



North Coast Marine Protected Area Baseline Monitoring Symposium Meeting Summary May 5, 2017

Welcome and Acknowledgement of Wiyot Ancestral Territory

Thomas Torma, Wiyot Cultural Director

There is renewal where the ocean meets the land, making these areas important to protect.

Introduction to the Symposium

Brian Tissot, Director of Telonicher Marine Laboratory

The goals of the symposium are to share key findings of monitoring projects, and discuss ways to build on knowledge to inform future research and management decisions for the marine protected area (MPA) network and the State of California.

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California's MPA Management Program

Adam Frimodig, California Department of Fish and Wildlife

California's MPAs include 124 MPAs and 15 special closures, which encompasses ~16% of state waters (over 9% in no-take MPAs). California's MPAs are managed as a statewide network through the MPA Management Program, which consists of four focal areas and was designed to ensure the network is adaptively managed and informed by engaged partnerships. Nested within the research and monitoring focal area is the two-phased MPA Monitoring Program. Phase 1 regional baseline monitoring (2007-2018) has been implemented across the state to characterize ocean conditions near the time of MPA implementation. Planning for Phase 2 statewide long-term monitoring is underway, including the development of a statewide MPA Monitoring Action Plan (anticipated in 2018) to guide future spending for Phase 2 activities.

Opening Prayer

Rachel Sundberg, Tribal Historic Preservation Officer, Cher-Ae Heights Indian Community of the Trinidad Rancheria

Women are the foundation of our culture, and so is the water. Honoring Song in recognition of the National Day of Awareness for Missing and Murdered Native Women and Girls.

Rocky Intertidal

Joe Tyburczy, California Sea Grant Extension

Quantitative baseline characterization of rocky intertidal invertebrates, fishes, and algae.

- Abundance of *Pisaster* declined markedly due to Sea Star Wasting Syndrome (SSWS). Prevalence of SSWS fluctuated and was higher during the winter than summer.
- Despite apparent release from predation by *Pisaster*, no substantial increase in mussel bed percent cover, bed depth, or mean mussel length was observed.
- Few abalone observed, except at one site (Ft. Bragg/Noyo Headland) protected by fences.
- Juvenile sculpin recruits were very abundant in high intertidal pools; lower pools had a more diverse assemblage of larger fishes.



- Previously, large numbers of black rockfish recruits were observed in tide pools, but none were seen in this study.

Rocky Reefs

Sean Craig, Humboldt State University

Ecological conditions within the region's nearshore rocky reefs and kelp forests, documenting 1) the density of macroinvertebrates, macroalgae, and benthic fishes, 2) the size structure and density of red abalone and red sea urchins, 3) the percent cover of sessile and colonial invertebrates and algae, and 4) substrate type and reef structure.

- Community structures between MPA and non-MPA sites were similar.
- Red and purple urchins abundant at Pt Cabrillo; more purple urchins at Southern sites. Exploring how this impacts abalone.
- Kelp forests were rare.
- More rockfish (blue and black) were observed at Pt Cabrillo.

Sandy Beaches

Jenny Dugan, University of California Santa Barbara

Comprehensive characterization of sandy beach ecosystems, measuring the abundance and diversity of macroinvertebrates fishes, and birds, including the activities of people on beaches.

- Found more kelp wrack on pocket beaches (< 1km), and seagrass wrack on long beaches (>1 km). Striking differences between the two beach types.
- Beach wrack increased invertebrate diversity; higher abundance on pocket beaches.
- More shorebird species observed on long beaches, more aquatic/wading birds on pocket beaches.
- New understanding of trophic links between kelp forests, rocky shores, estuaries, and surf zones.

Michelle Succow, Humboldt State University

Characterization of surfperch on sandy beaches.

- Relative abundance and mean length of Redtail Surfperch was similar between MPS and non-MPA sites.
- Sex ratio was close to 50:50 between males: females, but different between sites.
- Potential good indicator species for future monitoring.

Helen Mulligan, Humboldt State University

Dietary analysis of the Redtail Surfperch.

- Sand crabs were the dominant prey for Redtail Surfperch.
- Fish are also opportunistic and ate fish eggs, worms, and other crustaceans.
- Redtail Surfperch capture prey in and on the sandy bottom. Smaller fish pick out prey from gravel, while medium sized fish ingest fish eggs with spawning substrate.

Oceanographic Conditions

Eric Bjorkstedt, NOAA Southwest Fisheries Science Center

Environmental context using measurements and models to characterize ocean conditions during baseline monitoring, and for the 20 year period leading up to implementation of the MPAs.

- Unusual climate events during baseline monitoring.
- Warmer waters in the region from "Warm Blob" in 2014, and El Niño in 2015-2016.
- Observed poleward flow, reflected in changes in plankton ecosystem and harmful algal blooms.



