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Planning Approach and Background Materials

For the Main Hawaiian Islands Monk Seal Management Plan

January 2016



Planning Approach and Background Materials for the Main Hawaiian Islands Monk Seal Management Plan

NOAA Fisheries Pacific Islands Regional Office

January 2016

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Recommended Citation:

National Marine Fisheries Service. 2016. Planning Approach and Background Materials for Main Hawaiian Islands Monk Seal Management Plan. National Marine Fisheries Service, Pacific Islands Region, Honolulu, HI, 85 pp.

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For the Main Hawaiian Islands Monk Seal Management Plan

January 2016

U.S. DEPARTMENT OF COMMERCE

**National Oceanic and Atmospheric Administration
National Marine Fisheries Service**

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Contents

- Vision4
- Introduction4
- Authority and Responsibility for Hawaiian Monk Seal Management4
- Main Hawaiian Islands Management & Plan History5
 - Planning Approach6
 - Participatory Process6
 - Planning Methodology7
- Planning Process and Timeline.....8
 - Inter-agency Coordination9
 - Native Hawaiian Leaders and Practitioners9
 - Stakeholder Planning Workshop10
 - Continued Engagement with Stakeholders and Focus Groups.....11
 - Recovery Team Review11
 - Public Review12
- Technical Analysis.....12
 - Conservation Targets and Goals of the Plan.....12
 - Ecosystem Considerations12
 - Conservation Targets and Goals12
 - Human Wellbeing Outcomes13
 - Threat Identification and Ranking.....14
 - Direct Threat Identification.....14
 - Threat Ranking19
 - Situation Analysis of Direct and Indirect Threats to Monk Seal Conservation.....22
 - Building a Conceptual Model: Analyzing the Situation.....22
 - Situation Analysis - Contributing Factors and Overarching Themes.....24
 - Identification and Prioritization of Recommended Strategies26
 - Building Results Chains: Developing Recommended Strategies30
- Recommended Strategies33
 - Recommended Strategy #1: Build management capacity.....33
 - Recommended Strategy #2: Engage communities and build local capacity35
 - Recommended Strategy #3: Increase outreach and education37

Recommended Strategy #4: Prevention and effective response to seals of concern	39
Recommended Strategy #5: Reduce likelihood of infectious disease outbreaks.....	41
Recommended Strategy #6: Reduce harmful monk seal-fishery interactions through engagement, outreach, and prevention	43
Recommended Strategy #7: Support sustainable fishery management	45
Recommended Strategy #8: Support environmentally sustainable coastal development.....	47
Recommended Strategy #9: Support control of non-native and invasive species.....	49
Recommended Strategy #10: Support climate change planning and response	51
 Next Steps and Final Management Plan	 53
 Literature Cited.....	 53
 Appendix A. Summary of 2012 Native Hawaiian Leaders and Practitioners Focus Groups	 56
Appendix B. Agenda from 2012 Planning Workshop.....	58
Appendix C. Summary of 2013 Community.....	63
Appendix D. Summary of 2014 Monk Seal Focus	64
Appendix E. Notes from NGO Monk Seal Management Workshop	68
Appendix F. Comment and Recommendation Letters from the Hawaiian Monk Seal Recovery Team.....	71
Appendix G. Public Comment Summary	80

Vision

A healthy and thriving Hawaiian monk seal population in the main Hawaiian Islands, living in a productive and balanced coastal ecosystem and coexisting with the cultural and economic well-being of the people of Hawaii.

Introduction

In 2007, NOAA Fisheries issued a revised recovery plan for the Hawaiian monk seal (National Marine Fisheries Service 2007) that incorporated new biological information and more sophisticated recovery planning initiatives. In the revised recovery plan, one of the recommendations was for NOAA Fisheries to develop a *Main Hawaiian Islands Monk Seal Management Plan* that addresses the full scope of monk seal management needs in the main Hawaiian Islands.

This technical supplement describes the process through which we developed the *Main Hawaiian Islands Monk Seal Management Plan*, and the background technical information created through that process that we used as the basis for the plan. To produce a clear and concise management plan that practitioners, policymakers, and the public can easily use, we reorganized and restructured some of the analyses described in this document, occasionally using different terminology (or terminology with slightly different definitions). Wherever this is the case, the differences are noted.

This document includes descriptions of:

- Authority and responsibility for Hawaiian monk seal management
- Main Hawaiian Islands management and plan history
- Planning approach, participatory process, and methodology
- Agency roles and responsibilities in management planning
- Planning process and timeline
- Planning definitions
- Technical analysis
 - Conservation targets and goals
 - Threat identification and ranking
 - Situation analysis – conceptual model
 - Identifying and prioritizing recommended strategies
- Recommended strategies and results chains

Authority and Responsibility for Hawaiian Monk Seal Management

The federal Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) both give authority and the primary responsibility for Hawaiian monk seal recovery and management to NOAA Fisheries, on behalf of the Department of Commerce. The State of Hawaii also has statutory authority to manage and conserve Hawaiian monk seals in state waters through Hawaii Revised Statute (HRS)§195D. The State of Hawaii Division of Land and Natural Resources (DLNR) receives a grant from NOAA Fisheries under Section 6 of the ESA to support conservation of Hawaiian monk seals and Hawaiian green sea turtles, specifically mitigation of monk seal and green turtle interactions with fisheries in state waters.

NOAA's Office of National Marine Sanctuaries (ONMS) and the State of Hawaii (through DLNR) co-manage the Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS) in the main Hawaiian Islands. While the HIHWNMS does not currently have statutory authority to manage Hawaiian monk seals in the main Hawaiian Islands, they have historically supported the broader mission of NOAA and DLNR by supporting place-based education, emergency response to stranded cetaceans and some routine monk seal haul-outs in certain areas adjacent to the sanctuary, and assistance with managing volunteers who may support the sanctuary as well as monk seal response.

Main Hawaiian Islands Management & Plan History

NOAA Fisheries and others have been developing management strategies and policies to address threats to monk seals in the main Hawaiian Islands for several decades (see Lowry *et al.* 2011 for a description of monk seal management and recovery efforts from 1972-2010), and do so within the human environment and different cultures of Hawaii. Throughout this time, NOAA Fisheries and its partners have been engaged in a wide variety of monk seal management activities in the main Hawaiian Islands.

In October 2002, the Marine Mammal Commission, NOAA Fisheries, and the State of Hawaii's DLNR Division of Aquatic Resources (DAR) co-sponsored a workshop on the management of Hawaiian monk seals on beaches in the main Hawaiian Islands. Over a three-day period, stakeholders, including representatives from federal, state, and county agencies, non-governmental organizations (NGOs), volunteer groups, the local hotel and tourist industry, and the scientific community, discussed many issues of concern and importance, resulting in a final report with comprehensive comments and suggestions. This workshop served as the first community-based scoping of management issues relevant to the creation of a comprehensive management approach for monk seals in the main Hawaiian Islands.

In March 2006, NOAA Fisheries Pacific Islands Regional Office (PIRO) sponsored a two-day Main Hawaiian Islands Hawaiian Monk Seal Management Workshop. Representatives from NOAA Fisheries Pacific Island Fisheries Science Center (PIFSC), DLNR, HIHWNMS, and other agencies attended. Areas of discussion included adaptive management approaches to high profile issues such as emerging disease concerns, techniques and issues dealing with conditioned or habituated seals, pups born on popular beaches, pups born near contaminated streams, captive care and rehabilitation of sick or injured seals, and monk seal volunteer network development and outreach. This workshop was an important step in the continuing development of a *Main Hawaiian Islands Monk Seal Management Plan*.

In 2007, NOAA Fisheries issued a revised recovery plan for the Hawaiian monk seal (National Marine Fisheries Service 2007) that incorporated new biological information and more sophisticated recovery planning initiatives. In the revised recovery plan, one of the recommendations was for NOAA Fisheries to develop a *Main Hawaiian Islands Monk Seal Management Plan* that addresses the full scope of monk seal management needs in the main Hawaiian Islands.

Considering this, and building on the results of the 2002 and 2006 workshops and other associated efforts, NOAA Fisheries developed an annotated outline for a *Draft Main Hawaiian Islands Monk Seal Management Plan* in 2010 and presented the draft to the Hawaiian monk seal recovery team in February 2011. The Hawaiian monk seal recovery team had concerns with the format and development of the draft management plan. In response to these concerns, NOAA Fisheries adopted a new planning approach, based on the *Open Standards for the Practice of Conservation*, described in more detail in the next section.

Planning Approach

Participatory Process

While NOAA Fisheries has legal authority to administer the ESA and the MMPA to achieve and ensure lasting recovery of Hawaiian monk seals, the participation of communities and organizations external to NOAA Fisheries is necessary. Thus, NOAA Fisheries created this plan as a guidance document for our own agency, as well as a way to communicate priorities and the strategic direction of the management and recovery program to our partners and those who may be interested in being involved in monk seal recovery. The background and analysis presented here is the product of a participatory process with experts, partners, stakeholders, and communities. The content of the plan reflects ideas and input regarding monk seal management collated from public meetings and talk story sessions about monk seals, public hearings for regulatory processes (e.g., recent programmatic environmental impact statement and critical habitat), meetings with community members, and workshops with technical experts. This document will guide the efforts of NOAA Fisheries and other organizations in Hawaiian monk seal management and recovery.

Guiding Principle – Community-based Stewardship

Just as community participation was emphasized in the process of developing this plan, community participation is also necessary in the implementation of this plan. All of the recommended strategies rely on participation by key community members and stakeholders, and one of the areas focuses specifically on engaging communities and building local capacity to participate in decision-making and implementation of key aspects of monk seal management.

Effective management activities, such as activities to reduce interactions between seals and fishermen, or between seals and beach goers, will necessarily require a minimal level of participation by the people involved in the interactions. However, the approach adopted in this plan involves a deeper level of participation, including participation in decision-making and other key interactive processes. This includes monk seal stewardship plans that can be co-developed and implemented by community members to manage human-seal interactions in ways that work best for each unique community. Other participatory activities include outreach efforts co-developed and implemented by local community members, and fishing gear modifications and methods co-developed and tested by the affected fishermen.

Local community participation by coastal communities throughout the main Hawaiian Islands is paramount to monk seal management and recovery. Many (if not most) of the communities where monk seal management is a high priority are communities where natural resource uses and stewardship practices are deeply rooted in Hawaiian culture. NOAA recognizes the importance of incorporating and continuing Hawaiian cultural traditions and practices, in particular as they apply to managing monk seals and related natural resources and human activities. While direct Hawaiian cultural connections to monk seals appear to be limited, or at least a topic for further study, Hawaiian cultural connections to monk seals do exist and appear to be expanding in contemporary times. Other Hawaiian traditions and practices related to sustainable natural resource use and human co-existence with natural resources are expansive and will be integral to the success of this plan. To better understand and apply these connections toward effective management, objectives and activities included in this plan entail further study and dialogue on the traditional and contemporary cultural significance of monk seals.

Beyond the cultural significance of monk seals themselves, embracing and continuing Hawaiian cultural traditions and practices at a much broader level will be essential to successful monk seal management

in the main islands. To be effective, many aspects of this monk seal management plan will need to be developed and implemented in coastal communities known for strong their Hawaiian cultural roots and social norms. Many of these communities have already established, or are in the process of establishing, community-based systems for natural resources management and human co-existence. This plan seeks to integrate and partner with these communities and their local initiatives, and this is reflected in several recommended strategies. These recommendations include enhanced training for staff and volunteers in Hawaiian cultural awareness, increased cultural diversity of the response network, and partnering with existing Hawaiian initiatives such as the Aha Moku initiative and various Hawaiian fishpond projects. Both strategies also include gaining guidance and oversight regarding Hawaiian traditions and practices for community engagement and outreach via the newly-reconvened Hawaiian monk seal recovery team.

Planning Methodology

NOAA Fisheries used an adaptive management planning methodology and framework created by the Conservation Measures Partnership (CMP), known as the *Open Standards for the Practice of Conservation*, to develop the *Main Hawaiian Islands Monk Seal Management Plan*. More information on the *Open Standards for the Practice of Conservation* can be found at: <http://conservationmeasures.org/initiatives/standards-for-project-management>. The development of the *Main Hawaiian Islands Monk Seal Management Plan* essentially entails the first two steps of CMP project management (Figure 1).



Figure 1. Project cycle of planning, implementation, and evaluation from the Conservation Measures Partnership process.

The CMP, a joint venture of conservation organizations and collaborators that include organizations such as The Nature Conservancy, Conservation International, Wildlife Conservation Society, World Wildlife Fund International, National Fish and Wildlife Foundation, and National Audubon Society, among others, who are committed to improving the practice of conservation. Many large, multi-stakeholder conservation projects have used the *Open Standards* process, including the Papahānaumokuākea Marine National Monument, Hudson River Estuary Watershed, Lake Huron, Gulf of California, and the Southwest Amazon forest. CMP also developed computer software, called *Miradi*, to guide users through the *Open Standards* and document the planning process. NOAA Fisheries used the *Miradi* software through much of the development of the *Main Hawaiian Islands Monk Seal Management Plan*. The CMP basic planning process involved implementing the following seven steps (major components of the plan indicated in italics):

1. Identify the *conservation targets* and *scope*. In this case, the *targets* are the Hawaiian monk seal and monk seal terrestrial and marine habitat. The *scope* is the main Hawaiian Islands. We also developed *human wellbeing targets*, such as *targets* related to sustainable fishing and ocean access that can be addressed concurrently with the monk seal *conservation target*.
2. Identify and rank the *threats* that directly harm or degrade the *conservation targets*.
3. Create a conceptual model of the *contributing factors* leading to the *threats*. This entailed creating cause-and-effect diagrams showing connections between the *target*, *scope*, *direct threats*, and *contributing factors* (also known as *indirect threats* or *opportunities*).
4. Develop *goals* for each *target* that clearly identifies the desired status of the *targets* in the future.
5. Identify and prioritize management *strategies*. This entailed determining where interventions could influence the *contributing factors* or reduce the *direct* or *indirect threats*. Prioritization is based on the likelihood of the *strategy* mitigating the *direct* or *indirect threat*, and the feasibility of carrying the *strategy* out.
6. For high priority *strategies*, *results chains* are created to explicitly state how the *strategy* will mitigate the *threat*.
7. Develop *objectives*, *activities*, and *indicators* to achieve the desired results. This provides the details to help facilitate implementation of the *strategies* and measure implementation performance.

Planning Process and Timeline

Using the CMP *Open Standards for the Practice of Conservation* (<http://cmp-openstandards.org/>), NOAA Fisheries engaged diverse agency partners, stakeholders, and community members to develop the *Main Hawaiian Islands Hawaiian Monk Seal Management Plan*. Between 2012 and 2015, the following meetings and workshops provided information and recommendations to NOAA Fisheries staff on main Hawaiian Islands monk seal management:

- **July 2012** – 1-day workshop with inter-agency partners using new planning methodology
- **July-August 2012** – Focus group meetings with native Hawaiian community leaders (conducted by a native Hawaiian liaison contractor; summary in Appendix A).
- **September 2012** – 3-day workshop using new planning methodology, attended by partners,

stakeholders, and members of the community (held by a local non-profit to facilitate community and partner involvement in NOAA Fisheries' monk seal management; meeting agenda in Appendix B).

- **August-September 2013** – Informal meetings between the Hawaiian monk seal recovery coordinator, stakeholders, and members of the community across the islands discussing current monk seal management issues (summary in Appendix C).
- **June 2014** – Small focus group meetings with community members and stakeholders to provide input on an early draft of this management plan (meeting notes in Appendix D).
- **November 2014** – Workshop with several NGO groups to discuss outreach, communications, and other issues in the management plan (meeting notes in Appendix E).
- **August 2014-March 2015** – Discussion and review of early drafts of the management plan by a newly-reconvened Hawaiian monk seal recovery team (group of external experts that advises NOAA Fisheries on recovery and implementation; recommendation letters in Appendix F).
- **August-September 2015** – NOAA Fisheries made the draft *Main Hawaiian Islands Monk Seal Management Plan* available to the public for a 30-day review and comment period. (summary of comments in Appendix G)

Overall, we engaged and gathered input from over 20 NOAA Fisheries biologists, the 12-member Hawaiian monk seal recovery team, and more than 200 partners, stakeholders and community members through workshops, meetings, focus groups, and talk story sessions.

Inter-agency Coordination

July 2012 – 1-day workshop with inter-agency partners using new planning methodology

In July 2012, an interagency team of key staff members from NOAA Fisheries, HIHWNMS, Hawaii DLNR, and marine mammal response network partners met to develop draft products for the *Main Hawaiian Islands Monk Seal Management Plan*. These draft products included the project scope and vision, and developing initial conservation targets, threat ratings, and contributing factors in a draft conceptual model for monk seal conservation in the main Hawaiian Islands.

Native Hawaiian Leaders and Practitioners

July-August 2012 – Focus group meetings with native Hawaiian community leaders (conducted by a native Hawaiian liaison contractor; summary in Appendix A).

Prior to the September 2012 stakeholder workshop, meetings with native Hawaiian community leaders and practitioners were held from late July through late August 2012 on all the populated Hawaiian Islands (except Niihau) to gather input on issues related to managing Hawaiian monk seals in the main Hawaiian Islands. PIRO's native Hawaiian monk seal liaison contractor and another trained facilitator hired under contract facilitated the meetings. Meeting participants included local Hawaiian community members who were interested in Hawaiian monk seal management in the main Hawaiian Islands or who were leaders in the native Hawaiian, fishing, or ocean use communities. The native Hawaiian liaison compiled a report summarizing the input provided at the meetings and submitted it to PIRO in late August 2012 to share with the stakeholder workshop participants and for use in subsequent planning steps.

Stakeholder Planning Workshop

September 2012 – 3-day workshop using new planning methodology, attended by partners, stakeholders, and members of the community (held by a local non-profit to facilitate community and partner involvement in NOAA Fisheries’ monk seal management; meeting agenda in Appendix B).

The Monk Seal Foundation, a Maui-based non-profit organization, received a grant from NOAA Fisheries to facilitate community, federal, and state engagement in Hawaiian monk seal management, conservation, and recovery. In September 2012, as part of that grant, they hosted a 3-day workshop, facilitated by Foundations of Success, one of the organizations involved in the development of the CMP’s *Open Standards for the Practice of Conservation*. The purpose of the workshop was to help NOAA Fisheries form the foundation for the *Main Hawaiian Islands Monk Seal Management Plan*, including building capacity and information necessary to conduct and adaptively manage a conservation planning project.

The September 2012 workshop engaged approximately 30 participants and focused on refining the conceptual model of the plan and developing strategies and other major plan components. A facilitator with expertise in the *Open Standards for the Practice of Conservation* planning methodology and experience working with complex wildlife management planning projects facilitated the meeting. Workshop participants were provided the input obtained from the community meetings held with native Hawaiian leaders and practitioners. Workshop participants included individuals who are experts in the issues related to Hawaiian monk seal management in the main Hawaiian Islands. These areas of expertise included commercial and recreational fishing, ocean recreation, ocean safety, tourism, education and outreach, enforcement, wildlife management, and animal behavior. Each workshop participant served only as a subject matter expert and did not represent their constituency or agency positions.

The objectives of the workshop were twofold: the first objective was to teach the participants about the CMP’s conservation planning process and the second was to develop products for the management plan.

Objective 1. Conservation Planning Process

1. Strengthen knowledge about adaptive management and conservation project planning.
2. Strengthen capacity to carry out a conservation planning process according to the CMP’s *Open Standards for the Practice of Conservation*.
3. Introduce the Miradi conservation planning software and strengthen the capacity of the participants to manage the software.
4. Learn and use a common language for the design, management, and monitoring of conservation projects.

Objective 2. Conservation Planning Products

1. Receive feedback on the draft products created for the Main Hawaiian Islands Monk Seal Management Plan.
2. Refine the draft products created for the Main Hawaiian Islands Monk Seal Plan.
3. Identify strategies that NOAA Fisheries and its partners should implement, and develop results chains that describe the assumptions that link those strategies to desired conservation impacts.

NOAA Fisheries used the products and suggestions from the workshop as we developed a draft management plan that included goals, objectives, strategies, and an implementation and monitoring plan.

Continued Engagement with Stakeholders and Focus Groups

August-September 2013 – Informal meetings between the Hawaiian monk seal recovery coordinator and stakeholders and members of the community across the islands discussing current monk seal management issues (summary in Appendix C).

June 2014 – Small focus group meetings with community members and stakeholders to provide input on an early draft of this management plan (meeting notes in Appendix D).

November 2014 – Workshop with several NGO groups to discuss outreach, communications, and other issues in the management plan (meeting notes in Appendix E).

Throughout 2012 and 2013, PIRO staff compiled the information received from the workshop, native Hawaiian focus groups, and other meetings. Between August and September 2013, the Hawaiian monk seal recovery coordinator held approximately two dozen informal meetings and interviews with stakeholders on Hawaii, Kauai, Lanai, Maui, and Molokai. The goal of the meetings and interviews was to engage the communities, hear concerns, discuss monk seals, and obtain suggestions and feedback on NOAA's management of monk seals on their islands.

Meetings were held on June 18, 21, and 26, 2014 to gather input from leaders and experts throughout the main Hawaiian Islands in recreational and inshore fishing, outreach, communications, Hawaiian culture, community-based resource management, etc. The Monk Seal Foundation organized logistics for the meetings and PIRO staff facilitated the discussions for each group. The meetings were an opportunity for some participants of the September 2012 workshop and other community members and stakeholders to review the draft plan, assess how their previous comments and other community feedback was incorporated into the plan, and offer further suggestions. Participants were given drafts of the plan prior to the meetings, and agreed upon topics for discussion at the beginning of each meeting. Approximately 60 people total were invited, and about 5-10 individuals attended each focus group workshop. An additional focus group was conducted in November 2014 with experts from several NGOs, specifically to talk about partner coordination, outreach strategies, and community engagement.

Recovery Team Review

August 2014-March 2015 – Discussion and review of early drafts of the management plan by a newly-reconvened Hawaiian monk seal recovery team (group of external experts that advises NOAA Fisheries on recovery and implementation; recommendation letters in Appendix F).

The Hawaiian monk seal recovery team reviewed the draft *Main Hawaiian Islands Monk Seal Management Plan* at their first meeting in August 2014 and their second meeting in March 2015. After both meetings, the team spent significant effort preparing and compiling detailed comments. The team took into account all the input received throughout the previous steps (community meetings, workshops, and public input). PIRO staff revised the management plan in response to the team's comments after both the August 2014 and March 2015 meetings.

Public Review

August-September 2015 – NOAA Fisheries made the draft management available to the public for a 30-day review and comment period. (Comments and summary in Appendix G)

The public was given the opportunity to review and comment on the draft management plan. The public review period extended for 30 days from August 9 to September 9, 2015. The draft plan and a summary were published on the PIRO website, announced via PIRO Twitter and Facebook accounts, and notification was sent by email to 300-400 people, including:

- All participants from workshops, focus groups, and meetings (80+)
- Members of a monk seal news and updates listserv (~150)
- Members of a monk seal partners listserv (75)
- Other partners, interested community members, and contacts (100+)

**Some overlap between lists*

Partner government agency staff members, in addition to the interagency team, also had the opportunity to provide comments and feedback during the public review period.

