



Prepared for:  
 National Oceanic and Atmospheric Administration  
 National Marine Fisheries Service

# Programmatic Environmental Impact Statement

## Executive Summary

### Final PEIS for Hawaiian Monk Seal Recovery Actions

March 2014



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**Hawaiian Monk Seal Recovery Actions**  
**Programmatic Environmental Impact Statement**  
**Executive Summary**

**March 2014**

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Abstract: The National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Services (NMFS) is the Federal agency responsible for management, recovery and conservation of Hawaiian monk seals (*Monachus schauinslandi*) under the Endangered Species Act (16 United States Code [U.S.C.] 1531 *et seq.*) and the Marine Mammal Protection Act (16 U.S.C. 1361 *et seq.*). As part of their responsibilities, NMFS funds, permits, and conducts research and enhancement activities on endangered Hawaiian monk seals in the Northwestern Hawaiian Islands (NWHI), main Hawaiian Islands (MHI), and Johnston Atoll. NMFS proposes to implement research and enhancement actions identified in the Hawaiian Monk Seal Recovery Plan (NMFS 2007), with the goal of conserving and recovering the species. This Final Programmatic Environmental Impact Statement (PEIS) provides decision-makers and the public with an evaluation of the environmental, social, and economic effects of the proposed program and alternatives to the proposed action.

The agency's recommended Preferred Alternative is Alternative 3 (Limited Translocation). Alternative 3 encompasses a broad scope of research and enhancement activities that would yield greater recovery benefits to the species over the next several years than would be expected under the other alternatives. It is important to note that while Alternative 4 (Enhanced Implementation) was Preferred in the Draft PEIS, Alternative 3 has been selected as the Preferred Alternative in the Final PEIS. The only distinction between these two Alternatives is that Alternative 3 (Preferred) does *not* include any two-stage translocation option that would involve taking weaned pups born in the NWHI and releasing them in the MHI.

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## *LIST OF ACRONYMS*

ESA	Endangered Species Act
FR	Federal Register
MHI	Main Hawaiian Islands
MMPA	Marine Mammal Protection Act
Monument	Papahānaumokuākea National Monument
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NWHI	Northwestern Hawaiian Islands
PEIS	Programmatic Environmental Impact Statement
U.S.	United States
U.S.C.	United States Code
UDP	Unanticipated Discovery Plan
WNV	West Nile Virus

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This executive summary provides an overview of the Final Programmatic Environmental Impact Statement (PEIS) for Hawaiian Monk Seal Recovery Actions. The PEIS presents:

- The purpose and need for action;
- A reasonable range of alternatives that fulfill the purpose and need for this proposed federal action;
- An overview of public comments received during the August – October 2011 public comment period and how comments were addressed;
- An evaluation of the type and range of direct and indirect effects associated with Hawaiian monk seal research and enhancement activities that may be implemented in future research permits;
- The contribution of research activities to the cumulative effects on species and resources likely to be affected by these activities, including effects from past, present, and reasonably foreseeable future events and activities that are external to the research activities; and
- Recommendations, monitoring plans, and processes for proposed new research and enhancement activities that include considerations for continued and improved stakeholder and community involvement.



The National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Services (NMFS) is the Federal agency responsible for management, conservation and recovery of Hawaiian monk seals under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). As part of their responsibilities, NMFS funds,

permits, and conducts research and enhancement activities on Hawaiian monk seals in the Northwestern Hawaiian Islands (NWHI) and main Hawaiian Islands (MHI).

Hawaiian monk seals have experienced a prolonged population decline. In 1976, Hawaiian monk seals were listed as “endangered” under the ESA (41 Federal Register [FR] 51611) and “depleted” under the MMPA. The Hawaiian monk seal is the most endangered pinniped species in United States (U.S.) waters and the second most endangered pinniped in the world.

The most recently published best estimate of total abundance is 1,212 seals (Carretta *et al.* 2013) in 2010, and the number was estimated to be declining at approximately 4.0% per year. Preliminary unpublished results from more recent years indicate the population is still declining. The population is many times larger in the NWHI than in the MHI. However, the MHI population is increasing and juvenile survival rates are consistently higher than in the NWHI.



Hawaiian monk seals occur on islands, atolls, and emergent reefs throughout the Hawaiian Archipelago, from Kure Atoll to Hawai'i Island, a distance of over 2,500 km (approximately 1,553 miles). The seals forage in and transit the waters surrounding and between all land areas. Intermittent sightings of Hawaiian monk seals have also occurred at Johnston Atoll,

approximately 800 km (approximately 497 miles) south of the Hawaiian Archipelago.

#### **ES-2.0 PROPOSED ACTION**

NMFS is required by Section 4(f) of the ESA to develop a recovery plan for this critically endangered species. NMFS' proposed action includes permitting and implementing research and enhancement activities (as described in Section ES-5.0, below) identified in the Hawaiian Monk Seal Recovery Plan (NMFS 2007). NMFS considered a reasonable range of alternatives including the most promising actions to improve monk seal survival and provide the best hope for conservation and recovery of the species

#### **ES-3.0 PURPOSE AND NEED**

The purpose of implementing recovery activities (research and enhancement) for the Hawaiian monk seal is to promote the recovery of the species to population levels at which ESA protection is no longer needed.

The need for this action is rooted in fundamental biological and ecological factors that are now limiting the population. A comprehensive research program enables NMFS to recognize, and possibly quantify, factors limiting the population in order to designate appropriate actions to minimize human-induced impacts and other factors affecting seal survival. Data and analyses derived from research lead to improved decision-making, and strategic

management and enhancement activities that promote population recovery, prevent harm, and avoid jeopardy or continued disadvantage to the species as required under the ESA. Research and monitoring will continue to play a key role in determining whether enhancement activities achieve their desired outcomes.

#### **ES-4.0 PUBLIC INVOLVEMENT**

NMFS initiated public scoping for this PEIS when the Notice of Intent (NOI) was published in the Federal Register on October 1, 2010 (75 FR 60721). The NOI requested public participation in the scoping process and presented information to stimulate public discussion, such as a statement of purpose and need for the proposed action and preliminary alternatives. Scoping comments were summarized in the Scoping Report that was included as Appendix B of the Draft PEIS.

