of the important dates identified in the scoping meeting for future review/continuous improvement of the recruitment plan.

Success Factors

The table below represents an overview of the factors that will affect your volunteer recruitment success rate at different points in the process.

It should be emphasized that timeliness and professionalism at each step of the process from initial contact through to a volunteer's ongoing involvement with the program will have a huge impact on the success of your program.

Stage	Success Factors
Gathering sign-ups	The conversion number here will be affected by the following factors: • Your table should be setup for one call-to-action, having too many programs or themes at a tabling event will dilute your success • Make sure recruitment staff direct the potential volunteer to sign-up for more information after talking about the program • It should go without saying, but smiling goes a long way when interacting with potential volunteers
Contacted	The conversion number here will be affected by the following factors: • Follow-up within 24 hours of the sign-up being received • A concise email/text restating the volunteer opportunity with a clear call-to-action • A phone call to follow-up the email if there is no response • Younger volunteers predominately use social media to communicate either through Facebook profiles or direct texting via their cell phones. • Older/retired volunteers are more likely to answer the telephone early in the morning. • Some volunteers may take 2-3 follow-ups to garner a response
Trained	The conversion number here will be affected by the following factors: • A training time that is convenient for the majority of attending volunteers • The accessibility of the training location • The weather on the day of the training
Active	The conversion number here will be affected by the following factors: • The quality of the training session • The accessibility of the survey sites • Timely follow-up after the training session
Ongoing	The conversion number here will be affected by the following factors: • The programs in place that cultivate a sense of community among volunteers • Valuing the contribution of volunteers to your program

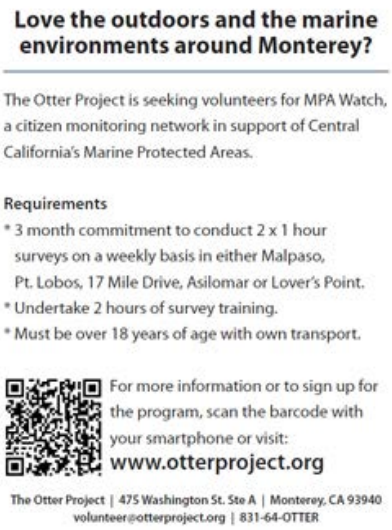
Effective Recruitment Materials

One of the factors that will greatly affect the performance of your recruitment efforts are the promotional materials you use. Refer to the following list as a guideline during your development process.

- All materials, whether online or printed, should have a connected look and feel. Consistent branding will help connect your organization with the program
- Don't use a whole sheet of paper when a design that fits 4 x 4 on one sheet and can be cut to size will do. This saves on paper and makes it easier to distribute. Making designs double-sided is also a money saver
- Don't get hung up on printing your materials on high gloss, expensive paper or having a super fancy design. Material that has some basic information about your program, a simple call to action and your logo will work just fine
- Don't put too much information on your flyers. Remember, the purpose of a flyer is to make the prospect either contact your office for more information or visit a website to sign-up for the program. Less is more
- Save yourself the money and print in black & white. Print on color paper stock (light blue, yellow, green or orange) to help your flyers stand out
- Design a flyer that you will use for handouts and a separate design for larger posters that can be used on notice boards
- Make printable materials available on your website. Volunteers can download them and distribute them as well!

FRONT SIDE

REVERSE SIDE



The example above is a flyer that is used at tabling events, volunteer fairs and farmers markets. The design can be laid out 4 x 4 on a Letter sized page and printed double sided. A couple of thing to note about the design above when making your own flyer:

- The front side has the organization's logo front and center
- Centered text/items from top to bottom help lead the eye
- The opening line 'Love the Ocean?' engages the target audience. On a fundamental level, the MPA Watch program is about ocean stewardship. Use language that engages an ocean loving demographic
- The other text on the front helps establish what the flyer is about (we need volunteers), what they will be doing (monitoring Marine Protected Areas) and what the next step is (turning over the page). Your flyers should be designed to lead the prospect through the flyer, step-by-step
- The reverse side provides expanded information about the program with information about getting in contact with the organization through either a website, email or phone number.

Flexibility

Your willingness to accommodate volunteers' other obligations can have a huge bearing on the success of your program.

Due to the nature of modern life and the ever increasing time commitments many people have to their jobs, studies, and family, finding time to attend a training or commit to a set time every week can be changing.

Ultimately, it is at the discretion of your organization to run the program in a way that works with your available resources. Here is a list of considerations you may wish to discuss internally:

- Will volunteers be locked into a set time/location for their surveys?
- Will training sessions be run ad hoc or at a set times and intervals?
- Will staff be available to run sessions on a weekend or after hours?

