Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration

GREATER FARALLONES NATIONAL MARINE SANCTUARY

NATIONAL MARINE SANCTUARIES

NOAA

Draft

2020-2030 Action Plan

Seabird Protection Network
Bodega Head to Point Sur Chapter

SEABIRD PROTECTION NETWORK

National Oceanic and Atmospheric Administration

U.S. Department of Commerce
Gina Raimondo, Secretary

Under Secretary of Commerce for Oceans and
Atmosphere and NOAA Administrator
Richard Spinrad, Ph.D.

Assistant Administrator for Ocean Services and
Coastal Zone Management, National Ocean Service
Nicole LeBoeuf, Assistant Administrator

Office of National Marine Sanctuaries
John Armor, Director

Greater Farallones National Marine Sanctuary
Maria Brown, Superintendent

Greater Farallones National Marine Sanctuary
991 Marine Drive, The Presidio
San Francisco, CA 94129

https://farallones.noaa.gov/

Seabird Protection Network
https://seabirdprotectionnetwork.org
Karen Reyna, Seabird Protection Network Director
Karen.reyna@noaa.gov
Paul Hobi, Bodega Head to Point Sur Chapter Program Manager (NOAA Affiliate)
paul.hobi@noaa.gov

Citation: Reyna, K., Hobi, P, Kordesch, W. (2021). 2020-2030 Seabird Protection Network Action Plan. Greater Farallones National Marine Sanctuary. San Francisco, CA. 42 pp.

Cover Photo: Common Murres. Photo: Ron Le Valley

The Seabird Protection Network Bodega Head to Point Sur Chapter

The Seabird Protection Network, led by the Greater Farallones National Marine Sanctuary, is a multi-organization collaborative that works to reduce human-caused disturbance to seabirds in California. The Seabird Protection Network is modeled through a geographic chapter structure, of which there are currently five chapters (see below). Greater Farallones National Marine Sanctuary manages the founding Chapter, Bodega Head – Point Sur, and facilitates program expansion.

Chapter Team

Karen Reyna	Chapter Lead, Greater Farallones National Marine Sanctuary
Paul Hobi	Program Manager, (NOAA Affiliate) Greater Farallones Association
Wendy Kordesch	Outreach Specialist, (NOAA Affiliate) Greater Farallones Association
Matt Pickett	Pilot and Military Outreach Contractor, Greater Farallones National Marine Sanctuary

Lead Chapter Partners

Gerry McChesney	Manager, Common Murre Restoration Project, U.S. Fish and Wildlife Service
Cassie Bednar	Wildlife Biologist, Common Murre Restoration Project, Humboldt State University
Jennifer Boyce	Habitat Resource Specialist, NOAA Restoration Center, NOAA Trustee to the Command and Luckenbach Trustee Councils

Special thanks to Maria Brown, Superintendent, Greater Farallones National Marine Sanctuary (Farallones Sanctuary) for her leadership and guidance on this Program, and to the Seabird Technical Advisory Committee for their advice.

Special thanks to Gerry McChesney for providing scientific guidance for the Action Plan and for ensuring that annual, ongoing monitoring is conducted by U.S. Fish and Wildlife Service, Common Murre Restoration Project.

The Command and Luckenbach Trustee Councils, the Farallones Sanctuary, the U.S. Fish and Wildlife Service, and the Golden Gate National Recreation Area have provided funding for the Chapter since its inception. A primary source of future funding is expected through the Luckenbach Oil Spill Natural Resource Damage Assessment and Restoration Fund, which is expected to support implementation of strategies in the Action Plan from 2020-2030. Funding has been provided by the *T/V Command* Oil Spill Natural Resource Damage Assessment and Restoration Fund to cover activities related to pilot outreach.

TABLE OF CONTENTS

ACRONYMS

ADS-B - Automatic Dependent Surveillance-Broadcast
AIS – Automatic Identification System
ANG - Air National Guard
AWOS - Automated Weather Observing System
BO - Outreach Strategy for Boaters
C - Coordinated Management Strategy
CDBW - California Division of Boating and Waterways
CDFW - California Department of Fish and Wildlife
CE - California Endangered Species
CMRP - Common Murre Restoration Project, United States Fish and Wildlife Service
CHP - California Highway Police
CP - Coordinated Management Strategy for Pilots
CPFV - Commercial Passenger Fishing Vessel
eFINS - electronic Fisheries Information Network System database
FGC – California Fish and Game Commission
FO - Outreach Strategy for Fishermen
FR - Formative Research; Strategy for Formative Research
M - Monitoring Strategy
MPA - Marine Protected Area
NGO - Non-governmental organizations
NOAA - National Oceanic and Atmospheric Administration
NOTAM - Notice to Airmen
O - Outreach Strategy
OG - Outreach Strategy for General Coastal Users
OHP - Outreach Strategy for Helicopter Pilots
ONMS - Office of National Marine Sanctuaries
OP - Outreach Strategy for Fixed-Wing Pilots
SO - Outreach Strategy for Sailors
TAC – Technical Advisory Committee
UAS - Uncrewed Aircraft Systems (drones)
USCG - United States Coast Guard
USFWS - United States Fish and Wildlife Service
WCRO - West Coast Regional Office, Office of National Marine Sanctuaries

INTRODUCTION

Background and Overview

Seabirds are significant wildlife resources of the California coast. The project area, Bodega Head to Point Sur is located in the California Current system, one of the world's four major nutrient-rich coastal upwelling systems. The area hosts thirteen species of resident breeding seabirds and over two dozen large breeding colonies including the largest population of breeding seabirds in the contiguous United States at the Farallon Islands National Wildlife Refuge. A variety of human-caused stressors including oil spills, fisheries entanglements, chemical contaminants, habitat destruction, and disturbance from close-approaching people or introduced predators have negatively impacted seabird populations. While several programs in California aim to address some of these individual threats to seabirds, prior to 2006 there was no coordinated effort addressing disturbance.

In 2006, Natural Resource Trustees chose the National Oceanic and Atmospheric Administration (NOAA) Greater Farallones National Marine Sanctuary (Farallones Sanctuary) to lead the Seabird Protection Network (Network) to promote seabird resiliency by preventing human-caused disturbances through monitoring and stakeholder-based research, outreach, and coordinated management. The Network started in the region of Bodega Head to Point Sur, referred to as the "Chapter" in the Action Plan, due to the particular acute, documented threats to seabirds from human-caused disturbances. These types of incidents can cause birds to flee their nests, leaving eggs or chicks exposed to predators – thus threatening their recovery.

The Chapter's main focus in 2006 was the restoration of seabirds injured by the *T/V Command* oil spill. The Command Restoration Plan set a framework for the Chapter's strategies in the current Action Plan. Chapter management continues under the *S.S. Jacob Luckenbach* and Associated Mystery Oil Spills Damage Assessment and Restoration Plan; both plans authorized oil spill restoration funds for monitoring, outreach and coordination to reduce human-caused disturbance affecting the recovery seabird in the region injured by oil spills.

The Chapter's area extends from Bodega Head to Point Sur and includes the Farallon Islands offshore and a portion of San Francisco Bay (**Figure 1**). The Farallones Sanctuary is the Chapter's lead agency for this project because of its demonstrated success leading outreach efforts to reduce wildlife disturbance as well as existing legal framework for protecting marine species. The Farallones Sanctuary now partners with several federal, state, regional, and local agencies to coordinate these efforts.

The Farallones Sanctuary spearheads the Chapter's outreach, stakeholder partnerships, and coordinated management. It directs the Chapter's vision, mission and goal; and provides oversight on the implementation of all strategies in this Action Plan. The United States Fish and Wildlife Service (USFWS) Common Murre Restoration Program (CMRP) leads all seabird monitoring activities for the Chapter and is the lead partner. Together, both agencies work to understand and address human-caused disturbance and predator related issues at significant seabird areas in this region.

The Chapter's first Action Plan, completed in 2006, identified: 1) impacts from human disturbance to seabirds; 2) methods to increase awareness about sensitive seabirds; and 3) opportunities for agencies and organizations to work collaboratively. An updated Action Plan in 2010 refined these efforts and included additional stakeholder-driven outreach and management actions to address human disturbance at key target locations.

The success of these efforts led to the publication *Seabird Protection Network: Guide to Establishing New Chapters* (Tezak et al. 2013), which used the Bodega Head to Point Sur Chapter as a model for creating additional Chapters to address human-caused disturbances throughout the State. Subsequently, this guide helped establish new chapters, each one with its unique needs, but all chapters use the same vision and brand identity. The Network currently has five chapters spanning most of the California Coast. Current information on all the chapters can be found at http://seabirdprotectionnetwork.org/the-network/.

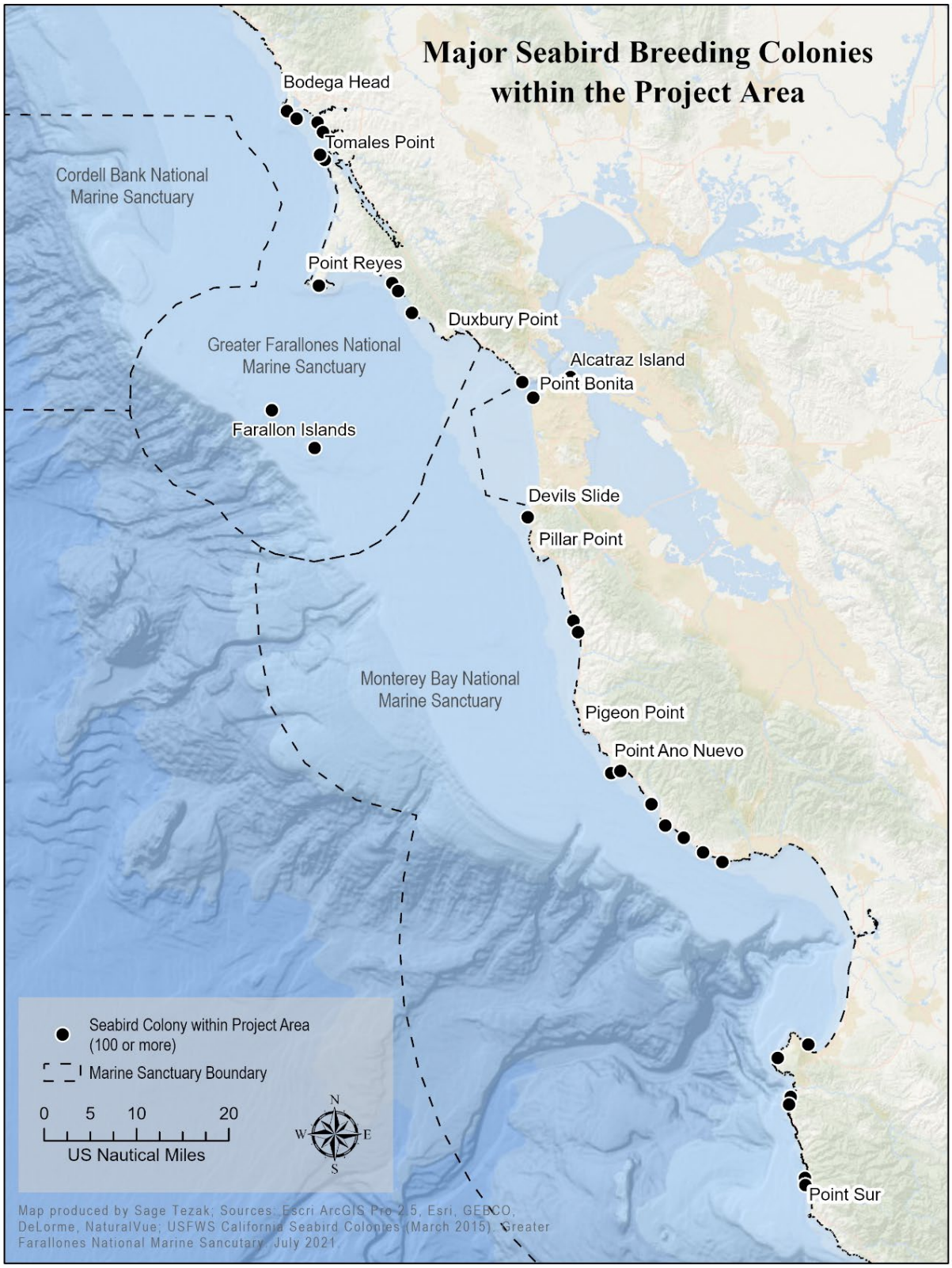
The Bodega Head to Point Sur Chapter is the lead organizing chapter of the statewide network and its success is based on a collaborative, network model. The Bodega Head to Point Sur Chapter leads other chapters by providing guidance on consistent branding, messages and outreach materials and creating a forum for information exchange.

This Action Plan builds on the successes of the Chapter and is a framework for conducting activities through 2030. It documents the best practices to work with specific audiences to reduce negative seabird interactions. It also includes more detail regarding the ways to reach subsets of each audience based on formative research conducted since 2013 and a program evaluation in 2018. A summary of the Central Coast Chapter's overall accomplishments to date is listed in **Appendix A** and is used as a basis for the strategies identified in the 2020-2030 Action Plan.

"Chapter Team" refers to the Seabird Protection Network staff who are directly funded to implement the majority of actions in the Action Plan and a Farallones Sanctuary team lead who directs the Chapter and Network. "Lead Partners" refers to the partners who are also either funded by the Command and/or Luckenbach Restoration Plans to implement parts of the Action Plan or administer the funding to NOAA for Action Plan implementation. The Farallones Sanctuary will continue to sponsor, facilitate, and direct implementation of Action Plan strategies, and coordinate completion of all priority actions in accordance with the Command and Luckenbach Restoration Plans (Command Trustee Council 2004, Luckenbach Trustee Council 2006), Farallones Sanctuary Management Plan (GFNMS 2014) and the Office of National Marine Sanctuaries (ONMS) Strategic Plan (ONMS 2017). The Seabird Technical Advisory Committee (Seabird TAC) will continue to advise Farallones Sanctuary Superintendent. The Command and Luckenbach Oil Spill Trustee Councils will continue to guide and shape annual Chapter activities to ensure the Central Coast Chapter is addressing priority actions. A list of all current active members and member organizations of the Chapter can be found in **Appendix A**.

This Action Plan advances the vision of the USFWS Pacific Seabird Conservation Plan (USFWS 2005), and is consistent with several of the recommendations in The California Current Marine Bird Conservation Plan Chapter on Human-Seabird Interactions (Mills et al. 2005).

Figure 1. Major Seabird Breeding Colonies of the Bodega Head to Point Sur Chapter, showing target colonies and surrounding waters within the project area.



Purpose and Need

> *…human disturbance could be reduced by developing, implementing, enforcing, and educating the public about new protective measures for seabird colonies and roosts, which would address disturbance from aerial overflights, landing on islands and rocks, close approach by boats and other watercraft, and close approach on foot or by vehicle on land.* - Carter et al. (1998)

Seabird restoration efforts have been underway in the Chapter's region for many years, but several factors impede recovery in some areas. Seabird species that nest or roost on cliffs or offshore rocks and feed in nearby coastal waters are highly susceptible to disturbances from:

1. Close-approaching water-based activities (e.g., kayaking, stand up paddling), and boating tourism/recreation (e.g. wildlife watching, diving);
2. Low-flying planes, helicopters, unmanned aerial systems (UAS or drones);
3. Coastal hiking;
4. Fishing gear entanglement; and
5. Introduced predators.

