



MPA Baseline Program

Annual Progress Report



Principal Investigators - please use this form to submit your MPA Baseline Program project annual report, including an update on activities completed over the past year and those planned for the upcoming year. This information will be used by the MPA Baseline Program Management Team to track the progress of individual projects, and will be provided to all MPA Baseline Program PIs and co-PIs prior to the Annual PIs workshop to facilitate discussion of project integration. Please submit this form to California Sea Grant when complete (sgreport@ucsd.edu, Subject [Award Number, project number, PI, "Annual Report"].)

Project Information

Project Year: 2012/2013 MLPA Region: South Coast Study Region

Project Title & Number: Use of Estuarine, Intertidal, and Subtidal Habitats by Seabirds Within the MLPA South Coast Study Region

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PI Contact Info Co- PI Contact Info (please list additional PIs and contact info in the "Project Personnel" section if necessary)

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Project Goals & Objectives

We will focus on seven species identified by the SCSR Science Advisory Team as likely to benefit from MPAs: Pelagic Cormorants, Brandt's Cormorants, Western Gulls, Black Oystercatchers, Pigeon Guillemots, California Least Terns, and California Brown Pelicans. We selected these species for 1) their dependence on nearshore habitats and 2) their susceptibility to human disturbances. Our seven focal species occupy a wide range of niches within coastal habitats, with some niches fixed to a particular ecosystem feature and others overlapping multiple features. The data we collect will provide information on five of the ecosystem features identified by the Monitoring Enterprise: 1) estuarine and wetland, 2) rocky intertidal, kelp and shallow rock (0-30m), 3) soft-bottom subtidal, and 4) nearshore pelagic.

Our study will focus on two main goals: 1) collecting baseline data on coastal habitat use by the seven focal species and 2) using these data in conjunction with other seabird studies to develop a baseline characterization of coastal habitat use at the time of MPA establishment. Our study will be designed to determine if proposed and existing MPAs provide adequate protection to seabird populations and, if not, where efforts can be made to provide additional protection. The results of this study will aid in future adaptive management of south coast MPAs.

Goal 1: Collect Baseline Data on Coastal Habitat Use

Our objectives for Goal 1 will focus on investigating four aspects of coastal habitat use by seabirds: 1) foraging in estuarine and nearshore habitats, 2) utilization of rocky coastlines for roosting, 3) breeding population size and productivity, and 4) disturbance at breeding and roosting sites.

Objective 1: We will analyze Least Tern diet samples from multiple breeding colonies throughout the SCSR to determine their use of estuarine and nearshore habitats within MPAs. Least Terns have a very limited foraging range while breeding, usually foraging within two miles of their breeding colony. They forage in estuarine, kelp forest, and nearshore pelagic habitats. We will analyze diet samples from colonies within foraging proximity and away from newly established MPAs. Tracking changes in diet at MPA and control sites over time will help us to determine whether the new MPAs are providing foraging benefits to Least Terns.

Objective 2: We will document the foraging rates of pursuit diving seabirds (e.g., Pigeon Guillemots, Pelagic Cormorants, Brandt's Cormorants) at sampling stations inside and distant from newly established MPAs. Pursuit divers can swim below the water's surface to forage on epibenthic and demersal fishes and invertebrates within subtidal habitats. Tracking changes in foraging rates at MPA and control sites over time will help us determine whether the new MPAs are providing foraging benefits to pursuit diving seabirds.

Objective 3: We will document the occurrence of foraging flocks from multiple sampling stations within the SCSR. Foraging flocks consist of seabirds and marine mammals that are foraging on nearshore pelagic fishes and invertebrates (e.g., anchovies and squid). Documenting the annual occurrence of these flocks will provide information on the biological responses to oceanographic conditions influencing the ecosystem features throughout the SCSR.

Summary of Project Activities Completed to Date

Overview of Project Year __ Activities, including progress towards meeting goals & objectives

Objective 4: We will document annual breeding population size and productivity (fledglings produced per breeding pair) for Least Terns, Black Oystercatchers, Western Gulls, Pelagic Cormorants, and Brandt's Cormorants at sites within the vicinity of our sampling stations for seabird foraging. Seabirds are long-lived species that can adjust their breeding effort in response to changes in prey abundance. Estimating annual breeding effort and success will provide information on the abundance of prey within the five ecosystem features.

Objective 5: We will document the distributions of roosting Western Gulls, Pelagic Cormorants, Brandt's Cormorants, and Brown Pelicans at sites within the vicinity of our sampling stations for seabird foraging. Roosting is an important activity in the daily lives of these species. Roost sites are selected to provide protection for potential predators and for proximity to prey resources. Documenting the distribution of roosting seabirds will help us determine if the placement of newly established MPAs is aligned with important seabird roost sites.

Objective 6: We will document the rates of human disturbance to breeding and roosting seabirds during all of our surveys. High rates of human disturbance have been shown to cause abandonment at breeding and roosting sites. It is anticipated that decreased human activities within the newly established MPAs will help minimize human disturbance to seabirds. Documenting disturbance rates inside MPAs and at control sites will help us determine if the new MPAs are providing protection against disturbance.

Goal 2: Develop Baseline Characterization of Coastal Habitat Use

Our overarching objective for baseline monitoring is to relate changes observed in seabird metrics to MPA establishment. We will therefore develop our baseline characterization in the context of a before-after-control-impact (BACI) monitoring scheme. To accomplish this, we will rely on both newly collected data and information collected from the reports of other monitoring projects within the SCSR.