The Notice of Availability (NOA) for the Draft PEIS was published in the *Federal Register* on August 19, 2011 (76 FR 51945), which began the official public comment period for this PEIS. The public comment period lasted for 60 days and concluded on October 17, 2011.



A total of 341 comment submissions were received from agencies and the public on the Draft PEIS. These submissions generated 1,180 substantive comments. Substantive comments received during the public comment process raised issues that have been addressed and incorporated throughout this Final PEIS.

A Comment Analysis Report is included as Appendix B to this Final PEIS. The Comment Analysis Report provides NMFS' responses to issues raised in comments and also refers to specific sections of this Final PEIS where additional information can be found or where changes to the document have been made after consideration of public comments.

Table ES-1 lists issues raised during the comment period and specific sections of this Final PEIS where those issues are discussed. More detailed comment summaries are provided in the Comment Analysis Report in Appendix B.

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**Table ES-1 Issues Raised During the Public Comment Period and Where They Are Addressed in the Final PEIS**

Issue	Sections in the PEIS Where Issue Is Discussed	General Description of Revisions Made
Alternatives	<ul style="list-style-type: none"> <li>• 2.6 Alternatives Carried Forward for Analysis</li> <li>• 2.12 Alternatives Not Carried Forward for Analysis</li> <li>• 4.7.1 through 4.8.7 Environmental Consequences of Alternatives for Resources Evaluated</li> <li>• 2.5 Research and Enhancement Components of the Alternatives</li> </ul>	<ul style="list-style-type: none"> <li>• 2.6 - Additional information is provided on the total number of weaned monk seal pups that could be translocated under Alternatives 3 and 4.</li> <li>• 2.12 - Additional information has been added about the rationale for eliminating alternatives such as predator control on the NWHI.</li> </ul>
Behavior Modification	<ul style="list-style-type: none"> <li>• 2.9 Alternative 3: Limited Translocation (Preferred Alternative)</li> <li>• 2.10 Alternative 4: Enhanced Implementation</li> <li>• 4.5 Steps for Identifying Cumulative Effects</li> <li>• 4.8 Social and Economic Environment</li> <li>• 5.4 Plan for Development of a Behavior Modification Program</li> </ul>	<ul style="list-style-type: none"> <li>• 4.8.1 thru 4.8.3 and 4.8.5 - Additional information is provided on the effects of behavioral modification activities or lack thereof (Alternative 2) as they relate to human-seal interactions, including fisheries interactions.</li> </ul>
Cumulative Effects	<ul style="list-style-type: none"> <li>• The following sections present the evaluation of cumulative effects of the Alternatives on subject resources:</li> <li>• 4.7.1.21 Hawaiian Monk Seals</li> <li>• 4.7.3.6 Sea Turtles</li> <li>• 4.7.4.4 Cetaceans</li> <li>• 4.7.5.3 Fish</li> <li>• 4.7.6.5 Birds</li> <li>• 4.7.8.2 Invasive Species</li> <li>• 4.8.1.5 Commercial Fishing</li> <li>• 4.8.2.5 Subsistence Fishing</li> <li>• 4.8.3.5 Recreational Fishing</li> <li>• 4.8.4.5 Cultural Resources and Historic Properties</li> <li>• 4.8.5.9 Recreation and Tourism</li> <li>• 4.8.6. Environmental Justice</li> <li>• 4.8.7.5 Military Activities</li> <li>• 4.9 Summary of Effects</li> </ul>	<ul style="list-style-type: none"> <li>• Table 4.5-2 <i>Reasonably Foreseeable Future Actions Within the Project Area</i> has been updated with the most current reasonably foreseeable activities.</li> <li>• Section 4.7.1.21 - additional information provided on levels of take from other activities besides research.</li> <li>• Sections 4.8.1.5 thru 4.8.3.5 - additional activities including the designation of monk seal critical habitat, spinner dolphin protection measures and modifications to the Hawaiian Islands Humpback Whale National Marine Sanctuary are included in the analysis of cumulative effects on fisheries.</li> </ul>
Diseases	<ul style="list-style-type: none"> <li>• 3.3.1.7 Crucial and Serious Environmental and Anthropogenic Stressors/Threats (subheading Infectious Diseases)</li> <li>• 4.7.1.6 Mechanisms for Injury From Translocation</li> <li>• 4.7.1.8 Mechanisms of Injury from Vaccination</li> <li>• 4.7.1.15 Assessment of Beneficial Contributions Toward Conservation Objectives</li> <li>• 4.7.1.19 Direct and Indirect Effects of Alternative 3: Limited Translocation</li> </ul>	<ul style="list-style-type: none"> <li>• Appendix E - has been updated with additional information on what specific events may trigger vaccination of wild seals.</li> </ul>

