

Using Citizen Science to Monitor Seabird Population Size, Roost Utilization, and Rates of Human-Caused Disturbance in Central California

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Background

- 2011: Point Blue begins baseline monitoring program to support the Central California Seabird Protection Network.
 - Seabird population and roost utilization
 - Human-caused disturbance
 - Support SPN's education, outreach and law enforcement efforts
- 2013: Establish citizen science program to increase local stakeholders.



In 2011 Point Blue Conservation Science joined forces with the newly established Central Coast Chapter of the Seabird Protection Network to collect seabird population and human-caused disturbance data. These data would be used by the SPN to guide their outreach, education, and law enforcement efforts. In 2013, we expanded the program to include a citizen science component to increase the number of local stakeholders.

Background

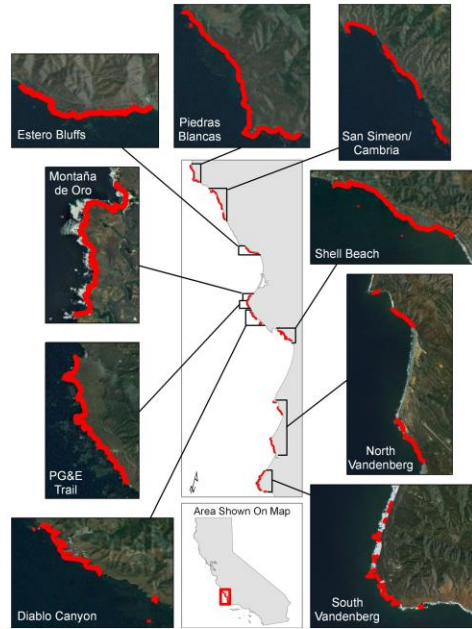
- Volunteers and coordination: **MCAS**
- Outreach materials and training: **CA State Parks**
- Monitoring protocols, training, data management, concurrent monitoring: **Point Blue**



The citizen science program had three parts. Morro Coast Audubon supplied the volunteers and coordination, California State Parks provided training, materials, and support of an education and outreach component, and Point Blue contributed their established monitoring protocols, field training, and data management. In addition, a Point Blue staff member conducted surveys concurrently with the Morro Coast volunteers over the course of the season. For the purposes of this talk, I'm going to focus on the partnership between Morro Coast and Point Blue.

Study Area

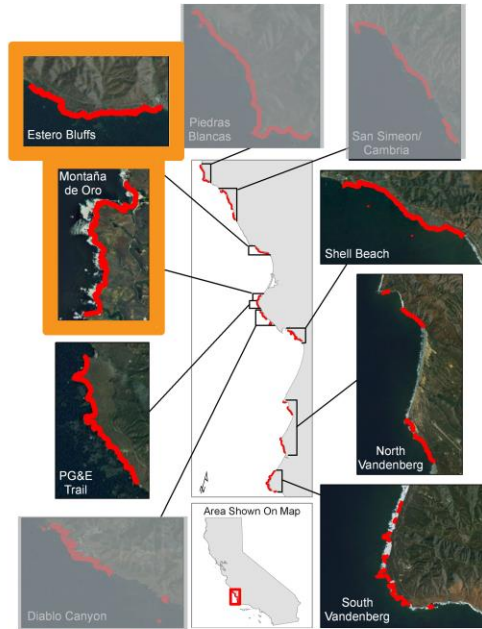
- 2011 – 2012
CCNM from
Piedras Blancas
to VAFB



Our original study area extended from Piedras Blancas in the north to the southern portion of Vandenberg Air Force Base, and included 9 study sites.

Study Area

- 2011 – 2012
CCNM from
Piedras Blancas
to VAFB
- 2013
Point Blue:
Estero Bluffs to
VAFB (no Diablo
Canyon)
MCAS: Estero
Bluffs and
Montaña de Oro



In 2013, we reduced the number of study sites to 6, and overlapped with the Morro Coast Audubon citizen science project at Estero Bluffs and Montaña de Oro, both of which are California State Parks. These sites were selected because of their accessibility and proximity to the interested volunteers.

Recruitment



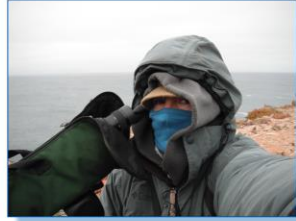
- MCAS members received email alert and newsletter
- Personal phone or email contact with local birders
- Introductory briefing and sign-ups
- Scheduling via Google account and calendar



Volunteers were recruited via Morro Coast's internal email alert system and electronic newsletter. Local birders were also contacted directly via phone or email to gauge their interest. An introductory meeting was held at the MCAS headquarters, detailing the different aspects of the project, and allowing the volunteers to sign up for the survey area of their choice. Volunteers were allowed to self-schedule via a dedicated Google account and calendar. This was also used to coordinate the exchange of shared equipment.

