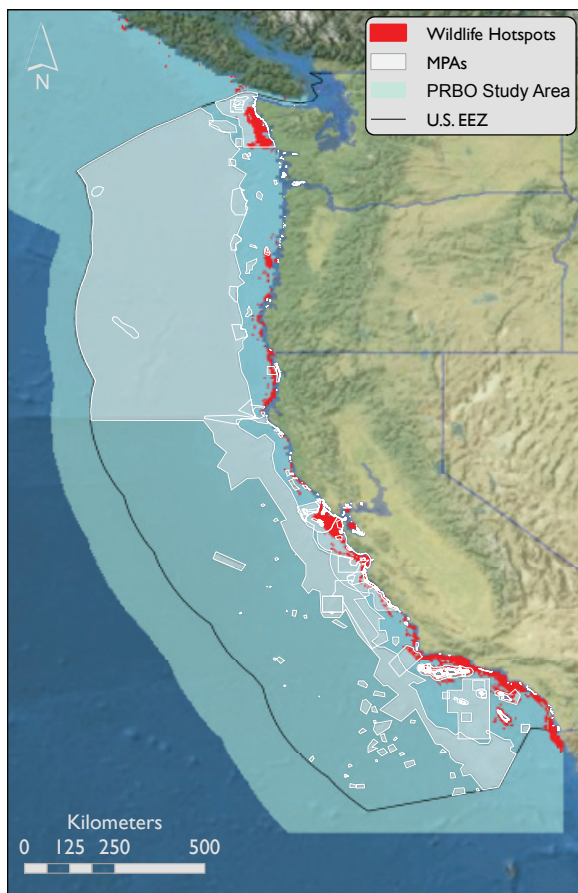


MARINE PROTECTED AREAS AND WILDLIFE HOTSPOTS IN THE CALIFORNIA CURRENT

INTRODUCTION

The National Marine Protected Areas Center (MPA Center) and PRBO Conservation Science (PRBO) assessed the conservation status of important seabird foraging habitats in the Pacific Ocean off the coasts of Washington, Oregon, and California. This effort applies geographic information system (GIS) techniques to combine data on west coast MPA boundaries (MPA Center) with foraging seabird hotspots (PRBO). Our results showed that more than 100 MPAs containing seabird hotspots within the study region restrict some resources from being extracted, while other extractive and non-consumptive uses are allowed.

DATA



The **MPA Inventory** is a comprehensive geospatial database designed to catalog and classify marine protected areas within U.S. waters. The Inventory contains information on over **1,600 sites** nationwide and provides detailed classification information related to resource protection and management. This dataset has various applications for marine management and conservation, but its primary purpose is to maintain baseline information on MPAs to assist in the development of the National System of MPAs.

The seabird hotspot dataset used in conjunction with the MPA Inventory was derived from an analytical modeling process conducted by PRBO to identify regions throughout the California Current system that are key foraging areas for **16 select seabird species** (left). The spatial data included hotspots identified using three separate criteria (each calculated independently): **abundance, importance, and persistence**, as explained below.

The two datasets were combined and spatially analyzed to determine the number and types of MPAs in the region that have identified hotspots for foraging seabirds, as well as the number of MPAs without foraging seabird hotspots. The seabird dataset uses data for 16 seabird species, but also indicates important foraging areas where wildlife (e.g., krill, fish, squid) are likely to be more abundant than elsewhere in the region.

Bird Species Studied

- Black-footed Albatross
- Bonaparte's Gull
- Brandt's Cormorant
- Brown Pelican
- Cassin's Auklet
- California Gull
- Common Murre
- Fork-tailed Storm-Petrel
- Glaucous-winged Gull
- Heermann's Gull
- Herring Gull
- Leach's Storm-Petrel
- Red-necked Phalarope
- Sabine's Gull
- Sooty Shearwater
- Western Gull

Abundance: Areas where a species was predicted to occur in high concentrations. Abundance was identified for each species, and standardized so that the combined abundance equally represented species with smaller population sizes which would otherwise be overwhelmed by species with large population sizes.

Importance: A location was designated as important if it was part of a species' core area (the smallest area that contained the top 25% of the predicted density) within the study region. Importance was identified for each species of seabird and averaged over all species.

Persistence: The number of years (out of 11) that a location was predicted to have high abundance (top 5%). Persistence was identified for each of the species of seabirds and averaged over all the species, but separately for each season.

NOAA's National Marine Protected Areas (MPA) Center's mission is to facilitate the effective use of science, technology, training, and information in the planning, management, and evaluation of the nation's system of marine protected areas. The MPA Center works in partnership with federal, state, tribal, and local governments and stakeholders to develop a science-based, comprehensive national system of MPAs.