Issue	Sections in the PEIS Where Issue Is Discussed	General Description of Revisions Made
	<ul style="list-style-type: none"> <li>• 4.7.1.20 Direct and Indirect Effects of Alternative 4: Enhanced Implementation</li> <li>• 5.3 Plan for the Vaccination Process</li> <li>• Appendix E – Vaccination Plan</li> </ul>	
Ecosystem	<ul style="list-style-type: none"> <li>• 3.2 Physical Environment</li> <li>• 3.3 Biological Environment</li> <li>• 4.7 Environmental Consequences – Biological Environment</li> </ul>	<ul style="list-style-type: none"> <li>• 3.3 and 4.7 general information has been updated as necessary.</li> </ul>
Fisheries	<ul style="list-style-type: none"> <li>• 3.4.3 Affected Environment – Commercial Fishing</li> <li>• 3.4.4 Affected Environment – Subsistence Fishing</li> <li>• 3.4.5 Affected Environment – Recreational Fishing</li> <li>• 4.8.1 Environmental Consequences – Commercial Fishing</li> <li>• 4.8.2 Environmental Consequences – Subsistence Fishing</li> <li>• 4.8.3 Environmental Consequences – Recreational Fishing</li> </ul>	<ul style="list-style-type: none"> <li>• 4.8.1 thru 4.8.3 – NMFS has made substantial revisions to the evaluation of fisheries-related impacts of the Alternatives. The analysis relies heavily upon a recently published report (Sprague et al. 2013). This publication evaluates reef fish biomass, monk seal biomass, monk seal consumption of fish, fishery landings and degree of overlap between monk seal prey selection and species targeted by fishers in the MHI.</li> <li>• Revisions also include information about potential costs associated with interactions between seals and fisheries such as increased fuel costs related to avoiding seals or damage to gear by seals.</li> </ul>
Hawaiian Monk Seal Biology	<ul style="list-style-type: none"> <li>• 3.3.1 Affected Environment - Hawaiian Monk Seals</li> </ul>	
Human-Seal Interactions	<ul style="list-style-type: none"> <li>• 3.4.8 Affected Environment – Recreation and Tourism</li> <li>• 3.4.9 Affected Environment – Public Safety</li> <li>• 4.8.1 Environmental Consequences – Commercial Fishing</li> <li>• 4.8.2 Environmental Consequences – Subsistence Fishing</li> <li>• 4.8.3 Environmental Consequences – Recreational Fishing</li> <li>• 4.8.5 Environmental Consequences – Recreation and Tourism</li> <li>• 4.8.6 Environmental Consequences – Environmental Justice</li> </ul>	<ul style="list-style-type: none"> <li>• 3.4.8 – Updates to the number and type of human-seal interactions that have occurred since publication of the Draft PEIS in 2011.</li> <li>• 4.8.1 thru 4.8.6 – Additional evaluation of the potential costs associated with human-seal interactions are provided in each of these sections. For example, the potential costs associated with fishermen attempting to avoid interactions with seals are evaluated.</li> </ul>
Management	<ul style="list-style-type: none"> <li>• 5.1 Implementation of the Hawaiian Monk Seal Recovery Actions PEIS Under NEPA</li> <li>• 5.2 Monitoring Plan for the Two-Stage Translocation Process</li> <li>• 5.3 Plan for the Vaccination Process</li> <li>• 5.4 Plan for Development of a Behavior Modification Program</li> <li>• 5.5 Mitigating Potential Impacts To Cultural Resources And Historical Properties</li> <li>• 5.6 Coordination with Stakeholders and Communities</li> </ul>	<ul style="list-style-type: none"> <li>• 5.1 thru 5.6 – Additional information has been provided on NMFS’s implementation of these programs.</li> <li>• 5.6 – Additional detail is provided about NMFS’s public outreach program.</li> </ul>
Cultural	<ul style="list-style-type: none"> <li>• 3.4.6 Affected Environment – Cultural Environment</li> <li>• 3.4.7 Affected Environment – Cultural Resources and Historic Properties</li> <li>• Appendix J – Historical and Contemporary Significance of the Endangered Hawaiian Monk Seal in Native Hawaiian Culture</li> </ul>	<ul style="list-style-type: none"> <li>• 3.4.6 thru 3.4.7 - Revisions have been made based on re-evaluation of potential impacts of monk seal research and enhancement activities on cultural and historic properties within the Project Area.</li> <li>• Appendix B – Section 106 Consultation has been completed and results of the evaluation as well as correspondence with the Hawai’i State Historic</li> </ul>

Issue	Sections in the PEIS Where Issue Is Discussed	General Description of Revisions Made
	<ul style="list-style-type: none"> <li>• Appendix B – Final Section 106 Analysis of the PEIS for the Hawaiian Monk Seal Recovery Actions</li> </ul>	<p>Preservation Division are provided.</p> <ul style="list-style-type: none"> <li>• Appendix K – Cultural Impact Assessment has been completed providing a detailed impact assessment and review of references and significance of monk seals in traditional Hawaiian culture.</li> </ul>
Public Coordination	<ul style="list-style-type: none"> <li>• 5.1 Implementation of the Hawaiian Monk Seal Recovery Actions PEIS Under NEPA</li> <li>• 5.2 Monitoring Plan for the Two-Stage Translocation Process</li> <li>• 5.3 Plan for the Vaccination Process</li> <li>• 5.4 Plan for Development of a Behavior Modification Program</li> <li>• 5.5 Mitigating Potential Impacts To Cultural Resources And Historical Properties</li> <li>• 5.6 Coordination with Stakeholders and Communities</li> <li>• Appendix C – Comment Analysis Report</li> </ul>	<ul style="list-style-type: none"> <li>• 5.1 thru 5.6 – Additional information has been provided on NMFS’s implementation of these programs.</li> <li>• 5.6– Additional detail is provided about NMFS’s public outreach program.</li> <li>• Appendix C – A Comment Analysis Report documenting the public comment period and associated public hearings is appended to the Final PEIS.</li> </ul>
Regulatory	<ul style="list-style-type: none"> <li>• 1.5 Federal Laws and Associated Permits and Authorizations Applicable to Hawaiian Monk Seal Research and Enhancement Activities</li> <li>• 1.6 Why a PEIS is Needed</li> <li>• 1.8 Required Decisions and Other Agencies Involved in this Analysis</li> </ul>	<ul style="list-style-type: none"> <li>• 1.5.2 Clarification has been added about civil penalties associated with the Endangered Species Act.</li> <li>• 1.5.4 An update on the Section 106 Consultation has been added</li> <li>• 1.5.6 An update on coordination with the Coastal Zone Management Program has been added.</li> </ul>
Socioeconomic	<ul style="list-style-type: none"> <li>• 3.4 Affected Environment – Social and Economic Environment</li> <li>• 4.8 Environmental Consequences – Social and Economic Environment</li> </ul>	<ul style="list-style-type: none"> <li>• 3.4 Updates to general social and economic information have been added such as population data, etc.</li> <li>• 4.8 Revisions to analysis of potential impacts of the Alternatives on fisheries, recreation and tourism, public safety, and cultural and historic properties have been made.</li> </ul>
Translocation	<ul style="list-style-type: none"> <li>• 2.5 Research and Enhancement Components of the Alternatives</li> <li>• 4.7.1 Environmental Consequences – Hawaiian Monk Seals</li> <li>• 4.8.1 thru 4.8.3 Environmental Consequences - Fisheries</li> <li>• Appendix F Proposed Translocation Plan</li> </ul>	<ul style="list-style-type: none"> <li>• 4.8.1 thru 4.8.3, 4.8.4 and 4.8.5 - Potential effects of the two-stage translocation (Alternatives 3 and 4) on fisheries, recreation and tourism, and cultural and historic properties have been re-evaluated and these revisions are presented in these sections.</li> </ul>

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Three action alternatives and a no action alternative were developed and analyzed in this PEIS. The four alternatives carried forward for detailed analysis vary in scope and level of activities, including the types of research and enhancement activities and number of animals that would be permitted under each alternative. Different thresholds for “acceptable” levels of mortality are also associated with the range of research activities. Additional detail about the alternatives can be found in Chapter 2.