Technical Analysis

Conservation Targets and Goals of the Plan

Ecosystem Considerations

In order for this monk seal management plan to successfully accomplish conservation of the seals, this must include an ecosystem-based approach to direct management not only of the animals themselves, but also of their habitat. Specifying the targets of this plan gives us a basis for setting goals, carrying out conservation actions, and measuring the effectiveness of those actions.

Conservation Targets and Goals

The Hawaiian monk seal population in the main Hawaiian Islands is currently increasing and moving on a trajectory toward 500 individuals. This plan will serve to support the trend, and will demonstrate progress toward addressing several of the threat-based recovery criteria listed in the Recovery Plan.

The conservation targets and goals that we intend to accomplish through implementation of this plan are:

- Wild Hawaiian monk seals
 - Goal: Stable or growing main Hawaiian Islands monk seal population of at least 500 seals (as required by the *Hawaiian Monk Seal Recovery Plan* [NMFS 2007])
- Suitable shoreline habitat
 - Goal: Sufficient shoreline habitat on the main Hawaiian Islands to support resting, pupping, molting, and other natural behaviors of at least 500 monk seals, and
- Suitable marine habitat
 - Goal: Sufficient marine habitat in the main Hawaiian Islands waters to support foraging, feeding, and other natural behaviors of at least 500 monk seals.

The goal of at least 500 seals in the main Hawaiian Islands is one of the conditions in the *Hawaiian Monk Seal Recovery Plan* (National Marine Fisheries Service 2007) to consider down-listing the monk seal species from endangered to threatened status under the ESA. In the recovery plan, the goal of 500 individuals in the main Hawaiian Islands is only one of several conditions that all must be met in order to consider reclassifying the monk seal species as threatened instead of endangered. Other biological criteria for down-listing include:

- Combined numbers exceed 2,900 total individuals in the Northwestern Hawaiian Islands
- At least 5 of the 6 main sub-populations in the Northwestern Hawaiian Islands are above 100 individuals *and the main Hawaiian Islands population is above 500*,
- Survival of females in each sub-population in the Northwestern Hawaiian Islands and in the main Hawaiian Islands is high enough that, along with the birth rates in each sub-population, the calculated population growth rate for each sub-population is not negative

Threat-based recovery criteria include:

- Adequate management of human-seal interactions
- Management measures in place to minimize human disturbance of hauled-out seals
- Measures in place to manage fishery interactions that are demonstrably effective at reducing fishery-related mortality
- Measures in place to minimize the probability of disease introduction and plans to respond in the event of a disease outbreak

**Not an exhaustive list*

Human Wellbeing Outcomes

We want to recognize that if we successfully implement strategies to improve the management and conservation of Hawaiian monk seals and their habitat, within the context of Hawaii's mosaic of cultures and the host native Hawaiian culture, we will also improve human wellbeing (Figure 2). Human wellbeing (as defined by the *Millennium Ecosystem Assessment*; Alcamo and Bennett 2003) consists of: 1) necessary material for a good life, 2) good health, 3) good social relations, 4) security, and 5) freedom and choice. Human wellbeing is affected by conservation through ecosystem services: the services our environment gives back to us, such as producing food and water, regulating climate and disease, supporting nutrient cycles and crop pollination, and creating cultural and recreational benefits.

The people of Hawaii will also experience improvements in human wellbeing from the successful management of Hawaiian monk seals and their marine and terrestrial habitats. In particular (Figure 2):

- Natural shorelines will lead to quality ocean access
- Safe wildlife viewing will promote opportunities for recreational ocean livelihoods and traditions through ecotourism
- Sustainable fisheries will foster better opportunities for fishery-based livelihoods and traditions
- Avoidance of overly close human-wildlife interactions will lead to improved public safety while viewing, engaging in recreational activities, and conducting other activities in proximity to monk seals

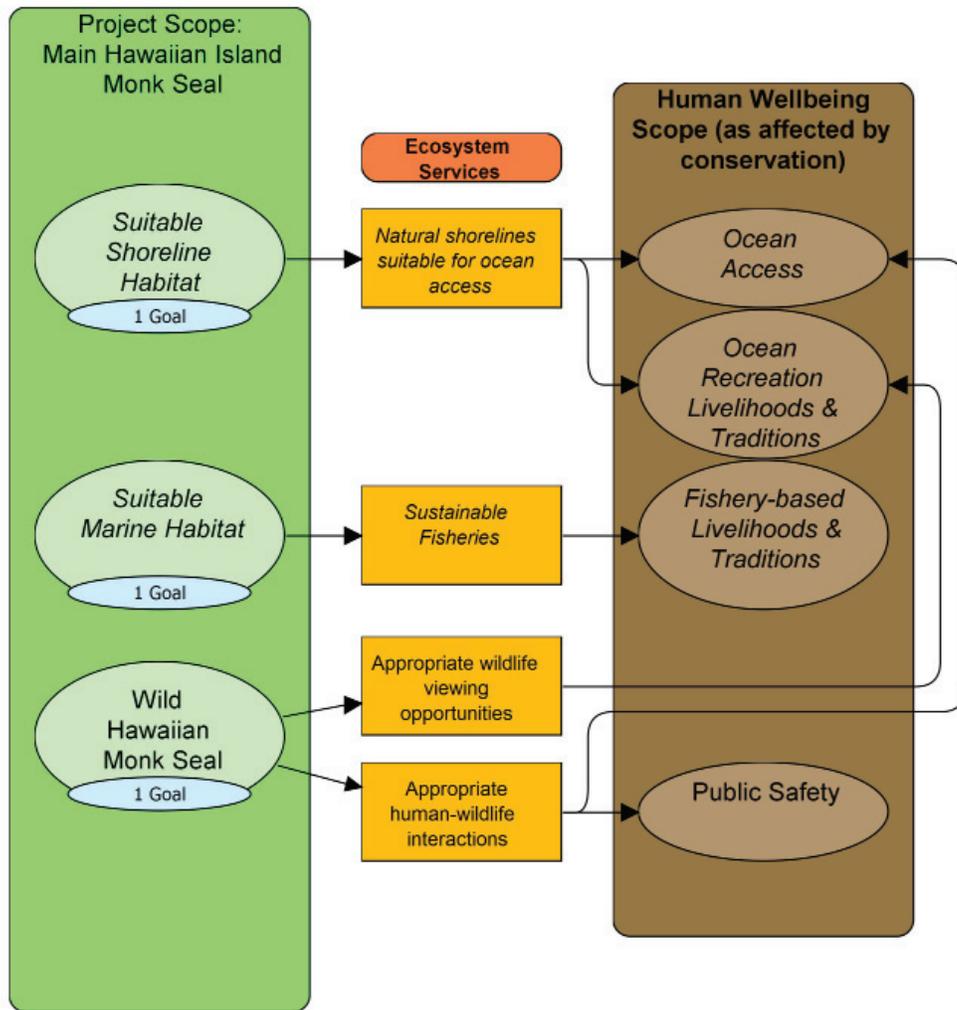


Figure 2. Depiction of how successful conservation and management of Hawaiian monk seals and their habitats through this plan will provide positive benefits to the wellbeing of humans in the main Hawaiian Islands.

Threat Identification and Ranking

Using this plan’s targets of Hawaiian monk seals and their marine and terrestrial habitats, we described and assessed the threats, starting first with direct threats.

Direct Threat Identification

Direct threats are primarily human-derived activities or circumstances that immediately and directly affect or degrade monk seals or their marine or terrestrial habitats. We first examined the sources of mortality for Hawaiian monk seals in the main Hawaiian Islands (Figure 3). For the 30 years from 1984-2014, there were 65 known monk seal mortalities where we had both gross (i.e., visual observations from necropsy) and histopathology data to make an informed determination as to a cause of death. The

primary sources of known mortality were undetermined (28%), trauma (18%; includes injury from hookings), infectious or inflammatory causes (15%), and failed pregnancy (12%). Malnutrition made up 6% of the mortalities, while entanglement, cardiovascular issues, suspected trauma, and other, each made up 5% of the mortalities. Of the 11 mortalities attributable to human sources from 1995-2014, four were hook-related (37%), three each from entanglement and gunshot trauma (27% each), and a single dog attack death (9%) (Figure 4).

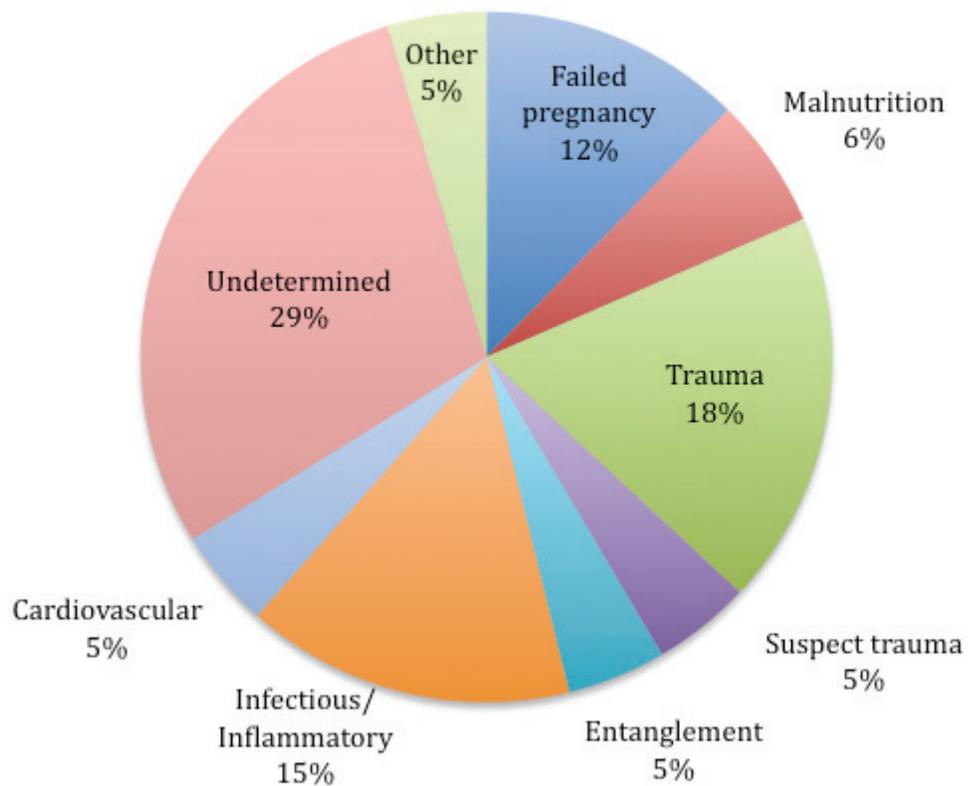


Figure 3. Causes of mortality in Hawaiian monk seals in the main Hawaiian Islands, 1984 through October 2014 (n=65 seals). *PIFSC unpub. data*

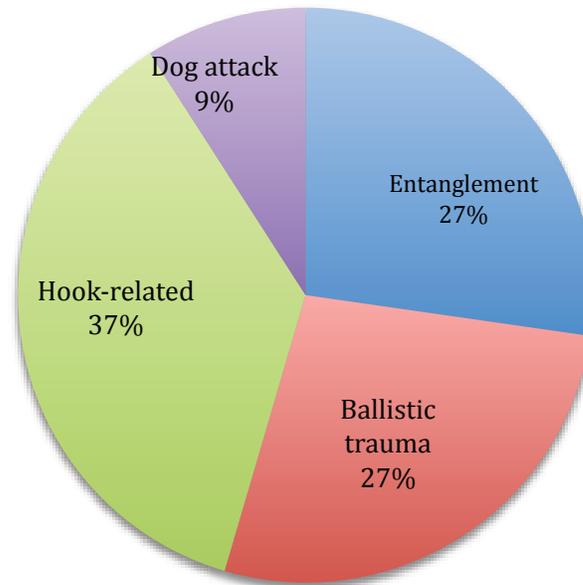


Figure 4. Mortalities of Hawaiian monk seals in the main Hawaiian Islands attributable to anthropogenic sources, 1995 through October 2014 (n=11). *PIFSC unpub. data*

Based on these empirical data and discussions, NOAA Fisheries scientists, agency partners, workshop participants, and native Hawaiian focus group participants, identified eight threats that directly have negative effects on monk seals or their habitat:

1. Disease
2. Intentional and non-fishing-related harm or removal
3. Fishing interactions and entanglement
4. Climate change
5. Invasive species
6. Impairment to water quality
7. Coastal development
8. Activities modifying the sea floor

1. Disease – Infectious diseases transmitted to monk seals in the main Hawaiian Islands from domestic pets, feral animals, insects, wastewater runoff, and contaminated stream water pose a serious recovery threat. While not currently causing widespread mortality, an infectious disease outbreak could have catastrophic implications to the small monk seal population in the main Hawaiian Islands. Potentially posing the highest risk to the monk seal population is morbillivirus (phocine distemper virus, cetacean morbilliviruses, and canine distemper virus). While phocine distemper virus has not yet been documented in Hawaii, closely related viruses have been observed in stranded cetaceans in Hawaiian waters (West *et al.* 2013) and have the potential to be transmitted across susceptible species, including to Hawaiian monk seals. Vaccination against canine distemper virus is routinely recommended in domestic

dogs, yet interactions between seals and canine carriers pose a possible pathway for introduction of this potentially devastating pathogen into a susceptible population. A preliminary survey of veterinarians in Hawaii revealed that while there was one reported case (by the 12 survey respondents), there is a relatively high amount of parvo seen in Hawaii (HMSRP, unpub. data). Given that distemper and parvo are vaccinated for in the same shot, this suggests that we do not have good vaccine compliance, and a fairly susceptible canine population; distemper is uncommon, but if there were a case in a dog in Hawaii, it would have the potential to spread rapidly.

Protozoal parasite exposure (e.g., *Toxoplasma gondii* and *Sarcocystis* spp.) has definitively caused at least six mortalities (HMSRP, unpub. data, Honnold *et al.* 2005, Yantis *et al.* 2003) and the prevalence of exposure among the wild population is under investigation using advanced technology. While not yet present in Hawaii, the mosquito-vectored West Nile virus is implicated in the mortality of a captive Hawaiian monk seal exposed on the United States mainland. Avian influenza is not yet present in Hawaii, but introduction of this virus would also pose a potential risk to Hawaiian monk seals (as well as poultry, native birds, and humans). The population impacts of disease from other animal or human sourced pathogens, such as leptospirosis and brucellosis, are presently considered to be low, but remain under investigation and may pose an increasing threat as human and seal populations increasingly coexist. The secondary or cumulative impacts of subclinical or chronic disease on foraging ability, reproduction, susceptibility to predation, and overall fitness are also of concern at the population level but are difficult to separate and quantify.

2. Intentional and non-fishing-related harm or removal – Intentional harm or removal refers to intentional injuring or killing of monk seals, as well as deliberate monk seal removal from the population into captivity by managers because of unintentional or intentional seal habituation and conditioning to humans. At least four monk seals appear to have been intentionally shot by humans in recent years (even though intentionally killing monk seals is against federal and state law), and there have been at least three other seal deaths in which human violence could not be ruled out as the cause of death. One seal has been removed from the main Hawaiian Islands into captivity so far because of behavioral conditioning and other health problems that jeopardized both human safety and the safety of the seal. At least two seals have been moved to the Northwestern Hawaiian Islands (and thus, removed from the breeding pool in the main Hawaiian Islands) due to behavioral conditioning leading to threats to their welfare and that of ocean users. Other situations may occur where monk seals are killed that do not fit into other categories. For instance, in July 2014, a 2-week-old monk seal pup was killed by a dog on Kauai. Five other seals were also injured in the attack (including the seal pup's mother, and two other mom-pup pairs), but there were no witnesses, so very little else is known about the incident.

3. Fishing interactions and entanglement – While recreational and commercial fishing is prohibited in the NWHI, in the main Hawaiian Islands there are interactions with commercial, recreational, and subsistence fishermen. Depending on the type of interaction, seals may be injured or killed due to being hooked, being drowned in lay gillnets, ingesting fishhooks, or having fish hooks embedded in their bodies. Monk seals also have to contend with being entangled in marine debris, which is primarily abandoned, discarded, and derelict fishing gear. But even non-fishing-related marine debris can be an entanglement hazard: two monk seals have been found entangled in packing straps. These entanglements can also lead to injury and death. Interactions with monk seals as a part of normal fishing activities also has the potential to drive animosity and resentment toward seals, which may sometimes lead a person to intentionally choose to injure or kill a seal (*threat #2*).

4. Climate change – The potential effects of climate change on Hawaiian monk seals are currently unknown, but there are several mechanisms through which climate change could impact seals in the main Hawaiian Islands. Sea level rise can decrease shoreline habitat needed for resting, pupping, rearing, nursing, molting, and mating. While there is much more land area in the main Hawaiian Islands than in the NWHI, 70% of beaches on Kauai, Oahu, and Maui are eroding with an average long-term rate of -0.11 meters per year (Fletcher *et al.* 2012). Twenty-two kilometers or 9% of beaches on the three islands were completely lost to erosion over the past century – in nearly all these locations, the shoreline is now characterized by coastal armoring such as seawalls.

In the marine habitat, ocean acidification and seawater warming can cause coral reef die-offs which could disrupt the overall marine ecosystem around Hawaii and degrade monk seal foraging habitat. Seawater warming can change localized ocean productivity, which could affect the area over which monk seals need to forage. Current evidence from the NWHI indicates that varying ocean productivity associated with temperatures and changes in ocean currents impacts juvenile survival, but we do not fully understand the drivers of seal survival from Laysan Island south through the main Hawaiian Islands.

5. Invasive species – Invasive species, especially invasive algae and fish, can have impacts on Hawaiian monk seals. Possible direct impacts of invasive species include preying on native species, out-competing native species for food or other resources, preventing native species from reproducing, killing the young of native species, and changing the food web dynamics in an ecosystem by destroying or replacing native food sources while providing little to no food value itself for other wildlife. Ultimately, the potential impacts of invasive species are unknown; these changes to native food webs could cause foraging and food limitation issues for monk seals, or could possibly also provide new food sources for monk seals. In addition, invasive species can alter the abundance or diversity of species that are important habitat for native wildlife. Some invasive species are even capable of changing the conditions in an ecosystem, such as altering water chemistry. Invasive species also can cause or carry disease.

6. Impairment to water quality – Impaired water quality is one of the major effects of humans being present in a coastal environment. Activities such as agriculture (fertilizers and pesticides), construction, manufacturing, sewage, burning of gasoline (driving), and littering, excess nutrients, sediments, toxic chemicals, and marine debris can pollute our marine environment and degrade the marine habitats upon which monk seals depend.

In Hawaii, land-based activities are the primary source of polluted runoff or non-point sources of pollution. The potential consequences of non-point source pollution are many: increased risk of disease from water recreation, algae blooms, fish kills, destroyed aquatic habitats, and turbid waters. Some polluted runoff can be the result of natural causes, such as heavy rains. However, most results from people's activities on the land and water, such as poor maintenance of sewage treatment facilities or infrastructure, and pollution caused by sewage and greywater released from cruise ships. Runoff carrying high sediment loads can cover near-shore coral reefs, disrupt photosynthesis and coral reproduction, directly smother corals, and allow the increase of harmful macroalgae. Coastal development is a primary driver of impairment to water quality through increased coastal activity, hardened surfaces, and sources of sediment and contaminants.

7. Coastal development – Coastal development can have direct and immediate adverse impacts on the coastal habitats Hawaiian monk seals depend on by decreasing and degrading available shoreline habitat needed for resting, pupping, rearing, nursing, and molting. Less shoreline habitat along with increased human presence in coastal areas also increases the chances of more human- seal interactions and seal disturbance incidents. Inland development also can have adverse impacts on the coastal environment. As inland development expands, upstream erosion increases, which reduces buffer zones and leads to increased flushing of terrestrial pathogens to the coastal environment.

Coastal development in many areas of Hawaii is at a premium, and the encroachment of the ocean onto multimillion-dollar residential and commercial lands and development has not gone unnoticed by the landowners. The response, in many cases, is to armor the shoreline with seawalls, revetments, sand bags, and other structures and devices, in many cases reducing or restricting the ability of monk seals to access the shoreline to haul out and rest. Artificial hardening of the shoreline protects coastal land at the expense of the beach where it causes chronic erosion and narrowing of the beach. On the island of Oahu, Fletcher et al. (2012) found that about 25 percent of sandy beaches have narrowed or been completely lost since 1949 as a result of artificial hardening of the shoreline. In an interaction between different threats, as coastal erosion increases with climate change, the rate of artificial shoreline hardening may be expected to increase.

8. Activities modifying the sea floor – Activities that modify the seafloor may have a direct and long-lasting adverse effect on the marine habitats that Hawaiian monk seals depend on for foraging. These activities include dredging, ocean aquaculture, offshore energy projects (wind farms, wave energy buoys, and ocean thermal energy conversion projects), marine industrial construction and repair, seabed mining, and installing inter- and intra-island cables. Depending on the method and location of implementation of the activities, they could potentially degrade the value of marine habitats for monk seals. Outside the scope and purview of this management plan, several laws and process already exist that regulate most of these activities including, Army Corps of Engineers permits, ESA Section 7 consultations between federal agencies, state Coastal Zone Management Planning Office, and compliance with the National Environmental Policy Act (NEPA) or Hawaii Environmental Policy Act (HEPA).

Threat Ranking

Each of the eight threats listed above was rated by Hawaiian monk seal experts as to its scope, severity, and irreversibility (permanence of effects) in relation to Hawaiian monk seals and their marine and terrestrial habitats (Table 1). Ranking threats helps to focus management efforts on those threats that have the largest impact (or potential impact) to the monk seal population.

Table 1. Ranking of threats to the conservation targets in the main Hawaiian Islands. Rankings are based on scope, severity, and irreversibility (definitions in Table 2).

Threats/Targets	Hawaiian Monk Seals	Marine Habitat	Terrestrial Habitat
Climate Change		Very High	Very High
Disease	Very High		
Coastal Development	Medium	High	High
Impairment to water quality		High	
Invasive Species		High	
Fishing interactions and entanglement	Medium		
Intentional harm or removal	Medium		
Activities modifying the sea floor		Low	

Table 2. Definitions of criteria used to rank threats.

Scope: *Most commonly defined spatially as the proportion of the target that can reasonably be expected to be affected by the threat within ten years given the continuation of current circumstances and trends. For ecosystems and ecological communities this is measured as the proportion of the target's occurrence. For species this measured as the proportion of the target's population.*

Low: The threat is likely to be very narrow in its scope, affecting the target across a small proportion (1-10%) of its occurrence/population.
Medium: The threat is likely to be restricted in its scope, affecting the target across some (11-30%) of its occurrence/population.
High: The threat is likely to be widespread in its scope, affecting the target across much (31-70%) of its occurrence/population.
Very High: The threat is likely to be pervasive in its scope, affecting the target across all or most (71-100%) of its occurrence/population.

Severity: *Within the scope, the level of damage to the target from the threat that can reasonably be expected given the continuation of current circumstances and trends. For ecosystems and ecological communities, typically measured as the degree of destruction or degradation of the target within the scope. For species, usually measured as the degree of reduction of the target population within the scope.*

Low: Within the scope, the threat is likely to only slightly degrade/reduce the target or reduce its population by 1-10% within ten years or three generations.
Medium: Within the scope, the threat is likely to moderately degrade/reduce the target or reduce its population by 11-30% within ten years or three generations.
High: Within the scope, the threat is likely to seriously degrade/reduce the target or reduce its population by 31-70% within ten years or three generations.
Very High: Within the scope, the threat is likely to destroy or eliminate the target, or reduce its population by 71-100% within ten years or three generations.