Final Considerations & Challenges

This section provides some final context regarding ongoing challenges that may present themselves during the running of your MPA Watch Volunteer Program. Some of the challenges below will be universal to all organizations running a program and others will be more regionally specific.

- The distance/time volunteers travel from their homes to survey sites in your region will effect survey numbers and retention rates. If there are survey sites more than 1 hour from an urban center, consider building a fuel stipend into your budget considerations
- The distance/time staff travel from the office to conduct infield trainings, tabling events or attend meetings can add considerable fuel costs to the program. Evaluate how often staff will need to travel and budget accordingly
- Ongoing wet weather can significantly impact participation and retention rates. If you live in an area that experiences months of sustained wet weather, consider planning activities that help engage your volunteers during the period of inactivity
- Don't put all your eggs into one basket when recruiting. Efforts should be diversified and ongoing
- Expect ebbs and flows in both recruitment numbers and total surveys submitted depending on the time of year. Your program may temporarily lose many of its student participants during the summer and holiday months and retirees often travel for sections of the year months at a time
- Collaboration with other organizations can be both a benefit and a loss. If the organization in question is effective at what they do, your recruitment efforts will be multiplied, if they are not an effective organization, your administrative overhead will increase. Chose you partnerships wisely and test the waters with a one day event to see if they're someone you wish to work with again
- If your region does not have the ideal events or tabling opportunities for your demographics, consider running your own. Running events can be a big administrative burden, although the benefits to organizations when run well can be considerable. Increased brand exposure, networking opportunities, press and access to new volunteers are all benefits of well-run events
- Don't stop trying new ideas when it comes to recruiting. Test your assumptions and add the new approach to your recruitment toolbox if successful.

FISH AND GAME CODE
SECTION 2850-2863

2850. This chapter shall be known and may be cited as the Marine Life Protection Act.

2850.5. Notwithstanding any other law and consistent with the authority granted under Section 2860, commencing on July 1, 2013, the Ocean Protection Council shall assume responsibility for the direction of policy of marine protected areas (MPAs).

2851. The Legislature finds and declares all of the following:

(a) California's marine protected areas (MPAs) were established on a piecemeal basis rather than according to a coherent plan and sound scientific guidelines. Many of these MPAs lack clearly defined purposes, effective management measures and enforcement. As a result, the array of MPAs creates the illusion of protection while falling far short of its potential to protect and conserve living marine life and habitat.

(b) California's extraordinary marine biological diversity is a vital asset to the state and nation. The diversity of species and ecosystems found in the state's ocean waters is important to public health and well-being, ecological health, and ocean-dependent industry.

(c) Coastal development, water pollution, and other human activities threaten the health of marine habitat and the biological diversity found in California's ocean waters. New technologies and demands have encouraged the expansion of fishing and other activities to formerly inaccessible marine areas that once recharged nearby fisheries. As a result, ecosystems throughout the state's ocean waters are being altered, often at a rapid rate.

(d) Fish and other sea life are a sustainable resource, and fishing is an important community asset. MPAs and sound fishery management are complementary components of a comprehensive effort to sustain marine habitats and fisheries.

(e) Understanding of the impacts of human activities and the processes required to sustain the abundance and diversity of marine life is limited. The designation of certain areas as sea life reserves can help expand our knowledge by providing baseline information and improving our understanding of ecosystems where minimal disturbance occurs.

(f) Marine life reserves are an essential element of an MPA system because they protect habitat and ecosystems, conserve biological diversity, provide a sanctuary for fish and other sea life, enhance recreational and educational opportunities, provide a reference point against which scientists can measure changes elsewhere in the marine environment, and may help rebuild depleted fisheries.

(g) Despite the demonstrated value of marine life reserves, only 14 of the 220,000 square miles of combined state and federal ocean water off California, or six-thousandths of 1 percent, are set aside as genuine no take areas.

(h) For all of the above reasons, it is necessary to modify the existing collection of MPAs to ensure that they are designed and

managed according to clear, conservation-based goals and guidelines that take full advantage of the multiple benefits that can be derived from the establishment of marine life reserves.

2852. The following definitions govern the construction of this chapter:

(a) "Adaptive management," with regard to marine protected areas, means a management policy that seeks to improve management of biological resources, particularly in areas of scientific uncertainty, by viewing program actions as tools for learning. Actions shall be designed so that, even if they fail, they will provide useful information for future actions, and monitoring and evaluation shall be emphasized so that the interaction of different elements within marine systems may be better understood.