**Alternative 1: Status Quo**

Under the Status Quo Alternative, the current NMFS research and enhancement permit (Permit No. 10137) would continue until its expiration in 2014.

New permits or permit amendments for levels and types of research the same as currently permitted would be approved. New permits or amendments would not be approved if it were determined under the ESA that the permitted activities would jeopardize the continued existence of the species or adversely modify critical habitat when expected effects were added to existing research, enhancement, and other activities in the baseline at the time the application was received.

Research and enhancement activities allowed under the Status Quo Alternative are listed in Table 2.10-1 and include those that have been carried out consistently for decades (*e.g.*, land-based surveys and marking), newer research (*e.g.*, de-worming studies), and ongoing mitigation for mortality (*e.g.*, disentanglement).

No new activities nor an expansion of the scope of existing activities would occur under the Status Quo Alternative.

**Alternative 2: No Action**

The No Action Alternative would only allow Hawaiian monk seal research and enhancement activities to continue until the existing permit expires in 2014. No new permit would be issued to replace permit 10137 when it expires, nor could that permit be amended to allow modifications in research or enhancement activities, sample sizes, or objectives. After expiration of the permit, all research and enhancement activities conducted by NMFS and requiring a permit would cease. Limited enhancement (*e.g.*, entanglement and de-hooking; hazing or translocating seals away from imminently harmful situations) could be accomplished under the separate permit for the Marine Mammal Health and Stranding Response Program (see Section 1.4) and not as part of this research and enhancement program.

*Alternative 3: Limited Translocation (Preferred Alternative)*

Alternative 3 would include all currently permitted activities and further address the recommendations of the Hawaiian Monk Seal Recovery Plan (2007) by including new research and enhancement activities not currently permitted.

While Alternative 4 (Enhanced Implementation) was preferred in the Draft PEIS, Alternative 3 (Limited Translocation) has been selected as the Preferred Alternative in the Final PEIS. The distinction between these two Alternatives is that Alternative 3 does *not* include any two-stage translocation option that would involve taking weaned pups born in the NWHI and releasing them in the MHI. However, a variety of translocation actions could occur under Alternative 3, including two-stage translocation *within* the NWHI, *within* the MHI, or from the MHI to the NWHI, with the option of returning the seals to their birth location or nearest appropriate site at age 2 years and older.

NMFS would conduct many important seal research and enhancement activities under Alternative 3 and engage the public in an effort to address concerns raised during the Draft PEIS public comment process, especially concerns related to human-seal interactions. Also, monitoring and intervention protocols to minimize undesirable human-seal interactions could be further developed under Alternative 3 (Preferred).

Alternative 3 would build upon the status quo and represents the assessment of steps that could be taken currently to prevent the extinction of the Hawaiian monk seal, based upon the best available scientific data. It encompasses a very broad and ambitious research and enhancement program, including research on population biology, ecology, health studies, foraging research, and a suite of enhancement tools designed to mitigate existing and emerging threats to the species, as identified in the species' recovery plan (NMFS 2007).

Activities currently permitted under the Status Quo that would continue under Alternative 3 (Preferred) are provided in Table 2.10-1 and include, but are not limited to:

- Monitoring via ground, vessel, and aerial surveys; marking and photo ID;
- Health screening and instrumentation;
- De-worming research;
- Specimen collection and import/export of specimens;
- Disentanglement and dehooking;
- Adult male removal for enhancement; and
- Translocation (one-way) for enhancement including:
  - Translocating abandoned nursing pups to a foster mother or their natural mother within their birth island or atoll;
  - Translocating weaned pups from a high risk area (*e.g.*, known shark predation) to a low risk area within the same island or atoll

in the NWHI or Johnston Atoll; translocations in the MHI may be to a different location on the same island or to a different island in the MHI; and

- Translocating weaned pups and juveniles in subpopulations where juvenile survival is low to subpopulations with higher rates of juvenile survival; seals may be translocated among subpopulations within the NWHI.

Activities not currently permitted that would also occur under Alternative 3 are provided in Table 2.10-1 and include, but are not limited to:

- Expanded surveys and use of new research tools (*e.g.*, new telemetry devices).
- Vaccination studies and potential implementation of vaccines to mitigate infectious disease.
- Potential implementation of de-worming as an enhancement tool to improve juvenile Hawaiian monk seal survival.
- Expanded scope and number of seal translocations, including:
  - Translocating seals with unmanageable human interactions from the MHI to the NWHI;
  - Translocating juvenile and older seals from the MHI to NWHI to examine their subsequent survival; and
  - Implementing a two-stage translocation program whereby weaned pups are taken from areas of lower survival to areas of higher survival within the NWHI, within the MHI, or from the MHI to the NWHI. ***This excludes taking weaned pups born in the NWHI to the MHI.*** This program would include the option of returning the translocated seals to their birth location or nearest appropriate site at age 2 years or older. Note that seals born in the MHI and previously translocated to the NWHI may be returned to the MHI. Details of the translocations would be determined by a decision framework that is described in Section 5.2 and Appendix F.
- Supplemental feeding at NWHI locations where seals are released after being cared for in captivity.
- Research to develop tools for preventing or minimizing undesirable Hawaiian monk seal behavior (referred to as behavior modification) related to interactions with humans and fishing gear in the MHI. If proven effective by research, these tools would be implemented.
- Decreasing aggressive male monk seal behavior using a drug to reduce testosterone.