Irreversibility (Permanence): *The degree to which the effects of a threat can be reversed and the target affected by the threat restored.*

Low: The effects of the threat are **easily reversible** and the target can be **easily restored** at a **relatively low cost and/or within 0-5 years** (e.g., off-road vehicles trespassing in wetland).

Medium: The effects of the threat **can be reversed** and the target restored with a **reasonable commitment** of resources and/or within **6-20 years** (e.g., ditching and draining of wetland).

High: The effects of the threat **can technically be reversed** and the target restored, but it is **not practically affordable** and/or it would take **21-100 years** to achieve this (e.g., wetland converted to agriculture).

Very High: The effects of the threat **cannot be reversed** and it is **very unlikely** the target can be restored, and/or it would take **more than 100 years** to achieve this (e.g., wetlands converted to a shopping center).

Summary

Climate change and disease are two of the highest threats, due to their potential impact in the future. Currently, neither of these threats is causing a significant amount of mortality or injury to Hawaiian monk seals or their habitat. However, climate change was ranked highly because it will likely affect both terrestrial and marine habitats, and the potential effects are unknown, but those effects could have widespread and catastrophic impacts that would be very difficult to reverse. Infectious and inflammatory causes are one of the more frequent causes of death in the main Hawaiian Islands, but are not currently widespread or limiting population growth. An infectious disease outbreak has not yet occurred; and while an outbreak would only affect monk seals themselves (and not degrade the habitat), it could again have devastating effects to the small monk seal population.

Coastal development, impairment to water quality, and invasive species were all recognized as generalized threats that all pose a high threat, mostly to marine habitat, though coastal development is also considered a threat to shoreline habitat, and potentially to monk seals themselves.

Fishing interactions and entanglement, and intentional/non-fishing-related harm or removal are each categorized as medium threats. Our historical data shows that known seal deaths from human causes have been primarily due to hookings, entanglements, and intentional killings. However, when looking at all monk seal deaths to date (with adequate data to determine a cause of death), infectious/inflammatory causes, failed pregnancy, and malnutrition were the most frequent causes of death apart from trauma. So in the greater scope of the main Hawaiian Islands population, these human-related injuries and deaths have occurred at a consistent, but relatively low, frequency.

Finally, activities modifying the sea floor, such as dredging, ocean aquaculture, offshore energy projects, installing inter- and intra-island cables, etc. have the potential to destroy or harm monk seal marine habitat. However, this was ranked a low threat because of the relatively low frequency and footprint of these activities compared to the areas over which monk seals forage, and the existence of other laws and regulatory mechanisms (such as Army Corps of Engineers permits, ESA Section 7 consultations between federal agencies, and rules from the state Coastal Zone Management Planning Office) that help to minimize the impact of those activities.

In the next section, we will discuss the contributing factors and other indirect threats that lead to these identified direct threats. The purpose of this is to understand not only the threats themselves, but the source of threats, and the interplay in factors that causes the threats. Nearly all of the threats are broad

in scope across the main Hawaiian Islands, are a result of multiple factors, and are issues that NOAA Fisheries and the Hawaiian Monk Seal Recovery Program do not have direct jurisdiction over. However, it is important to recognize when complicated and multi-source issues significantly intersect with Hawaiian monk seal management and recovery to fully present the problem so that strategies and actions within our purview may be identified.

Situation Analysis of Direct and Indirect Threats to Monk Seal Conservation

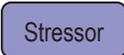
A visual diagram or “conceptual model” helps to show the causal relationships among different factors believed to influence the direct threats that impact these seals and their habitat (detailed definitions of each type of component can be found in Table 3). Starting from the direct threats to Hawaiian monk seals and their habitat, we created a diagram (Figure 5) showing the relationships between the indirect effects (or contributing factors) that lead to each of the direct threats. To analyze the situation, we worked backwards from the direct threats, thinking about the root causes of each, and the factors that contributed to making that threat worse (or better). As we built the diagram, we gathered information from Hawaiian monk seal experts, partners, and stakeholder groups in the main Hawaiian Islands, such as native Hawaiian focus groups, workshops, community meetings (sometimes related to other monk seal processes such as the Programmatic Environmental Impact Statement or critical habitat), and targeted meetings with stakeholders.

Building a Conceptual Model: Analyzing the Situation

Before deciding what actions to take to manage monk seals in the main Hawaiian Islands, it is important to have a clear understanding of what the situation and context is within the scope of the project. To do this, the various planning teams and other consulted participants analyzed the conservation targets for main Hawaiian Islands monk seals and their direct threats. These individuals then identified the biological, social, cultural, economic, political, and institutional factors that contribute to those threats. Those contributing factors, along with the direct threats and the conservation targets, were then used to build a conceptual model of the current situation of monk seals living in the main Hawaiian Islands.

When creating a conceptual model using the *Open Standards for the Practice of Conservation*, it is important to understand the terms and concepts used and the relationships between them. The terms listed in Table 3 describe a conceptual model of conservation planning and the *Miradi* symbol associated with each term.

Table 3. Components of a conceptual model as defined by *Miradi* and the *Open Standards*.

Term	Definition	Miradi Symbol
<i>Conceptual model</i>	A diagram illustrating the cause-and-effect relationships between different factors that you and your team believe exist within your project area. It should be as simple as possible while still including the most important details. Conceptual models are not perfect, but they should do a reasonable job of representing what is happening within the project scope. A conceptual model should be built with as much team participation as possible to make it generally represent what is happening.	Combination of symbols along with their relationship arrows.
<i>Conservation Target</i>	A limited suite of species, communities, and ecological systems that are chosen to represent and encompass the full array of biodiversity found in a project area. <i>Conservation targets</i> are the basis for setting goals, carrying out conservation actions, and measuring conservation effectiveness. Typical <i>conservation targets</i> include key ecosystems, focal species, or ecological processes that are threatened under the current situation.	
<i>Direct threat</i>	A primary agent or factor that directly degrades one or more <i>conservation targets</i> . <i>Direct threats</i> are primarily human activities that immediately degrade a biodiversity target (such as unsustainable fishing and hunting, oil drilling, construction of roads, pollution, or introduction of exotic invasive species). <i>Direct threats</i> can also include natural phenomena altered by human activities (such as global warming caused by fossil fuel use) or natural phenomena whose impact is increased by other human activities (such as a tsunami that threatens the last remaining population of an Asian rhino).	
<i>Contributing factor (indirect threat or opportunity)</i>	A human-induced action or event that influences or leads to one or more <i>direct threats</i> . <i>Contributing factors</i> can be either an <i>indirect threat</i> or an <i>opportunity</i> , or a given <i>contributing factor</i> (such as tourism) can be both an <i>indirect threat</i> and an <i>opportunity</i> . Some find it helpful to focus on neutral "factors" rather than trying to classify contributing factors as being either positive or negative.	
<i>Stressor</i>	An impaired aspect of a conservation target that results directly or indirectly from human activities (such as a low species population size, reduced river flows, increased sedimentation, or lowered groundwater table level). A <i>stressor</i> is generally equivalent to a degraded key ecological attribute (for example habitat loss).	
<i>Recommended Strategy</i>	A broad course of actions designed to restore natural systems, reduce <i>threats</i> , or develop capacity. A <i>strategy</i> typically describes a set of specific conservation actions that work together to achieve specific goals and objectives by targeting key intervention points, integrating opportunities, and limiting constraints.	

Situation Analysis - Contributing Factors and Overarching Themes

The situation analysis diagram (Figure 5) shows the cause and effect relationships between factors that lead to direct threats to Hawaiian monk seals and their habitat. This describes the situation around monk seal management and conservation in the main Hawaiian Islands, and helps us understand how (and where) to best intervene and apply effective management strategies (to be refined later into strategies in the final management plan). We have distilled the many factors leading to the threats to monk seals in the main Hawaiian Islands into three overarching themes:

1. Public knowledge and attitudes,
2. Engagement and communication, and
3. Management capacity.

All the other challenges and threats are a result of how these three themes currently function and relate to each other in the main Hawaiian Islands. A summary of indirect threats and opportunities (i.e., contributing factors leading to direct threats) organized by the three themes follows below.

1. Public knowledge and attitudes about Hawaiian monk seals are influenced by many factors, including depleted local fisheries (exacerbating feelings of competition with seals), the seals' connection to Hawaiian culture, history and relationships between government agencies and communities, and people's scientific and environmental awareness. The public's knowledge and attitudes greatly influence their support for or opposition toward monk seal conservation, as well as their own choices when they directly encounter wild monk seals.

- Injuries to and intentional killing of monk seals have potentially been linked to negative attitudes toward the U.S. government, misconceptions that monk seals are invasive species or responsible for depleted fish stocks and degradation of sea floor habitat, and more general feelings of disrespect and disenfranchisement by the government or monk seal recovery program.
- Social interaction with, feeding of (intentionally or unintentionally), and disturbance of monk seals by fishermen, beachgoers, or other ocean users can habituate or condition seals to people, to an area, or into undesirable behaviors. Seals that become conditioned to seek out human interaction may be at higher risk for disease transmission from close contact with domestic animals, higher risk of entanglement if they seek out active fishing gear, or may exacerbate negative attitudes of fishermen who fear for their safety or become frustrated and angry at seal depredation of bait and catch.
- Negative relationships or interactions with government agencies and officials tasked with managing monk seals can lead to negative feeling towards monk seals (this can include volunteers who may be perceived as representatives of the government, and other partners in monk seal recovery), and in extreme cases, intentional killings.
- Poor environmental knowledge of or a negative attitude toward monk seals may bring about lack of compliance with laws, regulations, and guidelines that help conserve seals.
- Exposure of monk seals to domestic pets may increase the transmission of disease-causing pathogens to the seal.
- Discarding of bycatch or offal off commercial fishing boats can cause (or encourage) monk seals to interact with active fishing gear and possibly be injured or entangled.
- Disposing of trash improperly and throwing away old or broken fishing gear in the ocean or on the beach creates an entanglement hazard for monk seals.

2. Engagement and Communication between and within the public, the government, and the non-governmental conservation community are very important. Quality engagement and communication is crucial to how the public's knowledge and attitudes about monk seals develop and to how successful management is in performing its regulation, funding, partnering, and coordination roles.

- Relationships between local communities and conservation communities can be either a challenge or an opportunity depending on the issue. In some cases, local communities have a conservation ethic related to a specific issue and can join forces with conservation groups, but in other cases, local communities feel that the conservation community does not share in their local concerns and practices.
- It is important to have positive relationships between the government and the public, the Native Hawaiian community, the local fishing community, and private businesses and landowners. Lack of community outreach programs, poor communication strategies, and inadequate community input (actual and perceived) into federal regulations and policies can hurt these relationships.
- Relationships between Hawaiian monk seal volunteers and the public or local communities are also important due to the one-on-one nature of the interaction. In many cases, the volunteer may be the only resource of information that the public or local community has, so it is important that the information is correct and conveyed properly, and with an appropriately respectful and inclusive attitude.

3. Management capacity is the ability or capability of management (federal and state agencies) to effectively regulate, adequately fund programs, partner with organizations and communities, and productively communicate and coordinate with other government agencies and officials. Management capacity plays a large role in how well communities are engaged, how coastal development occurs, how communities and economies grow, how fisheries and protected resources are managed, how non-native species are introduced (or not) to an area, how climate change can be mitigated (or planned for), and how disease spreads through monk seal populations.

- Adequate management capacity improves the ability of managers to respond to seals with behavioral issues of concern, entanglement and fishery issues, and disease issues.
- Marine fisheries produce marine debris and derelict fishing gear, as well as actively fished gear.
- Disease causing pathogens and contaminants can enter the Hawaiian monk seal population due to poor agricultural practices, inadequate animal containment and control, and contact with other wild animals.
- Ability to effectively engage with partner federal, state, and local governments to positively impact conservation laws and enforcement, coastal development, coastal zone management and land-use planning, and invasive species control.
- Inadequate conservation and environmental laws and inadequate enforcement lead to poor coastal development and actions that exacerbate climate change.
- Growing coastal communities and economies in Hawaii increase residential and tourist populations and drive greater coastal infrastructure and activities.
- Current coastal zone management and land-use planning lead to increased coastal development.
- Accidental or intentional introduction of non-native species to Hawaiian waters degrades marine habitat and prey resources.

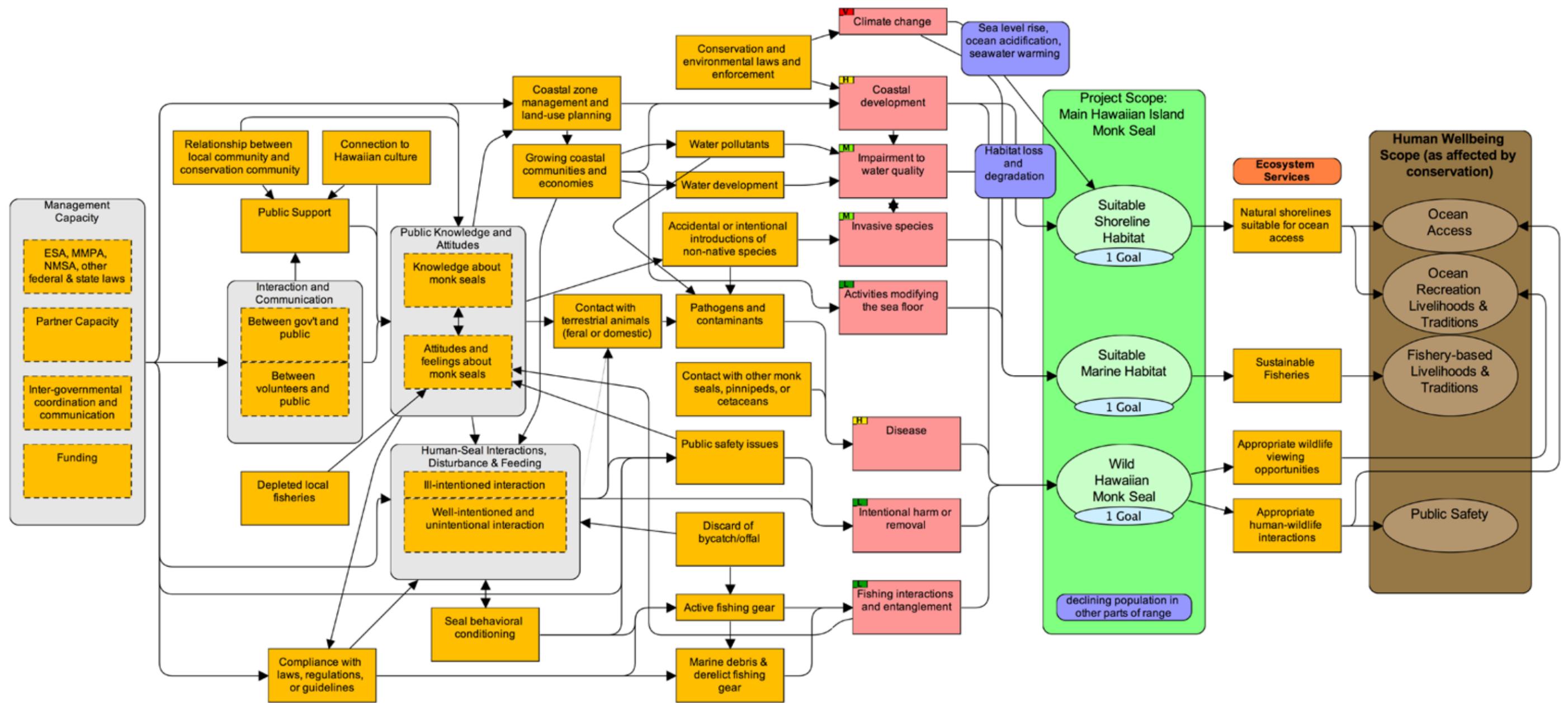


Figure 5. Conceptual model (i.e., situation analysis) showing the relationships between the threats (both direct and indirect) to monk seal conservation in the main Hawaiian Islands.

The contributing factors in these three themes work together to produce the direct threats that adversely affect wild Hawaiian monk seals and their habitat. But within this current situation are opportunities for change, and opportunities to develop strategies to make a difference in areas such as sustainable fisheries management, monk seal disease outbreak reduction, management capability enhancement, monk seal response, invasive species reduction, sustainable coastal development, and community stewardship.

Identification and Prioritization of Recommended Strategies

Using the situation analysis diagram and threat ranking, we identified opportunities where management strategies could potentially intervene and change a direct threat, or reduce an indirect threat (that would otherwise lead to a direct threat). The recommended strategies developed here were used as recommendations for the strategies in the final management plan.

NOAA Fisheries biologists, partners, stakeholders, and other community members recommended 10 strategies that were used as the basis for the final strategies put forward in the *Main Hawaiian Islands Monk Seal Management Plan*:

1. Build management capacity
2. Engage communities and build local capacity
3. Increase outreach and education
4. Prevention and effective response to seals of concern
5. Reduce the likelihood of infectious disease outbreaks
6. Reduce monk seal-fishery impacts through engagement, outreach, and prevention
7. Support sustainable fishery management
8. Support environmentally sustainable coastal development
9. Support control of non-native and invasive species
10. Support climate change planning and response

In Table 4, the recommended strategies are ordered by their likely effectiveness, which is a combination of their impact and feasibility ratings. Potential “impact” describes to what extent the recommended strategies, if implemented, will likely lead to the desired reduction in the threat. “Feasibility” refers to the extent to which implementing the recommended strategy is feasible within likely time, financial, staffing, ethical, and other constraints.

Table 4. Prioritization of recommended strategies identified for managing and conserving monk seals in the main Hawaiian Islands, ordered by their effectiveness, which is a combination of their impact and feasibility ratings.

Recommended Strategies	Impact rating: If implemented, will the strategy lead to desired changes?	Feasibility rating: Will project team be able to implement the strategy within the project constraints?	PRIORITY: Combined effectiveness rating
1. Build management capacity	High	High	Effective
2. Engage communities and build local capacity	High	High	Effective
3. Increase outreach and education	High	High	Effective
4. Prevention and effective response to seals of concern	High	High	Effective
5. Reduce the likelihood of infectious disease outbreaks	High	High	Effective
6. Reduce monk seal-fishery impacts through engagement, outreach, and prevention	High	High	Effective
7. Support sustainable fishery management	Medium	Medium	Less Effective
8. Support environmentally sustainable coastal development	Medium	Medium	Less Effective
9. Support control of non-native and invasive species	Low	Medium	Least Effective
10. Support climate change planning and response	Low	Medium	Least Effective

Impact and Feasibility Ranking Criteria

Potential impact:

Very High-The strategy is very likely to completely mitigate a threat or restore a target.

High-The strategy is likely to help mitigate a threat or restore a target.

Medium-The strategy could possibly help mitigate a threat or restore a target.

Low-The strategy will probably not contribute to meaningful threat mitigation or target restoration.

Feasibility:

Very High-The strategy is ethically, technically, and financially feasible.

High-The strategy is ethically and technically feasible, but will require some additional funding and other resources.

Medium-The strategy is ethically feasible, but either technically or financially difficult.

Low-The strategy is not ethically, technically, and/or financially feasible.

The contributing factors in the three themes described in the previous section work together to produce the direct threats that adversely affect wild Hawaiian monk seals and their habitat. But within this current situation are opportunities for change, and opportunities to develop strategies to make a difference in areas such as sustainable fisheries management, monk seal disease outbreak reduction, management capability enhancement, monk seal response, invasive species reduction, sustainable coastal development, and community stewardship.

Building Results Chains: Developing Recommended Strategies

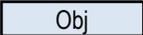
For each recommended strategy a diagram is presented showing specific step-by-step processes, or “results chain,” by which each strategy will reduce the threats.

Where applicable, actions stated in the *Hawaiian Monk Seal Recovery Plan* are referenced in parentheses (as “Recovery Plan Action”). A summary in Table 7 at the end of this section displays all the objectives together.

Just as with conceptual models, when developing results chains for recommended strategies using the *Open Standards for the Practice of Conservation* it is important to understand the terms and concepts used in a results chain and the relationships between them. The terms listed in Table 5 describe a results chain and the *Miradi* Symbol associated with each term.

Table 6 shows the relationship between the recommended strategies (used to inform the final strategies in the management plan) and the threats and contributing factors that are addressed by each.

Table 5. Components of a results chain as defined by *Miradi* and the *Open Standards*.

Term	Definition	Miradi Symbol
<i>Results Chain</i>	<p>A <i>results chain</i> is a tool that clarifies assumptions about how conservation activities are believed to contribute to reducing threats and achieving the conservation of biodiversity or thematic <i>targets</i>. <i>Results chains</i> are diagrams that map out a series of causal statements that link factors in an "if...then" fashion - for example, if a <i>threat</i> is reduced, then a biodiversity <i>target</i> is enhanced or if an opportunity is taken, then a thematic target might be improved. In some organizations, <i>results chains</i> are also termed logic models. The basis for a <i>results chain</i> comes from factor chains from your conceptual model, but you will build on those factor chains to make them more specific and to change the boxes from neutral factors describing the current state of the world to results you want to see.</p>	Combination of symbols along with their relationship arrows.
<i>Recommended Strategy</i>	<p>A broad course of actions designed to restore natural systems, reduce threats, or develop capacity. A <i>strategy</i> typically describes a set of specific conservation actions that work together to achieve specific goals and objectives by targeting key intervention points, integrating opportunities, and limiting constraints.</p>	
<i>Intermediate result</i>	<p>A feature in a <i>results chain</i> that describes a specific outcome that results from implementing one or more conservation <i>strategy</i> or actions.</p>	
<i>Objective</i>	<p>A formal statement detailing the desired outcomes and changes that you believe are necessary to attain your goals. <i>Objectives</i> specify the desired changes in the factors that you would like to achieve in the short- and medium-term and are attached to intermediate or threat reduction results. Good <i>objectives</i> are results oriented, measurable, time limited, specific, and practical.</p>	
<i>Indicator</i>	<p>A measurable entity related to a specific information need (the status of a target, a change in a threat, or progress towards an objective). A good <i>indicator</i> meets the criteria of being measurable, precise, consistent, and sensitive. <i>Indicators</i> are attached to intermediate or threat reduction results.</p>	
<i>Threat reduction result</i>	<p>A feature in a <i>results chain</i> that describes the desired change in a direct threat that results from implementing one or more conservation <i>strategy</i>.</p>	
<i>Conservation Target</i>	<p>A limited suite of species, communities, and ecological systems that are chosen to represent and encompass the full array of biodiversity found in a project area. They are the basis for setting goals, carrying out conservation actions, and measuring conservation effectiveness. <i>Targets</i> typically include key ecosystems, focal species, or ecological processes that can be enhanced due to the <i>strategies</i> developed to improve them.</p>	

RECOMMENDED STRATEGIES	DIRECT THREATS										CONTRIBUTING FACTORS		
	Very High		High		Medium		Low		Public knowledge and attitudes	Engagement and communication	Management capacity		
	Climate change	Disease	Coastal development	Impairment to water quality	Invasive species	Fishing interactions and entanglement	Intentional and non-fishing-related harm or removal	Activities modifying the sea floor					
High Priority/Effective	1. Build management capacity	X	X	X	X	X	X	X	X	X	X	X	
	2. Engage communities and build local capacity	X	X	X	X	X	X	X	X	X	X	X	
	3. Increase outreach and education	X	X	X	X	X	X	X	X	X	X	X	
	4. Prevention and effective response to seals of concern		X				X			X		X	
	5. Reduce the likelihood of infectious disease outbreaks		X					X				X	
	6. Reduce monk seal-fishery impacts through engagement, outreach, and prevention						X			X		X	
Medium Priority/Less Effective	7. Support sustainable fishery management				X	X	X	X	X	X	X	X	
Low Priority/Not Effective	8. Support environmentally sustainable coastal development	X	X	X	X	X	X	X	X	X	X	X	
	9. Support control of non-native and invasive species		X		X	X	X	X	X	X	X	X	
	10. Support climate change planning and response	X		X	X	X	X	X	X	X	X	X	

Table 6. Relationship between the recommended strategies and the threats and contributing factors that are addressed by each.