PRBO Conservation Science (PRBO) advances the conservation of birds, other wildlife and ecosystems. Founded as Point Reyes Bird Observatory in 1965, PRBO applies bird ecology studies to improve conservation outcomes throughout the west coast of North America, the northeast Pacific Ocean, and Antarctica.

ANALYSIS

The spatial analysis focused on the entire **California Current from the Straits of Juan de Fuca in Washington to the California/Mexico Border (with the exception of the Puget Sound region)**. The MPA Center identified 266 sites from the MPA Inventory that fall within this area. The spatial analysis investigated the presence or absence of seabird hotspots within each MPA using the following analytical workflow.

Each of the hotspot criteria datasets was overlaid individually with MPA site boundaries to determine which MPAs coincide with each of the three seabird hotspot criteria (importance, abundance and persistence). To account for scale issues and the limited extent of the seabird datasets in the nearshore area, a hotspot located within 5 km of an MPA boundary was considered to be within the MPA.

The analyses of each seabird hotspot criterion were merged and combined with the MPA attribute information to quantify the number and types of MPAs in which all three hotspot criteria were met within MPA boundaries (e.g. number of MPAs that include a combined hotspot for importance, persistence and abundance).

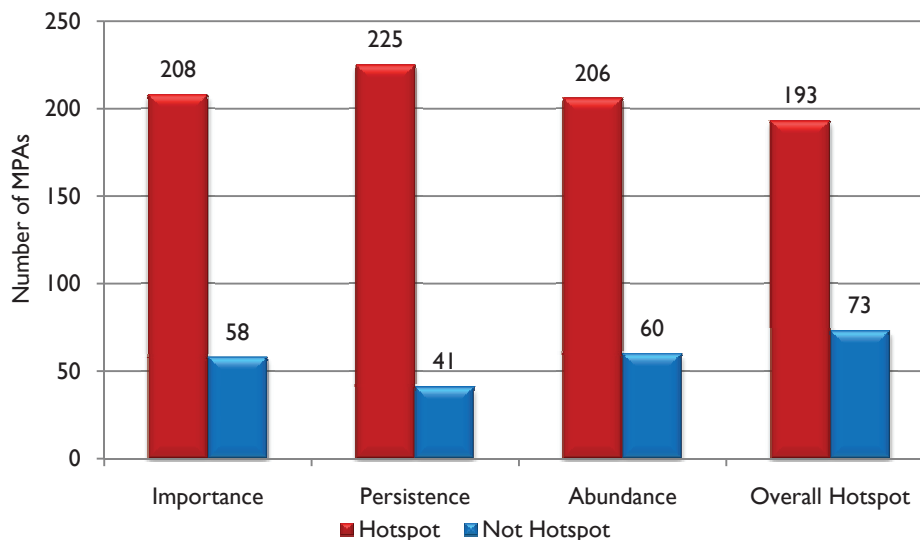
The analysis explored the number of MPAs with hotspots within their boundaries, as well as the various types of MPAs, as classified using the MPA Inventory classification strategy (<http://www.mpa.gov/aboutmpas/classification/>). This focused on the MPA's level of protection, fishing restrictions, conservation focus, level of government and the status of the MPA with respect to the National System. Each of these variables is explained in more detail in the following sections.

RESULTS

Within the California Current study region there are **266 MPAs** (excluding the Puget Sound MPAs). The MPAs in the study region protect nearly **389,000 sq. km.** and include 16% of the nation's MPAs. MPAs vary greatly in size: while 87 MPAs protect less than 1 sq. km each, 16 protect over 1,000 sq km, including an Essential Fish Habitat Conservation area spanning over 330,000 sq km from Washington to California. This effort investigated the presence or absence of seabird hotspots in an MPA, however it did not examine the exact area or spatial extent of hotspots within MPAs.

California Current Marine Protected Areas		
Level of Protection	Number of MPAs	Area (sq. km.)
No Access	15 (6%)	16
No Take	44 (17%)	871
Uniform Multiple Use	198 (74%)	358,000
Zoned Multiple Use	6 (2%)	42,500
Zoned w/No Take Areas	3 (1%)	3,800