NMFS concludes that Alternative 3 would best achieve project goals consistent with the purpose and need statement, and complies with the various goals,

objectives and requirements of the ESA, MMPA, and other applicable laws. Alternative 3 constitutes the most effective implementation of key elements in the Recovery Plan and is the agency's Preferred Alternative. It is a very broad program, including research on population biology, ecology, health studies, foraging research, and a suite of enhancement activities and tools designed to mitigate existing and emerging threats to the species.

#### Alternative 4: Enhanced Implementation



Alternative 4, the enhanced implementation alternative, would encompass all the activities permitted under Alternative 3 (Preferred), *with the addition of the option for temporary translocation of weaned pups from the NWHI to the MHI*. At age 2-3 years, any surviving translocatees would be returned to the NWHI.

The decision framework (Section 5.2 and Appendix F) used in Alternative 3 for conducting translocations would also be used under this alternative. A distinguishing factor of Alternative 4 is that seals born in the NWHI may be temporarily translocated from the NWHI to the MHI during the first few years of their lives. While a total of 200 weaned pups could be translocated to the MHI from the NWHI over a 10-year period under this alternative, only a maximum of 60 of these would be in the MHI (or any other host site) at any given time as they will be returned when they reach 2 or 3 years of age.

The ability under Alternative 4 to conduct two-stage translocation from the NWHI to the MHI would allow for maximal flexibility to take advantage of the potential benefits of two-stage translocation, because weaned pups could be moved to wherever their survival chances are best. However, implementing two-stage translocations from the NWHI to the MHI would be infeasible at this time. NWHI pups, once brought to the MHI, could become involved in fishery and other human interactions, just as has occurred among some seals born in the MHI. Capacity and techniques for monitoring translocated seals, and intervening to prevent and mitigate such interactions, must be further developed before this action can be conducted without risking failure as measured both in terms of seal survival and public attitudes toward monk seal conservation. As discussed above, monitoring and intervention activities could be further developed under Alternative 3 (Preferred). Thus, while Alternative 4 was the preferred alternative in the Draft PEIS, it is not the preferred alternative in the Final PEIS.

### Alternatives Not Carried Forward for Analysis

The public comment process highlighted other considerations for alternatives. In Section 2.12, two alternatives were considered but were not carried forward for analysis in this PEIS.

One alternative considered but discarded was to reduce populations of large predatory fish in the NWHI (Papahānaumokuākea Marine National Monument [Monument]) as a way to increase survival of Hawaiian monk seals. This proposal is based on the hypothesis that one of the primary factors limiting monk seal recovery in the NWHI is predation and direct or indirect competition with other predatory species such as sharks and jacks.

NMFS currently lacks sufficient information on NWHI food web dynamics to make a reliable prediction whether predator reduction would be an effective method for improving juvenile monk seal survival without unintended consequences. Compared to all other actions proposed in Alternative 3 (Preferred), the results of large-scale predator management/removal is far more uncertain. It is not the ability to remove fish that is uncertain, but rather whether it would benefit monk seals without having unanticipated and undesirable environmental consequences. NMFS is not dismissing this concept indefinitely and plans to investigate it further with other agency and independent scientists outside the context of the PEIS. However, the time required to gather sufficient data in order to understand the impacts and effectiveness of reducing predatory fish populations would not be timely for the recovery of the monk seal – which makes predator reduction inconsistent with the purpose and meed of this PEIS.

Another alternative considered but not carried forward was to construct a research facility or aquarium for breeding, rearing, and feeding monk seals in the NWHI. Human impacts in the Monument are minimized and heavily regulated to protect the native ecosystem. Construction, operation, and maintenance of such a facility in the NWHI would be logistically challenging and several orders of magnitude more costly, making this alternative unreasonable.

## ES-6.0

### **SUMMARY OF ENVIRONMENTAL CONSEQUENCES**

The direct and indirect effects, or environmental consequences, to the human environment were analyzed for each alternative. Each alternative was also evaluated to determine its contribution to cumulative effects on each resource.

Table ES-2 summarizes the direct, indirect, and cumulative effects under each alternative for all resources where environmental consequences were evaluated. Detailed analyses and discussions of effects can be found in Chapter 4.

The effects (both beneficial and adverse) of each alternative on a range of biological and socio-economic resources was analyzed and categorized on a scale ranging from *negligible* through *major*. A summary of the analysis results is

presented in Table ES-2. The totality of these analyses was very complex; for some resources several types of effects (for example, on mortality, reproduction, habitat, etc.) were analyzed, and for each resource direct, indirect and cumulative effects were evaluated. Because of this complexity, it can be a challenge to sort out the main conclusions. In order to do so, it is useful to first present all the effects that were found to be consistent among alternatives, and then to focus on just how the alternatives were distinct in terms of their effects.

#### *Effects on Other Resources - Negligible Effects for All Alternatives*

Among the biological resources, all effects on sea turtles, cetaceans, corals, and fish species were found to be *negligible* for all alternatives.

Likewise, among socio-economic resources, all effects on fishing (commercial, subsistence and recreational), environmental justice, and military resources were determined to be *negligible* for all alternatives.

Regarding effects on fisheries (commercial, subsistence and recreational), this PEIS relies upon a recent study (Sprague et al. 2013) regarding the estimated consumption of prey by monk seals compared to available prey biomass, consumption by other apex predators, and commercial and non-commercial fisheries landings. This research indicates that the current population of approximately 200 monk seals in the main Hawaiian Islands consumes a maximum of 0.009% of the estimated available prey biomass. Also, apex predatory fish in the main Hawaiian Islands likely consume over 50 times more prey than the monk seal population. The analysis presented in this PEIS draws on this and other research findings to conclude *negligible* effects on fisheries for all alternatives.

#### *Effects on Other Resources - Variable Effects for Alternatives*

Effects on birds, and invasive species ranged from *negligible* to *minor adverse* and were identical for Alternatives 1 (Status Quo), 3 (Preferred) and 4 (Enhanced Implementation). A distinction was that under Alternative 2 (No Action), all effects on birds and invasive species were found to be *negligible*.

Similarly, effects on cultural and historic properties were deemed *minor adverse* to *negligible* and were identical for all the Action Alternatives (1, 3, and 4), and *negligible* for the No Action Alternative (2).