Recommended Strategies

Recommended Strategy #1: Build management capacity

Management capacity plays a large role in all aspects of regulation and implementation of Hawaiian monk seal conservation and recovery efforts (see Table 6). It is therefore an effective management strategy with a high degree of impact, and is highly feasible both ethically and technically (Table 4).

Hawaiian monk seal conservation and recovery depend on the capability of management agencies (federal and state) to effectively regulate, adequately fund programs, partner with appropriate organizations and communities, and productively communicate and coordinate with other government agencies and officials. This strategy is fundamental to reducing and minimizing the threats to monk seals in the main Hawaiian Islands and addressing major contributing factors (Figure 6). As Figure 7 illustrates, reading left to right, a first step in implementing this strategy is creating an effective process of collaboration and engagement with agency and NGO partners, elected officials, and communities. Other collateral activities center on law enforcement, volunteer management, and information flow. By increasing communication and engagement we expect to improve attitudes, foster greater support and advocacy for monk seal recovery by partners, increase knowledge of issues and compliance with laws and guidelines, and garner a greater commitment from the government and public to monk seal recovery. Measureable outcomes from implementing this strategy should include a reduction in the number of seals intentionally killed or removed from the wild and a reduction in the amount of fishing interactions. This strategy shares objectives with other strategies, and as a result it may only be successful if other recommended strategies are also successfully implemented.

A management capacity strategy is recommended to reduce the direct threats of:

- Climate Change
- Disease
- Coastal development
- Impairment to water quality
- Invasive species
- Fishing interactions and entanglement
- Intentional and non-fishing-related harm or removal
- Activities modifying the sea floor

This recommended strategy will also address the overarching themes of:

- Public Knowledge and Attitudes
- Engagement and Communication
- Management Capacity

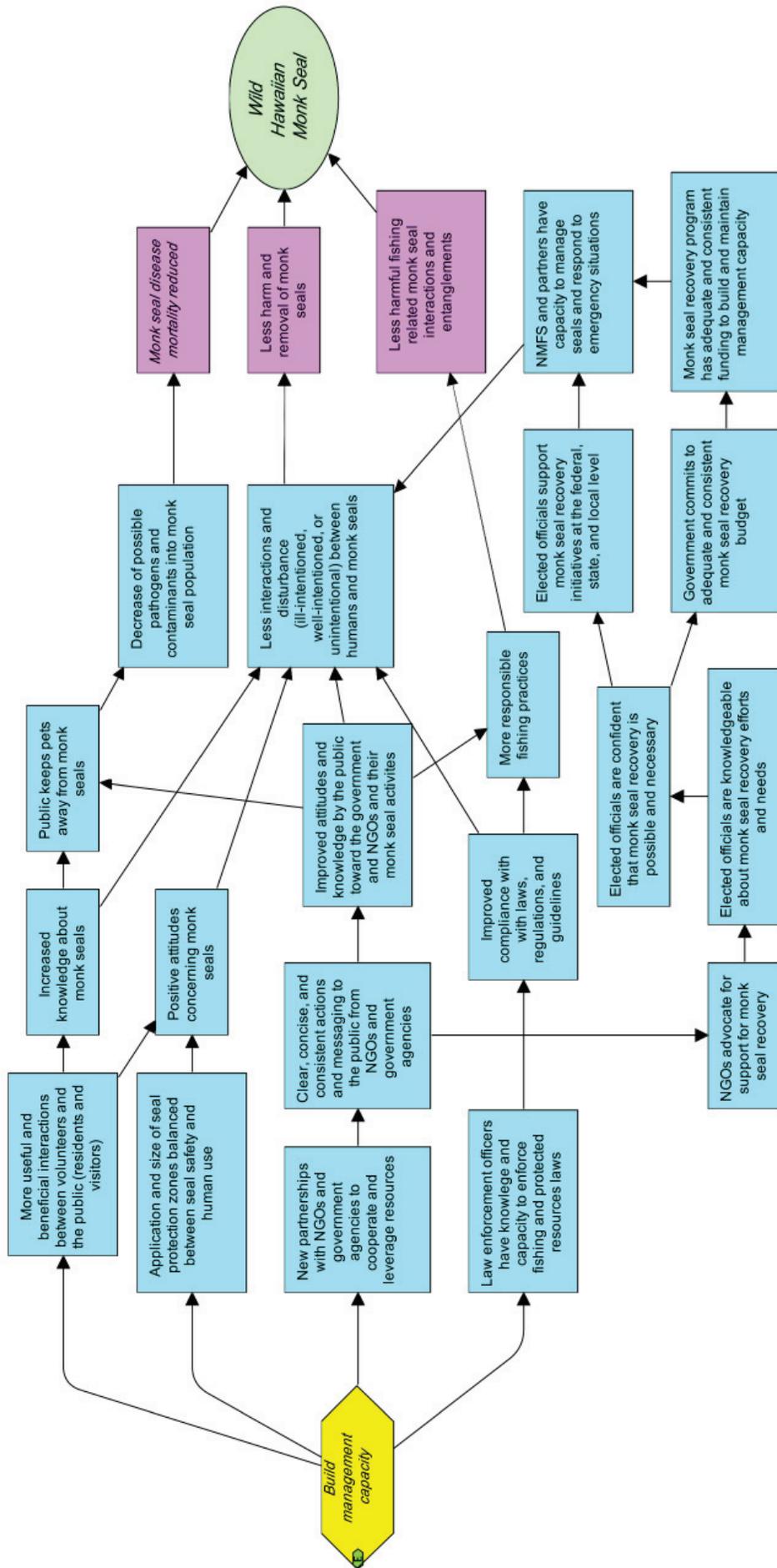


Figure 6. Recommended strategy #1 for building management capacity for the management of monk seals in the main Hawaiian Islands.

Recommended Strategy #2: Engage communities and build local capacity

Engagement and communication directed at local communities play a major role in shaping public perception and understanding of issues pertaining to monk seals, which in turn has a significant impact on public interactions with seals and the enabling environment for conservation work (Table 6). This strategy is expected to have a high level of impact, and is highly feasible (Table 4).

Managing seals in the main Hawaiian Islands requires doing so within the social and cultural context of the islands and the host cultures. To create a sustainable management program that partners and stakeholders support, engagement must happen early and often (Figure 7). As Figure 7 illustrates, reading left to right, a first step in implementing this strategy is improving communication with stakeholders and increasing NOAA Fisheries' presence in and relationship with communities. While NOAA Fisheries routinely attempts to engage stakeholders in transparent and open dialogue and management of monk seals, the agency has had a difficult time engendering lasting trust or constructive feedback and participation of its critics. This strategy recognizes that the process of community engagement and trust-building is slow, but that engaging local communities and stakeholders one-on-one and listening to their concerns, as well as exchanging up-to-date information about monk seals, creates better relationships between communities and the government.

Through the development of a trusting and respectful relationship, we expect to increase a shared aspiration with communities that monk seals and humans can successfully live together. Community members then are more likely to engage in their own outreach and education efforts, and teach about the dangers of marine debris, illegal fishing practices, and interacting with monk seals. These connections can be enhanced further by including more of Hawaii's diverse social and cultural groups in the response network. In particular, communities with strong native Hawaiian cultural affiliations need effective engagement. We expect that improving engagement will improve trust, and, in turn, community members will be more inclined to participate in management and recovery activities. We also expect that increased engagement would elicit greater understanding of monk seals, their impact on the ecosystem (so seen less as a competitor for targeted fish species), and people will make better choices around seals in the wild (so fewer seals develop behavioral problems and cause negative interactions and public safety issues), all of which would likely reduce animosity toward seals. Ultimately, we expect that this would result in fewer seals being intentionally harmed or killed. In addition, this could engender greater adherence to Hawaiian traditions and practices related to sustainable resource use and co-existence with natural resources, including Hawaiian monk seals.

An engagement strategy is recommended to reduce the direct threats of:

- Climate Change
- Disease
- Coastal development
- Impairment to water quality
- Invasive species
- Fishing interactions and entanglement
- Intentional and non-fishing-related harm or removal

This recommended strategy will also address the overarching themes of:

- Public Knowledge and Attitudes
- Engagement and Communication
- Management Capacity

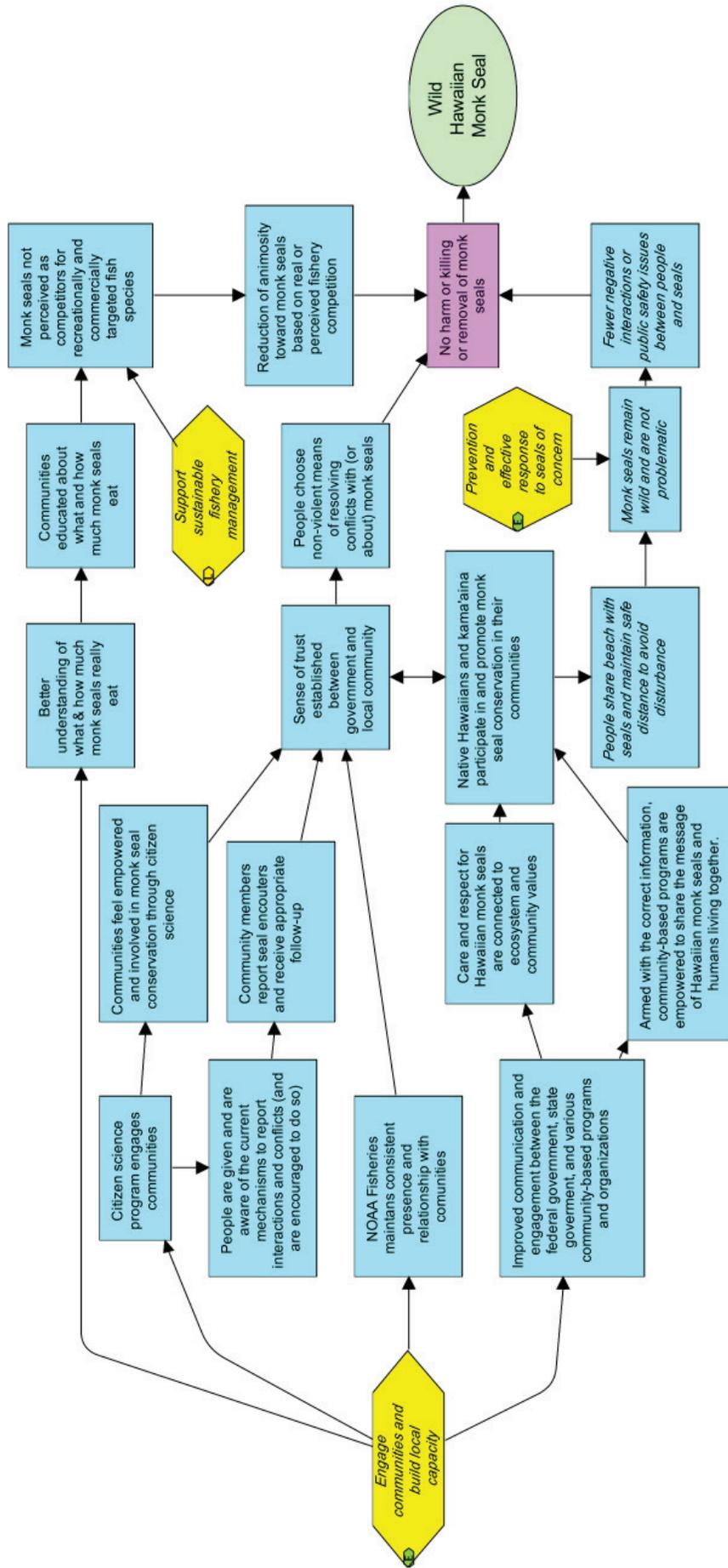


Figure 7. Recommended strategy #2 for engaging communities and building local capacity.

Recommended Strategy #3: Increase outreach and education

Public knowledge about and attitude toward Hawaiian monk seals play a major role in influencing decision-making when it comes to actions that may directly or indirectly affect seals (Table 6). This is an effective recommended strategy that NOAA and partners are well positioned to implement, and is expected to have a high level of impact (Table 4).

The more knowledgeable Hawaii residents and tourists are about monk seals, the better they can thoughtfully understand and support monk seal recovery efforts. Community members can help reduce the spread of misinformation, engender environmental stewardship, and foster a reduction in negative interactions with monk seals (Figure 8). When residents and visitors choose to behave in a way that allows seals to remain wild, fewer negative interactions and public safety issues are likely. Ultimately, we expect this strategy would result in fewer seals being intentionally harmed or removed because of public safety issues, fewer seals involved in fishing interactions and entanglement, and fewer seals exposed to risks of disease and habitat modification. With increased scientific and environmental awareness, the public's new knowledge and attitudes will greatly influence monk seal conservation and recovery.

While we present outreach and education as a single strategy, outreach and education activities support all strategies related to managing monk seals. Outreach and education activities require continual implementation and modification to begin and continue the process of behavioral change. Changing attitudes and increasing knowledge is not a onetime endeavor. Changing people's behavior requires imparting assurances that individual actions make a difference, and getting to this point will take a concerted effort by all involved in monk seal management.

An outreach strategy is recommended to reduce the direct threats of:

- Climate Change
- Disease
- Coastal development
- Impairment to water quality
- Invasive species
- Fishing interactions and entanglement
- Intentional and non-fishing-related harm or removal
- Activities modifying the sea floor

This recommended strategy will also address the overarching themes of:

- Public Knowledge and Attitudes
- Engagement and Communication
- Management Capacity

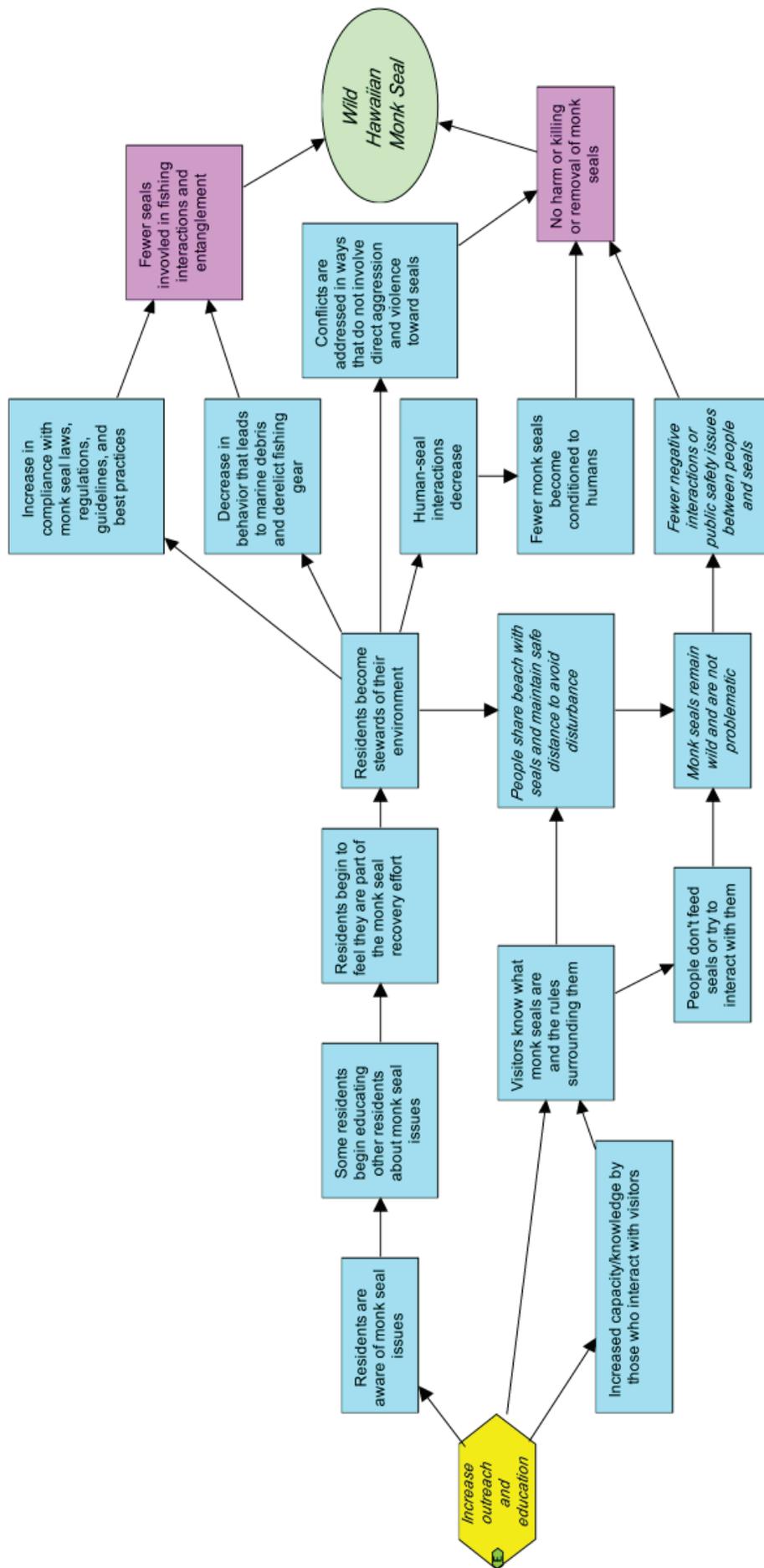


Figure 8. Recommended strategy #3 for increasing outreach and education about Hawaiian monk seals.

Recommended Strategy #4: Prevention and effective response to seals of concern

Efficient and timely response to seals of concern has proven to be highly impactful in the past, and continuing and improving this effort is highly feasible. Prevention and effective response to seals of concern is expected to be an effective management strategy (Table 4).

The Hawaiian Monk Seal Recovery Program and partners have a toolbox of options for intervening with monk seals of concern. First, as illustrated by Figure 9, NOAA Fisheries must receive timely reports to seals of concern. In turn, NOAA Fisheries must respond effectively, and in a timely manner. Well-trained employees, partners, and available care facilities are key to successful response and management of seal situations. “Response” may mean capturing seals and rendering medical care either *in situ* or in an animal care/rehabilitation facility, but may also mean responding by assessing a situation and determining that the best course of action is to not intervene. Both cases can represent appropriate responses depending upon the situation and the course of action warranted. If NOAA Fisheries can respond to sick, injured, or stranded monk seals and render appropriate treatment, then there will be fewer and less-harmful fishing-related monk seal interactions and entanglement, as well as a reduced likelihood of disease transmission through the population. These responses are also opportunities for overall population health monitoring, as well as other research activities.

If NOAA Fisheries receives timely reports of seals of concern, and is able to apply behavioral management techniques, then we should expect to see fewer habituated and conditioned monk seals, fewer seals seeking out active fishing gear and other human interactions (and thus fewer public safety conflicts between seals and humans), fewer interactions between seals and domestic animals (and thus a reduction in the risk of disease transmission), and less animosity toward seals. Behavioral modification is not the sole solution for seal behavior concerns; outreach and human behavior change are also necessary. In many cases, behavior modification techniques are unlikely to be successful if humans continue to reinforce undesirable behaviors in seals, such as spending time in harbors or approaching human swimmers to try to obtain food or “play.” Reducing these factors should ultimately lead to a reduction in the risk of mortality and a lowered risk of intentional harm or removal of seals for public safety issues.

A response strategy is recommended to reduce the direct threats of:

- Disease
- Fishing interactions and entanglement
- Intentional and non-fishing-related harm or removal

This recommended strategy will also address the overarching themes of:

- Public Knowledge and Attitudes
- Engagement and Communication
- Management Capacity

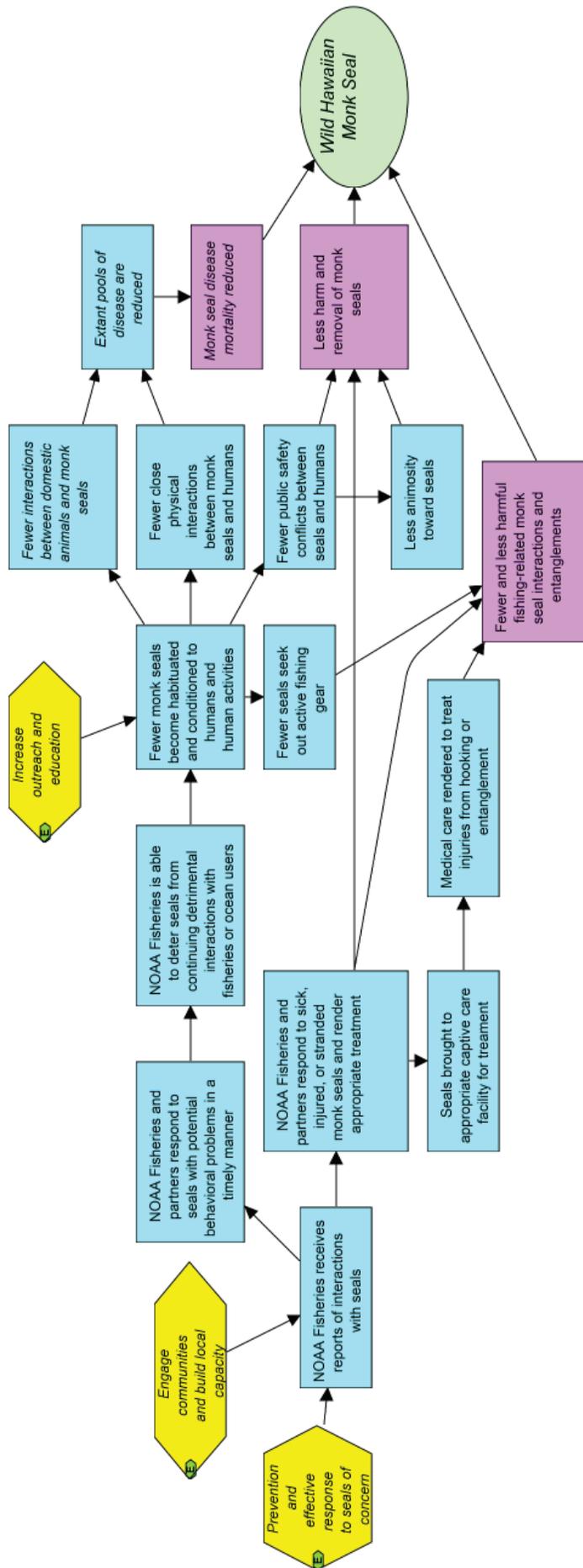


Figure 9. Recommended strategy #4 for effectively responding to monk seals of concern.

