Prepared for:

National Oceanic and Atmospheric Administration
National Marine Fisheries Service

Programmatic Environmental Impact Statement

Appendices A - M

Final PEIS for Hawaiian Monk Seal Recovery Actions

March 2014

- Page Intentionally Left Blank -

Appendix A
Agency Correspondence

- Page Intentionally Left Blank -

Initial Agency Letters to U.S. FWS and State of Hawai'i DLNR Inviting Them to Cooperate

- Page Intentionally Left Blank -

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 • Fax (808) 973-2941

SEP 14 2010

Loyal Mehrhoff, Ph.D.
Field Supervisor
Pacific Islands Ecological Field Service Office
Fish and Wildlife Service
300 Ala Moana Blvd., Room 3-122
Honolulu, HI 96850-0056

Dear Dr. Mehroff:

The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) is planning to prepare a Programmatic Environmental Impact Statement (PEIS) regarding implementation of various research and enhancement activities designed to improve survival of Hawaiian monk seals (HMS) in the Northwestern Hawaiian Islands (NWHI). As you are aware, the NMFS Pacific Islands Regional Office (PIRO) and NMFS Pacific Islands Fisheries Science Center (PIFSC) are responsible for HMS recovery and research under the Endangered Species Act (ESA) (16 United States Code [U.S.C.] 1531 et seq.) and the Marine Mammal Protection Act (MMPA) (16 U.S.C. 1361 et seq.).

The PEIS, in compliance with the National Environmental Policy Act (NEPA) (40 CFR Parts 1500-1508), will evaluate potential environmental, social, and economic impacts of implementing a range of research and enhancement activities stipulated in the HMS Recovery Plan (2007) to address low juvenile seal survival in the NWHI. As you know, low survival to reproductive age in the NWHI has been identified as a main factor driving the current steep HMS population decline.

Given the jurisdiction of USFWS within the proposed project area (the NWHI) and your agency's technical expertise regarding much of the subject matter to be covered in the PEIS, we are inviting your agency to participate as a cooperating agency on the proposed action pursuant to the Council on Environmental Quality's Regulations for Implementing NEPA (40 CFR 1501.6).

Should USFWS decide to work with NMFS as a cooprating agency, we suggest that we meet to discuss developing an MOU to deliniate our respective roles and responsibilities. Should you decide not to serve as a cooperating agency, please know that we will include USFWS in all of the public information gathering processes undetaken during the PEIS preparation. Regardless of your decision regarding this invitation, we look forward to continuing our coordination with USFWS on HMS recovery and research activities in the NWHI as co-trustees of the Papahanaumokuakea Marine National Monument.

We would appreciate being notified of your decision regarding this invitation on or before October 8, 2010. If you have any questions or would like to meet to discuss this request, please contact Jeff Walters, our Hawaiian monk seal recovery coordinator, at (808) 944-2235, or via email at jeff.walters@noaa.gov.

Sincerely,

Michael D. Tosatto
Acting Regional Administrator

cc: Barry Stieglitz, USFWS, Hawaiian and Pacific Islands NWR Complex

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 • Fax (808) 973-2941

SEP 14 2010

Barry Stieglitz
Project leader
Hawaiian and Pacific Islands National Wildlife Refuge Complex
Fish and Wildlife Service
300 Ala Moana Blvd., Room 5-231
Honolulu, HI 96850-0056

Dear Mr. Stieglitz:

The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) is planning to prepare a Programmatic Environmental Impact Statement (PEIS) regarding implementation of various research and enhancement activities designed to improve survival of Hawaiian monk seals (HMS) in the Northwestern Hawaiian Islands (NWHI). As you are aware, the NMFS Pacific Islands Regional Office (PIRO) and NMFS Pacific Islands Fisheries Science Center (PIFSC) are responsible for HMS recovery and research under the Endangered Species Act (ESA) (16 United States Code [U.S.C.] 1531 et seq.) and the Marine Mammal Protection Act (MMPA) (16 U.S.C. 1361 et seq.).

The PEIS, in compliance with the National Environmental Policy Act (NEPA) (40 CFR Parts 1500-1508), will evaluate potential environmental, social, and economic impacts of implementing a range of research and enhancement activities stipulated in the HMS Recovery Plan (2007) to address low juvenile seal survival in the NWHI. As you know, low survival to reproductive age in the NWHI has been identified as a main factor driving the current steep HMS population decline.

Given the jurisdiction of USFWS within the proposed project area (the NWHI) and your agency's technical expertise regarding much of the subject matter to be covered in the PEIS, we are inviting your agency to participate as a cooperating agency on the proposed action pursuant to the Council on Environmental Quality's Regulations for Implementing NEPA (40 CFR 1501.6).

Should USFWS decide to work with NMFS as a cooprating agency, we suggest that we meet to discuss developing an MOU to deliniate our respective roles and responsibilities. Should you decide not to serve as a cooperating agency, please know that we will include USFWS in all of the public information gathering processes undetaken during the PEIS preparation. Regardless of your decision regarding this invitation, we look forward to continuing our coordination with USFWS on HMS recovery and research activities in the NWHI as co-trustees of the Papahanaumokuakea Marine National Monument.

We would appreciate being notified of your decision regarding this invitation on or before October 8, 2010. If you have any questions or would like to meet to discuss this request, please contact Jeff Walters, our Hawaiian monk seal recovery coordinator, at (808) 944-2235, or via email at jeff.walters@noaa.gov.

Sincerely,

Michael D. Tosatto
Acting Regional Administrator

cc: Loyal Mehrfoff, USFWS, Pacific Islands Ecological Services

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 • Fax (808) 973-2941

SEP 1 4 2010

Ms. Laura H. Thielen
Chairperson
Department of Land and Natural Resources
1151 Punchbowl St.
Honolulu, HI 96813

Dear Ms. Thielen:

The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) is planning to prepare a Programmatic Environmental Impact Statement (PEIS) regarding implementation of various research and enhancement activities designed to improve survival of Hawaiian monk seals (HMS) in the Northwestern Hawaiian Islands (NWHI). As you are aware, the NMFS Pacific Islands Regional Office (PIRO) and NMFS Pacific Islands Fisheries Science Center (PIFSC) are responsible for HMS recovery and research under the Endangered Species Act (ESA) (16 United States Code [U.S.C.] 1531 et seq.) and the Marine Mammal Protection Act (MMPA) (16 U.S.C. 1361 et seq.).

The PEIS, in compliance with the National Environmental Policy Act (NEPA) (40 CFR Parts 1500-1508), will evaluate potential environmental, social, and economic impacts of implementing a range of research and enhancement activities stipulated in the HMS Recovery Plan (2007) to address low juvenile seal survival in the NWHI. As you know, low survival to reproductive age in the NWHI has been identified as a main factor driving the current steep HMS population decline.

Given the jurisdiction of DLNR within the proposed project area (the NWHI) and your agency's technical expertise regarding much of the subject matter to be covered in the PEIS, we are inviting your agency to participate as a cooperating agency on the proposed action pursuant to the Council on Environmental Quality's Regulations for Implementing NEPA (40 CFR 1501.6).

Should DLNR decide to work with NMFS as a cooprating agency, we suggest that we meet to discuss developing an MOU to deliniate our respective roles and responsibilities. Should you decide not to serve as a cooperating agency, please know that we will include DLNR in all of the public information gathering processes undetaken during the PEIS preparation. Regardless of your decision regarding this invitation, we look forward to continuing our coordination with DLNR on HMS recovery and research activities in the NWHI as co-trustees of the Papahanaumokuakea Marine National Monument.

We would appreciate being notified of your decision regarding this invitation on or before October 8, 2010. If you have any questions or would like to meet to discuss this request, please contact Jeff Walters, our Hawaiian monk seal recovery coordinator, at (808) 944-2235, or via email at jeff.walters@noaa.gov.

Sincerely,

Michael D. Tosatto
Acting Regional Administrator

Response by U.S.FWS

- Page Intentionally Left Blank -

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Hawaiian and Pacific Islands National Wildlife Refuge Complex
300 Ala Moana Boulevard, Room 5-231
Box 50167
Honolulu, Hawaii 96850

TAKE PRIDE IN AMERICA

October 5, 2010

NMFS PIRO
Received
OCT - 6 2010

Michael D. Tosatto
Acting Regional Administrator
Pacific Islands Regional Office
National Marine Fisheries Service
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700

Dear Mr. Tosatto:

Thank you for your letter dated September 14, 2010, regarding an invitation to participate as a cooperating agency on the preparation of the Programmatic Environmental Impact Statement (PEIS) to improve the survivability of the Hawaiian monk seal (HMS). The Hawaiian and Pacific Islands National Wildlife Refuge Complex recognizes the importance of this National Environmental Policy Act (NEPA) action to evaluate potential environmental, social, and economic impacts of implementing a range of research and enhancement activities identified in the HMS Recovery Plan (2007) to address low juvenile seal survival in the Northwestern Hawaiian Islands. On behalf of the Fish and Wildlife Service (FWS), we accept your invitation to participate in the preparation of this PEIS as a cooperating agency in accordance with NEPA regulations and procedures.

Based on FWS legally mandated management responsibilities and technical expertise associated with protecting, conserving, and, where appropriate, restoring fish, wildlife and plants and their habitats within the Hawaiian Islands and Midway Atoll National Wildlife Refuges, we look forward to working together with you on this PEIS. We also support your suggestion to develop a Memorandum of Understanding to delineate our respective roles and responsibilities.

I would also like to take this opportunity to introduce you to Mr. Thomas R. Edgerton, who will be arriving in Honolulu on November 8, 2010, to fill the currently vacant FWS Superintendent position for the Papahānaumokuākea Marine National Monument. Tom will be your point of contact for this cooperative effort and will also be replacing Ms. Susan White as the Fish and Wildlife Service member of the Hawaiian Monk Seal Recovery Team.

If you have additional questions or need assistance prior to Tom's arrival, please contact Ray Born, our Acting Superintendent, at 808.742.9488 or via email at Ray_Born@fws.gov.

Sincerely,

Barry W. Stieglitz
Project Leader

Cc: Loyal Mehrhoff, USFWS, Pacific Islands Ecological Services

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 • Fax (808) 973-2941

SEP 14 2010

Barry Stieglitz
Project leader
Hawaiian and Pacific Islands National Wildlife Refuge Complex
Fish and Wildlife Service
300 Ala Moana Blvd., Room 5-231

Dear Mr. Stieglitz:

The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) is planning to prepare a Programmatic Environmental Impact Statement (PEIS) regarding implementation of various research and enhancement activities designed to improve survival of Hawaiian monk seals (HMS) in the Northwestern Hawaiian Islands (NWHI). As you are aware, the NMFS Pacific Islands Regional Office (PIRO) and NMFS Pacific Islands Fisheries Science Center (PIFSC) are responsible for HMS recovery and research under the Endangered Species Act (ESA) (16 United States Code [U.S.C.] 1531 et seq.) and the Marine Mammal Protection Act (MMPA) (16 U.S.C. 1361 et seq.).

The PEIS, in compliance with the National Environmental Policy Act (NEPA) (40 CFR Parts 1500-1508), will evaluate potential environmental, social, and economic impacts of implementing a range of research and enhancement activities stipulated in the HMS Recovery Plan (2007) to address low juvenile seal survival in the NWHI. As you know, low survival to reproductive age in the NWHI has been identified as a main factor driving the current steep HMS population decline.

Given the jurisdiction of USFWS within the proposed project area (the NWHI) and your agency's technical expertise regarding much of the subject matter to be covered in the PEIS, we are inviting your agency to participate as a cooperating agency on the proposed action pursuant to the Council on Environmental Quality's Regulations for Implementing NEPA (40 CFR 1501.6).

Should USFWS decide to work with NMFS as a cooprating agency, we suggest that we meet to discuss developing an MOU to deliniate our respective roles and responsibilities. Should you decide not to serve as a cooperating agency, please know that we will include USFWS in all of the public information gathering processes undetaken during the PEIS preparation. Regardless of your decision regarding this invitation, we look forward to continuing our coordination with USFWS on HMS recovery and research activities in the NWHI as co-trustees of the Papahanaumokuakea Marine National Monument.

Anne Southam

From: Jeff Walters <Jeff.Walters@noaa.gov>
Sent: Wednesday, November 30, 2011 12:08 PM
To: Tom_Edgerton@fws.gov
Cc: Anne Southam
Subject: Re: Cooperating Agency for Hawaiian Monk Seal PEIS

Aloha Tom:

First, let me please extend my sincere apologies for the delay in responding to your email message below.

I have shared your message with my leadership and the PEIS team.

We understand and appreciate the rationale for your decision and agree that we have a good working relationship that will continue to draw on and strengthen as we develop the PEIS.

I will call and/or set up a meeting soon to give you an update on where we are in the PEIS process, share a revised time line, discuss your staff's engagement, etc. As we discussed at the recent MMB meeting, we are currently developing our responses to the comments received on the Draft PEIS.

Thanks again,

Jeff

Jeffrey S. Walters, Ph.D.
Marine Mammal Branch Chief
& Hawaiian Monk Seal Recovery Coordinator Protected Resources Division Pacific Islands Regional Office NOAA National Marine Fisheries Service
1601 Kapiolani Blvd., Suite 1110
Honolulu, HI 96814

Phone: (808) 944-2235
Email: jeff.walters@noaa.gov
Web: http://www.fpir.noaa.gov/PRD/prd_index.html

Tom_Edgerton@fws.gov wrote:
>
> Hi Jeff,
>
> Following our recent discussion, this is to formally document our
> agreement that the U.S. Fish and Wildlife Service (FWS) and NOAA
> National Marine Fisheries Service (NMFS) will no longer pursue
> completion of a formal MOU for the FWS to be a Cooperating Agency for
> development of the Hawaiian Monk Seal Programmatic Environmental
> Impact Statement.
>
> For the record, we had several reasons for this decision. For one, the

> FWS currently has limited staff capacity to provide the level of input
> that normally accompanies such a relationship. The Draft PEIS is
> already in an advanced stage of development and, without the formal
> MOU, the FWS has to date not been involved at the level normally
> expected by such a relationship. However this has not been an issue
> since the FWS does not have, nor does it expect, any major concerns
> regarding either the process or the proposed work addressed in the
> PEIS. The two agencies also have a good relationship, are already
> collaborating, and intend to continue working together whenever and
> wherever needed. In addition, the FWS intends to be a regular part of
> the public input process for review of the PEIS.
>
> In summary, representing our respective agencies, we agree that this
> is the best course of action and are comfortable that development of
> the HMS PEIS will in no way suffer due to the decision.
>
> Tom
>
> Tom Edgerton
>
> FWS Superintendent
> Papahanaumokuakea Marine National Monument National Wildlife Refuge
> System Honolulu, Hawaii
> Office: 808-792-9481
> Cell: 808-271-8637
> Fax: 808-792-9585
>
> "A team is a group of people that go out of their way to make each
> other look good." Unknown

- Page Intentionally Left Blank -

Response by State of Hawai'i
DLNR

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

GUY H. KAULUKUKUI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

April 19, 2011

NMFS/PIRO
Honolulu
APR 25 2011

Mr. Michael D. Tosatto
Regional Administrator
Pacific Islands Regional Office
National Marine Fisheries Service
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700

Dear Mr. Tosatto:

Thank you for your letter dated March 8, 2011, inviting the Department of Land & Natural Resources to participate in preparing the Programmatic Environmental Impact Statement (PEIS) for Hawaii monk seal recovery actions. We regret that we must decline your invitation to participate as a state cooperating agency in preparation of the PEIS. Our decision is based on severe staffing and budgetary constraints that our Department is presently facing. Unfortunately, we foresee further reduction in our workforce, considering the state of our State budget.

We will continue to be in close coordination with your staff during the development of the PEIS for Hawaiian monk seal recovery.

Sincerely,

WILLIAM J. AILA, JR.
Chairperson

ESA Section 7 Consultation Correspondence

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

FEB 13 2012

MEMORANDUM FOR: PR5 – Gina Shultz, Chief
Endangered Species Act Interagency Cooperation Division

FROM: PR1 – P. Michael Payne, Chief
Permits and Conservation Division

SUBJECT: Request for initiation of Section 7 Programmatic Consultation under the Endangered Species Act (File Nos. 10137 and 16632; and Programmatic Environmental Impact Statement for Hawaiian monk seal Recovery Actions)

The Permits and Conservation Division (PR1) proposes to issue a permit and a permit amendment to the NMFS Pacific Islands Fisheries Science Center (PIFSC), Hawaiian monk seal Research Program, to take Hawaiian monk seals (*Monachus schauinslandi*) for scientific research and enhancement purposes in the Hawaiian Archipelago and Johnston Atoll. The permits would be issued pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 et seq.), and the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 et seq.).

The PIFSC has requested an amendment to their existing Permit No. 10137-06 to conduct translocations of monk seals within the Northwestern Hawaiian Islands (NWHI), similar to that previously analyzed by the NMFS Endangered Species Division (PR3)[1] in a Biological Opinion for Permit No. 10137-01. Permit No. 10137-06 expires June 30, 2014. In compliance with the National Environmental Policy Act (NEPA), an environmental assessment (EA) was prepared for issuance of Permit No. 10137. This EA analyzed the effects of translocations within the NWHI. The translocations are proposed to take place in August 2012.

The PIFSC has also requested a new 5-year permit to include activities currently authorized plus expanded research and enhancement activities. This proposed permit (No. 16632) would expire 5 years after the date of issuance and would replace Permit No. 10137-06. The PIFSC is requesting activities under the new permit begin as early as April 2013.

PIRO, PIFSC, and PR1 have prepared a Draft Programmatic Environmental Impact Statement (PEIS) for Hawaiian monk seal Recovery Actions in compliance with NEPA. The purpose of the Draft PEIS is to evaluate the potential direct, indirect, and cumulative impacts on Hawaiian monk seals and other components of the human environment, from NMFS' funding, undertaking, and permitting research and enhancement activities on Hawaiian monk seals. The research and

1 The Endangered Species Division (PR3) was reorganized October 1, 2011; since then, section 7 consultations are conducted by the Endangered Species Act Interagency Cooperation Division (PR5).

Printed on Recycled Paper

enhancement priorities listed in the 2007 Hawaiian Monk Seal Recovery Plan provide a general framework for activities in the preferred alternative (Alternative 4) of the Draft PEIS and in the new permit application (File No. 16632).

PR1 concludes that issuing the permit amendment (No. 10137-07) and permit (No. 16632) to authorize the takes and carry out the activities described in the initiation package may adversely affect NMFS listed species, Hawaiian monk seals, but will not adversely modify designated critical habitat within the action area.

PR5 has determined that a programmatic consultation is appropriate for activities proposed under Alternative 4 in the Draft PEIS. Because the permit and the amendment cover, among other things, translocations within the NWHI, we are requesting PR5 consider both the permit and the amendment in the programmatic consultation. PR5 agreed to this approach on December 15, 2011.

To comply with ESA section 7 regulations (50 CFR 402.14(c)), an initiation package is provided. Please review the materials listed below and **respond no later than March 14, 2012** to inform me of whether the initiation package is complete or if additional information is needed.

Consultation history: Consultation on the proposed action first began when PIFSC, PR1, PR3, and NEPA staff attended a meeting in Sausalito, CA during May 8-12, 2009, to discuss the enhancement permit for expanded translocations, vaccinations, and captive care. The PEIS team (PIRO, PIFSC, and PR1), and PR3 later met in Seattle, WA during December 7-8, 2010, to discuss the analytical approach to assessing the impacts of the proposed activities on Hawaiian monk seals. Consulting biologists have attended bi-weekly calls on development of the Draft PEIS as requested. The Draft PEIS was made available to PR3 on March 24, 2011 during the NMFS-internal review of the draft, and comments were received from PR3 on April 7, 2011. The PEIS team and PR5 held meetings on several occasions during October and November 2011 to discuss the programmatic consultation.

Description of proposed action: The proposed action (as described in the PEIS) is funding, permitting, and carrying out recovery actions (research and enhancement activities) for the endangered Hawaiian monk seal. The purpose of permit issuance is to allow an exemption to the moratoria and prohibition on takes established under the MMPA and ESA (see Sections 1.5.2 and 1.5.3 of the Draft PEIS) so the proposed research and enhancement activities may be undertaken.

The PIFSC seeks a scientific research and enhancement permit amendment and permit to carry out take activities designed to recover the endangered Hawaiian monk seal. Research is intended to identify impediments to recovery, inform the design of conservation interventions, and evaluate those measures. Enhancement activities are designed to improve the survival and reproductive success of individual monk seals, with the intent to improve subpopulation and overall species' status.

Research activities covered by Permit No. 10137-06 include take associated with visual and photographic monitoring by ground, vessel, air, and remote video cameras; flipper tagging; pelage bleach marking; biological sampling for health screening; instrumentation for foraging studies; deworming research; necropsies; opportunistic tissue sampling (e.g., molt); and import/export of parts. Enhancement activities include translocations (within the NWHI or within the main Hawaiian Islands [MHI], but not between); removing aggressive adult male seals that harm or kill other seals; and, disentangling and de-hooking seals. Non-target seals may be disturbed during research and enhancement activities.

Alternative 4 of the Draft PEIS and draft Permit No. 16632 includes all currently permitted activities and further address the recommendations of the Hawaiian Monk Seal Recovery Plan by including new research and enhancement activities. New activities include but are not limited to:

- Expanding the scope and number of seal translocations, including (1) moving seals with unmanageable human interactions from the MHI to NWHI, (2) taking seals age three years and older from the MHI to NWHI to examine their subsequent survival, and (3) using a two-stage translocation program whereby weaned pups are taken from areas of lower survival to areas of higher survival. This could include moving seals from the NWHI to the MHI and vice versa.

- Researching and developing tools for modifying seal behavior related to interactions with humans and fishing gear in the MHI.

- Potentially implementing de-worming as a tool to improve juvenile survival.

- Supplementing monk seal diet using feeding stations in NWHI locations where seals are released after being cared for in rehabilitation.

- Conducting vaccination studies and potential use of vaccines to mitigate infectious diseases (West Nile Virus and Morbilliviruses).

- Conducting research on and potential use of chemical alteration of aggressive male monk seal behavior using a testosterone suppressant.

The purpose of each specific research and enhancement activity is described in the permit application (see Project Purpose: Hypothesis/Objectives and Justification), and in Section 2.5 of the Draft PEIS.

<u>Action area</u>: The action area is described in Section 1.3 of the Draft PEIS and includes the Hawaiian Archipelago and Johnston Atoll.

<u>Description of all listed species and/or critical habitat that may be affected by the action</u>:

(1) *Species description*: A complete description of the Hawaiian monk seal is provided in the Draft PEIS. This includes the species' distribution (Section 3.3.1.1), physical description and life

cycle (3.3.1.2), population status and trends (3.3.1.3), habitat requirements and critical habitat (3.3.1.4), foraging ecology (3.3.1.5), carrying capacity (3.3.1.6), threats to survival (3.3.1.7), and recovery plan priorities (3.3.1.8).

(2) *Proposed authorized take*: A list of the takes to be authorized for Hawaiian monk seals by activity and location can be found in the attached draft permits (see Appendix 1 of draft permits). Please note that the table in Permit No. 16332 includes updates since the Draft PEIS was published. Please refer to the permit tables for proposed take levels.

(3) *Other species*: There are no NMFS ESA-listed species that will be incidentally affected by the authorized activities. Sections 3.3.2 – 3.3.8 in Chapter 3 (Affected Environment) of the Draft PEIS describes non-target species in the action area. In Chapter 4 (Environmental Consequences), Sections 4.6 and 4.8.3 – 4.8.7 discuss how the non-target species may be affected, if at all, and what mitigation measures would be implemented to avoid or minimize take of non-target species.

In brief, spinner dolphins (*Stenella longirostris*) may be incidentally disturbed during research and enhancement activities. Green sea turtles (*Chelonia mydas*) on land and certain ESA-listed bird species may be affected by the proposed activities; however, these species are under the jurisdiction of the U.S. Fish and Wildlife Service, requiring consultation with that agency.

(4) *Species proposed listed*: The Hawaii insular stock of false killer whales (*Pseudorca crassidens*) is the only species proposed listed under the ESA in the action area. As described in Sections 3.3.3 and 4.8.4 of the Draft PEIS, NMFS does not anticipate impacts to this or other cetacean species (except spinner dolphins) from the proposed action.

(5) *Critical habitat*: Critical habitat for the Hawaiian monk seal was designated in 1986, revised in 1988, and is described in 50 CFR 226.201. It includes all beach areas and ocean waters out to 20 fathoms around the islands and atolls in the NWHI. Section 3.3.1.4 of the Draft PEIS also describes monk seal critical habitat.

On June 2, 2011, NMFS proposed to revise Hawaiian monk seal critical habitat (76 FR 32026). This would include an expansion of current critical habitat in the Northwestern Hawaiian Islands out to the 500 meter depth contour, and to include Sand Island at Midway Atoll. This proposed expansion would also include adding the main Hawaiian Islands (coastlines five meters inland from the shoreline and marine waters from the shoreline out to the 500 meter depth contour).

(6) *Other permits for take of monk seals*: Section 1.4 of the Draft PEIS describes the only two current permits authorizing direct takes of Hawaiian monk seals. These include PIFSC's Permit No. 10137-06 and Permit No. 932-1905/MA-009526 issued to the NMFS Marine Mammal Health and Stranding Response Program (MMHSRP). The MMHSRP ESA section 10 permit authorizes takes of Hawaiian monk seals for activities carried out under section 109h of the MMPA (i.e., response and rescue activities). Section 1.4 of the Draft PEIS describes how the MMHSRP activities are coordinated with PIFSC.

Description of the manner in which the action may affect Hawaiian monk seals, and analysis of cumulative effects:

(1) *Direct and indirect exposure*: The methods for carrying out the proposed research and enhancement activities, and how they will result in takes of Hawaiian monk seals, are described in the permit amendment application (File No. 10137-07), the File No. 16632 permit application (see Project Description/Methods and Appendices), and Section 2.5 of the Draft PEIS.

(2) *Minimization measures*: Conditions intended to minimize impacts from the proposed activities on monk seals are incorporated in the protocols in the permit applications, and also in Section 2.5 of the Draft PEIS. Conditions listed in the attached draft permits are also intended to minimize negative impacts from the proposed activities. Such conditions are also listed in Section 4.7 of the Draft PEIS.

(3) *Cumulative effects*: Section 4.5.1 of the Draft PEIS describes relevant past and present actions (federal and non-federal) within the action area. Section 4.5.2 of the Draft PEIS describes reasonably foreseeable future actions (federal and non-federal human-controlled actions and natural events).

(4) *Anticipated Responses*: Chapter 4 of the Draft PEIS (Section 4.8.1) and Appendix E (Proposed Translocation Plan, revised December 1, 2011) describe the anticipated responses and effects to Hawaiian monk seals from the proposed research and enhancement activities.

Relevant reports, including any EIS, EAs, BAs, or other analyses prepared on the proposal:

As mentioned above, a Draft PEIS has been completed for Hawaiian monk seal research and enhancement recovery actions. The Draft PEIS is available on our web site: http://www.nmfs.noaa.gov/pr/permits/eis/hawaiianmonksealeis.htm.

An EA was prepared for issuance of Permit No. 10137; supplemental EAs were prepared for certain amendments to Permit No. 10137.

A PEIS was prepared for issuance of Permit No. 932-1905/MA009526. This PEIS is available on our web site: http://www.nmfs.noaa.gov/pr/health/eis.htm.

Other relevant studies or information available on the action, the affected species, or critical habitat:

Recent peer-reviewed publications on Hawaiian monk seals, including those in a special edition of the journal Aquatic Mammals dedicated to the genus *Monachus*, are provided. The 2010 stock assessment report for Hawaiian monk seals and annual reports for Permit No. 10137 and the MMHSRP permit are provided.

The initiation package includes the following attachments:

- Amendment application for the August 2012 translocations
- Draft Permit No. 10137-07
- Permit application for File No. 16632
- Draft Permit No. 16632

The initiation package includes the following documents on a CD submitted with this memo. These documents and electronic copies of the attached documents have also been placed on the shared G: drive under G:/Prall/Temp HI monk seals/PEIS sec 7 files:

- 10137 documents
    - Permit 10137 and amendments with associated applications, NEPA analyses, Biological Opinions and other section 7 analyses; and 10137 annual reports
- 16632 documents
    - File No. 16632 application and draft permit
- Critical habitat
    - Federal Register notices - designation and proposed revision
- Meeting notes and emails
    - May 2009 and December 2010 meeting notes
    - Email correspondence with consulting biologists
- MMHSRP documents
    - Biological Opinion for Permit No. 932-1905/MA009526
    - Permit No. 932-1905/MA-009526
    - Annual reports for monk seal response activities for MMHSRP's Permit No. 932-1905/MA-009526
- PEIS Word files
    - PEIS schedule
    - Chapters 1-5
    - Chapter 4 with monk seal analysis only
    - Revised Translocation Plan (December 2011)
    - Revised Vaccination Plan (October 2011)
- Publications and data
    - Aquatic Mammals special issue publications
    - Health and disease
    - Morphometrics and survival data
    - Translocations
    - Vaccinations
    - 2010 Stock Assessment report

If you have any questions or require additional information, please contact Amy Sloan or Joselyd Garcia-Reyes at 301-427-8401.

Attachments

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

FEB 27 2014

Memorandum For: Tammy C. Adams, Ph.D.
Acting Chief, Permits and Conservation Division

From: Cathryn E. Tortorici CET
Chief, Endangered Species Act Interagency Cooperation Division

Subject: Biological and conference opinion on the proposal to implement the Hawaiian monk seal research and enhancement program and issue scientific research permit number 16632, pursuant to Section 10(a)(1)(A) of the Endangered Species Act of 1973

Enclosed is the NOAA National Marine Fisheries Service (NMFS) biological and conference opinion on the effects of the implementation of the Hawaiian monk seal research and enhancement program and issuance of scientific research permit number 16632, prepared pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 USC 1531 *et. seq.*).

In this biological opinion, NMFS concludes that the implementation of the program and issuance of the permit is not likely to jeopardize the continued existence of the Hawaiian monk seal or result in the adverse modification or destruction of its critical habitat. We also conclude that the action may affect, but is not likely to adversely affect, the following ESA-listed species: sperm whale, blue whale, fin whale, humpback whale, sei whale, false killer whale (Hawaiian insular) green sea turtle (all other areas), hawksbill sea turtle, leatherback sea turtle, loggerhead sea turtle (North Pacific), and olive ridley sea turtle (all other areas). In this conference opinion, NMFS concludes that the implementation of the program and issuance of the permit is not likely to jeopardize the continued existence of the following ESA-proposed species: *Acropora paniculata*, *Monitpora flabellate*, *M. dilatata*, *M. turgescens*, *M. patula*, and *M. verrilli*.

This concludes formal consultation and conference on this action. Consultation on this issue must be reinitiated if: (1) the amount or extent of allowable take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this biological opinion; (3) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

Printed on Recycled Paper

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

MAR 18 2013

Barry W. Stieglitz
Project Leader
Hawaiian and Pacific Islands Nat'l Wildlife Refuges and
Northwestern Hawaiian Islands Marine Nat'l Monument
300 Ala Moana Boulevard, Room 5-231
PO Box 50167
Honolulu, Hawai'i 96850

Dear Mr. Stieglitz,

The National Marine Fisheries Service (NMFS) requests consultation with the U.S. Fish and Wildlife Service (USFWS) under section 7 of the Endangered Species Act for incidental take of Laysan finch (*Telespyza cantans*) during field camps to take Hawaiian monk seals (*Monachus schauinslandi*) for research and enhancement purposes.

We also request concurrence from USFWS on our determination that the activities proposed may affect but will not likely adversely affect the green sea turtle (*Chelonia mydas*), Nihoa Miller bird (*Acrocephalus familiaris kingi*), Laysan duck (*Anas laysanensis*), and short-tail albatross (*Phoebastria albatrus*). We have determined that the proposed activities will not adversely modify or destroy designated critical habitat.

Enclosed is supporting documentation for these determinations and the USFWS 2009 biological opinion on incidental take of Laysan finch for Permit No. 10137. Please respond by April 15, 2013 to let us know if the enclosed initiation package is complete.

We propose to issue a new 5-year permit (Permit No. 16632) to the NMFS Pacific Islands Fisheries Science Center, Hawaiian monk seal Research Program (HMSRP) to replace their existing Permit No. 10137. The proposed start date for Permit No. 16632 is January 2014.

In compliance with the National Environmental Policy Act, NMFS is preparing a Final Programmatic Environmental Impact Statement (PEIS) for Hawaiian monk seal Recovery Actions, which includes activities proposed in the permit application. A Draft PEIS for Hawaiian monk seal Recovery Actions was made available to the public in 2011 (76 FR 51945). The intent of the PEIS is to evaluate the potential direct, indirect, and cumulative impacts on the human environment of the alternative approaches to implementing recovery actions, including research and enhancement activities requiring a permit.

Printed on Recycled Paper

If you have questions, please contact Amy Sloan (Amy.Sloan@noaa.gov) or Colette Cairns (Colette.Cairns@noaa.gov) by email or phone (301-427-8401).

Sincerely,

P. Michael Payne
Chief, Permits and Conservation Division
Office of Protected Resources
(phone: 301-427-8401)

Enclosures

cc: Patrice Ashfield, USFWS
Hoku Johnson, PMNM

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

JUN 5 - 2013

Loyal Mehrhoff, Ph.D.
Field Supervisor
Pacific Islands Fish and Wildlife Office
U.S. Fish and Wildlife Service
300 Ala Moana Boulevard, Suite 3-122
Honolulu, HI 96850

Dear Dr. Mehrhoff,

In a letter addressed to Mr. Barry Stieglitz, dated March 18, 2013, we requested consultation with the U.S. Fish and Wildlife Service (USFWS) under section 7 of the Endangered Species Act for incidental take of Laysan finch (*Telespyza cantans*) during field camps to take Hawaiian monk seals (*Monachus schauinslandi*) for research and enhancement purposes. We also requested concurrence that the activities proposed may affect but will not likely adversely affect the green sea turtle (*Chelonia mydas*), Nihoa Miller bird (*Acrocephalus familiaris kingi*), Laysan duck (*Anas laysanensis*), and short-tail albatross (*Phoebastria albatrus*). We have determined that the proposed activities will not adversely modify or destroy designated critical habitat.

The enclosed letter and consultation package were transmitted to Mr. Stieglitz via mail and email on March 18, 2013. On March 19, 2013, Mr. Stieglitz answered the email, indicating he would later respond with a point of contact for the consultation. On June 3, 2013, we were notified by Christine Ogura that section 7 consultation requests are handled by the Ecological Services Division and should be addressed you. Ms. Ogura verified the consultation package has been transmitted to your office.

Based on the guidance received from Ms. Ogura, we are requesting consultation with your office for incidental take of Laysan finch, and requesting concurrence that the green sea turtle, Nihoa Miller bird, Laysan duck, and short-tail albatross will not likely be adversely affected during Hawaiian monk seal research and enhancement activities. We propose to issue a new 5-year permit (Permit No. 16632) to the NMFS Pacific Islands Fisheries Science Center to replace their existing Permit No. 10137. The proposed start date for Permit No. 16632 is January 1, 2014. In compliance with the National Environmental Policy Act, NMFS is preparing a Final Programmatic Environmental Impact Statement (PEIS) for Hawaiian monk seal Recovery Actions, which includes activities proposed in the permit application. A Draft PEIS for Hawaiian monk seal Recovery Actions was made available to the public in 2011 (76 FR 51945). The intent of the PEIS is to evaluate the potential direct, indirect, and cumulative impacts on the human environment of the alternative approaches to implementing recovery actions, including research and enhancement activities requiring a permit.

Printed on Recycled Paper

Enclosed is supporting documentation for the consultation and the USFWS 2009 biological opinion on incidental take of Laysan finch for the current Hawaiian monk seal Permit No. 10137.

Please respond as soon as possible with a point of contact for the consultation and to let us know if the enclosed initiation package is complete. Correspondence regarding the consultation should be directed to Amy Sloan (Amy.Sloan@noaa.gov) and Colette Cairns (Colette.Cairns@noaa.gov); phone (301-427-8401).

Sincerely,

P. Michael Payne
Chief, Permits and Conservation Division
Office of Protected Resources
(phone: 301-427-8401)

Enclosures

cc: Barry Stieglitz, USFWS
Christine Ogura, USFWS
Hoku Johnson, PMNM

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai`i 96850

In Reply Refer To:
2013-F-0237

Tammy Adams, Ph.D
Acting Chief, Permits, Conservation and Education Division
Office of Protected Resources
United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Silver Spring, Maryland 20910

FEB 2 0 2014

Subject: Biological Opinion for the Final Programmatic Environmental Impact Statement for Hawaiian Monk Seal Recovery Actions, Hawaii Archipelago and Johnston Atoll

Dear Ms. Adams:

This Biological Opinion responds to your request for initiation of formal consultation with the U.S. Fish and Wildlife Service (Service) pursuant to the Endangered Species Act of 1973, as amended (Act). We initiated consultation on June 5, 2013. At issue are the impacts to the endangered Laysan finch (*Telespyza cantans*) resulting from Hawaiian monk seal (*Monachus schauinslandi*) recovery actions conducted by the National Marine Fisheries Service (NMFS) Pacific Islands Fisheries Center, Hawaiian monk seal Research Program (HMSRP) to continue population monitoring (including health, disease, and foraging research) on the endangered Hawaiian monk seal. In the course of conducting biological research on Hawaiian monk seals, researchers and technicians will camp and spend extended periods of time on Laysan Island and the islands in Pearl and Hermes Reef. In the past, seemingly benign activities such as camping or storage of supplies has led to the inadvertent death of several Laysan finches. This Biological Opinion will address the incidental take of the Laysan finch due to the presence of researchers working and camping on Laysan Island and the islands at Pearl and Hermes Atoll.

In your letter of June 5, 2013, you determined the proposed action "may affect but is not likely to adversely affect" the threatened green sea turtle (*Chelonia mydas*) on land, Nihoa millerbird (*Acrocephalus familiaris kingi*), short-tail albatross (*Phoebastria albatrus*), and Laysan duck (*Anas laysanensis*).

Green sea turtle

The action area for your potential impact to green sea turtles is the areas under the jurisdiction of the Service within the Monument. The green turtle nests in the NWHI and may be affected by

TAKE PRIDE® IN AMERICA

the research activities when on land. Sleeping and basking green sea turtles are generally unaware of unobtrusive human presence. However, there is the possibility that some activities such as small boat transits and landings, capturing seals, and other research activities may startle basking turtles, causing them to relocate into the water. Best management practices have been included to minimize and avoid the unintentional harassment of basking and/or nesting green sea turtles while conducting research or camping on various islands. These measures include the following:

- Walking is prohibited on all beaches, from dusk to dawn, where adult turtles rest.
- All field camps will use maximum light control (shading, minimum wattage, etc.).
- All field camps must avoid disorienting hatchling turtles.

We concur with your determination that this action "may affect, but is not likely to adversely affect" terrestrial green sea turtles because researchers will follow the aforementioned minimization measures and adhere to best management practices to avoid basking and nesting green sea turtles.

Nihoa Millerbird

The Service in conjunction with American Bird Conservancy translocated 24 millerbirds from Nihoa Island to Laysan Island in September 2011, to decrease the risk of extinction from a catastrophic event on Nihoa. The Nihoa millerbirds on Laysan Island do not appear to show the same camp-following behavior as Laysan finch. Injury or death to Nihoa millerbirds is not expected from interactions with field camps and HMSRP activities on Laysan Island. It is possible that Millerbirds could be disturbed if they nest near field camps or if HMSRP researchers hike through the interior of the island.

We concur with your determination that this action "may affect, but is not likely to adversely affect Nihoa millerbirds because outlined activities are unlikely to result in adverse effects to the species.

Short-tail albatross

Short-tailed albatross have been sighted on Kure Atoll, Laysan Island and Midway Atoll where a pair has successfully nested each of the last two years. Albatross require a long straight-line ground trajectory to become airborne, and there is a small risk that they could fly into camera-mounted poles (e.g., at French Frigate Shoals or at other sites if erected) or shoreline pen fencing (erected temporarily to hold seals at any site) with possible injury. Camera-mounted poles have been maintained at French Frigate Shoals, and the HMSRP is not aware of any records of sea birds flying into the poles. Temporary pens have been seasonally maintained by HMSRP at Kure Atoll, Midway Atoll, and French Frigate Shoals for over ten years during summer months with no incidents of seabirds becoming entangled in the fence. However, during 3-month winter maintenance of a temporary pen at French Frigate Shoals in 2006, a single Laysan albatross (*P. immutabilis*) flew into the fencing and was injured, but survived.

The HMSRP will ensure that monk seal pens would not be placed in the vicinity of short-tailed albatross or their nests. For example, at Midway Atoll, the shore pen will not be on the same island where the short-tailed albatross decoys, sound recordings, and recent nesting occurred.

The placement of the pen would be on Sand Island, approximately 3 miles from the short-tailed albatross nesting location.

Monk seal shore pens will normally be erected in the fall, after the short-tailed albatross breeding season and fledging of hatchlings. However, pens could be erected at any time of year. If shore pens are erected, the height of the pen would be below 5 ft. HMSRP researchers would increase monitoring of pens on windy days. Pens would be dismantled immediately after use, which typically would not exceed two weeks for holding seals. In the unlikely event that a short-tailed albatross were to fly into a shore pen, the pen would be taken down and the Monument and Service would be contacted for guidance. HMSRP field camps in the North Western Hawaiian Islands are typically supplied and staffed using vessels, rather than aircraft. The use of an aircraft may occasionally occur at Midway Atoll or French Frigate Shoals, which could pose a risk to short-tailed albatross. Requirements of the Monument would be in place to ensure the overall effects of air strikes on albatross and other birds is minimal (PMNM 2008). These include:

- Night flights for most of the year at Midway;
- Vegetation management along the runways to modify bird flight and nesting behavior;
- Flight path advisories given to pilots; and
- Runway clearing of birds and other wildlife by personnel prior to landing and takeoffs.

We concur with your determination that this action "may affect, but is not likely to adversely affect" short-tail albatross because researchers will follow the aforementioned minimization measures and adhere to best management practices to avoid adverse impacts to short-tail albatross.

Laysan duck

The Laysan duck is found on Laysan Island and Midway Atoll. Although these ducks primarily use vegetated upland and lake/lowland habitats, a few ducks on Laysan use the camp area to get freshwater, insects, and shade (Service 2009a). Coastal habitats are used more frequently during the post-breeding season (September through February) than the breeding season. Flocks of up to 70 Laysan ducks were recorded on the coast during the post-breeding season (Service 2009a).

HMSRP researchers could disturb ducks near camp. There is a small possibility that ducks in coastal areas could fly or run into the temporary monk seal holding pens when foraging. However, Laysan ducks have never interacted with shore pens used by the HMSRP since 1981 and any such occurrence is not expected. Thus, no injury or mortality to Laysan ducks is expected.

We concur with your determination that this action "may affect, but is not likely to adversely affect Laysan duck because outlined activities are unlikely to result in adverse effects to the species.

This response represents the Service's Biological Opinion regarding the effects of the proposed project on the Laysan finch pursuant to the Act. This consultation is based on information obtained from research permit applications, your Final Programmatic Environmental Impact

Statement and other information available to us. A full administrative record is available at our office. Details of the proposed Hawaiian monk seal research and population enhancement activities can be found in the Final Programmatic Environmental Impact Statement for Hawaiian Monk Seal Recovery Actions, Hawaii Archipelago and Johnston Atoll.

CONSULTATION HISTORY

March 11, 2013. P. Michael Payne Chief, Permits, Conservation and Education Division, National Marine Fisheries Service sent Barry Stieglitz, Project Leader for the Hawaiian and Pacific Islands National Wildlife Refuges and Northwestern Hawaiian Islands Marine National Monument, a letter requesting formal consultation for activities related to Final Programmatic Environmental Impact Statement for Hawaiian Monk Seal Recovery Actions, Hawaii Archipelago and Johnston Atoll.

June 3, 2013. Christine Ogura, Acting Pacific Island and Remotes Refuge Manager, informed National Marine Fisheries Service that our office should take the lead on preparing this Biological Opinion.

June 5, 2013. Mr. Payne transmitted the letter requesting formal consultation for activities related to Final Programmatic Environmental Impact Statement for Hawaiian Monk Seal Recovery Actions, Hawaii Archipelago and Johnston Atoll.

July 15, 2013. Aaron Nadig, Service Fish and Wildlife Biologist, had a phone call with Amy Sloan, NMFS Office of Protected Resources to discuss past interactions with Laysan finch under previous Biological Opinion and proposed covered activities under the PEIS.

July 25, 2013. Ms. Sloan provided excerpts from PEIS and additional Laysan Finch information requested on July 15 phone conversation.

DESCRIPTION OF THE PROPOSED ACTION

The Final Programmatic Environmental Impact Statement for Hawaiian Monk Seal Recovery Actions, Hawaii Archipelago and Johnston Atoll (NMFS 2013) fully describes the proposed actions and is incorporated by reference herein. A brief description of the proposed action is provided below. This Biological Opinion will include effects from recovery actions conducted by the NMFS Pacific Islands Fisheries Center, HMSRP to continue population monitoring (including health, disease, and foraging research) on the endangered Hawaiian monk seal. This consultation covers only activities authorized or permitted within the Monument. The HMSRP proposes to continue existing permitted activities in the Hawaiian Archipelago and Johnston Atoll including:

- Population assessment of seals (e.g., ground surveys; flipper tagging and marking for identification);
- Health and disease studies (e.g., capture, sedation, tissue sampling, weights and morphometrics);

- Foraging studies (e.g., telemetry studies, scat collection);
- De-worming research (e.g., fecal samples, testing anti-parasite treatments);
- Translocation of weaned pups within the NWHI to improve juvenile survival;
- Mitigation of fishery interactions (e.g., disentanglement, removal of hooks); and
- Mitigation of adult male aggression (e.g., removal of aggressive males).

New activities proposed include:

- Expanding the scope and number of seal translocations, including:
    - · moving seals with unmanageable human interactions from the MHI to the NWHI;
    - · taking seals three years of age and older from the MHI to NWHI to examine their subsequent survival; and
    - · using a two-stage translocation program where weaned pups are taken from areas of lower survival to areas of higher survival (no seals would be moved from the NWHI to the MHI as part of two-stage translocation under the proposed permit).
- Research and development of tools for modifying seal behavior to minimize interactions with humans and fishing gear in the MHI.
- Potential use of de-worming as a tool to improve juvenile survival.
- Supplementing monk seal diet using feeding stations in NWHI locations where rehabilitated seals are released.
- Vaccination studies and potential use of vaccines to mitigate infectious diseases including West Nile Virus and Morbilliviruses.
- Chemical alteration of aggressive male monk seal behavior using a testosterone suppressant.