(b) "Biogeographical regions" refers to the following oceanic or near shore areas, seaward from the mean high tide line or the mouth of coastal rivers, with distinctive biological characteristics, unless the master plan team establishes an alternative set of boundaries:

(1) The area extending south from Point Conception.

(2) The area between Point Conception and Point Arena.

(3) The area extending north from Point Arena.

(c) "Marine protected area" (MPA) means a named, discrete geographic marine or estuarine area seaward of the mean high tide line or the mouth of a coastal river, including any area of intertidal or subtidal terrain, together with its overlying water and associated flora and fauna that has been designated by law, administrative action, or voter initiative to protect or conserve marine life and habitat. An MPA includes marine life reserves and other areas that allow for specified commercial and recreational activities, including fishing for certain species but not others, fishing with certain practices but not others, and kelp harvesting, provided that these activities are consistent with the objectives of the area and the goals and guidelines of this chapter. MPAs are primarily intended to protect or conserve marine life and habitat, and are therefore a subset of marine managed areas (MMAs), which are broader groups of named, discrete geographic areas along the coast that protect, conserve, or otherwise manage a variety of resources and uses, including living marine resources, cultural and historical resources, and recreational opportunities.

(d) "Marine life reserve," for the purposes of this chapter, means a marine protected area in which all extractive activities, including the taking of marine species, and, at the discretion of the commission and within the authority of the commission, other activities that upset the natural ecological functions of the area, are prohibited. While, to the extent feasible, the area shall be open to the public for managed enjoyment and study, the area shall be maintained to the extent practicable in an undisturbed and unpolluted state.

2853. (a) The Legislature finds and declares that there is a need to reexamine and redesign California's MPA system to increase its coherence and its effectiveness at protecting the state's marine life, habitat, and ecosystems.

(b) To improve the design and management of that system, the commission, pursuant to Section 2859, shall adopt a Marine Life Protection Program, which shall have all of the following goals:

(1) To protect the natural diversity and abundance of marine life,

and the structure, function, and integrity of marine ecosystems.

(2) To help sustain, conserve, and protect marine life populations, including those of economic value, and rebuild those that are depleted.

(3) To improve recreational, educational, and study opportunities provided by marine ecosystems that are subject to minimal human disturbance, and to manage these uses in a manner consistent with protecting biodiversity.

(4) To protect marine natural heritage, including protection of representative and unique marine life habitats in California waters for their intrinsic value.

(5) To ensure that California's MPAs have clearly defined objectives, effective management measures, and adequate enforcement, and are based on sound scientific guidelines.

(6) To ensure that the state's MPAs are designed and managed, to the extent possible, as a network.

(c) The program may include areas with various levels of protection, and shall include all of the following elements:

(1) An improved marine life reserve component consistent with the guidelines in subdivision (c) of Section 2857.

(2) Specific identified objectives, and management and enforcement measures, for all MPAs in the system.

(3) Provisions for monitoring, research, and evaluation at selected sites to facilitate adaptive management of MPAs and ensure that the system meets the goals stated in this chapter.

(4) Provisions for educating the public about MPAs, and for administering and enforcing MPAs in a manner that encourages public participation.

(5) A process for the establishment, modification, or abolishment of existing MPAs or new MPAs established pursuant to this program, that involves interested parties, consistent with paragraph (7) of subdivision (b) of Section 7050, and that facilitates the designation of MPAs consistent with the master plan adopted pursuant to Section 2855.

2854. The workgroup shall, after appropriate consultation with members of the public, determine future actions for implementing the recommendations of its final report.

2855. (a) The commission shall adopt a master plan that guides the adoption and implementation of the Marine Life Protection Program adopted pursuant to Section 2853 and decisions regarding the siting of new MPAs and major modifications of existing MPAs. The plan shall be based on the best readily available science.

(b) (1) The department shall prepare, or by contract shall cause to be prepared, a master plan in accordance with this subdivision. In order to take full advantage of scientific expertise on MPAs, the department shall convene a master plan team to advise and assist in the preparation of the master plan, or hire a contractor with relevant expertise to assist in convening such a team.

(2) The team members convened pursuant to this subdivision shall have expertise in marine life protection and shall be knowledgeable about the use of protected areas as a marine ecosystem management tool. The members shall also be familiar with underwater ecosystems found in California waters, with the biology and habitat requirements of major species groups in the state's marine waters, and with water quality and related issues.

(3) The team shall be composed of the following individuals:

(A) Staff from the department, the Department of Parks and Recreation, and the State Water Resources Control Board, to be

designated by each of those departments.

(B) Five to seven members who shall be scientists, one of whom may have expertise in the economics and culture of California coastal communities.