Recommended Strategy #5: Reduce likelihood of infectious disease outbreaks

Given the magnitude of the potential risk to the monk seal population, reducing the likelihood of infectious disease outbreaks is considered a highly impactful recommended strategy, as well as highly feasible, and is therefore expected to be an effective management strategy (Table 4).

There is a high risk of a widespread disease outbreak among main Hawaiian Islands monk seals due to the risk of infectious diseases transmitting from domestic and feral animals, wastewater runoff, and contaminated streams. Potentially posing the highest risk to the monk seal population are toxoplasmosis, leptospirosis, brucellosis, morbillivirus infection, and West Nile virus. It is important to find ways to reduce the possibility and frequency of transmission to monk seals, including having strong disease prevention programs, disease treatment and response programs, and prevention of disease-causing pathogens from entering Hawaii (Figure 10). This would require collaboration with state partners in animal health and quarantine. While West Nile virus, avian influenza, and phocine distemper virus are not currently present in Hawaii, they have the potential to cause devastating effects in this naïve population, and having strong disease surveillance activities and importation and quarantine programs helps keep them from entering Hawaii and increases our ability to recognize emerging threats to survival. Increased public understanding of the disease risk from feral and domestic animals, and better coordination and communication with partner organizations, should lead to more support for feral animal control, effective monitoring and surveillance of disease in feral and domestic animal populations, effective animals importation and quarantine policies, and ultimately a reduction in the extant pools of disease that pose a mortality risk for monk seals.

A strategy addressing disease risks is recommended to reduce the direct threats of:

- Disease
- Invasive species

This recommended strategy will also address the overarching themes of:

- Public Knowledge and Attitudes
- Engagement and Communication
- Management Capacity

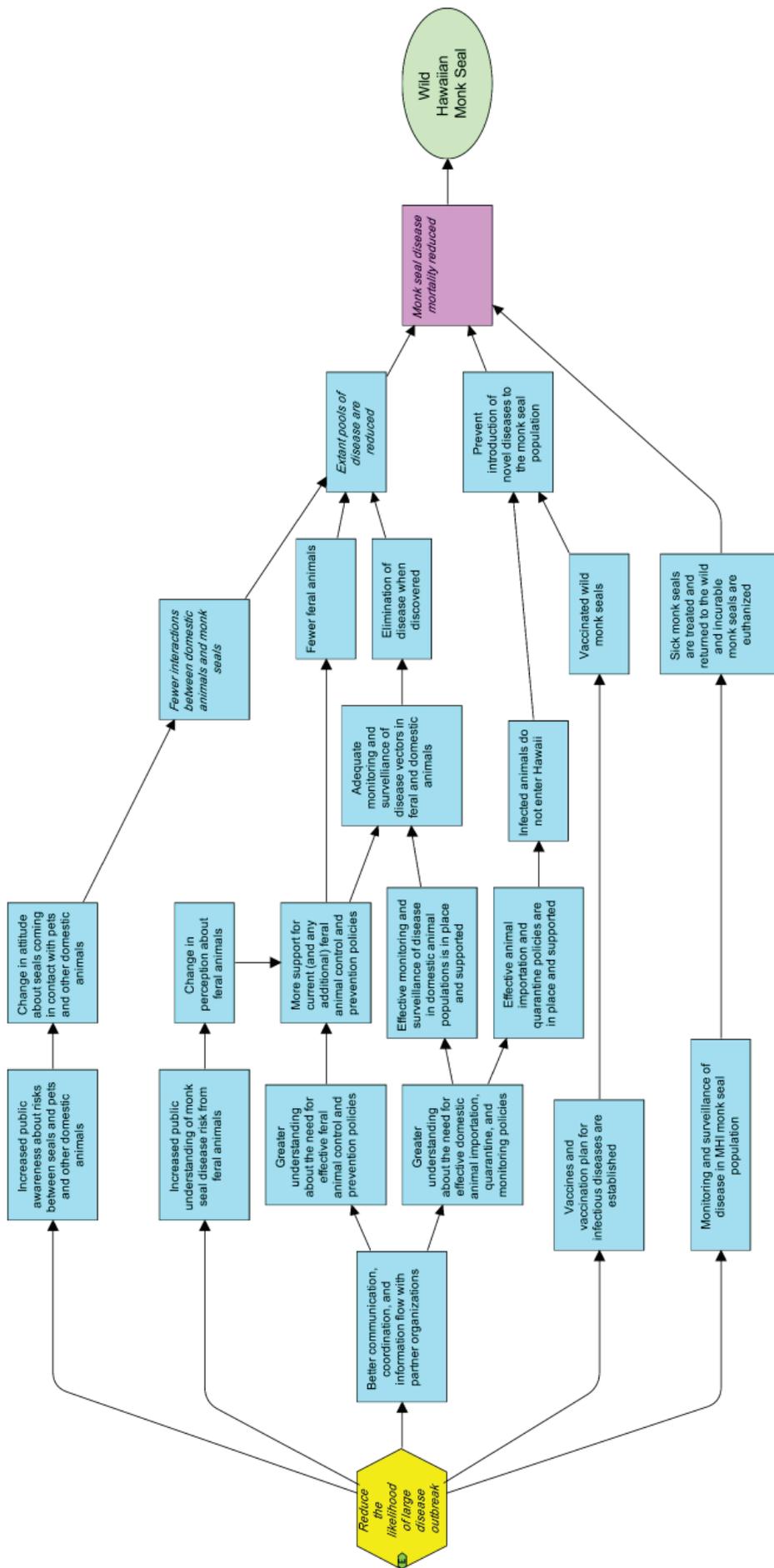


Figure 10. Recommended strategy #5 for reducing the likelihood of infectious disease outbreaks among Hawaiian monk seals.

Recommended Strategy #6: Reduce harmful monk seal-fishery interactions through engagement, outreach, and prevention

In the main Hawaiian Islands, there is a high probability of a monk seal encountering a commercial, non-commercial, or subsistence fisherman. Given the prevalence of these types of interactions and the potential for both monk seal injury and loss of catch or equipment, this strategy has a high degree of impact as well as high feasibility, and is expected to be effective (Table 4).

Monk seal entanglement in fishing gear and other fishing interactions (hookings, spearing, feeding from nets, traps, and fish stringers, and feeding on discarded offal) is a considerable problem for Hawaiian monk seals in the main Hawaiian Islands. Not only do these interactions result in injury and death, but they also condition monk seals to seek out and interact with fishermen or fishing gear. Human perceptions and conclusions are heavily influenced by individual experience, often even in the face of contradictory studies or scientific information. So an additional side effect of monk seal-fishery interactions is the role they play in coloring perceptions and driving animosity toward seals. Reductions in harmful fishery interactions are necessary to reduce monk seal injury and mortality (Figure 11). Generally, fishermen do not want to interact with a monk seals. When a monk seal depredates bait or catch, fishermen lose bait or catch, and sometimes gear. For the seal, those interactions are dangerous and can result in injury and death, or habituating and conditioning the seal to associate humans with food. If a seal becomes a behavioral problem, NOAA Fisheries cannot apply behavioral management techniques unless those interactions are reported. Thus, it is in the interest of fishermen and the agency to work together to figure out ways to decrease the number of interactions.

An extremely important aspect of this strategy involves increasing the number of reports of interactions by fishermen, which means gaining trust that individuals will not be prosecuted, and trust that a response by NOAA Fisheries will be undertaken. It is important to note that if we successfully build trust and have more people willing to report interactions, it may appear that the numbers of interactions or hookings are increasing. We will use multiple metrics (based on what we know from seal injuries and interactions in the past that we find about but are not reported by the public) to compare trends with the past so that we can accurately assess reporting.

Engaging with fishermen, improving fishing gear and technology, and collaboratively adjusting certain fishing methods will result in fewer seals interacting with fishing gear, and when interactions do occur, they will be less severe. One of the biggest challenges to implementing this strategy is that information on monk seal-fishery interactions is currently very limited, and past attempts to gain more information are often met with distrust and an unwillingness to share experiences or partner with NOAA Fisheries biologists to monitor and routinely report on interactions with active gear. Significant partnerships and progress are necessary to build trust, relationships, and take the next step toward meaningful information exchange between fishermen and NOAA Fisheries.

A fishery partnerships strategy is recommended to reduce the direct threats of:

- Fishing interactions and entanglement
- Intentional and non-fishing-related harm or removal

This recommended strategy will also address the overarching themes of:

- Public Knowledge and Attitudes
- Engagement and Communication
- Management Capacity

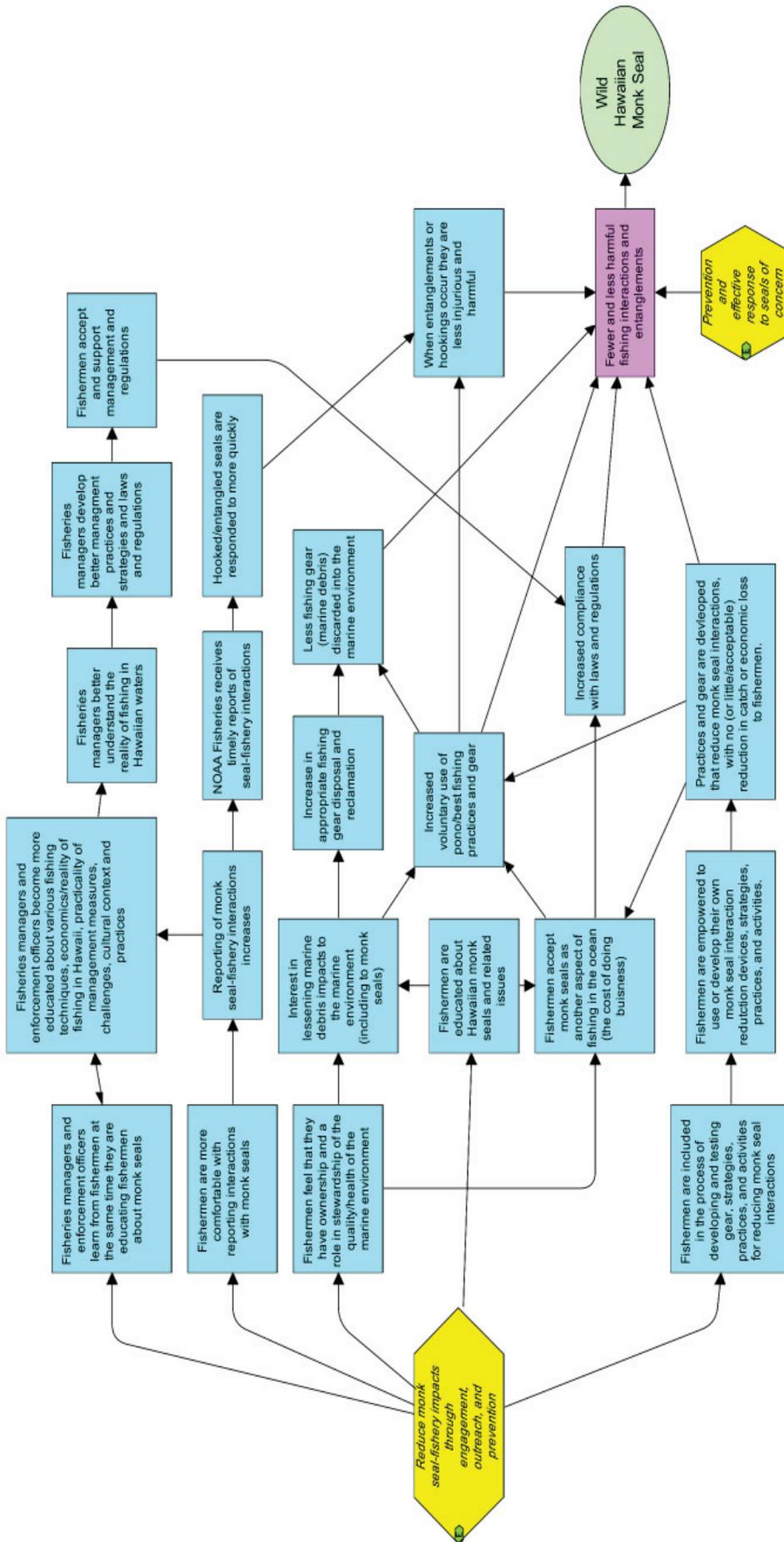


Figure 11. Recommended strategy #6 for reducing harmful Hawaiian monk seal-fishery interactions.

Recommended Strategy #7: Support sustainable fishery management

Supporting sustainable fishery management contributes to broader ecosystem health, and has the potential to mitigate threats to monk seals. This strategy is ethically feasible, but it is challenging technically and financially to directly correlate these types of efforts to monk seal recovery, and therefore is likely a less effective management strategy (Table 4).

A healthy near-shore ecosystem benefits both monk seal conservation and human wellbeing. Some of the ill-intentioned interactions between humans and monk seals may result from misperceptions that monk seals are responsible for the state's depleted fish stocks and degradation of sea floor habitat. By supporting change in the real drivers that are responsible for the depleted state of Hawaii's fisheries, the perceived level of competition between monk seals and fisheries should decrease and may start to change the negative attitudes and feeling that people may have about monk seals. If people are satisfied with the state of the near-shore fisheries, then real and perceived competition with monk seals and feelings that the ecosystem is stressed should be lessened (Figure 12).

A strategy to support sustainable fishery management is recommended to reduce the direct threats of:

- Impairment to water quality
- Invasive species
- Fishing interactions and entanglement
- Intentional and non-fishing-related harm or removal

This recommended strategy will also address the overarching themes of:

- Public Knowledge and Attitudes
- Engagement and Communication
- Management Capacity

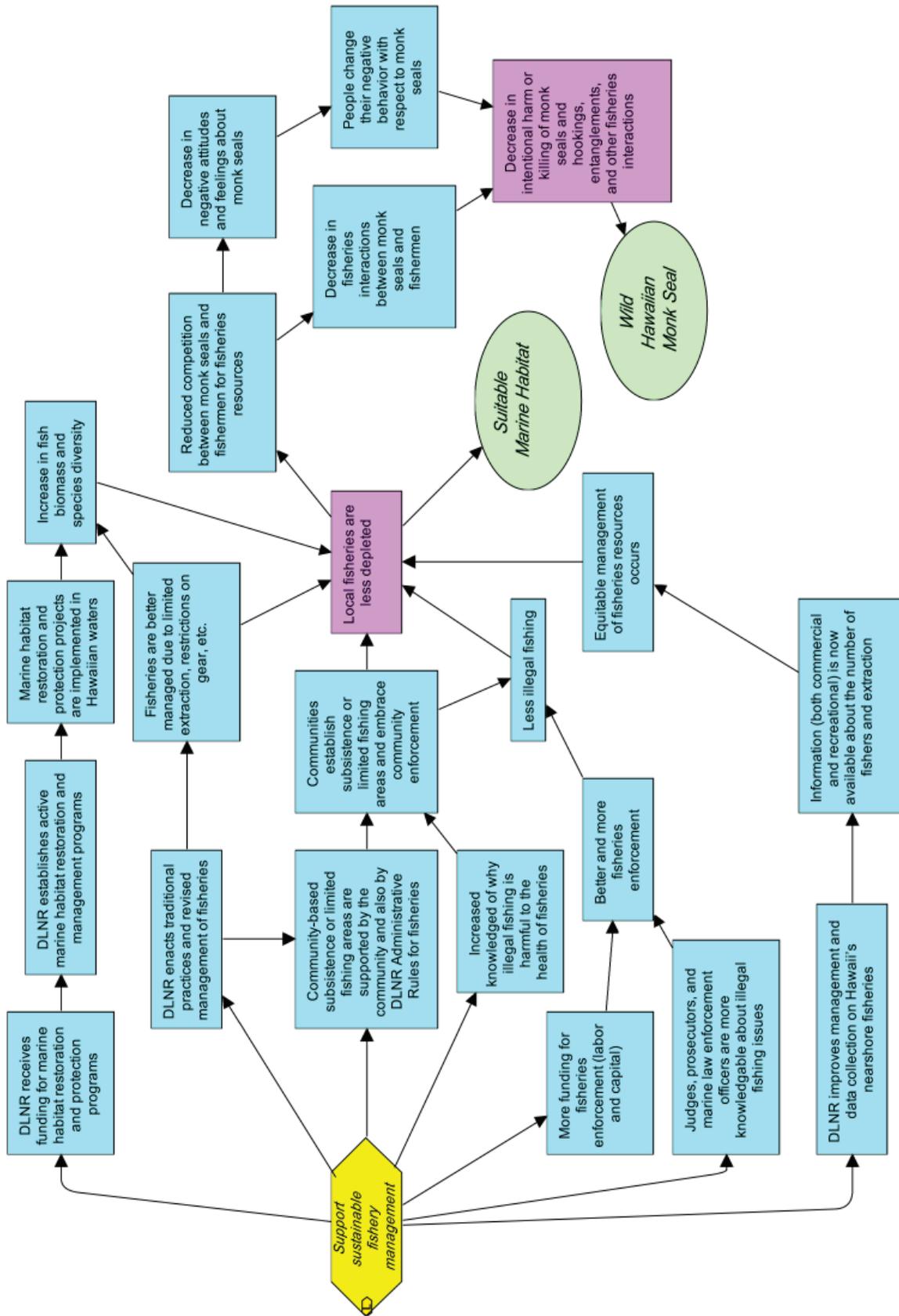


Figure 12. Recommended strategy #7 for supporting sustainable fishery management as it relates to Hawaiian monk seals.

Recommended Strategy #8: Support environmentally sustainable coastal development

Supporting sustainable coastal development contributes to broader ecosystem health and preservation, and may mitigate threats to monk seals (Table 6). This strategy is ethically feasible, but warrants a comprehensive assessment and approach rather than an approach focused too narrowly on monk seal needs. This strategy would be technically and financially challenging, and is therefore considered a less effective strategy (Table 4).

Hawaii's increasing residential population and tourism have a direct impact on economic growth and the resulting expansion of coastal infrastructure and activities. As coastal communities and activities grow the impacts of coastal development, seafloor modification, and water impairment will have real impacts on the coastal and marine habitats upon which monk seals depend. Additionally, wildlife management practices on land can affect marine habitats, for example in the case of non-native ungulate management causing greater runoff and sedimentation into near-shore marine habitats on some islands. By increasing intergovernmental engagement with appropriate regulatory agencies regarding monk seal conservation and habitat needs, we can begin to change behaviors and practices that lead to lost and degraded coastal habitat and polluted waters (Figure 13).

There are multiple layers of review and jurisdiction of coastal development projects that are outside the scope of this management plan, including ESA Section 7 consultations with federal agencies (includes critical habitat), state Coastal Zone Management regulations, and others. Critical habitat areas are designated under the ESA in the main Hawaiian Islands for Hawaiian monk seals. The designation means that actions with a federal nexus (i.e., conducted, funded, or permitted by a federal agency) are reviewed by NOAA Fisheries to determine if the action would destroy or adversely affect identified essential features of critical habitat. Through this process, a critical habitat designation applies on a project-by-project basis to make sure actions are implemented with fewer negative impacts to the essential features of monk seal critical habitat. However, it is important to note that critical habitat affects only actions with a federal nexus (i.e., conducted, funded, or permitted by a federal agency), and does not affect development projects conducted or funded privately or by the state (unless they require an Army Corps of Engineers permit or incidental take permit), or activities by members of the public, such as beach access, ocean recreation, or state commercial or recreational fishing.

A strategy to support environmentally sustainable coastal development is recommended to reduce the direct threats of:

- Climate change
- Disease
- Coastal development
- Impairment to water quality
- Invasive species
- Fishing interactions and entanglement
- Intentional and non-fishing-related harm or removal
- Activities modifying the sea floor

This recommended strategy will also address the overarching themes of:

- Public Knowledge and Attitudes
- Engagement and Communication

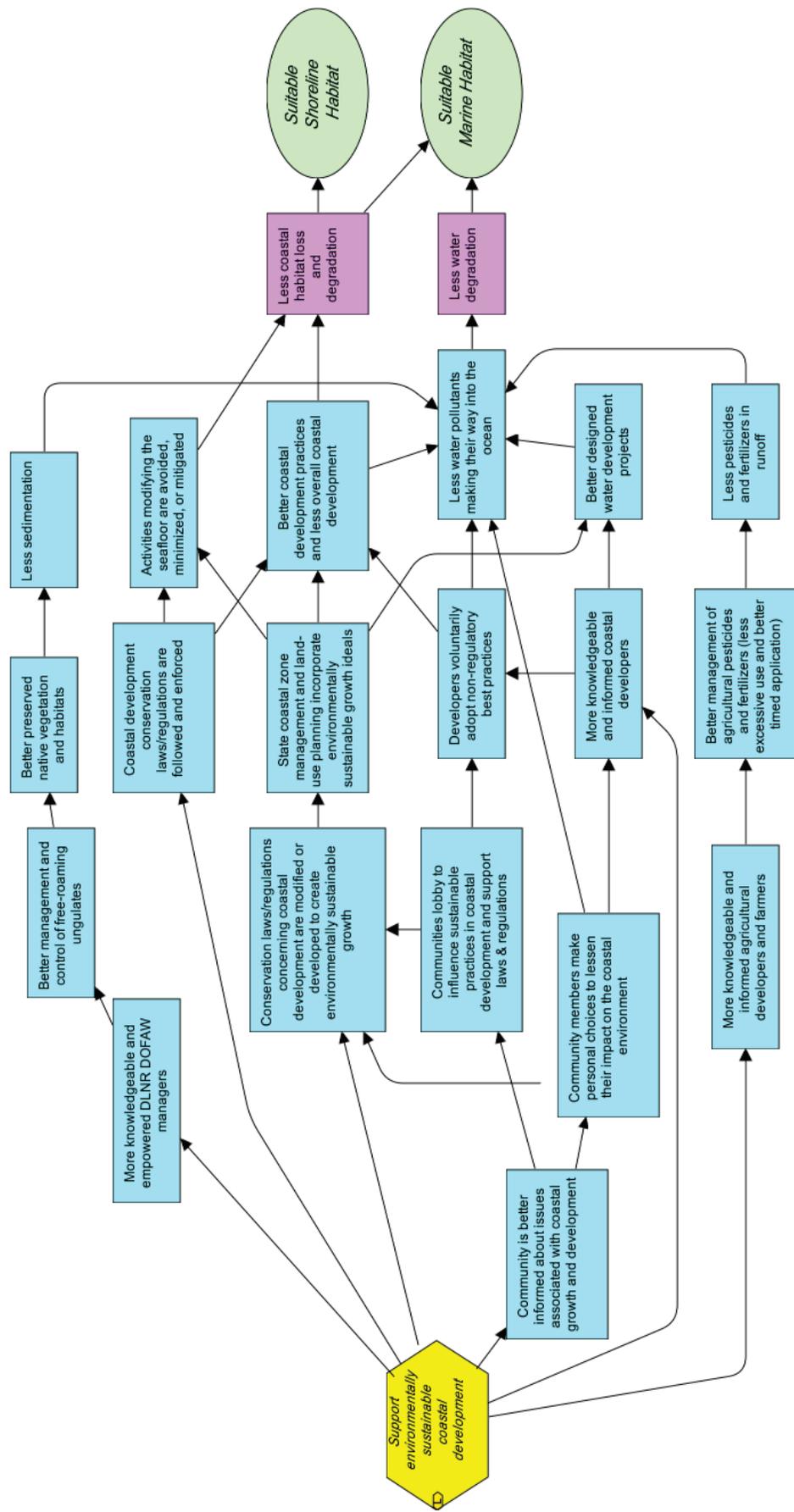


Figure 13. Recommended strategy #8 for supporting environmentally sustainable coastal development practices to protect Hawaiian monk seals and their habitat.