Recreation and Tourism effects were *negligible* for Alternatives 1 and 2, but were *moderate beneficial* for Alternative 3 and 4. The latter result was due to potentially increased wildlife viewing alternatives coupled with reduced negative human-seal interactions as a result of seal behavioral modification and translocation of seals that may become socialized to people.

### Effects on Hawaiian Monk Seals

The greatest distinction among the alternatives was their effects on the Hawaiian monk seal, the species which is the subject of the proposed research and enhancement activities. Three types of effects on Hawaiian monk seals were analyzed for each alternative:

- Effects on Mortality;
- Effects on Reproduction; and
- Contributions to Conservation Objectives.

Mortality and reproductive effects are adverse to monk seals. However, those are counter-balanced by the beneficial effects of contributing to conservation objectives and recovery of the species in the long-term.



#### ***Effects on Hawaiian Monk Seal Mortality - Vary by Alternative***

Mortality effects on monk seals were evaluated by how much the proposed lethal takes of seals allowed under each alternative would likely affect the species population in the future. Because Alternatives 3 and 4 involve a broader array of research and, especially, enhancement activities, there are greater associated risks of mortality. For that reason, **mortality effects on monk seals of Alternatives 3 and 4 were found to be *minor to moderate adverse***, slightly greater than the *minor adverse* effects under Alternative 1. Alternative 2 had *negligible* mortality effects because all permitted take of seals, including mortalities, would cease after 2014. In the context of the many other natural and human-caused sources of monk seal deaths, the cumulative effects of Alternative 1, 3 and 4 mortality was determined to be *negligible*.

#### ***Effects on Hawaiian Monk Seal Reproduction - Negligible for All Alternatives***

Reproductive effects on monk seals under all alternatives were determined to be *negligible*. This was concluded based upon past research and publications that show the types of activities proposed have not had any detectable reproductive effects on Hawaiian monk seals or other seal species. Also, very cautious protocols that would be used by NMFS (for example, not capturing pregnant or nursing females and minimizing disturbance of mother-pup pairs) make any reproductive impacts exceedingly unlikely.

#### ***Contributions to Hawaiian Monk Seal Conservation - Vary by Alternative***

Contributions to conservation benefits for monk seals varied among the alternatives. Under Alternative 1, status quo activities would continue to make *moderate beneficial* contributions, but not at a level that would be expected to make significant progress toward recovery. Alternative 2 would clearly lead to

*major adverse* effects on conservation, because nearly all research and enhancement activities would cease after 2014.

The broader scope of research and enhancement under Alternatives 3 and 4 led to both being categorized as resulting in ***major beneficial effects for conservation of monk seals***. Among those two alternatives, the only distinction is that Alternative 4 would allow for the option of temporary translocation of weaned pups from the NWHI to the MHI, followed by a return to the NWHI after age 2-3 yr.

Maximum potential benefits might not be realized through the two-stage translocation proposed under Alternative 3 because weaned pups could not be moved from areas of current low survival in the NWHI to current higher survival in the MHI. Weaned pups would only be translocated within each region or from the MHI to the NWHI. This limits the potential effectiveness of the translocation process given current demographic rates. If future conditions are such that translocations from the NWHI to MHI would be even more beneficial than they may be currently, the inflexibility to conduct such translocations would reduce potential conservation benefits of Alternative 3 further. However, monk seal monitoring and intervention capabilities essential for successful two-stage translocation from the NWHI to the MHI (as proposed under Alternative 4) require further development and refinement. Therefore, Alternative 3 is preferred at the present time.

Table ES-2 Summary of Direct/Indirect and Cumulative Effects

		Alternative 1: Status Quo	Alternative 2: No Action No Permit After 2014	Alternative 3: Limited Translocation (Preferred Alternative) (only MHI to NWHI or within each region)	Alternative 4: Enhanced Implementation
<b>HAWAIIAN MONK SEALS</b>					
<b>Mortality</b>	Direct/Indirect Effects	Minor Adverse	Negligible	Minor to Moderate Adverse	Minor to Moderate Adverse
	Cumulative Effects	Negligible contribution			
<b>Reproduction</b>	Direct/Indirect Effects	Negligible	Negligible	Negligible	Negligible
	Cumulative Effects	Negligible contribution			
<b>Contribution to Conservation Objectives</b>	Direct/Indirect Effects	Moderate beneficial	Major adverse	Major beneficial	Major beneficial
	Cumulative Effects	Moderate beneficial contribution	Major adverse contribution	Major beneficial contribution	Major beneficial contribution
<b>SEA TURTLES</b>					
<b>Mortality</b>	Direct/Indirect Effects	Negligible	Negligible	Negligible	Negligible
	Cumulative Effects	Negligible contribution			
<b>Reproduction</b>	Direct/Indirect Effects	Negligible	Negligible	Negligible	Negligible
	Cumulative Effects	Negligible contribution			

		Alternative 1: Status Quo	Alternative 2: No Action No Permit After 2014	Alternative 3: Limited Translocation (Preferred Alternative) (only MHI to NWHI or within each region)	Alternative 4: Enhanced Implementation
<b>CETACEANS</b>					
<b>Mortality</b>	Direct/Indirect Effects	Negligible	Negligible	Negligible	Negligible
	Cumulative Effects	Negligible contribution			
<b>Reproduction</b>	Direct/Indirect Effects	Negligible	Negligible	Negligible	Negligible
	Cumulative Effects	Negligible contribution			
<b>FISH</b>					
<b>Mortality</b>	Direct/Indirect Effects	Negligible	Negligible	Negligible	Negligible
	Cumulative Effects	Negligible contribution			
<b>BIRDS</b>					
<b>Productivity</b>	Direct/Indirect Effects	Negligible to Minor adverse	Negligible	Negligible to Minor adverse	Negligible to Minor adverse
	Cumulative Effects	Negligible to Minor adverse	Negligible to Minor adverse contribution	Negligible to Minor adverse contribution	Negligible to Minor adverse contribution
<b>Survival</b>	Direct/Indirect Effects	Negligible to Minor adverse (Moderate adverse for Laysan Finch)	Negligible to Minor adverse	Negligible to Minor adverse (Moderate adverse for Laysan Finch)	Negligible to Minor adverse (Moderate adverse for Laysan Finch)
	Cumulative Effects	Negligible to Minor adverse	Negligible contribution	Negligible to Minor adverse contribution	Negligible to Minor adverse contribution