MPAs WITH SEABIRD HOTSPOTS



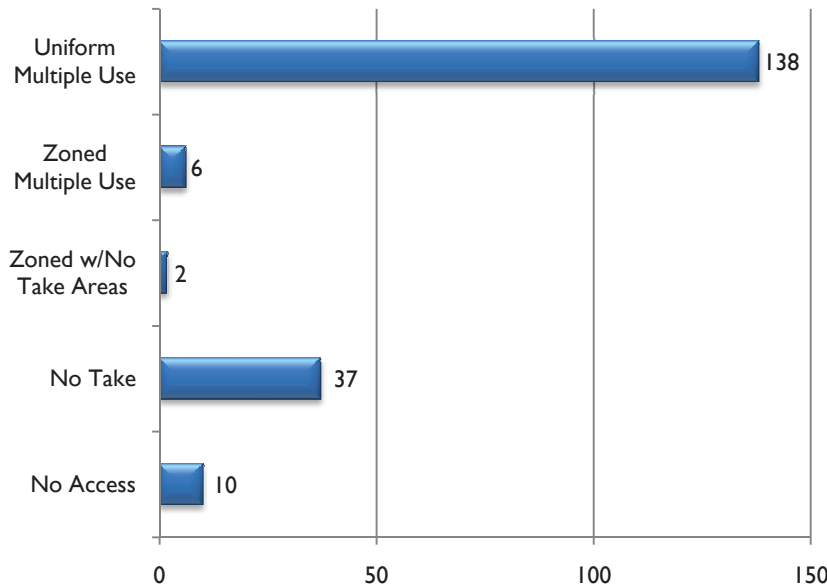
In evaluating the presence or absence of foraging seabird hotspots within MPAs, the analysis results indicate that 236 sites include at least one of the hotspot criteria (when evaluated individually), with a maximum of 225 sites for the persistence criteria. At least two criteria were included within

the boundaries of 210 sites, and 30 sites did not contain any of the hotspot criteria. When analyzed together, **193 sites (73%) include hotspots for all three seabird criteria. The level of government of these MPAs with hotspots include 43 federal, 145 state and 5 partnership sites.**

LEVEL OF PROTECTION

MPAs in the U.S. vary widely in the level and type of legal protection afforded to the site’s natural and cultural resources and ecological processes. Any MPA, or management zone within a larger MPA, can be characterized by one of the following six levels of protection, which will directly influence its effects on the environment and human uses.

Of all the MPAs with seabird hotspots, **138** sites are designated for **uniform multiple use** allowing a wide variety of activities within their boundaries; while **37** are **no-take sites** that prohibit removal or disturbance of resources. **Ten (10)** other MPAs with hotspots are classified as **no access** which is the highest level of protection, restricting all human access to the site.



Level Of Protection

Uniform Multiple-Use: MPAs or zones with a consistent level of protection and allowable activities, including certain extractive uses, across the entire protected area.

Zoned Multiple-Use: MPAs that allow some extractive activities throughout the entire site, but that use marine zoning to allocate specific uses to compatible places or times in order to reduce user conflicts and adverse impacts.

Zoned Multiple-Use With No-Take Area(s): Multiple-use MPAs that contain at least one legally established management zone in which all resource extraction is prohibited.

No-Take: MPAs or zones that allow human access and even some potentially harmful uses, but that totally prohibit the extraction or significant destruction of natural or cultural resources.

No Impact: MPAs or zones that allow human access, but that prohibit all activities that could harm the site’s resources or disrupt the ecological or cultural services they provide.

No Access: MPAs or zones that restrict all human access to the area in order to prevent potential ecological disturbance, unless specifically permitted for designated special uses such as research, monitoring or restoration.

FISHING RESTRICTIONS

To achieve conservation objectives, MPAs can restrict or prohibit certain types of fishing within their boundaries or within distinct zones. This can be achieved by restricting certain gear types, limiting certain types of fishing seasonally or by species, or by prohibiting fishing activities entirely within site boundaries.

In the study region, 151 MPAs (78%) that contain hotspots have some level of fishing restrictions, with **70 prohibiting commercial fishing, 49 prohibiting recreational fishing, and 46 prohibiting both.**

Fishing Restrictions	Number of MPAs with Hotspot
Commercial and Recreational Fishing Prohibited	46 (24%)
Commercial and Recreational Fishing Restricted	48 (25%)
Commercial Fishing Prohibited	2 (1%)
Commercial Fishing Restricted	27 (14%)
Commercial Fishing Restricted and Recreational Fishing Prohibited	3 (2%)
Commercial Fishing Prohibited and Recreational Fishing Restricted	22 (11%)
Recreational Fishing Restricted	3 (2%)
No Site Restrictions	39 (20%)
Restrictions Unknown	3 (2%)

PRIMARY CONSERVATION FOCUS

Most MPAs have legally established goals, conservation objectives, and intended purpose(s). Common examples include MPAs created to conserve biodiversity in support of research and education; to protect benthic habitat in order to recover over-fished stocks; or to protect and interpret shipwrecks for maritime education. These descriptors of an MPA are reflected in the site’s conservation focus, which represents the characteristics of the area that the MPA was established to conserve.