Recommended Strategy #9: Support control of non-native and invasive species

Invasive species are currently one of the most pressing conservation challenges facing Hawaii's threatened and endangered species, and are a high priority threat to address statewide. However, it is not evident at this time that invasive species present a major threat to monk seals, and therefore this strategy would probably not contribute to meaningful seal conservation efforts. It is also technically and financially difficult, and is therefore considered to be a less effective management strategy (Table 4).

Invasive species are more than just nuisance species. Invasive species can take over entire ecosystems, creating inhospitable environments for native species by degrading habitat, causing food limitation, or carrying disease pathogens. In order to limit the damage that invasive species cause to marine ecosystems upon which monk seals rely, existing invasive species, such as free-roaming domestic cats, need to be controlled, and accidental or intentional introductions of new non-native species should be prevented (Figure 14). Some of the activities associated with controlling invasive species and decreasing accidental or intentional introductions of non-native species are larger multi-level actions and affect additional strategies, such as disease prevention (e.g., the relationship between free-roaming domestic cats and toxoplasmosis).

A strategy supporting control of non-native and invasive species is recommended to reduce the direct threats of:

- Disease
- Coastal development
- Impairment to water quality
- Invasive species

This recommended strategy will also address the overarching themes of:

- Public Knowledge and Attitudes

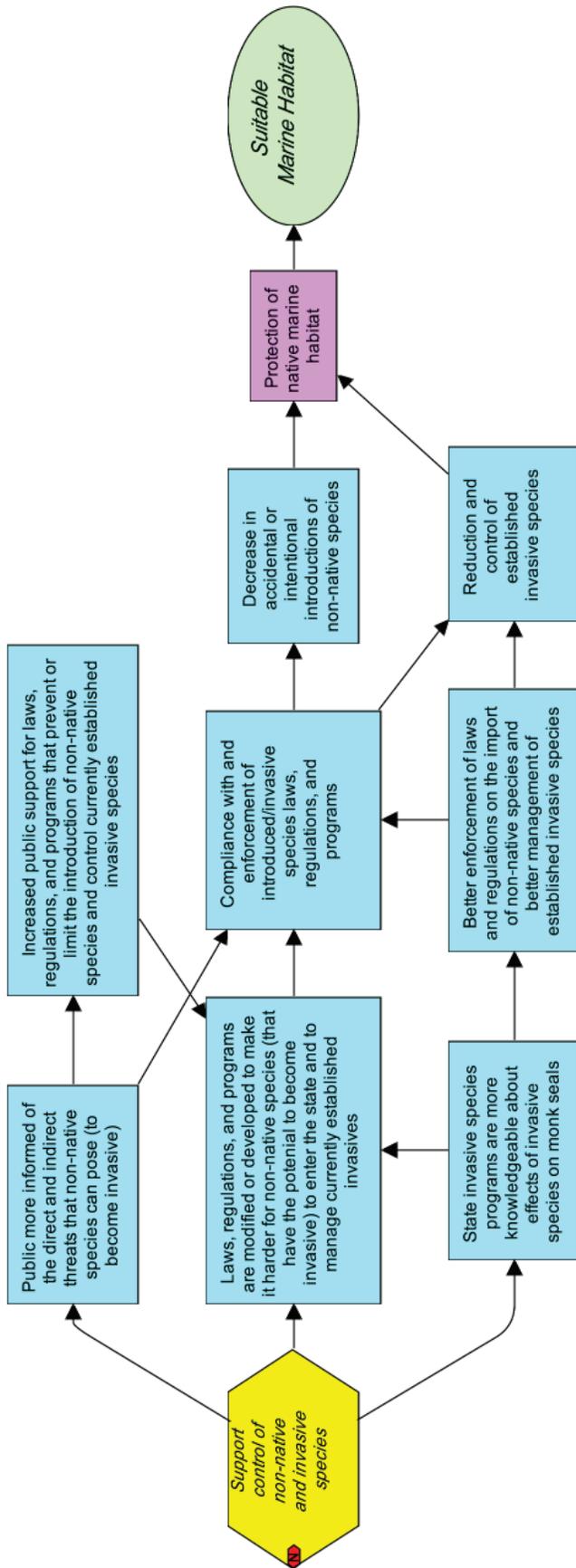


Figure 14. Recommended strategy #9 for supporting control of non-native and invasive species in the main Hawaiian Islands.

Recommended Strategy #10: Support climate change planning and response

While climate change is likely to affect Hawaiian monk seals and their habitat in the future, it is not currently an evident source of impact to the seals, and therefore the impact rating is low. Additionally, while NOAA broadly supports climate change research and analysis of the potential impacts on species and the environment, developing a strategic approach to mitigating monk seal-specific impacts would be technically and financially difficult (Table 4).

The effects of climate change can impact Hawaiian monk seals in numerous ways. Sea level rise, ocean acidification, and warming ocean waters can all hinder the ability of monk seals to survive and recover. The Hawaiian monk seal recovery program can better communicate how the monk seal population may respond to a changing climate, and encourage other organizations to use monk seals as a sentinel species for detecting larger ecological changes (Figure 15). This strategy alone is not likely to achieve outcomes of reducing the threat to climate change. The National Fish, Wildlife, and Plants Climate Adaptation Strategy (National Fish, Wildlife, and Plants Climate Adaptation Partnership 2012), identifies that one of the best wildlife management strategies for coping with climate change is to minimize or mitigate other threats to the maximum extent possible. To this end, the Hawaiian Monk Seal Recovery Program gives higher priority to other strategies that are likely to reduce direct threats. The program should continue coordination with partners and communication about the effects of climate change on monk seals, but those actions are unlikely to affect the threat itself, so this is a low-priority strategy.

A strategy supporting climate change planning and response is recommended to reduce the direct threats of:

- Disease
- Climate change
- Coastal development
- Impairment to water quality
- Invasive species

This recommended strategy will also address the overarching themes of:

- Public Knowledge and Attitudes

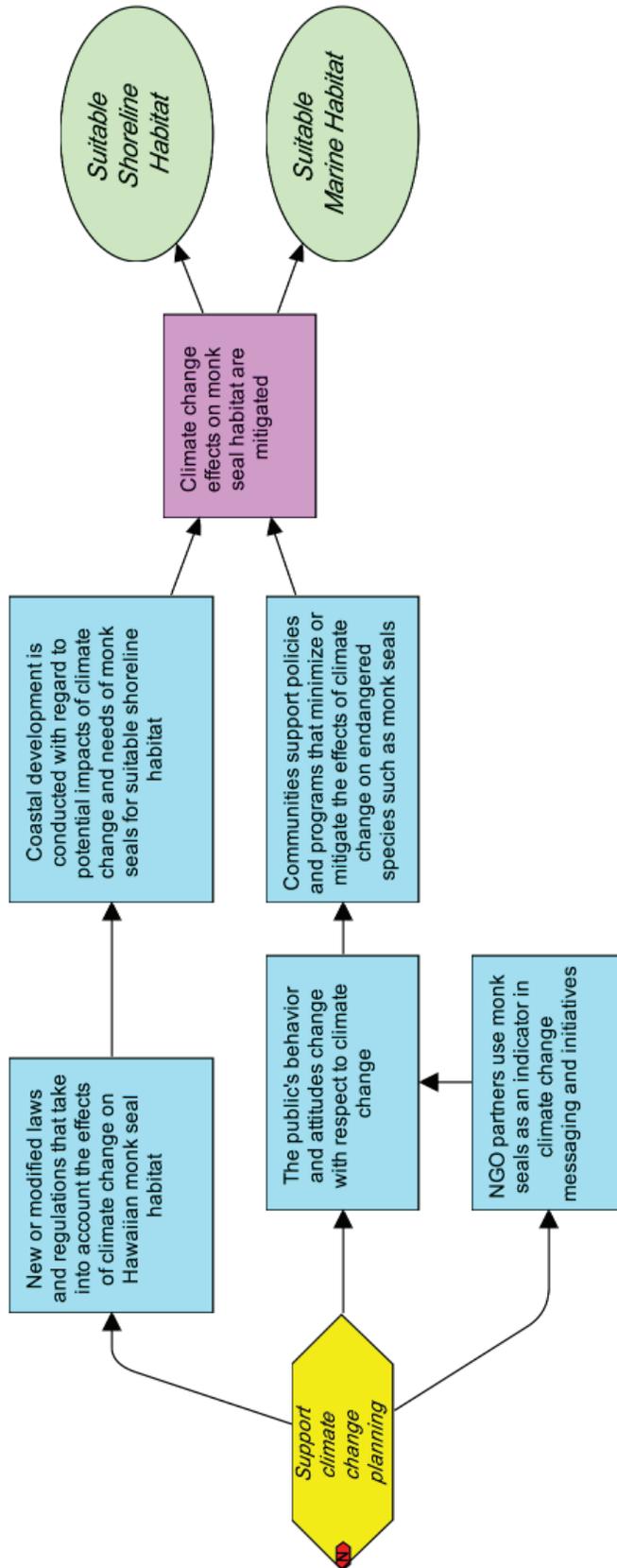


Figure 15. Recommended strategy #10 for supporting climate change planning and response in the main Hawaiian Islands.

Next Steps and Final Management Plan

The threat analysis and recommended management strategies presented here included significant input and contributions from experts, partners, stakeholders, and community members from across the Hawaiian Islands. This information was used as the basis for the resulting management plan. The final management strategies may be found in the NOAA Fisheries *Main Hawaiian Islands Monk Seal Management Plan*.

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Appendix A. Summary of 2012 Native Hawaiian Leaders and Practitioners Focus Groups

NOAA Fisheries' Native Hawaiian Liaison contractor conducted 10 focus group meetings with native Hawaiian community leaders and practitioners from July-August, 2012 on all the populated Hawaiian Islands except Niihau. These meetings were used to gather additional input to provide to the Monk Seal Foundation Workshop participants. The Monk Seal Foundation Workshop participants and NOAA Fisheries incorporated the suggestions from the native Hawaiian focus groups into the Plan as much as possible, fitting their ideas into the *Open Standards for the Practice of Conservation* conventions. As the conceptual model is a depiction of major factors and relationships, and not able to show every detail, many of the suggestions were added as details to existing contributing factors.

Native Hawaiian focus group recommendations that were incorporated into current draft management plan products.

<i>Recommendation</i>	<i>Response</i>
1. Modify targets to include more environmental and human welfare targets, not only Hawaiian monk seals	The draft management plan now includes the following conservation targets: wild Hawaiian monk seals, suitable shoreline habitat, and suitable marine habitat. The plan also identifies the following "human wellbeing targets": ocean access, ocean recreation livelihoods and traditions, fishery-based livelihoods and traditions, and public safety.
2. Recommend adding or modifying the following contributing factors:	
Volunteer network	Added contributing factor in the group box "interaction and communication:" "between volunteers and public"
(Low) scientific literacy	Included details in "knowledge about monk seals"
(Lack of) data regarding impact on biomass	Added to the details of "knowledge about monk seals." Data do exist, but results have not yet been widely distributed to the public.
Federal regulations	Encompassed in "ESA, MMPA, NMSA, other federal & state laws"
(Poor) relationship with the Native Hawaiian community	Added to details of "interaction and communication - between government and public."
(Poor) relationship with the local fishing community	Added to details of "interaction and communication - between government and public."
Commercial tourism	Encompassed in "growing coastal communities and economies;" added to details.
Immigrant/homeless presence on beaches	Encompassed in "growing coastal communities and economies;" added to details.
(Poor) community education programs	Added to details of "interaction and communication - between government and public."
(Conflict in) relationship between local community and conservation community	Added contributing factor, "relationship between local community and conservation community"
(Poor) communication and cooperation with state and local governments (specifically elected officials)	Added to details of "inter-governmental coordination and communication"
Sedimentation runoff	Added new threat, "impairment to water quality and quantity" that incorporates sedimentation and runoff

Relationship with private business and a private landowners	Added to details of "interaction and communication - between government and public."
(Poor) communication and community input into federal regulations and policies	Added to details of "interaction and communication - between government and public."
3. Identified human welfare targets:	Given the jurisdiction of NOAA Fisheries and the scope of this management plan, we can include human wellbeing targets, if they are linked to one of the conservation targets through ecosystem services.
Safe and clean beaches	Added human wellbeing target "ocean access" which is linked to "suitable shoreline habitat" through "natural shorelines suitable for ocean access" (and added "safe and clean beaches" to details)
Healthy near shore, coastal, and ocean environments (healthy, sustainable fisheries)	Added human wellbeing target "fishery-based livelihoods and traditions," linked to "suitable marine habitat" through "sustainable fisheries" (and added "healthy near shore, coastal, and ocean environments" to details)
Maximization of cultural access and gathering rights/restoration of traditional cultural practices	Added to details of "natural shorelines suitable to ocean access" as NOAA Fisheries jurisdiction and mandates allow
Maximization of partnerships, input of, and relationships with the Native Hawaiian community	Not a human wellbeing target directly tied to one of the conservation targets through an ecosystem service to humans. Added information to details of "management capacity - partner capacity."
Others not included ...	
Modify language of direct threat "entanglement and fishery interactions" to "entanglement, hookings, and interactions" because interactions with visitors and recreational users are also direct threats.	According to the conventions of the CMP "Open Standards," interactions with visitors and recreational ocean users are indirect threats, encompassed by the contributing factor "human-seal interactions, disturbance, and feeding." Direct interactions that involve physical contact and harm to the seal (or killing) are included in the direct threat, "physical harm or removal." The direct threat, "entanglement and fishery interactions" remains to specifically identify direct threats to seals coming from interaction with fishing gear (both active and derelict).
What is the difference between interactions in "entanglement and fishery interactions" and "physical harm or removal?"	Physical harm or removal specifically refers to humans directly harming or removing a seal from the population - either intentional killing, managers removing a seal who has become a safety/behavioral risk, or other unintentional/accidental removal that is not related to any of the other direct threats.
Add direct threat "loss of fertility, breeding, or weaning/juvenile survival"	This is currently only an issue in the NWHI, and would likely be considered a stressor as a result of other direct threats. While we remain vigilant in the MHI for this kind of issue, it is not currently a threat to the MHI population.

Appendix B. Agenda from 2012 Planning Workshop



Draft Agenda Planning Workshop for the Main Hawaiian Islands Monk Seal Management Plan

*Hosted by:
The Monk Seal Foundation
September 10-12, 2012*

Version: 2012-08-07

Description

The Monk Seal Foundation, a Maui-based non-profit organization, received a grant from NOAA Fisheries Service to facilitate community and partner engagement in Hawaiian monk seal management and conservation. As part of that grant, they are hosting this 3-day workshop, facilitated by Foundations of Success (FOS, www.fosonline.org), to help NOAA Fisheries Service develop a Main Hawaiian Islands Management Plan for the Hawaiian Monk Seal according to the Conservation Measures Partnership's *Open Standards for the Practice of Conservation* (www.conservationmeasures.org). The workshop will produce key components of the plan but will not result in a final plan. The NOAA team will work to complete the plan after the workshop.

Overall Goal of the Planning Process: Develop capacity and information necessary for NOAA Fisheries Service to conduct project planning and adaptive management, according to the [Conservation Measures Partnership's *Open Standards for the Practice of Conservation*](#) (see figure below) and, specifically, to use the *Miradi* software.

Figure 1. Conservation Measures Partnership – Steps in Project Management Cycle



Objectives of the Workshop

Objectives Related to the Planning Products

1. Receive feedback on the initial products developed to date.
2. Identify strategies that NOAA Fisheries Service and its partners should implement and develop results chains that describe the assumptions that link those strategies to desired conservation impacts.
3. Develop a draft action plan that includes goals, objectives and strategies.
4. Develop a draft monitoring plan.

Objectives Related to Learning the Planning Process

5. Strengthen knowledge about adaptive management and project planning.
6. Strengthen capacity to carry out a planning process according to the CMP Open Standards.
7. Introduce the Miradi conservation planning software and strengthen the capacity of a few participants to manage the software.
8. Learn and use a common language for the design, management and monitoring of conservation projects.

NOAA Fisheries Service has developed draft products including the definition of the project scope, vision, conservation targets, threat rating, and contributing factors in a draft conceptual model. NOAA Fisheries Service will present these products during the workshop and there will be time to discuss and refine them.

Meeting Details and Logistics

Location:

Pagoda Hotel
International Ballroom
1525 Rycroft Street
Honolulu, HI 96814

Parking:

Paid parking is available at the Keeaumoku Square structure on the corner of Keeaumoku and Kanunu Streets.

Workshop Check-In:

Please plan on arriving at the meeting room by 9:30 AM for the first day of the workshop on September 10, 2012.

Draft Agenda

Date/Hour	Session	Purpose
Monday September 10, 2012		
10:00 – 12:00	Opening of Workshop <ul style="list-style-type: none"> • Welcome • Introductions and expectations <ul style="list-style-type: none"> • Review agenda • Workshop rules • Monk seal biology and threats 101 • Hawaiian monk seal recovery program overview • Presentation: Introduction to the CMP <i>Open Standards for the Practice of Conservation</i> 	Participants introduce themselves and describe their expectations Review of biology and threats from the science program Introduce what will be covered in the workshop
12:00 – 1:00	Lunch	
1:00 – 2:00	Products Produced to Date <ul style="list-style-type: none"> • Presentation: What has been developed so far by a small working group 	Present products produced to date
2:00 – 3:30*	Feedback on the Draft Products Produced to Date <ul style="list-style-type: none"> • Conservation targets, scope and vision • Threat rating • Conceptual model • Goals for conservation target(s) • Current and some potential strategies 	Agree on revisions
3:30 – 5:00	Strategy Brainstorming and Selection <ul style="list-style-type: none"> • Presentation and discussion of proposed strategies • Prioritization of strategies to address highest priority threats 	Selection of final strategies
Tuesday September 11, 2012		
8:30 – 8:45	Recap and Review of Previous Day (FOS)	
8:45 – 12:00*	Results Chains <ul style="list-style-type: none"> • Presentation to introduce the topic • Breakout groups: Develop results chains 	Make explicit the assumptions about how the strategies will contribute to conservation
12:00 – 1:00	Lunch	
1:00 – 2:00	Results Chains (cont.)	
2:00 – 3:30*	Plenary Report Back on Results Chains	Share and discuss results of breakout groups

Wednesday September 12, 2012

8:30 – 8:45	Recap and review of previous day (FOS)	
8:45 – 12:00*	Objectives, Activities and Indicators <ul style="list-style-type: none">• Presentation to introduce the topic• In breakout groups, define specific objectives and activities to achieve strategies.• Define indicators to measure strategy effectiveness.	Introduce criteria for establishing good objectives and activities Introduce concepts of effectiveness and status monitoring; develop good indicators
12:00 – 1:00	Lunch	
1:00 – 2:00	Plenary Presentation of Day’s Products <ul style="list-style-type: none">• Present products developed during the morning	Share products and receive feedback
2:00 – 3:30*	Next Steps and Evaluation of the Workshop <ul style="list-style-type: none">• Develop a workplan for completing the strategic plan• Provide feedback on the workshop	Identify next steps Receive suggestions and feedback from the participants

* Session includes break

Appendix C. Summary of 2013 Community Meetings and Interviews

Between August and September, 2013, the Hawaiian Monk Seal Recovery Coordinator held approximately two dozen informal meetings and interviews with stakeholders on Hawaii, Kauai, Lanai, Maui, and Molokai. The goal of the meetings and interviews was to engage the communities, hear concerns, discuss monk seals, and obtain suggestions and feedback on NOAA's management of monk seals on their islands. Much of the information gained from these meetings and interviews was integrated into the Main Hawaiian Islands Monk Seal Management Plan. Responses obtained during the August and September 2013 meetings and interviews are summarized below.

Most common response across all islands
NOAA needs to do better with community engagement (needs to build relationships). Strong community relationships are the first step in instilling a community stewardship ethic.
Other common responses
Monk seal issues need to be integrated into other (larger or more all-encompassing) islands issues so you do not alienate the people who are not solely interested in monk seals.
Volunteers are a very important piece of the monk seal management picture. More volunteers are needed to do more outreach (at island events, schools, beaches, etc.). If possible, cross-training other organization's volunteers, like those who are focused on birds, whales, turtles, etc., would increase the numbers of volunteers in the islands that understand monk seal issues.
Focus on positive messages not just negative ones (such as monk seal killings, monk seal regulations, etc.). Messages should explain why monk seals are important and why people should care about monk seals.
All other responses
NOAA needs to engage and coordinate more with local, county, and state government offices that help manage monk seal issues.
NOAA needs more staff on the other islands.
Direct and available communication channels to NOAA are very important. Communities having knowledge of those communication channels is just as important.
It seems like not enough funding is being directed to monk seal recovery efforts. Some people have the impression that the government would rather spend money on new staff office buildings than on efforts to save monk seals, so why should they care if the government does not.
Focus tourist education efforts on points of entry into the islands (especially on Lanai since there are so few) and tourism operations and businesses. Keeping up with hotel outreach and education is important due to hotel staff turnover.
Create a monk seal educational module that fits into school curriculums
Provide better enforcement for illegal activities affecting monk seals.
Implement research into monk seal fishing deterrents.
NOAA needs to have better fishing community engagement and build relationship with the fishing communities (don't just focus on outreach).
A lack of prosecution and an official statement from NOAA about this lack of prosecution is needed to have self-reporting of legal, unintended monk seal interactions. NOAA also needs to show how it is using the reported information.
Island pet veterinarians can be an important resource, but they often have a different level-of-care threshold compared to wildlife or rehabilitation veterinarians.

Appendix D. Summary of 2014 Monk Seal Focus Group Discussions

Comments on the Main Hawaiian Islands Monk Seal Management Plan
June 18th, 21st, and 26th, 2014
(Organized by Topic)

Management Plan Content and Timing Comments

- Critical Habitat – NOAA needs to say something about it in the plan, so people aren't confused
- Create a simplified version of plan...some type of executive summary? Probably, yes.
- Think about when to roll out the MHI Monk Seal Management Plan, might want to separate it from when Sanctuary, Corals, etc. rules come out.
- Address spearfishing community specifically and separately in the plan (they are not just fishermen).
- “Cultural and Community Engagement and Education” in the plan - this should probably be Community Capacity Building, not education.
- Don't set yourself up to fail by having 100% completion rates for objectives.
- Separating education into its many parts has pros and cons.
- Who is kamaaina? – Need to be consistent (locals, residents, kamaaina, etc.) in the plan on how we use this word or if we use this word.
- Don't wait for the plan to come out – start doing some activities now.