Field Training

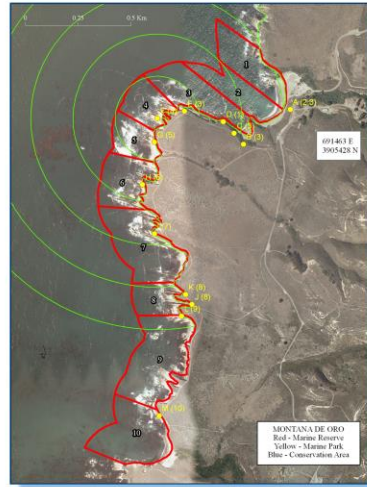
- Four hours spent at each site
- Protocol and data recording overview
- Mock survey
 - Visit observation points
 - Identify counting blocks
 - Collect observational data
- Equipment
 - Volunteers provide clipboards, binoculars
 - Personal spotting scopes / 2 MCAS loaner scopes



Those who signed up were then invited to a pre-season meeting in the field. The purpose of this meeting was to introduce the volunteers to each of the survey sites, and to provide training on the protocol, how to gather data and fill out the data sheets. The protocols provided were slightly modified from those used by Point Blue staff members for the sake of keeping the workload manageable for the volunteers. A mock survey was conducted to show volunteers how to identify the observation points and counting blocks, and how to collect and record their observational data. Volunteers were responsible for providing their own clipboards, binoculars, and scopes if they had them, although 2 scopes were available for loan from MCAS.

Methods

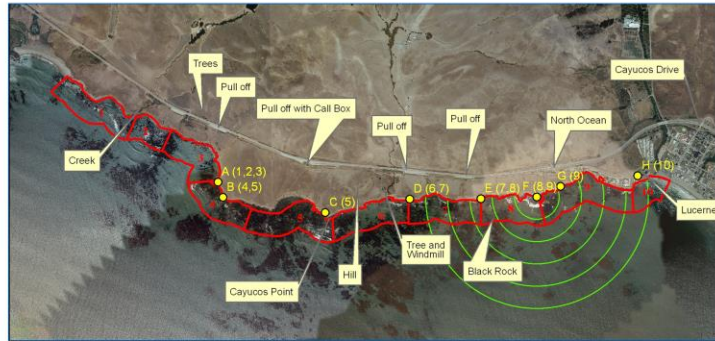
- Linear transect survey with pre-determined observation points and areas
- Identify and count
 - Roosting seabirds
 - Breeding seabirds
 - Hauled out marine mammals
- Record human-induced disturbance events
 - Number and species disturbed
 - Source of disturbance



Our surveys are linear transect surveys of counting blocks, indicated in red, which are observed from pre-determined observation points, in yellow. Volunteers were asked to count a limited list of seabird and marine mammal species. If a human-caused disturbance event occurred, they were asked to record the number and species of animals disturbed, and information about the disturbance such as time, source and activity/behavior.

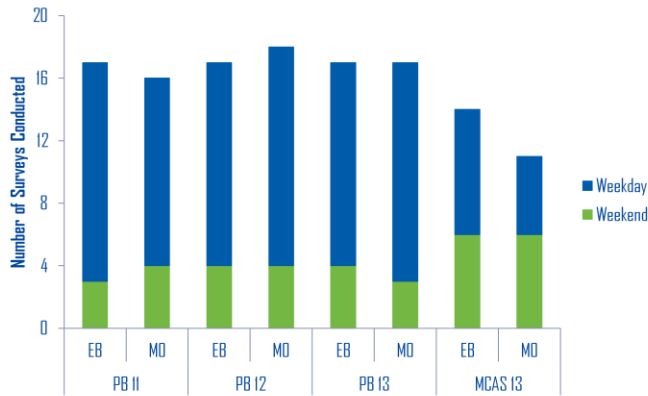
Methods

- One survey / area / week
- 1-2 people per survey
- Transect can be divided between two people
- Completed before noon



We asked that each area be surveyed once a week for the duration of the field season – April to July. Optimally 1-2 people would participate in each survey, but each transect could be divided between two people to decrease total survey time. Finally we requested that surveys be completed before noon, in order to keep them comparable with our established surveys that were to be conducted between 6 and 10 am.