Both NMFS and the Service maintain camps at Laysan Island. In addition to the camp at Laysan, NMFS personnel set up temporary field camps when they are working on the islands at Pearl and Hermes Atoll. Laysan finches are not fearful of humans and readily enter field camps in search of food and water. In the past, unfortunate incidents led to the mortality of several Laysan finches to include: (1) drowning in containers that filled with rain water during cloud bursts while biologist were away from the camp; (2) entrapment or entanglement in camping equipment such as tents; and (3) following a research vessel and flying down the smoke stack.

The action area pursuant to section 7 regulations consists of "all areas to be affected directly or indirectly by the Federal action." The action area for this Biological Opinion for Laysan finch is Laysan Island and the islands in Pearl and Hermes Reef. Currently there is no federally designated critical habitat for Laysan finch.

Conservation Measures to Avoid and Minimize Impacts to Laysan Finch

When used in the context of the ESA, "conservation measures" represent actions proposed by the Federal action agency that are intended to further the recovery of and/or minimize or compensate for project effects on the species under review. Because conservation measures are part of the

Project Description and committed to by the action agency, their implementation is required under the terms of the consultation.

In the past, seemingly benign activities such as camping or supply storage have led to the inadvertent death of several Laysan finches. The following Best Management Practices (BMPs) are incorporated to avoid and minimize take of Laysan finch:

To minimize accidental drownings:

a. Buckets will always be overturned so that they cannot collect rainwater.
b. Laundry buckets must have lids while laundry is soaking.
c. Buckets, bowls, and any other vessels large enough to hold a small bird containing water for dish washing or any other purpose will always be attended or covered securely.
d. Tarps (e.g., those covering propane) will be tucked in tightly so that they cannot collect rainwater.
e. Garbage cans used for desalinization will have netting placed between the can and the lid. Care will be taken to make sure the lids close properly; faulty positioning of hoses can interfere with proper closure.

To minimize accidental entanglement:

a. Loose threads on fabric will be burned to minimize the risk of entanglement. Birds' feet can become entangled when fabric is hung out to dry.
b. Loose threads will be cut off tents and tarps.
c. Anything with small mesh (e.g., mist nets) will be stored in closed ziploc bags to avoid entanglement.
d. Tent doors will be kept completely closed at all times (day and night) to preclude entry by birds.

To minimize impacts from general camping:

a. Camp supplies and water jugs will be aligned with ample space between rows so that small birds cannot become entrapped.
b. Storage jugs will always be capped.
c. Burn barrels will be attended at all times when burning trash. When burn barrels are not in use, any vents or rust-eaten holes in the barrel or lid will be covered with rocks or other objects.
d. For stability reasons, buckets will not be stacked more than two high. All personnel will watch for leaning buckets or water jugs and level the surface beneath leaning buckets, if necessary.
e. Birds will not be fed or allowed access to human food because dependency on the camp food by these birds may result in adverse impacts to them during or after camping periods.
f. Camp gear shall be checked daily during the nesting season to ensure finches are not building nests on or under camping gear.

Quarantine to Avoid Transport of Invasive Species

In addition to the measures described above, personnel working in the Monument must follow terrestrial quarantine protocols for moving between islands and packing for field camps (see

Appendix 1). These measures will minimize the potential for the introduction of non-native plant or insect taxa to the Monument. These strict quarantine measures will decrease the potential that invasive taxa will become established and modify the habitat for Laysan finch or green sea turtles.

STATUS AND ENVIRONMENTAL BASELINE OF THE SPECIES

Laysan Finch

Species Description

The Laysan finch is a member of the *Fringillidae* family with an overall length of 6 to 6.5 in (15 to 16 cm). It is one of four remaining finch-billed Hawaiian honeycreepers and is closely related to the smaller Nihoa finch. The Laysan finch is a large honeycreeper with a heavy bill. Males have yellow plumage with a whitish belly and a grey neck, while females are generally duller in color with brown streaking.

Listing Status

The Laysan finch was federally listed as endangered in 1967 (Service 1967).

Historical and Current Distribution

When discovered on Laysan in 1890, Laysan finches were considered "exceedingly common." Visitors to Laysan circa 1915 described the species as "abundant" and estimated 2,700 in 1911 and 4,000 in 1915. However, Laysan finches declined sharply after the vegetation on Laysan virtually disappeared subsequent to rabbit introduction circa 1903. As few as 100 Laysan finches may have remained in 1923 (Service 2008). Rabbit extirpation by members of the Tanager Expedition in 1923 undoubtedly saved the Laysan finch from extinction. An estimated 1,000 Laysan finches in 1936 increased to 5,000 by 1950. Service surveys in the 1970s and 1980s suggested as many as 10,000. Laysan finches were translocated to an island in Pearl and Hermes Atoll in 1967. There were 108 birds left on Laysan that year, which grew to an estimated 523 by 1983 (Service 2008).

Ecology

Laysan fiches lay their eggs generally late April to early June in clumps of bunchgrass, though other nesting sites, such as holes in rocky areas and even buildings (formerly present on Laysan), have been documented. *Eragrostis* spp. is currently the most common bunchgrass and most common nest site for shallow-cup nests averaging three eggs (range two to four). Nests are usually located several centimeters above the ground, centered in a grass clump, and well concealed. Incubation is about 16 days and the nestling period 15 days. Fledging is often in late July or early August (Service 2008).

Threats

Threats to Laysan finch are: 1) degradation and loss of habitat resulting from invasive alien species; 2) demographic effects of environmental stochasticity on small isolated populations; and 3) global warming and sea level rise that would increase storm frequency and magnitude increasing rainfall and wave height in Hawaiian Islands National Wildlife Refuge. In recent years, monotypic stands of the invasive plant *Verbesina encelioides* have been documented

replacing much of the native vegetation on the Southeast Island of Pearl, thus reducing nesting and foraging resources for Laysan finches (Service 2008).

Environmental Baseline

The Laysan finch population on Laysan Island has been monitored on an annual basis since 1966 (except 1980–1982). The estimated 44-year average Laysan finch population size was 10,029 (Underwood 2013) with population appearing stable and most likely at carrying capacity. Population estimates have ranged from >20,000 in 1976 to approximately 3,600 finches in 2007. The population at Pearl and Hermes Atoll was estimated as 329 in 2010, down from 600 to 900 in 2003 and 1,105 in 2002 (Service 2008).

EFFECTS OF THE ACTION

Laysan Finch

The Laysan finch is a highly inquisitive bird that constantly inspects and probes all types of objects. While this behavior may benefit the species in its natural environment, it can be problematic in human-altered environments. The Laysan finch does not appear innately wary of manmade items, possibly because it evolved in isolation from human-altered environments. Situations that one would not normally think of as hazards to wildlife become sources of Laysan finch mortality such as drowning, entanglement and entrapment. Both NMFS and the Service maintain camps at Laysan Island. In addition to the camp at Laysan, NMFS personnel set up field camps when they are working on the islands at Pearl and Hermes Atoll. Since Laysan finches are tame to human presence, they enter these field camps in search of food and water. Unintentional mortality or serious injury of Laysan finches has occurred in the past, and in all likelihood will occur in the future. Past mortalities resulted from events such as drowning in camp containers filled with water, becoming trapped in camp tents and entanglement in loose strings and netting. In May 2009, seven to ten Laysan finches flew out to the R/V Oscar Elton Sette as it was taking researchers to an islet in the Pearl and Hermes Atoll. It is thought the birds may have flown out to the ship in search of food and water as these resources were scarce on the island. Unfortunately, several of the birds flew down the smokestack of the ship and one was killed. This is the first known occurrence of this behavior and subsequently it is believed this was an anomalous event. This is another example of the type of odd behavior exhibited by these birds that can lead to unanticipated mortality (Flint 2009, pers. comm.). In 2009, the Service issued incidental take of up to 10 Laysan finch mortalities over a five-year period in a Biological Opinion analyzing NMFS research of Hawaiian monk seals on Pearl and Laysan (Service 2009b); eight mortalities have occurred to date (Johanos 2011). Of those 8 in 2011, five Laysan finches died at Pearl and Hermes during a single incident after a lid was left off a pallet tub and then accumulated rainwater. In response to these unfortunate incidences, the HMSRP has reviewed its training protocols for staff working at Laysan Island and Pearl and Hermes, and placed a renewed emphasis on the avoidance and minimization measures described below. The March 2011 tsunami may have affected the Laysan finch on Laysan, but no carcasses were found (Rehkemper 2011). There were no lethal takes of Laysan finches in 2012.

The conservation measures described in the project description will reduce the risk of inadvertent mortality due to drowning, entanglement and/or entrapment of Laysan finches at the campsite.

In addition, reducing the risk by eliminating problematic situations such as turning over buckets and not stacking camp materials will reduce the potential for inadvertent mortality of Laysan finch. The conservation measures outlined in this biological opinion to minimize the risk of harm to Laysan finches have been followed by the researchers for several years. There has been a decrease in the number of Laysan finch mortalities associated with the campsites in recent years due to the strict adherence to these measures (Rehkemper 2009, pers. comm.).

Based on the bird's inquisitive nature and lack of fear of humans, it is imperative that researchers try to anticipate situations that may result in take of Laysan finches and use their best judgment to avoid potential situations that may lead to Laysan finch mortality. As demonstrated in the past, when experiencing water and food stress, these birds will exhibit unusual behavior when interacting with humans that has resulted in mortality. Researchers, in coordination with Refuge and Service biologists, will be able to decrease finch mortality by adaptively modifying activities or camp sites if and when a new situation arises that harms Laysan finch.

Invasive Species

The quarantine measures required for persons working in the Monument will minimize the potential for introducing non-native plant and insect taxa within the Monument. As demonstrated in numerous insular habitats, the unintentional introduction of non-native taxa has had unintended and devastating consequences for insular biota (Cuddihy and Stone 1990). It is already thought that the introduction of *Verbesina encelioides* has altered the ecology of Pearl and Hermes Reef to such an extent that Laysan finches are affected by the change in vegetation composition and structure. Since the researchers have been and will continue to strictly adhere to the quarantine requirements as outlined in Appendix 1, the likelihood of introduction of other non-native taxa is greatly reduced. This measure also reduces the risk that researchers will negatively impact Laysan finch through the introduction of invasive taxa.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, local or private actions that are reasonably certain to occur within the area of action subject to consultation. Future Federal actions will be subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative for the proposed action. The Service maintains a camp on Laysan Island and in the past there have been occasional Laysan finch mortalities in the vicinity of the camp as a result of human actions. The Service is unaware of any other future State, local, or private actions that are reasonably certain to occur within the action area covered in this Biological Opinion and that would not be subject to consultation.

CONCLUSION

After reviewing the current status of the Laysan finch, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's Biological Opinion that implementation of the proposed action is not likely to jeopardize the continued

survival and recovery of the Laysan finch in the wild. No critical habitat has been designated for this species; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations promulgated pursuant to section 4(d) of the Act prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2) of the Act, taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

AMOUNT OR EXTENT OF TAKE

Based on Laysan finch mortality associated with human activity on Laysan and the islands at Pearl and Hermes Atoll in the past, it is the Service's opinion no more than two Laysan finch will be taken in the form of mortality per year, and a total of 20 individuals per decade as a result of HMSRP research and monk seal recovery activities.

The Service will not refer the incidental take of any migratory bird for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §703-712), if such take is in compliance with the terms and conditions specified herein.

Effect of the Take

The take of two Laysan finches annually represents a small fraction of the approximately 10,029 birds on Laysan. The take would not be of sufficient size or magnitude to have population level effects. We have determined that this level of anticipated take is not likely to jeopardize the survival or recovery of the Laysan finch.

Reasonable and Prudent Measures

The reasonable and prudent measures given below, with their implementing terms and conditions, are designed to minimize the impacts of incidental take that might otherwise result from the proposed actions. If, during the course of the action, the level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of
the reasonable and prudent measures provided. In addition, the action that caused the taking must cease; the action agency must immediately provide an explanation of the causes of the

taking; and must review with the Service the need for possible modification of the reasonable and prudent measures. The following reasonable and prudent measure is necessary and appropriate to minimize the effect of take on Laysan finch.

1. NMFS shall minimize the potential for harassment, harm, or mortality of Laysan finch.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Service and any subsequent project applicant, must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

The following terms and conditions implement reasonable and prudent measure number one.

1. If any unforeseen activity or action results in the harm or mortality of Laysan finches, all practicable means will be taken to apply avoidance or minimization measures to reduce the risk of additional take from that activity.
2. All Laysan finch mortalities that are a result of actions which are associated with research activities described above shall be reported to our office within five (5) days of the incident.
3. If an incidental death occurs that has not been addressed in this Biological Opinion, the Service will be contacted as soon as logistically feasible to discuss the cause of the mortality and determine the most appropriate method to avoid future mortalities from this new risk factor.
4. Dead Laysan finches will be sent to Dr. Thierry M. Work at the National Wildlife Health Center, Honolulu Field Station (U.S. Geological Survey-Biological Resources Discipline) for a necropsy. The method of shipment and preservation will be determined in coordination with Dr. Work.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The term "conservation recommendations" has been defined as suggestions from the Service regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information. The recommendations provided here relates only to the proposed action and do not necessarily represent complete fulfillment of the agency's 7(a)(1) responsibilities for these species.

1. As described above, *Verbesina encelioides* has invaded several islands within the Monument and has decreased the utility of these invaded islands as habitats for many bird species. The Service recommends the personnel implementing monk seal research and enhancement activities learn to identify *V. encelioides* and document its presence on each island. If the plant is identified where it has not been documented in the past, the plants

should be photographed and their locations mapped or marked by GPS. This information should be shared with Mr. Barry Stieglitz, Project Leader for the Hawaiian and Pacific Islands National Wildlife Refuges and Northwestern Hawaiian Islands Marine National Monument.

REINITIATION-CLOSING STATEMENT

This concludes formal consultation on this action. As required in 50 CFR § 402.16, reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operation causing such take must cease pending reinitiation.

As stated in the Conclusion (above), the Service's finding of non-jeopardy is based in large part on the conservation measures. Should there be a failure to carry out any or all of the described measures, or if the measures are not effective, or if these measures are modified in any way without Service coordination, reinitiation of consultation will be required. If you have any questions regarding this Biological Opinion, please contact Aaron Nadig at (808) 792-9400.

Sincerely,

Jess Newton

Jess Newton
Acting Deputy Field Supervisor:
Geographic Division

REFERENCES

Cuddihy, L.W., and C.P. Stone. 1990. Alteration of native Hawaiian vegetation: effects of humans, their activities and introductions. University of Hawaii, Honolulu. 138 pp.

Flint, B. 2009. U. S. Fish and Wildlife Service, Supervisory Wildlife Biologist, Pacific Islands Remotes. Telephone conversation with Patrice Ashfield, July 1, 2009.

Johanos, T. 2011. National Oceanic and Atmospheric Administration, Lead, Monk Seal Population Assessment Program, Pacific Islands Fisheries Science Center, Honolulu, Hawaii. Email correspondence with Tim Langer during July-August.

PMNM (Papahanaumokuakea Marine National Monument). 2008. PMNM managemnt Paln, Honolulu, Hawaii.

NMFS 2013. NMFS Hawaiian Monk Seal Recovery Actions Programmatic Environmental Impact Statement and Permit Application File No. 16632: Effects to U.S. Fish and Wildlife Service Species

Rehkemper, C. 2009. Biologist, Papahanaumokuakea National Marine Monument. Telephone converation with Patrice Ashfield June 30, 2009

Rehkemper, C. 2011. United States Fish and Wildlife Service, Refuge Biotechnician, Papahanaumokuakea National Marine Monument. Personal communication with Tim Langer, PIFWO biologist, on September 22.

Service (United States Fish and Wildlife Service). 1967. Endangered and threatened wildlife, listings of endangered and threatened fauna. Federal Register 32:48.

Service. 1984. Recovery Plan for the Northwestern Hawaiian Islands Passerines. Department of the Interior, U.S. Fish and Wildlife Service, Portland, Oregon.

Service. 2008. Laysan finch (honeycreeper) (*Telespiza cantans*) 5-Year Review: Summary and Evaluation.

2009a. Revised recovery plan for the Laysan duck (Anas laysanensis). United States Fish and Wildlife Service. Portland, Oregon. 114 pp.

Service 2009b. Biological opinion for the Issuance of a Permit to Conduct Field Research on the Hawaiian Monk Seal, Hawaii and Johnston Atoll. United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service and United States Department of the Interior, Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii. 18 pp.

Underwood, J. 2013. Population Status of the Endangered Laysan Finch. The Wilson Journal of Ornithology, 125(1):159-164. 2013.

Appendix 1

TAKE PRIDE® IN AMERICA

Appendix 1: Terrestrial Quarantine Protocol

PAPAHANAUMOKUAKEA MARINE NATIONAL MONUMENT TERRESTRIAL QUARANTINE PROTOCOLS FOR MOVING BETWEEN ISLANDS AND ATOLLS AND PACKING FOR FIELD CAMPS

February 2008

The islands and atolls of the Papahanaumokuakea Marine National Monument (Monument) and the Hawaiian Islands National Wildlife Refuge are special places providing habitat for many rare, endemic plants and animals. Many of these species are formally listed as Endangered under the Endangered Species Act. Endemic plants and insects, and the predators they support, are especially vulnerable to the introduction of competing or consuming species. Such introductions may cause the extinction of island and reef endemics, or even the destruction of entire island ecosystem or reef ecological communities. Notable local examples include the introduction of rabbits to Laysan Island in 1902, which caused the extinction of numerous plant and insect species, and three endemic land bird species; the introduction of rats to many Pacific Islands causing the elimination of many burrowing seabird colonies; the introduction of the annual grass, sandbur, to Laysan Island where it has crowded out native bunch grass thus, eliminating nesting habitat for the Endangered Laysan finch; and, the introduction and proliferation of numerous ant species throughout the Pacific Islands to the widespread detriment of endemic plant and insect species.

Several of the islands within the Monument are especially pristine, and as a result are rich in rare and special plants and animals. Nihoa Island has at least 17 endemic and rare insect species, five endangered plants and two endangered birds. Necker Island has endangered plants and 11 endemic insects. Laysan Island has endangered plants, nine endemic arthropods and the endangered Laysan finch and Laysan duck. Other islands in the Monument, such as Lisianski, and islands in Atolls such as Pearl and Hermes Reef and French Frigate Shoals provide homes for a variety of endemic and/or endangered species and require special protection from alien species.

Other Pacific Island such as Kure and the "high islands" (Oahu, Hawaii, Maui, Kauai, etc.) as well as, certain islands within Midway Atoll, Pearl and Hermes Reef and French Frigate Shoals have plants and/or animals that are of high risk for introduction to the relatively pristine islands discussed above. Of special concerns are snakes, rats, cats, dogs, ants and a variety of other insect and plant species. Harmful plant species of highest concern that we know of are *Verbesina encelioides, Cenchrus echinatus,* and *Setaria verticillata.*

The Co-trustees are responsible for the management and protection of the islands, reefs and wildlife of the Monument. No one is permitted to set foot within the Monument without the express permission of the Co-trustees through the permitting process. Because of the above concerns, the following restrictions on the movement of personnel and materials throughout the Monument exist.

Definitions:

New Off the shelf and never used anywhere but the island in question.

Clothing All apparel, shoes, and socks, over and under garments.

Soft Gear All gear such as daypacks, fanny packs, packing foam or similar material, camera bags, camera/binocular straps, microphone covers, nets, holding or weighing bags, bedding, tents, luggage, or any fabric or material capable of harboring seeds, spores, or insects.

Frozen Sealed in a clean or new container and put in a freezer for at least 48 hours to kill any insects or animals and damage any seeds that may be harbored within.

The following conditions and rules apply to the all islands within the Monument with the exception of those at French Frigate Shoals and Midway Atoll:

General Rules:

1. Regardless of origin or destination, inspect and clean all equipment, supplies, etc., just prior to any trip to the Monument. Carefully clean all clothing, footwear and soft gear following use to minimize risk of cross contamination of materials between islands.

2. Pack supplies in plastic buckets with fitted lids or other sealable metal or plastic containers so they can be thoroughly cleaned inside and out. Cardboard is not permitted on the islands. Cardboard boxes disintegrate in a short time and harbor seeds, animals, etc., which cannot be easily found or removed. Wood is not permitted unless sealed on all surfaces. Wooden boxes can also harbor insects and seeds and therefore are only allowed if they are well constructed (tight fitting seams are required). All wood must be treated, and inside and outside surfaces must be painted or varnished to provide a smooth, cleanable finish that seals all holes.
3. Freeze or tarp and fumigate then seal all equipment (clothes, books, tents, everything) just prior to departure. Food and cooking items need not be fumigated but should be cleaned and frozen, if freezable. Cameras, binoculars, radios, and other electronic equipment must be thoroughly cleaned, including internal inspection whenever possible, but do not need to be frozen or fumigated. Such equipment can only be packed in wooden crates if treated as in #2 above. Any containers must contain new, clean packing materials and be frozen or fumigated.
4. At present, Tern Island is the singular exception to the above rule, having less stringent rules due to the large number of previously established alien species. Careful inspection of all materials and containers is still required. However, it is acceptable to use wooden and cardboard containers for transporting supplies to Tern Island. Also, there is no requirement for freezing or fumigating items disembarked at Tern. Although requirements for Tern Island are more lax, the Monument is still concerned about the possibilities of new introductions. Do not wear clothing to Tern Island that has been worn at Pearl and Hermes, Midway Atoll or Kure Atoll.

5. To avoid transport of seeds from within the boats used between island and atolls in the Monument the following steps must be taken. For islands with safe or sandy landing conditions, one should keep quarantine shoes/socks inside quarantine containers until the island is reached. One should go ashore bare foot, and then don the quarantine shoes. Non-quarantine shoes should be removed in the small boat, put into a bucket or some kind of sealed container, and left enclosed in that container until the person departs the island. The sealed container, if clean on the outside, may be taken ashore, but should not be opened ashore. For landings which are rocky, rough, and relatively unsafe (such as Mokumanamana and Nihoa) for safety reasons, quarantine shoes should be donned when inside the small boats, but care should be taken to look for seeds and insects which may be in the small boat and ensure they do not get ashore.

Rules Regarding Clothing and Soft Gear:

1. Any personnel landing boats at any island should have clean clothes and shoes.
2. Any personnel going ashore at any island and moving inshore from the immediate area in which waves are breaking at the time of landing must have new footwear, new or island specific clothes and new or island specific soft gear. All must be frozen for at least 48 hours prior to landing.
3. At the discretion of the local FWS representative, personnel from the NOAA ships or any other vessel servicing the Monument may be allowed on shore to visit pre-designated areas for guided tours. For such tours, personnel must have new footwear, new clothes and new soft gear all frozen for at least 48 hours prior to landing.
4. Any personnel entering any vegetated area, regardless of how sparse the vegetation, must have new footwear, new clothes and new soft gear all frozen for at least 48 hours prior to landing.
5. Clothing or gear coming off Kure and Midway should never be moved to any of the other refuge islands. During transit, clothing and gear coming off Kure and Midway must be carefully sequestered to avoid contamination of gear bound for cleaner islands. Special care must be taken to avoid contaminating gear storage areas and quarters aboard transporting vessels with seeds or insects from these islands.

Rules Regarding Food:

1. All fresh food is prohibited.
2. Tomatoes (any variety), ray sunflower seeds, alfalfa seeds, mustard seeds.
3. Bulk dried fruits are allowed but should be frozen solid for at least one day to kill any insects.
4. Seeds from sprouting species such as alfalfa, mustard and cress, commonly used for sprouted greens, could potentially become established and cannot be brought to the islands. Other species, such as mung beans, soy beans, and radishes, would not likely to survive on the islands and can be used for fresh greens.
5. Soil can contain many seeds, eggs, larvae, etc., and cannot be transported to or between islands.
6. All other food that can be safely frozen (this does not apply to food in cans or glass jars) must be packaged in air tight containers just as all other gear and frozen for 48 hours.

Additional Rules for Travel to Nihoa and Necker (Mokumanamana) Islands:
Nihoa and Mokumanamana are the most pristine locations in the Monument. Nihoa is home to the highest number of federally listed endangered species in the Monument. Many areas of these small rugged islands are inaccessible. Introduction of any alien species could have disastrous results in a very short time. It would be almost impossible to mount any kind of control or eradication program on these islands should an alien species become established. Because of these reasons, access to Nihoa and Mokumanamana are strictly limited, and rules governing entry are more stringent. Access to Nihoa and Mokumanamana by permittees will only be allowed under the accompaniment and supervision of a U.S. Fish and Wildlife Service (Service) Representative. The representative, who shall be appointed by the U.S. Fish and Wildlife Service Monument Superintendent, will work with permittees to assure careful compliance with all rules for inspection, handling and preparation of equipment. The Service Representative will have the authority to control and limit access to various parts of the island to protect animals, plants and archaeological sites, especially endangered species. The Service Representative will have the authority to disallow access to the island, or order an immediate departure from the island if conditions for working on the island are not met or are violated in any way.

1. All field equipment made out of fabric material or wood must be new and never previously used in the Northwestern or main Hawaiian Islands. Equipment previously purchased or made for use on Nihoa and Mokumanamana that has been carefully sealed and stored while away from Nihoa and Mokumanamana, and not used elsewhere, may also be brought onto the island. Rules for freezing and/or fumigating are as described for other sites in the Monument (see above).
2. Clothing, footwear (shoes, slippers, socks, etc.), daypacks (soft gear) must be new, unused, or previously only used on Nihoa (or Mokumanamana) and carefully sealed and stored while off of the island. Hard gear such as camera and equipment must be thoroughly cleaned and inspected.

Additional Rules for Travel Within Pearl and Hermes Atoll:
In recent years *Verbesina encelioides* has been introduced to Southeast Island within Pearl and Hermes Atoll. This noxious weed has taken over a large portion of the island. To prevent the further spread of this weed to the other islands within this atoll the following precaution must be taken:

1. Every person should have one set of quarantine gear and clothing for Southeast Island and one set of quarantine gear and clothing for all other islands in the atoll. For instance the same clothing, and if needed camping gear, may be used at North and Seal Kittery, but anything used at southeast needs to stay off all other islands in the atoll. Do not use the outer islet clothing and gear on Southeast Island.
2. Carefully inspect small boats and their associated equipment when traveling between islands at Pearl and Hermes Atoll. Since folks likely take one anchor ashore and put one anchor in the water there is potential for seed dispersal on anchor lines as well as from within the small boats. This needs to be watched very carefully.

Coastal Zone Management Act Correspondence

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 • Fax (808) 973-2941

APR 08 2013

Mr. Leo Asuncion, Manager
Hawaii Coastal Zone Management Program
Department of Business, Economic Development, and Tourism
P.O. Box 2359
Honolulu, HI 96804

Dear Mr. Asuncion:

In coordination with the National Marine Fisheries Service (NMFS), Pacific Islands Regional Office, the NMFS Pacific Islands Fisheries Science Center has submitted a permit application to conduct a suite of Hawaiian monk seal recovery activities under the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA). This ESA-MMPA permit application has been submitted to the NMFS Office of Protected Resources. We have evaluated the recovery activities described in the permit application and have determined that issuance of the ESA-MMPA permit is consistent to the maximum extent practicable with the enforceable policies of the approved Coastal Zone Management Program of the State of Hawaii. This consistency determination is submitted in compliance with the federal consistency regulations, 15 C.F.R. Part 930.

The application is for a 5-year permit to conduct research and enhancement activities designed to help recover the endangered Hawaiian monk seal. A copy of the permit application is enclosed for your reference and additional information regarding the permit application and the proposed recovery activities may be viewed online at: http://www.nmfs.noaa.gov/pr/permits/monkseal16632.htm.

The research activities proposed in the permit application are intended to identify impediments to recovery, inform the design of conservation (or enhancement) measures, and evaluate those measures. These research activities include, but are not limited to: visual and photographic monitoring, tagging, health screening, foraging studies, deworming research, experimental translocation, behavioral modification research, and vaccination research.

Enhancement activities proposed in the permit application are designed to improve the survival and reproductive success of individual monk seals, with the intent to improve subpopulation and overall species' status. These enhancement activities include deworming, translocation, hazing and removal of aggressive adult male seals that harm or kill other seals, disentangling, dehooking, treating injured seals in the wild, behavioral modification, vaccination, and supplemental feeding of post-release rehabilitated seals.

Types of seal translocations proposed include translocation within the NWHI, within the MHI, and from the MHI to the NWHI. Translocation from the NWHI for release in the MHI as part of a two-stage translocation program is not included in the permit application.

Because Hawaiian monk seals have an expansive natural range, the geographic area in which the proposed research and enhancement activities could be conducted includes almost all shorelines and nearshore waters throughout the Hawaiian Archipelago, including the Northwestern Hawaiian Islands (NWHI) and main Hawaiian Islands (MHI). Nevertheless, the actual spatial "footprint" of the activities themselves would be quite small in comparison, and the activities would rarely occur repeatedly in any one location. The activities would also be quite limited in terms of intensity and duration. Only a limited number of staff (usually less than 10) and only one or two vehicles and/or small vessels would be involved in conducting any of the activities, and the activities would usually be completed in one hour or less. In addition, none of the activities would entail alteration of any structure, shoreline, or seafloor substrate, nor would any activity entail any new restriction on resource use or access. All of these factors, which we believe limit potential adverse effects on coastal uses and resources, were considered in reaching our consistency determination.

Before and during implementation of the activities proposed in the permit application, NMFS intends to conduct a suite of measures designed, in part, to mitigate potential adverse effects on coastal uses and resources that might result from implementing the proposed activities. These mitigation measures, which were also considered in our consistency determination, include:

- Avoiding, to the maximum extent practicable, implementation in areas known to be used extensively for recreational, cultural, historic, and/or economic purposes.
- Developing a *Management Plan for Hawaiian Monk Seals in the Main Hawaiian Islands* using a participatory planning methodology.
- Seeking regular advice from a *Hawaiian Monk Seal Recovery Team*, composed of experts in relevant topics, including fishing, ocean recreation, ocean industry, and cultural protocols.
- Ensuring staff training in recognition and avoidance of cultural resources and historic properties.
- Developing protocols regarding management, handling and removal of monk seals that enter fishponds.
- Conducting education and outreach regarding the proposed activities and other aspects of Hawaiian monk seal conservation and biology.
- Maintaining close coordination with relevant federal, state and county agencies.

We also note that the proposed activities, which are intended to promote the recovery of Hawaiian monk seals, appear to be consistent with Hawaii's *Ocean Resources Management Plan* (2009). The proposed activities appear to be particularly relevant to the following strategic action: "Enhance the conservation of Hawaii's marine protected

species, unique habitats and biological diversity." Conservation of Hawaiian monk seals is mentioned specifically in the section of the plan that discusses this strategic action.

We look forward to coordinating with you and your staff on your agency's review of this consistency determination. Please contact Jeff Walters at (808) 944-2235 or *jeff.walters@noaa.gov* if there are any comments or questions.

Sincerely,

Michael D. Tosatto
Administrator

Enclosure

cc: John Nakagawa, Hawaii CZMP

Response by State of Hawai'i
CZM Program

OFFICE OF PLANNING
STATE OF HAWAII

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

NEIL ABERCROMBIE
GOVERNOR

JESSE K. SOUKI
DIRECTOR
OFFICE OF PLANNING

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://hawaii.gov/dbedt/op/

Ref. No. P-13949

April 16, 2013

Mr. Michael D. Tosatto, Regional Administrator
Pacific Islands Regional Office
National Marine Fisheries Service
1601 Kapiolani Boulevard, Suite 1110
Honolulu, Hawaii 96814-4700

Attention: Mr. Jeff Walters

Dear Mr. Tosatto:

Subject: Hawaii Coastal Zone Management (CZM) Program Federal Consistency Review for Hawaiian Monk Seal Recovery Activities

The Hawaii CZM Program has reviewed the proposal by the National Marine Fisheries Service (NMFS), Pacific Islands Fisheries Science Center, to conduct various Hawaiian monk seal recovery activities under the Endangered Species Act and the Marine Mammal Protection Act. We will not be responding to the NMFS coastal consistency determination for the proposed activities due to the preemption of Hawaii CZM enforceable policies that are relevant to the taking of marine mammals. (See the attached letter from Jane C. Luxton, NOAA General Counsel, to Frank R. Jimenez, General Counsel of the Navy, June 20, 2008.)

Thank you for coordinating with the Hawaii CZM Program. If you have any questions, please call John Nakagawa of our CZM Program at 587-2878.

Sincerely,

Jesse K. Souki
Director

Enclosure

c: Department of Land and Natural Resources,
Division of Aquatic Resources (w/o enclosure)

National Historic Preservation Act
Section 106 Consultation -
Determination Letter to SHPO

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 • Fax (808) 973-2941

NOV 12 2013

Mr. William J. Aila, Jr.
Hawaii State Historic Preservation Officer
Department of Land and Natural Resources
1151 Punchbowl St.
Honolulu, HI 96713

Dear Mr. Aila:

The purpose of this letter is to transmit the determination of the National Marine Fisheries Service (NMFS) regarding our consultation pursuant to Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C.§ 740f, implementing 36 C.F.R. Pt. 800 (2008), for our proposed undertaking to implement a suite of Hawaiian monk seal recovery actions.

NMFS has completed the consultation process under NHPA Section 106, and has made a determination of no historic properties affected. This means that we have found there are historic properties present in the area in which the undertaking will occur, but the undertaking will have no effect, as described in 36 C.F.R. Pt. 800.16.(i), upon the historic properties.

The enclosed report is provided to present a summary of our NHPA Section 106 compliance process as well as to serve as documentation, as specified in 36 C.F.R. Pt. 800.11.(d), of our determination of no historic properties affected. Descriptions of the undertaking and its area of potential effects are provided in Sections 4 and 2 of the report, respectively. Descriptions of the steps taken to identify historic properties are presented in Sections 3 and 7 of the report, which describe the research methodology and consultation process, respectively. The basis for determining that no historic properties are affected is presented in Sections 8 and 9 of the report.

As specified in 36 C.F.R. Pt. 800.4.(d)(1), we are notifying all consulting parties of our determination (via transmittal of a letter and the enclosed report) and making the documentation (i.e., the enclosed report) available to the public via our website.

As indicated in 36 C.F.R. Pt. 800.4.(d)(1), if we do not hear from you within 30 days of your receipt of this letter and enclosed documentation, we will assume there is no objection to our determination.

We appreciate your and your staff's efforts during this NHPA Section 106 compliance process. Please contact Jeff Walters, at (808) 944-2235 or *jeff.walters@noaa.gov*, if there are any questions.

Sincerely,

Michael D. Tosatto
Regional Administrator

Enclosure

- Page Intentionally Left Blank -

Appendix B
National Historic Preservation Act Section 106 Compliance

- Page Intentionally Left Blank -

NATIONAL HISTORIC PRESERVATION ACT SECTION 106 COMPLIANCE FOR THE HAWAIIAN MONK SEAL RECOVERY ACTIONS

National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Pacific Island Regional Office

Portions prepared under contract by:
Pacific Legacy, Inc.

November 8, 2013

- Page Intentionally Left Blank -

TABLE OF CONTENTS

1.0 INTRODUCTION **1**
1.1 Overview 1
1.2 Relevant Statutes and Agency Regulations 1
1.2.1 National Environmental Policy Act 1
1.2.2 National Historic Preservation Act 2
2.0 BACKGROUND **5**
2.1 Hawaiian Monk Seal Recovery Program And Proposed Recovery Actions 5
2.2 Hawaiian Monk Seal 5
2.3 Area of Potential Effects 6
2.3.1 Main Hawaiian Islands 8
2.3.2 Northwestern Hawaiian Islands 8
2.4 Previous Studies 9
2.5 Scope of Work and Objectives 10
3.0 METHODOLOGY **11**
3.1 Background Research 11
3.2 Community Meetings 11
3.3 Section 106 Consultation 11
4.0 ACTIVITIES RELATED TO THE UNDERTAKING **12**
4.1 Current Activities 12
4.2 Activities Proposed In ESA-MMPA Permit Application 12
4.3 Relevant Tasks Associated With Undertaking 13
5.0 HISTORIC PROPERTIES POTENTIALLY AFFECTED **15**
5.1 Historic Properties 15
5.2 Historic Properties within the Area of Potential Effects 16
5.3 Northwestern Hawaiian Islands 17
5.4 Main Hawaiian Islands 18
5.4.1 Onshore Traditional Historic Properties 19
5.4.2 Intertidal Traditional Historic Properties 20
5.4.3 Off-Shore Traditional Historic Properties 20
5.4.4 Post-Contact Historic Properties 21
5.4.5 Traditional Cultural Properties 23
6.0 POTENTIAL EFFECTS TO HISTORIC PROPERTIES **24**
6.1 Potential Effects of Proposed Actions 25
7.0 SECTION 106 CONSULTATION **27**
7.1 The Consultation Process 27
7.2 Initiation of Consultation 27
7.3 Community Meetings 28
7.3.1 Identified Historic Properties 29

7.3.2 Concerns Expressed 29
7.3.3 Measures Recommended to Prevent or Minimize Adverse Effects 30
7.4 Consultation 30

8.0 RECOGNITION AND AVOIDANCE MEASURES 32

8.1 Northwestern Hawaiian Islands 32
8.2 Main Hawaiian Islands 32
8.2.1 Terrestrial Effects 32
8.2.2 Marine Effects 33
8.3 Training 34
8.4 Planning 34
8.5 Coordination 35
8.5.1 Coordination with the Hawai‘i State Historic Preservation Division 35
8.5.2 Additional Coordination 35
8.6 Protocols Regarding Monk Seals in Fishponds 35

9.0 SECTION 106 DETERMINATION 37

9.1 Assessment of Effects 37
9.2 Criteria for Determination 37
9.3 Finding of No Effect 37
9.4 No Effects Documentation 38

10.0 REFERENCES 39

APPENDIX A 41

APPENDIX B 45

APPENDIX C 49

APPENDIX D 57

APPENDIX E 67

APPENDIX F 75

APPENDIX G 89

LIST OF FIGURES

Figure 1. Project area for the Programmatic Environmental Impact Statement (PEIS) for the Hawaiian Monk Seal Recovery Actions.....7
Figure 2. Northwestern Hawaiian Islands. 9
Figure 3. Locations of known coastal fishponds within the main Hawaiian Islands (data courtesy State of Hawai‘i Office of Planning Geographic Information System database)....22

(This page left intentionally blank.)

1.0 INTRODUCTION

1.1 OVERVIEW

Pacific Legacy, Inc. has prepared the following report to assist the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS) in complying with its duties under Section 106 of the National Historic Preservation Act (NHPA). Section 106 consultation with Native Hawaiian organizations (NHOs) and other interested parties was conducted to consider the potential effects on historic properties of proposed Hawaiian monk seal recovery actions.

The proposed recovery actions include research and enhancement activities presented in an application prepared by NMFS for a research and enhancement permit under the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) (NOAA NMFS Permit application 16632). In compliance with the National Environmental Policy Act (NEPA), these activities and their potential environmental impacts are described and analyzed in the Programmatic Environmental Impact Statement for Hawaiian Monk Seal Recovery Actions (PEIS). The following report presents the process implemented by NMFS to comply with NHPA Section 106 for the undertaking of a program funded and carried out by a Federal agency and associated with issuance of the ESA-MMPA permit for Hawaiian monk seal recovery actions. The report includes descriptions of the undertaking, the potential area of effects, steps taken to identify the Historic properties potentially affected, and the consultation process conducted to assess the potential effects. The report concludes with a determination of no historic properties affected and presents the basis for this determination.

1.2 RELEVANT STATUTES AND AGENCY REGULATIONS

The proposed Hawaiian monk seal recovery actions entail "take" of Hawaiian monk seals under the ESA and MMPA. Issuance of a permit for "take" under the ESA and MMPA requires compliance with other federal laws including, but not limited to, NEPA and NHPA. Under these statutes, NOAA, as a federal agency, has the responsibility to ensure effective stewardship of the cultural resources that may be impacted by its proposed actions. The Code of Federal Regulations (Federal Code) implements these federal statutes.

1.2.1 National Environmental Policy Act

The National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. §§ 4321 *et seq.*, § 4331(a)(4) (2012), requires, in part, the consideration, discussion, and analysis of possible impacts to cultural resources as part of the human environment. The NEPA requirements related to Hawaiian monk seal recovery actions are implemented though the Federal Code provisions for environmental impact statements, 40 C.F.R. §§ 1502, § 1502.16(g) (2012), and the NHPA Section 106 consultation process discussed below.

Among the potential effects of federal actions to be considered under NEPA are historic and cultural effects, "whether direct, indirect, or cumulative" (40 C.F.R. §1508.8(b)), including

"considerations of both context and intensity" (40 C.F.R. §1508.27). The unique characteristics of the proposed project's geographic area, including its proximity to historic or cultural resources, must also be taken into consideration (40 C.F.R. §1508.27(b)(3)). According the Federal Code, the Environmental Impact Statement is required to discuss the potential impacts that all of the proposed alternatives may have on cultural resources, including analysis of the proposed actions, any unavoidable adverse effects if the proposals are implemented, the relationship of the short-term uses of the environment to the maintenance and enhancement of long-term use, and any irreversible or irretrievable commitment of resources involved in the proposals if they are implemented. It must also consider "the degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources" (40 C.F.R. §1508.27(b)(8)).

1.2.2 National Historic Preservation Act

The goal of the National Historic Preservation Act of 1966 (NHPA, Public Law 89-665 and amendments thereto; 16 U.S.C. §§ 470 *et seq*.) is to empower Federal agencies to act as responsible stewards of U.S. cultural resources when agency actions affect historic properties. The NHPA established the Advisory Council on Historic Preservation (ACHP), an independent federal agency that promotes the preservation, enhancement, and productive use of historic resources, and advises the President and Congress on national historic preservation policy. The ACHP is the only entity with the legal responsibility to encourage Federal agencies to factor historic preservation into Federal project requirements. It also authorized the Secretary of the Interior to expand and maintain a National Register of Historic Places composed of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, and culture. (Title I Section 101 (a)(1)(A)). Historic properties meeting criteria for evaluation defined in Federal Code 36 C.F.R. § 60.4 are eligible for designation as "National Historic Landmarks" and can be included on the National Register.

Section 106 of the NHPA (16 U.S.C. § 470 (f)) requires Federal agencies to take into account the effects of their undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places. An "undertaking," as defined as "a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval" (36 C.F.R. § 800.16(y)). The Section 106 process seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency officials and other parties with an interest in the effects of the undertaking on historic properties during the early stages of project planning (36 C.F.R. § 800.1(a)).

The Federal Code implementing the NHPA, 36 C.F.R. §§ 800 *et seq*. (2012), specifies the process for Section 106 consultation. The provision for consultation required under Section 106 applies when a project 1) includes a federal or federally licensed action, and 2) the action has the potential to affect properties that are listed in or are eligible for listing in the National Register of Historic Places. As part of the Section 106 process, the Federal agency must identify historic properties located within the Area of Potential Effects (APE) of the undertaking (CFR § 800.4 (b)). Identification efforts may include background research, consultation, oral history

interviews, investigation, and field survey depending upon the scope of the APE. The process of identifying historic properties that may be affected by the agency's undertakings involves:

1. Determining and documenting the area of potential effects for the project.
2. Reviewing existing information on historic properties within the area of potential effects, including any data concerning possible historic properties not yet identified.
3. Seeking information, as appropriate, from consulting parties, and other individuals and organizations likely to have knowledge of, or concerns with, historic properties in the area, and identify issues relating to the undertaking's potential effects on historic properties.
4. Gathering information from any Native Hawaiian organization to assist in identifying properties which may be of religious and cultural significance to them and may be eligible for the National Register (CFR § 800.4 (a)).

Section 101 of the NHPA states that, "In carrying out its responsibilities under section 106 of this Act, a Federal agency shall consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to properties described in subparagraph (A)" (Section 101 (d)(6)(B)). These are, "Properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization [that] may be determined to be eligible for inclusion on the National Register" (Section 101 (d)(6)(A)). The intent of this consultation is to identify historic properties potentially affected by the undertaking and to seek ways to avoid, minimize or mitigate any adverse effects on those properties (36 C.F.R. § 800.1(a)).

The NHPA, Section 301 Title III (16 U.S.C. 470 (w) – Definitions (5)) defines a Native Hawaiian organization (NHO) as any organization which "serves and represents the interests of Native Hawaiians," "has as a primary and stated purpose the provision of services to Native Hawaiians" and "has demonstrated expertise in aspects of historic preservation that are culturally significant to Native Hawaiians." This includes, but is not limited to, the Office of Hawaiian Affairs of the State of Hawaiʻi and Hui Mālama I Nā Kūpuna O Hawaiʻi Nei, an organization incorporated under the laws of the State of Hawaiʻi.

The Federal agency must ensure that the Section 106 process is initiated early in the undertaking's planning, so that a broad range of alternatives may be considered during the planning process. It must also complete the Section 106 process prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license. This, however, does not prohibit the agency from conducting or authorizing nondestructive project planning activities before completing compliance with Section 106, provided that such actions do not restrict the subsequent consideration of alternatives to avoid, minimize or mitigate the undertaking's adverse effects on historic properties (36 C.F.R. § 800.1 (c)).

Under the Federal Code, the consultation process provides for the inclusion of certain parties, including the State Historic Preservation Officer (36 C.F.R. § 800.2 (c)(1)), Native Hawaiian Organizations (36 C.F.R. § 800.2 (c)(2)), representatives of local governments (36 C.F.R. § 800.2 (c)(3)), additional consulting parties with a demonstrated interest in the undertaking (36 C.F.R. § 800.2 (c)(5)), and the public (36 C.F.R. § 800.2 (c)(5)(d)). There are specific provisions in 36 C.F.R. § 800.2 for coordination with the NEPA process and for consultation with any NHO that attaches religious and cultural significance to historic properties that may be affected by an

undertaking. 36 CFR §800.2 (c)(2)(ii)(A) requires that the federal agency conducting Section 106 consultation must insure that the consultation process provides the NHOs involved with a reasonable opportunity to identify their concerns about historic properties, to advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance, to articulate their views on the undertaking's effects on such properties, and to participate in the resolution of any potential effects.

2.0 BACKGROUND

2.1 HAWAIIAN MONK SEAL RECOVERY PROGRAM AND PROPOSED RECOVERY ACTIONS

NMFS is the federal agency responsible for management of Hawaiian monk seals, under the ESA (16 United States Code [U.S.C.] 1531 *et seq*.) and MMPA (16 U.S.C. 1361 *et seq*.). NMFS funds, permits, and conducts research and enhancement activities on Hawaiian monk seals in the Northwestern Hawaiian Islands (NWHI) and main Hawaiian Islands (MHI).