		Alternative 1: Status Quo	Alternative 2: No Action No Permit After 2014	Alternative 3: Limited Translocation (Preferred Alternative) (only MHI to NWHI or within each region)	Alternative 4: Enhanced Implementation
<b>Habitat Alteration</b>	Direct/Indirect Effects	Negligible to Minor adverse	Negligible	Negligible to Minor adverse	Negligible to Minor adverse
	Cumulative Effects	Negligible to Minor adverse	Negligible contribution	Negligible to Minor adverse contribution	Negligible to Minor adverse contribution
<b>CORALS</b>					
<b>Damage to corals and live rock</b>	Direct/Indirect Effects	Negligible	Negligible	Negligible	Negligible
	Cumulative Effects	Negligible contribution			
<b>INVASIVE SPECIES</b>					
<b>Spread of Invasive Species</b>	Direct/Indirect Effects	Negligible to Minor adverse	Negligible	Negligible to Minor adverse	Negligible to Minor adverse
	Cumulative Effects	Negligible contribution			
<b>COMMERCIAL FISHERIES</b>					
<b>Commercial Landings</b>	Direct/Indirect Effects	Negligible	Negligible	Negligible	Negligible
	Cumulative Effects	Negligible contribution			
<b>SUBSISTENCE FISHERIES</b>					
<b>Subsistence Catch</b>	Direct/Indirect Effects	Negligible	Negligible	Negligible	Negligible
	Cumulative Effects	Negligible contribution			
<b>RECREATIONAL FISHERIES</b>					

		Alternative 1: Status Quo	Alternative 2: No Action No Permit After 2014	Alternative 3: Limited Translocation (Preferred Alternative) (only MHI to NWHI or within each region)	Alternative 4: Enhanced Implementation
<b>Recreational Catch</b>	Direct/Indirect Effects	Negligible	Negligible	Negligible	Negligible
	Cumulative Effects	Negligible contribution			
<b>CULTURAL RESOURCES AND TRADITIONAL CULTURAL PRACTICES</b>					
<b>Traditional Fishing and Gathering Resources and Activities</b>	Direct/Indirect Effects	Negligible to Minor adverse	Negligible to Minor adverse	Negligible to Minor adverse	Negligible to Minor adverse
	Cumulative Effects	Negligible contribution			
<b>HISTORIC AND TRADITIONAL CULTURAL PROPERTIES</b>					
<b>Archaeological Sites, and other Historic Sites, and Cultural Properties</b>	Direct/Indirect Effects	Negligible to Minor adverse	Negligible	Negligible to Minor adverse	Negligible to Minor adverse
	Cumulative Effects	Negligible contribution			
<b>RECREATION AND TOURISM</b>					
<b>Recreation Experience and Cost, and Public Safety</b>	Direct/Indirect Effects	Negligible	Negligible	Moderate beneficial	Moderate beneficial
	Cumulative Effects	Negligible contribution			
<b>ENVIRONMENTAL JUSTICE</b>					
<b>Disproportionate</b>	Direct/Indirect Effects	Negligible	Negligible	Negligible	Negligible

		Alternative 1: Status Quo	Alternative 2: No Action No Permit After 2014	Alternative 3: Limited Translocation (Preferred Alternative) (only MHI to NWHI or within each region)	Alternative 4: Enhanced Implementation
Effects on Minority Populations	Cumulative Effects	Negligible contribution			
<b>MILITARY ACTIVITIES</b>					
Military Activities	Direct/Indirect Effects	Negligible	Negligible	Negligible	Negligible
	Cumulative Effects	Negligible contribution			

**COLOR KEY**

	Negligible effect
	Negligible to minor adverse effect
	Minor adverse effect
	Minor to moderate adverse effect
	Major adverse effect
	Moderate beneficial effect
	Major beneficial effect

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This PEIS addresses research and enhancement permit activities that are proposed in the foreseeable future. The process for preparing research and enhancement permit applications and how they would be reviewed for NEPA compliance using this PEIS is detailed in Chapter 5.

Proposed research and enhancement permit activities identified and analyzed within Alternative 3 (Preferred) will be subject to NEPA compliance review on a regular basis to determine whether activities conducted are within the scope of activities analyzed in this PEIS. Proposed research and enhancement permit activities not identified and analyzed in Alternative 3 (Preferred) will be subject to a separate NEPA compliance review, the level of which will be determined when an application is submitted.

#### ***Monitoring Plans for the Two-Stage Translocation Process***

The proposed two-stage translocation strategy is an option included in Alternatives 3 (Preferred) and 4, with Alternative 4 allowing the additional option of temporary translocation of NWHI pups to the MHI. For both of these alternatives, two-stage translocation is aimed at improving juvenile Hawaiian monk seal survival.

A multitude of variables exist that contribute to uncertainty of outcomes, thus the translocation program would be monitored and guided by a complex and adaptive decision framework described in Appendix F and summarized in Section 5.2.

Many of the inputs to the decision framework rely on monitoring key indicators such as population status, juvenile survival rates, and results from previous translocations. At various points in the decision framework, researchers would use a computer model (called a stochastic simulation model) updated with the most recent seal population data to estimate the likely range of benefits associated with different choices (that is, different source sites and nursery sites, or different numbers of seals). Existing survival and age/sex structure information will be the primary basis for determining when to conduct translocations and between which subpopulations. Public input would also play

a role in deciding the most appropriate release sites if translocations were done from the NWHI to the MHI (under Alternative 4). Continued monitoring of both translocated and non-translocated individuals will provide the basis for project evaluation, informing the subsequent steps and reducing uncertainties of simulations.

#### **Plan for the Vaccination Process**

The proposed vaccination program is somewhat unique among the actions in this PEIS because it is designed to address a potential, rather than a realized, threat to the Hawaiian monk seal. There is great potential for infectious disease to have devastating effects on the species. Morbillivirus and West Nile virus are two viral diseases, with available vaccines, that pose a potential threat to monk seals.