(C) One member, appointed from a list prepared by Sea Grant marine advisers, who shall have direct expertise with ocean habitat and sea life in California marine waters.

(4) The master plan shall be prepared with the advice, assistance, and involvement of participants in the various fisheries and their representatives, marine conservationists, marine scientists, and other interested persons. In preparing the master plan, the department shall confer, to the extent feasible, with the commission, the Pacific Fishery Management Council, the National Marine Fisheries Service, the United States Navy, the United States Geological Survey's national biological survey, staff from national marine sanctuaries off California, Sea Grant researchers, marine advisers, and national parks personnel.

(5) The department may engage other experts to contribute to the master plan, including scientists, geographic information system (GIS) experts, and commercial and recreational fishermen, divers, and other individuals knowledgeable about the state's underwater ecosystems, the history of fishing effort or MPA management, or other relevant subjects.

(c) The department and team, in carrying out this chapter, shall take into account relevant information from local communities, and shall solicit comments and advice for the master plan from interested parties on issues including, but not necessarily limited to, each of the following:

(1) Practical information on the marine environment and the relevant history of fishing and other resources use, areas where fishing is currently prohibited, and water pollution in the state's coastal waters.

(2) Socioeconomic and environmental impacts of various alternatives.

(3) Design of monitoring and evaluation activities.

(4) Methods to encourage public participation in the stewardship of the state's MPAs.

2856. (a) (1) The department and team shall use the best readily available scientific information in preparing the master plan adopted pursuant to Section 2855, and shall organize the location-specific contents, where feasible, by biogeographical region. In preparing the plan, the department and team shall use and build upon the findings of the Sea Grant survey of protected areas in California waters, which is entitled "California's Marine Protected Areas," the report of the State Interagency Marine Managed Areas Workgroup, the Department of Parks and Recreation's planning information and documents regarding existing and potential underwater parks and reserves, maps and other information from the department's marine nearshore ecosystem mapping project, and other relevant planning and scientific materials.

(2) The master plan shall include all of the following components:

(A) Recommendations for the extent and types of habitat that should be represented in the MPA system and in marine life reserves. Habitat types described on maps shall include, to the extent possible using existing information, rocky reefs, intertidal zones, sandy or soft ocean bottoms, underwater pinnacles, sea mounts, kelp forests, submarine canyons, and seagrass beds.

(B) An identification of select species or groups of species likely to benefit from MPAs, and the extent of their marine habitat, with special attention to marine breeding and spawning grounds, and

available information on oceanographic features, such as current patterns, upwelling zones, and other factors that significantly affect the distribution of those fish or shellfish and their larvae.

(C) Recommendations to augment or modify the guidelines in subdivision (c) of Section 2857, if necessary to ensure that the guidelines reflect the most up-to-date science, including, for example, recommendations regarding the minimum size of individual marine life reserves needed to accomplish the various goals set forth in Section 2853.

(D) Recommended alternative networks of MPAs, including marine life reserves in each biogeographical region that are capable of achieving the goals in Section 2853 and designed according to the guidelines in subdivision (c) of Section 2857.

(E) A simplified classification system, which shall be consistent with the goals of Section 2853 and the guidelines in subdivision (c) of Section 2857, and which may include protections for specific habitats or species, if no system that meets these specifications has already been developed.

(F) Recommendations for a preferred siting alternative for a network of MPAs that is consistent with the goals in Section 2853 and the guidelines in subdivision (c) of Section 2857.

(G) An analysis of the state's current MPAs, based on the preferred siting alternative, and recommendations as to whether any specific MPAs should be consolidated, expanded, abolished, reclassified, or managed differently so that, taken as a group, the MPAs best achieve the goals of Section 2853 and conform to the guidelines in subdivision (c) of Section 2857.

(H) Recommendations for monitoring, research, and evaluation in selected areas of the preferred alternative, including existing and long-established MPAs, to assist in adaptive management of the MPA network, taking into account existing and planned research and evaluation efforts.

(I) Recommendations for management and enforcement measures for the preferred alternative that apply systemwide or to specific types of sites and that would achieve the goals of this chapter.

(J) Recommendations for improving the effectiveness of enforcement practices, including, to the extent practicable, the increased use of advanced technology surveillance systems.

(K) Recommendations for funding sources to ensure all MPA management activities are carried out and the Marine Life Protection Program is implemented.

(b) The team shall, as necessary, identify and define additional appropriate components of the master plan as soon as possible after enactment of this section.