Populations of the Hawaiian monk seal (*Monachus schauinslandi*) have experienced a prolonged decline. In 1976, NMFS listed Hawaiian monk seals as "endangered" under the ESA (41 Federal Register [FR] 51611) and "depleted" under the MMPA. NMFS implements recovery actions (research and enhancement) for Hawaiian monk seals to promote the conservation and recovery of the species population to levels at which ESA protection is no longer needed. NMFS has proposed new research and enhancement activities for Hawaiian monk seals and has applied for authorization under the ESA and MMPA to conduct these activities (collectively referred to as recovery actions). The activities associated with this undertaking include, but are not limited to, monitoring, tagging, limited on-site medical treatment and the temporary translocation of seals between islands to enhance juvenile survival.

The intent of this report is to assess the potential effects to historic properties of the research and enhancement activities proposed in the ESA and MMPA permit application, to provide a summary of NHPA Section 106 consultations held regarding these potential effects, and to present the determination made by NMFS regarding these potential effects pursuant to NHPA Section 106.

Several actions proposed in the permit application may have the potential to affect historic properties within the Hawaiian archipelago. These historic properties may include both shoreline sites and submerged sites. Areas of traditional cultural significance, such as bays and beaches associated with legendary or historic events, which may be eligible for listing on the National Register as Traditional Cultural Properties could also be affected by activities related to the undertaking. The Section 106 consultation held in association with this undertaking focused on identifying Native Hawaiian concerns regarding the potential effects of the proposed NMFS Hawaiian monk seal research and enhancement activities on historic properties.

2.2 HAWAIIAN MONK SEAL

The Hawaiian monk seal is among the rarest of all marine mammals. It is endemic to the islands of the Hawaiian chain and found nowhere else on earth. Hunted to the brink of extinction in the late 19th century, Hawaiian monk seals have been declining in population since the late 1950s. The monk seal population is currently declining overall. While the larger monk seal population in the NWHI is shrinking, the population within the MHI is growing.

At present, the majority of monk seals live in six main breeding subpopulations located within the NWHI on Kure Atoll, Midway Islands, Pearl and Hermes Reef, Lisianski Island, Laysan Island, and French Frigate Shoals. Smaller breeding sub-populations also occur on Mokumanamana (Necker) and Nihoa Islands. Monk seals have also been observed at Gardner Pinnacles and Maro Reef. Monk seals are also found within the MHI where births have occurred on many of the major islands.

As a general rule, Hawaiian monk seals are relatively solitary and do not congregate in large groups as do other seal species such as sea lions and harbor seals. Monk seals occupy a range of marine and coastal habitats. They frequent the waters surrounding atolls, islands, and areas farther offshore on reefs and submerged banks. Monk seals are also found using deepwater slopes and coral beds as foraging habitats. They often haul-out on land to rest during the day, and prefer sandy, protected beaches surrounded by shallow waters when pupping. Hawaiian monk seals are apex predators within the coral reef environment. They are primarily benthic foragers, feeding along the sea bottom on a variety of prey including fish, cephalopods, and crustaceans, although their diet varies depending upon location, sex, and age.

2.3 Area of Potential Effects

The Project Area for the proposed Hawaiian monk seal recovery actions encompasses the range where Hawaiian monk seals are found throughout the Hawaiian Archipelago, including the main Hawaiian Islands, the Northwestern Hawaiian Islands, and Johnston Atoll (Figure 1). It includes portions of the open-ocean and near-shore environment where monk seals may be found, as well as the shore zone of the islands, islets and atolls that make up the Hawaiian Archipelago and Johnston Atoll. For the purposes of NEPA, the shore zone generally includes those terrestrial areas 5 meters inland from the line where the shore meets the sea. In addition, secondary use areas, such as research field camps in the NWHI, are also considered for inclusion.

For the purposes of NHPA Section 106 consultation, the Area of Potential Effects (APE) of an undertaking is defined as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist (CFR 36 § 800.16 (d)). The APE for the proposed Hawaiian monk seal recovery actions includes the shore zone, encompassing those terrestrial areas up to 25 meters inland from the upper reaches of the wash of the waves, at high tide during the season in which the highest wash of the waves occurs (usually evidenced by the edge of vegetation growth or the upper limit of debris), and the inshore waters up to 300 meters off from the shoreline, as well as camp sites further inland on the NWHI (as described in Section 3.4.6. of the PEIS). This APE has been extended further inland than the NEPA project area out of an abundance of caution regarding the potential direct and indirect effects of monk seal recovery actions on historic properties.

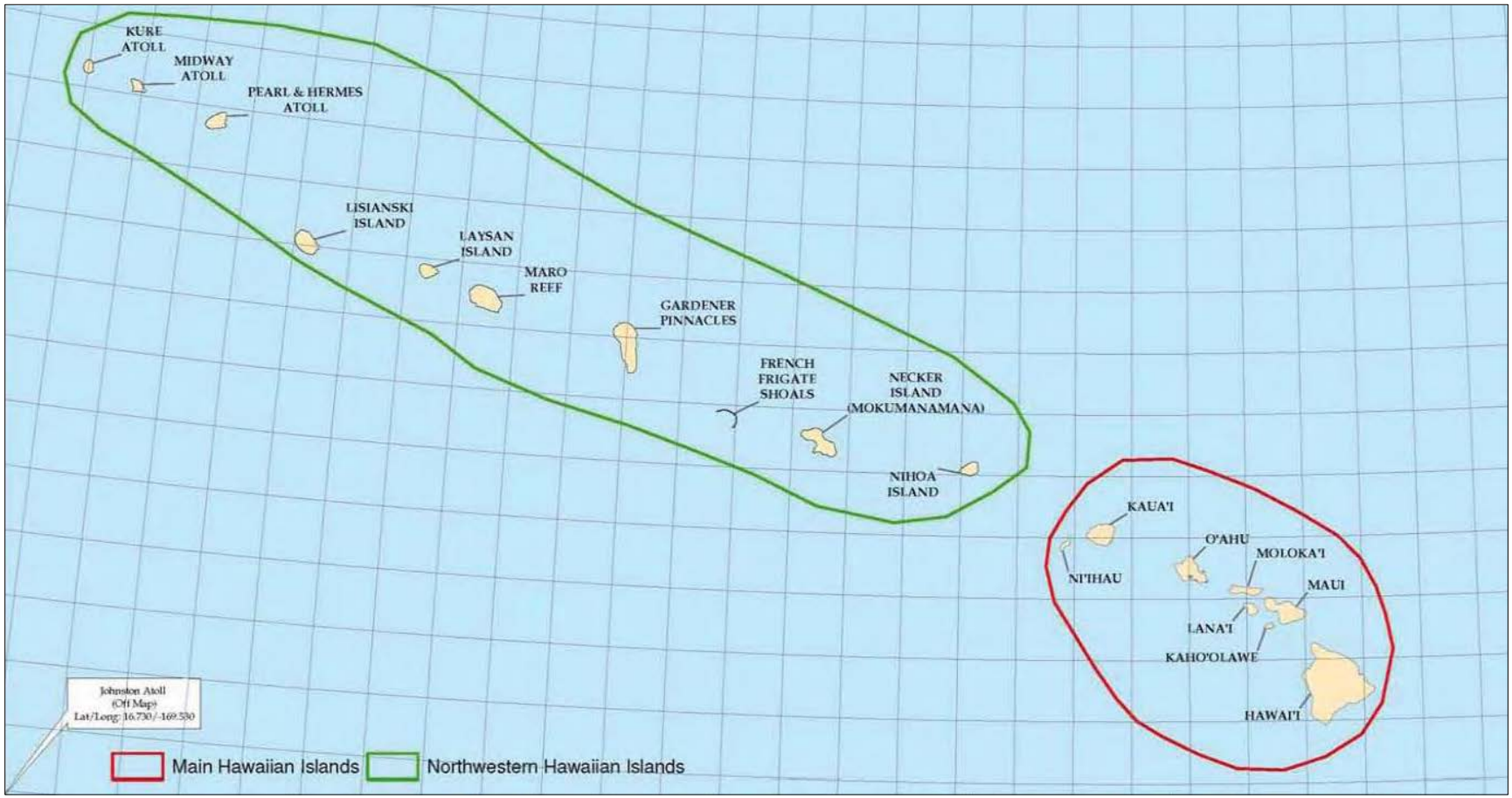


Figure 1. Project area for the Programmatic Environmental Impact Statement (PEIS) for the Hawaiian Monk Seal Recovery Actions.

2.3.1 Main Hawaiian Islands

The eight main islands of the Hawaiian chain include the high volcanic islands of Hawaiʻi, Maui, Kahoʻolawe, Lānaʻi, Molokaʻi, Oʻahu, Kauaʻi and Niʻihau, which rest at the southeastern end of the archipelago. The main Hawaiian Islands (MHI) comprise approximately 12,548 square kilometers of land and 1,431 km of coastline (Coastal Geology Group 2011; DBEDT 2010). Hawaiian monk seals can be found in small numbers throughout MHI (Antonelis *et al.* 2006). The areas within these main Hawaiian Islands (MHI) potentially affected by monk seal recovery actions addressed in the PEIS include the shoreline areas and the immediate offshore zone.

2.3.2 Northwestern Hawaiian Islands

The Northwestern Hawaiian Islands (NWHI) consist of those islands, atolls, rocks, reefs and shoals that lie to the northwest of the MHI. Also known as the Leeward Islands, the NWHI extend approximately 1,240 miles (2,000 kilometers) from the island of Nihoa in the southeast to Kure Atoll in the northwest (Figure 2). The land that makes up the NWHI totals approximately 13.6 square kilometers (approximately 5.2 square miles). None of the island groups cover more than 6 square kilometers (approximately 4 square miles) in total area. The mean elevation of the islands is less than 33 feet (10 meters), with the highest elevation being at 275 meters on Nihoa Island (Juvik and Juvik 1998). The NWHI are surrounded by over 30 submerged ancillary banks and seamounts. The majority of the islands are uninhabited, with the exception of Midway Atoll, Kure Atoll, Laysan Island, and French Frigate Shoals, which have been occupied by various government agencies for extended periods over the last century (Friedlander et al. 2009).

In 2006, the entire NWHI were included within the Papahānaumokuākea Marine National Monument, which was created by Presidential Proclamation 8031 on June 15, 2006 under the authority of the Antiquities Act of 1906 (16 U.S.C. §§ 431-433). The Monument, which encompasses an area of approximately 142,948 square miles (370,234 square kilometers), includes the ten main islands and atolls that make up Northwestern Hawaiian Islands and the surrounding waters. Its boundaries begin 125 miles west of the main Hawaiian Island of Kauaʻi. Papahānaumokuākea Marine National Monument is the largest protected area in the United States, as well as the world's largest fully protected marine area. On June 30, 2010, the World Heritage Committee of the United Nations Educational, Scientific and Cultural Organization (UNESCO) unanimously inscribed Papahānaumokuākea as a mixed (i.e., cultural and natural) site. The management of the Monument is under the co-trusteeship of the National Oceanic and Atmospheric Administration, the U. S. Fish and Wildlife Service and the State of Hawaiʻi.

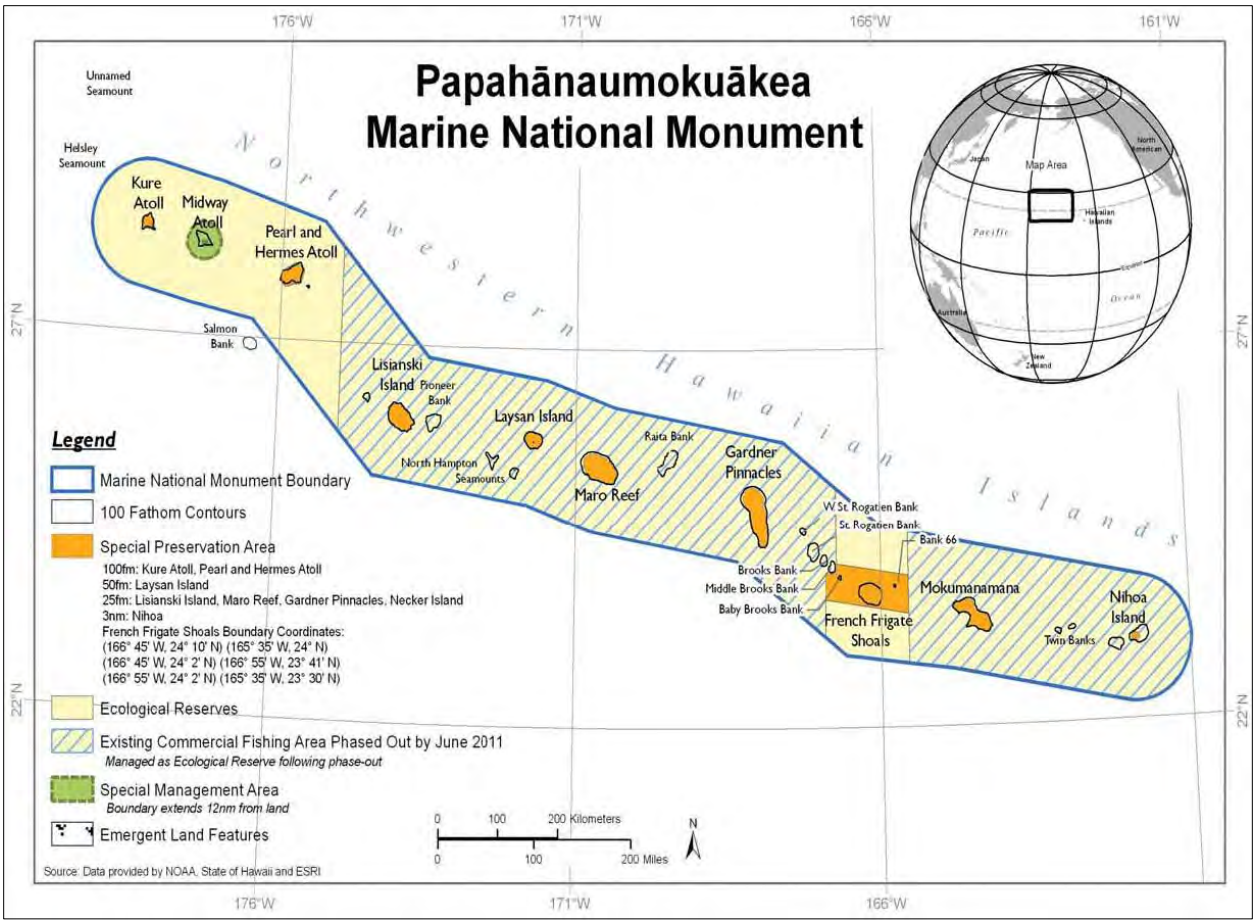


Figure 2. Northwestern Hawaiian Islands.

2.4 PREVIOUS STUDIES

The following previously existing studies were taken into consideration in preparing this report.

A document entitled "Draft Section 106 Analysis of Programmatic Environmental Impact Statement for the Hawaiian Monk Seal Recovery Program" was prepared for NMFS in 2011 (Watson 2011). This report determined that the research and enhancement activities proposed for Hawaiian monk seal recovery possessed no potential to cause effects on historic properties, and therefore Section 106 consultation was not required.

Considering public comment on the Draft PEIS and further analysis during preparation of the Final PEIS, NMFS reconsidered the "no potential to affect" finding of the 2011 report and determined that a potential to affect historic properties likely did exist. The present report documents the process and findings of the NHPA 106 compliance process under this assumption that there was a potential to affect historic properties.

Also in 2011, a *Maritime Heritage Research, Education, and Management Plan* was prepared for the Papahānaumokuākea Marine National Monument. This Management Plan addressed the sites in the Monument associated with the historic period and provides extensive information on these historic resources. The information contained in this document regarding the historic resources of the NWHI has been utilized in preparing the present report.

NMFS conducted a NHPA Section 106 consultation in 2008 regarding Hawaiian monk seal research and enhancement activities on Nihoa. The activities included camping restricted to specified locations and limited access to the interior of the island seal as needed for the purposes of seal monitoring and translocation. As a result of this consultation, NMFS determined it would mitigate physical damage and ensure the preservation of cultural properties at Nihoa consistent with a no adverse effects determination, and the Hawaii SHPO transmitted its concurrence with this determination on March 24, 2008. (As discussed in Section 7 below, unlike the undertaking considered in 2008, the activities associated with present undertaking considered in this report are limited to intertidal and coastal areas below the sea cliffs of Nihoa , and do not include camping or access to the interior of Nihoa.)

2.5 Scope of Work and Objectives

Several of the newly developed recovery actions may possess the potential to affect historic properties within in the Hawaiian archipelago. These properties include both shoreline sites (such as dune burials, coastal habitation structures, fishponds and fishing shrines) and submerged sites (such as offshore wrecks or underwater fishing *ko'a*). Traditional Cultural Properties eligible for listing on the National Register of Historic Places (such as geographic locations possessing traditional religious significance or headlands, bays and beaches associated with legendary or historic events) may also be affected. The following report focuses on addressing the potential effects of proposed Hawaiian monk seal recovery actions on these historic properties. The objective of the present study is to assist NMFS in fulfilling its statutory obligations under Section 106 of NHPA to protect historic properties during the planning and implementation of the proposed Hawaiian monk seal recovery actions.

3.0 METHODOLOGY

3.1 BACKGROUND RESEARCH

In order to understand the potential effects of Hawaiian monk seal recovery actions on historic properties, a thorough study was made of the types of archaeological and cultural sites that may be present within the project APE. Due to the geographic extent of the APE, an effort was made to identify the range of sites that may be affected rather than to identify individual historic properties. This was particularly necessary given that many of the potential activity locations within the APE have not been the subject of detailed archaeological investigations, and therefore not all of the sites present within them have been identified or documented.

An analysis was also undertaken of the range of research and enhancement activities proposed in order to determine their potential physical effects to historic properties. Not only were the recovery actions themselves taken into consideration (e.g. transit to and from project sites, activities involved in seal relocation), but consideration was also given to their consequences (e.g. translocated seals interacting with and impacting historic properties).

3.2 COMMUNITY MEETINGS

As part of public outreach associated with the preparation of the Hawaiian monk seal PEIS, a series of community meetings were held at various venues on the islands of Molokaʻi, Lānaʻi, Maui, Hawaiʻi, and Oʻahu. Examples of the meeting announcements published in island newspapers and posted on the NMFS PIRO website are provided in Appendix A of this report. The purpose of these meetings was to provide the public with the opportunity to offer information on the historic properties, cultural resources and traditional practices that may be affected by the recovery actions. The meetings were also intended to enable Native Hawaiian organizations and other interested parties to assist in developing strategies to prevent or minimize any potential effects resulting from these proposed actions. The results of these community meetings are discussed in Section 7.0.

3.3 SECTION 106 CONSULTATION

In complying with the statutory requirements of Section 106 of the NHPA, NMFS has identified, contacted and consulted with Native Hawaiian Organizations (NHOs) and other interested parties to obtain their assistance in identifying historic properties that may be affected by the recovery actions proposed. Copies of correspondence between NMFS and NHO's regarding the consultation are provided in Appendix C, D, E and F of this report. This consultation was also intended to provide the NHOs and other parties with an opportunity to express any concerns they might have about the potential effects of monk seal recovery actions on these historic properties and to recommend measures to avoid, minimize, or mitigate any potential adverse effects. This consultation process is discussed in detail in Section 7.0.

4.0 ACTIVITIES RELATED TO THE UNDERTAKING

4.1 CURRENT ACTIVITIES

The existing permit issued to the NMFS Pacific Islands Fisheries Science Center (PIFSC) under the Marine Mammal Protection Act (MMPA-ESA Permit No. 10137-07) authorizes research and enhancement activities on Hawaiian monk seals. These activities (which are listed in Table 2.10-1 of the PEIS) include aerial, vessel, and ground surveys, sample collection, medical treatment, marking of animals, attachment of telemetry instruments, translocation and temporary captivity. The PIFSC is authorized to undertake these activities each year through June of 2014, at which time the existing permit will expire.

4.2 ACTIVITIES PROPOSED IN ESA-MMPA PERMIT APPLICATION

The proposed recovery actions (referred to as research and enhancement activities) are presented in the ESA-MMPA Permit application (NMFS application number 16632). The actions are also described in the PEIS in the sections that present the preferred alternative (alternative 3). The activities are briefly summarized below. The entire permit application may be reviewed at the following website:
http://www.nmfs.noaa.gov/pr/permits/monkseal16632.htm.

4.2.1 Proposed Activities

The proposed actions presented in the ESA-MMPA permit application encompass the range of research and enhancement activities considered most promising for fostering monk seal recovery over the next five years. All activities currently permitted would continue (these activities are listed in Table 2.10-1 of the PEIS). The PEIS considers the suite of recovery actions that would be conducted on an intermittent basis over a 10-year period. Additional actions would include increased handling of Hawaiian monk seals, as well as a seal behavior modification program intended to prevent or reduce human-monk seal interactions. The scope and number of seal translocations would also be expanded to include the translocation of Hawaiian monk seals within the MHI or within the NWHI, as well as the translocation of a limited numbers of seals from the MHI to the NWHI (see PEIS Section 3.9). As a result, boat and land vehicle activity, as well as shoreline activities, would be greater than at present. Activities conducted would include aerial, vessel and land-based surveys, and some handling and transportation of Hawaiian monk seals. Boats and land vehicles will be used to transport researchers and possibly animals. Researchers will cross beach and dune areas on foot to reach monk seal locations. Recovery activities will be conducted throughout the APE, in the MHI, NWHI, and on Johnston Atoll. Researchers will seasonally (typically April or May through August) occupy existing camp sites in the NWHI.

The APE for this undertaking is relatively large considering the natural range of the Hawaiian monk seal. Nevertheless, the actual spatial "footprint" of the recovery activities themselves would be quite small in comparison, and the activities would occur infrequently and rarely

repeatedly in any one location. The activities would also be quite limited in terms of intensity and duration. Only a limited number of staff (usually less than 10) and only one or two vehicles and/or small vessels would be involved in conducting any of the activities, and the activities would usually be completed in one hour or less. In addition, none of the activities would entail alteration of any structure, shoreline, or seafloor substrate, nor would any activity entail any new restriction on resource use or access.

4.3 RELEVANT TASKS ASSOCIATED WITH UNDERTAKING

1. Translocation

This activity involves the temporary or permanent translocation of weaned pups, juveniles and sub-adults, and adult males within or between subpopulations within the species range. It will include translocations within the NWHI, within the MHI, and from the MHI to the NWHI.

Tasks Involved:

Translocation within the NWHI

Capture of the seal:

Seals are captured by manual physical restraint, herding (sometimes with plywood boards), and placed in nets or cages for transport. The removal cage (for adults) or net (for pups) is transported to the capture site by boat and is hand-carried from the boat to the seal's location on the beach. Depending on the size of the seal, two to four NOAA staff will be present to carry the cage or carrier and to monitor the seal. There is no large-scale movement of sand or digging.

Transport to the release site:

The captive seal is then hand-carried to the release site or to the waiting boat for transport to the release site.

Release of the seal:

The capture process is reversed at the release site, whether from a net or cage. The captive seal is hand-carried from the boat to the release site. Pups are typically released on the beach above the water-line. Depending on the size of the seal, two to four NOAA staff will be present to carry the cage or net and to monitor the seal.

Translocation within the MHI and from the MHI to the NWHI

Capture of the seal:

Seal cages are typically transported to the capture site by truck. As a seal is usually translocated from an area of human population to a more remote locale, the capture site is likely to have nearby vehicle parking for the truck, as in the case of a beach park, or at least nearby access to a paved road. No off-road vehicle access is involved. The cage (for adults) or net (for pups) is hand-carried from the truck to the seal's location on the beach. Depending on the size of the seal, two to four NOAA staff will be present to carry the cage or carrier and to monitor the seal. There is no large-scale movement of sand or digging.

Transport to the release site:
The captive seal is hand-carried to the waiting truck or boat for transport to the release site. The cage is typically not carried a long distance due to its weight. As the release site is usually remote, seals are often transported by boat.

Release of the seal:
The capture process is reversed at the release site, whether from a net or cage. The captive seal is hand-carried from the boat to the release site. Pups are typically released on the beach above the water-line. Depending on the size of the seal, two to four NOAA staff will be present to carry the cage or net and to monitor the seal.

2. <u>Carcass Removal</u>
Removal of a deceased animal in the MHI involves collection of the carcass and its transport to a necropsy facility. The site is accessed according to the same process outlined above for translocation via truck for a populated area or boat for a remote area. When the site is remote, two to four NOAA staff may be required to hike from the road, producing cross-country pedestrian traffic.

This activity in the NWHI involves access to the site and carcass removal by boat or on foot. Some necropsies are conducted where carcasses are found in the NWHI (without transporting the carcass).

3. <u>Other Tasks</u>
Other activities proposed, including disentanglement, health assessment, etc., may involve pedestrian traffic or boat traffic to access the seals. The sites would be accessed according to the same process outlined above for translocation via truck for a populated area or boat for a remote area. When the site is remote, two to five NOAA staff may be required to hike from the road, producing cross-country pedestrian traffic. This activity in the NWHI usually involves access to the site by boat.

5.0 HISTORIC PROPERTIES POTENTIALLY AFFECTED

5.1 HISTORIC PROPERTIES

The NHPA of 1966 (Section 101) authorized the Secretary of Interior to maintain and expand a National Register of Historic Places (National Register) that contains a listing of districts, sites, buildings, structures and objects significant in American history, architecture, archaeology, engineering and culture. The National Register is defined as an authoritative guide to be used by Federal, State, and local governments, private groups, and citizens to identify the nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment.

The term "historic property" is defined in the NHPA (Section 301 Title III, 16 U.S.C. 470w – Definitions (5)) as: "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register." Historic properties eligible for inclusion in the National Register include both properties formally listed on the National Register and all other historic and cultural sites that meet the National Register criteria (36 C.F.R. § 800.16(1)). These include properties of traditional religious and cultural importance.

A property may be listed on the National Register if it meets the criteria for evaluation as defined in Title 36 C.F.R. § 60.4:

> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> (a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) That are associated with the lives of persons significant in our past; or
>
> (c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) That have yielded, or may be likely to yield, information important in prehistory or history.

The Advisory Council on Historic Preservation has recently recognized that large scale historic properties of religious and cultural significance are often comprised of multiple, linked features that form a cohesive "landscape" (ACHP 2011). The component sites that make up such a Traditional Cultural Landscape all contribute their individual significance to form a greater landscape-wide whole. The range of criteria under which a cultural landscape can be determined to be significant is often greater than that of its component sites.

The Secretary of Interior has also recognized the significance of Traditional Cultural Properties (TCPs). The National Register Bulletin 38 "Guidelines for Evaluating and Documenting

Traditional Cultural Properties" (Parker and King 1990) defines "[a] traditional cultural property … as one that is eligible for inclusion on the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (Parker and King 1990:1).

A TCP can be considered a historic property even if it does not possess any recognizable archaeological remains. The lack of any physical evidence of an area's past use and significance would in no way reduce its importance as a TCP. "Although many traditional cultural properties have visual physical indications, others do not. Importantly, the historical significance of most traditional cultural properties can only be evaluated in terms of the oral histories of the community" (Sebastian 1993:22). The Advisory Council on Historic Preservation (ACHP) 1985 guidelines also note that "[a] property need not have been in consistent use since antiquity by a cultural system in order to have traditional cultural value..." (ACHP 1985:7).

As mentioned above, a historic property need not be formally listed on the National Register to receive NHPA protection. The property need only meet the National Register criteria (i.e., be eligible for listing in the National Register). Therefore, in those cases where the archaeological sites within an area have not yet been formally identified or documented, the sites may still warrant protection under NHPA if they meet the requirements to be eligible for listing in the National Register.

5.2 Historic Properties within the Area of Potential Effects

A wide range of historic properties are known to be present within the APE of the proposed monk seal recovery actions. NMFS has determined that the APE for this project encompasses the range where Hawaiian monk seals are found throughout the Hawaiian Archipelago, including the NWHI, MHI and Johnston Atoll. The APE includes the shore zone, encompassing those terrestrial areas up to twenty-five meters inland from the line where the shore meets the sea, and the inshore waters up to 300 meters off from the shoreline, as well as camp sites further inland on the NWHI (as described in Section 3.4.6. of the PEIS). Historic properties that may be present in these areas include both traditional Hawaiian and post-Contact sites.

Given the vast geographic extent of the APE, as well as the programmatic nature of the actions themselves, it is not practical to list all of the historic properties that have the potential to be affected by the undertaking. This list would easily extend into the thousands of sites. There also remain many coastal areas within the MHI where the archaeological sites have not yet been identified or adequately documented.

In order to determine the potential effects of monk seal recovery actions on historic properties within the APE and to propose measures that may serve to mitigate these effects, it is necessary to examine the range of sites that may be affected. The following sections describe the general types of historic properties that can be predicted to be present within the Area of Potential Effects of the monk seal recovery program in both the Northwestern Hawaiian Islands (NWHI) and the Main Hawaiian Islands (MHI).

5.3 NORTHWESTERN HAWAIIAN ISLANDS

The relative density of historic properties within the NWHI is much less than in the MHI. This is due primarily to the relative lack of habitable land area on many of the islands, reefs and atolls. Although recent studies suggest that several of the Leeward Islands were known to early Hawaiian voyagers (Kikiloi 2006, 2010), the only islands which have been found to contain evidence of traditional Hawaiian occupation are Nihoa and Mokumanamana (Necker), the closest islands to the main Hawaiian chain. These islands have been the subject of several archaeological investigations (Emory 1928, Cleghorn 1988, and Kikiloi and Graves 2005). Both islands were designated as archaeological districts (the Nihoa Island Archaeological District, Site # 92-01-89; and the Necker Island Archaeological District, Site # 91-01-53) and placed on the National Register in 1988. Together the two islands contain over 140 documented archaeological sites.

Located at the southeastern end of the NWHI chain, the island of Nihoa covers only about 1 square kilometer (171 acres) of land. This remnant volcanic island is bounded by sea cliffs, some of which rise up to 900 feet in height. More than 90 historic properties have been recorded on the island; 66 by the Tanager Expedition (Emory 1928) and an additional 22 in 1984 (Cleghorn 1984, Kikiloi and Graves 2006). These sites include habitation terraces and bluff shelters, agricultural terraces, ceremonial structures, and burial caves (State of Hawai‘i 2008:16). The presence of stone faced and soil filled terraces suggests cultivation of dryland crops, possibly ‘*uala* (sweet potato, *Ipomoea batatas*). It has been suggested that the island’s abundant natural resources, including fish, shell fish, birds, bird eggs, and presumably monk seals, as well as the presence of at least three freshwater seeps, allowed it to support as many as 100 people on a semi-permanent basis between A.D. 1000 and A.D. 1700 (Cleghorn 1988). All of the archaeological sites situated on the island are located on the gentler upland slopes above the coastal cliffs, while monk seal recovery activities would be restricted to the basalt ledges washed by the tide. Given Nihoa’s topography, there is little likelihood that monk seal recovery actions will affect the islands historic properties.

Much the same is true for the remnant volcanic island of Mokumanamana (Necker). Of the fifty-five documented historic properties on Mokumanamana, thirty-three are religious sites, seventeen are shelter caves, and two sites are of unknown function. The island possesses the highest concentration of religious structures found anywhere in the Hawaiian Archipelago (State of Hawai‘i 2008:16-17). Unlike Nihoa, however, the island does not possess agricultural terraces. This small, dry island has little soil suitable for cultivation. It seems probable that Hawaiian voyagers traveled to Mokumanamana from Nihoa and the MHI primarily for religious purposes. The island’s archaeological sites are all located along the upper slopes of its central ridge well away from the shoreline and outside the APE of the undertaking. Given the topography of the island there is little likelihood that monk seal recovery activities will geographically overlap the areas occupied by these historic properties and therefore will not affect them.

Many of the low-lying atolls located to the north and west of Nihoa and Mokumanamana are subject to dynamic environmental conditions. Small sand islands and sand spits shift over time

and are washed over in the winter by strong storm waves. To date, no direct archaeological evidence of Polynesian presence has been discovered on the remaining islands of the NWHI or on Johnston Island (Apple 1973; Ziegler 1990). A systematic archaeological survey for such sites has yet to be undertaken.

Historic era shipwrecks are present in the offshore waters of several ofNWHI. Archival research indicates that there may be as many as sixty shipwreck sites, the earliest dating back to 1818 (Papahānaumokuākea Marine National Monument 2011:20-21), and at least sixty-one aircraft sites in the waters of the Papahānaumokuākea Marine National Monument. To date, seventeen shipwreck sites have been discovered and documented by NOAA archaeologists. These vessels range from nineteenth century whaling ships and cargo vessels to World War II Liberty ships (Papahānaumokuākea Marine National Monument 2011:34-43). At least 67 naval aircraft are recorded as being lost in the vicinity of the NWHI. During the World War II, an intense air battle was waged directly over and around Midway Atoll. Numerous Japanese and American planes were shot down and their wrecks are considered to be war graves (Papahānaumokuākea Marine National Monument 2011:22). Shipwrecks and underwater plane crash sites located within 300 meters of the shoreline have the potential to be affected by the anchoring of vessels associated with monk seal recovery actions.

During the historic period, Midway Atoll was the most heavily utilized of the NWHI, and the relics of that use remain today in a variety of forms. By 1903 a cable station was in operation on the island, and in the 1930s, Midway became a stopover for the famous Pan American Airways flying clipper seaplanes on their five-day transpacific passage. The construction of a naval air facility at Midway began in 1940. The island played a major role in one of the most important battles of the war. The Battle of Midway, which took place from June 4 to 7, 1942, is considered the turning point of the war in the Pacific. Because of its association with the battle, Midway Atoll has been designated a National Memorial (Papahānaumokuākea Marine National Monument 2011:21-22). Historic properties present on the island include several ammunition magazines, a concrete pillbox, and gun and battery emplacements. For the most part these historic properties are located outside the APE of the undertaking. Although Johnston Island was at one time the site of a U. S. Navy air station, the only remnant of its historic remaining today is the airfield.

5.4 MAIN HAWAIIAN ISLANDS

Although relatively few of the archaeological and cultural resources located within the NWHI have the potential to be affected by the research and enhancement recovery activities, this is not the case in the MHI. The shoreline and immediate offshore areas within the MHI contain large numbers of both pre-Contact and historic archaeological sites. The individual sites are far too numerous to be listed here and, as noted above, many have not yet been formally identified or documented.

The Hawai‘i State Historic Preservation Division (SHPD) is presently updating its Geographic Information System (GIS) database of historic properties which have been assigned State Inventory of Historic Places (SIHP) site numbers. When completed, the database will show the exact location of all SIHP sites for which accurate location coordinates are available. Once the

database is fully operational, it will be possible to quickly identify all those documented sites that fall within the relative proximity of a proposed monk seal recovery action. The SHPD GIS database can therefore serve as a useful tool in planning monk seal recovery actions so as to avoid adversely affecting known historic properties.

Several types of traditional Hawaiian historic properties are likely to be encountered within the APE for monk seal recovery actions. These properties can be grouped into onshore sites, sites located within the intertidal zone, and offshore sites.

5.4.1 Onshore Traditional Historic Properties

Traditional Hawaiian sites can be found along the shorelines of all of the MHI. They occur in a range of natural environments from rocky headlands to sandy beaches. Due to the fact that many of these onshore features occur within or atop sand dunes, coastal sites can often be relatively fragile and susceptible to damage from pedestrian traffic and other activities. The types of historic properties found up to 25 meters inland from the line where the shore meets the sea include the following:

Coastal house sites and other habitation structures: These might consist of stone faced platforms or terraces that served as the foundations of pole and thatch dwellings or walled house enclosures. They can be built on or immediately behind sand dunes, on coastal flats, or atop shoreline promontories. The walls and facings of these structures, being of stacked stone, are relatively fragile and can be easily tumbled if climbed upon.

Buried cultural deposits: These subsurface deposits of cultural features (stone lined fire hearths, post holes, pits, etc.) and materials (artifacts, food remains, etc.) usually represent the remnants of former habitation areas. They are often present in sand flats and dunes situated just back of the high tide line and are visible as dark, charcoal stained layers exposed in the face of wave cuts. These deposits are highly susceptible to erosion by wave action or pedestrian traffic.

Canoe landings and canoe sheds: While canoe landings are often natural features such as small sand beaches or areas of gently sloping shingles where a canoe could easily be brought ashore, canoe sheds were long and narrow, stone walled enclosures that were originally roofed with thatch. Like other stacked stone structures, canoe sheds are susceptible to collapse.

Fishing shrines and other religious sites: Small fishing shrines (*koʻa*) were often built near the shoreline, usually on low promontories overlooking the sea. It was at these *koʻa* that the first fish of the catch was left as an offering to Kūʻulakai or one of the other patron gods of fishing. Larger religious structures (*heiau*) were usually set further back from the shore, but at times they can be found just above the high tide line. Both of these types of ceremonial sites, being stacked stone structures (platforms, terraces or enclosures), are susceptible to human impacts.

Human burials: It is relatively easy to excavate a shallow pit into soft sand. For this reason, sand dunes and sandy shorelines were among the preferred burial areas (*ilina*) utilized

during both the pre-Contact and early historic periods. Dune burial was particularly frequent in the early years of the post-Contact era when epidemics of introduced diseases decimated the Hawaiian population, leaving little time for more elaborate burial measures. Some coastal burial areas consist of formal cemeteries with individual graves marked by stone mounds or headstones. Other *ilina* are unmarked and may not be immediately recognizable on the surface. It is always safest to assume that a sizeable sand dune is likely to contain burials. Dune burials, like the dunes themselves, are extremely fragile and can be easily disturbed and damaged if exposed by wave action or human activity.

5.4.2 Intertidal Traditional Historic Properties

Very little archaeological evidence of past human activities has survived in the turbid environment of the surf zone. Some traditional features, however, have been documented within more gentle intertidal areas. Most of the historic properties present within the intertidal zone are relatively impervious to minor disturbances such as those that might result from monk seal recovery actions. These intertidal sites may include:

Fishing-related features: Along the shoreline where low promontories and fingers of lava extend out into the sea, it is not unusual to encounter depressions of various sizes and shapes that have been battered or ground into the surface of *pāhoehoe*. These depressions were created and used for a range of purposes. They include bait cups (mortar-like depressions used in grinding *palu*, bait) and fish poison basins (shallow depressions where plants like *ʻauhuhu* and *ʻakia* were pounded to extract their juices, which were then used to stun fish in tidal pools). These features were created by the Hawaiians who fished the tidal pools and the shallow offshore waters.

Salt pans: Some of the shallow depressions pecked and ground into the *pāhoehoe* lava at or just above the high tide line were used for the manufacture of salt. These basins were filled with sea water, which was then allowed to evaporate and the resulting salt crystals were collected and used to season food and for ceremonial purposes.

Rock art: Some traditional Hawaiian petroglyphs are known to have been carved into the surface of level lava or sandstone benches which extend out into the intertidal zone. The primary example of an occasionally submerged petroglyph field is in the *ahupuaʻa* of Kahaluʻu on the island of Hawaiʻi.

5.4.3 Off-Shore Traditional Historic Properties

While there are a substantial number of pre-Contact historic properties located within the shoreline zone of the monk seal APE, there are relatively few located in the offshore waters up to 300 meter from the shore. The sites that do exist are for the most part stacked stone structures that could potentially be disturbed by activities such as the capture and translocation of a monk seal.

Fishponds and fish traps: Stone walled fishponds (and, to a lesser extent, fish traps) were traditionally constructed in the shallow off-shore waters that fringe the leeward coasts (and sheltered portions of the windward coasts) of several of the MHI. The largest concentrations of traditional *loko iʻa* (fishponds) are located along the southern coastlines of Oʻahu and Molokaʻi, and the west coast of Hawaiʻi island, though *loko iʻa* can be found on

almost all of the main islands. The State of Hawai‘i Office of Planning maintains a GIS database that shows the locations of several fishponds presently listed on the NRHP (Figure 3). Traditional fishponds are most commonly of two types, either *loko kuapā* (walled shoreline ponds) or *pu‘uone* (inland ponds connected to the sea). While many ancient ponds are long abandoned (the walls of some having been damaged or destroyed, others silted in), some ponds have been restored and are actively used for aquaculture. The stacked stone walls of these ponds are susceptible to damage from human activity.

Ceremonial sites: There is archaeological evidence that some traditional ceremonial structures were located within the off-shore zone. Such sites are relatively rare. The most well known of these is the *heiau* of Hale o Kapuni located in Pelekane bay on the Kohala coast of the island of Hawai‘i. This shrine is submerged just offshore below the larger *heiau* of Mailekini and Pu‘u Koholā and near the former royal compound within Pu‘u Koholā National Historic Site. A site like Hale o Kapuni could be damaged by vessels unaware of its existence.

5.4.4 Post-Contact Historic Properties

Post-Contact shoreline structures include piers, jetties, lighthouses and other historic properties associated with maritime activities. Stone walled livestock enclosures were sometimes constructed just back of the beach, particularly when cattle and other livestock were to be taken or swum out to vessels waiting offshore to transport them to other islands. The remains of historic residential sites are less common, but are sometimes present close to the shoreline. Also found are the remnants of the cement pillboxes erected during World War II as part of a coastal defense system aimed at defending against a potential Japanese invasion. These military defensive positions are located at strategic points along the coastlines of most of the main islands. In general, because of the materials used in their construction, post-Contact shoreline sites tend to be more robust than pre-Contact sites and are less likely to be impacted by monk seal recovery activities.

The most common offshore historic properties that date from the post-Contact period are historic shipwrecks. Shipwrecks in shallow water close to shore have been reported off most of the MHI. There are several shipwrecks off the coast of O‘ahu which are listed on the NRHP. Many of these are located within Pearl Harbor, including the U.S.S. Arizona, U.S.S. Bowfin, and U.S.S. Utah. Shipwrecks are generally much more fragile than most historic era shoreline sites, and have the potential to be affected by vessels anchoring on or near them to conduct monk seal recovery activities.

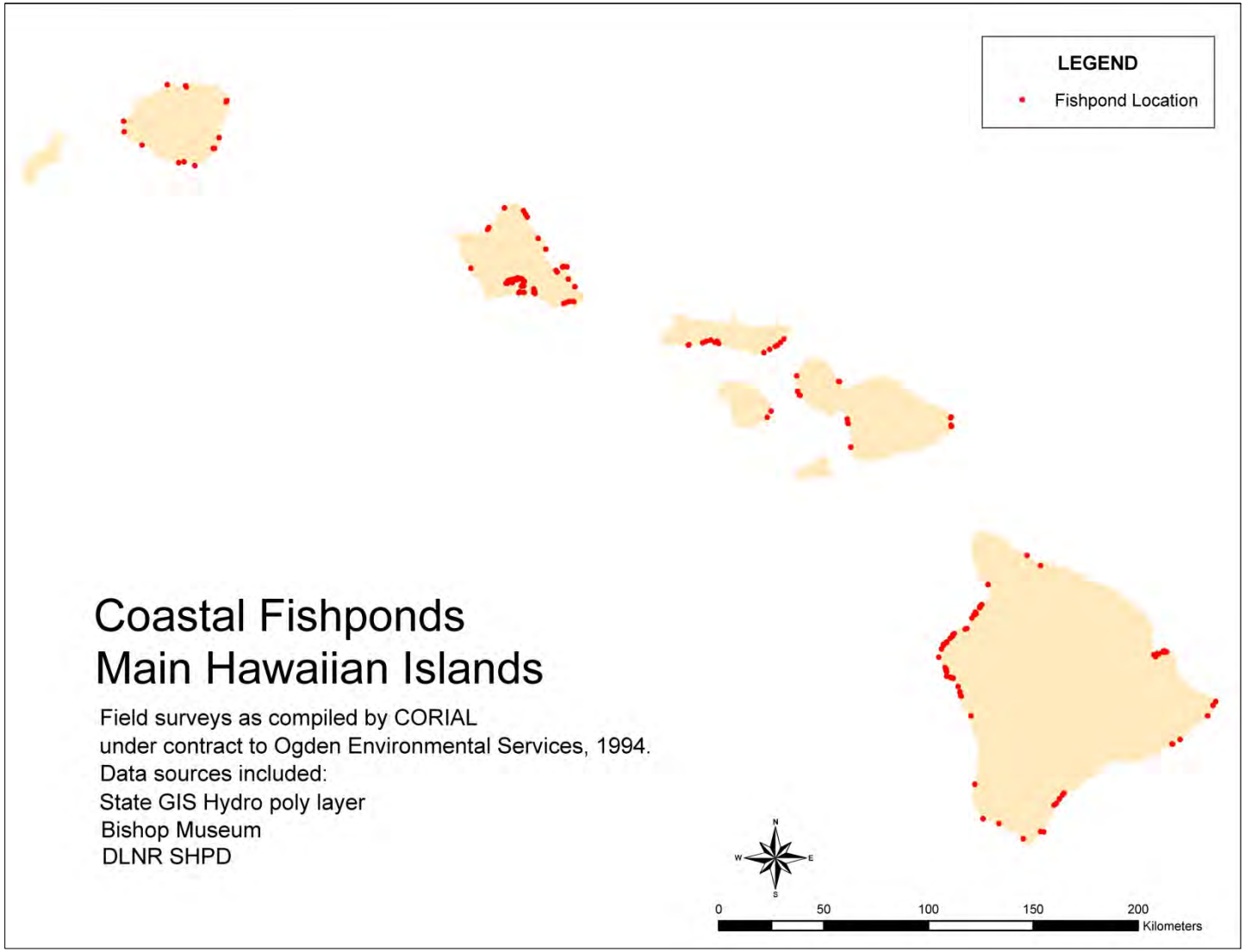


Figure 3. Locations of known coastal fishponds within the main Hawaiian Islands (data courtesy State of Hawai‘i Office of Planning Geographic Information System database).

5.4.5 Traditional Cultural Properties

Traditional Cultural Properties (TCPs) are far more difficult to recognize than most archaeological sites since their significance often depends less on a physical structure than on some mythical or historic event that may have taken place there or some ritual associated with the place. At present, there are no TCP listed on the National Register for Hawaiʻi. There are, however, numerous known *wahi pana* (storied places) which may be eligible for nomination. Sites eligible for listing as a coastal TCP may include physical features such as *leina a ke akua*, the leaping off points from which a departing spirit enters the next world. There are several of these within the MHI. Bays and beaches, stretches of shoreline and other natural landmarks may be associated with mythic or historic figures, traditional activities or historic events. One example is the westernmost tip of the island of Kahoʻolawe, which is known as Lae o Kealaikahiki, the point of the pathway to Kahiki (foreign lands). This point and the adjacent channel are traditionally associated with the epic sea voyages which once took place between Hawaiʻi and the islands of Central Polynesia. In most cases the activities associated with monk seal recovery will have little effect on areas that may be eligible for listing as TCPs. It is important, however, that NMFS staff and volunteers be aware of such areas and treat them with respect.