Human-caused disturbance to seabirds is a significant issue for both Monterey Bay and Greater Farallones National Marine Sanctuaries. Since 2015, the ONMS WCRO tracks incidents that potentially violate sanctuary regulations. According to data released in June 2021 by the WCRO, the majority of incidents reported to or by west coast sanctuaries were wildlife disturbance or take. A closer look at the reports between 2015 and June 2021 by area show that a total of 271 wildlife disturbance incidents were reported between Bodega Head and Ano Nuevo, which encompasses over half of the Chapter's region (**Table 1**). Seabird disturbance accounted for 260 of those incidents, or 96%. The majority of incidents, 188, were low flying aircraft in MBNMS at Devil's Slide Rock, a location that is not protected by a NOAA Regulated Overflight Zone that requires aircraft to fly above 1000 feet Above Ground Level. Thus, this area is also not subsequently demarcated on the FAA Aeronautical Charts.

Table 1. Incidents reported to sanctuaries from Ano Nuevo to Bodega Head. Of the 188 seabird disturbances by aircraft in northern MBNMS, 99% were reported at Devil's Slide Rock.

	2021	2020	2019	2018	2017	2016	2015	multi-year repeat incidents	**TOTALS**
Seabird Disturbances by Aircraft in GFNMS	0	4	19	10	3	0	3	7	**46**
Seabird Disturbances by Vessels in GFNMS	0	2	0	0	1	1	6	0	**10**
Seabird Disturbances by Other in GFNMS	0	1	0	0	1	2	0	0	**4**
Seabird Disturbances by Aircraft in northern MBNMS	9	21	46	38	20	19	35	0	**188**
Seabird Disturbances by Vessels in northern MBNMS	0	5	0	2	0	0	0	0	**7**
Seabird Disturbances by Other in northern MBNMS	0	4	0	0	0	1	1	0	**6**

Although the Chapter has successfully demonstrated that actions from the past 10 years reduced the number of incidents at specific locations, data indicates that incidents related to human caused disturbance is an ongoing, chronic issue.

Human-caused disturbance can impact seabird colonies significantly. Frequent disturbance or a single severe event can disrupt nest site prospecting, courtship, resting, and feeding of young. It can lead to increased predation, increased stress levels, and higher energy costs – the net effect of which reduces breeding success, results in fewer young, and can cause colony abandonment over time.

The primary focus of the Chapter, based on original Trustee Restoration Plans, is the protection and restoration of seabird breeding colonies (aggregations of nesting seabirds) through reducing human disturbance. **It focuses on reducing disturbance to breeding colonies that have experienced high rates of disturbance in the past. Focusing on these colonies can ensure the future health of the species that breed there.** The Chapter also aims to reduce impacts of human disturbance to roosting birds (seabirds aggregating at a site to rest), non-colonial nesting seabirds (e.g. Black Oystercatchers) and birds rafting and feeding in the water. All of these seabird species are prone to human-caused disturbance, **and will benefit from efforts to reduce it**.

The Chapter addresses overlapping jurisdictions by identifying leads for all actions and identifying engagement with affected stakeholders and selected audiences through collaboration, partnerships, and coordination. Strategies and actions consider biological factors, regulatory issues, conservation threats, management needs, and restoration opportunities; they also are designed to consider stakeholder and selected audience perceptions, as well as the benefits and barriers to reducing human disturbances. Strategies and actions address human disturbance and enhance seabird recovery efforts through an outreach program coupled with enforcement, management, evaluation and monitoring.

This Action Plan will guide the Chapter through 2030, ensure continued implementation of projects in the Command and Luckenbach Restoration Plans, and lay a framework for activities that protect seabirds from human disturbance which can be funded through other sources. The Chapter's leadership on addressing human disturbance to seabirds will continue to guide the Network actions and inform actions by other chapters. The Action Plan also provides guidance to other organizations throughout the country that focus on addressing human disturbances to wildlife. Information gained through formative research will be shared, as it is critical for communicating the success and failures of specific actions and achieving the goals of all Network chapters. This in turn will help the broader community of professionals addressing wildlife disturbance refine its strategies. The collective actions selected and outlined in this Action Plan are based on the following guiding principles:

Guiding Principles

Vision

Thriving, resilient seabird populations flourish throughout the coastal and near-shore waters.

Mission

Change human behaviors that disturb seabirds.

Goal

The Seabird Protection Network Bodega Head to Point Sur Chapter collaborates with agencies, NGOs, boaters, pilots and coastal users to reduce human disturbance to seabirds from Bodega Head to Point Sur through outreach informed by formative research and ongoing evaluation, streamlined and coordinated agency management, and robust monitoring that ensures timely and effective strategy implementation.

Scope of the Action Plan

This Plan presents ideas generated through a diverse and collaborative effort to identify potential future actions that could be taken by or in the Greater Farallones or Monterey Bay National Marine Sanctuaries to address human-caused seabird disturbance. The geographic scope of this Plan focuses on strategies located both within and outside of the Greater Farallones or Monterey Bay National Marine Sanctuaries management areas that provide a benefit to sanctuary resources (Figure 1). The strategies outlined in this document do not represent the entirety of what can be implemented, nor are they fully inclusive of other actions that may be relevant to other agencies' mandates.

The National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321 et seq., as implemented by the Council on Environmental Quality (CEQ) Regulations (40 CFR Parts 1500 through 1508), requires that Federal agencies include in their decision-making processes appropriate and careful consideration of all environmental effects of proposed actions, analyze potential environmental effects of proposed actions and their alternatives, avoid or minimize adverse effects of proposed actions, and restore and enhance environmental quality to the extent practicable.

Adoption of this Plan does not authorize or approve implementation of any individual project. A majority of the actions are administrative in nature and would not have effects that can be meaningfully evaluated. NOAA does not have control nor the responsibility to decide which strategies in the Plan would be implemented beyond the actions that identify NOAA as the lead. For individual projects, each agency would have the discretion to initiate and direct any individual project. Agencies with the control and responsibility to implement a future project or recommendation included in this Plan would be responsible for determining and documenting the necessary environmental compliance, such as any applicable reviews, permits or consultations under NEPA, CEQA, the Endangered Species Act, the Coastal Zone Management Act, the National Historic Preservation Act, and other applicable regulations. Additionally, implementation of certain projects may involve activities otherwise prohibited by Sanctuary regulations and could require a permit under the National Marine Sanctuaries Act.

For actions for which NOAA is the lead agency, NOAA determined that the projects are within the scope of the proposed action, range of alternatives, and environmental effects described in the following restoration plans and environmental assessments:

- S.S. Jacob Luckenbach and Associated Mystery Oil Spills Damage Assessment and Restoration Plan/Environmental Assessment (EA) page 97 to 105. The description for the preferred restoration alternative can be found on page 97 of the Restoration Plan/EA and descriptions for the environmental consequences can be found on page 101.
- Command Restoration Plan page 42 to 51. The description for the preferred restoration alternative can be found on page 45 of the Restoration Plan/EA and descriptions for the environmental consequences can be found on page 48.

The National Environmental Policy Act (NEPA) compliance for all actions where NOAA is the identified lead agency are covered under the following plans:

- S.S. Jacob Luckenbach and Associated Mystery Oil Spills Damage Assessment and Restoration Plan/Environmental Assessment (EA) page 97 to 105. The description for the preferred restoration alternative can be found on page 97 of the Restoration Plan/EA and descriptions for the environmental consequences can be found on page 101.
- Command Restoration Plan page 42 to 51. The description for the preferred restoration alternative can be found on page 45 of the Restoration Plan/EA and descriptions for the environmental consequences can be found on page 48.

Therefore, no further NEPA analysis is required at this time for these NOAA-led projects. Implementation by NOAA of any the strategies in the Plan beyond those what is covered in the Command and Luckenbach Restoration Plans may will require additional funding, legal, environmental, and methodological considerations by the sanctuary on a case-by-case basis. For these future actions, NOAA will assess whether their effects are adequately addressed in these existing NEPA analyses, consistent with Section 5 of the NOAA NEPA Companion Manual. If they are not, NOAA may conduct additional environmental reviews, and develop independent environmental compliance and consultation documentation, as needed. Sanctuary regulations and considerations that may be applicable to specific actions will need to be considered during implementation. Some actions may require permits, and consultations by a variety of agencies. Implementation of these actions are also subject to regulations and considerations from a variety of local, state, and federal agencies.

Environmental Compliance with the NEPA requires federal agencies to follow a systematic approach to evaluate the potential environmental impacts of any major federal action. The Council on Environmental Quality's regulations implementing NEPA define major federal actions to be "actions with effects that may be major and which are potentially subject to federal control and responsibility" (40 CFR 1508.18). NOAA issued guidelines in "Policy and Procedures for Compliance with the National Environmental Policy Act (NEPA) and Related Authorities" (NOAA Administrative Order (NOA) 216-6A and Companion Manual for NAO 216-6A) to further clarify that an environmental review under NEPA is required when "the proposed action and effects are subject to NOAA control and responsibility."

Any project discussed in this Plan that is currently in progress that is implemented or coordinated by an agency other than NOAA would be subject to environmental statutes and regulations applicable to that agency, such as NEPA and the California Environmental Quality Act (CEQA). Agencies with the control and responsibility to implement a future project or recommendation included in this Plan would be responsible for determining the necessary environmental compliance, such as any applicable reviews or consultations under NEPA, CEQA, the Endangered Species Act, the Coastal Zone Management Act, and the National Historic Preservation Act. A full description of Seabird-Related Laws, Regulations and Authorities in the project area is detailed in **Appendix B**.

SETTING

Target Species and Key Colonies

Key seabird breeding colonies (i.e. greater than 100 breeding pairs) are found between Bodega Head to Point Sur and out to the Farallon Islands (**Figure 1**). Many species in the region have strong site fidelity, returning to the same nest site or colony to lay eggs annually, and are highly dependent on the region's productive waters.

The Network aims to protect seabirds that have the highest risk of potential exposure to human impact and therefore, disturbance from humans. Species and colonies were selected to restore seabird colonies harmed by the *T/V Command* and *S.S. Jacob Luckenbach* oil spills through reductions in human disturbance. At-risk seabirds include breeding colonies and seabirds that feed and rest in near-surface environments such as cliffs, offshore rocks, and islands on the central coast of California (**Table 2**). Currently, the Chapter focuses on reducing human-caused impacts to Common Murres (*Uria aalge*) and other sensitive species at their colonies within the region, including the North and South Farallon Islands, Point Reyes, Drake's Bay Colony Complex, Devil's Slide Rock & Mainland, and Castle-Hurricane Colony Complex. Three of these colonies/colony complexes are the focus of intensive ongoing monitoring efforts established by the CMRP (i.e. for human-caused disturbances, avian disturbance and predation, seabird productivity, seabird attendance patterns, and relative population sizes) at Point Reyes Headlands, Devil's Slide Colony Complex, and the Castle-Hurricane Colony Complex.

Other at-risk seabirds include diurnal surface-nesting and burrow/crevice-nesting species at various sites throughout the region. Target species can vary over time and geography based on human disturbance issues, and the Chapter can adjust its efforts as needed to address human-caused impacts to other surface-nesting seabirds (e.g. California Least Terns burrow-nesting seabird species such as Pigeon Guillemots, Cassin's Auklets, Rhinoceros Auklets, Tufted Puffins, Leach's Storm-Petrels and Ashy Storm-Petrels, and roosting seabirds.

Table 2. Seabird species in the Chapter's region categorized by the likelihood of exposure to human disturbance, based on preferred breeding habitat (Buckley and Buckley 1980, McChesney Personal Communication).

Common Name	Scientific Name	Breeding Habitat	**Protection Status** (Federal/State)
HIGHEST EXPOSURE – DIURNAL SURFACE-NESTING SPECIES			
Western Gull	*Larus occidentalis*	Surface	California's Bird Responsibility List, USFWS Bird of Conservation Concern
Caspian Tern	*Hydroprogne caspia*	Surface (beaches, artificial habitats)	No Status
Brown Pelican*	*Pelecanus occidentalis*	Surface	Federal/State Delisted

Double-crested Cormorant*	*Phalacrocorax auritus*	Surface	No Status
Pelagic Cormorant*	*Phalacrocorax pelagicus*	Surface (cliffs)	No Status
Brandt's Cormorant*	*Phalacrocorax penicillatus*	Surface	California's Bird Responsibility List, USFWS Bird of Conservation Concern
California Least Tern	*Sternula antillarum browni*	Beaches, Artificial habitats	Federal/State Endangered
Common Murre*	*Uria aalge*	Surface	No Status
MODERATE EXPOSURE – DIURNAL BURROW/CREVICE-NESTING SPECIES			
Pigeon Guillemot*	*Cepphus columba*	Rock crevices & artificial structures	No Status
Tufted Puffin	*Fratercula cirrhata*	Burrows, Rock crevices	California Bird Species of Special Concern, USFWS Bird of Conservation Concern
LOW EXPOSURE – NOCTURNAL BURROW/CREVICE-NESTING SPECIES			
Rhinoceros Auklet	*Cerorhinca monocerata*	Burrows, Rock crevices	No Status
Leach's Storm-Petrel	*Oceanodroma leucorhoa*	Rock crevices, Burrows	No Status
Ashy Storm-Petrel	*Oceanodroma homochroa*	Rock crevices	California Bird Species of Special Concern, USFWS Bird of Conservation Concern
Cassin's Auklet	*Ptychoramphus aleuticus*	Burrows, Rock crevices	California Bird Species of Special Concern, USFWS Bird of Conservation Concern
LOW TO MODERATE EXPOSURE – OLD-GROWTH CONIFEROUS TREES			
Marbled Murrelet	*Brachyramphus marmoratus*	Old-growth trees	Federal Threatened/ California Endangered

** Focal species for the Chapter's disturbance reduction from most human activities.*

Threats to Recovery

Seabirds in this region face a challenging future, and continually face increasing natural and human-caused threats to their survival. Scientists project long-term changes in oceanic conditions due to climate change that will have substantial impacts to California seabirds (Largier et al. 2010; Hutto et al. 2015). Due to their high sensitivity and accessibility, seabirds are used as biological indicators of ocean climate conditions in Farallones Sanctuary and throughout the world's oceans (Duncan et al. 2013). Common Murre populations have been a consistent indicator of seabird decline (Piatt et al. 2020; Gibble et al. 2018). From 2014-2016, an unprecedented Pacific marine heat wave resulted in an estimated one million dead Common Murres along North America's west coast (Piatt et al. 2020). A large-scale die-off and resultant decline of Brandt's Cormorants in central California in 2009 resulted from a population crash of a favored prey item, the Northern Anchovy (Ainley et al. 2018). Additional human-caused stressors act in parallel with climate change to impact seabird population health - so it is critical to build resilient populations of seabirds that can endure these known threats.

Humans have been responsible for many of the stressors that have historically challenged nesting seabirds on the California Coast. Nineteenth century egg collectors decimated the Farallon Islands Common Murre colony to feed San Francisco's growing population. Gill net fishing entanglements and a series of oil spills led to further die-offs and ultimately the extirpation of a breeding colony of about 3,000 Common Murres at Devil's Slide Rock, and declines of up 60% at central California colonies (Takekawa et al. 1990; Carter et al. 2001; Hampton et al. 2003).

In response to alarming declines in this region's seabird populations, in 1995 the CMRP began efforts at the Devil's Slide Rock colony to restore Common Murres – whose populations suffered the greatest loss. Program biologists used several techniques, including social attraction, to successfully reestablish Devil's Slide Rock as a breeding colony (Carter et al. 2001, 2003; Parker et al. 2007). Common Murre populations in the region have experienced overall growth since the 1990s (Bednar et al. 2020). This represents a tentative success story for seabird restoration in this region.

However, as CMRP biologists conducted restoration and seabird monitoring at Devil's Slide Rock they began to observe frequent disturbances, mostly caused by low flying aircraft and close approaching boats. Intensive multi-year studies at several colonies led biologists to conclude that Common Murres and other diurnal surface nesting seabirds are particularly susceptible to human disturbance (Carney and Sydeman 1999; Carter et al. 1998, Rojek et al. 2007, Fuller et al. 2018).