Objective 1: Given the large spatial scope of the SCSR and the limited amount of available funding, it will not be feasible to collect data from all important seabird areas. In order to produce a more complete baseline characterization, we will compile existing information from reports we obtain from other projects.

Objective 2: We will produce a final report that incorporates ongoing studies with newly collected data. The report will establish baselines for determining future trends in foraging distributions, roosting distributions, annual colony population size and productivity, and levels of human disturbance at breeding and roosting sites. The report will outline recommendations for continued long-term monitoring with the goal of producing statistical models that control for oceanographic variability and allow us to determine the degree to which MPAs are affecting change in seabird metrics.

MPA Baseline Program Annual Report

Highlights from project progress so far, such as successes achieved, new collaborations or partnerships, or interesting stories from the past year that may be suitable for a blog post or other media venue

The most obvious highlight thus far has been the Southern California Bight-wide reproductive failure of California Least Terns that was likely related to El Niño conditions that developed during the 2012 summer. The impacts of this event did not appear to extend north of Point Conception. Least Tern diet has not been well studied in southern California, but diet time series of >10 years exist for two northern sites. Time series analyses show that reproductive success is improved when diet is dominated by few key species like northern anchovy and juvenile rockfish. In 2012, diet at the southern California sites was variable with key species decreasing and diet diversity increasing towards the end of the breeding season. This indicates that prey conditions decreased as the El Niño event progressed and likely explains the decreased reproductive success observed throughout southern California.

Description of any unforeseen events and substantial challenges, and resulting effects on project activities and progress. Please indicate any issues that may affect other PI's or require coordination with other Baseline partners (e.g., ME, DFG, Sea Grant).

To date, we have not had any significant challenges that have changed the proposed timeline for deliverables or the content of proposed deliverables.

Data status (i.e., paper/raw format or digitized; if digitized, what format?)

All 2012 data have been entered and proofed and are being stored as Excel spreadsheets. All 2013 data have been entered are currently being proofed.

Activities Planned for following Project Year __ (if applicable) – *Please describe remaining work and approximate timelines for completing that work, including any anticipated budget variances necessary to complete the project.*

Activities for this final year include data analyses, report writing, and participation in the UCSB-led baseline assessments. We anticipate delivery of our draft report by the June 2014 deadline.

Project Personnel – Please indicate additional project personnel involved in your MPA baseline project, including students and volunteers, or additional PI contact information if necessary, as well as the nature of their assistance in the project project.

	<i>Students Supported</i>	<i>Student Volunteers</i>	<i>Nature of Assistance</i>
<i>K-12</i>	0	0	
<i>Undergraduate</i>	0	0	
<i>Masters</i>	0	0	
<i>PhD</i>	0	0	

Number of other Volunteers not counted above and the nature of their assistance in the project:

Additional PI contact info not listed on first page:

Cooperating Organizations and Individuals - Please list organizations or individuals (e.g., federal or state agencies, fishermen, etc.) that provided financial, technical or other assistance to your project since its inception, including a description of the nature of their assistance.

<i>Name of Organization or Individual</i>	<i>Sector (City, County, Fed, private, etc.)</i>	<i>Nature of cooperation (If financial, provide dollar amount.)</i>
<i>Brian Collins, USFWS, Tijuana River National Estuary Research Reserve</i>	<i>Federal</i>	<i>Provided access to Tijuana River Estuary Least Tern colony</i>
<i>Barak Shemai, USMC, Camp Pendleton</i>	<i>Federal</i>	<i>Provided access to Camp Pendleton Least Tern colony</i>
<i>Warren Wong, CDFW</i>	<i>State</i>	<i>Provided access to Batiquitos Lagoon Least Tern colonies</i>
<i>Kelly O'Reilly, CDFW, Bolsa Chica Ecological Reserve</i>	<i>State</i>	<i>Provided access to Bolsa Chica Least Tern colonies</i>
<i>Nathan Mudry, EGIS Environmental & GIS Services, LLC</i>	<i>Private</i>	<i>Provided access to Port of L.A. Least Tern colony</i>
<i>Tom Ryan, Ryan Ecological Consulting</i>	<i>Private</i>	<i>Provided access to Venice Beach Least Tern colony</i>
<i>Martin Ruane, USNavy, Point Mugu</i>	<i>Federal</i>	<i>Provided access to Point Mugu Least Tern colonies and Port Hueneme Brandt's Cormorant colony</i>
<i>Christina Boser, The Nature Conservancy</i>	<i>Private</i>	<i>Provided housing, vehicle, and logistical support on Santa Cruz Island</i>
<i>National Parks Service</i>	<i>Federal</i>	<i>Provided transportation to Santa Cruz Island and housing on the island.</i>

Project Outputs and Materials: Please provide any other project-relevant information, such as descriptions of attached materials, media coverage your project has received, presentations, publications, images etc.

To date, we have presented Least Tern diet data from 2012 at the Statewide Least Tern Management Meeting and the 2013 Headwaters to Ocean (H2O) Conference in San Diego. A pdf of our H2O presentation is attached. We have also provided information for a Sea Grant online newsletter story. The story can be found using the following link: <http://caseagrantsnews.org/2013/06/18/study-seabird-chick-survival-linked-to-diet/>

We have also contributed a story to the PRBO Observer that can be found at this link: http://www.pointblue.org/observer/index.php?module=browse&browse_issue_num=170&browse_article_num=365&chooseIssue=1