6.0 POTENTIAL EFFECTS TO HISTORIC PROPERTIES

Section 106 of NHPA requires Federal agencies to take into account the effects of their undertakings on any historic properties located within the APE of a proposed project. The Federal Code that implements Section 106 of the NHPA defines "effect" as an "alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register" (36 C.F.R. § 800.26). These effects may be either direct or indirect. Effects to historic and cultural resources, including historic structures, archaeological sites, and traditional cultural properties, would be considered significant if they affected the integrity of historic properties that are listed (or are eligible for listing) on the National Register of Historic Places. Integrity can be considered to mean not simply the physical integrity of a structure, but "the integrity of [its] location, design, setting, materials, workmanship, feeling, and association" (Title 36 C.F.R. § 60.4). Adverse effects are those that detract from the qualities that give a property its significance and contribute to its NRHP eligibility. Direct effects are those that physically alter the historic property in some way. Indirect effects diminish some significant aspect of the historic property, but do not physically alter it.

Adverse effects to historic properties may include, but are not limited to:

1. Physical destruction of or damage to all or part of the property.
2. Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines.
3. Removal of the property from its historic location.
4. Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance.
5. Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features.
6. Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization.
7. Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance (36 CFR § 800.5(a)(2)).

As detailed in the previous section, a variety of historical properties are present within the APE for the proposed Hawaiian monk seal recovery actions. These historic properties are most abundant within the MHI, but also occur in the NWHI. The purpose of this section is to identify direct, indirect and cumulative effects to cultural and historical resources that may result from proposed monk seal recovery actions.

None of the proposed actions associated with Hawaiian monk seal recovery entail the intentional alteration or destruction of any structure, land, shoreline or seafloor substrate. Therefore, all potential effects to historic properties would be the unintended result of

conducting recovery activities. Potential direct effects to historic properties could result from the physical activities associated with Hawaiian monk seal recovery actions or from the activities of monk seals relocated as part of the recovery effort.

Pedestrian and vehicle traffic through remote areas in order to access seal locations and vessel traffic to access seals on remote beaches have the greatest potential to affect historic properties in the form of specific sites or structures. Land based pedestrian and vehicle traffic has the potential to directly affect fragile stacked stone structures, subsurface archaeological deposits, and human burials. Such sites may be located along the route of travel from the established road to the study or translocation area, on the beach itself, or in adjacent sand dunes. There is much less likelihood that recovery activities will affect broader areas that may be eligible for listing as TCPs, such as bays and beaches, stretches of shoreline and other natural landmarks. The highly intermittent frequency and small "footprint" of the proposed activities, combined with the very low physical impact of the activities themselves, especially at a landscape level, would likely cause no effect to these TCPs. It is important, however, that NMFS staff and volunteers be aware of such areas and treat them with respect.

Due to the short term nature of Hawaiian monk seal recovery activities there is much less potential for indirect effects on historic properties. Indirect effects which might be considered to diminish some significant aspect of a historic property include long term visual and auditory effects. These sorts of effects are unlikely to occur as a result of Hawaiian monk seal recovery actions.

During their normal haul out activities, Hawaiian monk seals seldom venture further inland than the high tide line. Translocated seals are therefore unlikely to adversely affect on-shore historic properties. The only off-shore historic properties seals may be likely to affect are coastal fishponds or fish traps. A number of traditional *loko iʻa* (fishponds), located along the coastlines of the MHI, have been returned to operation in the last few years. A translocated monk seal that managed to enter such a pond could feed on the fish being raised there, and thus disrupt aquaculture operations. The physical activities involved in removing the monk seal from within the pond could possibly result in damage to the structure.

6.1 POTENTIAL EFFECTS OF PROPOSED ACTIONS

The proposed undertaking includes activities that can include aerial, vessel, and land-based surveys, as well as some handling and transportation of the monk seals. Boats and land vehicles will be used to transport researchers and possibly animals. Researchers will also cross beach and dune areas on foot to reach monk seal locations. Recovery activities will be conducted throughout the APE, in the MHI, NWHI, and on Johnston Atoll. Researchers will seasonally (typically April or May through August) occupy existing camp sites in the NWHI.

Hawaiian monk seal recovery actions are likely to take place in both well-traveled beach areas and in more remote locations that have not been subject to much human traffic. These remote areas can be fragile and susceptible to disturbance. Archaeological sites located along the path of access to and from monk seal locations have the potential to be affected. Stacked stone structures and surface scatters of cultural material could be impacted by pedestrian traffic, as

could fragile dune areas that may contain buried cultural deposits or human remains. In order to mitigate potential effects, researchers and volunteers undertaking monk seal recovery activities would need to recognize and avoid these sensitive sites and areas. While vessel-based activities are less likely to impact historic sites, anchoring could result in damage to marine wreck sites. There is also the possibility that Hawaiian monk seals translocated by NMFS as part of the proposed undertaking might enter fishponds on their own accord and may have to be physically removed from the fishponds. The activities associated with the removal of a translocated monk seal from the interior of a fishpond have the potential to result in damage to the fishpond walls and other structural features.

The proposed research and enhancement recovery activities associated with the undertaking have the potential to result in effects on historic properties within the APE. However, given the temporary and limited nature of the proposed monk seal recovery actions, the likelihood of adverse effects to historic properties is very low. The implementation of the measures to recognize, report and avoid historic properties outlined in Section 8.0 will further reduce the potential for effects to historic properties.

7.0 SECTION 106 CONSULTATION

Based on the analysis presented above, NMFS has determined that the proposed actions to recover the Hawaiian monk seal have the potential to cause effects on listed or eligible historic properties. For this reason, Section 106 consultation was initiated.

Section 106 of the NHPA requires that Federal agencies initiating undertakings in Hawaiʻi consult with Native Hawaiian Organizations (NHOs) that attach traditional religious and cultural significance to eligible or listed historic properties that may be affected by that agency's undertakings (Section 101 (d)(6)(A&B)). Section 301 Title III of the NHPA (16 U.S.C. 470w – Definitions (5)) defines a Native Hawaiian organization as any organization which "serves and represents the interests of Native Hawaiians," "has as a primary and stated purpose the provision of services to Native Hawaiians" and "has demonstrated expertise in aspects of historic preservation that are culturally significant to Native Hawaiians." This includes, but is not limited to, the Office of Hawaiian Affairs of the State of Hawaiʻi and Hui Mālama I Nā Kūpuna O Hawaiʻi Nei. The goal of this consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any potential adverse effects on historic properties that are eligible to the National Register of Historic Places (36 C.F.R. §800.1(a)).

36 CFR §800.2 (c)(2)(ii)(A) requires that the federal agency conducting Section 106 consultation must ensure that the consultation process provides the NHOs involved with a reasonable opportunity to identify their concerns about historic properties, to advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance, to articulate their views on the undertaking's effects on such properties, and to participate in the resolution of adverse effects.

7.1 THE CONSULTATION PROCESS

In fulfilling its responsibilities under Section 106 of the NHPA, NMFS has undertaken a program of consultation with NHOs and other organizations and individuals with an interest in the eligible or listed historic properties that may be affected by the activities associated with Hawaiian monk seal recovery actions. The intent of the consultation was to:

1. Identify historic properties that may be affected by the proposed Hawaiian monk seal research and enhancement recovery actions. .
2. Identify potential adverse effects that may occur to these properties as a result of the actions.
3. Develop acceptable measures to recognize, report and avoid historic properties and thereby minimize any potential adverse effects.

7.2 INITIATION OF CONSULTATION

36 C.F.R. § 800.1(c) recommends that consultation be initiated early in the undertaking's planning, so that a broad range of alternatives may be considered during the planning process

for the undertaking. For this reason, NMFS initiated the Section 106 consultation process with the State Historic Preservation Division in March of 2011 (Appendix B). On October 17, 2012, letters (Appendix C) were sent to the State Historic Preservation Division and the following NHO's:

- Office of Hawaiian Affairs;
- Association of Hawaiian Civic Clubs;
- Hui Malama I Na Kupuna O Hawaiʻi Nei; and
- Island Burial Councils for Kauaʻi/Niʻihau, Oʻahu, Maui/Lānaʻi, Molokaʻi and Hawaiʻi islands.

In concurrence with the Code of Federal Regulations implementing Section 106 consultation, NMFS requested these agencies and NHOs to assist in identifying historic properties which may be of religious and cultural significance to them and may be eligible for listing on the National Register (36 CFR 800.3 (f)(2)), as well as to identify any effects to those properties that might result from the proposed action. The letters also requested assistance in identifying additional NHO's with which to consult. NMFS received no response to these letters sent to the NHO's on October 17, 2012.

7.3 COMMUNITY MEETINGS

The Code of Federal Regulations implementing Section 106 stipulates that the agency involved must provide the public with information concerning the undertaking and its effects on historic properties and seek public comment and input (36 C.F.R. § 800.2 (c)(5)(d)(2)). In order to better inform the public about the proposed Hawaiian monk seal recovery actions and to seek public input, NMFS held a series of 11 public meetings between October and December 2012 on the islands of Kauaʻi (N=2), Oʻahu (N=3), Molokaʻi (N=1), Lānaʼi (N=1), Maui (N=2), and Hawaiʻi (N=2). The purpose of these meetings was to discuss the proposed undertaking, obtain assistance in identifying potentially affected historic properties, and invite participation by NHOs and other interested parties in the Section 106 consultation process. The public was notified of these meetings via newspaper ads placed in major local newspapers, posting on the NMFS website, and e-mail announcements sent to various group lists on file.

All meetings were held at public venues (elementary, middle or high schools) between 6:00 and 8:00 pm to allow them to be attended by individuals who worked or attended school during the day. Examples of public notices for these meetings are provided in Appendix A of this report. The meetings were held at eleven venues on six islands.

Molokaʻi	
Kaunakakai (29 October 2012)	Molokaʻi High School
Lānaʻi	
Lānaʻi City (30 October 2012)	Lānaʻi High and Elementary School
Kauaʻi	
Waimea (7 November 2012)	Waimea High School
Kapaʻa (8 November 2012)	Kapaʻa Middle School

Maui

Hāna (14 November 2012)	Hāna High School
Lāhainā (15 November 2012)	Lāhaināluna High School

Hawai‘i

Hilo (27 November 2012)	Hilo High School
Kona (28 November 2012)	Kealakehe Elementary

O‘ahu

Wai‘anae (11 December 2012)	Wai‘anae High School
Waialua (12 December 2012)	Waialua High and Intermediate School
Waimānalo (13 December 2012)	Waimānalo Elementary and Intermediate School

At these meetings, the proposed Hawaiian monk seal recovery actions associated with the undertaking were described and input was received from the public regarding the nature and extent of historic and cultural properties, resources, and practices that were expected to be located within, and/or associated with, the APE. These meetings were planned, convened, and facilitated by Dr. Paul Cleghorn of Pacific Legacy, Inc., working under a NMFS contract. Members of the NMFS staff participated in each meeting, providing information and responding to concerns expressed by those attending.

While meeting participants expressed comments and concerns about Hawaiian monk seals in general, very few comments were offered about potential effects to historic properties. More detailed descriptions of the individual meetings are provided in a separate cultural impact assessment report (Section 6.3) that was prepared by NMFS and provided in Appendix K of the PEIS.

7.3.1 Identified Historic Properties

Participants in the community meetings identified several types of historic properties that might be affected by proposed Hawaiian monk seal recovery activities. These included:

- Coastal *heiau* (religious sites);
- *Ko‘a* (fishing shrines);
- Traditional stacked stone walls;
- Sand dunes containing buried cultural deposits;
- *Iwi kāhiko* (ancient human remains);
- Fishponds; and
- Fishing villages.

7.3.2 Concerns Expressed

The majority of concerns raised at these community meetings did not deal directly with historic properties, but were primarily related to issues affecting cultural resources and traditional cultural practices, public safety and commercial fishing. Some concern was expressed regarding the possibility that translocated monk seals might enter fishponds. Resulting discussions addressed the question of how best to remove a seal while minimizing impact to the pond itself. It was suggested that NMFS staff and volunteers be trained in removing seals from fishponds and that NMFS develop a protocol for such situations that would involve consulting with the *kahu* (caretaker) of the pond.

7.3.3 Measures Recommended to Prevent or Minimize Adverse Effects

A number of possible measures intended to prevent or minimize effects to historic properties during monk seal recovery activities were recommended by individuals attending the community meetings. These included:

Education of NOAA Staff and Volunteers

It was recommended that all personnel associated with the undertaking go through an orientation program that would include training in:

- Recognition and identification of cultural sites;
- Proper behavior around identified sites;
- How to report the presence of newly discovered sites; and
- Getting seals out of fishponds.

This training might need to be repeated every few years.

Consultation and Coordination

It was suggested that NMFS work with a cultural representative for each *moku* (district) on each island. Input should be sought from each *moku* individually.

It was also suggested that if a seal needs to be removed from a sensitive cultural area, such as a fishpond, that NMFS contact the *kahu* (caretaker) of that site or a community contact/expert to get direction about such things as the best way to access the site, where to stage activities, where to place the cage for the seal, etc. It was recommended that a protocol be developed to govern this community consultation prior to an activity, and a list of community contacts should be developed.

7.4 CONSULTATION

In March of 2013, the NMFS sent a second consultation letter to the original consulting parties listed in Section 7.2 above (Appendix D). This letter provided an update on the project and summarized NHPA Section 106 compliance efforts that had taken place to that point.

In April 2013, as a means of broadening the potential consulting parties, the NMFS sent out a letter (Appendix E) to 73 NHOs whose contact information was obtained from a list maintained by the Department of Interior, Office of Hawaiian Affairs (http://www.doi.gov/ohr/nativehawaiians/nhol.cfm).

Six of the NHOs contacted responded that they would be interested in consulting on the potential effects of the undertaking. Follow-up letters (Appendix F) were sent to the following six NHOs:

- Winifred Basques; Haʻouiwi Homestead Association on Lānaʻi;
- Lu Ann Faborito; Makaha Hawaiian Civic Club;
- Roy Oliveira; Waiehu Kou Phase 3 Association;

- Jade Alohalani Smith; Moku o Kaupō;
- Hardy Spoehr; Papa Ola Lōkahi; and
- Matt Sproat; Honua Consulting.

Two of the above NHOs were unable to attend consultations (Basques and Faborito), despite repeated attempts by NMFS to include them in the process. The remaining four NHOs participated in two separate consultation sessions. Spoehr and Sproat attended a consultation meeting at the NMFS office on 12 June 2013 and Oliveira and Smith participated in a conference call consultation meeting on 24 July 2013. The consulting parties all voiced satisfaction with the measures proposed by NMFS (see Section 8.0) to recognize and avoid effects to historic properties and thought that with these in place the potential for any effects on historic properties would not be likely. All consulting parties indicated that the program would be more successful if NMFS could involve the various local communities in their activities.

8.0 RECOGNITION AND AVOIDANCE MEASURES

Although the actions associated with the undertaking are, by their nature, unlikely to affect historic properties, NMFS has developed a set of measures designed to further reduce the likelihood of effects. These measures have been developed in part via the community meetings and Section 106 consultations described in previous sections of this report. These measures serve in part to provide the basis for a determination of no historic properties affected by the undertaking.

8.1 NORTHWESTERN HAWAIIAN ISLANDS

Permits are presently required to conduct Hawaiian monk seal research and enhancement activities within the limits of the Papahānaumokuākea Marine National 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). Thus, the "Monument permit program allows for a comprehensive review of proposed activities and will be administered to ensure compliance with Presidential Proclamation 8031, as well as other applicable Federal statutes (such as the NHPA) and state laws and regulations" (NOAA 2008b). Under the terms of the Monument permit, researchers and volunteers involved in Hawaiian monk seal recovery actions coordinate their activities with the Monument archaeologist and historic preservation specialists to insure that they do not adversely impact any of the Monument's historic properties. All researchers landing on Nihoa or Mokumanana (Necker) are instructed to limit their activities to the immediate coastal area below the sea cliffs. The campsites in the NWHI to be used by researchers (not including Nihoa and Mokumanamana where no camping will occur) have already been in seasonal use since the 1980s, with rigorous protocols in place to protect the natural and cultural resources surrounding them (Monument Permit PMNM 2011-001, Appendix L of the PEIS). These protocols will be followed by all researchers involved in Hawaiian monk seal recovery actions to ensure that use of the NWHI camps will not impact cultural and historic resources.

8.2 MAIN HAWAIIAN ISLANDS

8.2.1 Terrestrial Effects

Historic properties located within the shoreline and intertidal zones have the potential to be impacted by terrestrial activities associated with Hawaiian monk seal recovery activities. The following measures will be implemented whenever feasible (see note below) to minimize these potential effects.

- At least one trained staff person and/or volunteer will be on hand and responsible for recognizing and avoiding historic properties whenever a recovery action is conducted within the APE. These personnel will be trained in the avoidance of known historic properties and the recognition, avoidance and reporting of

previously unknown historic properties, including archaeological sites and human remains.

- If previously unknown historic properties are found or suspected (such as an inadvertent find of a burial site), all personnel and activities associated with the recovery actions will be immediately moved away from the area of the found or suspected historic property, and the appropriate SHPD office will be notified as soon as possible.

- Any natural features (such as large sand dunes) that have a high potential to contain buried cultural deposits and human remains will be avoided.

- NMFS staff will reference the SHPD GIS database of historic properties when available or other available data provided by SHPD for the purposes of avoiding historic properties.

- Access routes will be planned in advance so as to avoid historic properties. NMFS staff and volunteers taking part in the activity will be instructed as to the locations, significance, condition and susceptibility to disturbance of all known historic properties in the area.

- All land based vehicles used to transport researchers and animals will be restricted to existing roadways (paved and unpaved).

- All equipment (temporary pens, markers, etc.) will be promptly removed from an area once monk seal recovery activities in that area are completed.

8.2.2 Marine Effects

Historic properties located within the off-shore zone have the potential to be impacted by vessel based activities associated with Hawaiian monk seal recovery. There is also the potential that activities associated with the removal of monk seals from fishponds may result in unintentional damage to those structures. The following measures will be implemented to minimize the potential effects of monk seal research and enhancement activities on off-shore historic properties.

- As described in NAO 217-103 (Management of NOAA Small Boats), and BMPs 004 (Small Boat Operations Diving Activities in Water), NMFS follows strict policies for operation of small boats that would be used for monk seal research and enhancement.

- Boat crews will be made aware of the locations of any known shipwrecks that may qualify as historic properties. These locations will be avoided so as not to disturb any subsurface features. Through coordination with SHPD staff, boat crews will also be made aware of the locations of all other known submerged cultural or historic sites.

- All boats will be launched and retrieved from established boat harbors, other developed locations, or shoreline areas (such as sandy beaches) previously determined to be absent of historic properties. Larger vessels will anchor in previously designated locations away from any known shipwrecks or other submerged cultural or historic sites.

- Should a Hawaiian monk seal enter a traditional fishpond that has been translocated as part of the recovery actions included in the undertaking, NMFS staff will work closely with SHPD, the landowner, local NHOs, and other appropriate entities to plan and coordinate seal removal efforts so as to ensure that suitable actions are taken to minimize impacts to the fishpond. (See Section 8.6.)

8.3 TRAINING

While many of the archaeological and cultural sites located within the APE for proposed Hawaiian monk seal recovery actions have been previously identified and can therefore be avoided, others remain either undiscovered or unrecorded. As specified above in the measures intended to mitigate potential terrestrial effects, specific NMFS staff and/or volunteers will be designated to be responsible for recognizing, avoiding, and reporting historic properties in the field and these personnel will receive sufficient training to carry out this responsibility. This training would include an overview of the types of traditional and historic archaeological sites and traditional cultural properties that they are likely to encounter, as well as instructions in how to recognize and avoid these sites. Proper and respectful protocol to be practiced while working around cultural sites would also be discussed. In addition, the training would cover the procedures for reporting the inadvertent discovery of unrecorded historic properties, most particularly human remains, should they be encountered.

8.4 PLANNING

Consideration of historic properties will be incorporated into the planning process for seal relocations whenever feasible (see note below). As part of this process, efforts will be made to identify any known historic properties that may be present in the vicinity of a proposed translocation site. The proximity of historic properties (such as coastal settlement structures, religious sites, or sand dunes that may contain cultural deposits or human burials) will be taken into consideration when considering potential alternative sites for monk seal translocation. If an area is known to possess fragile historic and cultural resources, such as sand dunes containing cultural deposits or human burials, translocation at this site will be avoided or carefully planned and conducted to avoid any pedestrian traffic or other activity on or adjacent to the site.

In the MHI, planning would involve referencing the SHPD GIS database of historic properties when available (see Section 8.5.1 below). Prior to that, NMFS will consult with SHPD to the maximum extent practicable prior to carrying out recovery activities. Planning will also involve finalization, and periodic revision as needed, of reporting procedures for field researchers to use in the event of inadvertent discoveries of archaeological sites and human remains. In general, SHPD staff and the appropriate Island Burial Council Chairperson will be the primary

initial points of contact, but other contact persons may be added depending on the type of inadvertent discovery and the specific site and/or island at which the inadvertent discovery is made. In the NWHI, under the terms of the Monument permit, researchers and volunteers involved in Hawaiian monk seal recovery actions coordinate their activities with the Monument archaeologist and historic preservation specialists as described above to insure that they do not adversely impact any of the Monument's historic properties.

8.5 COORDINATION

As part of the planning process, to the maximum feasible extent, NMFS will coordinate with appropriate stakeholders to help identify historic properties located within areas targeted for Hawaiian monk seal recovery actions.

8.5.1 Coordination with the Hawai'i State Historic Preservation Division

As mentioned in Section 4.3, SHPD is currently updating its GIS database of historic properties located within the MHI. This database will show the exact location of all documented historic properties for which accurate location coordinates are available. Once the database is fully operational, it will be possible to quickly identify any recorded sites located within the APE of a proposed action.

The SHPD GIS database can serve as a useful tool in planning Hawaiian monk seal research and enhancement activities so as to avoid impacting known historic properties. Teams planning the translocation of a seal would be able to ascertain the types and locations of the identified historic properties located within the APE of the various relocation alternatives. This information, supplemented by knowledge from local individuals, could help in determining which relocation site will have least impact on historic properties. The SHPD GIS database can also help teams conducting monk seal monitoring or medical related activities recognize and avoid identified historic properties. In addition, SHPD staff are located in each county and possess a broad knowledge base of documented historic properties on their respective islands. The SHPD staff may be able to suggest areas that would be suitable and unsuitable for the translocation of seals. Whenever feasible, NMFS staff will consult with SHPD during the planning of monk seal translocation activities so as to obtain their input and guidance.

8.5.2 Additional Coordination

The often brief and intermittent nature of many Hawaiian monk seal recovery actions makes it difficult to involve community members in specific activities. However, when appropriate and feasible, NMFS staff will contact and consult with island burial councils and the other identified knowledgeable individuals within the local communities in which recovery actions, such as translocations, are planned. These consultations will be conducted in part to determine if there are any known burials or possible burial locations within the identified areas and what, if any, cultural protocols may be appropriate.

8.6 PROTOCOLS REGARDING MONK SEALS IN FISHPONDS

NMFS will develop a protocol for dealing with the removal of Hawaiian monk seals that have

entered traditional fishponds. This protocol would involve consultation with the land owner and/or *kahu* (caretaker) of the pond, SHPD, local Native Hawaiian Organizations (if appropriate), and other appropriate entities to plan and coordinate the removal of the monk seal in a manner that would have the least impact on the structural integrity of the fishpond. A general protocol will be developed before recovery actions are conducted in the MHI, with the intent to revise and update this protocol to incorporate lessons learned and location specific information gathered if/when the protocol is implemented.

Note: In the course of implementing the recovery actions, there may be unplanned situations when some or all of these measures will not be feasible because human safety and/or animal welfare would be put at risk as a result of the time and/or actions necessary to implement the measures. These situations would typically arise as a result of factors beyond NMFS's control, such as changes in weather, changes in seal health status, equipment failure, vehicle break down, travel delays, and other unanticipated problems. Nevertheless, these situations will likely be very infrequent, and the measures specified above will be considered by NMFS as "best practices" and every reasonable effort will be made to implement them consistently.

9.0 SECTION 106 DETERMINATION

9.1 ASSESSMENT OF EFFECTS

As part of the Section 106 process, the federal agency proposing an undertaking is required to assess the effects that the undertaking will have on historic properties located within the project's APE. This is done by applying the criteria of adverse effect. In applying these criteria, the agency needs to consider any views concerning such effects that have been provided by consulting parties and the public during the Section 106 consultation process (36 CFR § 800.5(a)).

9.2 CRITERIA FOR DETERMINATION

The Code of Federal Regulations that implements NHPA Section 106 consultation (36 CFR § 800) defines an "effect" as an alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register (36 CFR § 800.16 (i)). "An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association" (36 CFR § 800.5(a)(1)). Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative in nature (36 CFR § 800.5(a)(1)).

Adverse effects to historic properties may include, but are not limited to:

1. Physical destruction of or damage to all or part of the property.
2. Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines.
3. Removal of the property from its historic location.
4. Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance.
5. Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features.
6. Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization.
7. Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance (36 CFR § 800.5(a)(2)).

9.3 FINDING OF NO EFFECT

According to Federal regulations, if the Federal agency planning an undertaking finds that either there are no historic properties present within the APE of the undertaking, or that there

are historic properties present but the undertaking will have no effect upon them (will not alter the characteristics of the historic property that qualify it for inclusion in or eligibility for the National Register), the agency may submit a determination of No Historic Properties Affected (36 CFR § 800.4 (d)(1)).

Although some of the Hawaiian monk seal recovery actions proposed could potentially cause physical damage to listed or eligible historic properties within the APE (as described in Section 6.0), the potential for any damage that would cause an effect as defined in the NHPA (36 CFR 800.16 (i)) is very low. The proposed activities entail small numbers of trained researchers engaged in light foot traffic in shoreline areas, use of light vehicles on pre-existing roadways, and operation of small vessels in inshore waters, to monitor, assess, restrain, capture, medically treat, apply seal behavior management procedures, and translocate endangered Hawaiian monk seals. None of the activities involve any land or ocean floor alteration or construction. These activities would be conducted intermittently and/or seasonally, and would occur within very small spatial areas dispersed very widely over the entire Hawaiian Archipelago. In addition, a suite of measures involving training and other procedures to recognize and avoid historic properties and report inadvertent finds (outlined in Section 8.0) is expected to further minimize and diminish any potential effects of these actions. This will result in the proposed undertaking having no effect upon historic properties present within the APE of the project. For this reason, NMFS has determined that the recovery actions proposed in the NMFS ESA-MMPA permit application (application number 16632) and described in the PEIS for Hawaiian Monk Seal Recovery Actions will result in no historic properties being affected.

9.4 No Effects Documentation

Federal regulations stipulate that should a determination of no historic properties affected be arrived at, the agency proposing the undertaking is required to provide documentation of this finding to the State Historic Preservation Officer. The agency shall also notify all consulting parties, including Native Hawaiian organizations, and make the documentation available for public inspection prior to approving the undertaking (CFR § 800.4 (d)(1)).

The documentation of this finding shall include:

1. A description of the undertaking, specifying the Federal involvement, and its area of potential effects, including photographs, maps, drawings, as necessary.
2. A description of the steps taken to identify historic properties.
3. The basis for determining that no historic properties are present or affected (CFR § 800.4 (d)).

In order to comply with these regulations, NMFS has prepared a No Effects Determination letter for this undertaking. The document has been sent to the Hawai‘i State Historic Preservation Officer, and copies have been made available to the public and provided to all of the parties directly involved in Section 106 consultation.

10.0 REFERENCES

Advisory Council on Historic Preservation (ACHP)

1985 Guidelines for Consideration of Traditional Cultural Values in Historic Preservation Review. Washington, D.C.: Advisory Council on Historic Preservation. (Draft report, August).

2011 Native American Traditional Cultural Landscapes Action Plan. The plan was formally adopted by the ACHP members on November 10, 2011. Retrieved from http://www.achp.gov/pdfs/native-american-traditional-cultural-landscapes-action-plan-11-23-2011.pdf.

Antonelis, G., J. Baker, T. Johanos, C. Braun and A. Harting

2006 Hawaiian monk seal (Monachus schauinslandi): status and conservation issues. Unpublished manuscript, Department of Botany, University of Hawaiʻi, Honolulu. Retrieved from http://www.botany.hawaii.edu/faculty/duffy/ARB/543/06.pdf

Apple, Russel A

1973 Prehistoric and Historic Sites and Structures in the Hawaiian Islands National Wildlife Refuge. Prepared for the National Park Service, Honolulu.

Cleghorn, Paul L.

1988 The Settlement and Abandonment of Two Hawaiian Outposts: Nihoa and Necker. In *Bishop Museum Occasional Papers* 28:35-49. Bishop Museum Press, Honolulu.

Code of Federal Regulations

2010 36 CFR - Code of Federal Regulations - Title 36: Parks, Forests, and Public Property, Section 60.4 - Criteria for evaluation.

Coastal Geology Group

2011 University of Hawaiʻi at Mānoa, School of Ocean & Earth Science & Technology Retrieved from http://www.soest.hawaii.edu/coasts/publications/hawaiiCoastline/hawaii.html; March 2011.

DBEDT, Research & Economic Analysis Division

2010 Hawaiʻi's Population on April 1, 2010 from the 2010 Census. December 21, 2010.

Emory, Kennth P.

1928 *Archaeology of Nihoa and Necker Islands*. Bishop Museum Press, Honolulu.

Friedlander, A., K. Keller, L. Wedding, A. Clarke, M. Monaco (eds.)

2009 A Marine Biogeographic Assessment of the Northwestern Hawaiian Islands. NOAA Technical Memorandum NOS NCCOS 84. Prepared by NCCOS's Biogeography Branch in cooperation with the Office of National Marine Sanctuaries Papahānaumokuākea Marine National Monument. Silver Spring.

Juvik, S.P. and J.O. Juvik
1998 *Atlas of Hawai'i*. Third Edition. University of Hawai'i Press, Honolulu.

Kikiloi, Kekuewa
2006 Reconnecting with Ancestral Islands: Examining Historical Relationships between Kanaka Maoli and the Northwestern Hawaiian Islands. A Report by the University of Hawai'i Center for Hawaiian Studies to the National Oceanic Atmospheric Administration and the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve.

2010 Rebirth of an Archipelago: Sustaining a Hawaiian Cultural Identity for People and Homeland. In *Hūlili: Multidisciplinary Research on Hawaiian Well-Being*, Vol 6.

Kikiloi, Kekuewa and Michael Graves
2005 Preliminary Reconnaissance Report for the Archaeological Sites on Nihoa Island, Hawai'i. Prepared for United States Fish and Wildlife Service. University of Hawai'i, Honolulu.

Papahānaumokuākea Marine National Monument
2011 Maritime Heritage Research, Education, and Management Plan: Papahānaumokuākea Marine National Monument. Prepared for the National Oceanographic and Atmospheric Administration, Honolulu.

Parker, P.L., and T.F. King
1990 Guidelines for Evaluating and Documenting Traditional Cultural Properties. National Register Bulletin 38. U.S. Department of the Interior, National Park Service, Washington D.C.

Sebastian, L.
1993 Protecting Traditional Cultural Properties Through the Section 106 Process. CRM Vol. 16:22-26 (Special Issue).

State of Hawai'i Department of Land and Natural Resources
2008 Cultural Impact Assessment, Papahānaumokuākea Marine National Monument Management Plan.

Watson, Trisha Kehaulani
2011 Draft Section 106 Analysis of Programmatic Environmental Impact Statement for the Hawaiian Monk Seal Recovery Program. Appendix L of the Hawaiian Monk Seal Draft Programmatic Environmental Impact Statement. Prepared for the National Marine Fisheries Service by Honua Consulting.

Ziegler, Alan C
1990 Search for Evidence of Early Hawaiian Presence on Lisianski Island, Northwestern Hawaiian Islands, Summer 1990. Report prepared for State of Hawai'i, Office of Hawaiian Affairs, Honolulu.

APPENDIX A

Announcements of Community Meetings

COMMUNITY INPUT SOUGHT ON NOAA'S PROPOSED HAWAIIAN MONK SEAL RECOVERY ACTIONS*

NOAA Fisheries and Pacific Legacy, Inc., are holding a series of community meetings seeking community input on proposed Hawaiian Monk Seal Recovery actions. Specifically, we are seeking information on potential adverse effects to historic properties and/or traditional cultural properties (e.g., archaeological sites), as well as information on potential impacts to cultural resources and practices (e.g., fish ponds and fish pond operation) that may result from implementation of actions proposed in the Draft Programmatic Environmental Impact Statement (PEIS) for Hawaiian Monk Seal Recovery. Examples of the proposed actions include capture, veterinary treatment, transportation, and release of monk seals on shorelines throughout the Hawaiian archipelago. Input from community meetings around the State will be incorporated into a revised Cultural Impact Assessment for the PEIS and will form an important component of NOAA's compliance with the National Historic Preservation Act Section 106. The Draft PEIS is available for review at:
http://www.nmfs.noaa.gov/pr/permits/eis/hawaiianmonkseal.htm

MEETING SCHEDULE
(all meetings to be held between 6:00 – 8:00 pm)

Moloka'i	
Kaunakakai (29 October 2012)	Moloka'i High School
Lāna'i	
Lāna'i City (30 October 2012)	Lāna'i High and Elementary School
Kaua'i	
Waimea (7 November 2012)	Waimea High School
Kapa'a (8 November 2012)	Kapa'a Middle School
Maui	
Hāna (14 November 2012)	Hāna High School
Lāhainā (15 November 2012)	Lāhaināluna High School
Hawai'i	
Hilo (27 November 2012)	Hilo High School
Kona (28 November 2012)	Kealakehe Elementary
O'ahu	
Wai'anae (11 December 2012)	Wai'anae High School
Waialua (12 December 2012)	Waialua High and Intermediate School
Waimānalo (13 December 2012)	Waimānalo Elementary and Intermediate School

* THE PURPOSE OF THESE MEETINGS IS TO GATHER INPUT AND CONSULT WITH INTEREST PARTIES FOR THE PREPARATION OF A CULTURAL IMPACT ASSESSMENT (CIA) AND COMPLIANCE WITH THE NATIONAL HISTORIC PRESERVATION ACT SECTION 106 FOR THE HAWAIIAN MONK SEAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT.

For further information or to request sign language interpretation or other auxiliary aids, please contact Paul Cleghorn at cleghorn@pacificlegacy.com, (808) 263-4800 (phone), or (808) 263-4300 (fax). These meetings are accessible to people with disabilities.

Contact: Paul L. Cleghorn
Pacific Legacy
Phone: (808) 263-4800
Fax: (808) 263-4300

30 Aulike Street, Suite 301
Kailua, HI 96734
cleghorn@pacificlegacy.com

NOAA FISHERIES

PRESS RELEASE

COMMUNITY INPUT SOUGHT ON NOAA'S PROPOSED HAWAIIAN MONK SEAL RECOVERY ACTIONS*

NOAA Fisheries is holding a series of community meetings seeking community input on proposed Hawaiian monk seal recovery actions. Specifically, we are seeking information on potential adverse effects to historic properties and/or traditional cultural properties (e.g., archaeological sites), as well as information on potential impacts to cultural resources and practices (e.g., fish ponds and fish pond operation) that may result from implementation of actions proposed in the Draft Programmatic Environmental Impact Statement (PEIS) for Hawaiian Monk Seal Recovery. Examples of the proposed actions include capture, veterinary treatment, transportation, and release of monk seals on shorelines throughout the Hawaiian archipelago. Input from community meetings around the State will be incorporated into a revised Cultural Impact Assessment for the PEIS and will form an important component of NOAA's compliance with the National Historic Preservation Division Section 106. The Draft PEIS is available for review at: http://www.nmfs.noaa.gov/pr/permits/eis/hawaiianmonkseal.htm

MEETING SCHEDULE
(all meetings to be held between 6:00 – 8:00 pm)

Maui

Hāna (14 November 2012)	Hāna High School
Lāhainā (15 November 2012)	Lāhaināluna High School

Hawai'i

Hilo (27 November 2012)	Hilo High School
Kona (28 November 2012)	Kealakehe Elementary

O'ahu

Wai'anae (11 December 2012)	Wai'anae High School
Waialua (12 December 2012)	Waialua High & Intermediate School
Waimānalo (13 December 2012)	Waimānalo Elementary & Intermediate School

*** THE PURPOSE OF THESE MEETINGS IS TO GATHER INPUT AND CONSULT WITH INTERESTED PARTIES FOR THE PREPARATION OF A CULTURAL IMPACT ASSESSMENT (CIA) AND COMPLIANCE WITH THE NATIONAL HISTORIC PRESERVATION ACT SECTION 106 FOR THE HAWAIIAN MONK SEAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT.**

For further information or to request sign language interpretation or other auxiliary aids, please contact Paul Cleghorn at cleghorn@pacificlegacy.com, (808) 263-4800 (phone), or (808) 263-4300 (fax). These meetings are accessible to people with disabilities.

- Page Intentionally Left Blank -

APPENDIX B

Letter to State Historic Preservation Division – Dated March 28, 2011

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 • Fax (808) 973-2941

MAR 2 8 2011

Pua Aiu, Ph.D.
Administrator
State Historic Preservation Division
Hawai'i Department of Land and Natural Resources
601 Kamokila Boulevard, Suite 555
Kapolei, HI 96707

Dear Dr. Aiu:

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS), Pacific Islands Regional Office is preparing a Programmatic Environmental Impact Statement (PEIS) to assess the potential impacts of implementing specific management actions and administering a research and enhancement program to improve survival of Hawaiian monk seals (*Monachus schauinslandi*) in the Northwestern and Main Hawaiian Islands.

The purpose of this proposed action is to ensure the long-term viability of the Hawaiian monk seals in the wild, with the eventual goal of achieving reclassification to threatened status and, ultimately, removal from the List of Endangered and Threatened Wildlife under the ESA. Alternatives considered in the PEIS would generally include the provision of limited on-site medical treatment to monk seals and temporarily translocating seals from areas of low juvenile survival to areas of high juvenile survival. None of the alternatives under consideration entail destruction or alteration of land, substrate, or habitat. The Hawaiian monk seal population has experienced a prolonged decline and currently less than 1,200 monk seals remain. Additional information including the Federal Register notice and the first project newsletter are enclosed for reference.

Section 106 of the National Historic Preservation Act (NHPA) requires that Federal agencies identify historic properties that may be impacted by a federal undertaking, and seek to protect those properties that are eligible to the National Register of Historic Places (Register). NHPA regulations at 36 CFR Part 800 identify a consultative process to determine site eligibility, to evaluate potential impacts, and to identify impact avoidance or mitigation actions. Consultation parties are typically the State Historic Preservation Officer (SHPO) and any Native Hawaiian organization that attaches religious or cultural significance to any properties that may be affected by an undertaking. NMFS has identified this project as an "undertaking," as defined in 36 CFR Part 800, and this letter serves as notice that NMFS is initiating consultation under Section 106 of the NHPA. NMFS is currently studying the potential of the proposed project to affect historic properties, and will provide our findings to your office for comment once they are developed. We are seeking your assistance in identifying those properties within the Area of Potential Effects (APE) that may be eligible for the National Register listing, as well as potential impacts.

The APE for this project encompasses the range where Hawaiian monk seals are found throughout the Hawaiian Archipelago and Johnston Atoll including the NWHI and MHI. More specifically, the APE includes portions of the open ocean and near shore environment where monk seals may be found as well as the shore zone of the islands, islets, and atolls that make up the Hawaiian Archipelago and Johnston Atoll. For the purposes of this project, the shore zone includes terrestrial habitat 5 m inland from the upper reaches of the wash of the waves, at high tide during the season in which the highest wash of the waves occurs, usually evidenced by the edge of vegetation growth or the upper limit of debris. In addition, secondary use areas, such as research field camps in the Northwestern Hawaiian Islands, are also considered for inclusion in the APE. Known shipwrecks or navigational hazards within 300 meters from shore will be evaluated.

Once our current assessment has yielded results, NMFS will provide you a summary of our findings of effect and invite the agency to comment. If you have any questions about the project or our Section 106 compliance efforts, please contact Jeff Walters, our Marine Mammal Branch Chief, at (808) 944-2235, or via email at jeff.walters@noaa.gov.

Sincerely,

Michael D. Tosatto
Regional Administrator

Enclosures

- Page Intentionally Left Blank -

APPENDIX C

Letter to State Historic Preservation Division and Selected NHO's – Dated Oct. 17 2012

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 • Fax (808) 973-2941

OCT 17 2012

Pua Aiu, Ph.D.
Administrator
State Historic Preservation Division
Hawai'i Department of Land and Natural Resources
601 Kamokila Boulevard, Suite 555
Kapolei, HI 96707

Dear Dr. Aiu:

To follow up on my March 28, 2011, letter, the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS), Pacific Islands Regional Office is preparing a Programmatic Environmental Impact Statement (PEIS) to assess the potential impacts of implementing specific management actions and administering a research and enhancement program to improve survival of Hawaiian monk seals (Monachus schauinslandi) in the Northwestern and main Hawaiian Islands. The Hawaiian monk seal population has experienced a prolonged decline and currently less than 1,200 monk seals remain.

The purpose of this proposed action is to ensure the long-term viability of Hawaiian monk seals in the wild, with the eventual goal of achieving reclassification to threatened status and, ultimately, removal from the List of Endangered and Threatened Wildlife under the Endangered Species Act. Alternatives considered in the PEIS include recovery actions conducted along shorelines and in the ocean, including monk seal monitoring; temporary seal restraint, capture and release; limited on-site medical treatment, and translocating seals from areas of low juvenile survival to areas of high juvenile survival. None of the alternatives under consideration entails destruction or alteration of any structure, land, shoreline, seafloor substrate, or habitat.

As you are aware, Section 106 of the National Historic Preservation Act (NHPA) requires that federal agencies identify historic properties that may be impacted by a federal undertaking, and seek to protect those properties that are eligible to the National Register of Historic Places. NHPA regulations at 36 CPR Part 800 identify a consultative process to determine site eligibility, to evaluate potential impacts, and to identify impact avoidance or mitigation actions. Consultation parties are typically the State Historic Preservation Officer and any Native Hawaiian organization (NHO) that attaches religious or cultural significance to any properties that may be affected by an undertaking. NMFS has identified this project as an "undertaking," as defined in 36 CPR Part 800, and as indicated in my March 28, 2011, letter, NMFS is initiating consultation under Section 106 of the NHPA. We are currently studying the potential of the proposed project to affect historic properties, and will provide our findings to your office for

comment once they are developed. We are seeking your assistance in identifying those properties within the Area of Potential Effects (APE) that may be eligible for the National Register listing, as well as potential impacts.

The APE for this project encompasses the range where Hawaiian monk seals are found throughout the Hawaiian Archipelago and Johnston Atoll including the Main Hawaiian Island and the Northwestern Hawaiian Islands. More specifically, the APE includes portions of the open ocean and near shore environment where monk seals may be found as well as the shore zone of the islands, islets, and atolls that make up the Hawaiian Archipelago and Johnston Atoll. For the purposes of this project, the shore zone includes terrestrial habitat 5 meters inland from the upper reaches of the wash of the waves, at high tide during the season in which the highest wash of the waves occurs, usually evidenced by the edge of vegetation growth or the upper limit of debris. In addition, secondary use areas, such as research field camps in the Northwestern Hawaiian Islands, are also considered for inclusion in the APE. Known shipwrecks or navigational hazards within 300 meters from shore will be evaluated.

NMFS is initiating the Section 106 consultation process with the SHPD and the following NHOs: Office of Hawaiian Affairs; Association of Hawaiian Civic Clubs; Hui Malama I Na Kupuna O Hawai'i Nei; and the Burial Councils for Kauai/Niihau, Oahu, Maui/Lanai, Molokai and Hawaii. We are seeking your assistance in identifying additional NHOs.

NMFS has contracted Pacific Legacy, Inc. to assist in the Section 106 consultation process including consultations with NHOs and other interested parties, and in revising the current cultural impact assessment in the PEIS. In this regard, community meetings will be held around the state to: (1) identify additional NHOs, (2) obtain information regarding the existence of historic properties of religious and cultural significance to NHOs, and (3) determine if the undertaking has the potential to impact traditional practices within the APE. The schedule for these community meetings is enclosed.

Once our current assessment has yielded results, we will provide you a summary of our findings of effect and invite the agency to comment. We look forward to hearing from you regarding additional NHOs, or if you have any questions or comments. Please contact Dr. Jeff Walters, our Marine Mammal Branch Chief, regarding this matter at (808) 944-2235, or via email at jeff.walters@noaa.gov.

Sincerely,

Michael D. Tosatto
Regional Administrator.

Enclosure

2

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 • Fax (808) 973-2941

OCT 17 2012

Mr. Clisson Kunane Aipoalani, Chair
Kauai/Niihau Island Burial Council
c/o Mr. Hinano Rodriques
History and Culture Branch Chief
State Historic Preservation Division
Department of Land and Natural Resources
DLNR Maui Office Annex
130 Mahalani Street
Wailuku, HI 96793

Dear Mr. Aipoalani:

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS), Pacific Islands Regional Office is preparing a Programmatic Environmental Impact Statement (PEIS) to assess the potential impacts of implementing specific management actions and administering a research and enhancement program to improve survival of Hawaiian monk seals (Monachus schauinslandi) in the Northwestern and main Hawaiian Islands. The Hawaiian monk seal population has experienced a prolonged decline and currently less than 1,200 monk seals remain.

The purpose of this proposed action is to ensure the long-term viability of Hawaiian monk seals in the wild, with the eventual goal of achieving reclassification to threatened status and, ultimately, removal from the List of Endangered and Threatened Wildlife under the Endangered Species Act. Alternatives considered in the PEIS include recovery actions conducted along shorelines and in the ocean, including monk seal monitoring; temporary seal restraint, capture and release; limited on-site medical treatment, and translocating seals from areas of low juvenile survival to areas of high juvenile survival. None of the alternatives under consideration entails destruction or alteration of any structure, land, shoreline, seafloor substrate, or habitat.

Section 106 of the National Historic Preservation Act (NHPA) requires that federal agencies identify historic properties that may be impacted by a federal undertaking, and seek to protect those properties that are eligible to the National Register of Historic Places. NHPA regulations at 36 CPR Part 800 identify a consultative process to determine site eligibility, to evaluate potential impacts, and to identify impact avoidance or mitigation actions. Consultation parties are typically the State Historic Preservation Officer and any Native Hawaiian organization (NHO) that attaches religious or cultural significance to any properties that may be affected by an undertaking. NMFS has identified this project as an "undertaking," as defined in 36 CPR Part 800, and NMFS is initiating consultation under Section 106 of the NHPA. We are currently studying the potential of the proposed project to affect historic properties, and will provide our

findings to your office for comment once they are developed. We are seeking your assistance in identifying those properties within the Area of Potential Effects (APE) that may be eligible for the National Register listing, as well as potential impacts.