Aircraft and watercraft disturbance to seabirds can greatly affect their reproductive success, colony size, and continued use of colony sites over time (McChesney 1997). For example, serious disturbances cause Common Murres to flush from their nests – leaving eggs and chicks exposed to predators. If a low-flying aircraft or close approaching causes a major disturbance

during the breeding season, it can result in large-scale or complete nest abandonment and potential loss of the entire colony's reproductive effort for the year (Rojek et al. 2007, Thibault et al. 2010, Fuller et al. 2018; Common Murre Restoration Project, annual reports). The cumulative effects of individual disturbance events can result in a reduction of the long-term health and survival of affected species, and when coupled with changing oceanic conditions and other human-induced stressors, can impart large-scale harm – such as population loss, and abandonment of entire colonies.

Healthy and thriving seabird populations are more capable of withstanding long-term threats, and one of the best ways to protect seabirds is to prevent human disturbance at breeding colonies. CMRP has identified the three most common disturbances to be low-flying aircraft; close approaches by motorized and non-motorized boats; and general ocean and coastal users (i.e. humans on foot). Each of these threats are discussed in detail below. Their combined impacts to seabird breeding colonies highlights the need for efforts to reduce human caused disturbance.

Since 2007, the Chapter has worked to reduce vessel and aircraft disturbance to seabirds using a combination of regulations and outreach. Initial efforts documented in previous action plans focused on a regulatory approach to protect specific colonies. The Chapter supported designation of special closures that prohibit vessel access around six significant colonies, and NOAA Regulated Overflight Zones that require pilots to fly over 1000 feet above designated areas (which include many seabird colonies). More recently, the Chapter has relied on outreach that motivates aircraft pilots and boaters to keep their distance from seabirds. This approach gives them tools to identify seabird colonies, enabling them to keep at least 1000 feet of distance – nearly eliminating disturbance.

The Chapter's efforts to reduce human disturbance support not only the ongoing restoration of Common Murres, but the resilience of other seabirds in the region. The Chapter Team encourages audiences to keep at least 1000 feet away from all seabirds and shorebirds. Promoting behaviors that reduce human disturbance increases seabird resilience, enhancing the health and sustainability of the region's seabird populations susceptible to the formidable stressors of a challenging and changing ocean.

While the Chapter has achieved important milestones in reducing disturbance to nesting seabirds, human-caused disturbance remains a challenge throughout the region. Over 500 unique disturbances from Bodega Head to Point Sur are cataloged in the Chapter's database between 2006 and 2021. CMRP continues to monitor several colonies between Bodega Head and Point Sur that continually experience disturbance from vessels and aircraft. If one major flushing is caused during a sensitive period, such as a low-flying aircraft or a boat approaching too close during the breeding season, large-scale or complete nest abandonment and potential loss of the entire colony's reproductive effort for the year can result. Devil's Slide Rock has the greatest combined aircraft and watercraft disturbance rates of all monitored colonies, with between 50-150 CMRP documented disturbances each breeding season (Bednar et al. 2020).

Low-flying aircraft

Low-flying aircraft includes fixed-wing planes, helicopters, and UAS. Low overflight incident reporting data provided to Farallones Sanctuary from 2005-2007 was used as a baseline for understanding the frequency and severity of seabird disturbance. CMRP biologists monitoring specific colonies during the peak breeding season (April-July) reported most incidents. Of the 334 incidents below 1000 feet Above Ground Level (AGL) reported, 322 (96%) resulted in disturbance to monitored seabirds. This data also showed that aircraft-caused disturbances were a frequent occurrence. Annual reports by CMRP provide more detailed information (e.g., Bednar et al. 2020).

In 2012, NOAA amended its long-standing regulatory provisions prohibiting low overflights clearly connecting the adverse impacts on seabirds (i.e. disturbance) caused by low overflights as the regulatory basis for overflight regulations. This action lead to the demarcation of NOAA Regulated Overflight Zones on the Federal Aviation Administration (FAA) Aeronautical Charts surrounding most seabird hotspots within sanctuaries (Federal Register, Vol. 77, No. 17, Thursday, January 26, 2012). Pilots are required to possess all FAA Aeronautical Charts in their aircraft, and abide by them. The Chapter has consistently used NOAA Regulated Overflight Zones as a critical tool for outreach to pilots.

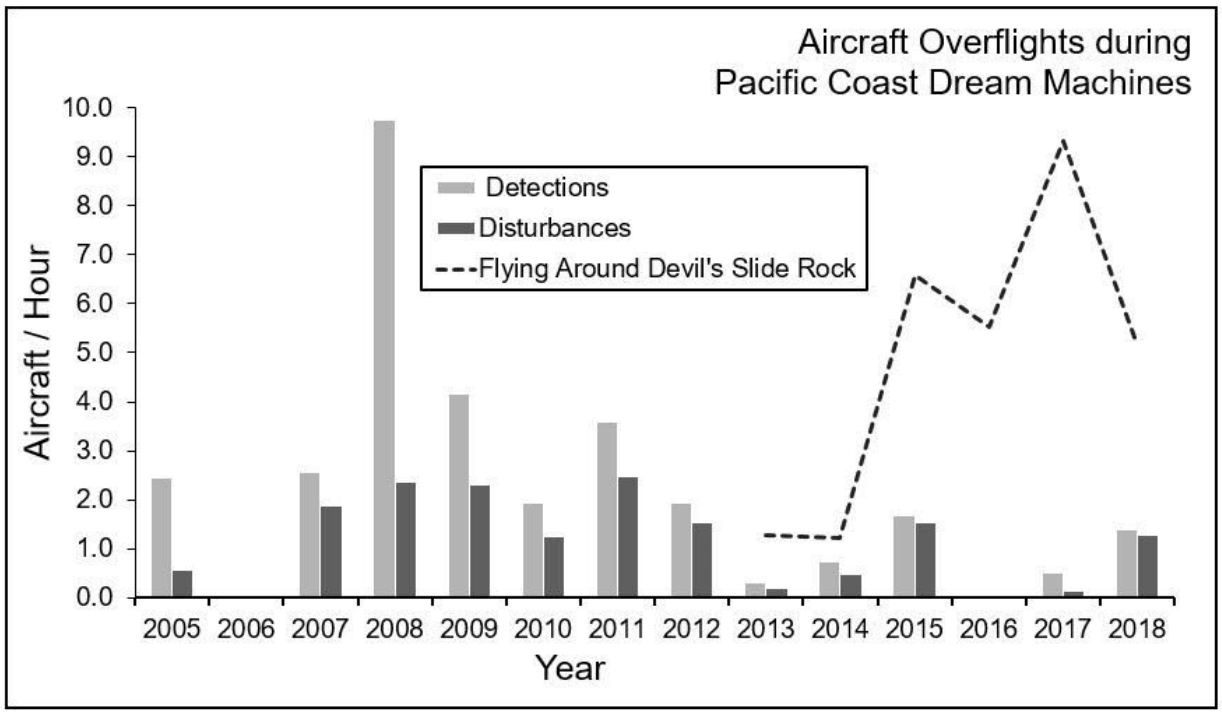
The area surrounding Devil's Slide Rock presents a particular challenge for reducing aircraft disturbance. It is not protected by a NOAA Regulated Overflight Zone and is not demarcated on FAA Aeronautical Charts. Additionally, it is a heavily trafficked airspace that is five miles north of Half Moon Bay Airport. Low flying planes and helicopters are the most frequent source of human disturbance at Devil's Slide Rock, with helicopters the most likely to cause a severe disturbance (Fuller et al. 2018). Aircraft disturbances have not changed significantly in monitored locations since monitoring began in 2005 (Bednar et al. 2020).

The area surrounding Devil's Slide Rock is not protected by a NOAA Regulated Overflight Zone and is not demarcated on FAA Aeronautical Charts. Since 2005, numbers of helicopters and total aircraft flying within 1,000 feet of Devil's Slide Rock & Mainland have decreased significantly, though aircraft disturbances have not changed significantly (Bednar et al. 2020). Low flying planes and helicopters continue to be the most frequent source of human disturbance at Devil's Slide Rock, with helicopters the most likely to cause a severe disturbance (Fuller et al. 2018). All flushing and 91% of agitation events occurred at aircraft altitudes of approximately 1000 feet at Devil's Slide Rock (Fuller et al. 2018). Declines in numbers of aircraft observed at Devil's Slide is a positive sign that outreach efforts are having a noticeable impact on the behavior of pilots passing the area.

Despite the chronic issue of aircraft-caused disturbance at Devil's Slide Rock, the Chapter has used outreach to successfully reduce aircraft overflights during the annual Dream Machines air show in Half Moon Bay. Aircraft associated with this event were previously the cause of numerous and significant disturbances to seabirds at Devil's Slide Rock. Persistent outreach in

partnership with event organizers and the Half Moon Bay Airport has resulted in pilots flying higher, and around the area (**Figure 2**). In 2012, the Chapter began partnering directly with event organizers and briefing air show pilots prior to the event. This has led to a decrease in "detections" – aircraft that fly lower than 1000 feet or within 1500 feet of Devil's Slide Rock. In other words, more pilots are following the Chapter's guidance on flying in the area, and have increasingly flown around the colony since 2013. However, data from the WCRO indicates that seabirds monitored at Devil's Slide Rock are still experiencing repeated disturbances on days other than the Pacific Coast Dream Machines event. Although there has been less seabird disturbances reported since 2012, aircraft-caused disturbance also remains a persistent issue at Devil's Slide and continues to need attention during the Dream Machines air show.

Figure 2. Aircraft Overflights during Pacific Coast Dream Machines. The dotted line "*Flying Around Devil's Slide Rock*" indicates aircrafts that fly above 1000 feet and/or 1500 feet offshore of the area (Bednar et al. 2019b).



Disturbances are most commonly caused by out of area fixed-wing civilian aircraft, and helicopters piloted by the United States Coast Guard (USCG) and military. The Chapter continues to conduct outreach to pilots at the event, and uses a variety of strategies outlined below.

UAS can be a potential source of disturbance to birds – which seem especially sensitive relative to other wildlife (Rhodes and Spiegel 2017). The prohibition of UAS in many protected areas within the project area may contribute to a low number of reported UAS-caused wildlife disturbance incidents in some locations. However, CMRP monitoring has detected an increase in UAS use in recent years at monitored colonies, and many wildlife disturbances caused by UAS hobbyists are frequently posted on the internet, which in turn results in reports to authorities with jurisdiction in the project area. This Action Plan includes an outreach strategy and tools to build partnerships with UAS pilots and encourage them to avoid disturbing seabirds.

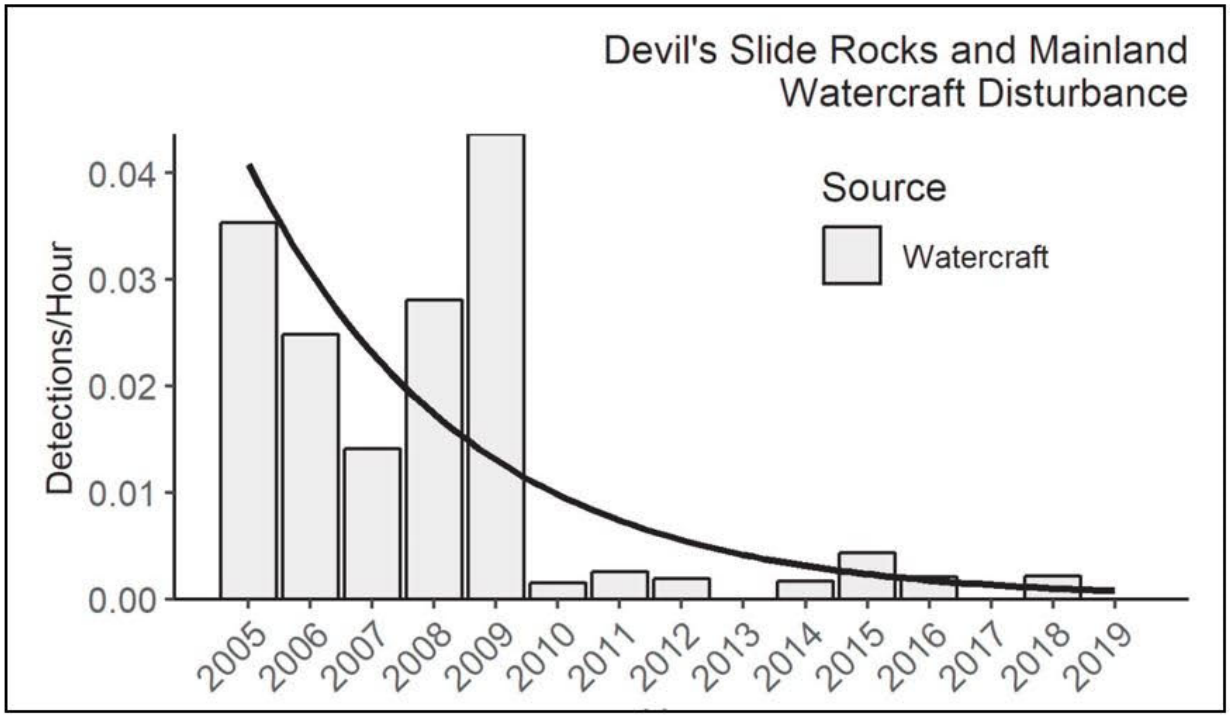
Motorized/Non-motorized boats

The Chapter's region has a very active and diverse boating community. There are over 100 marinas, ports and launch ramps in this region, which allow thousands of boats to easily access the coast. Kayaks, private motorized boats, commercial fishing boats, wildlife watching and recreational fishing charter boats, motorized personal watercraft (jet skis) and even stand up paddlers cause disturbances to seabirds (Rojek et al. 2007, Bednar et al. 2020). Disturbance occurs when watercraft approach too close, causing alert seabird behaviors or flushing (Rojek et al. 2007). Another source of boat-based disturbance at night is from artificial light pollution, introduced by fishermen who use bright lights while fishing or at anchor, which can illuminate and disturb seabirds, and make nocturnal seabirds and nesting colonies visible to predators.

The Chapter Team has successfully communicated a science-based need for regulations to protect sensitive seabird colonies from boat-based disturbance. In 2010, based in part on Lead Partner data provided by the Chapter Team, California's Fish and Game Commission enacted special closures at six seabird colonies within the project area, including Devil's Slide Rock. These special closures established strong regulatory protections for seabirds and no-access zones that prohibit all watercraft and human presence.

The closures, combined with outreach from the Chapter Team and others, have been largely successful in halting boat-based disturbances from some sectors of the boating and fishing communities. There has been a sharp decrease in reported disturbances beginning in 2010, when the closures went into effect (**Figure 3**). Commercial fishing boats and wildlife watching and recreational fishing charter boats have caused very few disturbances since 2010. Many of these vessel captains are Chapter partners and help with outreach to other boaters and fishermen.

Figure 3. Watercraft Disturbance at Devil's Slide Rocks and Mainland reported by the USFW CMRP since 2005 (Bednar et al. 2019a)



CMRP biologists still report recreational boats causing disturbances in special closures, likely due to lack of knowledge of the closures. There are also several larger colonies not protected by special closures such as Castle-Hurricane Colony Complex off the coast of Big Sur, where CMRP biologists have reported close approaching boats causing disturbances. The Chapter has outlined a range of outreach actions below that are designed to reduce these disturbances.