The proposed vaccination activities (detailed in Appendix E) for Hawaiian monk seals involve two primary elements as follows:

- 1) Continue research to test these vaccines on captive seals, confirm the vaccines' safety, and determine whether the expected immune response occurs by following up with blood tests; and
- 2) Be prepared with response plans should a "trigger" occur (for example, a case of morbillivirus in a wild monk seal). Even in the case of such a response, vaccinations would be initially limited to the population perceived to be at immediate risk, and would be expanded only after confirmation of safety and efficacy.

Prophylactic (preventative) vaccination may be considered in the future, but only after careful and conservative testing indicates that such an approach would be safe and effective.

#### **Plan for Development of a Behavior Modification Program**

Chapter 2 includes a description of a variety of aversive and disruptive (noise, visual, tactile, etc.) stimuli that may be considered for behavioral modification. Behavioral modification techniques will be applied only in situations where wild seals are beginning to regularly demonstrate behaviors that put themselves or humans at risk. Some examples include (but are not limited to): regularly interacting with snorkelers, divers or other ocean users; or regularly interacting with fishermen or fishing gear. The behavior modification program will employ a graduated approach, with escalating levels of aversive stimuli or deterrents (or positive stimuli to redirect behavior) delivered in response to increasing persistence or aggression on the part of the seal.

#### **Mitigating Potential Impacts to Cultural Resources and Historic Properties**

NMFS intends to implement activities or mitigation measures (described in Chapter 5) that are specifically designed to mitigate potential adverse impacts to historic and cultural properties. This includes coordination with the Hawai'i

State Historic Preservation Division (SHPD), which is currently updating its Geographic Information System (GIS) database of historic properties located within the MHI. This database will show the exact location of all historic properties for which accurate location coordinates are available. The SHPD GIS database can serve as a useful tool in planning Hawaiian monk seal recovery actions so as to avoid impacting known historic properties. NMFS staff and volunteers conducting monk seal recovery actions will also receive training as needed in the recognition and avoidance of archaeological and cultural sites.

NMFS will further develop a protocol for dealing with the removal of Hawaiian monk seals if they enter traditional fishponds. This protocol would involve consultation with the landowner and/or kahu (caretaker) of the pond, SHPD, local Native Hawaiian Organizations (if appropriate), and other appropriate entities to plan and coordinate the safe removal of the monk seal in a manner that would have the least impact on the structural integrity of the fishpond.

Finally, in the NWHI, permits are required for access to conduct Hawaiian monk seal research and enhancement activities within the limits of the Monument. Any activities associated with monk seal recovery actions undertaken within the NWHI must therefore comply with Monument regulations and the terms and conditions of Presidential Proclamation 8031. Monument regulations state that “permittees [must] attend a cultural briefing on the significance of Monument resources to Native Hawaiians” and that there are “prohibitions against the disturbance of any cultural or historic property” (NOAA 2008b).

#### *Coordination with Stakeholders and Communities*

NMFS intends to further develop and maintain close coordination with key stakeholders, community members, and partners to facilitate implementation of the proposed recovery actions. Ocean-oriented stakeholders and community members, such as fishers, surfers, Native Hawaiian practitioners, coastal property managers, etc., are among those most likely to encounter monk seals or most likely to have unique knowledge or experience that would be useful for successful implementation of the proposed activities in the MHI. Government agency and non-government organizations have been, and will continue to be, essential partners in successful recovery action implementation. Chapter 5 summarizes community-based programs NMFS has or will support to the maximum extent possible and discusses how these or similar programs could facilitate implementation of the proposed recovery actions.

NMFS manages the Marine Mammal Response Network in Hawai'i in partnership with several government and non-government partners, and with oversight and authorization from the NMFS National Marine Mammal Health and Stranding Response Program. The network is comprised of island-based response coordinators who oversee the activities of numerous volunteers and partner agency staff. The network responds to monk seals reported as sick, injured, entangled or hooked in the MHI. The network also responds to

“routine” monk seal haulouts and conducts outreach and education activities at schools and community events.

NMFS convened a Hawaiian Monk Seal Recovery Team to support development of the revised Hawaiian Monk Seal Recovery Plan (2007), and is convening a new recovery team to support implementation of the revised recovery plan, including implementation of research and enhancement actions proposed in this PEIS. The role of the new recovery team will be to advise NMFS on a variety of matters concerning the conservation and recovery of the endangered Hawaiian monk seal.

NMFS is developing a MHI Hawaiian Monk Seal Management Plan that will include roles for NMFS and partner government agencies, as well as non-government organizations, communities, and individual stakeholders. The MHI Management Plan will include an Outreach Plan, with the goal to inform citizens and thus enable them to think critically, and make decisions based on sound science and cultural information, about Hawaiian monk seals to facilitate monk seal population recovery. As part of the development of the outreach strategies related to the MHI Management Plan, significant input will be obtained from partners, stakeholders, and other individuals with expertise in conservation outreach and education.

Subject to available funding, the NMFS Pacific Islands Regional Office has and will continue to solicit competitive applications for partnerships supporting activities related to Hawaiian monk seal recovery, in particular activities related to recovery in the MHI. NMFS anticipates that priority will continue to be given to community-based and community-integrated projects or projects with an educational or outreach component geared to elevate public awareness and build capacity from the community level for Hawaiian monk seal recovery.

To support activities proposed in Alternative 3 (Preferred), coordination with community members should continue to draw on extensive two-way communication and information sharing between NMFS and the key stakeholders and community members as discussed above. This would be facilitated by continuing and expanding programs, such as those discussed above, that entail participatory planning and implementation, education and outreach, and other interactive and participatory activities.

This executive summary is a synopsis of the contents of the Final PEIS for



Hawaiian Monk Seal Recovery Actions. Comments received during the public comment period were reviewed and considered when developing this Final PEIS.

Approximately one month after the release of this Final PEIS, NMFS will publish a notification in the *Federal Register* announcing the issuance of the Record of Decision to the public. This decision document will conclude

the NEPA process on the proposed action. For updates on the Record of Decision, please visit the NMFS project website at:

<http://www.nmfs.noaa.gov/pr/permits/eis/hawaiianmonkseal.htm>.

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