The APE for this project encompasses the range where Hawaiian monk seals are found throughout the Hawaiian Archipelago and Johnston Atoll including the Main Hawaiian Island and the Northwestern Hawaiian Islands. More specifically, the APE includes portions of the open ocean and near shore environment where monk seals may be found as well as the shore zone of the islands, islets, and atolls that make up the Hawaiian Archipelago and Johnston Atoll. For the purposes of this project, the shore zone includes terrestrial habitat 5 meters inland from the upper reaches of the wash of the waves, at high tide during the season in which the highest wash of the waves occurs, usually evidenced by the edge of vegetation growth or the upper limit of debris. In addition, secondary use areas, such as research field camps in the Northwestern Hawaiian Islands, are also considered for inclusion in the APE. Known shipwrecks or navigational hazards within 300 meters from shore will be evaluated.

NMFS is initiating the Section 106 consultation process with the State Historic Preservation Division and the following NHOs: Office of Hawaiian Affairs; Association of Hawaiian Civic Clubs, Hui Malama I Na Kupuna O Hawai'i Nei; and the Burial Councils for Kauai/Niihau, Oahu, Maui/Lanai, Molokai and Hawaii. We are seeking your assistance in identifying additional NHOs.

NMFS has contracted Pacific Legacy, Inc. to assist in the Section 106 consultation process including consultations with NHOs and other interested parties, and in revising the current cultural impact assessment in the PEIS. In this regard, community meetings will be held around the state to: (1) identify additional NHOs, (2) obtain information regarding the existence of historic properties of religious and cultural significance to NHOs, and (3) determine if the undertaking has the potential to impact traditional practices within the APE. The schedule for these community meetings is enclosed.

Once our current assessment has yielded results, we will provide you a summary of our findings of effect and invite your organization to comment. We look forward to hearing from you regarding identifying additional NHOs, or if you have any questions or comments. Please contact Dr. Jeff Walters, our Marine Mammal Branch Chief, regarding this matter at (808) 944-2235, or via email at jeff.walters@noaa.gov.

Sincerely,

Michael D. Tosatto
Regional Administrator.

Enclosure

Similar letters, all dated October 17, 2012, were sent to:

Ms. Hinaleimoana Wong Kalu, Chair
Oahu Island Burial Council
c/o Mr. Hinano Rodriques
History and Culture Branch Chief
State Historic Preservation Division
Department of Land and Natural Resources
DLNR Maui Office Annex
130 Mahalani Street
Wailuku, HI 96793

Ms. Jersula L. Manaba, Chair
Molokai Island Burial Council
c/o Mr. Hinano Rodriques
History and Culture Branch Chief
State Historic Preservation Division
Department of Land and Natural Resources
DLNR Maui Office Annex
130 Mahalani Street
Wailuku, HI 96793

Mr. Kimo Lee, Chair
Hawaii Island Burial Council
c/o Mr. Hinano Rodriques
History and Culture Branch Chief
State Historic Preservation Division
Department of Land and Natural Resources
DLNR Maui Office Annex
130 Mahalani Street
Wailuku, HI 96793

Mr. Keeaumoku Kapu, Chair
Maui/Lāna`i Island Burial Council
c/o Mr. Hinano Rodriques
History and Culture Branch Chief
State Historic Preservation Division
Department of Land and Natural Resources
DLNR Maui Office Annex
130 Mahalani Street
Wailuku, HI 96793

Mr. Edward Halealoha Ayau
Hui Mālama I Nā Kūpuna O Hawai'i Nei
622 Wainaku Ave
Hilo, HI 96720

Ms. Mahealani Cypher
President
Association of Hawaiian Civic Clubs
P.O. Box 664
Honolulu, HI 96813

Mr. Kamanaʻopono Crabbe
CEO
Office of Hawaiian Affairs
711 Kapiolani Blvd., Suite 500
Honolulu, HI 96813

- Page Intentionally Left Blank -

APPENDIX D

Letter to State Historic Preservation Division and Selected NHO's – Dated March, 27 2013

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 • Fax (808) 973-2941

MAR 27 2013

Ms. Pua Aiu, Ph.D
Administrator
State Historic Preservation Division
Department of Land and Natural Resources
601 Kamokila Blvd., Suite 555
Kapolei, HI 96707

Dear Ms. Aiu:

I would like to provide an update to my October 17, 2012, letter regarding a National Historic Preservation Act (NHPA) Section 106 consultation process currently underway in association with a suite of proposed actions intended to promote recovery of the endangered Hawaiian monk seal. I would also like to take this opportunity to reiterate my request for your assistance in identifying any additional Native Hawaiian Organizations (NHOs) that may be interested in joining this consultation.

A permit application for authorization under the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) to conduct the Hawaiian monk seal recovery actions has been submitted to the National Marine Fisheries Service (NMFS), Office of Protected Resources. The 45-day public comment period for this permit application closes on April 15, 2013. The application, related documents, and guidance on submitting public comments may be viewed online at: http://www.nmfs.noaa.gov/pr/permits/monkseal16632.htm.

We are considering the suite of recovery actions included in the ESA-MMPA permit application to be an "undertaking" under the NHPA as defined in 36 CFR Part 800. As indicated in my October 17, 2012, letter regarding the Hawaiian monk seal recovery actions, the National Marine Fisheries Service (NMFS) has initiated a consultation process under Section 106 of the NHPA.

NMFS is preparing a "Final Programmatic Environmental Impact Statement (PEIS) for Hawaiian Monk Seal Recovery Actions" in compliance with the National Environmental Policy Act. The intent of the PEIS is to evaluate the potential direct, indirect, and cumulative impacts on the human environment of the alternative approaches to implementing Hawaiian monk seal recovery actions, including the actions specified in the ESA-MMPA permit application mentioned above.

We would like to point out that the recovery actions specified in the ESA-MMPA permit application no longer include temporarily moving seals from the Northwestern Hawaiian Islands (NWHI) to the main Hawaiian Islands (MHI) as part of the two-stage translocation process

described in the "Draft PEIS for Hawaiian Monk Seal Recovery Actions." NMFS is not currently pursuing this specific type of two-stage translocation recovery action pending further development of associated monk seal monitoring and management capacity. Since NMFS is not currently pursuing this specific recovery action and it is not included in the current ESA-MMPA permit application, the two-stage translocation action (i.e., moving seals from the NWHI for temporarily release in the MHI) is not be part of the "undertaking" under consideration during the current ongoing NHPA Section 106 consultation process.

We would also like to clarify that the area of potential effect (APE) under consideration in our NHPA 106 consultation process encompasses the range in which Hawaiian monk seals are found throughout the Hawaiian Archipelago and Johnston Atoll including the main Hawaiian Islands and the Northwestern Hawaiian Islands. More specifically, the APE includes portions of the open ocean and near shore environment where monk seals may be found as well as the shore zone of the islands, islets, and atolls that make up the Hawaiian Archipelago and Johnston Atoll. For the purposes of this project, the shore zone includes terrestrial habitat 25 meters inland from the upper reaches of the wash of the waves, at high tide during the season in which the highest wash of the waves occurs, usually evidenced by the edge of vegetation growth or the upper limit of debris. (We note that the October 17, 2012, letter erroneously indicated the shore zone included terrestrial habitat 5 meters inland, however, a 25-meter distance inland was specified in the Draft PEIS and has been used in all other communications with the public and consulting parties.) In addition, secondary use areas, such as research field camps in the Northwestern Hawaiian Islands, are considered for inclusion in the APE. Known shipwrecks or navigational hazards within 300 meters from shore will also be evaluated.

Regarding the NHPA Section 106 and NEPA processes, we have completed a round of public meetings to discuss the proposed recovery actions, identified potentially affected historic properties, and invited participation by Native Hawaiian Organizations and other interested parties in the Section 106 consultation process. Eleven public meetings were held on the islands of Kauai, Oahu, Lanai, Maui, Molokai, and Hawaii Island from October through early December 2012. The public was notified of these meetings via newspaper ads placed in major local newspapers, posting on a NMFS website, and e-mail announcements sent to various group lists on file. At these public meetings, the proposed actions associated with the undertaking were described and input was received from the public regarding the nature and extent of historic and cultural properties, resources, and practices that were expected to be located within, and/or associated, with the APE. Examples of the proposed actions discussed include capture, veterinary treatment, transportation, and release of monk seals on shorelines throughout the Hawaiian archipelago. Potential mitigation measures were also discussed at the meetings, including providing cultural and historical awareness training for program staff, and developing and maintaining close relationships with cultural practitioners in areas in which the proposed actions would be conducted. While meeting participants expressed comments and concerns about Hawaiian monk seals in general (e.g., concerns about impacts that may arise from the growing monk seal population in the main Hawaiian Islands), we heard very few concerns specifically regarding potential effects to historic properties or traditional cultural properties as

defined in the NHPA. Furthermore, to date, only one NHO representative has expressed interest in participating in the Section 106 consultation.

At this time, we have identified the following types of historic properties of religious and cultural significance to NHO's within the APE that may be affected by the proposed undertaking: coastal house sites and other habitation structures, buried cultural deposits, canoe landings and canoe sheds, fishing shrines and other religious sites, human burials, fishing related features, rock art, salt pans, and ceremonial sites. We note that none of the proposed actions associated with the undertaking entail alteration or destruction of any structure, land, shoreline or seafloor substrate. However, we recognize that your organization has special expertise in assessing the eligibility of properties of religious and cultural significance to NHO's, as well as in applying the criteria of adverse effects under 36 C.F.R. Part 800. Accordingly, before we conclude the identification process, and further to our letter dated October 17, 2012, we invite you to assist us in carrying out identification efforts and evaluating National Register eligibility of identified properties. In addition, we request your assistance in identifying additional NHOs and interested parties interested in joining this consultation.

We look forward to hearing from you no later than April 19, 2013 regarding identifying additional properties and NHOs and/or if you have any questions or comments. Please contact Dr. Jeff Walters, our Marine Mammal Branch Chief, regarding this matter at (808) 944-2235, or via email at jeff.walters@noaa.gov.

Sincerely,

Michael D. Tosatto
Regional Administrator

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 • Fax (808) 973-2941

MAR 27 2013

Mr. Clisson Kunane Aipolani
Chair
Kaua'i/Ni'ihau Island Burial Council
c/o Hinano Rodriques
History and Cultural Branch Chief
State Historic Preservation Division
Department of Land and Natural Resources
Maui Annex Office
130 Mahalani Street
Wailuku, HI 96793

Dear Mr. Aipolani:

I would like to provide an update to my October 17, 2012, letter regarding a National Historic Preservation Act (NHPA) Section 106 consultation process currently underway in association with a suite of proposed actions intended to promote recovery of the endangered Hawaiian monk seal. I would also like to take this opportunity to reiterate my request for your assistance in identifying any additional Native Hawaiian Organizations (NHOs) that may be interested in joining this consultation.

A permit application for authorization under the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) to conduct the Hawaiian monk seal recovery actions has been submitted to the National Marine Fisheries Service (NMFS), Office of Protected Resources. The 45-day public comment period for this permit application closes on April 15, 2013. The application, related documents, and guidance on submitting public comments may be viewed online at: http://www.nmfs.noaa.gov/pr/permits/monkseal16632.htm.

We are considering the suite of recovery actions included in the ESA-MMPA permit application to be an "undertaking" under the NHPA as defined in 36 CFR Part 800. As indicated in my October 17, 2012, letter regarding the Hawaiian monk seal recovery actions, the National Marine Fisheries Service (NMFS) has initiated a consultation process under Section 106 of the NHPA.

NMFS is preparing a "Final Programmatic Environmental Impact Statement (PEIS) for Hawaiian Monk Seal Recovery Actions" in compliance with the National Environmental Policy Act. The intent of the PEIS is to evaluate the potential direct, indirect, and cumulative impacts on the human environment of the alternative approaches to implementing Hawaiian monk seal recovery actions, including the actions specified in the ESA-MMPA permit application mentioned above.

We would like to point out that the recovery actions specified in the ESA-MMPA permit application no longer include temporarily moving seals from the Northwestern Hawaiian Islands (NWHI) to the main Hawaiian Islands (MHI) as part of the two-stage translocation process described in the "Draft PEIS for Hawaiian Monk Seal Recovery Actions." NMFS is not currently pursuing this specific type of two-stage translocation recovery action pending further development of associated monk seal monitoring and management capacity. Since NMFS is not currently pursuing this specific recovery action and it is not included in the current ESA-MMPA permit application, the two-stage translocation action (i.e., moving seals from the NWHI for temporarily release in the MHI) is not be part of the "undertaking" under consideration during the current ongoing NHPA Section 106 consultation process.

We would also like to clarify that the area of potential effect (APE) under consideration in our NHPA 106 consultation process encompasses the range in which Hawaiian monk seals are found throughout the Hawaiian Archipelago and Johnston Atoll including the main Hawaiian Islands and the Northwestern Hawaiian Islands. More specifically, the APE includes portions of the open ocean and near shore environment where monk seals may be found as well as the shore zone of the islands, islets, and atolls that make up the Hawaiian Archipelago and Johnston Atoll. For the purposes of this project, the shore zone includes terrestrial habitat 25 meters inland from the upper reaches of the wash of the waves, at high tide during the season in which the highest wash of the waves occurs, usually evidenced by the edge of vegetation growth or the upper limit of debris. (We note that the October 17, 2012, letter erroneously indicated the shore zone included terrestrial habitat 5 meters inland, however, a 25-meter distance inland was specified in the Draft PEIS and has been used in all other communications with the public and consulting parties.) In addition, secondary use areas, such as research field camps in the Northwestern Hawaiian Islands, are considered for inclusion in the APE. Known shipwrecks or navigational hazards within 300 meters from shore will also be evaluated.

Regarding the NHPA Section 106 and NEPA processes, we have completed a round of public meetings to discuss the proposed recovery actions, identified potentially affected historic properties, and invited participation by Native Hawaiian Organizations and other interested parties in the Section 106 consultation process. Eleven public meetings were held on the islands of Kauai, Oahu, Lanai, Maui, Molokai, and Hawaii Island from October through early December 2012. The public was notified of these meetings via newspaper ads placed in major local newspapers, posting on a NMFS website, and e-mail announcements sent to various group lists on file. At these public meetings, the proposed actions associated with the undertaking were described and input was received from the public regarding the nature and extent of historic and cultural properties, resources, and practices that were expected to be located within, and/or associated, with the APE. Examples of the proposed actions discussed include capture, veterinary treatment, transportation, and release of monk seals on shorelines throughout the Hawaiian archipelago. Potential mitigation measures were also discussed at the meetings, including providing cultural and historical awareness training for program staff, and developing and maintaining close relationships with cultural practitioners in areas in which the proposed

actions would be conducted. While meeting participants expressed comments and concerns about Hawaiian monk seals in general (e.g., concerns about impacts that may arise from the growing monk seal population in the main Hawaiian Islands), we heard very few concerns specifically regarding potential effects to historic properties or traditional cultural properties as defined in the NHPA. Furthermore, to date, only one NHO representative has expressed interest in participating in the Section 106 consultation.

At this time, we have identified the following types of historic properties of religious and cultural significance to NHO's within the APE that may be affected by the proposed undertaking: coastal house sites and other habitation structures, buried cultural deposits, canoe landings and canoe sheds, fishing shrines and other religious sites, human burials, fishing related features, rock art, salt pans, and ceremonial sites. We note that none of the proposed actions associated with the undertaking entail alteration or destruction of any structure, land, shoreline or seafloor substrate. However, we recognize that your organization has special expertise in assessing the eligibility of properties of religious and cultural significance to NHO's, as well as in applying the criteria of adverse effects under 36 C.F.R. Part 800. Accordingly, before we conclude the identification process, and further to our letter dated October 17, 2012, we invite you to assist us in carrying out identification efforts and evaluating National Register eligibility of identified properties. In addition, we request your assistance in identifying additional NHOs and interested parties interested in joining this consultation.

We look forward to hearing from you no later than April 19, 2013 regarding identifying additional properties and NHOs and/or if you have any questions or comments. Please contact Dr. Jeff Walters, our Marine Mammal Branch Chief, regarding this matter at (808) 944-2235, or via email at jeff.walters@noaa.gov.

Sincerely,

Michael D. Tosatto
Regional Administrator

3

Similar letters, all dated March 27, 2013, were sent to:

Ms. Hinaleimoana Wong Kalu, Chair
Oahu Island Burial Council
c/o Mr. Hinano Rodriques
History and Culture Branch Chief
State Historic Preservation Division
Department of Land and Natural Resources
DLNR Maui Office Annex
130 Mahalani Street
Wailuku, HI 96793

Ms. Jersula L. Manaba, Chair
Molokai Island Burial Council
c/o Mr. Hinano Rodriques
History and Culture Branch Chief
State Historic Preservation Division
Department of Land and Natural Resources
DLNR Maui Office Annex
130 Mahalani Street
Wailuku, HI 96793

Mr. Kimo Lee, Chair
Hawaii Island Burial Council
c/o Mr. Hinano Rodriques
History and Culture Branch Chief
State Historic Preservation Division
Department of Land and Natural Resources
DLNR Maui Office Annex
130 Mahalani Street
Wailuku, HI 96793

Mr. Keeaumoku Kapu, Chair
Maui/Lāna`i Island Burial Council
c/o Mr. Hinano Rodriques
History and Culture Branch Chief
State Historic Preservation Division
Department of Land and Natural Resources
DLNR Maui Office Annex
130 Mahalani Street
Wailuku, HI 96793

Mr. Edward Halealoha Ayau
Hui Mālama I Nā Kūpuna O Hawai'i Nei
622 Wainaku Ave
Hilo, HI 96720
Mr. Soulee Stroud

President
Association of Hawaiian Civic Clubs
P.O. Box 1135
Honolulu, HI 96807

Mr. Kamanaʻopono Crabbe
CEO
Office of Hawaiian Affairs
711 Kapiolani Blvd., Suite 500
Honolulu, HI 96813

- Page Intentionally Left Blank -

APPENDIX E

Section 106 Consultation Invitation Letters – Dated April 9, 2013

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 • Fax (808) 973-2941

0 9 2013

Mr. Souiee LKO Stroud
Association of Hawaiian Civic Clubs
P.O. Box 1135
Honolulu, HI 96807

Dear Mr. Stroud:

The National Marine Fisheries Service (NMFS), Pacific Islands Region has submitted a permit application for authorization under the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA) to conduct recovery actions to improve survival of Hawaiian monk seals (*Monachus schauinslandi*) in the Northwestern and main Hawaiian Islands. The Hawaiian monk seal is currently listed as an endangered species under the ESA. NMFS believes the research and management actions included in the permit application will increase understanding of the threats facing monk seals and ensure the long-term viability of Hawaiian monk seals in the wild. The Hawaiian monk seal population has experienced a prolonged decline and currently less than 1,200 monk seals remain in the world.

Section 106 of the National Historic Preservation Act (NHPA) requires that federal agencies identify historic properties that may be impacted by a federal undertaking, and seek to protect those properties that are eligible for listing in the National Register of Historic Places. NHPA regulations in 36 CFR Part 800 identify a consultation process to determine site eligibility, to evaluate potential impacts, and to identify impact avoidance or mitigation actions. Consultation parties are typically the State Historic Preservation Officer and any Native Hawaiian organization (NHO) that attaches religious or cultural significance to historic properties that may be affected by an undertaking. NMFS has identified this action identified in the ESA-MMPA permit application as an "undertaking" as defined in 36 CFR Part 800.

In October 2012, NMFS initiated a NHPA Section 106 process with the State Historic Preservation Division and reached out to the following NHOs: Office of Hawaiian Affairs, Association of Hawaiian Civic Clubs, Hui Mālama I Na Kūpuna O Hawai'i Nei, and the Burial Councils for Kaua'i/Ni'ihau, O'ahu, Maui/Lāna'i, Moloka'i and Hawai'i Islands. We invite your organization to consult with NMFS under NHPA Section 106, including identifying those properties (or types of properties) found within the Area of Potential Effect (APE) that may be eligible for National Register listing, and providing relevant information regarding potential impacts to those properties.

The APE for this project encompasses the range where Hawaiian monk seals are found throughout the Hawaiian Archipelago and Johnston Atoll, including the main Hawaiian Islands and the Northwestern Hawaiian Islands. More specifically, the APE includes portions of the

open ocean and near shore environment where monk seals may be found, as well as the shore zone of the islands, islets, and atolls that make up the Hawaiian Archipelago and Johnston Atoll. For the purposes of this project, the shore zone includes terrestrial habitat 25 meters inland from the upper reaches of the wash of the waves, at high tide during the season in which the highest wash of the waves occurs, usually evidenced by the edge of vegetation growth or the upper limit of debris. In addition, secondary use areas, such as research field camps in the Northwestern Hawaiian Islands, are also considered for inclusion in the APE. Known shipwrecks or navigational hazards within 300 meters from shore will also be evaluated.

In addition to NHPA compliance, NMFS is preparing a "Final Programmatic Environmental Impact Statement (PEIS) for Hawaiian Monk Seal Recovery Actions" in compliance with the National Environmental Policy Act (NEPA). The intent of the PEIS is to evaluate the potential direct, indirect, and cumulative impacts on the human environment of the alternative approaches to implementing Hawaiian monk seal recovery actions, including the actions specified in the ESA-MMPA permit application mentioned above.

We would like to point out that the recovery actions specified in the ESA-MMPA permit application no longer include temporarily moving seals from the Northwestern Hawaiian Islands (NWHI) to the main Hawaiian Islands (MHI) as part of the two-stage translocation program described in the "Draft PEIS for Hawaiian Monk Seal Recovery Actions." NMFS is not currently pursuing this specific type of two-stage translocation recovery action, pending further development of associated monk seal monitoring and management capacity. Since NMFS is not currently pursuing this specific recovery action and it is not included in the current ESA-MMPA permit application, the two-stage translocation action (i.e., moving seals from the NWHI for temporarily release in the MHI) is not be part of the "undertaking" under consideration during the current ongoing NHPA Section 106 consultation process.

Regarding the NHPA Section 106 process thus far, we have completed a round of public meetings to discuss the proposed recovery actions, identified potentially affected historic properties, and invited participation by NHOs and other interested parties in the Section 106 consultation process. NMFS held eleven public meetings on the islands of Kaua'i, O'ahu, Lāna'i, Maui, Moloka'i, and Hawai'i Islands from October through early December 2012. The public was notified of these meetings via newspaper ads placed in major local newspapers, posting on a NMFS website, and e-mail announcements sent to various group lists on file. At these public meetings, the proposed actions associated with the undertaking were described and input was received from the public regarding the nature and extent of historic and cultural properties, resources, and practices that were expected to be located within, and/or associated, with the APE. Examples of the proposed actions discussed include capture, veterinary treatment, transportation, and release of monk seals on shorelines throughout the Hawaiian archipelago. Potential mitigation measures were also discussed at the meetings, including providing cultural and historical awareness training for program staff, and developing and maintaining close relationships with cultural practitioners in areas in which the proposed actions would be conducted. While meeting participants expressed comments and concerns about Hawaiian monk seals in general (e.g., concerns about impacts that may arise from the growing monk seal population in the main Hawaiian Islands), we heard very few concerns specifically regarding

potential effects to historic properties or traditional cultural properties as defined in the NHPA. Furthermore, to date, only one NHO representative has expressed interest in participating in the Section 106 consultation.

At this time, we have identified the following types of historic properties of religious and cultural significance to NHO's within the APE that may be affected by the proposed undertaking. Areas included in the APE are coastal house sites and other habitation structures, buried cultural deposits, canoe landings and canoe sheds, fishing shrines and other religious sites, human burials, fishing related features, rock art, saltpans, and ceremonial sites. We note that none of the proposed actions associated with the undertaking entail alteration or destruction of any structure, land, shoreline or seafloor substrate. However, we recognize that your organization may have special expertise in assessing the eligibility of properties of religious and cultural significance to NHO's, as well as in applying the criteria of adverse effects under 36 CFR Part 800. Accordingly, before we conclude the identification process, we invite you to assist us in carrying out identification efforts and evaluating National Register eligibility of identified properties. We further request your assistance in identifying additional properties that could be affected by the proposed actions, and NHOs and interested parties interested in joining this consultation. While the NHPA Section 106 consultation process does not have a specific deadline, the 45-day public comment period for the ESA-MMPA permit application itself closes on April 15, 2013. The application, related documents, and guidance on submitting public comments may be viewed online at: http://www.nmfs.noaa.gov/pr/permits/monkseal16632.htm.

We look forward to hearing from you no later than April 23, 2013 regarding your wish to consult under NHPA Section 106, identifying additional properties and NHOs, and/or if you have any other questions or comments. Should you be interested in participating as a consulting party, please submit your request in writing. We are enclosing a brochure that provides an overview of Hawaiian monk seal biology and conservation for your reference. Please contact Dr. Jeff Walters, our Marine Mammal Branch Chief, regarding this matter at (808) 944-2235, or via email at jeff.walters@noaa.gov.

Sincerely,

Michael D. Tosatto
Regional Administrator

Enclosure

cc: Dr. Pua Aiu, State Historic Preservation Division

(This is an example letter, for additional recipients, please see attached list)

3

Organization Name	Contact Prefix	Contact First Name	Contact Last Name
'Ahahui Siwila Hawai'i O Kapōlei	Mr.	Lance	Holden
'Aha Kāne	Mr.	G.	Kai
Aha Moku O Kahikinui	Ms.	Donna	Sterling
Aha Moku o Maui Inc.	Mr.	Ke'eaumoku	Kapu
Aha Wahine	Ms.	Linda	Paik
Ahupua'a o Moloka'i	Ms.	Kammy	Purdy
Aloha First	Mr.	Dennis	Kanahele
Association of Hawaiian Civic Clubs	Mr.	Soulee	Stroud
Association of Hawaiians for Homestead Lands	Ms.	Blossom	Feiteira
Au Puni O Hawaii	Mr.	Samson	Brown
Brian Kaniela Nae'ole Naauao	Mr.	Brian	Nae'ole Naauao
Charles Pelenui Mahi Ohana	Ms.	Maydean	Bowman
Council for Native Hawaiian Advancement	Ms.	Robin	Danner
Four Points Global Services, Corp.	Mr.	Howard	Joy
Friends of 'Iolani Palace	Mr.	Kippen	de Alba Chu
Friends of Moku'ula, Inc.	Ms.	Shirley	Kahai
George K. Cypher 'Ohana	Ms.	Mahealani	Cypher
God's Country Waimanalo	Ms.	Ilima	Ho-Lastimosa
Hau'ouiwi Homestead Association on Lāna'i	Ms.	Winifred	Basques
Hawai'i Maoli	Mr.	Henry	Gomes
Hawaiian Civic Club of Hilo	Ms.	Antoinette	Mallow
Ho Ohana	Ms.	Ilima	Ho-Lastimosa
Ho'okano Family Land Trust	Ms.	Dawn	Chang
Hui Ho'oniho	Mr.	Edward	Ayau
Hui Huliau	Mr.	Adrian	Silva
Hui Kāko'o 'Āina Ho'opulapula	Ms.	Kaipo	Kincaid
Hui Kaleleiki Ohana	Ms.	Jaynie	Stone
Hui Mālama I Na Kūpuna O Hawai'i	Mr.	Edward	Ayau

Nei			
Kāko'o 'Ōiwi	Ms.	Mahealani	Cypher
Kalaeloa Heritage and Legacy Foundation	Ms.	Melissa	Lyman
Kalama'ula Mauka Homestead Association	Ms.	Victoria	Kapuni
Kamealoha	Mr.	Thomas	Kamealoha
Kamehameha Schools - Community Relations and Communications Group, Government Relations	Ms.	Piilani	Hanohano
Kamiloloa One Alii Homestead Association	Ms.	Vivian	Ainoa
Kanu o ka 'Āina Learning 'Ohana	Ms.	Taffi	Wise
Kapolei Community Development Corporation	Ms.	Shirley	Swinney
Kawaihapai Ohana	Mr.	Thomas	Shirai
Keoni Kealoha Alvarez	Mr.	Keoni	Alvarez
Ko'olau Foundation	Ms.	Mahealani	Cypher
Ko'olaupoko Hawaiian Civic Club	Ms.	Mahealani	Cypher
La'i 'Ōpua 2020	Mr.	Craig	Kahui
Lahui Kaka'ikahi	Mr.	Kaleo	Keeno
Ma'a 'Ohana c/o Lani Ma'a Lapilio	Ms.	Lani	Lapilio
Machado-Akana-Aona-Namakaeha Ohana	Ms.	Brenda	Lee
Mahu Ohana	Ms.	Keona	Mark
Makaha Hawaiian Civic Club	Ms.	Lu	Faborito
Maku'u Farmers Association	Ms.	Paula	Kekahuna
Malu'ōhai Residents Association	Ms.	Homelani	Schaedel
Meleana Kawaiaea, LLC	Mr.	Paul	Richards
Moku o Kaupo	Ms.	Jade	Smith
Na Aikane O Maui	Ms.	Uilani	Kapu
Na Ku'auhau 'o Kahiwakaneikopolei	Ms.	H.	Cheek
Na Ohana o Puaoi a me Hanawahine	Ms.	Roxanne	Hanawahine
Nanakuli Housing Corporation	Ms.	Paige	Barber
Native Hawaiian Church	Mr.	Kaleo	Patterson

Native Hawaiian Economic Alliance	Mr.	Austin	Nakoa
Native Hawaiian Education Council	Ms.	Michelle	Balutski
Nekaifes Ohana	Ms.	Maraea	Nekaifes
Office of Hawaiian Affairs	Dr.	Kamana'opono	Crabbe
Pacific American Foundation	Mr.	Herb	Lee
Pacific Justice & Reconciliation Center	Mr.	Kaleo	Patterson
Papa Ola Lokahi	Mr.	Hardy	Spoehr
Papakōlea Community Development Corporation	Ms.	B.	Kekauoha
Paukukalo Hawaiian Homes Community Association	Ms.	Olinda	Aiwohi
Peahi Ohana	Mr.	Apela	Peahi
Piihonua Hawaiian Homestead Community Association	Mr.	Kaleo	Aki
Royal Hawaiian Academy of Traditional Arts	Mr.	L.	Suganuma
The Friends of Hokule'a and Hawai'iloa	Mr.	William	Richards
The I Mua Group	Mr.	Melvin	Soong
Wai'anae Hawaiian Civic Club	Ms.	Gege	Kawelo
Waiehu Kou Phase 3 Association	Mr.	Roy	Oliveira
Waimānalo Hawaiian Homes Association	Mr.	Paul	Richards
Honua Consulting	Mr.	Matthew	Sproat

- Page Intentionally Left Blank -

APPENDIX F

Letters to Responding NHO's Regarding Consultation Meetings

Pacific Legacy
Historic Preservation

Pacific Basin — O'ahu
30 Aulike Street, Suite 301
Kailua, HI 96734

Phone: 808.263.4800
Fax: 808.263.4300
www.pacificlegacy.com

3 May 2013

Ms. Winifred Basques, Jr.
Ha'ouiwi Homestead Assn on Lanai
PO Box 63052
Lanai City, HI 97675

Re: Section 106 consultation for the Hawaiian monk seal recovery actions

Dear Ms. Basques:

Thank you for your interest in participating in the consultation on historic properties pursuant to Section 106 of the National Historic Preservation Act (NHPA) regarding the Hawaiian monk seal recovery actions described in the April 9, 2013, letter sent to you by Michael D. Tosatto, Regional Administrator for the National Marine Fisheries Service (NMFS), Pacific Islands Regional Office. We are now ready to begin consulting with the parties who have expressed interest. I will be contacting you within two weeks to schedule a telephone conference to discuss the undertaking, answer any questions, and conduct the consultation. Participating in this conference call will be Drs. Jeff Waters and Rachel Sprague of NMFS, and me.

Enclosed are some documents that may help as reference materials before and during the consultation. The enclosed documents include:

1. A copy of the ESA-MMPA permit application. Issuance of the ESA-MMPA permit would be the "undertaking" that is triggering the NHPA 106 consultation process.
2. A short article summarizing the activities included (and not included) in the permit application (undertaking).
3. A fact sheet regarding the NHPA.
4. A draft document describing potential measures intended to mitigate (reduce or prevent) potential adverse impacts (or effects) on historic and cultural properties.

Please note that these consultations will be focused solely on potential effects to historic properties as specified in the NHPA and will not be addressing potential effects to cultural practices and other cultural resources as these effects are being evaluated by NMFS through a separate process under the National Environmental Policy Act (NEPA). Information on this NEPA process is available online at:
http://www.nmfs.noaa.gov/pr/permits/eis/hawaiianmonkseal.htm

Pacific Basin - Hawai'i Island
900 Kanoikos Street
Hilo, HI 96720
808.351.9560 Ph.
808.263.4300 Fax

Business Office
2641 Hwy 4
PO Box 6050
Arnold, CA 95223
209.795.4481 Ph.
209.795.1967 Fax

Bay Area
900 Modoc Street
Berkeley, CA 94707
510.524.3991 Ph.
510.524.4419 Fax

Sierra/Central Valley
4919 Windplay Drive, Ste. 4
El Dorado Hills, CA 95762
916.358.5156 Ph.
916.358.5161 Fax

Inland Empire/Mojave Desert
44702 10th Street West
Lancaster, CA 93534
661.729.9395 Ph.
661.729.9417 Fax

Southern California
PO Box 421282
San Diego, CA 92142
858.900.8024 Ph.
510.524.4419 Fax

We will be contacting you soon in hopes of moving forward on the consultation. In the meantime, if you have any questions or desire more information, please feel free to contact me at 808-263-4800, or via email at cleghorn@pacificlegacy.com.

Sincerely,

Paul L. Cleghorn, Ph.D.
Principal and Senior Archaeologist

Enclosures

Pacific Legacy
Historic Preservation

Pacific Basin — O'ahu
30 Aulike Street, Suite 301
Kailua, HI 96734

Phone: 808.263.4800
Fax: 808.263.4300
www.pacificlegacy.com

3 May 2013

Lu Ann Faborito
P O Box 1783
Wai'anae, HI 96792 3

Re: Section 106 consultation for the Hawaiian monk seal recovery actions

Dear Ms. Faborito:

Thank you for your interest in participating in the consultation on historic properties pursuant to Section 106 of the National Historic Preservation Act (NHPA) regarding the Hawaiian monk seal recovery actions described in the April 9, 2013, letter sent to you by Michael D. Tosatto, Regional Administrator for the National Marine Fisheries Service (NMFS), Pacific Islands Regional Office. We are now ready to begin consulting with the parties who have expressed interest. I will be contacting you within two weeks to schedule a telephone conference to discuss the undertaking, answer any questions, and conduct the consultation. Participating in this conference call will be Drs. Jeff Waters and Rachel Sprague of NMFS, and me.

Enclosed are some documents that may help as reference materials before and during the consultation. The enclosed documents include:

1. A copy of the ESA-MMPA permit application. Issuance of the ESA-MMPA permit would be the "undertaking" that is triggering the NHPA 106 consultation process.
2. A short article summarizing the activities included (and not included) in the permit application (undertaking).
3. A fact sheet regarding the NHPA.
4. A draft document describing potential measures intended to mitigate (reduce or prevent) potential adverse impacts (or effects) on historic and cultural properties.

Please note that these consultations will be focused solely on potential effects to historic properties as specified in the NHPA and will not be addressing potential effects to cultural practices and other cultural resources as these effects are being evaluated by NMFS through a separate process under the National Environmental Policy Act (NEPA). Information on this NEPA process is available online at:
http://www.nmfs.noaa.gov/pr/permits/eis/hawaiianmonkseal.htm

Pacific Basin - Hawai'i Island
900 Kumukoa Street
Hilo, HI 96720
808.351.9560 Ph.
808.263.4300 Fax

Business Office
2641 Hwy 4
PO Box 6050
Arnold, CA 95223
209.795.4481 Ph.
209.795.1967 Fax

Bay Area
900 Modoc Street
Berkeley, CA 94707
510.524.3991 Ph.
510.524.4419 Fax

Sierra/Central Valley
4919 Windplay Drive, Ste. 4
El Dorado Hills, CA 95762
916.358.5156 Ph.
916.358.5161 Fax

Inland Empire/Mojave Desert
44702 10th Street West
Lancaster, CA 93534
661.729.9395 Ph.
661.729.9417 Fax

Southern California
PO Box 421282
San Diego, CA 92142
858.900.8024 Ph.
510.524.4419 Fax

We will be contacting you soon in hopes of moving forward on the consultation. In the meantime, if you have any questions or desire more information, please feel free to contact me at 808-263-4800, or via email at cleghorn@pacificlegacy.com.

Sincerely,

Paul L. Cleghorn, Ph.D.
Principal and Senior Archaeologist

Enclosures

Pacific Legacy
Historic Preservation

Pacific Basin — O'ahu
30 Aulike Street, Suite 301
Kailua, HI 96734

Phone: 808.263.4800
Fax: 808.263.4300
www.pacificlegacy.com

3 May 2013

Mr. Roy Oliveira
49 Kaulana Na Pua Circle
Wailuku, HI 96793

Re: Section 106 consultation for the Hawaiian monk seal recovery actions

Dear Mr. Olivera:

Thank you for your interest in participating in the consultation on historic properties pursuant to Section 106 of the National Historic Preservation Act (NHPA) regarding the Hawaiian monk seal recovery actions described in the April 9, 2013, letter sent to you by Michael D. Tosatto, Regional Administrator for the National Marine Fisheries Service (NMFS), Pacific Islands Regional Office. We are now ready to begin consulting with the parties who have expressed interest. I will be contacting you within two weeks to schedule a telephone conference to discuss the undertaking, answer any questions, and conduct the consultation. Participating in this conference call will be Drs. Jeff Waters and Rachel Sprague of NMFS, and me.

Enclosed are some documents that may help as reference materials before and during the consultation. The enclosed documents include:

1. A copy of the ESA-MMPA permit application. Issuance of the ESA-MMPA permit would be the "undertaking" that is triggering the NHPA 106 consultation process.
2. A short article summarizing the activities included (and not included) in the permit application (undertaking).
3. A fact sheet regarding the NHPA.
4. A draft document describing potential measures intended to mitigate (reduce or prevent) potential adverse impacts (or effects) on historic and cultural properties.

Please note that these consultations will be focused solely on potential effects to historic properties as specified in the NHPA and will not be addressing potential effects to cultural practices and other cultural resources as these effects are being evaluated by NMFS through a separate process under the National Environmental Policy Act (NEPA). Information on this NEPA process is available online at:
http://www.nmfs.noaa.gov/pr/permits/eis/hawaiianmonkseal.htm

Pacific Basin - Hawai'i Island
900 Kumakua Street
Hilo, HI 96720
808.351.9560 Ph.
808.263.4300 Fax

Business Office
2641 Hwy 4
PO Box 6050
Arnold, CA 95223
209.795.4481 Ph.
209.795.1967 Fax

Bay Area
900 Modoc Street
Berkeley, CA 94707
510.524.3991 Ph.
510.524.4419 Fax

Sierra/Central Valley
4919 Windplay Drive, Ste. 4
El Dorado Hills, CA 95762
916.358.5156 Ph.
916.358.5161 Fax

Inland Empire/Mojave Desert
44702 10th Street West
Lancaster, CA 93534
661.729.9395 Ph.
661.729.9417 Fax

Southern California
PO Box 421282
San Diego, CA 92142
858.900.8024 Ph.
510.524.4419 Fax

We will be contacting you soon in hopes of moving forward on the consultation. In the meantime, if you have any questions or desire more information, please feel free to contact me at 808-263-4800, or via email at cleghorn@pacificlegacy.com.

Sincerely,

Paul L. Cleghorn, Ph.D.
Principal and Senior Archaeologist

Enclosures

Pacific Legacy
Historic Preservation

Pacific Basin — O'ahu
30 Aulike Street, Suite 301
Kailua, HI 96734

Phone: 808.263.4800
Fax: 808.263.4300
www.pacificlegacy.com

3 May 2013

Hardy Spoehr, executive director
Papa Ola Lokahi (Native Hawaiian Health Board)
894 Queen Street
Honolulu, HI 96813

Re: Section 106 consultation for the Hawaiian monk seal recovery actions

Dear Mr. Spoehr:

Thank you for your interest in participating in the consultation on historic properties pursuant to Section 106 of the National Historic Preservation Act (NHPA) regarding the Hawaiian monk seal recovery actions described in the April 9, 2013, letter sent to you by Michael D. Tosatto, Regional Administrator for the National Marine Fisheries Service (NMFS), Pacific Islands Regional Office. We are now ready to begin consulting with the parties who have expressed interest. I will be contacting you within two weeks to schedule a telephone conference to discuss the undertaking, answer any questions, and conduct the consultation. Participating in this conference call will be Drs. Jeff Waters and Rachel Sprague of NMFS, and me.

Enclosed are some documents that may help as reference materials before and during the consultation. The enclosed documents include:

1. A copy of the ESA-MMPA permit application. Issuance of the ESA-MMPA permit would be the "undertaking" that is triggering the NHPA 106 consultation process.
2. A short article summarizing the activities included (and not included) in the permit application (undertaking).
3. A fact sheet regarding the NHPA.
4. A draft document describing potential measures intended to mitigate (reduce or prevent) potential adverse impacts (or effects) on historic and cultural properties.

Please note that these consultations will be focused solely on potential effects to historic properties as specified in the NHPA and will not be addressing potential effects to cultural practices and other cultural resources as these effects are being evaluated by NMFS through a separate process under the National Environmental Policy Act (NEPA). Information on this NEPA process is available online at:
http://www.nmfs.noaa.gov/pr/permits/eis/hawaiianmonkseal.htm

Pacific Basin - Hawai'i Island
900 Kanukoa Street
Hilo, HI 96720
808.351.9560 Ph.
808.263.4300 Fax

Business Office
2641 Hwy 4
PO Box 6050
Arnold, CA 95223
209.795.4481 Ph.
209.795.1967 Fax

Bay Area
900 Modoc Street
Berkeley, CA 94707
510.524.3991 Ph.
510.524.4419 Fax

Sierra/Central Valley
4919 Windplay Drive, Ste. 4
El Dorado Hills, CA 95762
916.358.5156 Ph.
916.358.5161 Fax

Inland Empire/Mojave Desert
44702 10th Street West
Lancaster, CA 93534
661.729.9395 Ph.
661.729.9417 Fax

Southern California
PO Box 421282
San Diego, CA 92142
858.900.8024 Ph.
510.524.4419 Fax

We will be contacting you soon in hopes of moving forward on the consultation. In the meantime, if you have any questions or desire more information, please feel free to contact me at 808-263-4800, or via email at cleghorn@pacificlegacy.com.

Sincerely,

Paul L. Cleghorn, Ph.D.
Principal and Senior Archaeologist

Enclosures

Pacific Legacy
Historic Preservation

Pacific Basin — O'ahu
30 Aulike Street, Suite 301
Kailua, HI 96734

Phone: 808.263.4800
Fax: 808.263.4300
www.pacificlegacy.com

3 May 2013

Matt Sproat
Honua Consulting
4348 Wai'alae Ave. #254
Honolulu, Hawai'i 96816

Re: Section 106 consultation for the Hawaiian monk seal recovery actions

Dear Mr. Sproat:

Thank you for your interest in participating in the consultation on historic properties pursuant to Section 106 of the National Historic Preservation Act (NHPA) regarding the Hawaiian monk seal recovery actions described in the April 9, 2013, letter sent to you by Michael D. Tosatto, Regional Administrator for the National Marine Fisheries Service (NMFS), Pacific Islands Regional Office. We are now ready to begin consulting with the parties who have expressed interest. I will be contacting you within two weeks to schedule a telephone conference to discuss the undertaking, answer any questions, and conduct the consultation. Participating in this conference call will be Drs. Jeff Waters and Rachel Sprague of NMFS, and me.

Enclosed are some documents that may help as reference materials before and during the consultation. The enclosed documents include:

1. A copy of the ESA-MMPA permit application. Issuance of the ESA-MMPA permit would be the "undertaking" that is triggering the NHPA 106 consultation process.
2. A short article summarizing the activities included (and not included) in the permit application (undertaking).
3. A fact sheet regarding the NHPA.
4. A draft document describing potential measures intended to mitigate (reduce or prevent) potential adverse impacts (or effects) on historic and cultural properties.

Please note that these consultations will be focused solely on potential effects to historic properties as specified in the NHPA and will not be addressing potential effects to cultural practices and other cultural resources as these effects are being evaluated by NMFS through a separate process under the National Environmental Policy Act (NEPA). Information on this NEPA process is available online at:
http://www.nmfs.noaa.gov/pr/permits/eis/hawaiianmonkseal.htm

Pacific Basin - Hawai'i Island
900 Kumukoa Street
Hilo, HI 96720
808.351.9560 Ph.
808.263.4300 Fax

Business Office
2641 Hwy 4
PO Box 6050
Arnold, CA 95223
209.795.4481 Ph
209.795.1967 Fax

Bay Area
900 Modoc Street
Berkeley, CA 94707
510.524.3991 Ph.
510.524.4419 Fax

Sierra/Central Valley
4919 Windplay Drive, Ste. 4
El Dorado Hills, CA 95762
916.358.5156 Ph.
916.358.5161 Fax

Inland Empire/Mojave Desert
44702 10th Street West
Lancaster, CA 93534
661.729.9395 Ph.
661.729.9417 Fax

Southern California
PO Box 421282
San Diego, CA 92142
858.900.8024 Ph.
510.524.4419 Fax

We will be contacting you soon in hopes of moving forward on the consultation. In the meantime, if you have any questions or desire more information, please feel free to contact me at 808-263-4800, or via email at cleghorn@pacificlegacy.com.

Sincerely,

Paul L. Cleghorn, Ph.D.
Principal and Senior Archaeologist

Enclosures

Pacific Legacy
Historic Preservation

Pacific Basin — O'ahu
30 Aulike Street, Suite 301
Kailua, HI 96734

Phone: 808.263.4800
Fax: 808.263.4300
www.pacificlegacy.com

3 May 2013

Jade Alohalani Smith
Moku o Kaupo Representative
Phone:(808) 870-2820
www.ahamoku.org

Re: Section 106 consultation for the Hawaiian monk seal recovery actions

Dear Ms. Smith:

Thank you for your interest in participating in the consultation on historic properties pursuant to Section 106 of the National Historic Preservation Act (NHPA) regarding the Hawaiian monk seal recovery actions described in the April 9, 2013, letter sent to you by Michael D. Tosatto, Regional Administrator for the National Marine Fisheries Service (NMFS), Pacific Islands Regional Office. We are now ready to begin consulting with the parties who have expressed interest. I will be contacting you within two weeks to schedule a telephone conference to discuss the undertaking, answer any questions, and conduct the consultation. Participating in this conference call will be Drs. Jeff Waters and Rachel Sprague of NMFS, and me.

Enclosed are some documents that may help as reference materials before and during the consultation. The enclosed documents include:

1. A copy of the ESA-MMPA permit application. Issuance of the ESA-MMPA permit would be the "undertaking" that is triggering the NHPA 106 consultation process.
2. A short article summarizing the activities included (and not included) in the permit application (undertaking).
3. A fact sheet regarding the NHPA.
4. A draft document describing potential measures intended to mitigate (reduce or prevent) potential adverse impacts (or effects) on historic and cultural properties.