General Outreach and Education Comments

- How to get to consensus on monk seals? Sole focus on the seal? Focus on larger issue, like the habitats seals rely on?
- How to empower people to be and do their best?
- Outreach to children/younger generation very important. (For young fisherman – instill best practices, what to take and what not to take, Critter Cam footage makes an impression, Changing behavior patterns early is important).
- Get kids started early with education on monk seals and be specific with messages.
- Children can have great influence on their parents.
- Focusing on the community that is affected by whatever “thing” you are promoting is important.
- The consumer has a lot of power and is a driver of economic change; try to tap into this if possible.
- Recovery plan of at least 500 seals in MHI...when does it end?
- Remember that education is a step-by-step process. Activities to pursue: Monk Seal Month at Hanauma Bay, Use research as a way to education the community, Use monk seal biology aids (scat, molts, skull, etc.) for education. People will always think, what is it to me and why should I care: need to keep this in mind when providing outreach and education.
- Education is not a onetime only endeavor, it needs to be continuous.
- Everyone views things through their own lens, so messages have to be tailored.
- Use social media to disseminate information.
- Issue of marine mammal tour boat operations going to places where people can see monk seals.

- Focus on the people you can actually reach (the middle of the road people), don't focus too much energy on the people that will never change their minds (the extremes on both sides).
- Answer people's questions (like at a public testimony meeting), don't ignore them! Maybe have a talk story session before the meeting. Part of this includes: Don't treat people like they are dumb, give them some benefit of the doubt, and don't tell people they are wrong, that will only reinforce their beliefs.
- NOAA should hold regular periodic update meetings to engage the community (like DLNR Chair does). Top three issues right now would be Whale Sanctuary, Monk Seals, Fishing Restrictions.
- Be a speaker at another group's meeting (fishermen orgs., neighborhood groups, etc.)
- Circle hooks – promote that they work just as well as regular hooks.
- Use high school programs, college volunteer programs, etc. to move monk seal messages forward.
- Monk seal education should be focused over a broader context.
- Social media is where people are getting their information right now...work with moderators of these sites to remove and not let in bad/incorrect information.
- Having a monk seal app. – for learning about specific monk seals and making it personal to people. Possibly could use existing app. (Naturalist?) or maybe just have a website that lists information.
- Citizen science does engage people – how to make it work for monk seals.
- However it is done, just make the information available!
- Finding stories about good outcomes (sound bite size) – these turn into your PSAs, brochures, etc.
- Educate the media about how things work or they will make assumptions (possibly incorrect)
- Use “Hawaii Goes Fishing” or “Hawaii Spearfishermen” and show a good monk seal interaction for people to see.
- One cohesive message from Federal/State/Local government taken to airlines, rental car companies, etc. Monk seals will be small part of that one message.
- Don't forget to put messages into fun stories. Use positive stories to counteract negative stories.
- Finding balanced “truth tellers” is important going forward.
- Ocean safety personnel need to be in the know, need to have the correct information because they are asked questions about monk seals. Maybe having a brochure in every lifeguard tower might help.

Interactions, Sightings, and Reporting Comments

- Reporting interactions can and should be simplified.
- When there is an interaction, confusion on whose authority it is, Federal OLE or DOCARE.
- Establishing an Amnesty Program will create more reporting, but what does this program look like? Complete amnesty, partial amnesty, etc.? Need to come up with criteria.
- Reporting of monk seal sightings is important.
- Having a monk seal app. – maybe it could be a way to have people report sightings and feel part of the process. Possibly could use existing app. (Naturalist?) or maybe just have a website.

- Reporting sightings and interactions - want to reduce your interactions (it is for your benefit), people need to feel comfortable about reporting (won't get in trouble for having interaction).
- People need to see that their efforts (their reporting) is used/shows up somewhere for them to want to report again.

Cultural Comments

- Hawaiian traditional culture is not the same as other cultural practices elsewhere. Important to keep in mind.
- Can't just focus on Hawaiian culture in Hawaii...also have Pilipinos, Micronesians, etc. that have their own culture, need to reach them too, and there are different ways of reaching different groups of people.

Fishing Comments

- Need to talk story (especially to fishermen) and find common ground, what everyone can care about. Unfortunately, there is no single organization that all fishermen accept and agree with (Matt Ramsey might be able to identify Rec. organizations to work with).
- Fishermen might not realize all the legal mandates surrounding monk seals. They might not realize that NOAA can help, they just have to ask.
- Fishing organizations have to be the ones taking the message out to fishing communities, so NOAA should build partnerships with fishing organizations.
- Message to fishermen – don't over exploit the resource.
- Need to think about how to get fishermen to think that their ideas/thoughts are not hitting a brick wall or entering a black hole.
- Ways to reach fishermen – maybe tournaments, but more likely fish and dive expos and fishing and seafood festivals.
- Have a Dolphin Smart type program for fishermen in relation to monk seals. Get key fishermen on board, key incentive to lessen interactions and keep fishing areas open.
- Fishermen thoughts – depleted marine resources could be related to monk seals, what are NOAA's solutions to depleted marine resources, and don't just place more restrictions and regulations.
- How to bring Hawaiian kapu system into fishing regulations?
- WESTPAC is perceived as the enemy, when in reality they are not. Fishermen perceive nobody is looking out for them. NOAA should engage WESTPAC more.
- Big issue for fishermen – lost fishing grounds and competition with monk seals

Perception and Misconception Comments

- Monk seals are perceived as eating all the communities' fish (food).
- Big issue for people/communities is competition for food and space with monk seals.
- More work with press – need to decrease perception monk seals are cute and cuddly, and increase knowledge that they are wild animals and can be dangerous.
- Don't let monk seals be perceived as a NOAA/Federal animal.
- The issue of bringing NWHI seal to MHI is still alive and well.
- Don't just show exciting footage for monk seal cam, also show boring footage, that way people believe what they are seeing.
- Need to get historical information out to communities – talk about where the seals went (“My grandfather never saw seals”). Need to get the community to believe monk seals are from Hawaii, need to state what is truth to what it is not.
- Message of what is really damaging fish stocks vs. what and how much monk seals really eat and maybe even what invasive species are eating.

- Maybe need some paper or website where all monk seal historical information is housed. A place to tell the monk seal's origin story. This issue is integral for native Hawaiians and fishermen to have buy-in.
- WESPAC is perceived as the enemy, when in reality they are not. Fishermen perceive nobody is looking out for them. NOAA should engage WESPAC more.
- Big issue for fishermen – lost fishing grounds and competition with monk seals

Enforcement Comments

- Federal money – when given to the state, how do we know it is going towards what it is meant for? Talk out of DLNR is that they need more money for enforcement, but are they actually enforcing their existing regulations (need more data)?
- Values education – fishing the proper way, always think about the community, etc. can help with enforcement issues.
- Enforcement of fishing is important – need follow through with citations and enforcement (courts/judiciary is integral in this follow through).

Partnering Comments

- Be more proactive with state legislature, need to improve relationship with legislature and work with on a more regular basis (with a staffer on a natural resources committee perhaps).
- Partnering with HTA – using hotel room tax?
- Target outreach partners (look for successful programs) and they will reach out and educate for you. Create a list of criteria for how to select partners (want to maximize partners' abilities).
- Go through Makai Watch and other groups to reach communities, native Hawaiians, hard core fishermen, etc. – NOAA can't do it all by themselves.
- Get the information to other people so they can be the ones to have one- on-one conversations with other people.
- Identify the correct people in the community and then both NOAA and these people can spread the messages.
- Meet and talk story together (NOAA and cultural or community liaison/fishing organization/etc/), show that you are taking care of the community, the environment, etc. (show your accomplishments)

Volunteer Comments

- Volunteers – don't be exclusionary when roping off beaches.
- Finding a balance between roping off and not roping off beaches/seals is important.
- Better management of the volunteers, they are (typically) one side of the extreme and are the first face the public sees.
- Need to have some monitoring or review of those people who are empowered (volunteers, communities, etc.) to help manage monk seals.

Invasive Species Comments

- Invasive species is a problem, but sometimes there may be a conflict between management and hunting/tourism (like axis deer on Lanai) on how to (or even whether to) solve that problem.
- Invasive species are a problem, and not just in the ocean, but also upland due to erosion (axis deer).

Miscellaneous Comments

- Because Lanai only has one landowner, you may be able to make headway on monk seal issues.

Appendix E. Notes from NGO Monk Seal Management Workshop

November 13, 2014

Attendees:

Allyson Johnson, The Monk Seal Foundation
Cindi Punihaole, The Kohala Center
David Schofield, NOAA Fisheries
Deb Wickham, Ke Kai Ola
Diane Pike, The Monk Seal Foundation
Marjorie Ziegler, Conservation Council for Hawaii
Pauline Sato, Malama Learning Center
Pat Wardell, The Monk Seal Foundation
Rachel Sprague, NOAA Fisheries
Tim Ragen, Hawaiian Monk Seal Recovery Team

Still comes off as NOAA's plan
Where do we prioritize what can actually be tackled
How to move from conceptual model to tangible things that can be done
Change orientation to make little conceptual models bigger

Good plan Not all that NOAA is going to do
Conceptual big-picture plan – not the implementation plan
Like it because trying to figure out where NGO resources can be used to help monk seals
Restate ungulate connection
Love prioritized strategies/objectives
Also like intro w/ benefits to people – human wellbeing targets – emphasize more**
List of organizations and monk seal teams w/contact
Make people feel more included like they know the organizations and structure
Add a little more specifics into some of the later strategies
(e.g., get invited to hearings on “bad bills”)

Coastal development – coordination meetings ok. But maybe think about getting monk seal/marine people onto committees etc?

Find actions most useful**

Find somewhere more to use “cultural practitioners” or cultural practitioner group
Acknowledge traditional customary practices and values
Do right by the people and do right by the animals
Paddlers/canoe clubs – ocean users, etc.

Education/Outreach/Communication

Having info in one place would be important
Lots of disconnects – need to find connections
How much do monk seals eat?
Facebook page/website/group
Updates, timely info
What to do/what not to do
Scheduled updates

NGO group

**Resource center – different groups can share documents, powerpoints, PSAs, models, toys, etc.
Also other presentation/equipment tools? w/location & owner/contact person
Monk seals w/hook for clip to backpack
Monk seal costumes – available?
Longer videos:
Waikiki Aquarium podcasts
Privilege to see
Good neighbors
Reef etiquette

Airlines –

Baggage claim? Banners? Maybe rental cars?

TMMC/Kohala Ctr working on outreach for intermediate/high school

Key is to find spot for respect – if they respect you, might at least give seals a chance
Art project – calendar of kids work – use for fundraiser

Who are we reaching, with what materials, where? Gaps? Needs assessment/gap analysis

MSF – mailing for 4th grade classrooms – whoever wants them
5 teachers

Kohala Center

Relationships with universities – use interns and have them be teachers
Or high school seniors

Problem – lots of knowledge in just a few people's heads

Planning and operations manual for organizations

Even for high school students, even paying a little will give a very good response

One traveling kit w/brochures etc.

**Need to be looking to the future – need to have a plan for when the population really grows – set up a network and interisland communication

Hightail
Google drive/groups
Yahoo groups

Outreach/communication – need contact person
Contact person – need little bit of info, brochures, etc.
Internships?

**Revisit reporting anonymously and prosecuting
Can report to someone on the island who will later prosecute?

Aggressive volunteers – LINGERS
Focus on the people on the beach

Volunteer teams reflect the diversity of their communities

TEENAGERS

Acknowledge as a challenge

E Alapu – community based subsistence fisheries

Network of community groups

Figure out network of people who may not be full volunteers, but communities and individuals who help, let NOAA know what's going on, etc.

Give stuff & resources

Displacement plan – can we haze seals away from busy beaches – desensitizes them to lots of people

Action: Finding local heroes to speak – not just speaking for NOAA

Work on reducing “us vs them” for locals, govt, everything – ALL

For volunteers - What is protocol? How do you assess people? What is appropriate in different areas? Do you approach at all?

MSF can have video module assessments for advanced volunteer training

Series of trainings for volunteers

Get key points in budget process to NGOs

Summary of basic timing

Who to contact at different times

Appendix F. Comment and Recommendation Letters from the Hawaiian Monk Seal Recovery Team



27 March 2014

Michael D. Tosatto
Regional Administrator
Pacific Islands Regional Office
National Marine Fisheries Service
1845 Wasp Blvd., Building 176
Honolulu, HI 96818

Dear Mr. Tosatto:

This letter conveys the recommendations of the Hawaiian Monk Seal Recovery Team (HMSRT, Team) following its 3-4 March 2015 meeting in Honolulu. First, however, the Team would like to express its gratitude to Rachel Sprague, Jeff Walters, and Ann Garrett. Their work on the Main Hawaiian Islands Monk Seal Management Plan (MSMP, Plan) is essential to the species' conservation and, in many respects, is groundbreaking for NOAA Fisheries. Conservation efforts often depend heavily on a small group of individuals who provide essential leadership through their hard work and dedication. All three deserve great credit for their efforts.

Audience

The HMSRT recommends that the MSMP be written for the diverse communities in Hawaii. Indeed, the primary purpose of the Plan should be to help link and unite those communities behind monk seal recovery and conservation efforts. With such a diverse audience, the Plan should be understandable and compelling to all parties, comprehensive but not overly complex, and sufficiently focused to give clear direction to NOAA Fisheries and its partners. To be an effective working guide to monk seal conservation, the Plan must be available as a primary resource for all partners in Hawaii and elsewhere and it must be amenable to change with new information. These are not easy standards, but this must be no ordinary plan.

Existing draft

The HMSRT recommends that you formally preserve the existing draft MSMP as a Technical Memorandum or Administration Report because it describes important background information on the thinking and the procedures followed to prepare the Plan. However, because this document is structured and written in a format consistent with standard government practice, the Team does not feel that it is well-suited for its intended audience. Appropriate for an audience of resource managers, it is overly complex on some topics and not sufficiently succinct, straightforward, and compelling for the intended diverse audience of partners.

A new version

Based on the good work already completed, the HMSRT recommends that you develop a simpler version of the Plan that is visionary but practical, comprehensive but succinct, and factual but engaging. The challenge is to tell a story that integrates not only our biological and ecological understanding of the monk seal, but also our social, economic, and cultural understanding of Hawaiian communities—the communities that are needed to help conserve the monk seal.

Vision, introduction, context, and tone

The vision statement and introduction to this new plan are pivotal to its success. The HMSRT recommends that you use the vision statement from the preceding draft – it appropriately emphasizes the integration of a healthy monk seal population and a productive, balanced coastal ecosystem with the cultural and economic well-being of the people of Hawaii.

Hawaiian Monk Seal Recovery Team

Phil Fernandez

Cal Hirai

*David
Hyrenbach*

Sabra Kauka

Julie Leialoha

Lloyd Lowry

Kepā Maly

Dane Maxwell

Tim Ragen

Walter Ritte

Craig Severance

Darrell Tanaka



27 March 2014

Michael D. Tosatto
Regional Administrator
Pacific Islands Regional Office
National Marine Fisheries Service
1845 Wasp Blvd., Building 176
Honolulu, HI 96818

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This letter conveys the recommendations of the Hawaiian Monk Seal Recovery Team (HMSRT, Team) following its 3-4 March 2015 meeting in Honolulu. First, however, the Team would like to express its gratitude to Rachel Sprague, Jeff Walters, and Ann Garrett. Their work on the Main Hawaiian Islands Monk Seal Management Plan (MSMP, Plan) is essential to the species' conservation and, in many respects, is groundbreaking for NOAA Fisheries. Conservation efforts often depend heavily on a small group of individuals who provide essential leadership through their hard work and dedication. All three deserve great credit for their efforts.

Audience

The HMSRT recommends that the MSMP be written for the diverse communities in Hawaii. Indeed, the primary purpose of the Plan should be to help link and unite those communities behind monk seal recovery and conservation efforts. With such a diverse audience, the Plan should be understandable and compelling to all parties, comprehensive but not overly complex, and sufficiently focused to give clear direction to NOAA Fisheries and its partners. To be an effective working guide to monk seal conservation, the Plan must be available as a primary resource for all partners in Hawaii and elsewhere and it must be amenable to change with new information. These are not easy standards, but this must be no ordinary plan.

Existing draft

The HMSRT recommends that you formally preserve the existing draft MSMP as a Technical Memorandum or Administration Report because it describes important background information on the thinking and the procedures followed to prepare the Plan. However, because this document is structured and written in a format consistent with standard government practice, the Team does not feel that it is well-suited for its intended audience. Appropriate for an audience of resource managers, it is overly complex on some topics and not sufficiently succinct, straightforward, and compelling for the intended diverse audience of partners.

A new version

Based on the good work already completed, the HMSRT recommends that you develop a simpler version of the Plan that is visionary but practical, comprehensive but succinct, and factual but engaging. The challenge is to tell a story that integrates not only our biological and ecological understanding of the monk seal, but also our social, economic, and cultural understanding of Hawaiian communities—the communities that are needed to help conserve the monk seal.

Vision, introduction, context, and tone

The vision statement and introduction to this new plan are pivotal to its success. The HMSRT recommends that you use the vision statement from the preceding draft – it appropriately emphasizes the integration of a healthy monk seal population and a productive, balanced coastal ecosystem with the cultural and economic well-being of the people of Hawaii.

Hawaiian Monk Seal Recovery Team

Phil Fernandez

Cal Hirai

David
Hyrenbach

Sabra Kauka

Julie Leialoha

Lloyd Lowry

Kepā Maly

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Walter Ritte

Craig Severance

Darrell Tanaka



1 December 2014

Ms. Ann Garrett
Acting Assistant Regional Administrator for Protected Resources
National Marine Fisheries Service
1845 Wasp Blvd., Building 176
Honolulu, HI 96818

Dear Ms. Garrett:

I am writing on behalf of the Hawaiian Monk Seal Recovery Team (Team) to provide you and your staff with comments on the draft Main Hawaiian Islands Monk Seal Management Plan. Monk seals are becoming more abundant in this region and a management plan is necessary to address those human-related factors that pose risk to the species or may otherwise hinder its recovery.

The Service's management of this species has expanded considerably over the years. The Team gratefully acknowledges the thoughtful and detailed work of your monk seal staff in preparing this draft. It reflects a deep review of the environmentally and socially complex issues faced by the Service and its partner agencies, organizations, communities, and individuals.

Complexity, clarity, and time

That being said, the Team believes that this draft suffers from three major shortcomings: it is overly complex, it lacks essential clarity with regard to the direction of future management actions, and its development is inconsistent with the timeframe needed to respond efficiently and effectively to recovery impediments.

Complexity – The plan should be written for the larger, collective, Hawaiian community and, with that audience in mind, the Team considers this draft to be far too detailed. The purpose of the plan should not be to describe the complexity of recovery efforts, but rather, to provide a clear path forward for needed management efforts. Several Team members felt that this plan would be more discouraging than productive.

Clarity – The plan should provide clear analyses of the impediments to monk seal recovery and the proposed actions should follow directly from those analyses. The draft does not include those analyses, nor does it describe the targeted actions needed to address the impediments. In short, the draft does not present a clear line of thought from issue analysis to management solution. In addition, the draft is rich with terms (jargon) that are not used consistently and, the Team believes, will unnecessarily generate confusion. Clarity is essential if the collective Hawaiian community is to be asked to support management actions that may affect them.

Time – In a general sense, the management strategy should be to develop and maintain a close temporal connection between recovery issues/challenges and management actions. To be efficient and effective, management actions must be rapidly responsive to recovery needs. The Revised Hawaiian Monk Seal Recovery Plan was completed in 2007 and we are now nearly in 2015 – an untenable delay of eight years. Furthermore, this draft does not represent the whole planning process; that is, it proposes the development of additional action plans, which could take years. The Team does not believe that such an overall approach is functional – it is simply too encumbered with detail, process, and delay. Such delay is inconsistent with the need for an adaptive and responsive management strategy.

A revised approach

For all the above reasons, the Team recommends that the plan be rewritten with something like the following outline.

***Hawaiian
Monk Seal
Recovery Team***

Phil Fernandez

Cal Hirai

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Hawaiian Monk Seal Recovery Team Meeting

**Honolulu, Hawaii
August 27-28, 2014**

Meeting Summary

MEETING PURPOSE

The National Marine Fisheries Service held this meeting to welcome members of the new Hawaiian Monk Seal Recovery Team and to give team members the opportunity to—

- introduce themselves and become acquainted with each other to facilitate future team communications and efforts
- become familiar with the monk seal recovery program, including current research and management efforts
- improve their understanding of the National Marine Fisheries Service’s roles, responsibilities, and needs in managing Hawaiian monk seal recovery efforts
- discuss overarching conservation issues, and
- develop an understanding of the team’s role and identify issues that the team may want to focus on in the future.

TEAM FUNCTIONS

The team’s function and potential roles are to—

- advise and make recommendations to the National Marine Fisheries Service on research and, particularly, management efforts to conserve the Hawaiian monk seal, with primary emphasis on monk seals in the main Hawaiian Islands
- help the Service to identify, prioritize, and resolve shortcomings in its recovery efforts
- identify key parties (i.e., people, organizations) that the Service can engage in monk seal recovery efforts
- serve as a link between the Service’s recovery program and the various communities in Hawaii
- speak publicly about issues pertinent to monk seal recovery and encourage community leaders to do the same, and
- advocate for resources (including federal and state funding) to promote the research and management efforts needed to recover the Hawaiian monk seal.

ACTION ITEMS

Team action items identified during the meeting are to—

- review the revised (2008) *Recovery Plan for the Hawaiian Monk Seal* and the executive summary of the recently completed environmental impact statement prepared to support the Service’s application for a research permit
- review and comment on the draft *Main Hawaiian Islands Monk Seal Management Plan*
- convene a conference call this autumn to review comments on the main Hawaiian Islands management plan and discuss other team business
- investigate the feasibility of having a student examine unprocessed midden collections at the Bishop Museum and University of Hawaii to look for evidence of monk seals in the main Hawaiian Islands; Craig Severance will take the lead on this item
- consider interviewing Niihau residents regarding the history and Hawaiian name of monk seals. For now, this activity will be limited to investigating the feasibility of such interviews. The team will need to identify a lead person for this last item.

Action items identified for the National Marine Fisheries Service include compiling and distributing to the team—

- a list of monk seal recovery coordinators for each island
- information from those coordinators regarding issues of importance to them
- previous public service announcements developed to highlight Hawaiian monk seals
- the web link for Kumulipo
- research papers and published articles describing the history of Hawaiian monk seals, and
- a summary of critical population measures.

MAIN ISLANDS MANAGEMENT PLAN

Conservation of Hawaiian monk seals in the main Hawaiian Islands will require attention to social and socio-economic issues, as is apparent in the draft *Main Hawaiian Islands Monk Seal Management Plan*. The need for appropriate expertise on these topics is reflected in the composition of the new team. The team will provide detailed comments on the draft plan before the end of the calendar year. In the meantime, it provides the following general comments.

General Comments

The plan should be revised to—

- convey a broad vision of healthy marine ecosystems that integrate and support all our marine-related goals
- emphasize the importance of cultural stewardship of the Hawaiian monk seal

- summarize the best available information regarding the question of whether monk seals have occupied the main Hawaiian Islands for millennia and are therefore considered native to the islands
- provide more explanation and justification for budgetary requests
- provide more detail about the time horizon for the various tasks set forth in the plan, including those tasks that are anticipated to be less effective in the short-term, and
- use the plan to lay the groundwork for future recovery activities.