General ocean users

General ocean users include humans on foot, coastal hikers, walkers or general beach goers, picnickers, people with leashed or unleashed pets, and people fishing from the shore. Disturbance occurs when humans approach seabirds too closely. Responses can differ between seabird species and between habitats. Humans climbing on cliffs or landing on offshore rocks where seabirds breed can cause large-scale disturbances. Fortunately, most seabirds within the project area are difficult to access, and documented incidents of humans on foot causing a disturbance are rare (note: this is not the case with shorebirds, where humans on foot are the primary source of disturbance). However, central California's coast is heavily impacted by human activities, and with increased population and migration to the greater Bay Area and the coast, pressures on marine resources will intensify – leading to a greater likelihood of disturbance from general ocean users (Halpern et al. 2009).

Disturbance by general ocean users is episodic, but a single event can have a large impact on multiple species and/or a larger number of seabirds. For example, at Natural Bridges State

Beach, coastal hikers who jumped fences have disturbed large groups of roosting Brown Pelicans and cormorants. The combination of expanded human activities on the coast and increased frequency of episodic disturbance can have lasting impacts on seabird populations that nest, roost and feed on and around offshore rocks, islands and mainland cliffs. The Chapter pursues various strategies to address these types of disturbances, which are detailed below.

Entanglements occur when fishermen improperly discard gear. The impact is also episodic, and each incident typically harms a single individual. The harm is likely greater than a disturbance to individual seabirds as data shows entanglements can kill seabirds. Seabird entanglements are also a concern that the Chapter addresses through its fishing line recycling program.

Finally, CMRP biologists have brought disturbances caused by invasive predators to the attention of the Chapter. For example, Common Ravens (*Corvus corax*) are native to California but have increased in the region over the last several decades, fueled in large part by their foraging on human-provided food and refuse (Kelly et al. 2002, Liebezeit and George 2002). Because of their human-caused increases and heavy predation on many birds and other species, they are considered invasive by some and raven control is conducted at some locations to protect sensitive species (Liebezeit and George 2002). Ravens often raid Common Murre colonies in the region, including Devil's Slide Rock, causing large amounts of disturbance and depredating many eggs and chicks. At the mainland Devil's Slide Rock colony, to cite another example, introduced red foxes have preyed on nesting Common Murres and possibly other seabirds. Outreach actions have not been identified for this topic. The Chapter Team will improve understanding of this potential impact to determine if additional actions are needed in the future for specific locations or species.

STRATEGIES

Four Core Strategies

Section Structure

The Chapter uses four core strategies to guide actions that reduce human-cause disturbance to seabirds. These are:

1. Monitoring (M)
2. Formative Research (FR)
3. Outreach (O)
4. Coordinated Management (C)

The tables below outline actions organized by these four strategies. Actions are further segmented by audience, highlighting the Chapter's efforts to design actions that focus on

specific audiences. Each action also identifies a "lead" that is responsible for tasks, outcomes, and products. Together, these tables comprise an Action Plan for addressing human-caused disturbance over a ten-year horizon with a "menu" of actions. The Network Team can pull appropriate actions from this menu to set annual priorities that address the most pressing issues that arise from disturbance monitoring throughout all Network chapters.

"Partners" refers to the member agencies and organizations of the Chapter. "Stakeholders" refers to organizations and individuals outside of the Chapter that have an interest in seabird disturbance issues, and can include all or some of the selected audiences in the Action Plan. "Audience" refers to people identified for a targeted strategy.

See page 5 for a complete list of acronyms used throughout the strategy tables in the document. **Appendix C** is a summary of the Central Coast Chapter's overall Communication Philosophy, Strategies and Successful Messages i. **Appendix D** is a description of the Outreach Materials and Style Guide.

Defining the Seabird Protection Network

- The Network, composed of independent chapters, is led by government and NGOs working collaboratively to protect and restore seabirds in California.
- The Network Team, led by Farallones Sanctuary, coordinates a consistent approach and shares information across all chapters.
- The Bodega Head to Point Sur Chapter Team, led by Farallones Sanctuary, works under the advisement of the Luckenbach and Command Trustee Council to implement actions in the respective Restoration Plans and is the lead agency for formative research, outreach, and coordinated management.
- The Seabird Technical Advisory Committee (TAC), is comprised of government representatives that advise Farallones Sanctuary superintendent on actions to protect and restore seabirds.
- The Lead Partner is the U.S. Fish and Wildlife Service, San Francisco Bay National Wildlife Refuge Complex, which partners with Humboldt State University. It is the lead agency for the monitoring component.

Connecting the Strategies

The four core strategies in the tables below work together to reduce human-caused disturbance to seabirds. Formative Research strategies inform the development and refinement

of Outreach strategies. Monitoring and Coordinated Management strategies aim to identify disturbance issues in a specific location and a tailored response.

Because the Chapter has engaged in this multi-pronged approach for over a decade, many actions listed in the tables are underway. Current actions are outlined in the 2013 Network Action Plan, the 2015 Farallones Sanctuary Management Plan, and informed by the Seabird Technical Advisory Committee. The actions below have also been informed by a 2018 Program Evaluation, Farallones Sanctuary Advisory Council recommendations, and the Seabird Technical Advisory Committee.

Understanding the Strategies

Monitoring (M) is spearheaded by USFWS CMRP. From April to August each year, seabird biologists monitor key Common Murre breeding colonies for health and for disturbance. These data allow the Chapter to understand and characterize human-cause disturbances to seabirds, identify responsible audiences, and focus outreach efforts. Since the inception of the Chapter in 2006, the primary sources of observed human-caused disturbances have consistently been from low-flying aircraft and close-approaching boats. Monitoring data has also identified introduced predators and fishing line entanglements as problematic. Analysis of monitoring data can also inform whether efforts to reduce human-caused disturbance to seabirds are working.

Formative Research (FR) is the process of seeking to understand and find the best ways to reach and work collaboratively with audiences. Formative Research allows the Chapter to fully comprehend audiences' knowledge, attitudes, and practices related to human-caused seabird disturbance. This process dives deeper into why a particular audience may or may not adopt the desired behavior change, how they receive information, what sources they trust, and why. Formative research is conducted along with evaluation, the process of using audience feedback to continually adapt actions, outcomes, and products for maximum effectiveness.

Formative research is a critical part of building partnerships with the selected audiences and generates more effective outreach campaigns. However, the full formative research process requires significant time and resources, so the Chapter carefully selects audiences requiring the most focus and prioritizes formative research efforts based on the potential for the greatest impact and probability of success. For example, a current priority for formative research is to understand why fixed-wing pilots continue to fly planes low over Devil's Slide. This is illustrated below as an example of using formative research to craft an outreach strategy that will effectively reduce fixed-wing disturbances at Devil's Slide Rock.

Formative Research:

Assessing How to Successfully Communicate Messages to Fixed-Wing Pilots Who Fly near Devil's Slide

Through in-depth interviews, focus groups and continuous dialogue with fixed-wing pilots, the Chapter seeks to answer the following questions:

1. Why do fixed-wing pilots fly low over the Devil's Slide Area?
2. Which select groups of pilots should be engaged regarding the desired behavior change of flying higher?
3. What are perceived barriers to the behavior change?
4. What are the perceived benefits to the behavior change?
5. What media and personal sources do these pilots rely on?
6. Who do fixed-wing pilots trust?
7. Who are major influencers within the select pilot community?

In cumulatively understanding pilots' views related to these questions, the Chapter has been able to develop actions and messages to effectively inspire pilots to change the way they fly over the Devil's Slide Area, thus reducing impacts to seabirds.

Outreach (O) determines how we connect and build partnerships with selected audiences to change behavior that causes disturbance to seabirds. While the Chapter has a long-standing outreach program, the Chapter regularly evaluates outreach products and outcomes to ensure maximum impact. Through this process, the Chapter can conduct outreach based on the needs of each specific audience and tailor outreach to targeted locations. Outreach leads to messages and materials that resonate with the audience, leading to increased credibility and long-term partnerships.

For example, the current campaign designed for fixed-wing pilots flying over Devil's Slide is identified as part of several actions; many products and outcomes link to this campaign.

Actions in the Outreach strategy for fixed-wing pilots seek to:

1. Highlight the benefits of the behavior change.
   - *Example: The Chapter wants to lead with messages regarding bird strike prevention and safety, as those are the benefits that pilots see to flying higher. The Chapter determined this from formative research in the form of surveys and via a focus group.*
2. Acknowledge the barriers to behavior change.
   - *Example: The Chapter needs to understand that weather and airspace restrictions may necessitate flying at lower altitudes, so our messages have to address this fact.*
3. Determine when and where to message the behavior.
   - *Example: The Chapter annually attends the Dream Machines Air Show to message the importance of avoiding Devil's Slide during the breeding season for Common Murres. Dream Machines is a popular air show that attracts hundreds of pilots to Half Moon Bay Airport during the breeding season, most of whom fly by Devil's Slide Rock.*
4. Determine the most effective tactics that should be used.

Example: Formative research determined that pilots are heavily influenced by other pilots – a phenomena known as "social proof". So, the Chapter developed a pilot pledge campaign that asks pilots to hold a plaque in front of their plane that says "I Fly Above 1000' AGL for Safety and for Wildlife." These photos are displayed on a website, and are used to collect additional pledges. By highlighting influential pilots' commitments to flying high, the campaign sets an example for other pilots to follow.

Coordinated Management (C) refers to efforts that increase coordination and information exchange among Chapter partners. Managers need to respond in a coordinated way to address issues related to consistency in laws, regulations, policies, permit procedures and management outcomes. This, in turn, links the team to receiving timely and accurate data from monitoring. Coordinated management actions allow Farallones Sanctuary and Network Partners to develop tools to promote compliance with existing laws and regulations or change laws and regulations if outreach efforts are not fully successful.

Monitoring (M)

Strategy:
Use seabird monitoring data to identify local and regional human-caused disturbance issues, inform management strategies, and guide outreach and enforcement efforts.

Audience: Agencies and partners
Includes policy-makers, scientists, enforcement personnel, and natural resource managers

Actions	Lead	Activities and Products
M-1. USFWS CMRP conducts seabird monitoring at designated locations to assess annual seabird disturbance data, breeding success, population size, and regional population changes.	USFWS CMRP	• Share seabird disturbance levels, breeding, and population estimates to inform the Chapter's geographical focus for reducing human disturbance. • Identify, quantify and characterize the causes of human disturbance at each affected colony. • Use technological resources (e.g. ADS-B and AIS, eFINS, UAS) when it is an efficient and effective method of data collection.
M-2. Analyze data from the USFWS CMRP and other available sources to understand the source and nature of disturbances to seabirds in the project area.	Chapter Team in partnership with USFWS CMRP	• Identify the locations most frequently or severely affected by human-caused disturbance. • Identify audiences for outreach and enforcement strategies. • Identify technological resources available for more efficient and effective data collection.
M-3. Conduct aerial photographic surveys and analyze photos as funds allow.	USFWS, UC Santa Cruz	• Continue photo analyses of colony locations, colony sizes, and breeding population trends of Common Murres, Brandt's Cormorants, Double-crested Cormorants and other species in the study area. • Identify potential disturbance problems not covered in ground monitoring. • Assist in determining the success of the Network's efforts to increase seabird populations.
M-4. Manage disturbance data from monitoring seabirds.	Chapter Team	• Incorporate information on how human-related disturbances can affect seabirds into outreach, enforcement and management strategies. • Maintain database on seabird disturbance events and identify repeat offenders.
M-5. Collate and publish data collected from monitoring seabirds.	USFWS CMRP	• Publish data for Network, Chapter, and public use. • Use monitoring information to better understand causes and impacts of disturbance, evaluate the effect of outreach strategies, and to help inform outreach efforts. • Present oral and poster presentations at scientific meetings and conferences.

Formative Research (FR)

Strategy:
Use effective messages and means of communication, conduct formative research on boaters and pilots that informs goals, planning efforts, and strategies to promote seabird colony and roost avoidance behaviors.

Audience: Chapter, Network and partner agencies that interface with boaters and pilots and general ocean users
Includes Chapter members, technical partners, policymakers, and project managers

Actions	Lead	Activities and Products
FR-1. Conduct quantitative research on boaters and pilots to understand their motivations and determine their perceptions of seabird avoidance behaviors.	Chapter Team in partnership with USFWS	• Conduct a literature review of trade magazines, reports and articles to synthesize audience baseline knowledge and perceptions on seabird disturbance to understand how much is known and what preventive actions are current community practices. • Communicate results to Network chapters and partner agencies.
FR-2. Conduct qualitative assessments of selected audiences through focus groups, in depth interviews and/or other data collection methods to learn about knowledge, attitudes, and behaviors as well as understand the specific reasons, barriers and motivations that shape current actions regarding seabirds.	Chapter Team with assistance from program evaluator consultant	• Identify the respective pilot and boater audience subsets that have highest known and potential disturbance impact and determine probability for a successful behavior change campaign. The currently identified audience subsets are fixed-wing civilian pilots and small craft boaters. • Work with each audience to understand their perceived benefits to avoiding disturbing seabirds (i.e., increased safety); barriers to avoiding disturbing seabirds (i.e., awareness of sensitive locations, weather); what sources they turn to for guidance; and what kinds of messages resonate. • Communicate results to partner agencies and Network chapters.
FR-3. Conduct baseline survey to understand current wildlife disturbance knowledge, attitudes and behaviors of fixed-wing pilots and small craft boaters.	Program evaluator consultant in partnership with Chapter Team	• Conduct online and paper surveys that ask questions about knowledge, attitude and practices. • Communicate results to partner agencies and Network chapters.

FR-4. Use USFWS CMRP monitoring data and observations to determine a baseline that identifies the type and percentage of pilots who avoid seabirds and ones that do not In order to develop a campaign strategy for addressing low-flying aircraft based on the outcomes of formative research	Chapter Team in partnership with USFWS	● After breeding season, conduct a data analysis of pilot behavior for that year. ● Communicate results to partner agencies and Network chapters.
FR-5. Use eFINs and other vessel monitoring data to determine a baseline that identifies the types and percentages of boaters who avoid seabirds and ones that do not.	Chapter Team	● After breeding season, conduct a data analysis of boater behavior for that year. ● Communicate results to partner agencies.
FR-6. Use formative evaluation techniques throughout implementation of the Action Plan to continue to guide and shape efforts to promote seabird avoidance behaviors by listening to, consulting with and responding to the needs of audiences.	Chapter Team	● A combination of efforts outlined in *FR-1, FR-2, FR-3* and *FR-5* will result inform an effective campaign strategy for addressing close-approaching vessels. ● Track pilots and boaters that have received communications, and use USFWS CMRP monitoring data to determine whether they have changed behavior. ● Use observational monitoring tools (e.g. ADS-B monitoring data, eFINS, cameras, UAS) to determine effectiveness of outreach strategies and tools (i.e. communication methods and messages). ● Use feedback from stakeholders and audiences to revise and refine communications, messages and materials.
FR-7. Produce a summative evaluation to measure overall impact.	Chapter Team	● Publish and present findings.

Outreach (O)

Strategy:
Use outreach to build long-term partnerships with selected audiences that result in reducing human-caused disturbance to seabirds.