Please note that these consultations will be focused solely on potential effects to historic properties as specified in the NHPA and will not be addressing potential effects to cultural practices and other cultural resources as these effects are being evaluated by NMFS through a separate process under the National Environmental Policy Act (NEPA). Information on this NEPA process is available online at:
http://www.nmfs.noaa.gov/pr/permits/eis/hawaiianmonkseal.htm

Pacific Basin - Hawai'i Island
900 Kumukoa Street
Hilo, HI 96720
808.351.9560 Ph.
808.263.4300 Fax

Business Office
2641 Hwy 4
PO Box 6050
Arnold, CA 95223
209.795.4481 Ph.
209.795.1967 Fax

Bay Area
900 Modoc Street
Berkeley, CA 94707
510.524.3991 Ph.
510.524.4419 Fax

Sierra/Central Valley
4919 Windplay Drive, Ste. 4
El Dorado Hills, CA 95762
916.358.5156 Ph.
916.358.5161 Fax

Inland Empire/Mojave Desert
44702 10th Street West
Lancaster, CA 93534
661.729.9395 Ph.
661.729.9417 Fax

Southern California
PO Box 421282
San Diego, CA 92142
858.900.8024 Ph.
510.524.4419 Fax

We will be contacting you soon in hopes of moving forward on the consultation. In the meantime, if you have any questions or desire more information, please feel free to contact me at 808-263-4800, or via email at cleghorn@pacificlegacy.com.

Sincerely,

Paul L. Cleghorn, Ph.D.
Principal and Senior Archaeologist

Enclosures

- Page Intentionally Left Blank -

APPENDIX G

State Historic Preservation Division Response Letter – Dated May 10, 2013

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ESTHER KIA'AINA
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD STE 555
KAPOLEI HI 96707

May 10, 2013

Michael D. Tosatto
Regional Administrator
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, HI 96814-4700

Log# 2013.2530
Doc# 1305PA01

Dear Mr. Tosatto,

Re: NHPA Section 106 Consultation
Update to October 17, 2012 letter regarding consultation on proposed actions to promote recovery of the endangered Hawaiian Monk seal.
Request for additional information regarding NHOs and traditional cultural properties.
All islands

Thank you for your letter of March 27, 2013, which we received on April 4, 2013. We have been discussing this request with Dr. Jeff Walters and apologize for our delayed response.

Your request indicates the following:

1. A permit application for authorization to conduct Hawaiian monk seal recovery action has been submitted to the National Marine Fisheries Service.
2. The public comment period ends on April 15, 2013.
3. The recovery actions in the permit are considered an undertaking.

Therefore consultation under 106 has been initiated. The area of potential effect (APE) includes the entire Hawaiian Archipelago and Johnston Atoll. In addition to areas of open ocean, the shore zone includes terrestrial habitat 25 meters inland from the upper reach of the wash of the waves. Although unlikely that monk-seal recovery efforts would affect a historic property, potential exists for burials and registered and eligible

sites within the APE to be affected, as well as not yet identified surface or subsurface historic properties.

The State Historic Preservation Division has the following comments:

The division recommends that you consult with the Island Burial Councils. In addition we are providing you with a list of families who have established protocols to deal with burials that erode regularly from certain areas of the main Hawaiian Islands. They may be helpful in drafting protocols for your program.

We will withhold further comment until we can review your recovery plan which should have specifics on possible impacts to historic properties. We believe that our office and Native Hawaiian Organizations will be better able to comment on a plan with more specifics.

Please feel free to contact me at 692-8040 or by e-mail at pua.aiu@hawaii.gov if you have further questions.

Sincerely,

Pua Aiu
Administrator

Appendix A
List of families to consult for the Monk Seal Recovery Permit

Kona Coast

Curtis Tyler
77-6399 Nalani St. #104
Kailua-Kona, HI 96740

Nicole Lui
76-6217 Lehua Road
Kailua-Kona, HI 96740

Mikiala Roy
P.O. Box 596
Kailua-Kona, HI 96745

Hannah Reeves
P.O. Box 844
Kailua-Kona, HI 96745

Mahealani Pai
P.O.Box 251
Kailua-Kona, HI 96745

Jimmy Medeiros
P.O. Box 166
Honaunau, HI 96726

Kualoa

Cy Bridges: bridgesc@polynesia.com
Gladys Pualoa-Ahuna: verlamoore@hawaii.rr.com
Dawn Wasson: laiekupuna@yahoo.com
Kekela Miller: millerk010@hawaii.rr.com
Calvin Hoe: chhoe_hic@yahoo.com
Keoni Fox: fox@aliiwireless.com
Kealoha Domingo: hawaiianstyle@rocketmail.com

Appendix C
Comment Analysis Report

TABLE OF CONTENTS

1.0	*INTRODUCTION*	*4*
NUMBER OF COMMENTS RECEIVED		*6*
THE COMMENT ANALYSIS PROCESS		*6*
RESPONSES TO PUBLIC COMMENTS		*10*
ALT	*ALTERNATIVES*	*11*
BEH	*BEHAVIOR MODIFICATION*	*23*
BIO	*HAWAIIAN MONK SEAL BIOLOGY*	*28*
CEF	*CUMULATIVE EFFECTS*	*35*
CUL	*CULTURAL*	*37*
DIS	*DISEASES*	*40*
ECO	*ECOSYSTEMS*	*47*
FISH	*FISHERIES/ FISHERMEN*	*49*
GEN	*GENERAL*	*56*
INA	*INADEQUATE INFORMATION TO ASSESS EFFECTS/UNCLEAR INFORMATION*	*60*
INT	*HUMAN-SEAL INTERACTIONS*	*64*
MGT	*MANAGEMENT*	*68*
PUB	*PUBLIC COORDINATION*	*72*
REG	*REGULATORY*	*76*
SOC	*SOCIOECONOMIC EFFECTS OF HAWAIIAN MONK SEAL RESEARCH AND ENHANCEMENT*	*81*
TRAN	*TRANSLOCATION*	*86*
REFERENCES		*95*

LIST OF FIGURES

1: Project Area Map	*4*
2. Top 30 Comment Summary Statements with the Highest Number of Comments	*10*

LIST OF TABLES

Table 1: Locations and Dates of the Public Hearings and Agency Meeting on the Draft PEIS 6

Table 2: Number of Public Comment Submissions By Type 6

Table 3: Issues Identified in Public Comments on the Draft PEIS 8

Table 4: Number of Comment Summary Statements for each Issue 9

LIST OF ADDENDA

Addendum A: Submission Index

ACRONYMS AND ABBREVIATIONS

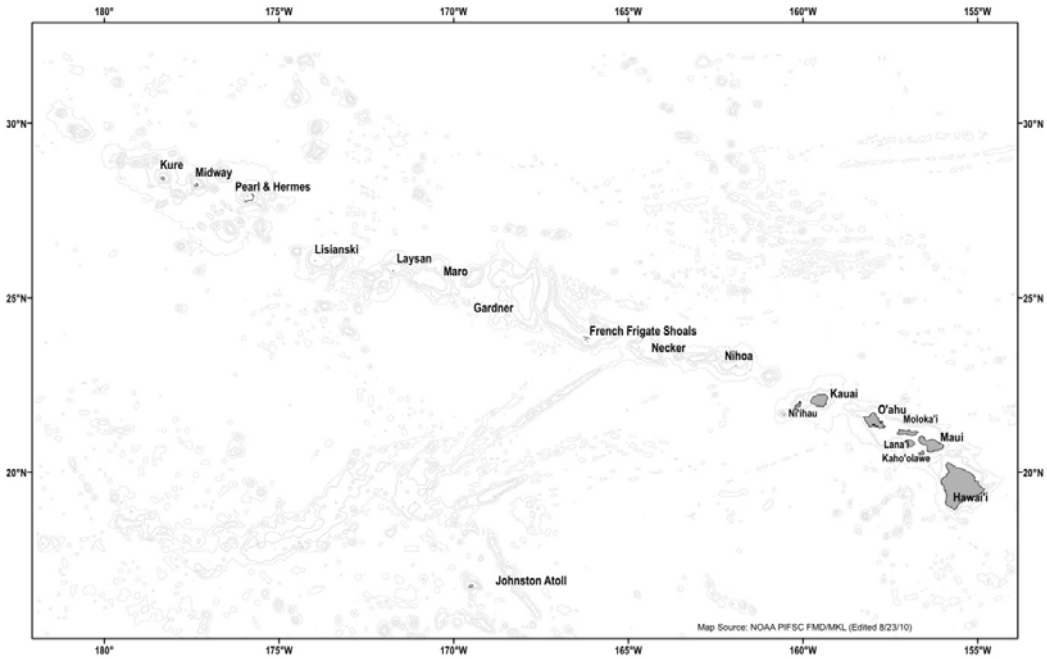
AWA	Animal Welfare Act
CAR	Comment Analysis Report
CFR	Code of Federal Regulations
DLNR	Department of Land and Natural Resources
ERM	ERM-West, Inc.
ESA	Endangered Species Act
FR	Federal Register
GnRH	gonadotropin-releasing hormone
HEPA	Hawai‘i Environmental Protection Act
HIHWNMS	Hawaiian Islands Humpback Whale National Marine Sanctuary
IACUC	Institutional Animal Care and Use Committee
ID	identification
MHI	main Hawaiian Islands
MMPA	Marine Mammal Protection Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NWHI	Northwestern Hawaiian Islands
PEIS	Programmatic Environmental Impact Statement
PIRO	Pacific Islands Regional Office
PIFSC	Pacific Islands Fisheries Science Center
PMNM	Papahānaumokuākea Marine National Monument
PSA	public service announcement
RFFA	Reasonably Foreseeable Future Action
SPZ	seal protection zone
U.S.	United States
UME	unusual mortality event
UH	University of Hawai‘i
U.S.C.	United States Code

1.0 *INTRODUCTION*

The National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) is responsible for management, conservation, and recovery of Hawaiian monk seals (*Monachus schauinslandi*), under the Endangered Species Act (ESA) (16 United States Code [U.S.C.] 1531 *et seq*.) and the Marine Mammal Protection Act (MMPA) (16 U.S.C. 1361 *et seq*.). The NMFS Pacific Islands Regional Office (PIRO) and NMFS Pacific Islands Fisheries Science Center (PIFSC) are responsible for implementation of the Hawaiian Monk Seal Recovery Plan (NMFS 2007).

NMFS prepared a Draft Programmatic Environmental Impact Statement (PEIS) to assess the impacts of implementing specific research and enhancement activities to improve survival of Hawaiian monk seals. Conducting these activities and issuing a permit to conduct these activities constitute a federal action subject to compliance with the National Environmental Policy Act (NEPA) of 1969 (40 Code of Federal Regulations [CFR] Parts 1500 - 1508), a procedural law intended to facilitate better government decisions concerning any project that involves federal funding, work performed by the federal government, or permits issued by a federal agency.

Figure 1. *Project Area Map*



THE ROLE OF PUBLIC COMMENT

Solicitation of public comment on proposed research and enhancement activities is required under NEPA. Furthermore, NMFS must "assess and consider public comments both individually and collectively" (Title 40 CFR 1503.4). Most importantly, such comments are viewed by NMFS as critical in helping managers to shape responsible plans for Hawaiian monk seal recovery actions that best meet NMFS' mission.

During the formal comment period, the public reviewed and commented on the Draft PEIS on the proposed action. The comment period described in this document is part of a broader effort of public involvement and agency consultation described in Sections 1.8 and 5.6, and Appendix B (*Scoping Report*) of the Draft PEIS.

The comments received are analyzed and considered by NMFS management while developing the Final PEIS. Section 3.0, *The Comment Analysis Process*, of this Comment Analysis Report (CAR) provides a more complete discussion of how NMFS addresses public comments and the Executive Summary of the Final PEIS includes a summary of issues raised and where they were discussed in the Final PEIS.

PUBLIC COMMENT PERIOD AND HEARINGS

The Hawaiian Monk Seal Recovery Actions Draft PEIS was released for public review on August 12, 2011 on the project website: http://www.nmfs.noaa.gov/pr/permits/eis/hawaiianmonkseal.htm.

The Notice of Availability (NOA) for the Draft PEIS was published in the *Federal Register* August 19, 2011 (76 Federal Register [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. Six public hearings and an agency meeting on the Draft PEIS were held as shown in Table 1 below.

Table 1: Locations and Dates of the Public Hearings and Agency Meeting on the Draft PEIS

Location	Date	Time
Honolulu, O‘ahu	Monday, September 12, 2011	Agency Meeting: 10–11 a.m. Public Hearing: 5:30–8:30 p.m.
Kaunakakai, Moloka‘i	Tuesday, September 13, 2011	Public Hearing: 6–9 p.m.
Hilo, Hawai‘i	Wednesday, September 14, 2011	Public Hearing: 6–9 p.m.
Kīhei, Maui	Thursday, September 15, 2011	Public Hearing: 6–9 p.m.
Līhu‘e, Kaua‘i	Saturday, September 17, 2011	Morning Hearing: 9 a.m.–noon Evening Hearing: 4–7 p.m.

NUMBER OF COMMENTS RECEIVED

A total of 341 comment submissions were received from agencies and the public on the Hawaiian Monk Seal Draft PEIS as shown in Table 2. These submissions generated 1,180 substantive comments.

Table 2: Number of Public Comment Submissions By Type

Submission Type	Number of Submissions
Comment Letter (hard-copy or electronic, including e-mail attachments)	182
E-mail Message	48
Petition	1
Public Hearing Testimony	110
Total Number of Submissions	**341**

THE COMMENT ANALYSIS PROCESS

The analysis of public comments on the Draft PEIS was a multi-stage process that included coding, sorting, and summarizing public comment submissions into categories based on common themes.

All submissions including letters, testimony, and electronic comments were reviewed and logged into a database where each was assigned an automatic tracking number (Submission Identification [ID] number). When provided, the following information was also entered into the database: sender’s name, address,

affiliation (if any), type of submission (*i.e.*, individual submission or petition), date submitted, and comment text.

SORTING, ANALYSIS AND CODING

Each submission was reviewed by an analyst and divided into a series of 'comments', each having a unique Comment ID number. The goal of this process was to ensure that each substantive comment pertinent to the Draft PEIS was entered into the database. Substantive comments constitute assertions, suggested alternatives or actions, data, background information, or clarifications relating to the Draft PEIS document or its preparation. Analysts then assigned each substantive comment to an issue category as shown in Table 3 on the next page.

Table 3: Issues Identified in Public Comments on the Draft PEIS

Issue	Issue Code	Number of Comments (includes double coded)
Alternatives	ALT	294
Behavior Modification	BEH	16
Cumulative Effects	CEF	37
Diseases	DIS	32
Ecosystem	ECO	27
Fisheries	FISH	176
General	GEN	181
Hawaiian Monk Seal Biology	BIO	78
Human-Seal Interactions	INT	49
Inadequate Information to Assess Effects/Unclear Information	INA	29
Management	MGT	28
Cultural	CUL	59
Public Coordination	PUB	36
Regulatory	REG	29
Socioeconomic	SOC	36
Translocation	TRAN	103
Total Number of Comments-Issues[1]		**1,210**

COMMENT SUMMARY STATEMENTS

A second review of the comments within each issue category was conducted to identify specific subcategories. These subcategories were then synthesized into succinct "Comment Summary Statements" that intend to capture the particular concern within each issue category. Comment Summary Statements are not intended to replace actual comments. Rather, they summarize for the reader the range of concerns on a specific issue.

Each Comment Summary Statement was given a three- or four-character code, identifying the general issue category (*e.g.*, DIS for Diseases), and numbered consecutively. For example, there are twenty-three Comment Summary Statements under ALT (ALT 01, 02, 03, etc.). Each substantive comment was assigned to one or more Comment Summary Statement depending on content.

---

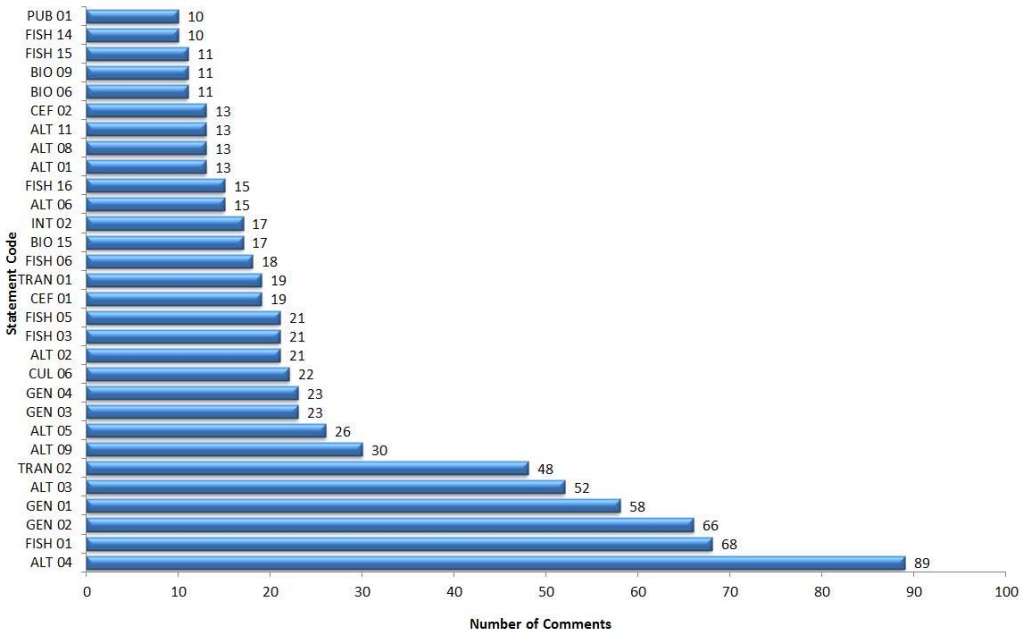
[1] The number of actual substantive comments is 1,180 (Table 2). However, 30 comments were coded under two issue categories therefore resulting in 1,210 comment-issues.

Table 4 presents the entire list of Issues and the number of associated Comment Summary Statements within each category. Figure 2 shows the top 30 Comment Summary Statements with the highest number of comments.

Table 4: Number of Comment Summary Statements for each Issue

Issue	Number of Comment Summary Statements
Alternatives (ALT)	23
Behavior Modification (BEH)	9
Cumulative Effects (CEF)	4
Diseases (DIS)	13
Ecosystems (ECO)	8
Fisheries (FISH)	16
General (GEN)	14
Hawaiian Monk Seal Biology (BIO)	17
Human-Seal Interactions (INT)	9
Inadequate Information to Assess Effects/Unclear Information (INA)	12
Management (MGT)	11
Native Hawaiian Concerns (CUL)	12
Public Coordination (PUB)	11
Regulatory (REG)	13
Socioeconomic Effects of Hawaiian Monk Seal Research and Enhancement (SOC)	10
Translocation (TRAN)	17

Figure 2. Top 30 Comment Summary Statements with the Highest Number of Comments



RESPONSES TO PUBLIC COMMENTS

NEPA requires government agencies to include in a Final EIS all the substantive comments received on the Draft. The Final document must include responses to the comments or comment summaries, and if changes to the Draft document are made as a result of those comments, indication of where they were made in the document.

This CAR provides a summary of the public comments and NMFS's responses to those comments on the Draft PEIS. Some public comments have been be responded to in their entirety within this CAR; other public comments refer readers to sections of the Final PEIS that provide additional information related to the comment. The Executive Summary of the Final PEIS summarizes where changes to the PEIS were made based on public comments. Responses to comments are organized by Comment Summary Statements and their associated code *(i.e.,* ALT 01).

To find responses to specific comments summarized in this section:

1. Look up the name of the organization's or individual's name in the Submission Index.
2. Note the Comment Summary Statement or Statements (*i.e.,* ALT 05, BEH 02, etc.) associated with that submission.
3. Return to this section to read the response.

ALT Alternatives

ALT 01 Comments in support of Alternative 1 Status Quo (no rationale provided).

Response: Despite the fact that Alternative 1 does address many of the Recovery Plan objectives (see Section 3.3.1.8) to varying degrees, Status Quo efforts have not reversed the decline. In addition, mitigation of disease risk and reduction of unmanageable human-seal interactions would be very limited under Alternative 1 measures.

ALT 02 Comments in support of Alternative 2 No Action, including comments that there would be no monk seal mortalities under this alternative because permitted take of seals would stop.

Response: The research and enhancement actions proposed in the Preferred Alternative would prevent far more mortalities than would be permitted as takes. The lack of future research and enhancement permits under Alternative 2 would likely result in higher monk seal mortality from the absence of activities like disentanglement or translocation of pups away from harmful situations. With the exception of activities that could be accomplished without permits, or those that are under the auspices of stranding response, none of the objectives of the Recovery Plan would be attained. Please also see response to ALT 16.

ALT 03 Comments in support of Alternative 3 Limited Translocation, including comments that prohibition of moving monk seals to the MHI would reduce undesirable human contact and comments that Alternative 3 is a win-win for monk seals and fishermen because it will help seals and allow fishermen to fish.

Response: While Alternative 4 was Preferred in the Draft PEIS, Alternative 3 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.

Implementing two-stage translocations from the NWHI to the MHI under Alternative 4 would be infeasible at this time. NWHI pups, if 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.

The necessary monitoring and intervention protocols are the same in Alternatives 3 and 4 and could be further developed under Alternative 3 (Preferred). NMFS would also conduct other 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. Some of these concerns were related to undesirable contact or interaction between humans and seals, which appear to be on the rise due to the naturally increasing population of monk seals in the MHI. This is occurring despite the fact that there are no current translocations to the MHI.

NMFS concluded 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.

As described in Section 5.6 of the Draft PEIS, NMFS has developed and disseminated guidelines for fishers and others to follow to prevent and mitigate human-seal interactions. Outreach and collaboration with fishers and other community members to further prevent and mitigate interactions was recommended in Draft PEIS Sections 5.6.3, 5.6.4 and 5.6.5. NMFS recognizes that even with effective guidelines, and outreach and collaboration in place, some human-seal interactions will likely still occur. In these cases, the most effective means of addressing this are the seal behavior modification measures proposed under both Alternatives 3 and 4.

In extreme cases, even seal behavior modification methods may not be effective and translocating seals away from populated areas may be necessary, and this measure is included in Alternatives 3 and 4. NMFS recognizes that no action or combination of actions proposed in the PEIS would completely eliminate the possibility of any and all human-seal interaction. NMFS believes that Alternative 3 (the Preferred Alternative) provides the best balance between actions to benefit monk seals while minimizing the impact of human-seal interactions.

In terms of adverse impacts on fishermen resulting from human-seal interactions, Sections 4.8.1 thru 4.8.3 in the Final PEIS (Environmental Consequences of the Alternatives on commercial, subsistence and recreational fisheries, respectively), have been revised to reflect a re-evaluation of potential impacts of the Alternatives on fisheries. This re-evaluation takes into consideration public comments, and additional information and analysis. Regarding the concern about

continuing to allow fishermen to fish, the proposed action would implement research and enhancement activities under existing authorities and no new fishing restrictions or regulations are proposed under any Alternative.

ALT 04 Comments in support of Alternative 4 Enhanced Implementation. This alternative is the best option to promote the survival of Hawaiian monk seals and gives scientists a flexible, complete set of management tools. The evaluation of Alternative 4 in the PEIS is thorough and thoughtful. Promotion of monk seal reproduction is necessary to prevent the extinction of the seals. The benefits of this alternative outweigh the risks.

Response: While Alternative 4 was Preferred in the Draft PEIS, Alternative 3 has been selected as the Preferred Alternative in the Final PEIS (see response to ALT 03). The 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.

Implementing two-stage translocations from the NWHI to the MHI under Alternative 4 would be infeasible at this time. NWHI pups, if 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.

The necessary monitoring and intervention protocols are the same in Alternatives 3 and 4 and could be further developed under Alternative 3 (Preferred). NMFS would also conduct other 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. Some of these concerns were related to undesirable contact or interaction between humans and seals, which appear to be on the rise due to the naturally increasing population of monk seals in the MHI. This is occurring despite the fact that there are no current translocations to the MHI.

NMFS concluded 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.

ALT 05 Comments opposing Alternative 2 No Action including comments that Alternative 2 does not do enough to help save Hawaiian monk seals.

Response: NMFS agrees that Alternative 2 would not contribute to Hawaiian monk seal recovery because all research and enhancement activities currently permitted would cease in 2014, and that higher monk seal mortality could further imperil the survival and recovery of the species in the absence of recovery activities, which is inconsistent with ESA and MMPA objectives.

ALT 06 Comments opposing Alternative 1 Status Quo including comments that Alternative 1 does not help protect Hawaiian monk seals.

Response: NMFS agrees that although Alternative 1 does address many of the Recovery Plan objectives (see Section 3.3.1.8) to varying degrees, Status Quo efforts have not reversed the decline and are unlikely to be sufficient in the future unless supplemented by additional interventions.

ALT 07 Comments opposing Alternative 3 Limited Translocation because it subjects seals to testing for a long time.

Response: NMFS' priority for this program is monk seal recovery, by enhancing the long-term survival of the species. All NMFS activities that involve "take" of monk seals (whether associated with research or enhancement activities) must be authorized under the ESA and MMPA. NMFS has conducted scientifically rigorous controlled studies and believes that its activities are safe for monk seals and do not cause adverse impacts on the monk seal population (Baker and Johanos 2002). Any permits issued would contain mitigation measures to avoid and minimize adverse impacts to individual monk seals and the population.

ALT 08 Comments opposing Alternative 4 Enhanced Implementation (no rationale given).

Response: NMFS acknowledges that some comments received did not support Alternative 4 as the Preferred Alternative. While Alternative 4 was Preferred in the Draft PEIS, Alternative 3 has been selected as the Preferred Alternative in the Final PEIS (see response to ALT 03 and Alt04). The 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.

Implementing two-stage translocations from the NWHI to the MHI under Alternative 4 would be infeasible at this time. NWHI pups, if 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.

ALT 09 NMFS needs to evaluate predator removal or supplemental feeding in the NWHI more thoroughly as alternatives in the PEIS. The PEIS is incomplete without considering these concepts and the rationale that there is a "lack of sufficient information" used to dismiss this alternative is inadequate. What is so hard about managing predators? Open up fishing in the NWHI.

Response: NMFS has considered reduction of competition and predation (Final PEIS Section 2.12.1) to benefit monk seals. With regard to competition, 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 the preferred alternative, 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 Need of this PEIS.

Removal of sharks that prey on seal pups at French Frigate Shoals has already been permitted and has been subject to the NEPA process, and the actions subject to this PEIS would complement these ongoing actions. Information regarding the effectiveness of predator removal is still being developed, and such activities alone are not expected to reverse the decline of the monk seal population.

NMFS has evaluated supplemental feeding and included the potential for feeding seals released to the wild in the NWHI after captive care in Alternatives 3 and 4. NEPA requires us to discuss a reasonable range of alternatives to the proposed action. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint, using common sense. Constructing and operating a captive facility (where monk seals could be fed) in the remote NWHI (Final PEIS Section 2.12.2) is not being analyzed because it is deemed logistically and economically infeasible. Furthermore, even assuming the necessary funding and

technical support to build such a facility, the immediate need for monk seal recovery efforts, makes such an approach impractical and would not meet the purpose and need for the action (see also response to ALT 14).

ALT 10 I do not support reducing populations of large predatory fish.

Response: Limited removal of Galapagos sharks is currently permitted in some areas of the NWHI (i.e., French Frigate Shoals) to reduce direct predation on monk seals. The potential effectiveness of large-scale removal of large predatory fish (such as sharks and jacks) that compete with juvenile monk seals for food is uncertain. 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 Need of this PEIS. It is uncertain whether such action would necessarily benefit monk seals without having other unanticipated and undesirable environmental consequences. This proposed action addresses research and enhancement activities under ESA and MMPA that are currently authorized and that may result in directed take of monk seals for the purpose of enhancing the species' survival and recovery. Please see the response to ALT09 for additional information.

ALT 11 No alternative should include moving seals from the NWHI to the MHI. If seals move here of their own accord, that is acceptable but NMFS should not be moving seals. NMFS should focus their resources on building a healthy population of Hawaiian monk seals that should be kept in the NWHI. NMFS should focus on where seals are born before managing seals in the MHI.

Response: NMFS is focused on building healthy populations of monk seals throughout the species' range, including both the NWHI and MHI. In the Draft PEIS, Alternative 4 was Preferred. However, Alternative 3 has been selected as the Preferred Alternative in the Final PEIS (see response to ALT 03). Despite this, Alternative 4 meets the Purpose and Need for this PEIS and is therefore included for analysis. The 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.

Implementing two-stage translocations from the NWHI to the MHI under Alternative 4 would be infeasible at this time. NWHI pups, if 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.

ALT 12 Using Palmyra as a wildlife refuge for monk seals should be considered a viable alternative in the PEIS. NMFS should consider restoring the historic range of the population of Hawaiian monk seals to Johnston Atoll, Christmas Island, Bismarck Island Chain or Kiribati Island.

Response: The known historical range of Hawaiian monk seals includes only the Hawaiian Archipelago and Johnston Atoll (Section 3.3.1.1), areas of which comprise the project area for this PEIS. There are no known sightings of monk seals at Palmyra, Christmas Island, the Bismarck Archipelago, nor Kiribati. Translocations to Johnston Atoll could occur under Alternatives 3 and 4, but if undertaken, would be done with much caution. Johnston Atoll is considered part of the monk seal's natural range, because of sporadic sightings of seals there over the past several decades. However, Johnston Atoll has never been known to host a self-sustaining population of seals. Monk seals do not seem to persist at Johnston Atoll for long periods and adult males that have been translocated to the atoll have not remained there very long (Baker et al. 2011). It may be that Johnston Atoll is not well suited as monk seal habitat, or perhaps there simply have not been enough seals to achieve the social cohesion necessary for a sustained resident monk seal population. NMFS has not dismissed the potential for a Johnston Atoll seal population and translocations to this site could occur as part of the proposed action.

ALT 13 Until cumulative effects of the entire Hawaiian monk seal recovery program as well as other NMFS management actions such as designating monk seal critical habitat and including monk seals in the Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS) are addressed, only Alternative 2 No Action can be supported.

Response: Please see the response to CEF 01.

ALT 14 NMFS should consider building a facility in the NWHI to help Hawaiian monk seals. The PEIS states that this alternative would be cost prohibitive and logistically challenging but how much will the proposed two-stage translocation cost? The PEIS does not include how much translocation will cost. NMFS can't say one alternative is cost prohibitive and another isn't if the costs are not presented in the PEIS.

Response: NMFS does not expect to incur substantial costs above the fiscal year 2009-2010 program operating budgets to begin implementing the translocation plan. This is especially true because Alternative 3 has been selected as the Preferred Alternative in the Final PEIS (please see response to Alt 11). By foregoing the option to conduct two-stage translocation between the NWHI and MHI, some costs associated with monitoring, mitigating human- and translocated-seal interactions, and perhaps quarantine costs may be reduced. NMFS has a history of successful translocations between islands in the NWHI (Baker et al. 2011). The proposed translocation plan has a strong foundation in science and the past experience of the research program. NMFS is confident that

the translocations proposed under Preferred Alternative 3 could be accomplished within the existing field program infrastructure (i.e. using existing staff hired for the field camps, already-scheduled cruises to deploy and pick-up the field camps).

On the other hand, the concept of building a facility in the NWHI to provide long-term care for Hawaiian monk seals in captivity is logistically and economically infeasible at this time. The NWHI have been designated as the Papahānaumokuākea Marine National Monument, as well as a United Nations World Heritage Site. Human impacts in the Monument are minimized and heavily regulated to protect the native ecosystem. All access is subject to strict permitting requirements. Construction of a facility to hold monk seals in captivity in the NWHI could theoretically be possible at a site such as Midway Atoll, which has a working runway and other infrastructure. However, given the immediate need for monk seal recovery efforts and the many years that would be required to plan, permit, build and fund such a facility in the NWHI (if it could even be done), such an approach is impractical and does not meet the Purpose and Need of this PEIS. NMFS has provided additional discussion of the alternatives considered but not carried forward in the Final PEIS (PEIS Section 2.12).

ALT 15 I support Alternative 3 but am concerned about some of the intrusive research that it includes.

Response: Section 1.5 lists all the federal laws that NMFS researchers must abide by in order to do intrusive research on monk seals. Laws such as the Animal Welfare Act (AWA), MMPA, and ESA include strict requirements for minimizing impacts on the seals from research. The AWA requires that research on mammals be overseen by an Institutional Animal Care and Use Committee (IACUC), as described in Section 2.11.7 of the Final PEIS. For Hawaiian monk seal research, NMFS uses the IACUC established by the University of Hawai'i (UH) in addition to the NMFS IACUC as a form of independent review and because UH personnel are involved in much of the research. The purpose and functions of the IACUC include such things as inspecting and reporting on the facilities program for humane care and use of research animals; investigating complaints concerning animal welfare; and suspending activities related to the care and use of animals if deemed necessary.

Obtaining an ESA-MMPA permit to do research on an endangered marine mammal is a rigorous process that involves reviews by outside experts, including veterinarians and scientists. The ESA and MMPA permitting requirements are summarized in Section 2.11. These include, among other things, a requirement that the research activity is conducted in a humane manner and does not present unnecessary risks to the health and welfare of marine mammals. Humane methods are those involving the least amount of pain and suffering as is

practicable. ESA-MMPA permits contain numerous conditions to minimize impacts to the seals from research. These are listed in Section 2.11 of the Final PEIS.

ALT 16 We support Alternative 2 because it will allow time for the NWHI to recover from overfishing and allow NMFS to stand back and reevaluate other alternatives available. Alternative 2 also reduces NMFS's expenditures while preparing for the future when Permit 10137 expires. Alternative 2 would protect monk seals from human intervention and decrease human contact, which might be best.

Response: It is unclear whether fishing in the NWHI had an effect on monk seal foraging success, survival, and recovery. The cessation of the lobster fishery has apparently not resulted in a significant recovery of lobster stocks. The closure of the NWHI bottomfish fishery may result in an increase of those prey resources for monk seals, but it is not certain. What is certain is that the population of monk seals is continuing to decline in the NWHI. Without an ambitious recovery program, the population may decline to a point where recovery is highly unlikely. The activities proposed in the Preferred Alternative aim to increase the number of seals in the population and mitigate sources of mortality. Alternative 2 would not allow NMFS and its partners to implement the proposed behavior modification program and fisheries impact mitigation program, both proposed in the Preferred Alternative. Moreover, selection of Alternative 2 would result in the cessation of research and enhancement activities that have proven beneficial to the species in the past and prohibit the most promising new activities proposed for the future. NMFS would also be unable under Alternative 2 to evaluate population trends and know whether the various populations were recovering or declining further. Under the preferred alternative, NMFS would have the authorization to intervene at the appropriate level to foster the species recovery. Please also see response to ALT 02.

ALT 17 The evaluation of Alternative 4 in the PEIS is problematic. The PEIS states that potential impacts on commercial, subsistence, and recreational fishing of bringing 200 more seals to the MHI would be negligible. But the Federal Register notice for monk seal critical habitat states that this number of monk seals may impact the amount of prey species; therefore, there may be restrictions on the spatial and temporal extent of commercial fisheries.

Response: As noted above, while Alternative 4 was Preferred in the Draft PEIS, Alternative 3 has been selected as the Preferred Alternative in the Final PEIS (please see response to Alt 03). Nevertheless, please note that Sections 4.8.1 thru 4.8.3 in the Final PEIS (Environmental Consequences of the Alternatives on commercial, subsistence and recreational fisheries, respectively), have been revised to reflect a re-evaluation of potential impacts of the Alternatives on fisheries.

This re-evaluation takes into consideration public comments, and additional information and analysis. The re-evaluation still leads to the conclusion that Alternative 4 would have negligible impacts on fisheries. Implementation of Alternative 4, if selected, would result in a maximum of 60 temporarily translocated seals in the MHI at any given time (Section 4.8.1.4 of PEIS). While under Alternative 4 a total of 200 weaned pups could be translocated to the MHI from the NWHI over a 10-year period, at most only 60 of these seals would be in the MHI at any given time since they would be returned to the NWHI when they reach 2 or 3 years of age. The analysis associated with the proposed rule to re-designate critical habitat for Hawaiian monk seals is based on the entire population of Hawaiian monk seals, including the naturally occurring population in the MHI, which exceeds the number of seals that could be temporarily translocated under the 2-stage translocation action included in Alternative 4.

In Section 4.8.1 of the Final PEIS, we acknowledge that additional fish consumption by seals may occur if seals were translocated to the MHI. However, Hawaiian monk seals are known to prey on a wide variety of fishes, cephalopods (e.g., octopus), and crustaceans (e.g., crabs), some of which are not eaten or used by people. Further, fish eaten by monk seals would not necessarily have otherwise been available to fishermen. For example, those fish may have been eaten by another predatory fish, seabird, or marine mammal. Hawaiian monk seals are also known to forage over a wide range of areas, both in terms of depth and variety of habitats, many of which are not used by commercial fishermen.

The proposed rule to revise critical habitat and the PEIS are two separate monk seal conservation initiatives under consideration by NMFS. The ESA requires that NMFS consider the economic impacts of a critical habitat designation. This separate process is ongoing, and no final decision as to critical habitat has been made.

In the Final PEIS, Sections 4.8.1 thru 4.8.3 (Environmental Consequences of the Alternatives on commercial, subsistence and recreational fisheries, respectively), have been revised to reflect a re-evaluation of potential impacts of the Alternatives on fisheries. As part of the cumulative impact assessment on the socioeconomic environment in the Final PEIS, NMFS has also re-evaluated the impacts to fisheries that may result from the proposed research and enhancement activities and the critical habitat designation. Updates regarding the critical habitat designation may be found at:
http://www.fpir.noaa.gov/PRD/prd_critical_habitat.html.

ALT 18 Though it may be out of the scope of the PEIS, NMFS should address juvenile survival and starvation through more focused management of fishery resources. The recovery of key prey species is vital as this important food resource is currently depleted. For example, stocking depleted lobster stocks or enhancing prey habitat might boost prey recovery.

Response: This PEIS only applies to activities that involve direct interaction with monk seals requiring an ESA/MMPA permit, and general modification to fisheries resources management is not included in the alternatives considered. Although NMFS agrees that an effective monk seal conservation program would draw from and incorporate other management programs, at this point it is speculative to conclude that the recommended actions would enhance recovery of the monk seal.

There is currently no evidence that stocking depleted lobster stocks would enhance monk seal recovery, or that it would address the purpose and need identified in this PEIS. As described under the response to ALT 16, there is currently a lack of sufficient information on NWHI food web dynamics to reliably predict whether stocking lobster would be an effective method for improving juvenile monk seal survival without unintended consequences. Please also refer to Section 2.12 in the PEIS for more discussion related to this comment.

ALT 19 Is the reason NMFS wants to bring seals to the MHI because no researchers want to live up in the NWHI where there are no cars or facilities?

Response: NMFS researchers do spend several months each year living in the NWHI in very rudimentary field camps. Each year, the number of researchers applying for temporary field camp jobs far exceeds the number of vacant positions. The lack of cars and facilities in the NWHI was unrelated to selection of translocation source or recipient sites (see Appendix F of Final PEIS).

ALT 20 We support components of Alternatives 3 and 4 including: partnering with the State to develop a detailed outreach plan; consultation with the Department of Land and Natural Resources (DLNR) to identify translocation sites; a detailed monitoring plan; improved messaging plan emphasizing that translocation would be a pilot program; frequent communication with the State and development of a communication plan to alert State authorities for coordinating monitoring, outreach, and enforcement, and direct involvement in NOAA's decision framework.

Response: NMFS values its ongoing partnerships with DLNR and other state agencies regarding Hawaiian monk seal recovery, and will continue to place these partnerships among its highest priorities. This partnership entails developing and implementing all of the elements (outreach plan, etc.) listed in this comment. NMFS has provided a grant to DLNR under Section 6 of the ESA to help support DLNR's involvement in some of this work. See Section 5.6 of the PEIS for more

description of how NMFS intends to work in collaboration with DLNR and other partner agencies and stakeholders.

ALT 21 The principal threats described in the 2007 Hawaiian Monk Seal Recovery Plan and the biological and ecological factors limiting monk seal recovery are not sufficiently addressed by any of the proposed alternatives. Merely increasing the scope of research is not a sufficient way to address the decline.

Response: NMFS believes that the actions proposed in Alternative 3 and 4 do more than merely increase the scope of research, they also propose new enhancement activities designed to increase the survival of the species. Research by itself is an important component of any effective long-term recovery action. In addition to necessary research, NMFS is also undertaking enhancement activities that will provide a more immediate conservation benefit. For example, there are several important new actions, including vaccinations (Appendix E of Final PEIS), seal behavioral modification (Section 2.5), and temporary 2-stage translocation (Appendices F and G of Final PEIS), that have been carefully developed and evaluated by NMFS and its scientific research partners to be the most promising and feasible actions that can be taken to address the principal threats described in the recovery plan. These threats include infectious disease, poor juvenile survival (food limitation), and human-seal interactions.

ALT 22 The controversial component of Alternative 4, translocation of seals to the MHI, is misunderstood. Only a limited number of female pups would be brought to the MHI and then after three years, would be returned to the NWHI. This would not result in a noticeable increase of seals in the MHI.

Response: As noted previously (please see response to Alt 03), NMFS has selected Alternative 3 as the Preferred Alternative in the Final PEIS, which precludes translocating weaned pups from the NWHI to the MHI as part of two-stage translocation.

Implementing two-stage translocations from the NWHI to the MHI under Alternative 4 would be infeasible at this time. NWHI pups, if 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.

ALT 23 The proposed alternatives are just modified versions of management actions already in place that have not reduced the decline in the monk seal population. NMFS should consider more management options.

Response: NMFS agrees that many elements of the alternatives are research and enhancement (or management) actions that have been in place for varying periods of time. Because this is a Programmatic EIS, all proposed actions requiring a permit under the MMPA or ESA and not otherwise covered under other NEPA documents, including those elements already in existence and new activities, are evaluated. NMFS disagrees that past actions have not reduced the rate of decline of the monk seal population. Actions such as disentanglement, de-hooking, mitigation of male aggression, and translocation have been successfully used to prevent monk seal mortalities. We acknowledge that past actions have been insufficient to halt or reverse the population decline, but NMFS contends that its actions have slowed the decline compared to what it would have otherwise been.

NMFS believes that an effective conservation program consisting of past actions that have proven successful in conjunction with previously unused methods is necessary to mitigate and reverse the population decline. For example, vaccination (Appendix E of Final PEIS), behavioral modification (Section 2.5), two-stage translocation (as described in Appendices F and G of Final PEIS and limited to the scope of the Preferred Alternative 3), and supplemental feeding (Section 2.5) are all programs and actions that currently do not exist. Further, NMFS will continue its efforts to identify new management options that may be effective in arresting the decline. Any new management options not covered by this PEIS will be fully analyzed in future NEPA evaluations.

BEH Behavior Modification

BEH 01 Hawaiian monk seals that have shown aggressive behavior should not be euthanized. Euthanizing seals is disrespectful and should not happen.

Response: Although every animal is important in a small population that continues to decline, concern for the overall species must be our priority. Since extremely aggressive males can threaten the lives of young seals, including the young females crucial to the species' future survival, the Recovery Plan for the Hawaiian Monk Seal (NMFS 2007) identifies male aggression as a threat to the species, and every option has to be explored to reduce the threat.

Available information confirms that increasing the rate of female pup survival is essential to achieving population recovery, given the reproductive potential that the female contributes to the species. Males are generally less essential to ensuring population viability, and when males injure or harm female pups, removal of the male from the population is more easily tolerated. In these extreme cases, there may be no other available option; but the decision to lethally remove an animal is

only made after careful evaluation of the situation and after exhausting all other available options (*e.g.* translocation to an alternate site as long as other seals would not be endangered, removal to permanent captivity, or administration of medicine to alter aggressive behavior). If seals are euthanized, the methods used must be in accordance with the American Veterinary Medical Association's guidelines on euthanasia (AVMA 2013) and in a humane manner that involves the least possible degree of pain and suffering possible to the animal involved (50 CFR 216.3).

BEH 02 How does NMFS know that behavior modification or chemical alteration of aggressive male behavior will work? Why can't NMFS just move seals instead of injecting them with chemicals? What happens if seals that are not aggressive are given hormones? NMFS has stated they want to keep wild seals wild but injecting chemicals does not uphold this statement.

Response: NMFS does not and cannot know whether behavioral modification or chemical treatment of aggressive males will have the desired effect until these methods are tried. Promising methods, especially those that have been successful in other species, will be tried in an experimental fashion (*e.g.*, on captive seals) and the results interpreted to refine methods (Section 2.5). Any techniques that have risks will be employed cautiously until they are proven safe.

Aggressive males may still be moved (translocated), brought into captivity, or euthanized to mitigate injury and mortality to other seals. All of these methods have some disadvantages. For example, translocation can be expensive, slow, and logistically complicated. Further, there is often no good location to bring an aggressive male where he will not pose a threat to other seals.

As described in Section 2.5, it is desirable to develop an alternative tool for mitigating male aggression that is effective, humane, feasible, affordable, and reversible. Gonadotropin-releasing hormone (GnRH)-inhibiting drugs have been used to successfully suppress aggressive behavior in other species, and NMFS believes it is worthwhile to explore their efficacy in monk seals. NMFS would not give GnRH-inhibiting drugs to seals unless there is compelling evidence that the seal has been involved in aggressive behavior that is a threat to adult females or young animals of either sex.

Aggressive males are identified based on field observations that document an individual male's involvement in multiple aggressive interactions. NMFS only intervenes with aggressive males when their behavior is extreme and a strong threat to other seals. While NMFS acknowledges that use of chemical remedies is not generally desirable, the alternative methods (translocation, captivity, lethal removal) are all arguably more extreme than successful chemical treatment would be. The latter would allow seals to remain living wild in their native habitat without presenting a persistent threat to other seals' survival.

BEH 03 The behavior modification program will be important for the future of Hawaiian monk seals in the MHI independent of the two-stage translocation program. The population of Hawaiian monk seals is naturally increasing in the MHI, therefore interactions between humans and seals are also increasing. Given this, NMFS should reevaluate the lack of behavior modification under Alternative 2 which would likely result in a negative impact on the human environment.

Response: NMFS agrees that behavioral management of monk seals in the MHI will be important as the population continues to naturally increase. The Final PEIS evaluates the potential impacts of both Alternatives 1 and 2 on the social and economic environment (Section 4.8), taking into account the naturally increasing monk seal population in the MHI, and the lack of a behavioral management program in those two alternatives. The discussion of impacts of Alternatives 1 and 2 stresses that numerous activities to promote monk seal recovery would not be accomplished under these alternatives, including reducing unmanageable human-seal interactions.