2857. (a) On or before July 1, 2001, the department shall convene, in each biogeographical region and to the extent practicable near major working harbors, siting workshops, composed of interested parties, to review the alternatives for MPA networks and to provide advice on a preferred siting alternative. The department and team shall develop a preferred siting alternative that incorporates information and views provided by people who live in the area and other interested parties, including economic information, to the extent possible while maintaining consistency with the goals of Section 2853 and guidelines in subdivision (c) of this section.

(b) The preferred alternative may include MPAs that will achieve either or both of the following objectives:

(1) Protection of habitat by prohibiting potentially damaging fishing practices or other activities that upset the natural ecological functions of the area.

(2) Enhancement of a particular species or group of species, by prohibiting or restricting fishing for that species or group within

the MPA boundary.

(c) The preferred siting alternative shall include MPA networks with an improved marine life reserve component, and shall be designed according to each of the following guidelines:

(1) Each MPA shall have identified goals and objectives. Individual MPAs may serve varied primary purposes while collectively achieving the overall goals and guidelines of this chapter.

(2) Marine life reserves in each bioregion shall encompass a representative variety of marine habitat types and communities, across a range of depths and environmental conditions.

(3) Similar types of marine habitats and communities shall be replicated, to the extent possible, in more than one marine life reserve in each biogeographical region.

(4) Marine life reserves shall be designed, to the extent practicable, to ensure that activities that upset the natural ecological functions of the area are avoided.

(5) The MPA network and individual MPAs shall be of adequate size, number, type of protection, and location to ensure that each MPA meets its objectives and that the network as a whole meets the goals and guidelines of this chapter.

(d) The department and team, in developing the preferred siting alternative, shall take into account the existence and location of commercial kelp beds.

(e) The department and team may provide recommendations for phasing in the new MPAs in the preferred siting alternative.

2858. The department shall establish a process for external peer review of the scientific basis for the master plan prepared pursuant to Section 2855. The peer review process may be based, to the extent practicable, on the peer review process described in Section 7062.

2859. (a) On or before January 1, 2005, the department shall submit to the commission a draft of the master plan prepared pursuant to this chapter.

(b) On or before April 1, 2005, after public review, not less than three public meetings, and appropriate modifications of the draft plan, the department shall submit a proposed final master plan to the commission. On or before December 1, 2005, the commission shall adopt a final master plan and a Marine Life Protection Program with regulations based on the plan and shall implement the program, to the extent funds are available. The commission's adoption of the plan and a program based on the plan shall not trigger an additional review under the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code).

(c) The commission shall hold at least two public hearings on the master plan and the Marine Life Protection Program prior to adopting the plan and program. The commission may adopt the plan and the program immediately following the second public hearing or at any duly noticed subsequent meeting.

(d) Upon the commission's adoption of the program, the commission shall submit the master plan and program description, including marine life reserve and other MPA designations, to the Joint Committee on Fisheries and Aquaculture for review and comment. Upon receipt of the plan, the joint committee shall have 60 days to review the plan and to submit written recommendations to the commission regarding the plan and program. The joint committee shall only submit a recommendation to the commission if a majority of the members agree to that recommendation. The commission shall consider all

recommendations submitted by the joint committee, and may amend the program to incorporate the recommendations. If the commission does not incorporate any recommendations submitted by the joint committee, the commission shall set forth, in writing, its reasons for not incorporating that recommendation.

2860. (a) The commission may regulate commercial and recreational fishing and any other taking of marine species in MPAs.

(b) Notwithstanding any other provision of this code, the taking of a marine species in a marine life reserve is prohibited for any purpose, including recreational and commercial fishing, except that the commission may authorize the taking of a marine species for scientific purposes, consistent with the purposes of this chapter, under a scientific collecting permit issued by the department.

2861. (a) The commission shall, annually until the master plan is adopted and thereafter at least every three years, receive, consider, and promptly act upon petitions from any interested party, to add, delete, or modify MPAs, favoring those petitions that are compatible with the goals and guidelines of this chapter.

(b) Nothing in this chapter restricts any existing authority of the department or the commission to make changes to improve the management or design of existing MPAs or designate new MPAs prior to the completion of the master plan. The commission may abbreviate the master plan process to account for equivalent activities that have taken place before enactment of this chapter, providing that those activities are consistent with this chapter.

2862. The department, in evaluating proposed projects with potential adverse impacts on marine life and habitat in MPAs, shall highlight those impacts in its analysis and comments related to the project and shall recommend measures to avoid or fully mitigate any impacts that are inconsistent with the goals and guidelines of this chapter or the objectives of the MPA.

2863. The department shall confer as necessary with the United States Navy regarding issues related to its activities.