Audience: Fixed-wing pilots
Includes motorized civilian, commercial, military, and experimental fixed-wing aircraft (Outreach Pilots – OP)

Actions	Lead	Activities and Products
OP-1. Develop an outreach strategy and tools to build partnerships with pilots and encourage them to adopt behaviors that avoid disturbing seabirds; focus on addressing barriers to behavior change at Devil's Slide.	Chapter Team	• Develop an outreach strategy based on the outcomes of formative research (See *FR 1 - FR 3*) for pilots in the region and at Devil's Slide. • Compile a document outlining measurable goals, an outreach strategy, and possible outreach tools (e.g. social diffusion, messages, and incentives) for preventing low-flying aircraft. • Meet with stakeholders including pilot organizations, airport management, and flight instructors to review and revise the outreach strategy and possible tools.
OP-2. Develop a communications and messaging campaign to connect with pilots.	Chapter Team with assistance of a marketing consultant	• Compile a detailed communications plan from the outreach strategy (See *OP-1*) to reach pilots using specific tools (e.g. online outreach, materials, presentations, one-on-one outreach, media partnerships). • Using community-based social marketing principles, devise a messaging campaign to reduce seabird disturbance at Devil's Slide. • Define the geographic scope for implementing the campaign. • Host focus groups of pilots that have engaged with the Chapter, as well as new pilots to test, discuss, and evaluate the campaign. (See *FR-6*). • Build partnerships with airport managers, flight clubs and training facilities.
OP-3. Develop and distribute tangibleoutreach materials to pilots.	Chapter Team in partnership with USFWS and Network Partners, and with assistance from a design consultant	• Design outreach materials to support the communications and messaging campaign (See *OP-2*) that inspire desired pilot behavior at Devil's Slide (e.g. maps, aerial photographs, guidance on avoiding disturbances). • Mail physical outreach materials to pilots in advance of the Pacific Coast Dream Machines Festival, as well as in advance of seabird breeding season. • Work with partners to distribute outreach materials in flight planning rooms and external communications.

		• Solicit feedback from pilots on how to improve the effectiveness of materials with respect to messaging, distribution, and design (See *FR-6*). • Assess and revise outreach products and strategies using feedback from formative research.
OP-4. Conduct in-person outreach and broadcast information to civilian pilots, aviation organizations, airport management, and the FAA.	Chapter Team with assistance from an aviation consultant	• Exhibit at relevant air shows including Pacific Coast Dream Machines; provide information, interact with pilots, and build partnerships with event organizers. • Attend, exhibit, and present at local civilian aviation conferences (e.g. San Carlos Flight Center's Bay Flight). • Partner with FAA Safety Team to organize and promote presentations that incentivize pilots' attendance with FAA WINGS credits. • Regularly present at civilian aviation clubs across the project area. Maintain relationships with club leadership. • Continually develop and revise presentations to include new information and incorporate feedback. • Submit AWOS notices for Mavericks Surf Contest and Pacific Coast Dream Machines. • Submit a NOTAM during key air show events as needed.
OP-5. Conduct online outreach specifically directed to fixed-wing pilots.	Chapter Team in partnership with the FAA Safety Team	• Work with FAA Safety Team to host online trainings that include messaging on seabird disturbance and offer pilots the opportunity to earn WINGS credit. • Work with air show organizers to post information on event websites and newsletters encouraging pilots to avoid disturbing seabirds. • Provide online content for airport managers to disseminate. • Send monthly online newsletter with pilot-specific content for the express goal of engaging pilots and providing opportunities for feedback. • Continually build the newsletter email list via direct interaction with pilots at events and presentations.
Audience: Helicopter Pilots *Includes civilian, commercial and media pilots; USCG, CHP and military pilots (Outreach Helicopter Pilots – OHP)*		
Actions	**Lead**	**Activities and Products**
OHP-1. Develop an outreach strategy and outreach tools to build partnerships with helicopter pilots and encourage them to adopt behaviors that avoid disturbing seabirds.	Chapter Team	• Develop an outreach strategy based on in-depth interviews with helicopter pilots who fly the Central Coast including Devil's Slide; differentiate between civilian, commercial, USCG, CHP, and military pilots. • Identify any flight operation or safety issues that present barriers to desired behavior change. Address specific barriers to behavior change at Devil's Slide Rock.

		• Meet with audiences including USCG, commercial pilots, and helicopter flight instructors to review the outreach strategy and possible outreach tools.
OHP-2. Develop a communications and messaging strategy to connect with helicopter pilots.	Chapter Team	• Draft a communications plan from the outreach strategy (see *OHP-1*) to reach helicopter pilots using specific tools (e.g. online outreach, materials, and presentations). • Develop specific communications strategies for USCG and military pilots, including presentations, online outreach, and customized materials. • Solicit helicopter pilots' input on strategy, messages, and communications; revise accordingly.
OHP-3. Develop and distribute tangible outreach materials.	Chapter Team with assistance from a design consultant	• Design outreach materials based on the communications and messaging campaign (See *OHP-2*) that inspire desired behavior. • Mail letters and postcards to helicopter pilots that include latest outreach materials. • Incorporate feedback from helicopter pilots on how to improve the effectiveness of materials with respect to messaging, distribution, and design (See *FR-6*).
OHP-4. Conduct in-person and online outreach to helicopter pilots.	Chapter Team	• Exhibit at relevant aviation events to provide information and interact with helicopter pilots and build partnerships with event organizers. • Build partnerships with USCG, military, and helicopter flight clubs to ensure outreach materials are posted in flight rooms and included in external communications. • Build relationships with helicopter flight instructors; meet one-on-one with commercial and private helicopter pilots; present at helicopter-specific safety seminars. • Annually present at USCG Air Station San Francisco and other military and Coast Guard related airfields in advance of seabird breeding season. Maintain relationships with commanding officers and flight instruction officers. • Build list of helicopter pilots in online newsletter database; track engagement relative to fixed-wing pilots.
Audience: Uncrewed aerial system pilots *Includes researchers, permitting agencies, civilian, commercial, and media UAS pilots (Outreach UAS Pilots – UAS)*		
Actions	**Lead**	**Activities and Products**
UAS-1. Develop an outreach strategy and outreach tools to build partnerships with UAS pilots and encourage them to adopt	Network Team Network with assistance from a UAS consultant	• Meet with UAS pilot organizations, UAS manufacturers, and county park managers to establish core strategies for reaching pilots. • Work with UAS manufacturers to establish guidelines and internal software fencing features that support

behaviors that avoid disturbing seabirds.		wildlife safe flying and pilot education about avoiding wildlife disturbance. ● Work with UAS-based scientific monitoring programs and scientists to promote best practices. ● Work with permitting agencies to ensure consistent permit conditions for UAS-based scientific monitoring. ● Promote use of FAA's B4UFly mobile app by UAS pilots to improve their situational awareness about wildlife areas.

Audience: All Boaters

Includes motorized pleasure boaters, recreational kayakers, kayak tourism operators, and stand up paddlers (Boater Outreach– BO)

Actions	Lead	Activities and Products
BO-1. For all boating audiences, conduct research to identify the best opportunity for a behavior change campaign to reduce seabird disturbance.	Chapter Team and program evaluator consultant	● Chapter NGO staff run focus groups and conduct surveys on key subsets of boaters to understand their baseline views on their knowledge, attitudes, and practices related to seabird disturbance. ● Maintain awareness of boating and fishing issues including fishing seasons and regulations. ● Analyze areas where increased disturbances occur as well as disturbance risk for each subset of boaters to focus and tailor outreach efforts. Use monitoring data to understand disturbances (See *M-1*). ● Identify priority groups of boaters for a behavior change campaign based on the highest potential impact to reducing disturbances and probability for success (See *FR-2*).
BO-2. For all boating audiences, develop an outreach strategy to build partnerships with specific subsets of boaters and encourage them to adopt behaviors that avoid disturbing seabirds.	Chapter Team program evaluator consultant	● Compile a document outlining outreach strategies to distinct groups of boaters and focus on a campaign for the primary boater audience. ● Chapter NGO staff host focus groups of boaters to test, discuss, and evaluate tools.
BO-3. For all boating audiences, develop communications and messaging campaign to connect with distinct groups of boaters.	Chapter Team with assistance of a marketing consultant	● Compile a detailed communications plan from the outreach strategy (See *BO-2*) to reach boaters using specific strategies (e.g. promoting responsible fishing and wildlife viewing practices, informing how to identify seabirds, and safe viewing distances). Tailor strategies specific to audiences and mediums. ● Identify priority locations for signage at boat launch ramps. ● Identify boaters that already model no-disturbance behavior (e.g. sailors, See-*SO-1*) and develop strategy to highlight their wildlife friendly behaviors (e.g., responsible wildlife excursion vendors).

		• Build partnerships with USCG Auxiliary units and enlist their help in educating boaters about avoiding disturbance to seabirds.
BO-4. Develop and distribute outreach materials that inform boaters of ways to avoid boat-based disturbance to seabirds.	Chapter Team in partnership with CDBW and Chapter Partners	• Design outreach materials based on the communications and messaging campaign (See *BO-3*) that inspire desired boater behavior. • Distribute outreach materials at strategic locations including harbor kiosks, boating supply stores, and tackle shops. • Develop and place signage in partnership with local agencies in priority locations. • Partner with MPA collaboratives to include special closures and locations of sensitive seabirds in outreach materials in the project area. • Partner with Point Blue Conservation Science to ensure that biologists on the Farallon Islands can continue to conduct on-the-water outreach using waterproof brochures. • Solicit feedback from boaters on how to improve the effectiveness of materials with respect to messaging, distribution and design (See *FR-6*). • Assess and revise outreach products and strategies using feedback from formative research.
BO-5. Conduct in-person outreach to boaters.	Chapter Team in partnership with CDBW and Chapter Partners	• Exhibit at strategic events including boat shows, boating safety week events, and boating club meetings. • Meet with audiences including recreational fishermen, harbormasters, and tackle shop owners to review core messages, materials, and presentations and evaluate effectiveness (See *FR-6)*. • Provide materials and guidance on fishing line Reel In and Recycle program.
Audience: Fishermen *Includes CPFV, boat and shore-based recreational fishermen (Fishermen Outreach – FO)*		
Actions	**Lead**	**Activities and Products**
FO-1. Conduct in-person and online outreach to fishermen to build partnerships and encourage them to adopt behaviors that avoid disturbing seabirds.	Chapter Team in partnership with Chapter Partners	• Develop and refine, based on formative research and any subsequent community based social marketing campaign (See *BO-1 – BO-3*). • Understand boat-based fishermen's baseline knowledge of seabirds and special closures. • Develop guidelines for safe behavior around seabirds, special closures, and rafting seabirds at sea.

		• Distribute materials that facilitate on-the-water and land-based outreach, including tide books and waterproof maps. • Ensure that CDFW includes content on special closures in annual sport-fishing regulation guides and in MPA materials. • Partner with Central Coast MPA collaboratives to include special closures and other sensitive seabird hotspots in outreach materials. • Partner with Point Blue Conservation Science to ensure that Farallon Island biologists can continue to conduct on-the-water outreach. • Convene focus group of recreational fishermen to understand their baseline views on approaching seabirds. • Solicit feedback from fishermen on how to improve the effectiveness of materials with respect to messaging, distribution and design (See *FR-6*). • Assess and revise outreach products and strategies using feedback from formative research.
FO-2. Maintain the Reel In and Recycle Program.	Chapter Team in partnership with CDBW	• Continue existing fishing line recycling partnerships with CPFV captains, harbormasters, and tackle shop owners. • Coordinate program with California Division of Boating and Waterways. • Invite Reel In and Recycle partners to help develop and spread our messages to CPFV fishermen. • Conduct an evaluation on program effectiveness to share with Network partners. • Investigate additional funding sources to expand program.

Audience: Sailors

Includes recreational sailors and commercial operators (Sailor Outreach – SO)

Actions	Lead	Activities and Products
SO-1. Conduct in-person and online outreach to sailors to build partnerships and encourage them to spread the word about the tactics they use to avoid disturbing seabirds.	Chapter Team	• Develop, refine, and distribute materials that facilitate on-the-water and land-based outreach (See *BO-1 – BO-3*). • Exhibit at events including the Pacific Sail and Boat show. • Identify sailors that already model no-disturbance behavior and develop strategy to highlight their wildlife friendly behaviors using social diffusion tactics.

Audience: Coastal Users *Includes humans on foot, coastal hikers, walkers or general beach goers, picnickers, and people with leashed or unleashed pets (Outreach General – OG)*		
Actions	**Lead**	**Activities and Products**
OG-1. Conduct in-person and online outreach to promote public awareness of sensitive seabirds.	Chapter Team with Network Partners	• Present at seabird monitor and/or docent trainings. • Collaborate with partners on the development of interpretive signage at or near sensitive seabirds. • Ensure that special closures are included in materials related to Central Coast marine protected areas. • Regularly update Network websites and Facebook pages.
Audience: Agencies and Partners *Includes TAC, ONMS, NOAA, restoration center, agency partners, other practitioners (Internal Communications – IC)*		
Actions	**Lead**	**Activities and Products**
IC-1. Clearly communicate Seabird Protection Network mission, goals and strategies to Network partners.	Network Team	• Build a constituency of support at all internal levels of the Seabird Protection Network and its partners. • Participate in the Wildlife Disturbance symposium. • Annually report to Oil Spill Trustee Councils and other funders (if applicable). • Annually present to USFWS CMRP seasonal seabird monitors. • Maintain regular communications with other agency partners.
IC-2. Communicate Seabird Protection Network mission, goals and strategies to internal partners	Chapter Team	• Host Technical Advisory Committee meetings. • Report annually to Sanctuary Advisory Councils • Regularly update Farallones Sanctuary staff and leadership, and NOAA Restoration Center staff. • Communicate alignment between the Chapter, Network and broader NOAA-led seabird science, management, and stakeholder outreach efforts, including the National Seabird Team, the Respect Wildlife Campaign, ONMS, and the WCRO.

Coordinated Management (C)

Strategy:
Coordinate information exchange among agencies, NGOs, researchers and stakeholders.
Streamline management and regulatory approaches.
Develop tools that promote and incentivize stakeholder compliance with existing laws and regulations regarding seabird protection and determine enforcement needs.

Audience: Federal, state, and local agency managers, researchers, NGOs, and enforcement personnel
Includes policy-makers, enforcement personnel, natural resource managers, chart designers, and the FAA

Actions	Lead	Activities and Products
C-1. Distribute and publicize disturbance incident reporting procedures and forms to field biologists and citizen scientists. Train field biologists on incident reporting, regulations related to seabird disturbance, and ways they can collect evidence useful to enforcement.	Chapter Team	• Share incident reporting form data with appropriate enforcement agencies. • Train field biologists and citizen scientists on regulations and response protocol and documentation and ensure they are submitting forms when incidents occur. • Use wildlife disturbance incidents to guide management needs, provide information on locations, and identify audiences with the greatest need for enforcement or compliance monitoring (See *M-1*).
C-2. Ensure that all Network viewing guidelines are consistent with laws, regulations, policies, and management outcomes.	Network Team	• Maintain clear and accurate seabird viewing guidelines. • Provide guidance on campaign messages that aim to address seabird disturbance, such as the Respect Wildlife Campaign.
C-3. Form and maintain agency and public partnerships to share equipment and resources, and involve user groups and NGOs in implementing strategies.	Chapter Team	• Leverage agency and public partnerships for efficient, effective, and coordinated management aimed at minimizing disturbance events from aircraft, boats and humans on foot.
C-4. Develop and maintain enforcement partnerships to conduct patrols, distribute incident reports, honor agreements and MOU among agencies, and hold workshops on seabird disturbance laws and regulations.	Farallones Sanctuary	• Host Enforcement Coordination meetings at a least once per year. • Participate in ongoing information sharing with enforcement personnel, Enforcement TAC, and the Seabird TAC to enlist member support for addressing seabird disturbance by aircraft, boats and humans on foot.
C-5. Recommend a coordinated framework for managing and enforcing laws and regulations	Farallones Sanctuary with ONMS,	• Recommend changes and clarifications to state and federal policies and regulations related to seabird disturbance.

by advising on coordinated regulatory approaches and uniform policies.	Policy and Planning Branch	
C-6. Review all policy and management recommendations from the Farallones Sanctuary Advisory Council Report on low-flying aircraft.	Farallones Sanctuary	• Implement feasible actions that result in minimizing seabird disturbance throughout Farallones Sanctuary.
C-7. Identify seabird colony and roost locations that are susceptible to invasive predators.	USFWS in partnership with Chapter Team	• Communicate findings to partner agencies.
C-8. Review Network's chapter geographies to ensure a Network Chapter represents the expanded Farallones Sanctuary.	Network Team	• Make recommendations to Farallones Sanctuary for actions, activities and products in the expanded sanctuary.