BEH 04 Behavior modification talks about keeping wild seals wild. Bringing seals to the MHI is not keeping wild seals wild, it's intermingling them.

Response: NMFS recognizes that it is generally desirable to avoid habituating wild animals, including monk seals, to human presence. Of the nearly 200 monk seals currently in the MHI, there are only a few that have displayed behaviors that we would consider "socialized" or "conditioned" to humans. NMFS acknowledges that some seals may also have an impact on local fishermen. For this reason, behavior modification is proposed under Alternatives 3 and 4 to help minimize potential interactions between seals and humans.

As a percentage of the whole MHI population, most seals in the MHI behave like other wild seals in the NWHI and tolerate humans at a reasonable distance, but do not seek out human interaction. Moreover, under Alternative 3 (Preferred), NMFS will not be bringing weaned pups from the NWHI and releasing them in the MHI (see response to Alt 03).

The Final PEIS Section 5.4 describes the plans for developing a detailed behavioral management program, and as described in Chapter 5.6, NMFS will continue to work with its state partners and the volunteer response programs to monitor seals and intervene if seals begin displaying potentially problematic behavior.

BEH 05 There must be a better alternative than chemical alteration of seals. Please do not chemically manipulate young male seals.

Response: See responses to BEH 1 and BEH 2. NMFS acknowledges that chemical alteration of aggressive behavior is not ideal, and is not the first option for dealing with aggressive male seals. Aggressive interactions between adult male seals and smaller seals are normal (in a variety of species, not just monk

seals), and often leads to scratches and relatively minor bite wounds. However, adult male aggression is of particular concern when the perpetrator displays an aberrant focus on young animals, with frequent, repeated, and severely aggressive behavior that threatens the young animals' life. The extreme aggression that has been documented is highly unusual behavior amongst monk seals in Hawaii and cannot be well explained, but previous experience shows that the impact of such aggression on smaller seals can be considerable and life threatening.

The Recovery Plan for the Hawaiian Monk Seal (NMFS 2007) directs NMFS to mitigate male aggression, and NMFS has been encouraged to explore non-lethal options. In cases where a male seal is extremely aggressive and causing injuries and death of young seals, if medication can be shown to safely alter extreme aggressive behavior, that option would be considered a viable, temporary alternative to euthanizing the seal.

BEH 06 Comments in support of conducting research on effective physical or chemical deterrents and other behavior changing techniques. Specific suggestions on techniques that could be used for behavior modification such as air horns.

Response: NMFS anticipates that the behavior modification protocols will include a suite of techniques that are adapted to each unique situation, implemented according to specific guidelines. In identifying what techniques may be suitable, NMFS has, and will continue to, avail itself of the published literature in this field and to consult with experts in aversive conditioning and behavior modification as applied to other captive and wild populations. Sections 2.5 and 5.4 of the Final PEIS provide additional information on behavior modification and aversive conditioning.

BEH 07 Behavior modification seems unlikely unless seals are placed in captivity.

Response: See response to BEH 02. The outcome of behavior modification research is not certain, but there is a need to have tools to respond to seals exhibiting undesirable behaviors that will allow them to remain in the wild population. Limited behavior modification techniques used on Hawaiian monk seals thus far have been successful and behavior modification has also been used successfully on other species including black bears (Mazur 2010). In some cases, seals may be placed in temporary captivity (e.g., to test taste aversion methods), but the majority of behavioral modification techniques would need to be used on seals in the wild to be effective. In addition, seals already in permanent captivity could be used to test behavioral modification techniques.

BEH 08 Comments opposed to behavior modification of seals - instead, behavior modification should focus on humans.

Response: NMFS recognizes that some undesirable seal behaviors and human-seal interactions are a consequence of seals that have received food, social interaction, or other rewards from people. In those cases, some modifications in human behaviors are also necessary to ensure that the undesirable interactions are eliminated. To this end, NMFS will continue to work with partners and community groups to develop public outreach to inform ocean users of how to avoid conditioning seals to human interaction. However, not all undesirable seal behaviors develop because humans are providing rewards or deliberately engaging with seals - in some cases the interactions are initiated by the seals. Regardless of the origin of the undesirable behavior, some behavior modification or other intervention is often necessary to extinguish the behavior and maintain the seal in the population.

BEH 09 Intensive efforts of the NMFS Monk Seal Response Team volunteers to "protect" nursing mothers has effectively modified their behavior by interfering with birthing and rearing seals.

Response: The NMFS proposed actions involving "behavior management" or "behavioral modification" in this PEIS all refer to actions that would directly involve "take," or direct interaction with Hawaiian monk seals to modify the seals' behaviors. The efforts to put up signs and educate the public by the Marine Mammal Response Network members do not fall into this category and are covered by the NMFS Marine Mammal Health and Stranding Response Program, separate from the action alternatives in this PEIS. Members put up signs to notify beachgoers that a seal is resting or nursing a pup, and to provide education and information about monk seals to visitors and residents. These efforts often prevent seals from being disturbed and scared into the water (either intentionally or unintentionally) by humans or domestic animals, and help keep humans safe by providing a recommended distance to stay back from the seals. We considered the impact of the proposed action together with other monk seal conservation activities, including volunteer outreach, in the cumulative impact analysis of the Final PEIS.

NMFS is unaware of any evidence that actions taken by members of the Marine Mammal Response Network to protect nursing mothers has an adverse effect on seal behavior or affects a seal's choice of beach haul-out location in the future. NMFS places signs and, in some cases, temporary fencing, in order to protect seal pups and mothers through weaning, a critical stage in pup survival.

BIO Hawaiian Monk Seal Biology

BIO 01 NMFS says Hawaiian monk seals don't stay in one area to feed but I see seals with the same tag on them in one area all the time, pounding the same area every week.

Response: It is true that certain seals tend to rest on land at particular sites that they return to frequently. However, studies of at-sea movements of seals in the MHI using Global Positioning System (GPS)- and satellite-linked transmitters, show that over time periods of weeks or months, seals tend to use foraging habitats spread all around an island and even often make trips between islands. While seals certainly do revisit the same foraging areas over time, it would not likely be a good strategy for them to continuously feed in the exact same area. Knowledge about how all kinds of animals, including seals, forage suggests that they feed in a prey area until their success falls to a certain level, and then they move on to another area. Despite the above, it is understandable how one could get the impression that seals are using the same area over and over. Because seals tend to come to rest on the same beaches, they traverse the waters near shore to get to and from their resting spots. However, when we examine the individual seal's behavior on a longer time scale, their typical use of wider foraging grounds is evident.

BIO 02 People must remember that NMFS is proposing to translocate pups that are much smaller and eat maybe 30 to 50 percent less than adult seals. So the amount of fish the pups could eat is far less than adults. Also, seals forage on other species in addition to those sought by fishermen.

Response: NMFS agrees with these statements and covered these topics in Sections 3.3.1.5, 4.8.5.1 and 4.9.1 of the Draft PEIS. As stated in Draft PEIS Section 4.9.1, a juvenile Hawaiian monk seal may weigh approximately 250 pounds while an adult seal may reach up to 600 pounds. Thus, the amount of fish a juvenile seal is expected to eat is much less than an adult. Despite their size, given the wide variety of fish consumed by monk seals, the likelihood that seal predation on fish could cause a long-term decline in fish populations is unlikely. Hawaiian monk seals are known to prey on a wide variety of fishes, cephalopods (e.g., octopus), and crustaceans (e.g., crabs), some of which are not generally eaten by people. Hawaiian monk seals are also known to forage over a wide range of areas, both in terms of depth and variety of habitats, many of which are not used by fishermen.

Sections 4.8.1 thru 4.8.3 in the Final PEIS (Environmental Consequences of the Alternatives on commercial, subsistence and recreational fisheries, respectively), have been revised to reflect a re-evaluation of potential impacts of the alternatives on fisheries. This re-evaluation takes into consideration public comments, and additional information and analysis. Consistent with the Draft PEIS, the re-evaluation concluded that all PEIS alternatives would have negligible effects on fisheries. Nevertheless, for reasons described in the response to Alt 03, the

Preferred Alternative (Alternative 3) in the Final PEIS does not include translocation of weaned pups from the NWHI for release in the MHI.

BIO 03 Please address gender balance of seals in the PEIS. NMFS talks about translocating female pups but does not mention whether or if there tend to be more males born than females. Sometimes sex ratios of species change when under stress.

Response: Sex ratios at birth in a given year at a given site can be predominantly male or female; however, the average sex ratio of pups over time and across subpopulations is close to 50:50. At several places in Appendix F of Final PEIS (summarized in Table E-1), NMFS addresses the possibility that translocating female pups could lead to male-biased sex ratios at the source subpopulation. In summary, temporarily translocated weaned female pups will be returned to natal or nearby sites prior to sexual maturity. Presumably they will have experienced higher survival than (non-translocated) males, and therefore the two-stage translocation should ultimately result in some female bias for affected cohorts. Alternately, if in fact the translocated females fare poorer than their male counterparts or cannot be repatriated for any reason, weaned pup translocations would be suspended as described in the decision framework. This could result in male bias for a few affected cohorts, but this would be a small portion of the total population.

BIO 04 The PEIS does not discuss how many of the seals that have been translocated to the MHI already are surviving. What will be the measure of success; how many seals?

Response: The only seals that have been translocated to the MHI from the NWHI were 21 adult males brought to the MHI from Laysan Island in 1994 (see Section 3.3.1.7). These seals exhibited high survival rates, which is normal for adult seals (Baker et al. 2011). However, the expected survival rates of temporarily translocated weaned pups and subadults (Alternatives 3 and 4) may be different than that of the previously translocated adults because younger animals naturally have lower survival rates compared to adults. For a review of NMFS' history of translocations, including moving seals of different ages a variety of distances, see Baker et al. (2011).

Metrics for assessing the success of translocations are described in Section 4.7.1.16 and Appendix F of Final PEIS. They involve a variety of comparisons of abundance, survival, and population status. While Alternative 4 was Preferred in the Draft PEIS, Alternative 3 has been selected as the Preferred Alternative in the Final PEIS (see response to ALT 03). The distinction between these two Alternatives is that Alternative 3 does not include any two-stage translocation option that would involve taking weaned pups from the NWHI and releasing them in the MHI. However, a variety of translocation actions could occur under the Preferred

Alternative, including two-stage translocation *within* the NWHI, *within* the MHI, or from the MHI to the NWHI.

Any translocation program would continue only if successful, with any increase in numbers of translocated seals carefully managed. We would consider two-stage translocation to be successful if:

- Survival of young seals moved temporarily to a host subpopulation is better than survival of comparable seals in the subpopulation from which they came;
- Survival of seals returned to their birth subpopulation is better than the survival of comparable seals in the same subpopulation that were not translocated; and
- NMFS is able to capture and return all surviving translocated seals.

BIO 05 NMFS has stated that predation and disease are major factors for seals declining in the NWHI. What is to stop predation and disease from affecting seals in the MHI? Is the impact of fisheries interactions in the MHI less of a threat than food limitation and predation in the NWHI?

Response: Galapagos shark predation is a major source of mortality to pups only at French Frigate Shoals, contributing to the decline of that subpopulation (Section 3.3.1.7). Tiger sharks are known to prey on monk seals, but NMFS stated in Section 3.3.1.7 that the exact amount or extent of mortality due to tiger shark predation is not known because the predation event usually occurs away from shore. It is possible that predation could affect seals in the MHI to a greater degree sometime in the future; however, this is unlikely because large shark population density is much lower in the MHI due to fishing pressure, compared to the NWHI (Friedlander and DeMartini 2002). NMFS has not stated that infectious disease (as opposed to emaciation and starvation due to food limitation) is a major factor contributing to the decline in the NWHI. Rather, NMFS is concerned about the potential effects of future disease outbreaks.

Section 2.5 of the PEIS states: "Current information suggests infectious disease is not limiting recovery of the Hawaiian monk seal. However, the species is rare, has very low genetic diversity, and may have been buffered from exposure to many mammalian diseases due to its isolation in the Hawaiian Archipelago for millions of years. Together, these factors raise great concern that outbreaks of diseases to which monk seals have not been previously exposed could have devastating impacts." Disease outbreaks could occur anywhere in the monk seal's range, but may be more of a risk in the MHI where there is greater exposure to potential disease carriers (i.e., vectors)(Section 5.3 of Final PEIS). Concern about disease is the motivation for ongoing disease monitoring research (Section 2.5 of Final PEIS), the proposed vaccination plan (Appendix E of Final PEIS), and the proposed health screening and quarantine protocols to accompany translocation (Appendix G of Final PEIS).

The impact of fisheries interactions is thought to be less of a threat in the MHI than food limitation and predation (from Galapagos sharks at French Frigate Shoals only) in the NWHI. Despite fishery interactions ongoing in the MHI, the seal population is growing robustly, whereas the NWHI populations are mostly declining. Because these threats are dynamic and their relative importance could change in the future, an active research and population monitoring program is essential to detect, diagnose, and, if feasible, mitigate significant threats to recovery.

BIO 06 Hawaiian monk seals grub along the bottom of the ocean like pigs when they eat. This destroys microbes and coral and affects what you call "rubbish" fish that actually keep the reef healthy. This action is going to endanger fish populations in the MHI.

Response: While monk seals do feed on the sea floor, there is no evidence that their foraging behavior negatively impacts corals, microbes, reef health, or reef fish populations. In fact, by many measures, NWHI coral reef ecosystems, where the vast majority of monk seals have long persisted, tend to be much healthier with more robust reef fish populations compared to the MHI where there are relatively few seals.

BIO 07 I don't know why monk seals are called "Hawaiian" monk seals. There is no historic evidence of monk seals or cultural reference to them. Who can validate whether they are native or not? Monk seals exist in the MHI because they were transplanted here in the 1990s by researchers.

Response: Hawaiian monk seals are named so because they are endemic to the Hawaiian Islands Archipelago, and found nowhere else on earth. As described in Appendices B and K, there are historic and cultural records of Hawaiian monk seals across the NWHI and MHI from many sources including Hawaiian- and English-language newspapers (1800-1900s), ships' logs (e.g. King Kamehameha IV saw several seals on Nihoa in 1857), naturalist logs (e.g. seal killed in Hilo in 1900), and oral traditions and place names. NMFS did translocate 21 male seals from Laysan Island to the MHI in the 1990s because of problems at Laysan with aggression toward female and juvenile seals. Seals already existed in the MHI at that time. Regardless, the translocation of males alone could not have established a breeding population in the MHI, as females were not translocated with the males.

BIO 08 Hawaiian monk seals are endemic to Hawai'i and there is no doubt they are the most kupuna mammals here in the islands. Monk seals are here in the MHI naturally.

Response: NMFS agrees that based on all of the historical, biological, and physical evidence described in Appendices B and K monk seals are endemic to

the entire Hawaiian Archipelago (Section 3.3.1.1 and Appendices B and K of Final PEIS). Please also see response to BIO 07.

BIO 09 If monk seals are naturally increasing in the MHI, why mess that up by translocating them? Leave monk seals where they originated in the pristine sanctuary of the NWHI where there is more fish, they will not interact with humans, and can survive better.

Response: As explained in the response to comment ALT 03, NMFS has selected Alternative 3 as the Preferred Alternative in the Final PEIS. Alternative 3 does not allow for translocation of weaned pups from the NWHI for release in the MHI. Yet, it is worth noting that in Appendix E of the Draft PEIS, NMFS explained the rationale for two-stage translocation, which under Alternative 4 could involve moving some seals temporarily to the MHI from the NWHI. Under Alternative 4, two-stage translocations between the NWHI and MHI would not be expected to either increase or decrease the natural growth of the MHI seals. Translocated seals would have resided in the MHI for a few years, then been returned to their natal areas before they reached reproductive age, thus having no net effect on the number of seals living in the MHI permanently.

With regard to the comment that seals can survive better in the NWHI, information presented in Section 3.3.1.3 and Appendix E of the Draft PEIS (renamed Appendix F in Final PEIS) demonstrates that in fact monk seals in the NWHI typically have lower survival rates compared to the MHI.

BIO 10 As stated, in the last 10 years, monk seals have declined 40 percent. The 10 years before that, everything was fine so what happened in these last 10 years? This should be evaluated.

Response: NMFS would like to clarify that the overall abundance in the NWHI has declined on average for several decades (PEIS Section 3.3.1.3). To assess "current" rates of change in the overall population, NMFS uses the most recent 10 years of data. However, that does not mean that the decline only began 10 years ago. Known threats and mortality sources are described in Section 3.3.1.7 of the PEIS.

BIO 11 Given the behavioral plasticity and opportunistic foraging strategies of Hawaiian monk seals, it is unlikely that local adaptations would hinder long-term foraging ability or survival at donor or nursery locations.

Response: NMFS agrees with this statement and this is supported by the success of past translocation efforts (Baker et al. 2011). However, in the modeling used to help evaluate the benefits from two-stage translocation (Appendix F in Final PEIS), NMFS incorporated one-year survival “decrements” or penalties to account for any temporary threats or adjustments that might accompany release into an unfamiliar environment.

BIO 12 Is inbreeding a concern with such a small population of Hawaiian monk seals?

Response: As explained in the Draft PEIS Section 3.3.1.3: "Hawaiian monk seals exhibit extremely low genetic diversity according to a variety of measures (Schultz et al. 2008). This is probably due in part to a population bottleneck associated with overexploitation in the 19th Century, but genetic diversity appears to have been low even prior to that time (Schultz et al. 2008). There is little indication of contemporary inbreeding, and Hawaiian monk seal subpopulations have exhibited robust growth at various times despite their low genetic diversity. Further, although the species is distributed in a metapopulation, there is no evidence of genetic population structure. That is, the species is comprised of a single, panmictic (unstructured) population (or "stock") (Schultz et al. 2011)." In summary, while inbreeding may be a problem for some animal populations of this small size, data indicate that inbreeding is not a problem for the Hawaiian monk seal population.

BIO 13 Additional research on the MHI population is needed to determine factors that contribute to the observed success. For example, dietary factors, milk analysis, female pre-delivery weights, nutrient profiles, etc. should be evaluated.

Response: NMFS intends to continue conducting research to better understand and detect changes in factors that contribute to success and failure of monk seals throughout their range. This work is summarized in Section 2.5 and includes measurements of body condition, foraging behavior, and diet studies. However, some of the techniques proposed in this comment (milk analysis, pre-delivery weights) would involve handling and disturbance of pregnant or nursing females, which NMFS currently does not deem prudent, due to the risks to the female seals.

BIO 14 The 2006 NMFS stock assessment report stated that 34 monk seals have died during rehabilitation efforts or other research. This needs to be taken into consideration.

Response: NMFS has considered risks associated with past, current and future research and enhancement efforts. This is a major focus of Final PEIS Section 4.7.1. With regard to past mortalities, PEIS Section 3.3.1.7 states: "From 1982 to 1994, 23 seals died during rehabilitation efforts. Most of these involved seals brought into captivity for rehabilitation when they were already in exceedingly poor health. Thus, some portion of these seals would have certainly also died if they had not been brought into captivity. Additionally, two other seals have died in captivity, two adult males died when captured for translocation to mitigate male aggression, one was euthanized (an aggressive male known to cause mortality), four died during captive research and four died during field research." The PEIS specifies the number of seals that may be accidentally killed, euthanized (very ill or aggressive male seals), or brought into permanent captivity (aggressive

males) associated with research and enhancement actions. The effect of these losses on the population status was evaluated for each alternative using computer modeling (Final PEIS Sections 4.7.1.17 – 4.7.1.20).

BIO 15 If you bring seals to the MHI, what's going to stop the sharks here from coming in and eating seals? People are very concerned about this. I have seen more sharks in the MHI than ever before. The PEIS needs to address the issue of sharks.

Response: A concern that monk seals in an area may attract sharks and create a human safety risk is understandable, at least partly because we know that some monk seals are eaten by sharks. However, there is currently no evidence or expert opinion indicating that more monk seals in the MHI will lead to more shark attacks on humans. When shark predation is usually cited as a threat to Hawaiian monk seals, it refers to unusual predation on pre-weaned pups at French Frigate Shoals by Galapagos sharks (Gobush and Farry 2012), not "normal" low levels of predation on the population at large. Other well-known examples of shark predation on seals occur where seals seasonally aggregate in dense colonies (for example, in South Africa and parts of California), but those situations are very different than the dispersed, low density distribution of monk seals in the MHI.

According to the *International* Shark *Attack File*, there have been a total of 116 documented unprovoked shark attacks on people in Hawai'i from 1828-2012, and 9 of these were fatal. The most recent fatal attacks in Hawai'i were in 2004 and 2013**.** Over the past 20 years, there has been an average of 3 to 4 attacks per year in the MHI, with no upward trend in the number of attacks, while the MHI monk seal population has increased substantially over the same time period. There were 10 attacks reported in the MHI in 2012, and 13 attacks reported from January through December 2013. Shark experts in Hawaii have not attributed this recent apparent spike in attack numbers to the presence of monk seals and maintain that it may "simply reflect natural variability and arise purely through chance" (Meyer and Holland, *Honolulu Star Advertiser,* Op-Ed, December 23, 2012). As of September 2013, DLNR and other researchers were starting research studies aimed at understanding shark movement around Hawaii and the apparent increase in attacks during 2012 and 2013 around Maui in particular.

In summary, while the number of monk seals in the MHI has increased due to natural population growth over the past several years, the number of **shark** attacks has not increased over that same time period in a manner that would suggest a direct correlation. This comment appears to be related primarily to translocating weaned pups from the NWHI for release in the MHI. Under the preferred alternative (Alternative 3) selected in the final PEIS, such translocations of pups from the NWHI to the MHI will not occur.

BIO 16 People need to understand that the issue of sharks attacking seals is unique to French Frigate Shoals and was the result of aggressive male seals

trampling monk seal pups. The dead and injured pups were what attracted the sharks.

Response: As noted in Section 3.3.1.7, Galapagos shark predation on monk seal pups is only a concern at French Frigate Shoals. It is possible that the behavior was initially learned by Galapagos sharks due to the presence of pups killed by aggressive males in the 1990s. That hypothesis has been considered by NMFS but is difficult if not impossible to prove or disprove. Regardless, the shark predation behavior has continued at French Frigate Shoals long after male aggression ceased to be a significant factor. It is worth noting that some unknown level of tiger shark predation on monk seals of all ages occurs throughout their range.

BIO 17 Hawaiian monk seals have survived for over 16 million years so this concept that they are going extinct based on computer modeling is ludicrous when data show the species is doing fine. The population has actually been stable for five years.

Response: NMFS agrees that Hawaiian monk seals have existed for millions of years. However, many island species throughout the world have been documented to decline and become extinct following human colonization, which occurred in Hawai'i some 1500-1600 years ago. NMFS has not concluded that monk seals are certain to become extinct; rather, NMFS has concluded that the species is at risk of extinction and requires the protections of the ESA in order to recover. Computer population models are a mechanism for synthesizing all the relevant available information about populations (abundance, age of individuals, sex ratio, survival rates, birth rates, migration, etc.). Seal counts and population estimates have also revealed that overall abundance in the NWHI is declining and has not been stable for the past five years (Section 3.3.1.3).

CEF Cumulative Effects

CEF 01 The PEIS must address the cumulative effects of critical habitat designation, the changes to the Hawaiian Islands Humpback Whale National Marine Sanctuary, spinner dolphin protection measures, monk seal rehabilitation centers, and the programmatic recovery actions on the Hawaiian Islands and its people. The current evaluation is subjective, misleading, and too narrow.

Response: NMFS has addressed the potential cumulative effects of actions including designating monk seal critical habitat, modifications to the Hawaiian Islands Humpback Whale National Marine Sanctuary, spinner dolphin protection measures, monk seal rehabilitation centers, and others (as presented in PEIS Table 4.5-2 and described for specific resources throughout Chapter 4 of the PEIS). Please refer to the Response to CUL 01-10.

CEF 02 Overdevelopment, pollution, nuclear byproducts, land-based activities, and other wastes are part of the reason why seals are declining. NMFS

should clean up the environment where monk seals might live. These factors need to be considered in the PEIS. NMFS needs to clean up all the garbage around the Islands.

Response: NMFS acknowledges that ecosystem dynamics are complex and we do not know all of the effects human actions (e.g., development, pollution, and fishing) may be having on the Hawaiian marine ecosystem. However, our population monitoring clearly identifies most causes of mortality in the population and thus far, we do not have clear evidence that the issues raised in this comment are directly contributing to the current population decline. Cumulative effects of past, present, and reasonably foreseeable future actions (RFFAs) on Hawaiian monk seals have been considered, were listed in the Draft PEIS Table 4.5-2 and are described in more detail in Section 4.7.1.21 of the Final PEIS. NMFS has updated the cumulative effects assessment including a review of the actions currently considered along with other past, present, and reasonably foreseeable monk seal conservation activities in the Final PEIS. Necessary changes to the list of past, present, or RFFAs have been made such that a robust cumulative effects assessment was conducted.

CEF 03 Military activities should be evaluated as part of the cumulative effects analysis.

Response: Military activities have been included in the cumulative effects assessment where warranted and as described in Table 4.5-2 and sections throughout Chapter 4 of the PEIS for specific resources. NMFS updated the cumulative effects assessment including a review of the actions currently considered for analysis in the Final PEIS. Necessary changes to the list of past, present, or RFFAs have been made such that a robust cumulative effects assessment was conducted.

CEF 04 The PEIS fails to address climate change, earthquakes, or tsunamis. The debris from the March 11, 2011 earthquake in Japan is likely to hit the NWHI this winter and will cover the beaches with toxic, potentially radioactive debris.

Response: NMFS has considered the potential cumulative effects of actions including climate change, tsunamis, and earthquakes as listed in Table 4.5-2 of the Draft PEIS. At the time the Draft PEIS was being prepared, little was known regarding the debris from the tsunami in Japan in March 2011. However, since publication of the Draft PEIS, additional information is now available on debris from the tsunami in Japan; this information has been included in the cumulative effects assessment in the Final PEIS.

CUL Cultural

CUL 01 NMFS should first coordinate with the kupuna and other Native Hawaiians of these islands to improve the recovery plans in order to avoid unjust harm to the monk seals you are trying to save.

Response: NMFS considers coordinating with Native Hawaiians on Hawaiian monk seal recovery a high priority. To address this priority NMFS has funded (when possible) a statewide Hawaiian cultural liaison and Hawaiian practitioner network coordinator, and community liaisons on Kaua'i, O'ahu, Moloka'i, and Maui (PEIS Section 1.9.4). NMFS has also facilitated the participation of Hawaiian cultural practitioners in Hawaiian monk seal research and enhancement activities in the NWHI. As a result of these and other efforts, Native Hawaiians, including kupuna and cultural practitioners, have become increasingly engaged in the Hawaiian monk seal recovery program, and NMFS intends to continue to support this engagement to the maximum extent possible. Please also see Sections 5.5 and 5.6 of the Final PEIS for more information relevant to this comment.

CUL 02 NMFS needs to consider cultural practices as well as just historic and cultural properties. NMFS must address how the proposed actions will affect the Hawaiian people and their cultural practices. The PEIS fails to consider Native Hawaiian rights and cultural practices or impacts to traditional ocean users, the fishing community, and targeted socio-economic populations as required under NEPA and Section 106 of the NHPA. A cultural impact assessment has not been prepared.

Response: NMFS has considered public comments and conducted additional analyses to assess potential impacts to cultural resources, traditional cultural practices, and traditional cultural properties. The results of this additional consideration and analysis are presented in Section 4.8.4 of the Final PEIS (additional information found in Appendices B and K). Potential impacts to the fishing community have also been further analyzed and the results are presented in Sections 4.8.1 – 4.8.3 of the Final PEIS. Regarding NHPA Section 106, NMFS determined that the proposed Federal agency actions to recover the Hawaiian monk seal had the potential to affect listed or eligible historic properties. Section 106 consultation was therefore initiated with the appropriate parties, including the State Historic Preservation Office (SHPO), Native Hawaiian Organizations, representatives of local governments, and the public. The NHPA Section 106 consultation was completed in compliance with the NHPA and NMFS made a determination of no historic properties affected (see Appendix A, Agency Correspondence). NMFS received no response from SHPO regarding the determination. NMFS made available to the public a separate document (Appendix B) describing the results of the Section 106 consultation process. Please also see the response to CUL 01.

CUL 03 What cultural protocols does NMFS have in place if a monk seal strands or entangles itself? How has NMFS consulted with cultural practitioners to gain their insights about traditional values and stewardship for finite resources?

Response: In the MHI, such stranding responses are covered by the Marine Mammal Health and Stranding Response Program, which is covered by a separate EIS and permit. Stranding response in the MHI is not the subject of this PEIS. As a standard procedure, NMFS engages practitioners to conduct cultural protocols before, during, and after responses to monk seals, including responses to strandings and entanglements. The practitioners are generally associated with the ahupua`a in which the response occurs, or have been previously identified to have cultural ties to the location or the seal being responded to. The protocols conducted are generally determined by each practitioner, depending on the variables of each response. Also please see response to CUL 01.

CUL 04 What happens when a Hawaiian monk seal gets into a fishpond? What does NMFS do and how is this covered in the PEIS? How is the pond going to be affected? How is the seal going to be affected?

Response: Monk seals that get into enclosed fishponds with functioning walls and makaha (gates) would generally be considered by NMFS to be "out of habitat" (a type of stranding) and NMFS will work with the fishpond owner or responsible party to remove the seal as safely and quickly as possible with a goal of minimal or no impact to the fishpond. The Final PEIS contains additional analysis of potential fishpond impacts (Section 4.8.4) and additional fishpond impact mitigation measures (Section 5.5).

CUL 05 The island that will be most affected by this action is Moloka'i and it should receive something in return so that the island can exercise Ho'okipa, traditional in Hawai'i for a stranger that comes and needs to be fed.

Response: NMFS recognizes that the number of monk seals using the shores and waters surrounding Moloka`i has increased over the past several years. NMFS has worked with some members of the Moloka`i community regarding Hawaiian monk seal recovery, and has provided a grant to a Moloka`i–based organization for community liaison work. NMFS looks forward to continuing and strengthening coordination and collaboration with various Moloka`i residents, including fishermen, Hawaiian practitioners, educators and students. As described in Appendices J and K of the Final PEIS, Hawaiian monk seals are native to the MHI as well as the NWHI.

CUL 06 As a Native Hawaiian community, we will not support any federal intrusion or give up any access, gathering, coastal, cultural or fishing rights. Expansion of Hawaiian monk seal critical habitat will affect our family and food resources. The proposed action infringes on our Native Hawaiian rights

and culture protected under State law. We depend on the ocean's resources to survive and have for thousands of years.

Response: NMFS recognizes that there are concerns over the recent actions taken by the agency to revise critical habitat for Hawaiian monk seals. The revision to critical habitat is a federal action separate from this PEIS on monk seal research and enhancement activities and had a separate comment period that ended on January 6, 2012. Additional information on monk seal critical habitat can be found at: http://www.fpir.noaa.gov/PRD/prd_critical_habitat.html. Please also see Section 1.9.1 of the PEIS for more information on critical habitat.

Regarding the actions proposed in this PEIS on research and enhancement, based on all the analysis and research conducted by NMFS thus far, none of the actions proposed in the PEIS would cause any loss of access, gathering, coastal, cultural, or fishing rights. NMFS recognizes the value of Hawai`i's marine resources for subsistence and other purposes, and will continue to work with our government and non-government partners to ensure Hawaiian monk seal recovery actions do not adversely impact these resources or access to these resources.

CUL 07 Native Hawaiians are the endangered species, not monk seals. Hawaiian people are more important and we keep getting more and more restrictions on what we can do. Any time a foreign environmental concept is introduced, it destroys our culture. The Hawaiian monk seal expansion program will limit access to subsistence resources families rely on and curtail fishing in Hawaiian communities.

Response: Please see the responses to CUL 01 and 06. Considering all research and analysis to date, this PEIS is not proposing any new restrictions on access as a result of implementation of the actions proposed in the PEIS.

CUL 08 We do not support Hawaiian monk seal expansion because monk seals have never been part of Hawaiian culture. Seals are not mentioned in Hawaiian history, there is no Hawaiian name for seals, and no evidence of seals in carvings, burials, hula, etc., etc.

Response: Although not prominent and pervasive in Hawaiian culture compared to other sea creatures, such as green sea turtles, NMFS staff and contractors have consulted with Native Hawaiian practitioners and determined that some Hawaiian families have traditional ties to monk seals and there are some traditional Hawaiian cultural references to Hawaiian monk seals. Like the scattered and inconsistently distributed monk seal population, references to monk seals in Hawaiian culture are scattered and specific to certain geographic locales within the MHI. There appear to be references to monk seals in traditional place names and stories, and seal remains were found in a midden on Hawai`i Island dating from 1450-1700 A.D. (pre-European contact). Additional discussion of the significance of Hawaiian monk seals in traditional Hawaiian culture is presented in Section 3.4.7.1 and in Appendices J and K. Also see response to BIO 07.

CUL 09 Hawaiian monk seals are in the Polynesian Triangle so these seals will affect all cultures and people in the Polynesian Triangle.

Response: NMFS will continue to hold community meetings and connect with Native Hawaiians. As described in Section 5.6 of the Final PEIS, NMFS is committed to a dialogue with local communities so we can hear concerns, share ideas, and work together toward monk seal recovery.

CUL 10 The PEIS fails to consider environmental justice to Native Hawaiians. Mokumanamana and Nihoa are spiritually significant, traditional sites registered on the National Register of Historic Places. Impacts to these areas are not given adequate consideration in the PEIS.

Response: Environmental justice is discussed in Section 4.8.6. Nihoa Island and Mokumanamana (Necker Island) are part of Papahānaumokuākea Marine National Monument. As described in Section 5.5 of the Final PEIS, any activities associated with monk seal recovery actions undertaken within the NWHI must 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". The "Monument permit program allows for a comprehensive review of proposed activities and will be administered to ensure compliance with Presidential Proclamation 8031, as well as other applicable Federal statutes (such as the NHPA) and state laws and regulations" (NOAA 2008b). Under the terms of the Monument permit, researchers and volunteers involved in Hawaiian monk seal recovery actions coordinate their activities with the Monument archaeologist and historic preservation specialists to insure that they do not adversely impact any of the Monument's historic properties. All researchers landing on Nihoa or Mokumanana (Necker) are instructed to limit their activities to coastal areas. The only exceptions are camping in designated camping areas and traveling between coastal areas. Monk seal researchers may place remote cameras near beach and rocky areas where seals congregate. The purpose of these cameras (Section 2.5) is to obtain monk seal data without the need for human presence. The installation and maintenance of any such remote cameras on Nihoa or Mokumanamana would be conducted in strict compliance with Monument permitting conditions.

DIS Diseases

DIS 01 If there is concern about Hawaiian monk seals getting exposed to disease, how is bringing seals to the MHI where there are pollutants, ships, humans, etc., minimizing risk of disease and keeping wild seals wild?

Response: As noted in PEIS Section 2.5, "Current information suggests infectious disease is not limiting recovery of the Hawaiian monk seal. However, the species is rare, has very low genetic diversity and may have been buffered

from exposure to many mammalian diseases due to its isolation in the Hawaiian Archipelago for millions of years. Together, these factors raise great concern that outbreaks of diseases to which monk seals have not been previously exposed could have devastating impacts." There is no evidence that infectious disease is currently impacting the monk seal population, but NMFS is concerned about the potential for future outbreaks. Seals already occur throughout the Hawaiian Islands and are exposed to whatever disease threats are present in the islands now or will emerge in the future. Seals also move between the NWHI and MHI of their own accord.

While Alternative 4 was Preferred in the Draft PEIS, Alternative 3 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 from the NWHI and releasing them in the MHI (See Alt03). However, disease risk was not one of the reasons for the change in the Preferred Alternative. NMFS believes that the disease screening protocols described in Appendix G would have minimized any extra risk of disease associated with translocation to the MHI. These protocols will still apply to translocation actions included in the Preferred Alternative, including translocations *within* the NWHI, *within* the MHI or from the MHI to the NWHI. (See response to comment BIO 05). Notwithstanding the translocation programs, NMFS included enhanced disease monitoring and mitigation in Alternatives 3 and 4 precisely because of the concern about potential disease outbreaks. This includes development of a vaccination plan (Final PEIS Appendix E).

In response to the comment that seals should be kept wild, the MHI are currently within the monk seal's natural habitat, and only a small proportion of seals in the MHI become habituated to humans. Although no weaned pups will be translocated from the NWHI for release in the MHI under the Preferred Alternative, human-seal interactions are likely to continue involving the already naturally growing seal population in the MHI. For that reason, NMFS plans to implement new Behavior Modification protocols as described in Sections 2.5 and 5.4 of the PEIS.

DIS 02 NMFS has explained that monk seals move around from island to island on their own. Seals will pick up diseases as they move around and this will end up in our food chain because the monk seals will spread disease to humans and other animals in the MHI.

Response: Seals do move around from island to island throughout their range. There is no indication that monk seals carry diseases that are not already in the ecosystems in which they live. The concern is the opposite - that monk seals may become exposed to diseases that are not typical marine mammal diseases (see PEIS Section 3.3.1.7) through contact with other wild or domesticated species, or human secretions. For example, *Toxoplasma gondii*, a parasite that can cause the

disease toxoplasmosis, can infect both seals and humans, but only sexually reproduces in cats. Overall, the minute risk of spreading disease to humans and other animals in the MHI already exists regardless of the alternatives presented in this PEIS, as the MHI monk seal population is naturally growing and moves freely among the islands.

DIS 03 There is not enough information about the effects of disease vaccines and de-worming medicines on Hawaiian monk seals to understand all the risks involved.

Response: NMFS is currently conducting deworming research described in the Final PEIS (Section 2.5) on wild seals under Permit No. 10137, which has accompanying NEPA analyses on the use of various deworming drugs and their effects on monk seals and the environment. We propose to continue deworming research under the Preferred Alternative to collect sufficient data to determine the efficacy of treatments in the wild prior to implementing a deworming enhancement program. Results of preliminary deworming studies on monk seals have been published (Gobush 2011) and are summarized in Section 4.7.1.11 of the Final PEIS. Also, current and future permits would contain mitigation measures such as requiring researchers to halt studies if adverse effects are observed, and to demonstrate that the deworming drugs are safe, effective, and will not adversely impact non-target species prior to conducting deworming as an enhancement activity.

Appendix E of the Final PEIS includes information on previous use of vaccinations in Hawaiian monk seals and other phocids. Vaccinations for West Nile Virus (WNV) have been used for over five years on 8 captive Hawaiian monk seals as part of the normal husbandry and medical care those seals receive, with no adverse effects observed. The WNV vaccine is considered safe for use in wild monk seals as discussed in Appendix E. Two facilities are currently permitted to test the proposed canine distemper virus (CDV) vaccination on captive Hawaiian monk seals, and one captive Hawaiian monk seal has been vaccinated to date with no adverse effects observed. Additional research on use of the CDV vaccination will be done on more captive Hawaiian monk seals. The PEIS proposes such additional vaccination research before these tools would be safely applied to the benefit of the monk seal in the wild.

DIS 04 Any vaccination protocol must be used with extreme caution to minimize the possibility of adverse events in a population that is already endangered. Please test vaccines on captive animals before using them on the wild population.

Response: This is precisely the approach that NMFS has taken to date and proposes to continue in the future (Final PEIS Appendix E). See response to DIS 03.

DIS 05 Since vaccines may not always be effective for treating disease, NMFS should make sure there is a backup plan to treat and handle affected animals in order to minimize mortality.

Response: NMFS uses very detailed protocols to minimize risk of injury and mortality when handling monk seals, both in the wild and in captivity. Many of these procedures require the involvement of a veterinarian, and in some cases, animals are taken into captivity for additional treatment or rehabilitation. In addition, as described in Appendix E of the Final PEIS, NMFS will first assess the safety and efficacy of vaccines before they are used on the broader monk seal population to minimize potential negative effects.

DIS 06 If a virus mutates and spreads into Hawaiian monk seals, how is NMFS going to vaccinate animals if there is no vaccine available?

Response: NMFS is proposing to use vaccines already developed for other species to provide immunization against the same or similar viruses (e.g. *morbillivirus* and West Nile Virus, see Appendix E). Sometimes a vaccine developed for a particular pathogen can confer immunity against a related but not identical virus. If a new virus emerges in monk seals against which no existing vaccine is effective, then NMFS will not be able to provide a vaccine to protect seals. However, NMFS has developed protocols for addressing an Unusual Mortality Event (UME). The UME plan is designed to enable rapid mobilization and response for any emergent mortality risk, whether from disease or other causes. The UME protocols are not evaluated in this PEIS, as they are addressed under separate permits and NEPA analysis for the national Marine Mammal Health and Stranding Response Program.

DIS 07 The use of vaccines in Hawaiian monk seals is valuable. High priority should be given to testing a vaccine for morbillivirus on captive animals to identify potential effects of the vaccine. NMFS should also modify the criterion for triggering morbillivirus vaccination on wild seals to include the detection of canine distemper in any species outside of quarantine in the MHI.

Response: Since the completion of the Draft PEIS, NMFS and partners have updated the vaccination plan with somewhat more sensitive triggers in the Final PEIS. For instance, any confirmed case of canine distemper in a dog or any other species outside quarantine in Hawai'i would trigger vaccination of wild seals. A confirmed case of morbillivirus in a cetacean in the MHI would trigger testing of seals for antibodies but not necessarily vaccination of wild seals. NMFS conferred with the respondent and other specialists when developing revised triggers in the Final PEIS.

DIS 08 Vaccines should not be tested on Hawaiian monk seals. They have not been shown to be safe. Many vaccines are produced in China these days.

Response: As described in Appendix E of the Final PEIS, some testing of West Nile Virus vaccine and canine distemper virus vaccine have already been tested in captive monk seals and shown to be safe thus far. NMFS plans to move forward cautiously with more captive (and then wild) seal testing for safety and achievement of the desired antibody response.

DIS 09 Translocation is problematic because there is a chance you will be introducing diseases to the NWHI.

Response: NMFS acknowledges that there is some risk of disease transmission associated with translocation of seals between any two subpopulations. That is why NMFS has established strict health and disease screening protocols any time seals are moved among subpopulations (Appendix G of Final PEIS). In addition, these protocols allow for a quarantine period for seals being moved from the MHI to the NWHI, recognizing the potentially greater disease transmission risk associated with moves in that direction. As explained in the Final PEIS, Appendix G: "When transporting seals from the MHI to the NWHI, a period of quarantine may be necessary to reduce the likelihood of transferring a disease between the two regions. Quarantine holding will be done at a facility, on board a ship or in shore pens depending on the situation and facilities availability. The quarantine period should be long enough for the analysis of biomedical samples or longer than the prepatent period for the demonstration of clinical signs for the diseases of greatest concern. Two weeks is the generally accepted period and this period could include the transport period." Note that toxoplasmosis is an infectious disease threat to seals in the MHI. This disease cannot be transmitted from seal to seal, but is transmitted to seals by oocysts shed by domestic cats in the MHI. Thus, although seals are at risk for the disease in the MHI, they cannot transmit toxoplasmosis to seals in the NWHI.

DIS 10 Hawaiian monk seals may not show symptoms of disease (asymptomatic) and therefore spread disease to other vulnerable animals. It seems prudent to use a prophylactic approach rather than an outbreak response approach to treating diseases. It is not clear in the PEIS which approach is preferred by NMFS. This should be illustrated more clearly in the Final PEIS.

Response: NMFS acknowledges that it has not taken a position regarding whether a prophylactic or outbreak response approach to vaccination is preferred. A comprehensive prophylactic vaccination program may be advantageous, but such an effort can be both costly and risky. Disease risks to monk seals may be better characterized through vaccination research, even in early stages of the program. The costs of administering vaccines to all seals would be substantial and whether it is warranted will depend upon the probability and magnitude of a disease outbreak as well as the estimated protection afforded by vaccination. One

other consideration is that by vaccinating seals prophylactically and eliciting an antibody response, the ability to detect exposure to disease versus vaccination is lost. Thus, there would be a loss of disease monitoring potential in a vaccinated population. Despite the above considerations, NMFS considers prophylactic vaccination to be a viable approach and will consider its relative merits as research and response actions accrue. A revised vaccination plan is included in the Final PEIS (Appendix E).

DIS 11 NMFS should describe how translocation health screenings are part of a larger framework for disease monitoring throughout the Hawaiian Archipelago. It is not clear how NMFS will implement a population-wide disease monitoring program. In addition, the PEIS should provide more information on how long the vaccination or de-worming trials would last.

Response: The population-wide disease monitoring program elements are described in Section 2.5 and include opportunistic sample collection, analysis of carcasses, and opportunistic sample collection from live animals for health status. Translocation health screenings information will augment these efforts, and the samples will be analyzed, archived, and logged in the same system as the overall disease monitoring program.

NMFS has determined that disease monitoring should normally be done opportunistically whenever a seal is captured and sedated for other reasons (e.g., telemetry studies, hook removal, etc.). That is, unless some specific seal health concern arises (e.g., illness or injury), NMFS rarely captures and samples seals simply for health assessment. This is based on 1) the constraints involved in choosing seals for safe handling (e.g., finding a safe location, no pregnant or molting seals, etc.); 2) analysis of samples collected in the past during dedicated disease monitoring effort; and 3) recommendations from an external review of the Hawaiian monk seal health and disease program.

NMFS did not state how long vaccination and deworming trials would last. This will depend upon a number of factors, including funding, the results of the trials to date, and the availability of new drugs, routes of administration, or vaccines.

DIS 12 The Draft PEIS should provide more explanation on the criteria used to determine whether a seal is healthy or unhealthy. These criteria will determine the effectiveness of disease monitoring and how disease risk will be determined for each location.

Response: Determining whether a seal is healthy or unhealthy depends on numerous variables (e.g., morphology, blood chemistry, disease exposure, behavior, growth, presentation of possible disease symptoms, and other factors) and are highly context dependent (e.g., presence of other threats). Standardized health forms and biomedical sampling (included in Appendix G of Final PEIS) are used to determine the health of an animal, and judgments are typically made on a case-by-case basis with the assistance of veterinarian consultation. Standardized

criteria are used to assess whether an Unusual Mortality Event (UME) is occurring, as addressed above in DIS 06.

DIS 13 To make the translocation program consistent, and to increase validity of any survival outcomes, NMFS should apply deworming treatment to both MHI-born seals and seals that may be translocated in order to compare both groups and assess the performance of the translocation program.

Response: If deworming is proven to be an effective way to improve the condition and survival of young seals, it may be applied anywhere in the monk seals' range and in conjunction with other activities (Final PEIS Appendix H). That includes potential treatment of seals translocated anywhere for any purpose within the strictures of NMFS' research and enhancement permit. NMFS acknowledges that if deworming notably affects survival and it isn't applied to both treatment and control groups in translocations, then it could affect NMFS' assessment of the translocation program performance. The commenter specifies that deworming should be applied to both MHI-born seals and any translocated to the MHI. NMFS has selected Alternative 3 as the Preferred Alternative in the Final PEIS (please see response to ALT 03), under which there would be no translocations of weaned pups from the NWHI to the MHI. Regardless, the commenter's point could be applicable to any translocation scenario where survival of translocated seals would be compared to another group (i.e., whether the translocation was to or from the MHI or within the NWHI).