The conservation focus, in turn, influences many fundamental aspects of the site, including its design, location, size, scale, management strategies and potential contribution to surrounding ecosystems. U.S. MPAs may have more than one conservation focus, but generally address one of the following as the primary conservation focus. **Most MPAs with seabird hotspots (167) focus on natural heritage, with significantly fewer (26) that focus on sustainable production.** No MPAs in the study region focus primarily on cultural heritage.

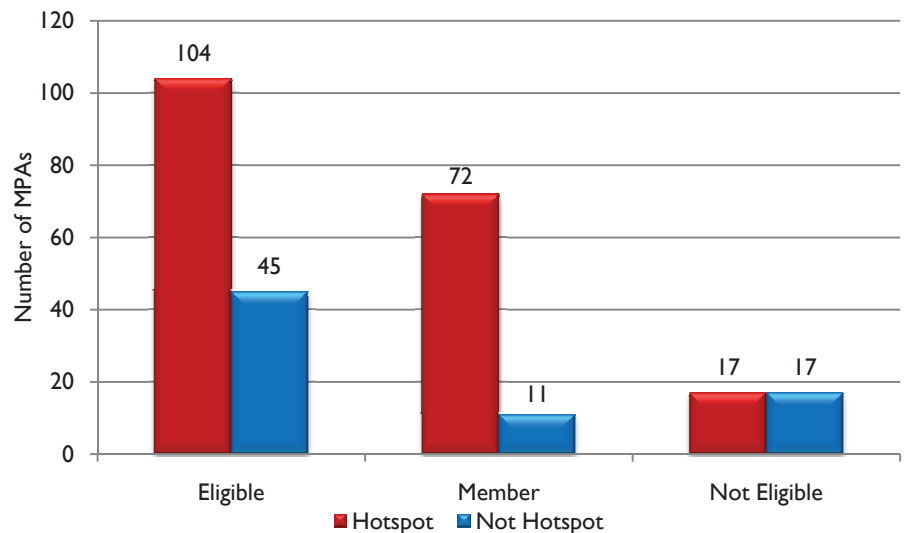
Primary Conservation Focus	Hotspot	Not Hotspot
Natural Heritage	167	39
Sustainable Production	26	34
Cultural Heritage	-	-

Primary Conservation Focus
Natural Heritage: MPAs or zones established and managed wholly or in part to sustain, conserve, restore, and understand the protected area’s natural biodiversity, populations, communities, habitats, and ecosystems; the ecological and physical processes upon which they depend; and, the ecological services, human uses and values they provide to this and future generations.
Cultural Heritage: MPAs or zones established and managed wholly or in part to protect and understand submerged cultural resources that reflect the nation’s maritime history and traditional cultural connections to the sea.
Sustainable Production: MPAs or zones established and managed wholly or in part with the explicit purpose of supporting the continued extraction of renewable living resources (such as fish, shellfish, plants, birds, or mammals) that live within the MPA, or that are exploited elsewhere but depend upon the protected area’s habitat for essential aspects of their ecology or life history (feeding, spawning, mating, or nursery grounds).

NATIONAL SYSTEM OF MPAS

The national system is the group of MPA sites, networks and systems established and managed by all levels of government that collectively enhance conservation of the nation’s natural and cultural marine heritage and represent its diverse ecosystems and resources. Within the study area, **72 MPAs with seabird hotspots are members of the national system**, and over 100 additional sites are eligible to self-nominate and become part of the national system.

The national system does not restrict or change the management of any MPA. It does not bring state, territorial or local sites under federal authority. The system provides technical assistance and establishes partnerships to enhance MPA stewardship. Criteria for joining the national system are listed at www.mpa.gov.



SUMMARY

This preliminary research was undertaken to gain a better understanding of the current management and protection status of important seabird foraging habitats along the California Current. This initial effort shows that more than 100 MPAs containing seabird hotspots within the study region restrict some resources from being extracted, while other extractive and non-consumptive uses are allowed. Future work will focus on more detailed evaluation of MPA restrictions and management of hotspot areas and on the types of human uses occurring throughout the study region and within MPA boundaries.



Rondi Robison
 Conservation Planner
 NOAA’s MPA Center
 Rondi.Robison@noaa.gov
 831-645-2701
 www.mpa.gov

Dr. Jaime Jahncke
 Director Marine Ecology
 PRBO Conservation Science
 jjahncke@prbo.org
 707-781-2555x335
 www.prbo.org