Audience: Pilots

Includes pilots of fixed-wing planes, including "ultra-light" craft, and rotary aircraft (helicopters), blimps, UAS; Private, and commercial pilots; USCG, CHP and other military pilots; FAA and NOAA (Coordinated Management Pilots – CP)

Actions	Lead	Activities and Products
CP-1. Develop UAS-based research best practices and permitting guidelines; share information about UAS disturbance with agency managers and the FAA.	Farallones Sanctuary with ONMS, Policy and Planning Branch	• Publish researchers "best practices" guide and educate seabird researchers and other federal, state and local agencies through presentations and meetings to promote consistent approaches. • Develop standard permit special conditions for UAS research that serves as model for all NMS.
CP-2. Review UAS-related laws, policies, and regulations.	Farallones Sanctuary	• Provide comments and, where appropriate, regulatory recommendations to prevent seabird disturbances from UAS pilots.
CP-3. Coordinate with other federal, state, and local agencies to provide training for USCG, CHP, local county sheriff pilots, and appropriate military personnel on regulated and recommended distances for aircraft. Set up annual meetings with the local USCG operations officers.	Chapter Team	• Disseminate NOAA Regulated Overflight Zone coordinates and maps to appropriate agencies and promote avoiding and flying higher than 1000 feet AGL near seabird hotspots not on the aeronautical charts with a primary focus on Devil's Slide Rock and mainland. • Prevent unnecessary seabird disturbances from USCG, CHP, local county sheriff pilots, and appropriate military personnel through information sharing, meetings, presentations, and support for internal training modules.

CP-4. Scope aeronautical chart modifications to demarcate Devil's Slide Rock as a sensitive seabird colony. If needed, pursue regulatory changes.	Farallones Sanctuary in coordination with ONMS	• Ensure that Devil's Slide Rock and mainland are recognized as an area for pilots to avoid and fly above 1000 feet AGL.
Audience: Boaters *Includes CDFW, CFGC, and NOAA nautical chart division (Coordinated Management Boaters – CB)*		
Actions	**Lead**	**Activities and Products**
CB-1. Work with NOAA's National Ocean Service to display special closures on nautical charts.	Chapter Team and GIS consultant	• Collect, collate, and publish monitoring data. • Use data to help convey how human-related disturbances can affect seabirds in order to make a case for demarcation. • At a minimum, ensure that special closures are demarcated on nautical charts.
CB-2. Monitor data on boat-based seabird disturbances at locations not protected by State special closures and, if needed, participate in public processes to establish special closures.	Farallones Sanctuary in coordination with CDFW and CFGC	• Pursue a process to establish additional special closures if outreach actions are not successful.

REFERENCES

Ainley, D.G., J.A. Santora, P.J. Capitolo, J.C. Field, J.N. Beck, J.D. Carle, E. Donnelly-Greenan, G.J. McChesney, M. Elliott, R.W. Bradley, K. Lindquist, P. Nelson, J. Roletto, P. Warzybok, M. Hester, and J. Jahncke. 2018. Ecosystem-based management affecting Brandt's cormorant resources and populations in the Gulf of the Farallones, California. Biological Conservation 217:407–418.

Bednar, C. M., G. J. McChesney, S.D. Collar, J.A. Windsor, R.J. Potter, A. C. Wilson, S.A. Aguilar, P. J. Capitolo, and R. T. Golightly. 2019a. Restoration of Common Murre colonies in central California: annual report 2020. Unpublished report, U.S. Fish and Wildlife Service, San Francisco Bay National Wildlife Refuge Complex, Fremont, California and Humboldt State University, Department of Wildlife, Arcata, California. 86 pages.

Bednar, C. M., G. J. McChesney, T. Golightly, W. Kordesch, P. Hobi, K. Reyna. 2019b. Cooperative Monitoring and Outreach Efforts Lead to Declining Human Disturbance to Seabird Nesting Colonies [abstract]. In: Pacific Seabird Group 2019 Annual Meeting Abstracts. Feb 27 - Mar 3; Kaua'i, Hawai'i.

Buckley, F.C. and Buckley, P.A. 1980. Habitat selection and marine birds. pp. 69-112 in Behavior of Marine Animals: Current Perspectives in Research, Volume 4: Marine Birds. Plenum Press, New York.

Carney, K.M., and Sydeman, W.J. 1999. A review of human disturbance effects on nesting colonial waterbirds. Waterbirds, 22:1, pp. 68-79.

Carter, H.R., P.J. Capitolo, W.R. McIver, and G.J. McChesney. 1998. Seabird population dataand human disturbance of seabird colonies in South-Central California, 1979-1995. Unpubl. final report, U.S. Geological Survey, Biological Resources Division, Western Ecological Research Center, Dixon, California; and Humboldt State University, Department of Wildlife, Arcata, California. 35 pp.

Carter, H., Wilson, U., Lowe, R., Rodway, M., Manuwal, D., Takekawa, J., and Yee, J. 2001. Population trends of the Common Murre (Uria aalge californica). In: Biology and conservation of the Common Murre in California, Oregon, Washington, and British Columbia. Volume 1: Natural History and Population Trends. D. Manuwal, H. Carter, T. Zimmerman, and D. Orthmeyer, editors. Dixon, California., U.S. Geological Survey, Information and Technology Report: 137:33-132.

Carter, H. R., V. A. Lee, G. W. Page, M. W. Parker, R. G. Ford, G. Swartzman, S. W. Kress, B.R. Siskin, S. W. Singer, and D. M. Fry. 2003. The 1986 Apex Houston oil spill in central California: seabird injury assessments and litigation process. Marine Ornithology 31:9-19.

Command Trustee Council. 2004. Command Oil Spill Final Restoration Plan and Environmental Assessment. Prepared by United States Fish and Wildlife Service, National Oceanic and Atmospheric Administration, California Department of Fish and Game California Department of Parks and Recreation, and California State Lands Commission.

Duncan, B.E., K.D. Higgason, T.H. Suchanek, J. Largier, J. Stachowicz, S. Allen,S. Bograd, R. Breen, H. Gellerman, T.Hill, J. Jahncke, R. Johnson, S.L onhart,S. Morgan, J. Roletto, F. Wilkerson. 2013. Ocean Climate Indicators: A Monitoring Inventory and Plan for Tracking Climate Change in the North-central California Coast and Ocean Region. Report of a Working Group of the Gulf of the Farallones National Marine Sanctuary Advisory Council. 74pp.

Fuller, A. R., G.J. McChesney, and R.T. Golightly. 2018. Aircraft disturbance to Common Murres (Uria aalge) at a breeding colony in central California, USA. Waterbirds 41:257-267.

Gibble, C., Duerr, R., Bodenstein, B., Lindquist, K., Lindsey, J., Beck, J., Henkel, L., Roletto, J., Harvey, J. and Kudela, R. 2018. Investigation of a largescale Common Murre (Uria aalge) mortality event in California, USA, in 2015. Journal of wildlife diseases, 54(3):569-574.

Greater Farallones National Marine Sanctuary. 2014. Greater Farallones National Marine Sanctuary Management Plan. Report of the Greater Farallones National Marine Sanctuary. NOAA. San Francisco, CA. 286 pp.

Halpern, B.S., Kappel, C.V., Selkoe, K.A., Micheli, F., Ebert, C.M., Kontgis, C., Crain, C.M., Martone, R.G., Shearer, C. and Teck, S.J. 2009. Mapping cumulative human impacts to California Current marine ecosystems. Conservation Letters, 2:138- 148.

Hampton, S., Kelly, P.R. & Carter, H.R. 2003. Tank vessel operations, seabirds and chronic oil pollution in California. Marine Ornithology, 31:29-34.

Hutto, S.V., K.D. Higgason, J.M. Kershner, W.A. Reynier, D.S. Gregg. 2015. Climate Change Vulnerability Assessment for the North-central California Coast and Ocean. Marine Sanctuaries Conservation Series ONMS-15-02. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 473 pp.

Jones, T., J. K. Parrish, W. T. Peterson, E. P. Bjorkstedt, N. A. Bond, L.T. Ballance, et al. 2018. Massive mortality of a planktivorous seabird in response to a marine heatwave. Geophysical Research Letters, 45.

Kelly, J.P., K.L. Etienne, and J.E. Roth. 2002. Abundance and distribution of the Common Raven and American Crow in the San Francisco Bay Area, California. Western Birds 33: 202-217.

Largier, J.L., B.S. Cheng, and K.D. Higgason, editors. 2010. Climate Change Impacts: Gulf of the Farallones and Cordell Bank National Marine Sanctuaries. Report of a Joint Working Group of the Gulf of the Farallones and Cordell Bank National Marine Sanctuaries Advisory Councils. 121pp.

Liebezeit, J.R., and T.L. George. 2002. A summary of predation by corvids on threatened and endangered species in California and management recommendations to reduce corvid predation. Unpublished report, California Department of Fish and Game, Habitat Conservation Branch, Species Conservation and Recovery Program Report, 2002-02.

Luckenbach Trustee Council. 2006. *S.S. Jacob Luckenbach* and Associated Mystery Oil Spills Final Damage Assessment and Restoration Plan/Environmental Assessment. Prepared by California Department of Fish and Game, National Oceanic and Atmospheric Administration, United States Fish and Wildlife Service, National Park Service.

McChesney, G.J. 2021. Personal communications (July 5, 2021).

McChesney, G.J., Lontoh, D.N., Rhoades, S.J., Borg, K.A., Donnelly, E.L., Gilmour, M.E., Kappes, P.J., Eigner, L.E., and Golightly, R.T. 2009. Restoration of Common Murre colonies in central California: annual report 2008. Unpublished report, U.S. Fish and Wildlife Service, San Francisco Bay National Wildlife Refuge Complex, Newark, California.

Mills, K. L., Sydeman, W.J. and Hodum, P. J. (Eds.), 2005. The California Current Marine Bird Conservation Plan, v. 1,PRBO Conservation Science, Stinson Beach, CA

Office of National Marine Sanctuaries. 2017. Our Vision for America's Treasured Ocean Places: A Five-Year Strategy for the National Marine Sanctuary System. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 473 pp.

Page, G.W., Carter, H.R., and Ford, R.G. 1990. Numbers of seabirds killed or debilitated in the 1986 Apex Houston oil spill in Central California. Studies in Avian Biology, 14:164-174.

Parker, M. W., S. W. Kress, R. T. Golightly, H. R. Carter, E. B. Parsons, S. E. Schubel, J. A. Boyce, G. J. McChesney, and S. M. Wisely. 2007. Assessment of social attraction techniques used to restore a Common Murre colony in central California. Waterbirds 30:17-28.

Piatt J.F., Parrish J.K., Renner H.M., Schoen S.K., Jones T.T., Arimitsu M.L., 2020. Extreme mortality and reproductive failure of Common Murres resulting from the northeast Pacific marine heatwave of 2014-2016. PLoS ONE 15(1): e0226087.

Rhodes, R. and N. Spiegel. 2017. A Literature Review of the Effects of Unmanned Aircraft Systems on Seabirds and Marine Mammals. Report to the Greater Farallones National Marine Sanctuary. NOAA. San Francisco, CA. 22 pp.

Rojek, N. A., M. W. Parker, H. R. Carter, and G. J. McChesney. 2007. Aircraft and vessel disturbances to Common Murres at breeding colonies in central California, 1997-1999. Marine Ornithology 35:67-75.

Takekawa, J., Carter, H., and Harvey, T. 1990. Decline of the Common Murre in central California, 1980-1986. Studies in Avian Biology, 14:149-163.

Tezak, S., Maheigan, M., Reyna, K., Brown, C.M., McChesney, G., Boyce, J., and Plaisted, C. 2013. Seabird Protection Network: Guide to Establishing New Chapters. Marine Sanctuaries Conservation Series ONMS-13-02. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD. 33 pp.

Thibault, J.M., G.J. McChesney, R.T. Golightly, P.D. Goley, and H.R. Carter. 2010. Decline of the Common Murre colony at Redding Rock, California and restoration options. Unpublished report, U.S. Fish and Wildlife Service, San Francisco Bay National Wildlife Refuge Complex, Newark, California and Humboldt State University, Departments of Wildlife and Biological Sciences, Arcata, California

U.S. Fish and Wildlife Service. 2005. Regional Seabird Conservation Plan, Pacific Region. U.S. Fish and Wildlife Service, Migratory Birds and Habitat Programs, Pacific Region, Portland, Oregon

APPENDICIES

Appendix A: Major Outcomes of the Bodega Head – Point Sur Chapter, 2005-2020

Chapter Team and Lead Partner

Karen Reyna	Manager, Greater Farallones National Marine Sanctuary
Paul Hobi	Program Manager, Greater Farallones National Marine Sanctuary (affililate)
Wendy Kordesch	Outreach Specialist, Greater Farallones National Marine Sanctuary (affiliate)
Matt Pickett	Pilot and Military Outreach Specialist, Greater Farallones National Marine Sanctuary (contractor)
Gerry McChesney	US Fish & Wildlife Service, San Francisco Bay National Wildlife Refuge Complex
Cassie Bednar	Common Murre Restoration Project, San Francisco Bay National Wildlife Refuge

Technical Advisory Committee to Greater Farallones National Marine Sanctuary Superintendent Maria Brown

FEDERAL

Scott Kathey	Monterey Bay National Marine Sanctuary
Jesus Navarro	US Fish & Wildlife Service, Law Enforcement Officer
Ben Becker	National Park Service
Anne Morkill	US Fish & Wildlife Service, San Francisco Bay National Wildlife Refuge Complex
Karen Arendt	Federal Aviation Administration Safety Team
Lidia D'Amico	Golden Gate National Recreation Area, Alcatraz
Alyssa Clevenstine	US Fish & Wildlife Service, Farallon Islands National Wildlife Refuge
Alison Forrestel	Point Reyes National Seashore
Dave Press	Point Reyes National Seashore
Bill Merkle	Golden Gate National Recreation Area
William Standley	Bureau of Land Management, California Coastal National Monument

STATE

Vivian Matuk	California Coastal Commission and California Division of Boating and Waterways
Chet Bardo	California Department of Parks and Recreation

Command Trustee Council

FEDERAL

Jennifer Boyce	NOAA Restoration Center

STATE

Joanne Kerbavaz	California Department of Parks and Recreation
Sarah Mongano	California State Lands Commission

S.S. Jacob Luckenbach Trustee Council

FEDERAL

Jennifer Boyce	NOAA Restoration Center
Carolyn Marn	US Fish & Wildlife Service

STATE

Laird Henkel	Oil Spill Response and Prevention California Dept. of Fish and Game
Daniel Orr	California Department of Fish and Wildlife

The following highlights the top 10 major outcomes achieved by the Chapter since 2005.

2006: Greater Farallones National Marine Sanctuary established the Seabird Protection Network
The Command Oil Spill Trustee Council approved funding for the Seabird Protection Network, and selected Greater Farallones National Marine Sanctuary as the lead agency for the program. Since 2006, it has been directed by Resource Protection Coordinator Karen Reyna, and overseen and lead by Superintendent Maria Brown, who is advised by an agency-staffed Technical Advisory Committee. Based on monitoring data from the USFWS CMRP, advisors recommended the program focus on reducing aviation and boat-based disturbances, especially at the Devil's Slide Rock seabird colony.