Outreach, Education, and Community Involvement

Given the focus on monk seals in the main Hawaiian Islands, much of the plan will be directed toward improving outreach, education, and community involvement. With that objective in mind, the team believes that the National Marine Fisheries Service should expand its staff to include a person dedicated to public relations, education, and outreach. In addition, the team believes that the Service should revise the plan to—

- include long-term media strategies for conveying monk seal messages to the public; for example, establish a regular monk seal column in a local newspaper (e.g., Ron Mizutani’s column in Midweek) and/or a regular monk seal segment on morning radio or television shows
- dispel current myths and correct public misinformation and misperceptions
- seek to build a monk seal conservation ethic within Native Hawaiian communities
- use social media (e.g., Twitter) to reach younger individuals in the various communities in Hawaii
- develop a monk seal syllabus that can be integrated into educational curricula to promote better awareness of monk seals and their importance to Hawaii’s marine ecosystems
- engage Hawaiian cultural and community leaders to create testimonials and make public statements
- engage commercial, recreational, and subsistence fishermen in the recovery process
- maintain a fact sheet describing the information of most interest to the public
- develop a specific education/outreach budget that reflects the importance of education and outreach to monk seal conservation in the main Hawaiian Islands
- use education/outreach methods developed by public relation firms
- use other marine issues (e.g., revision of sanctuary management plan, revision of monk seal critical habitat) to explain the context and importance of monk seal recovery efforts
- educate the Western Pacific Fishery Management Council regarding the historical presence of monk seals in the main Hawaiian Islands
- use all opportunities to educate the Hawaiian community about NOAA’s responsibilities under the Endangered Species Act, Marine Mammal Protection Act, Magnuson-Stevens

Fishery Conservation and Management Act, National Marine Sanctuaries Act, National Environmental Policy Act, and other pertinent federal and state laws

- coordinate messages about monk seals with those about other endangered species (e.g., false killer whales, humpback whales, corals) to ensure that they do not lead to confusion within the community
- recognize that the Hawaiian society is comprised of multiple communities that should be integrated into monk seal conservation efforts in a manner consistent with the unique character of each community
- conduct periodic internal program assessments to improve and prioritize future recovery efforts.

The Service must develop partnerships to facilitate its education and outreach objectives. To that end, the team believes that the Service should engage—

- private and public elementary and secondary schools, community colleges, and universities
- Native Hawaiian communities and especially, “Kūpuna” (community leaders)
- non-profit organizations
- public-private organizations (e.g., Monterey Aquarium)
- Western Pacific Fishery Management Council and fishery participants
- Marine and Coastal Zone Management Advocacy Council (so that its members understand monk seal issues as they advocate for a comprehensive management system to restore, preserve, and protect Hawaii’s marine and coastal environments)
- Volunteers
- Other federal and state government agencies and offices, and
- Other recovery or management teams active in Hawaiian ecosystems to address overarching issues such as water quality and coral reef health.

Messages must be tailored to each specific community in the Hawaii society. Further work is needed to craft the appropriate messages, particularly with regard to human-sea interactions and the need to avoid injury to humans and seals. Messages should be positive and informative. Key messages to be incorporated into education and outreach efforts include—

- the monk seal is a native Hawaiian species that has been and still is part of the integrated Hawaiian system of *kinolau*
- being better stewards of the ecosystem benefits all of us, including monk seals
- monk seal conservation efforts must be integrated with similar efforts for other endangered species

- viewing and living with wild animals enriches our lives, but is best done safely by respecting the fact that the seals are wild animals that may be unpredictable in their behavior and pose a risk to people under certain conditions

The team believes that the issue of the “environmental carrying capacity” for monk seals in the main Hawaiian Islands will generate controversy and that the Service, with the team’s assistance, should review the best available scientific information to provide, and provide the basis for, the best possible estimate of the carrying capacity.

Monk Seal-fishery Interactions

Minimizing monk seal-fishery interactions clearly will be an important element of recovery efforts. Based on presentations at the recovery team meeting, the team believes that managing such interactions will require—

- more comprehensive fisheries enforcement
- increased cooperation between fisheries management and monk seal research and recovery efforts
- better fishery management: monk seals may be persecuted as scapegoats if fisheries are poorly managed and fishing is poor
- restoration/enhancement of fish habitat to distribute fishing effort and improve fishing conditions
- a safe reporting environment so that fishermen do not fear enforcement actions if they report seal-fishery interactions
- explanation of the term “critical habitat” so that fishermen do not fear being excluded from their fishing locations,
- further explanation of the relationship between critical habitat under the Endangered Species Act and corresponding state laws (i.e., Hawaii Revised Statute, Section 195D), and
- alternative fishery management measures that do not require fishery participants to engage in monk seal recovery efforts.

Behavior Modification

Managing monk seal interactions with other human activities will require modifying the behavior of both humans and the seals. Although it may achieve only limited success, behavior modification may help maintain a safe separation between the seals and human activities. To that end, the Service should—

- work with science center, law enforcement, and legal council to develop guidelines for behavior modification techniques

- enlist the advice and guidance of persons with the necessary experience in behavioral modification techniques
- recognize that behavioral conditioning of monk seals will depend, in part, on the age and previous experiences of the seals involved
- recognize that such conditioning may or may not be successful and, therefore, should be part of a larger strategy to minimize interactions
- consider and, when advisable, use techniques to manage human behaviors that may otherwise result in adverse interactions, and
- ensure that its education and behavior modification methods do not create public expectations that will lead to increased, intentional interactions.

PARTICIPATING MEMBERS

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David Hyrenbach
Sabra Kauka
Julie Leialoha
Lloyd Lowry
Kepa Maly
Dane Maxwell
Tim Ragen
Walter Ritte
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Darrell Tanaka

Appendix G. Public Comment Summary



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1845 Wasp Blvd., Bldg 176
Honolulu, Hawaii 96818
(808) 725-5000 • Fax: (808) 725-5215

To: Michael D. Tosatto
Regional Administrator 

From: Rachel S. Sprague
Hawaiian Monk Seal Recovery Coordinator

Through: Ann M. Garrett 
Assistant Regional Administrator, Protected Resources Division

Subject: Summary of Public Comments and Resulting Revisions to the Main Hawaiian Islands Monk Seal Management Plan

Drawing on extensive community input, PIRO recently completed a *Draft Main Hawaiian Island Monk Seal Management Plan*. We developed the draft plan through a participatory process, reflecting ideas and input from experts, partners, stakeholders, and communities, including outcomes from workshops and other meetings held to discuss monk seal management issues. We chose to continue the participatory process by voluntarily including a public review before finalizing the plan.

Public Review

The plan was available on the Pacific Islands Regional Office website for public review and comment for 30-days, from August 11 through September 9, 2015. Posts on social media (Facebook and Twitter) announced availability of the plan, and I sent notification by email to 300-400 community members and stakeholders, including:

- All participants from workshops, focus groups, and meetings (80+)
- Members of a monk seal news and updates listserv (~150)
- Members of a monk seal partners listserv (75)
- Other government and NGO partners, the Recovery Team, interested community members, and contacts (100+)

**Some overlap between lists*

Public Comment Summary

We received comments by mail and at the email address, monkseal@noaa.gov. Overall, 18 organizations and individuals submitted comments, including:

- Hawaiian Monk Seal Recovery Team
- State of Hawaii Division of Land and Natural Resources
- Western Pacific Fishery Management Council



- Conservation Council for Hawaii
- Sierra Club and Center for Biological Diversity (joint submission)
- The Humane Society of the United States
- American Bird Conservancy
- Senator Ronald Kouchi (Hawaii State Senate president, 8th Senatorial District – Kauai and Niihau)
- Nine residents of Hawaii
- One resident of Alberta, Canada

Comments from our partner organizations and several community members were very positive and gave constructive suggestions. They expressed appreciation for the inclusive tone and emphasis on partnership and outreach. Important comments included suggestions of other organizations we should list as partners, additional ideas for specific actions (particularly in the *Education* strategy), request for an improved tone to be more inclusive of fishermen as partners, request for a more thorough description of science needs/gaps, and agreement with our statements of support for community-based management efforts.

Comments from five community members and Sen. Kouchi were not supportive of monk seals in the main Hawaiian Islands, or efforts to manage them, but offered few actionable suggestions.

General Statements of Support and Agreement

Kudos

- Outstanding effort to respond comments on previous draft (Recovery Team).
- Very well done and organization is very supportive of growing and expanding partnership with NOAA Fisheries on monk seal recovery (DLNR).
- Encompassing and well-developed (DLNR).
- Comprehensive in scope and action-oriented (Sierra Club and Center for Biological Diversity).
- Commends NOAA for comprehensive plan (American Bird Conservancy).
- Strong plan that will help prevent extinction (community member from Hawaii Island).
- Thorough and well-written, sensitive to local communities, Native Hawaiian culture, and ocean users (Conservation Council for Hawaii).
- Unprecedented for NMFS to release a draft management plan as supplement to Recovery Plan and applauds the agency for continued involvement of stakeholders in developing recovery actions (Humane Society of the US).
- Commends NMFS on including unusual section on priorities and 2016 work plan that provides accountability and transparency (Humane Society of the US).
- NMFS strongly encouraged to take similar effort (to this plan) to engage stakeholders and public in recovery efforts for other listed species (Humane Society of the US).

General

- Recognition that a plan is needed to manage growing seal population in the main Hawaiian Islands.
- Activities and outcomes are clearly observable and measurable and linked to Recovery Plan actions.
- Support outreach as an important component of plan to reduce hooking of, and competition with, monk seals.
- Appreciate attention given to the need for outreach to communities, NGOs, and state and county agencies.
- Critical and important that plan states: “partner with coastal communities that have already established, or are in the process of establishing” community-based systems for natural resource management and human co-existence with wildlife.
- Appropriate and valuable that plan begins with exploration of the place of monk seals and *honua ola* in Hawaiian history and culture.
- Agree with our stated actions to support stronger laws and regulations concerning invasive species management and efforts to reduce numbers of feral animals in Hawaii (actions in both the Management and Recovery plans).

Changes Made to the Plan in Response to Comments

We made a number of revisions to the plan in response to the public comments we received. These revisions are described below. The sources of the comments addressed in the described revisions are indicted in parentheses at the beginning of each section.

Cultural

(In response to comments from Phil Fernandez/HFACT and WPFMC.)

- Minor revisions to clarify that the plan does not only focus on Native Hawaiian communities (at the expense of other communities in Hawaii), and that we do not assume that there is major overlap between Native Hawaiians and fishermen.

Additions and Modifications to Strategies/Actions

(In response to comments from the Monk Seal Recovery Team, Phil Fernandez/HFACT, WPFMC, DLNR, Paulette Smith, and Jennifer Barrett.)

- Renamed strategies to be more descriptive and distinguish from challenges/threats.
 - “Disease Risk: Reduce disease-related mortality” is now “Health: Reduce infectious disease risk and disease-related mortality.”
 - “Seal-Fishery Impacts: Reduce monk seal-fishery impacts through engagement, outreach, and prevention” is now “Fishery Partnerships: Reduce harmful monk seal-fishery interactions through engagement, outreach, and prevention.”
- Linked statement of outcome(s) to each action (similar to Recovery Team recommended tables).
- Underscored diversity of needs and strategies for reaching out to different communities.

Infectious Disease Challenge/Health Strategy

(In response to comments from DLNR, Sierra Club/CBD, American Bird Conservancy, Paul Chang, and Lyn McNutt.)

- Added reference to Sheep, goats, and game mammals (such as deer and mouflon) as additional feral animals of concern.
- Add action referencing contacting local Humane Societies to increase disease surveillance and increase response capacity.
- Clarified reason for monitoring wild and feral animal populations (not only cats) to focus management efforts - in response to a comment that it is insufficient to monitor feral cat colonies (i.e., we already know that cats are the ultimate source of risk for *Toxoplasmosis*, efforts should be focused on removing colonies and encouraging all cats to be maintained exclusively indoors).
- Revised language to clarify how seals can be protected from infections from dogs, and vice versa (primarily keeping dogs vaccinated and on leashes at the beach).

Seal-Fishery Interactions Challenge/Fisheries Partnerships Strategy

(In response to comments from Phil Fernandez/HFACT, WPFMC, and Shyla Moon.)

- Modified challenge and strategy sections to address concern that the tone of the plan could be perceived to point to fishermen as part of the problem, not part of the solution.
 - Changed title of strategy from “Seal-Fishery Impacts” to “Fishery Partnerships” (see above).
 - Rather than call out seal-fishery interactions and entanglement as a separate challenge, included it as one type of human-seal interaction.
 - Minor revisions throughout to improve inclusive tone where possible.
- Removed specific term “community-based fisheries management” (comment that it is a loaded term for some), but maintained language supporting community-based management and partnerships.
- Clarified that working group could include fishermen, not just NOAA and DLNR.
 - Added action create tactical plan for fisheries portion of management plan that is reviewed (or created by) working group.
- Revised language to better reflect partnership with WPFMC, including:
 - Council encouraged to use ability to mobilize large numbers of fishers to promote communication with the fishing communities in support of measures for addressing and reducing frequency and severity of seal-fishery interactions.
 - Working closely with Council, as well as other fishery organizations, rather than simply considering the Council as a conduit for outreach.
- Emphasized recognition of barbless circle hook efforts.

Human-seal interactions Challenge/Response Strategy

(In response to comments from Conservation Council for Hawaii, DLNR, the Humane Society of the US, Lyn McNutt, and Greg Holtzman.)

- Clarified biological need for monk seals to haul out on beaches to rest. They do not “own” the beach, but there must be coexistence.

- Clarified that developing behavioral management techniques are necessary to deter seals from taking food from or interaction fishermen and other ocean users.
- Media interest to publicize rescue efforts should be important component of engaging the public and investing them in recovery.
- Include statement clarifying that reports of interactions, injuries, and entanglement may be made anonymously (p. 19).
- Include action to promote the hotline (e.g., printing on beach and boating items, encouraging people to add numbers to mobile phones).
- Improve *and expand* volunteer network.
 - Volunteer response network on Oahu ineffective in building positive relationships and trust with most-needed stakeholders (notably fishermen) – volunteers are well-intentioned and do important work, but should be redirected to better leverage contributions in constructive ways.
 - Should empower response network within each community, of residents or others that have ties to community and are part of a well-managed stewardship initiative (e.g., Makai Watch, E Alu Pu) – transformative to response effort.
 - “Need to develop improved and updated Volunteer Education Guides and materials/tools.” (p. 29)
- Clarified reference to translocation as a tool for behavioral management in the MHI (i.e., translocation currently only happens within the MHI or from the MHI to the NWHI).

Engagement

(In response to comments from DLNR, Shyla Moon, and Jennifer Barrett.)

- Emphasized working with established place-based and community-driven initiatives to help repair relationships that have been soured by well-intentioned volunteers (who can be perceived to be “invading do-gooders” by communities they patrol).
- Noted that engagement also needs to be undertaken by staff from the recovery program, avoiding using “token Hawaiians” as messengers to engage with meetings or communities.
- Added reference to need for community engagement in management strategies, decisions and implementation plans.

Education

(In response to comments from DLNR, Conservation Council for Hawaii, Paulette Smith, and Jennifer Barrett.)

- Clarified that actions should be tailored specifically to meet the needs and approaches for each individual island and community (for engagement as well).
- Added activities:
 - Need to assess media and outreach/education departments and consider ways to improve their lead.
 - “Supply current and improved outreach materials to target diversity of audiences” (p. 29).
 - Important to equip existing community-based initiatives with material, training, and support directly from NOAA Fisheries (rather than 3rd party non-profit).

- Specifically mentioned youth and programs focused on raising awareness and support for monk seal among youth.
 - i. Include venues, activities, games, and outreach focused on youth outside school environment.
- Target specific tourism sectors and events, also need to target resident sectors and events (local country fairs, parades, festivals).
- Inventory and curate education resources, including 4th grade curricula (several exist) to help educational practitioners find resources and maintain more consistent messaging (and avoid repetition of efforts).
- Create summary of past and ongoing outreach efforts and measurement of their efficacy.
- Create forum (e.g., online message board, working group) to share knowledge about what groups on each island are doing on behalf of monk seal could be among all groups on that island (for transparency, and economy of scale).

Habitat Threats Challenge/Capacity Strategy

(In response to comments from Conservation Council for Hawaii and Sierra Club/CBD.)

- Include need for outreach to county, state, and federal agencies about critical habitat and requirements (and educate public about benefits of critical habitat for the seal and the public).
- More outreach and education on federal recovery and management processes, (e.g., funding process, recovery planning, etc.) to let people know what is needed to save the seal and help NGOs, communities, and concerned citizens take action and learn about the process.
- Added language, actions, and science needs (see section below) in Capacity strategy to better address climate change impacts (recognizing authority lies primarily with state and county levels), including:
 - Working with responsible agencies to promote measures to allow natural “retreat” of shorelines where possible, and “managed retreat” of some shorelines where necessary to assure that beach shorelines can move inland with sea level rise.

Other

- Acknowledgements revised to include thanks to all island coordinators, volunteers, and partners.
- Added more thorough descriptions of science needs throughout the strategies:
 - Investigate the incidence of various diseases in the MHI and their principal vectors.
 - Determine the severity of effects of the various diseases on monk seals.
 - Determine the efficacy of vaccines and the permanence of their effects.
 - Follow treatment strategies in a manner that gives valid scientific data for evaluation of treatment efficacy.
 - Determine side effects of vaccines.
 - Monitor for disease in the NWHI to assess risk of transmission in both directions.

- Demographic measurements of fishermen and fishing communities to better understand heterogeneous structure and target engagement.
- Identifying coastal areas vulnerable to sea level rise.
- Vulnerability analysis of monk seal habitat in the main and Northwestern Hawaiian Islands.
- Revised how we present the time-frame covered by the plan.
- Revised Priorities/Work Plan section to clarify dates covered by FY16 and the difference between solid and open bullets.
- Corrected reference to the Aha Moku Advisory Council in Appendix A (previously used the incorrect term “Aha Kiolo” for the state organization).
- Added to the list of partners in Appendix A:
 - KUA (Kua’aina Ulu ‘Auamo) and its E Ala Pu coalition of community based organizations (exec director – Kevin Chang)
 - HFACT and PIFG
 - Fishing organizations
 - Marine Mammal Commission
 - Sierra Club (statewide/national scope) with areas of interest in outreach/education and advocacy
 - American Bird Conservancy welcomes opportunities to work collaboratively on efforts to protect seals and other species, including from infectious disease risks
- Various typographical and editorial revisions

Comments and Questions Not Addressed in the Final Revision of the Plan

- Already addressed in existing parts of the plan:
 - Pet and farm wastes allowed into marine environment from non-point-source pollution or point-source pollution.
 - Toxins and pollutants from farm industry and residential development (DLNR comments).
 - In Table 1, should have X’s in cells to indicate engagement with and education of fishermen are critical components to managing fishery interactions and entanglement.
 - Include outreach material with new or renewal commercial licenses and vessel registrations, AND Hawaiian Fishing Regulations and any other DAR handouts.
 - Concerns about asking for seal-fishery interactions without assurance that information will not be used against fisheries.
 - Problematic to ask for information from users without explaining internal threat to individuals and industries – need to exempt voluntary reports on incidents from public campaigns to destroy fishing and ocean use in areas where seals have taken over.
 - To partner, need to protect fishing interests and deal legally with incident reports being used against fisheries (NGOs can FOIA to shut down lifestyles and livelihoods).

- Recommendations to delete sections (or the whole plan) that we have chosen to keep in the plan for various reasons:
 - Delete diagram on p. 14 and all others – not sufficiently explicit and does not convey clear line of reasoning from objectives to action and purpose; redundant to tables.
 - Delete performance measures/indicators (focus on outcomes) [*RS – From the Recovery Team. Other groups specifically found the measurable indicators very useful. We modified so that we are both incorporating the measurable indicators, but also including outcomes/purpose the way the Recovery Team suggested.*]
 - Plan focuses on benefit of agency and partners, not seals, and should be rewritten
 - Foreword is unrelated to management and should be removed.
 - Build management capacity should not be a strategy – should be something done before management starts.
- Recommendations to add sections that we do not think fit into the scope of this management plan:
 - Inconsistent and incorrect to use diacriticals only in the foreword and some Hawaiian words, but not place names. Diacriticals are a part of the Hawaiian language – use throughout for place names to use the language correctly (from multiple comments, including from OHA).
 - No strategy for dealing with habitat threat related to sea level rise [*RS – We did incorporate more references to sea level rise into the Capacity strategy.*]
 - Also could include concept of *pu'u honua* (place of refuge) as the plan seeks to provide multiple areas of refuge and protection for monk seals.
 - Suggest one cultural subcommittee/working group for each island.
 - Specifically reference types of outreach events that we already attend or in which we would like to increase our participation – e.g., local organizations and events targeting residents, particularly fishing, Native Hawaiian communities, and other local communities.
 - Should include photos of monk seal injuries and entanglement, as well as people inappropriately approaching seals with dogs, etc. Should include images that compel people to take action.
 - After the last Monk Seal Management Plan proposal, NOAA was instructed to include economic and social impact studies as part of the rationale for all management plans for endangered species. Where is the economic assessment? Where is the cultural and social assessment?
 - Proposed rule changes, draft EIS, and draft MP do not analyze economic impact, impact on national security, and thus plan is deficient and should not be adopted.
 - Oppose plan because it does not state criteria for delisting (ESA Section 4).
 - Management plan does not outline site-specific management techniques and strategies (citing Sanctuaries Act).
 - Can NOAA guarantee that the management plan will not hold the 'needs' of the ESA over those of the general population where interactions occur? Will fishing restrictions be imposed?

- If current funding levels drop, the plan will become an unfunded mandate for the state and counties – so proposal should not continue without identification of sufficient and proper funding.
 - Shark populations often increase with increased monk seal presence. What is the plan in this document to deal with this issue?
- Table on p. 13:
 - Should have X's in the disease risk row in the cells for human-seals interactions and habitat threats. *[RS – Not consistent with what the table is presenting.]*
 - Should have X's in cells to indicate building response capabilities requires critical human interactions. *[RS – Nowhere to put this; does not fit with purpose of the table.]*
- Please categorize public comments received by Hawaiians as opposed to outside agencies or non-residents. *[RS – All substantive comments were received by Hawaii residents or by organizations that do work in Hawaii.]*
- Oppose any plan to increase the # seals in MHI.
- Oppose critical habitat.
- Seals will eat millions of pounds of reef fish each year and creates a competitive threat to feeding Hawaii's population.
- NOAA had a hand in bringing seals to MHI and threatening way of life.
- Does NOAA intend to include the Hawaiian Monk Seal in the new proposed regulations, or similar regulations as found in 50 CFR Part 22 {Docket No. 140725620-4620-01} entitled "Endangered and Threatened Species: Proposed Regulations for the Designation of Experimental Populations under the Endangered Species Act (ESA)"? Does NOAA define the MHI Monk Seal as "essential to the continued existence" of the listed species (16 U.S.C. 1539(j)(2)(B)), and therefore qualify them as "experimental populations" under the ESA?
- Please justify the assertion by Dr. Rachael Sprague that Monk Seals and subsistence and ohana fishers are not competing for the same resources and that monk seals will not have an impact on food security for the people of Hawaii Nei. The document focuses on pelagic fisheries and does not give adequate scientific justification that there will not be (or is not now) competition for resources, especially in the nearshore waters. *[RS – Commenter misinterpreted the study; it specifically excluded pelagic fisheries and focused on overlap and competition in the nearshore marine resources.]*



U.S. Secretary of Commerce
Penny Pritzker

**Administrator of National Oceanic and Atmospheric
Administration and Undersecretary of Commerce**
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January 2016

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