Results – Number of Surveys

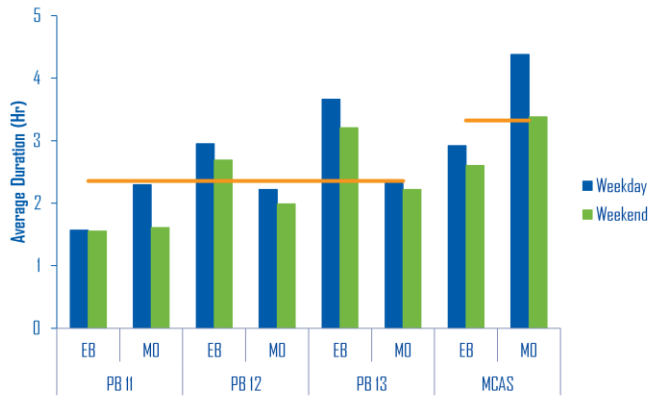


**More surveys by staff,
More weekends by volunteers**



We have three years of data collected by Point Blue staff, including an overlap year in 2013 with the MCAS volunteers indicated in orange. Ideally, 17-18 surveys would be conducted per season, although some surveys are missed due to weather or other circumstances. This first graph is a comparison of number of surveys, with the three years of Point Blue surveys indicated by PB and the Morro Coast surveys indicated by MCAS. The initials EB and MO are the locations – Estero Bluffs and Montana de Oro. And the colors represent weekday data in blue, weekend data in green. Overall, more surveys were completed annually by paid staff than by volunteers. However, more surveys were conducted on weekends by volunteers, and this provided an interesting insight, as we'll see later.

Results - Effort

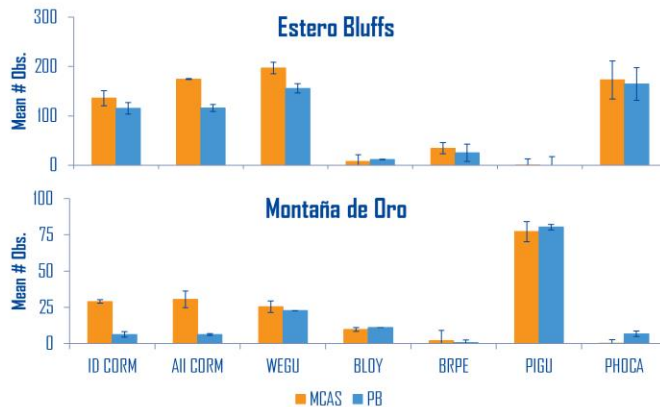


Longer volunteer duration,
Less weekend effort by all!



This graph illustrates the effort, as measured by time spent conducting a survey, of staff members and volunteers. On the y-axis is the average daily survey duration in hours, with the x-axis and colors are similar to the previous graph. The pattern here is the opposite of the number of surveys, with paid staffers generally spending less time per survey than the volunteers, averaging 2.4 hours for all surveys conducted by paid staff versus 3.3 hours for volunteers at both sites. It can also be seen that weekend surveys average a shorter duration than weekday surveys, no matter who is doing the survey!

Results – Species Counts 2013

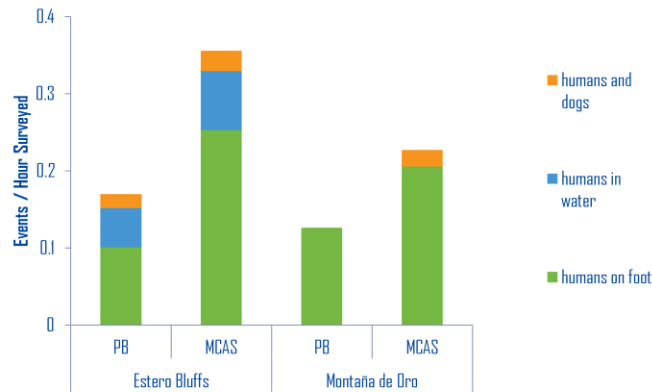


Same species counts, except cormorants



These graphs illustrate the average species counts by area for volunteers in orange and staff in blue. Species are on the x-axis and include identified cormorants, all cormorants (identified and not identified), western gulls, black oystercatchers, brown pelicans, pigeon guillemots, and harbor seals. In general the number of individuals of a given species observed was similar between volunteers and staff. However, volunteers tended to have more unidentified cormorants, and observed more cormorants at Montaña de Oro than the Point Blue staff member. The difference at Montaña de Oro was driven by 4 days of high counts of Pelagic and Double-crested cormorants, which are generally not observed in large numbers at this location. Since identified and non-identified numbers were high, misidentification cannot be the driver of this difference. Perhaps a temporary local biological event such as a feeding flock occurred that attracted the birds to the area, or birds were displaced from other areas of the coast.