2009: Established standardized disturbance incident reporting and coordinated enforcement response between agencies
In response to a lack of enforcement coordination and disturbance tracking, the Chapter Team convened multiple agency partners to standardize a protocol for reporting and tracking wildlife disturbances. In 2009, these partners developed a web-based disturbance reporting form for wildlife biologists and trained volunteers, and the Chapter Team built a database to centralize the data. The form and database made it possible to identify repeat offenders and coordinate on enforcement actions. It also made it possible for the Chapter Team to focus outreach and education toward specific audiences, and send information packets directly to boaters and pilots that caused a disturbance. Over 500 unique disturbances from Bodega Head to Point Sur are cataloged in the Chapter's database between 2006 and 2021.

2010: Special closures enacted to prevent disturbance from close-approaching vessels
The Chapter Team provided CMRP data on impacts from close approaching vessels and stakeholder coordination services for a two year marine protected area design process, which resulted in the FGC establishing special closures (no access zones) around six sensitive seabird colony complexes. The Chapter Team has embarked on a sustained, multi-year outreach campaign to educate boaters and fishermen using materials, partnerships and presentations. These efforts resulted in a significant decrease in boat-based disturbances. Based on the elements of this success, the FGC approved additional special closures protecting seabird colonies on the North Coast of California. The Chapter Team continues to raise awareness about special closures as a key element of boater outreach.

2012: FAA Aeronautical Charts with NOAA Regulated Overflight Zones reduced low overflight disturbance
Farallones Sanctuary Staff – working closely with ONMS attorneys – presented a report on the Chapter's pilot outreach efforts and USFWS CMRP disturbance data that showed chronic disturbances at low altitudes and supported changes to NOAA Regulated Overflight Zones to make them enforceable. The report made the case for changes to the regulations and inclusion on the FAA charts, resulting in a final rule that stated "failure to maintain a minimum altitude of 1,000 feet is presumed to disturb birds,

marine mammals and sea turtles." This provided legal rational for enforcement of the zones, as well as a powerful outreach tool the Network uses throughout California to educate pilots - who are much less likely to disturb wildlife when they abide by them.

2016: No seabird disturbance from Dream Machines air show

Since 2008, the Chapter Team worked with organizers of the annual Dream Machines air show at Half Moon Bay Airport to reduce disturbances to seabirds breeding at nearby Devil's Slide Rock. In some years, dozens of planes flying in for the event would fly low over the area, causing numerous disturbances to breeding seabirds. The Chapter Team began an outreach campaign to reduce disturbances related to the event, partnering with event organizers, airport staff, and the local flight club. Together, this partnership succeeded in convincing visiting pilots to fly above 1000 feet, and around Devil's Slide Rock – thus reducing disturbances. After years of outreach, 2016 became the first event in which no disturbances occurred. Disturbances have subsequently recurred, so the Chapter annually focuses outreach on the event and has deepened their relationships with the community of pilots that attend year after year.

2017-2019: Monofilament fishing line recycled

In 2017 the Chapter launched a pilot fishing line recycling project in partnership with five passenger sport fishing charter boats. Previously, line recycling stations were only placed on land. Based on its success, in 2019, the Chapter expanded line recycling partnerships to include tackle shops, harbors, fishing clubs, and eight new passenger fishing vessel captains who have collected at least 50 pounds of monofilament line – keeping it out of the water and away from animals. These partners also distribute the Chapter's boater outreach products, which help reduce seabird disturbances by fishermen and boaters.

2018: Improved online communication with boaters and pilots

Working with a digital marketing consultant, the Chapter revamped its approach to online communication. The team began sending an e-newsletter monthly (as opposed to quarterly), which is customized with separate content for boaters (the "Monthly Drifter") and aviators ("Monthly Aviator"). The newsletter provided a mix of fun stories that resonate with boaters and pilots, and information about how to avoid disturbances. This became one piece of the Chapter's overall communication strategy – at presentations, staff asked participants to sign up for the newsletter. Readers then pledged to avoid disturbing seabirds, asked for physical materials, and reached out to schedule presentations. Flight schools, airports and pilots' clubs have spotlighted content from the Monthly Aviator in their newsletters, and on their Facebook pages – helping spread the Chapter's messages. Since 2016, total recipients of the newsletters doubled, to 1,414. The newsletters consistently beat industry standards for engagement:

- The Monthly Aviator had a 31.94% average open rate from July 2020 to June 2021, an 8.5% increase from the 23.79% average open rate in 2016.
- The Monthly Drifter had a 31.12% average open rate from July 2018 to June 2021, a 7% increase from the 23.79% average open rate in 2016.

2020: Over 26,000 pilots heard the Network's key messages

During the COVID-19 pandemic, the Chapter faced a huge challenge: how to continue to connect with pilots. The Chapter Team turned to a reliable partner: FAAST, a trusted voice in pilot education.

Previously, they hosted the Chapter Team for in-person presentations at pilot club meetings and safety conferences. FAAST and the Chapter built an interactive, hour-long online presentation: *Ten Secret Sights on the California Coast Only Pilots Can See*. This reflected the Chapter's formative research on pilots, which informed the decision to engage pilots' sense of adventure, while weaving in guidance about avoiding seabird disturbance. In 2020, staff presented three times to over 1,000 pilots across California. This was the largest audience ever reached in a single year (or with a single presentation). Pilots loved it; one called the presentation "one of the best I have seen in my 17 years of flying." As a result, there was a 32% increase in e-newsletter subscriptions, a 5% increase in the yearly average e-newsletter open rate, 200 new mailing addresses for annual mailings, and 33 new online pledges to fly above 1000 feet. Additionally, the Chapter put together an email blast on NOAA Overflight Zones that FAAST sent out to over 26,000 California airmen, which included all registered general aviation pilots in the state.

2010-2020: Delivered 135,205 total products to target audiences of pilots, boaters and other ocean users using appropriate messages and mediums of communication

Between fiscal years 2010 – 2020, Chapter Team:

- Gave **144** presentations to over **4,248** pilots, boaters, and other ocean users.
- Sent **47** distinct e-newsletters resulting in a total of **54,124** points of communication.
- Distributed the following physical products from Bodega Head to Point Sur:
    - **37,062** tide books with Network messaging
    - **19,331** seabird aware brochures
    - **765** maps of seabird colonies on aeronautical charts
    - **4,262** Devil's Slide Postcards
    - **5,206** Pilot Mailings
    - **3,437** Boater packets

These statistics represent:

- A **36% increase** in the total number of items disseminated to target audiences (17,512 in 2020, 11,144 in 2011).
- A **42% increase** in total attendees per year at presentations in 2020 (1,086 people in 2020, 630 in 2011).
- **Doubling** the total number of e-newsletter recipients (765 in 2016, 1,414 in 2021) and **tripling** the frequency of delivery (12x per year from 4x per year).

2021: Chapter Team engaged with military pilots about the potential harm from seabird disturbances

In 2021, the Chapter made significant headway campaigning to reduce seabird disturbances by military aircraft – a persistent issue affecting seabird colonies. Chapter staff launched an outreach campaign to connect with military airfield managers overseeing aircraft that fly within NOAA Regulated Overflight Zones in California. Ultimately, 26 airfield managers were contacted using phone and email communications, a "teaser" slide deck with the most relevant information, and an offer for a follow up presentation. Two presentations were given to the Air Force in 2021. Together, this work built a solid foundation for the Chapter Team to build a long-term relationship with military aviation leadership and ultimately reduce the number of low overflights in NOAA Regulated Overflight Zones and over Devil's Slide Rock.

Appendix B: Overview of Federal and State Wildlife Disturbance Laws, Regulations and Authorities from Bodega Head to Point Sur

June 2021

Federal Authority	Regulatory Bodies	Jurisdiction / Area	Covered Species	Prohibited Activities	Penalties
Endangered Species Act	NOAA (NMFS) DOI (USFWS)	All of the United States	Species designated as "threatened or endangered" under ESA	"Take" of any listed species in the US or territorial waters. –16 USC 1538(a) "Take" defined to include "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." – 16 USC 1532(19) Prohibition against "take" extends to eggs. – 16 USC 1532(8) Regulatory definition of "harass" includes "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering." – 50 CFR 17.3 Regulatory definition of "harm" includes "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering." – 50 CFR 17.3	Civil and criminal penalties for "taking" – 16 USC 1540
National Marine Sanctuaries Act	NOAA	Within sanctuary boundaries for all sanctuaries that have take regulations	Marine mammals, sea turtles, or birds, whether endangered or not, located in	"Take" or "taking" means: (1) For any marine mammal, sea turtle, or bird listed as either endangered or threatened pursuant to the Endangered Species Act, to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect or injure, or to attempt to engage in any such conduct; (2) For any other marine mammal, sea turtle, or bird, to harass, hunt, capture, kill, collect or injure, or to attempt to engage in any such conduct. For the purposes of both (1) and (2) of this definition, this includes but is not limited to… operate a vessel	Civil penalties for violation of regulations, including "take." – 16 USC 1437

			the sanctuary	or aircraft or to do any other act that results in the disturbance or molestation of any marine mammal, sea turtle or seabird. -15 CFR Subpart A 922.3	Criminal penalties only for interfering with enforcement. – 16 USC 1437
National Marine Sanctuaries Act (Monterey Bay National Marine Sanctuary)	NOAA - Monterey Bay National Marine Sanctuary	Within sanctuary boundaries	Marine mammals, sea turtles, or birds, whether endangered or not, located in the sanctuary	Taking any marine mammal, sea turtle or birds within or above the Sanctuary, except as authorized by Marine Mammal Protection Act, the Endangered Species Act, or the Migratory Bird Treaty Act. – 15 CFR Subpart M 922.132 Disturbing marine mammals or seabirds by flying motorized aircraft, except as necessary for valid law enforcement purposes, at less than 1,000 feet above any of the four zones within the Sanctuary as described in within the regulations. Failure to maintain a minimum altitude of 1,000 feet above ground level above any such zone is presumed to disturb marine mammals or seabirds. – 15 CFR Subpart M 922.132 Operating motorized personal watercraft within the sanctuary except within four designated zones and access routes. – 15 CFR Subpart M 922.132 Possessing within the sanctuary (regardless of where taken, moved or removed from), except as necessary for valid law enforcement purposes, or any marine mammal, sea turtle or seabird taken in violation of regulations, promulgated under the MMPA, ESA or MBTA. – 15 CFR Subpart M 922.132	Civil penalties for violation of regulations, including "take." – 16 USC 1437 Criminal penalties only for interfering with enforcement. – 16 USC 1437
National Marine Sanctuaries Act (Greater Farallones National Marine Sanctuary)	NOAA – Greater the Farallones National Marine Sanctuary	Within sanctuary boundaries	Marine mammals and birds, whether endangered or not, located within the sanctuary	Taking any marine mammal, sea turtle, or birds within or above the Sanctuary, except as authorized by Marine Mammal Protection Act, the Endangered Species Act, and the Migratory Bird Treaty Act. – 15 CFR Subpart H 922.82 Disturbing marine mammals or seabirds by flying motorized aircraft at less than 1,000 feet over the waters within any of the seven designated Special Wildlife Protection Zones described in appendix D to this subpart, except transiting Zone 6 to transport persons or supplies to or from Southeast Farallon Island authorized by the U.S. Fish and Wildlife Service, Farallon National Wildlife Refuge, or for enforcement purposes. Failure to maintain a minimum altitude of 1,000 feet above ground level	Civil penalties for violation of regulations – 16 USC 1437 Criminal penalties only for interfering with enforcement. – 16 USC 1437

				over such waters is presumed to disturb marine mammals or seabirds.– 15 CFR Subpart H 922.82 Operation of motorized personal watercraft, except for the operation of motorized personal watercraft for emergency search and rescue mission or law enforcement operations (other than routine training activities) carried out by National Park Service, U.S. Coast Guard, Fire or Police Departments or other Federal, State or local jurisdictions. – 15 CFR Subpart H 922.82	
Migratory Bird Treaty Act	Department of the Interior State Cooperators	All of the United States	Migratory birds, whether threatened or endangered or not	Without a permit, pursuing, hunting, taking, capturing, killing, attempting to take, capture, or kill, possessing, offering for sale, selling, offering to barter, bartering, offering to purchase, purchasing, delivering for shipment, shipping, exporting, importing, causing to be shipped, exported, or imported, delivering for transportation, transporting or causing to be transported, carrying or causing to be carried, or receiving for shipment, transportation, carriage, or export a migratory bird. – 16 USC 703 Prohibition extends to migratory birds, parts, nest, and eggs. – 16 USC 703	Misdemean or to take without permit. – 16 USC 707 Felony to knowingly take with intent to sell or barter without a permit. – 16 USC 707
Airborne Hunting Act	Department of the Interior State Cooperators	All of the United States	Birds, fish, and other animals	Use aircraft to harass any bird, fish, or other animal. – 16 USC 742j-1 Harass means to disturb, worry, molest, rally, concentrate, harry, chase, drive, herd, or torment. – 50 CFR 19.4	Violation is a misdemean or crime. – 16 USC 742j-1
Bureau of Land Management Regulations of General Applicability	Department of the Interior – Bureau of Land Management (BLM)	All public lands administere d by BLM	All wildlife	Operating an off-road vehicle in a manner causing, or likely to cause significant, undue damage to or disturbance of the soil, wildlife, wildlife habitat, improvements, cultural, or vegetative resources or other authorized uses of the public lands. – 43 CFR 9268.3(a)(2)(vii)(D) Drive or operate a motorized vehicle or otherwise conduct oneself in a manner that may result in unnecessary frightening or chasing of people or domestic livestock and wildlife in undeveloped areas used for recreational purposes. – 43 CFR 9268.3(c)(2)(vi)	Violation of the BLM land use regulations referenced above is a misdemean or crime. – 43 CFR 9268.3(a)(4)
National Wildlife	Department of the Interior – FWS – National Wildlife	National Wildlife Refuges (NWR), including	All wildlife	Taking any member of the animal kingdom in a wild, unconfined state, whether alive or dead, including a part, product, egg, or offspring of the member. – 50 CFR 27.12	Violation of a National Wildlife Refuge regulation is a

Refuge Regulations[1]	Refuge Program	Farallon NWR		Disturbing, injuring, spearing, poisoning, destroying, collecting or attempting to disturb, injure, spear, poison, destroy or collect any plant or animal on any national wildlife refuge is prohibited except by special permit. – 50 CFR 27.51	misdemean or crime. – 50 CFR 28.31, 16 USC 460k-3.
National Park Service Regulations	Department of the Interior	All National Parks	All wildlife	Policy Memorandum 14-05 directed each superintendent to use the authority under 36 CFR 1.5 to prohibit the launching, landing, or operation of unmanned aircraft, subject to the certain conditions and exceptions set forth in the memo. This is still in force with a very few exceptions.	Fine, imprisonme nt, or both, and costs of all proceedings. – 36 CFR1.3(a-d)
National Park Service Regulations – Golden Gate Recreation Area[2]	Department of the Interior – National Park Service (NPS)	The boundaries of federally-owned lands and waters administere d by the NPS.	All wildlife	The taking of wildlife, except by authorized hunting and trapping activities…– 36CFR2.2(a)(1) …intentional disturbing of wildlife nesting, breeding or other activities. – 36CFR2.2(a)(2) Boating: The following areas are closed to all vessels, including rowboats, kayaks, rafts, surfboards, sail boards, kite boards and windsurfing boards: •Bird Rock: All waters within 300 ft. of Bird Rock • Point Bonita Cove and tide pools and marine area 300 ft. offshore • Alcatraz Island Seasonal Closure: From February 1 to September 30, which extends from the shoreline seaward to 300 feet, excluding the East shoreline area between the guard tower and the South East corner of the island (122 25'07.9"W 37 49'29.9"N) where only NPS contracted ferry/barge service and NPS and United States Coast Guard vessels access the island. • Crissy Field Wildlife Protection Area includes all tidelands and submerged lands to 300 feet offshore. Snowy Plover Protection Areas: Dog walking is restricted seasonally (July 1 to May 15 of the following year) to on-leash only at *Ocean Beach, Stairwell 21 to Sloat Boulevard*, including all tidelands. Dog walking is restricted seasonally (July 1 to May 15 of the following year) to on-leash only	Fine, imprisonme nt, or both, and costs of all proceedings. – 36 CFR1.3(a-d)