Seabirds

Dan Barton, Humboldt State University

Characterization of seabirds in the North Coast region through 1) a region-wide census of seabird abundance through aerial surveys of breeding colonies, 2) trends in breeding population sizes from 1989-2014, and 3) documented foraging and roosting of key seabird species, as well as incidences of disturbances by human activities.

- Identified large and regionally important seabird colonies throughout the region, with the largest aggregations around Trinidad Head/Patrick's Point and Castle Rock.
- Common Murre populations grew between 1989-2014, while Brandt's Cormorants fluctuated but were stable. Growth of both species was negatively impacted by El Niño events.
- Counts by citizen scientists were consistent with counts by biologists.

Stephanie Schneider, Humboldt State University

Seabird reproduction, foraging effort, and diet at Castle Rock, the largest seabird colony in the region.

- Common Murre nesting success dropped in 2016.
- Adult pairs spent more time away from the nest to gather resources for a chick, indicating limited food availability.
- Diet reflects nearby fish availability; smelt contributed the largest proportion of diet.

Estuaries

Katherine Osborn, Humboldt State University

Ecological status of the Mad River estuary, by surveying plants, invertebrates, and fishes in tidal mudflats and eelgrass beds. The North Coast was the only region to include estuarine ecosystems in baseline monitoring.

- Summertime increase in abundance and diversity.
- Fish community determined by time of year sampled, and invertebrate communities determined by location.
- The diet of staghorn sculpin predicted by location.

Frank Shaughnessy, Humboldt State University

Description of estuarine biodiversity, contextual metrics of the physical environment, and recommendations for future monitoring efforts.

- Large spatial differences in biodiversity.
- Each of the four estuaries studied in the region was different, categorized as oceanic, riverine, or a seasonal lagoon.
- Influence of oceanic conditions created diverse estuarine habitat.

Indigenous Traditional Knowledge

Megan Van Pelt, Rosa Laucci, and Jaytuk Steinruck, Tolowa Dee-ni' Nation

Baseline of Traditional Ecological Knowledge of keystone marine habitats and species, using archival and tribal community research collected by each partner Tribe/Tribal organization.

- Stewardship practices of marine, estuarine, and coastal ecosystems reflected in archival research and interview responses.
- Having deep connections to specific places, customary harvesting through lifetime provided valuable historical context for baseline.
- Smelt was the marine resource harvested by 91% of interview respondents.



Socioeconomics and Human Dimensions

Laurie Richmond, Humboldt State University

Characterization of fishing patterns and socioeconomic status of commercial and commercial passenger fishing vessel (CPFV) fishermen, and assessment of impacts following MPA implementation.

- Formation of a Fisherman's Advisory Council, and high survey participation.
- Perceptions of marine resource responses to MPA network depended on species.
- Opportunity for collaboration with university researchers.

Citizen Science of Rocky Reefs and Kelp

Jan Freiwald, Director of Reef Check California

Volunteer SCUBA divers were trained as citizen scientists, and monitored the rocky reef and kelp forest ecosystem, recording density or percent cover of invertebrates and algae species, and density and size structure of fish populations.

- More species of fish found in northern sites.
- Larger fish found at Pt. Cabrillo SMR compared to nearby fished sites.
- Sea stars and kelp forests declined prior to and during the study period, while sea urchin density increased.

Mid-Depth and Deep Subtidal Ecosystems

Heidi Lovig, Marine Applied Research and Exploration

Describes the baseline condition including substrate, habitat, fish, and macro-invertebrate species assemblages of three distinct ecosystems: mid-depth, soft-bottom, and deep ecosystems.

- Over 100,000 fish were observed. Rockfish including Young of Year (<10cm), small schooling rockfish, and larger rockfish represented ~88% of fish observations.
- Fish species composition and density was similar between all MPA and reference area pairs, except at Point St. George.
- Over 124,000 invertebrates were observed. Slipper and CA sea cucumbers and white-plumed anemones represented ~67% of the total invertebrate observations.
- 8 species/groupings of sea stars significantly declined from 2014 to 2015.

Fish Communities

Ian Kelmartin, Humboldt State University

Characterization of abundance, size, and species of fishes associated with nearshore rocky reef habitats using hook-and-line surveys with commercial charter captains.

- Collaborative fisheries research engaged local fishing community and increased knowledge and support for MPAs.
- Higher abundance further away from ports (distance to port).
- Little evidence of MPA effects at this time due to the slow growth, late age at maturity, and long lifespans of many species of interest.

Integration Workshop

Eve Robinson, California Ocean Science Trust and Humboldt State University

The goal of this workshop was to bring together expertise across baseline monitoring projects to discuss next steps for the North Coast with the data and knowledge collected, and propose ideas for integration projects. Reviewing the list of ideas generated from annual baseline monitoring team meetings, and by project leaders and partners, groups identified areas of scientific interest, connections to management, and available capacity.