Results – Disturbance 2013



**Same event types
MCAS > PB / hr**

**Both EB > MO
(MCAS > weekend)**



Observation of disturbance events per hour surveyed was not equal between volunteers and staff, but this is a factor of effort, survey day, and location. The y-axis represents the rate of disturbance events, The majority of disturbance events observed were caused by humans on foot, with more humans and dogs and humans in the water causing disturbance at Estero Bluffs. Overall, there was more disturbance of more variety at Estero Bluffs, which is to be expected because roosting areas are more accessible to people there. The volunteers observed more disturbances per hour surveyed than staff members, but they also spent more time at individual observation points, increasing their potential exposure to disturbance events. The fact that volunteers did more weekend surveys also plays into the fact they had higher observance rates - public use of these parks is higher on the weekends.

Challenges

- Need more pre-season training

- Species ID
- Distribute protocols before training
- Go over protocols during pre-season meeting

- Initial field survey confusion

- Accompany to answer questions, assist with methodology



As with any project, this project had its challenges. We think that the volunteers could benefit from an additional pre-season training session. We found varying ID skill levels among the volunteers. During this training, seabird ID skills could be assessed and improved, and the protocols and methods could be introduced in house. Trying to explain a 4-page protocol to birders on a windy day with birds everywhere was not optimal. In addition, providing the protocols and datasheets to the volunteers before the initial field training day would give them a chance to go over and understand them better before having to apply them. Just like paid staff, volunteers don't find protocols to be very interesting reading, and often don't know that many of their questions may be answered in the document.

Second, since many questions arise during the first field survey effort, it is worth having an experienced team member accompany the volunteers on their initial survey to answer questions as they arise.

Challenges

- Wide range of computer and map literacy

- Provide guidebook with calendar instructions
- Overview maps and photos of individual observation points and counting blocks
- Data delivery: scanning vs. data entry

- Scheduling

- Need 1-2 more volunteers to fill gaps



Third, we found there was a wide range of computer and map literacy among the volunteers. We intend to put together a guidebook that contains the protocols and sample data, as well as instructions on how to use the Google calendar, overview survey area maps and photos of the individual observation points and counting block boundaries. Because not everyone has a GPS unit or can easily translate from an aerial photo to ground view, these photos should increase the volunteers' confidence that they are in the right place and looking in the right area. Finally, data delivery methods could use improvement. Volunteers scanned data and sent it to the data manager, but this needs to be done immediately after the survey in order to resolve issues with the data while the volunteers' memory is still fresh. We are considering instituting an online data entry tool for the coming season, but that may come with its own set of challenges.

Fourth, Scheduling proved to be a minor issue, as evidenced by fewer surveys completed by volunteers than staff. Because the schedule was not fixed, it might be necessary to recruit 1-2 more volunteers to help fill the gaps.

Successes

- Volunteer and staff data were comparable overall
- Once trained, volunteers stayed with the program
 - Project was initiated by MCAS, so members were invested
- More weekend surveys = more disturbances observed both in volume and rate = more input for outreach



That said, we were very pleased with the results of this first season of this citizen science project. Overall, the volunteer and staff data were comparable, and well within the range of natural variability. Second, the volunteers who started with the program finished the program, and enjoyed it. This may be partially due to the fact that MCAS initiated the project, and therefore the members who participated had a vested interest in it, as opposed to drawing from a general public base that had no pre-determined connection to the work. Third, because volunteers observed more unique disturbance events on weekends, they provided additional information to help focus the Seabird Protection Network's outreach and education efforts on disturbance sources that might have been under-represented during weekday surveys.

Successes

- Program ran relatively autonomously once established.
- Post-season pot-luck and data presentation.



Conveniently, the project began to run itself after the first month or so, with the volunteers taking the responsibility to schedule themselves and deliver the data. Finally, we found that a post-season pot-luck and data presentation was a great excuse for a social gathering of the volunteers, and a way to show them the product of their efforts. Knowing that they were contributing to a larger effort was gratifying for them, and all expressed an interest in repeating the project this year.

Thank you!

MCAS

Jen Moonjian

Linda Foisy

Doug Hunt

Jodi Issacs

Kathleen Kent

Stephen Peterson

Daisy Sharp

Douglas Shinoda

Cara O'Brien (CA State Parks)

Point Blue

Johanna Anderson

Emma Bishop

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Katie Kauffman

Mindi Mohamed



Morro Coast Audubon Society
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