[1] See California Fish and Game Code, Marine Protected Areas and Special Closures for information on a seasonal closure between March 15 and August 15 to vessel traffic within 300 feet of shoreline at specified portions of Southeast Farallon Island.
[2] Specific prohibitions are published in the Superintendent's Compendium of Designations, Closures, Permit, Requirements and Other Restrictions Imposed Under Discretionary Authority. The prohibitions listed reflect the 2020 Compendium.

				in the *Crissy Field Wildlife Protection Area* – 36 CFR §2.15.	
National Park Service Regulations – **Point Reyes National Seashore[2]**	Department of the Interior – National Park Service (NPS)	The boundaries of federally-owned lands and waters administered by the NPS.	All wildlife	The taking of wildlife, except by authorized hunting and trapping activities…– 36CFR2.2(a)(1) …intentional disturbing of wildlife nesting, breeding or other activities. – 36CFR2.2(a)(2) Boating or the use of any vessel (as defined by 36 CFR 1.4) is prohibited within 100 yards of the Point Reyes headlands shoreline between the Point Reyes Lighthouse and Chimney Rock. Bird Rock is closed year round to visitor use. Drakes Beach elephant seal pupping area as delineated by signs at the western-most end of Drakes Beach is closed at all times of the year. Seasonal Closures: Miller Rocks, Stormy Stack, Hog Island, and Duck Island are closed to the public from March 1 to July 30 of each year. Double Point, Drakes Estero and Limantour Spit (as signed) are closed to all entry from March 1 to June 30 of each year. The southern end of South Point Reyes Beach (as signed) to the Lighthouse; the beach from the Chimney Rock Lifeboat Station to Chimney Rock; the road leading from the gate at the end of the Chimney Rock Road to the Fish Dock area including immediately adjacent beaches; and Drakes Beach starting at the bluff near the southwest end of the Drakes Beach Parking Lot and continuing south to the current permanent elephant seal closure are all closed from December 15 to March 31 The Point Reyes (Great) beach between the North Beach Parking lot and Abbotts Lagoon is closed to all entry by visitors each Saturday and Sunday and Federal Holidays from the Saturday immediately preceding Memorial Day through Labor Day. Disturbing Wildlife with Sound: The use of any audio or mechanical device to attract or disturb wildlife is prohibited. Remote Controlled, Motorized Aircraft: Remote controlled aircraft are not allowed in the park. Under the Wilderness Act, motorized vehicles are prohibited in congressionally designated wilderness areas.	Fine, imprisonment, or both, and costs of all proceedings. – 36 CFR1.3 (a-d)

State Authority	Regulatory Bodies	Jurisdiction / Area	Covered Species	Prohibited Activities	Penalties
California Endangered Species Act	State of California – Department of Fish and Game	State of California	Species designated by the State of California as threatened or endangered and located within the State	Taking any species designated by the state as threatened or endangered without a permit. – CA Fish and Game Code, Section 2080 "Take" is defined as hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, capture, or kill. – CA Fish and Game Code, Section 86	
California Game Refuge Statutes	State of California – Department of Fish and Game	State of California Game Refuges	Birds and mammals located within California Game Refuges	Taking or possessing any bird or mammal, or part thereof, in any game refuge except as otherwise provided for by law or regulation. – CA Fish and Game Code, Section 10500 Flying any aircraft less than 3,000 feet above water or land over the Sespe Condor Sanctuary, and less than 1,000 feet above water or land over the Año Nuevo State Reserve, the Farallon Islands Game Refuge, the Point Lobos State Reserve, the California Sea Otter Game Refuge, and Anacapa, San Miguel, Santa Barbara, and San Nicolas Islands, except for rescue operations or pursuant to a permit. – CA Fish and Game Code, Section 10501.5 "Take" is defined as hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, capture, or kill. – CA Fish and Game Code, Section 86	
California State Parks Regulations	State of California – Department of Parks and Recreation	State of California Parks, including, but not limited to: - Año Nuevo State Reserve - Asilomar State Beach - Bean Hollow	Birds and mammals located within California State Parks	Molesting, hunting, disturbing, harming, feeding, touching, teasing, or spotlighting any kind of animal or fish or attempting to do so unless specifically authorized by individual park regulations. – 14 CCR 4305	

		State Beach - Carmel River State Beach - Carpinteria State Beach - Cayucos State Beach			
California Fish and Game Code, Marine Protected Areas and Special Closures	State of California – Department of Fish and Game	Includes colonies on the Farallon Islands, Devil's Slide Rock, Stormy Stack, Point Resistance and Point Reyes.		All vessels shall observe a five (5) nautical mile per hour speed limit within 1,000 feet of any shoreline in the reserve. CA Fish and Game section 632 (17)(C) A Special Closure is an area designated by the Fish and Game Commission that prohibits access or restricts boating activities in waters adjacent to sea bird rookeries or marine mammal haul-out sites. Distances can be set at either 300 or 1000 feet from land or offshore islands. 14 CCR § 632	
Miscellaneous California Statutes and Regulations	State of California	State of California		Taking, possessing, or needlessly destroying the nest or eggs of any bird, except as otherwise provided by the California Fish and Game Code (e.g., licensed hunting, etc.) – CA Fish and Game Code, Section 3503 Taking or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act or any part of such migratory non-game bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Bird Treaty Act. – CA Fish and Game Code, section 3513	

Appendix C: Communication Philosophy, Strategies and Successful Messages

This document summarizes the approach that the Seabird Protection Network Central Coast Chapter (Network) takes for communicating with stakeholders and selected audiences and includes best practices for messaging to pilots and boaters based on formative research, 2018 Program Evaluation findings from focus groups and one-on-one stakeholder conversations, and longer-term trial and error during events and presentations.

Communications Philosophy: The Behavior Change Model

The basic philosophy behind actions of the Network is rooted in behavior change science. Behavior change is about tapping into motivations to model a positive behavior regardless of the current knowledge about the issue. It is about understanding why people do what they do and how they perceive doing something different. The Network's aim is changing human behaviors that cause disturbance to seabirds by strategically promoting actions that prevent seabird disturbances. The premise is that people who take positive environmental actions often have no better understanding of the problem than those who don't act. Simply put, the Network seeks the answers to the following question: what is the benefit for doing the action (i.e. preventing disturbance) and what are the barriers that prevent someone from doing that action?

Current and future actions that will prevent, stop or reverse harm to seabirds are predicated on following a model outlined in the publication *Environmental Education Communication for a Sustainable World* (Day and Monroe 2000). Using this model, the Network weaves four complementary disciplines together to give us the best path forward for addressing the barriers to preventing human-caused disturbances to seabirds and promoting actions that curtail human-caused disturbances.

Discipline 1: Social Marketing

Social marketing, derived from commercial marketing and behavioral psychology, is used to encourage new behaviors. It identifies key factors that determine the behaviors of a selected audience to make the new behavior desirable. It involves five non-linear steps aimed at getting the right messages to the right people in the right way and adjusting as needed based on feedback. The five steps are:

1. Assessment
2. Design and Plan
3. Pretest and Revise
4. Implement
5. Monitor and Evaluate

Social marketing also needs to involve the audience intended for the targeted action: Who is our audience? How do they behave? Why do they make their choices? How can the Network address behavior change and foster a social norm that promotes the desired behavior? (McKenzie-Mohr, 2011). Once the Network understands the motivations that either cause a disturbance or avoid a disturbance, it can then implement actions that can be tested, revised and evaluated for success.

Discipline 2: Environmental Communication

Environmental communication is about creating strategies for reaching certain audiences, then selecting the appropriate media and developing messages to reach the selected audiences. It involves four linear steps starting with setting a goal, determining the selected segment of an audience, understanding the medians of how to deliver the information and then developing a message. Critical to success is understanding how to reach an audience before developing messages. For example, if the goal is to prevent wildlife disturbance and the audience is fixed-wing pilots then the Network must first understand the media diet of those particular pilots and the most effective way to reach them. Then the right message can be developed. A message written for a community bulletin board or fixed-wing pilot magazine is quite different—and could be more effective in changing behavior— than one written for TV or for a general audience for example.

Discipline 3: Environmental Education

Environmental education is a traditional way to reach an audience and this model is well known worldwide and developed by UNESCO in 1978 (UNESCO 1978). The process is as follows: First, a person acquires awareness of an issue like human disturbance to seabirds. Then, having experience in and knowledge of the issue to acquire a set of values and feelings of concern, they have a motivation to actively participate in protecting seabirds. Finally, they acquire the skills for addressing the problem, and become involved in working towards resolving the issue. Contrary to popular belief, consistently strong positive attitudes toward the environment alone are not effective in causing behavior change if there is not also a motivation to do so. Consequently, the Network links this discipline to the elements of social marketing and environmental communication to be effective.

Discipline 4: Stakeholder and audience participation

The Network must understand how stakeholders and selected audiences perceive an issue. The process of reaching this understanding is known as formative research. Formative research is first about assessing a situation to have a clear snapshot of the existing state of the second and third disciplines: environmental communication and education. This includes reviewing existing documents, and can include surveys, interviews, focus groups, or direct observation. Formative research is conducted in the early stages of designing a behavior change approach to really understand the audience(s), the convincing messages for each audience, the packaging of the

messages, the media mix, and the ideal frequency of exposure to the message. However, participation does not end with simple feedback. Stakeholders and selected audiences can engage in message, product and outcome development, but true participation requires consistent engagement. Continually involving stakeholders and selected audiences will ensure lasting behavior change.

Communications Strategies and Messages

The following sections contain a summary of the results from research and development of messages through the four disciplines listed above.

The right type of engagement

The Chapter uses messaging to engage our selected audiences (i.e. boaters and pilots) as partners in protecting wildlife, to convey key messages about the locations of sensitive seabirds and regulations that protect them, and to create opportunities for further engagement.

How to engage stakeholders

- Appeal for help through partnership and invite audiences to help solve problems.
- Captivate audiences through storytelling, sightseeing, games, freebies, and trivia.
- Assume good intentions and use positive, collaborative communication.
- Speak the selected audience's language (e.g. aviation and nautical terms and charts).
- Create opportunities for continued dialogue and feedback.
- Build lasting partnerships (e.g. with those who model appropriate seabird interactions).

Messengers

- Deliver messages from trusted voices in the community (e.g. pilots, airport managers).
- Co-host events with authorities (e.g. FAA Safety Team, Department of Boating and Waterways).
- Build connection through sharing who we are, why we care, what we have in common.

Process

- Test new messages individually, locally, then regionally. Use every event to seek specific feedback and improve messaging over time.
- Limit each event or interaction to one main 'ask' and create a sequence of interactions to build engagement (e.g. during a presentation advertise signing up for the newsletter, the newsletter 'welcome' email advertisements for pledge, pledge asks to share on social media).

Messages to avoid

- Avoid catchy messages without including specific recommendations or explaining why (e.g. 'Fly Seabird Safe' and 'Fly high' are ambiguous).
- Avoid leading messaging with regulations, legality, or threat of enforcement. Aim for audiences to be passionate and knowledgeable about the reasons they follow the rules.

- Avoid fear, negative, or blame-based messaging (e.g. graphs that point out disturbance statistics by audience, photos of bird strikes).

Key recommendations

- Focus on specific ways pilots and boaters can make a difference.
- Use catchy 'buzz feed' style language to spark interest in events (e.g. 10 'secret' sights).
- Highlight successes (e.g. Common Murre comeback at Devil's Slide), tell stories that inspire awe and build appreciation and interest (e.g. Farallones egging, sooty shearwaters inspired 'The Birds'), and offer fun facts on coastal topics they're interested in (e.g. 'flightseeing').
- All audiences like the phrase 'White rocks = seabird flocks.' Explain that seabirds leave their mark, and it's how researchers look for new breeding colonies.
- Always include ***why*** it's important to do something or not do something.
    - When talking about disturbance, communicate ***why*** minimizing human-caused disturbance is important and desirable by describing breeding habits and the impacts of getting close.
        - Explain the value of giving space to colonies.
        - Explain that all user groups share responsibility in protecting wildlife.
        - Broaden the message to include charismatic megafauna that audiences are familiar with (e.g. elephant seals).
    - When talking about regulations, lead with ***why*** they exist.
        - Explain what Special Closures and NOAA Regulated Overflight Zones and wildlife disturbance laws are designed to do.
        - Explain that the nation has decided these areas are important and critical.
        - Give specific examples (e.g. harbor seals at Russian River, Common Murres on Pt Reyes).
        - Never ***lead*** with regulations. They need to be mentioned, but never first.
        - Do not cite "Acts''. The names don't necessarily reflect the actual regulations (i.e. The Airborne Hunting Act), instead refer to 'federal laws and regulations' and CFRs.

Key messaging for PILOTS

- Lead messages:
    - Fly above 1000 feet AGL for safety and wildlife. It's a good practice!
    - Fly above 1000 feet AGL and ¼ mile offshore of the Devil's Slide Rock area.
    - Group reasons to fly above 1000 feet: Reduce bird strike risk, Avoid Devil's Slide Rock, Respect wildlife, Avoid the drone zone, Give yourself gliding distance.
- Sightseeing:
    - Pilots are interested in 'flightseeing' and giving tours to passengers. They like aerial history, geology, and wildlife spotting.
- Safety Messages:

    - Frame Overflight Zones as seabird hotspots: "Know your blue dots (i.e. wildlife hotspots) and magenta dots (seabird hotspots), and explain what species are protected.
    - Bird Strikes: They are one of the main motivating factors to fly higher. Use trusted sources of information specific to an audience (i.e. guidance on bird strike risk in the FAR-AIM. Show data from the FAA Wildlife Strike Database.
    - Disturbance: Explain the impact of flying too close (e.g. one flight can impact an entire breeding cycle, Matt Pickett's experience is that only polar bears are not impacted).
    - Always include a caveat about weather: Pilot lives and safety always come first.
- Presentation titles:
    - Let a Geologist Take You on a Bay Tour
    - 10 Secret Sights Only Pilots Can See, and How to Fly Them Like a Pro

Key messaging for BOATERS

- Lead messages:
    - Keep 1000 feet from nesting seabirds and wildlife to give them the space they need to feed, breed, rest, and survive. This is a science-based number.
    - Describe Marine Protected Areas and how they are designed as a network to increase the health of the whole coast.
    - Explain the outsized importance of our coast because this is where wildlife breeds.
- Speak Boater:
    - Show what boaters need to do/avoid while they are out on the water, and why.
    - Boaters are closer to the water. Appeal to their natural curiosity about spotting wildlife.
    - State distances in yards, not feet.
- Presentation title:
    - The Secret Lives of Seabirds
    - How You Can Help Protect Marine Wildlife
    - Paddling California's Marine Protected Areas

References

Day, B. A. Monroe, M.C. (2000). Environmental Education & Communication for a Sustainable World: Handbook for International Practitioners. Washington, DC: United States Agency for International Development: Academy for Educational Development.

McKenzie-Mohr, D. (2011). Fostering sustainable behavior: An introduction to community-based social marketing. Gabriola Island, B.C: New Society Publishers.

UNESCO and Environmental Education. UNESCO Occasional Paper 31. (1978). Ottawa, Canada. Canadian Commission for UNESCO.