In any case, NMFS agrees that it will be important to design these studies in such a way that multiple factors can be accounted for (in this case deworming and translocation effects). Two-stage translocation remains an action available under the Preferred Alternative 3 so long as it does not involve moving seals born in the NWHI to be released in the MHI. The first stage of 2-stage translocation is expected to involve recently weaned pups. Seals at this age have typically not been feeding independently and have not acquired parasites, thus deworming would rarely if ever be conducted during the first stage of the translocation. The NMFS deworming permissions to date specify that seals would only be treated at least 120 days post-weaning. However, seals being returned to their natal areas at age 2-3 years may be treated for parasites prior to release. If that is deemed warranted and feasible, NMFS may treat a separate group of similarly-aged seals at the release site to help separate de-worming from translocation effects. It is not yet clear whether this could be accomplished. NMFS is currently conducting research to determine whether deworming can be effectively accomplished in the field with minimal disturbance or stress to wild seals. Captive seals (such as those being translocated), may be more readily treatable for parasites because they are under more controlled veterinary care for at least several days.

ECO Ecosystems

ECO 01 NMFS must consider that moving seals around is manipulating the ecosystem just as is removing top predators. We don't understand the ecosystem effects of either of these things. There may be unintended consequences of moving 60 female pups that we don't understand.

Response: NMFS expects that any effective predator manipulation program would require a rather large-scale effort involving large numbers of predators (many orders of magnitude more than the potential number of seals that could be translocated). In contrast, NMFS stands by its analysis (Final PEIS Section 4.7) that the proposed level of translocation of young seals under any of the Alternatives would have negligible or minor adverse effects on other species in the ecosystem. Note that under the Preferred Alternative in the Final PEIS (Alternative 3), weaned pups would not be translocated from the NWHI to the MHI, but two-stage translocation could be conducted *within* the NWHI, *within* the MHI, or *from the* MHI to the NWHI. While a total of 200 weaned pups could be translocated over a 10-year period, only a maximum of 60 of these could be at any host site at any given time as each seal will be returned when it reaches 2 or 3 years of age. Nevertheless, unintended consequences are possible, and that is why NMFS has proposed a gradual cautious approach for implementation (Final PEIS Section 5.2) and continuous monitoring to detect problems (Final PEIS Appendix F).

ECO 02 Hawaiian monk seals have lived in the NWHI for hundreds or thousands of years so what has changed with the ecosystem? Has NMFS really looked at what has changed in the NWHI ecosystem that has created all these problems? We are not going to save the seals if we don't understand what is wrong with their habitat. NMFS needs to fix the problem in the NWHI first.

Response: The dynamics of marine ecosystems extending over hundreds of thousands of square kilometers are extremely complex. NMFS and other divisions within NOAA conduct a great deal of research evaluating the NWHI ecosystem beyond monk seals. This will continue to be an active area of research as noted in Table 2.12-1, including continuing demographic and ecosystem modeling, using remote sensing technology to collect elevation and bathymetry data for the NWHI, and conducting oceanographic studies to determine effects of oceanographic variability on prey abundance availability and foraging success. Many habitat and ecosystem issues thought to affect monk seals are described in Section 3.3.1.7. See also ECO 5 and BIO 10.

ECO 03 Competition between Hawaiian monk seals and predators for the same food resources will destroy the ecosystem and all species will be negatively impacted. Bringing seals to the MHI will dramatically impact the ecosystem.

Response: NMFS disagrees. Hawaiian monk seals have been an integral part of the Hawaiian marine ecosystem for many millions of years. More than 900 seals live and forage in the NWHI, and the reefs there tend to be much healthier with

more robust reef fish populations compared to the MHI, so that NMFS does not believe the natural increase in the MHI monk seal population will have any negative impact on the ecosystem. Nevertheless, note that the Preferred Alternative in the Final PEIS (Alternative 3) does not allow for weaned pups to be translocated from the NWHI and released in the MHI (please see the response to ALT 03). Please also see the response to ECO 01 and BIO 06.

ECO 04 The PEIS should include a discussion about ecosystem-based management measures to improve conditions to enhance juvenile survival. Ecosystem-based management may be necessary to conserve seals and maintain the biodiversity of the atoll and island ecosystem.

Response: This PEIS supports the goals of the recovery program for the Hawaiian monk seal, and is required by the ESA and MMPA (Section 1.0 of the PEIS). This is a focused single-species goal although arguably achieving this goal could have ecosystem benefits. Thus, ecosystem-based management in the Hawaiian Archipelago is not one of the alternatives considered in this PEIS. NMFS considered the impact of the proposed action together with other monk seal conservation activities in the cumulative impact analysis of the Final PEIS. (See also responses to ALT 09 and ALT 10).

ECO 05 Ecosystem-based management might involve numerous individuals and groups, and require many years to evaluate options, identify solutions, and gain approval. Nonetheless, failing to begin such discussions now could result in resource managers being ill-prepared in the future when measures must be taken and are most needed. In order to save one species, we must look at the entire ecosystem.

Response: NMFS does not disagree with these statements and in fact is eager to continue and expand discussion of these topics. Once specific monk seal recovery actions have been sufficiently developed, NMFS may pursue permits and associated NEPA processes to be able to implement them. However, these ecosystem-based approaches are not sufficiently developed to be included in the PEIS for reasons, such as the uncertainty regarding important ecological processes, food-web dynamics, etc., explained in Section 2.12.1 of the Final PEIS. (See also responses to ALT 09 and ALT 10).

ECO 06 Prior to adopting the translocation program, NMFS must consider the ecosystem changes that may result in areas where seals proliferate. Will there be a depletion of marine life in those areas? Will there be enough food resources available for monk seals and humans?

Response: Note that under the Preferred Alternative in the Final PEIS (Alternative 3), seals may not be translocated from the NWHI to the MHI, but two-stage translocation could be conducted *within* the NWHI, *within* the MHI, or *from the* MHI to the NWHI. As described in Appendix F, NMFS would only translocate a small number of seals at any given time to another subpopulation.

While a total of 200 weaned pups could be translocated over a 10-year period in the first stage of two-stage translocation, only a maximum of 60 of these could be at the host site at any given time as they will be returned when they reach 2 or 3 years of age. Further, NMFS has stated that it would implement the translocation program (under either Alternative 3 or 4) gradually initially and monitor for any unintended consequences. This would constitute a small proportion of the already existing seal population at a host site. NMFS has explained how it will monitor various seal population variables to ensure that any undesired effects that should result will be detected. If such problems are found, the translocation plan would be adjusted accordingly. NMFS does not believe this small number of seals will deplete marine life (See also responses to ECO 03). These issues are described in Appendix F of the Final PEIS.

ECO 07 The ecosystem is connected and each species is important. The ecosystem will become unbalanced if monk seals go extinct.

Response: NMFS agrees that monk seals are an integral part of the Hawaiian ecosystem. Aiding in the monk seals' survival and recovery is the fundamental purpose of the Recovery Program supported by this PEIS (Section 1.0).

ECO 08 Historical human disturbance in the NWHI such as military activity, guano mining, and seal hunting has thrown the ecosystem of the NWHI off balance.

Response: There have likely been many human-caused and natural disturbances in the NWHI over last few hundred years and the respondent has certainly identified several of them. The level of human use and disturbance now occurring in the NWHI is relatively low as compared to historical times, but there are undoubtedly many residual effects from decades of intensive use, manipulation, and, in some cases, extraction.

FISH Fisheries/ Fishermen

FISH 01 Monk seals are going to compete with fishermen, which will cause considerable negative impacts to commercial, subsistence, and recreational fisheries in the MHI. NMFS's target is 500 monk seals in the MHI. We depend on fishing to feed our family and this will affect our way of life. Humans are the top of the food chain and should be first. These impacts will affect islanders well into the future. What is NMFS going to do about that? NMFS is protecting seals but who is protecting us?

Response: Under the Recovery Plan for Hawaiian Monk Seals, 500 seals in the MHI is part of the criteria identified for potentially reclassifying the monk seal from "endangered" to "threatened" status under the ESA. NMFS recognizes the importance of fishing to the lives of many Hawaii residents. Alternatives 3 (the Preferred Alternative in the Final PEIS) and 4 include important mitigation measures (described in PEIS Sections 2.5 and 5.4 – 5.6), including a seal behavior

modification program and various measures to engage stakeholders, including fishermen. These mitigation measures are designed to address many concerns regarding adverse impacts caused by monk seals interacting with fishermen and other ocean users.

The Draft PEIS analysis concluded that any adverse impacts on fisheries associated with the proposed alternatives would be negligible. NMFS revised sections of the PEIS related to fisheries impacts (Final PEIS Sections 4.8.1 - 4.8.3), considering comments received regarding the Draft PEIS and further analysis conducted by NMFS (Sprague et al. 2013). The updated analysis in the Final PEIS confirmed the conclusions from the Draft that impacts of all alternatives on fisheries would be negligible. Moreover, the Preferred Alternative of the Final PEIS does not include moving weaned pups from the NWHI for release in the MHI. It is also important to note that no new restrictions or regulations on fishing, access, gathering, or other resource use activities are expected to occur as a direct result of implementing the proposed action.

FISH 02 NMFS must evaluate the impacts of the proposed action on recreational fisheries close to shore, not commercial fisheries in the outer islands. The PEIS only compares fish consumption by juvenile seals to commercial catch in the NWHI, which is not right.

Response: NMFS revised sections of the PEIS related to fisheries impacts (Final PEIS Sections 4.8.1 - 4.8.3), considering comments received regarding the Draft PEIS and further analysis conducted by NMFS (Sprague et al. 2013), which specifically focuses on nearshore fishery resources in the MHI and includes data from reported commercial and recreational fishery landings in the MHI. The updated analysis in the Final PEIS confirmed the conclusions from the Draft that impacts of all alternatives on fisheries would be negligible. Moreover, the Preferred Alternative of the Final PEIS does not include moving weaned pups born in the NWHI for release in the MHI.

FISH 03 The number of Hawaiian monk seals that will be in the MHI is not going to have a notable effect on fish that might be sought after by commercial, recreational, or subsistence fishermen. In fact, seals have much more to fear from people. Fishermen should share fish resources with seals or move to other fishing areas if monk seals are present.

Response: Please note that under the Preferred Alternative in the Final PEIS (Alternative 3), weaned pups may not be translocated from the NWHI to the MHI. NMFS believes that monk seals and fishermen can co-exist in the MHI with minimal adverse interaction and has provided grant funds to the State of Hawaii, DLNR under Section 6 of the ESA, in part to support DLNR's work to minimize adverse fishery interactions with monk seals. NMFS has also partnered with DLNR in disseminating guidelines for fishermen that are intended to prevent and mitigate fishery-seal interactions. These guidelines may be viewed at the

following URL:
http://www.fpir.noaa.gov/Library/PRD/Hawaiian%20monk%20seal/HMS-fishing_guidelines-FINAL-PUBLIC.pdf

FISH 04 When a monk seal gets into our fishpond, who is going to pay for our fish? We spend a lot of money on fish for our fishpond but all NMFS talks about is saving the seal. NMFS should consider setting up a compensation program for fishermen to alleviate the financial burden of monk seal interactions. This may soften some of the negative feelings fishermen have toward seals.

Response: The Final PEIS considers potential impacts on fishponds in Section 4.8.4 and presents a related mitigation measures in Sections 5.4 – 5.6. NMFS must operate within authorized appropriations and currently has no authority or plans to set up a compensation fund for fishpond incursions. As noted in the response to comment CUL 04, monk seals that get into enclosed fishponds with functioning walls and *makaha* (gates) would generally be considered by NMFS to be "out of habitat" (a type of stranding) and NMFS will work with the fishpond owner or responsible party to remove the seal as safely and quickly as possible with a goal of minimal or no impact to the fishpond.

FISH 05 There are already too many Hawaiian monk seals. Monk seals are going to eat all the fish. Comments calculating the amount of fish consumed by Hawaiian monk seals based on their average weight. Based on calculations stated in comments, a single monk seal eats from 50 to 100 pounds of fish per day. Currently there are 150 seals eating up to 2,737,000 pounds of food per year. If NMFS brings 60 more seals to the MHI, that will equal 210 seals. This many seals could eat up to 6,387,500 pounds of fish per year. The amount of fish monk seals are going to eat is going to have an effect on commercial, subsistence, and recreational fishing. How can the PEIS state there would be no impact?

Response: The calculations presented in the comment appear to be based on inaccurate overestimates of daily consumption by Hawaiian monk seals. For example, a recent NMFS analysis found that monk seals likely eat, on average, around 15 lb. of prey per day, perhaps less (Sprague et al. 2013). Furthermore, much of the fish consumed by monk seals are not targeted by fishers in the MHI (Sprague et al. 2013). NMFS revised sections of the Final PEIS related to fisheries impacts (PEIS Sections 4.8.1 - 4.8.3), considering comments received regarding the Draft PEIS and the further analysis conducted by NMFS (Sprague et al. 2013). The updated analysis in the Final PEIS confirmed the conclusions from the Draft that impacts of all alternatives on fisheries would be negligible. Moreover, the Preferred Alternative of the Final PEIS does not include moving seals from the NWHI for release in the MHI.

FISH 06 Fishermen in Hawai'i are already under pressure given recent closures and restrictions. This proposed action will again increase pressure on Hawaiian fishermen. Fishermen are having a hard time dealing with monk seals

interacting with fishing gear. Please keep the fishermen in mind when moving forward on this action.

Response: NMFS will continue and enhance its collaboration with Hawaiʻi's fishing community to the maximum extent possible. NMFS has provided a grant to DLNR to help support such collaboration with fishermen. Part of DLNR's grant project includes development and testing of a system to report Hawaiian monk seal interactions with fishing gear. NMFS appreciates fishermen who report interactions, as this provides information useful in developing and implementing the fishery interaction mitigation program discussed in Section 2.5 of the PEIS. It is important to note that no new restrictions or regulations on fishing or other resource use activities are expected to occur as a direct result of implementing the proposed action, because no such restrictions or regulations are proposed in any of these Alternatives.

Please also see the response to comment FISH 01 for more information relevant to this comment.

FISH 07 The Hawaiian monk seals are increasing in the MHI and our lobster population is declining. Is there a correlation?

Response: NMFS is not currently aware of a correlation nor a causative link between lobster and monk seal trends. Please also see the response to comment FISH 01 for more information relevant to this comment.

FISH 08 Is NMFS going to put Hawaiian monk seals in fishing grounds? Fishermen have very substantial concerns about this and it needs to be adequately addressed in the PEIS.

Response: In the Final PEIS, the Preferred Alternative is Alternative 3, under which weaned pups may not be translocated from the NWHI to the MHI, but translocations could be conducted *within* the NWHI, *within* the MHI, or *from the* MHI to the NWHI. As described in Section 5.2 and Appendix F of the Final PEIS, several criteria will be considered in determining the locations to which seals would be translocated. One of these criteria will be the likelihood of fishery interactions, and with all other criteria being equal, areas where fishing activity is known to be heavy would rank lower for translocation purposes than areas where fishing activity is relatively light. Section 5.6 of the Final PEIS describes how NMFS plans to engage fishermen and local community leaders as part of the process to determine appropriate translocation release sites. Please also see the response to comment FISH 01 for more information relevant to this comment.

FISH 09 There is a lot of confusion about the types of fish that Hawaiian monk seals eat. I've been told that monk seals eat fish that are six to eight inches long. They are not eating the large fish in the holes. Monk seals often eat fish further from shore than where fishermen fish.

Response: As described in Section 3.3.5 of the PEIS, the fish families most frequently consumed by seals in the MHI are *Balistidae* (triggerfish), *Acanthuridae* (surgeonfish), *Muraenidae* (moray eels), *Serranidae* (groupers, basslets etc.), *Holocentridae* (squirrelfish), *Labridae* (wrasses), *Scaridae* (parrotfish), *Ostraciidae* (boxfish), *Monacanthidae* (filefish), *Scorpaenidae* (scorpionfish), and *Congridae* (eels). There are numerous other families consumed but at a very low frequency. Cephalopods (octopus and squid) occur less frequently in the monk seal diet than fish; the most important species are day octopus, night octopus, and a squid species. The size of prey in the diet varies, but based on footage collected by seal-mounted video cameras, most of the prey were small (3-4 inches on average). However, there are occasionally exceptions when a large fish or octopus was captured and brought to the surface for eating.

There is also a large amount of variability in foraging strategies employed by individual monk seals. Tracking studies of over 30 seals in the MHI show that seals begin searching the bottom for food immediately after leaving the beach. Some seals stay within a mile of shore while others will travel out 30 miles or more to feed. Most foraging occurs in water less than 200 feet deep but some seals dive over 1,500 feet to find their food. All monk seals feed along extensive tracks of coastline and ocean, not just one single location, thus distributing their foraging effort and making it unlikely that seals will dramatically impact any one place.

FISH 10 Fishery-monk seal interactions should be monitored more closely by government given the rate of incidental mortality that occurs in the near-shore fisheries. NMFS should work closely with the State to reduce fishery-related interactions.

Response: NMFS agrees with this comment. Please also see the response to comment FISH 01 for more information relevant to this comment.

FISH 11 Commercial fisheries impacts result from interactions with Hawaiian monk seals in terms of increased fuel cost and trip length to compensate for depredation events rather than changes in MHI commercial catch data as presented in the PEIS.

Response: NMFS revised sections of the PEIS related to fisheries impacts (PEIS Sections 4.8.1 - 4.8.3), considering comments received regarding the Draft PEIS and further analysis conducted by NMFS (Sprague et al. 2013). The updated analysis in the Final PEIS confirmed the conclusions from the Draft that impacts of all alternatives on fisheries would be negligible. Nevertheless, Alternatives 3 (the Preferred Alternative in the Final PEIS) and 4 include important mitigation measures (described in PEIS Sections 2.5 and 5.4), including a seal behavior

modification program and a fisheries interactions mitigation program. These mitigation measures are designed to address many concerns regarding adverse impacts caused by monk seals interacting with fishermen and other ocean users. Please also see response to comments FISH 01, FISH 06, FISH 08, and FISH 09.

FISH 12 NMFS's conclusion that the potential impact of Hawaiian monk seals on commercial fisheries would likely constitute only 0.6% to 1.6% of annual commercial catch. However, monk seal prey typically do not include pelagic species. Thus, the annual consumption of prey species by monk seals should instead be compared with non-pelagic commercial fisheries landings, which would have been approximately 4.8% of the total commercial catch for 2009.

Response: NMFS has revised sections for the Final PEIS related to fisheries impacts (Sections 4.8.1 - 4.8.3) considering this comment and other comments received regarding the Draft PEIS as well as further analysis conducted by NMFS. Sprague et al. (2013) have made revised and very conservative estimates of monk seal consumption of fish prey specifically in nearshore areas (excluding pelagic catch) and compared this to estimated consumption by other apex predators (i.e., sharks and jacks) as well as nearshore fishery landings. The conclusion from the Draft PEIS that all alternatives would have negligible impacts on fisheries did not change with the revised Final PEIS analysis. While this was focused on nearshore resources, it remains important to note the lack of impact monk seals have on the very important pelagic fisheries, which make up ~95% and ~82% of the landed weight by commercial and recreational fisheries, respectively. In assessing impacts it is important to document areas where there will be no competition or conflict as well as those areas where such potential exists. Please refer to FISH 09 for a description of the partial overlap of fish consumed by monk seals and targeted by fishers.

FISH 13 The bottomfish fishery in Hawai'i has been under strict management since 2007 and the fact that Hawaiian monk seals are foraging generalists that may compete with the fisheries creates reasonable concern in the fishing community. NMFS should continue to engage the fishing community to alleviate these concerns.

Response: NMFS agrees with this comment and will engage the fishing community to the maximum possible extent. Please also see responses to comment FISH 01, FISH 08, and FISH 09.

FISH 14 The amount of fish a monk seal could consume pales in comparison to the amount of fish caught each year by people in Hawai'i. It is difficult to evaluate the potential effects of a larger monk seal population on recreational fisheries given there is little federal or state oversight of this industry. Thus, NMFS should continue to work with the recreational and commercial fishing sectors to obtain better data on fishery landings as well as continue to pursue studies on monk seal foraging habits.

Response: NMFS agrees with this comment, and intends to continue the work referred to in the comment to the maximum extent possible. NMFS will continue to work with DLNR to get the best possible data on recreational and commercial landings to best manage potential interactions with Hawaiian monk seals. Please also see the recent NMFS publication by Sprague et al. (2013).

FISH 15 Hawaiian monk seals impact fishermen by damaging fishing gear which results in lost income. Comments describing interactions with Hawaiian monk seals while fishing including accounts of monk seals eating fish off of gear.

Response: NMFS recognizes that interactions do occur. Reporting fisheries interactions is a requirement for commercial fishers (see 50 CFR 229.6) and is important for monk seal recovery as well as for fisheries impact mitigation purposes. Timely reports of interactions help NMFS work with fishermen and effectively manage seals to minimize interactions and potentially reduce damage to gear. NMFS has produced a set of guidelines to help reduce these interactions and also maintains a toll-free hotline to report the interactions and other marine mammal incidents. The seal behavior modification program and stakeholder engagement activities, described in Section 5.4 – 5.6, are designed to help reduce the frequency and impact of seal-fisheries interactions. NMFS revised its analysis regarding fisheries impacts considering this and other comments received and present this analysis in the Final PEIS (Sections 4.8.1-4.8.3). Also please see the response to FISH 06.

FISH 16 Seals are migrating naturally to the MHI because they are starving in the NWHI. They are reproducing on their own in the MHI. The reason they are starving in the NWHI is because of humans overfishing species like lobsters, not because of seals eating them all. Overfishing needs to be stopped and monk seals should not take the blame for how much fish are in ocean.

Response: A small number of seals have been documented moving between the NWHI and the MHI; however, the growth of the MHI seal population (Section 3.3.1.3) cannot be explained by the low level of migration observed from the NWHI. Instead the MHI population is growing due to high survival and reproduction of the local MHI population. The lobster fishery in the NWHI has been closed since 2000, and whether the fishery affected monk seals is unresolved (Section 3.3.1.7). The bottomfish fishery closed in 2009 (Section 3.3.1.7), so there is no commercial fishing occurring in the NWHI.

GEN General

GEN 01 Comments expressing general support for the proposed action. Hawaiian monk seals should receive the most protection possible, particularly for juvenile seals. Comments in support of saving Hawaiian monk seals from extinction.

Response: NMFS acknowledges the recommendation to implement Alternative 4, which was the Preferred Alternative in the Draft PEIS. In accordance with the mandate of the ESA, NMFS is committed to using necessary and appropriate measures to ensure the survival and recovery of the Hawaiian monk seal population. While Alternative 4 was Preferred in the Draft PEIS, Alternative 3 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 from the NWHI and releasing them in the MHI. Alternative 4 would be infeasible at this time. NWHI pups, if 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. NMFS also intends to conduct other important seal research and enhancement activities and to engage the public in an effort to address concerns raised during the Draft PEIS public comment process, especially concerns related to the two-stage translocation process. It is our goal to ensure that all future management and recovery efforts are as successful as possible by staying engaged with, and responsive to, Hawaii's communities. See response to ALT 03.

GEN 02 Comments expressing general opposition for the proposed action. The proposed action is too risky and will not be good for the communities that would be affected in the MHI or the Hawaiian monk seals. Comments expressing general public safety concerns about seals in the MHI.

Response: NMFS disagrees that the proposed actions would be risky for monk seals or people. Several measures are currently in place, and additional measures would be added to monitor and mitigate any possible public safety risks that might arise from implementation of any of the proposed actions. These measures include seal behavior modification actions and stakeholder engagement activities as discussed in Sections 2.4 and 5.4 – 5.6 of the PEIS. Moreover, under the Preferred Alternative (Alternative 3) in the Final PEIS, no seals will be moved from the NWHI and released in the MHI.

GEN 03 Hawaiian monk seals do not belong in the MHI. Comments expressing general support for protecting monk seals as long as they remain in the NWHI.

Response: See response for BIO 07. The best available evidence indicates that Hawaiian monk seals have inhabited the Hawaiian Islands Archipelago for several million years. The Hawaiian Islands are a continuous archipelago from Hawai'i Island to Kure Atoll, and wild animals do not recognize the invisible line that humans have drawn between the NWHI and MHI. NMFS understands that many people have concerns about interactions between Hawaiian monk seals and humans in the MHI. However, monk seals are protected throughout their range under MMPA and ESA, and NMFS must use necessary and appropriate means to provide for the conservation of the species throughout this range. As explained in Section 5.6, NMFS is committed to working with communities in Hawai'i to discuss issues, quantify interactions, identify seals of potential concern, and work toward solutions for humans and seals to coexist safely in Hawai'i.

GEN 04 NMFS should let nature take its course and not intervene by trying to protect Hawaiian monk seals. Every time NMFS tries to manage nature, it gets messed up. Permits should be revoked due to scientific misconduct.

Response: NMFS intends to continue to implement actions that promote Hawaiian monk seal recovery as required by and authorized under the ESA and MMPA. Scientific studies show that NMFS Hawaiian monk seal research handling has had no negative impact on the species and only very rarely on the individual seals handled (Baker and Johanos 2002). Recovery actions over the past several decades have saved many seals from injury and death due to entanglement, hookings, shark predation, aggressive males, etc. The NMFS PIFSC has no violations of their current permit (No. 10137) and takes a conservative approach to conducting new activities. NMFS maintains high scientific standards and complies with stringent scientific review and oversight protocols, and requests that any allegation of scientific misconduct be accompanied by supporting information.

GEN 05 NMFS must limit human intervention to only what is necessary to promote survival of Hawaiian monk seals so that survival does not become impeded.

Response: NMFS shares the concerns about limiting human intervention with Hawaiian monk seals to only what is necessary to promote survival. As described in PEIS Sections 1.5.2 and 1.5.3, NMFS activities that require interaction with monk seals in Hawai'i (such as moving seals away from harmful situations) are all permitted by the NMFS Office of Protected Resources under the ESA and MMPA. NMFS research and enhancement activities also adhere to the Animal Welfare Act standards and requirements (see Section 1.5.10). All NMFS activities are stringently reviewed during the permitting process and are reviewed at

regular intervals to ensure that activities are continuing to benefit, and not harm, the monk seal population.

GEN 06 State of Hawai'i buy-in with this proposed action is essential for the success of the Hawaiian monk seal program. Some type of legislation may be necessary to mitigate some of the effects that might occur.

Response: NMFS values its partnership with the Hawai'i state government and will continue to coordinate and collaborate with DLNR and other state agency partners to the maximum extent possible. NMFS has provided grant funds to DLNR under Section 6 of the ESA, in part to support DLNR's work on Hawaiian monk seal recovery. NMFS is not aware of any new legislation necessary for successful implementation of the actions proposed in the PEIS.

GEN 07 The USEPA has rated the Draft PEIS on Hawaiian Monk Seal Recovery Actions as Lack of Objections (LO).

Response: NMFS acknowledges the USEPA has not identified any potential environmental impacts requiring substantive changes to the proposal. We will continue to coordinate with USEPA as required by NEPA and other laws and regulations.

GEN 08 Hawai'i has so many unique species that are becoming endangered, including Hawaiian monk seals. Monk seals represent how poorly humans have taken care of our environment and the challenge we face to reverse this trend.

Response: NMFS agrees that some human activities in the past, especially in the NWHI, contributed to the current endangered status of Hawaiian monk seal. NMFS recognizes the challenge we face in promoting Hawaiian monk seal recovery, and we believe the actions proposed in the PEIS represent the best way to address this challenge.

GEN 09 Some of the proposed actions seem to address the "symptoms" of monk seal decline and a more retroactive approach that is expensive rather than effective long-term recovery.

Response: NMFS has carefully considered actions that hold promise to support Hawaiian monk seal recovery and has determined that the actions proposed in the PEIS are most likely to result in the most effective and positive outcome for Hawaiian monk seal recovery. Please also refer to Section 2.12 in the PEIS for more discussion related to this comment.

GEN 10 As long as the monk seals don't prohibit our fishing and beach use, I support the proposed action.

Response: No new rules or regulations are proposed in the PEIS including any new or additional prohibitions on fishing or beach use resulting from implementation of the actions proposed in the PEIS.

GEN 11 An example of where something like this was very successful is the Gulf of Mexico. A lot of research has been done where fishermen used sea turtle "excluder" devices to keep endangered sea turtles away from their nets. This prevented costly damage to shrimp trawler nets and protected the endangered turtles.

Response: NMFS will continue to look for and consider solutions to fishery interactions and other Hawaiian monk seal recovery issues within Hawaiʻi and throughout the world. We frequently confer with our American and international colleagues to make sure we are aware of conservation measures that may be applicable for Hawaiian monk seal recovery.

GEN 12 Where is the projected negative impact study on this plan? Where are the documents that describe how monk seals will negatively affect our island?

Response: Chapter 4 of the Final PEIS describes adverse and beneficial impacts (including some minor adverse impacts) that are anticipated to be associated with the proposed alternatives. Please see the Executive Summary as well as Section 4.7 for descriptions of biological impacts and Section 4.8 for descriptions of social (including cultural) and economic impacts. In summary, among the biological resources, all effects on sea turtles, cetaceans, 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. After considering substantive comments received regarding the Draft PEIS and further analysis, NMFS revised the description of cultural impacts and impacts on fisheries in the Final PEIS.

GEN 13 NMFS should determine the cost of translocating seals and include costs in the decision-making process. A cost-benefit analysis should be provided in the PEIS for each alternative.

Response: NMFS does, and will continue to, consider costs among several factors in its decision-making processes related to actions it undertakes to promote Hawaiian monk seal recovery. While NEPA does not require explicit discussion of direct costs of implementing proposed actions in a PEIS, the actions proposed in this PEIS do consider feasibility of implementation, including cost. Alternatives were primarily selected however, because of their potential to provide the greatest benefit to Hawaiian monk seal recovery. NMFS is required to undertake activities within authorized appropriations, and routinely makes decisions concerning the allocation of limited financial resources to competing conservation programs.

GEN 14 If NMFS moves seals to the MHI, they will be killed and eaten.

Response: See response to GEN 03 and BEH 04. It is against federal law to kill or harm a Hawaiian monk seal without proper authorization under the ESA and MMPA. Violations of the MMPA and ESA can be charged either civilly or criminally, with criminal fines under the ESA of up to $50,000 or imprisonment for up to one year, or both. NMFS recognizes that some monk seals have been intentionally killed already and that may continue to occur regardless of the fact that under the Preferred Alternative in the Final PEIS (Alternative 3), no weaned pups will be translocated from the NWHI and released in the MHI. NMFS will continue to address this type of issue through education, outreach, and enforcement activities.

INA Inadequate Information to Assess Effects/Unclear Information

INA 01 The PEIS should include an assessment of the carrying capacity in the NWHI and the effects of climate change to gain a better understanding of the state of the ecosystem.

Response: NMFS provided a discussion of carrying capacity in Section 3.3.1.6 of the Draft PEIS, explaining the concept and the difficulty associated with its determination. There is considerable uncertainty about the underlying factors driving the decline, and the role of climate change remains uncertain. While it would be beneficial to have a more complete understanding of the role of climate change in altering the NWHI ecosystem, NMFS does not believe that beneficial recovery actions can or should be deferred while we pursue that understanding. Waiting until NMFS has a significantly better understanding of climate change effects is not compatible with the needs of monk seals (and therefore with the Purpose and Need of this action).

Refer to Section 3.3.1.7 of the PEIS for a discussion of the current understanding about the role of climate change, including apparent effects of varying oceanographic productivity on monk seal survival and body condition, and potential effects of sea-level rise on terrestrial habitat for monk seals.

INA 02 The PEIS should include an evaluation of whether the numbers of monk seals is realistic for the NWHI where the land is disappearing. The analysis of the proposed alternative is not quantitative.

Response: NMFS published the first study on the potential effects of sea level rise on NWHI terrestrial habitat and biota (described in PEIS Section 3.3.1.7). Recently, the USGS published a more complete analysis of land elevations and projected sea level rise impacts in the NWHI (Reynolds et al. 2012, available at http://pubs.usgs.gov/of/2012/1182/). The future of sea level rise and the potential for mitigating habitat loss remains uncertain. NMFS considers this an important issue and is committed to preserving the NWHI as important habitat for monk seals in the foreseeable future.

INA 03 NMFS does not know enough about the impacts of moving 10 to 20 seals a year to the MHI or about removing predators such as jacks (ulua) from the NWHI to move forward on this action.

Response: NMFS conducted an impact assessment of the proposed 2-stage temporary translocation in the Draft PEIS, and updated fishery impacts analysis for the Final PEIS. While Alternative 4 was Preferred in the Draft PEIS, Alternative 3 has been selected as the Preferred Alternative in the Final PEIS. The distinction between these two Alternatives is that Alternative 3 (Preferred) does not include any two-stage translocation option that would involve taking seals born in the NWHI and releasing them in the MHI.

Alternative 4 would be infeasible at this time. NWHI pups, if 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.

Nevertheless, please note that the updated fishery impacts analysis in the final PEIS (Sections 4.8.1-4.8.3) concluded (consistent with the Draft PEIS) that impacts on fisheries from all Alternatives would be negligible. Regarding the removal of jacks (ulua) and other Hawaiian monk seal competitors in the NWHI, NMFS agrees that the impacts of this type of activity remain uncertain. Please also see the response to ALT 09.

INA 04 The PEIS does not take anything into account except the translocation program. The statements that there are negligible impacts on ocean users are just not true. A complete review of the entire monk seal recovery program is needed.

Response: The PEIS evaluates all aspects of NMFS' monk seal research and enhancement program. This encompasses not just the proposed translocation action, but also all other research and enhancement actions, whether ongoing or new. Please refer to Chapter 4 of the PEIS for this information.

INA 05 The PEIS does not explain what sampling monk seals for genetic analysis means or includes.

Response: In Section 2.5 of the Draft PEIS NMFS described the three sources for genetic sampling of Hawaiian monk seals. 1) Shed molt (skin) samples, 2) tissue collected from dead seals and 3) small flipper skin punches which are a byproduct of flipper tagging.

INA 06 The PEIS does not include any kind of pictorial display or description of what having 500 monk seals in the MHI will look like. How many seals will be in what areas of the islands and what impact will they have?

Response: Seal abundance in the MHI is increasing naturally. Under the Preferred Alternative (Alternative 3) in the Final PEIS, no weaned pups would be translocated from the NWHI and released in the MHI. The expanding naturally occurring population and the movements of individual seals in various habitats makes it difficult to depict precisely how monk seals would be distributed if the population reaches 500 seals.

INA 07 The PEIS is not based on evidence. The whole idea of translocation is based on computer modeling; it's not even based on real data. The science presented in the PEIS is inadequate.

Response: NMFS disagrees with this comment. The PEIS is based on years of scientific research. The translocation concept is not based on computer modeling; rather it is based on over 25 years of detailed demographic data, successful experience with translocation (including published results), and sound conservation science. The stochastic simulation model (described in Appendix M) is closely tied to the most recently available field research data. The model serves to integrate all of the relevant data in order to better predict, quantify, and compare the probable outcomes derived from various possible translocation scenarios. In this way, the model helps identify the most beneficial translocation scenarios based on everything we know about monk seal demographics and previous translocation experience.

INA 08 The PEIS needs to be more specific and describe where seals would be translocated. There is lack of information describing the science behind an increase in the number of translocations. Why does NMFS believe an increase in the number of translocations will support recovery? There is no explanation of what "additional permits above the number permitted" means in the alternatives.

Response: The exact locations where seals would be translocated have not been decided; however, the process by which those decisions would be made is described in Appendix F and Section 5.2 of the Final PEIS. The scientific process by which the number of seals to translocate will be decided is also described in Appendix F.

Although Alternative 4 was Preferred in the Draft PEIS, Alternative 3 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 seals born in the NWHI and releasing them in the MHI. However, a variety of translocation actions could occur under the Preferred Alternative, including two-stage translocation *within* the NWHI, *within* the MHI, or from the MHI to the NWHI. The maximum

numbers that could be translocated under each alternative are presented in Appendix H and the Executive Summary of the Final PEIS.

When specific locations are chosen for translocation, NMFS will evaluate the potential effects of moving seals to chosen sites as part of the permitting process. Site-specific activities will be evaluated against the analyses presented herein for future NEPA compliance and the appropriate level of NEPA review will be completed accordingly as described in Section 1.6 and Chapter 5 of the Final PEIS.

The respondent may be referring to wording in the Alternative Proposed Table 2.10-1, which mentions additional takes over the status quo in some alternatives. These are explicitly enumerated in Appendix H. Also, scientific research permits are valid for up to 5 years, and the PEIS is intended to cover a 10-year period. Thus, more than one permit will be required over the duration of the PEIS.

INA 09 The establishment of feeding stations as described in the PEIS raises concerns and needs further explanation in the Final PEIS. It is not clear whether feeding stations will require human involvement or be self-sufficient. Feeding stations may draw in other animals besides Hawaiian monk seals. The PEIS states that this approach has not been tried to date with monk seals yet later states that it was tried successfully in the 1990s making it unclear whether feeding stations have been tested or not.

Response: NMFS agrees that "feeding stations" was inadequate wording and have explained this concept more thoroughly in the Final PEIS (Section 2.5). In short, the draft PEIS discussed a proposal to provide supplemental feeding of seals after release back to the wild in the NWHI following captive care. Trained technicians would perform the feeding after the seals have been conditioned to take food in this way during their captivity. This temporary process would help the seal meet its subsistence requirements while it transitions to self-sufficiency on a natural diet. NMFS has previously fed seals in head start or captive care programs in shore pens in the NWHI using reef fish or frozen herring in the past, so feeding fish to seals in the remote NWHI has been accomplished before. The proposal in the PEIS differs in that the seals may not be held in pens for feedings. As with any of the recovery actions, this strategy will be approached with caution and the implementation of supplemental feeding will be designed to quantitatively determine effectiveness.

INA 10 There are no impact criteria presented in the PEIS for recreation and tourism. The terms "negligible" and "moderate" are far too subjective for this analysis.

Response: Impact criteria for recreation and tourism and descriptions of what is meant by “negligible” and “moderate” are included in Sections 4.4.3 and 4.8.5 of the Final PEIS.”

INA 11 The Draft PEIS does not provide enough detail on how long the de-worming or vaccination trials would last. NMFS should address food limitation first before beginning other initiatives such as de-worming and translocations.

Response: NMFS did not state how long vaccination (Appendix E) and deworming trials (Section 2.5) would last. This will depend upon a number of factors, including funding, the results of trials, and the availability of new drugs, routes of administration, or vaccines. NMFS does not agree that it should solve food limitation before developing other tools to aid recovery. The monk seal is in crises and NMFS believes it should pursue all promising tools for recovering the species without deferring action pending additional long-term investigations. NMFS will continue to investigate the nature and underlying causes of food limitation affecting juvenile survival. The common objective of many recovery actions evaluated in the PEIS is to preserve or enhance the number of reproductive-aged females so that the population maintains its capacity to respond once natural foraging conditions become more favorable to growth.

INA 12 Impacts to piscivorous wildlife species, global climate change, sea level rise, tourism, or the military are not adequately considered in the PEIS. Information about the marine ecosystem and food web is not available for the MHI or NWHI.

Response: The following sections of the Final PEIS address each of the topics mentioned in the comment: 1) Section 4.7.5 (Fish); Section 4.7.6 (Birds); Section 4.8.5 (Recreation and Tourism); and Section 4.8.7 (Military Activities). The potential effects of climate change and the issue of sea level rise are addressed as part of the cumulative effects analysis for each resource evaluated in the PEIS as listed in Table 4.5-2 Reasonably Foreseeable Future Actions Within the Project Area. NMFS also notes that Sections 4.8.1 – 4.8.3 regarding potential impacts to commercial, subsistence, and recreational fisheries, have been revised in the Final PEIS.

INT Human-Seal Interactions

INT 01 NMFS wants to minimize human-seal interactions but you are exposing yourselves to seals during research. What's the difference? Is human disturbance due to research contributing to population decline? Research should be closely monitored to ensure there are no deleterious effects.

Response: NMFS has historically been, and remains, extremely sensitive to the potential for adverse effects of research on seals. NMFS keeps careful records of all research- and enhancement-related disturbances and handling of monk seals, and monitors for deleterious effects. All research and enhancement activities are conducted in a precautionary manner to minimize the potential for negative effects. NMFS has published peer-reviewed scientific articles evaluating the effects of research and has not found negative effects, with the exception of a

very small number of unintended seal deaths over the long history of the research program. The protocols and their conservative nature are described throughout Section 2.5 of the PEIS.

NMFS also recognizes that, despite past performance, there is some risk of harm or death to seals associated with research and enhancement activities. That is why NMFS is applying for a permit that includes a limited number of unintentional mortalities (Final PEIS Appendix H), the potential impacts of which are analyzed in Chapter 4. Research and enhancement activities do involve some risk to the individual animals, but this small level of risk is acceptable in relation to the expected conservation benefits to the species. In contrast, most non-research and non-enhancement interactions between humans and seals entail risks of harm to both the seals and the people, and achieve no benefit to the seals.

INT 02 Increasing the number of Hawaiian monk seals in the MHI will increase the number of human-seal interactions. It seems the existing mitigation measures used to manage human-monk seal interactions are insufficient. Seals do nothing for us but cause problems such as closing roads and beaches. Seals are also at more risk for injury where there are more interactions.

Response: See response to BEH 03. NMFS acknowledges that people have concerns about interactions between humans and Hawaiian monk seals. The Hawaiian monk seal population in the MHI is naturally increasing due to high survival rates of pups that are born here. While seals may still experience harmful interactions or injuries, survival is still high relative to most sites in the NWHI.

Note that while Alternative 4 was Preferred in the Draft PEIS, Alternative 3 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. Therefore, any increase in the number of seals in the MHI will be attributable to natural growth of the population. NMFS acknowledges that Alternative 4 would be infeasible at this time. NWHI pups, if 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.

Given the natural population increase in the MHI, NMFS agrees that the currently permitted options may be insufficient to manage the expected corresponding increase in seal-human interactions. To address this need, NMFS has proposed a behavioral management program in PEIS Chapter 2 (included in Alternatives 3 and 4). NMFS believes that humans and seals can safely coexist and share the beaches and ocean around the Hawaiian Islands.

As described in Section 5.6 of the PEIS, NMFS acknowledges that it will need the cooperation and involvement of the community in Hawai'i to learn about interactions and work with communities to develop solutions. See response to SOC 06 regarding closure of roads and beaches.

INT 03 If a monk seal is on a beach and becomes aggressive with small children that are there, am I going to risk getting fined for intervening or am I supposed to watch a child get injured or possibly die in front of my eyes?

Response: NMFS acknowledges that people have concerns about monk seals and human safety. NMFS would like to emphasize that seals and people generally coexist peacefully in the waters and beaches around Hawai'i. However, in some situations, people may be concerned for their safety, or the safety of others, around a seal displaying aggressive behaviors (or defensive, in the case of mothers and pups). Monk seals are protected by both the Endangered Species Act and the Marine Mammal Protection Act, and both statutes have provisions that ensure that actions that are taken in self-defense or in defense of others are not subject to prosecution (see PEIS Sections 1.5.2 and 1.5.3).

NMFS would like to stress that in any case where it is made aware (through input from the public or other sources) that a seal is engaging in behaviors that cause risk to either humans or the seal, it would investigate and, if necessary, apply appropriate mitigation (behavior modification, removal, or other action as appropriate). Input from the public is vitally important for these protocols to be effective and implemented in a safe, timely manner. Also refer to the response to INT 04 below.

INT 04 NMFS should know that if people are threatened by a monk seal, they are going to kill the seal. There is no safety among seals and seals are harming people. Monk seals are aggressive and they are going to bite. What is your accountability if someone gets injured?

Response: All scientific evidence, field observations, and public reports to date indicate that public safety risks associated with Hawaiian monk seals in the wild are extremely low. Monk seals are not aggressive by nature and only exhibit aggressive behavior toward humans when they feel threatened or when they have been previously fed by humans or otherwise interacted with, and have thereby been conditioned or "trained" to seek out human interaction. As discussed in the PEIS (Section 3.4.9) only a very small number of such interactions have occurred in the MHI over the past 20 years. NMFS has, and will continue to conduct outreach and education activities that help prevent human-seal interactions and minimize the risk of injury when they occur. The seal behavior modification program (described in Sections 2.5 and 5.4 of the PEIS) included in Alternatives 3 and 4 of the PEIS is designed in part to further address this concern. If the public follows the viewing guidelines and ESA/MMPA regulations, the risk of injury

from a seal is negligible to non-existent. Please also refer to the response to INT 03.

INT 05 Given the high number of human-seal interactions and the unsustainable number of monk seal mortalities in recent years, NMFS should dedicate more attention to this issue in the Final PEIS. Additional community outreach and education to address interactions should be highlighted in more detail and recommendations for reducing interactions should be included. Alterations in human behavior are mentioned in Section 5.4 as an effective measure for preventing socialization of seals. NMFS should provide greater attention to this in the Final PEIS.

Response: NMFS has presented information regarding human-seal interaction in Section 3.4.9 of the Draft PEIS. Section 3.4.9 of the Final PEIS reflects significant new human-seal incidents that have occurred between the release of the Draft PEIS and the completion of the Final PEIS.

Sections 5.4 and 5.6 present information regarding community education and outreach to address human-seal interactions. NMFS agrees that recommendations and guidelines for reducing interactions are important to disseminate to the public and additional education and outreach efforts in this regard are currently high priorities for NMFS. Since publication of the Draft PEIS, NMFS developed a public service announcement on human behavior around monk seals. This video and guidelines for human behavior are available on the NMFS web site

http://www.fpir.noaa.gov/PRD/prd_good_neighbors.html and are an important component of ongoing outreach efforts. The focus of this PEIS, however, is on research and enhancement activities directed on Hawaiian monk seals.

INT 06 Comments describing interactions with Hawaiian monk seals.

Response: NMFS recognizes that, as with many other wildlife species around the world, there are interactions in the MHI where seals and humans overlap in their use of resources. NMFS appreciates the public sharing this information and encourages continued dialogue to help us better manage seals in the MHI in the future. Section 5.4 of the Final PEIS describes the plan for the development of a behavior modification program to help minimize seal-human interactions.

INT 07 When Hawaiian monk seals hear a boat engine, they begin following the boat. Older seals already in the MHI are going to teach the pups to interact with the fishermen. These seals are going to end up relying on handouts for food.

Response: Scientific evidence to date does not support the idea that monk seals "teach" other monk seals. Monk seals are typically solitary animals, living and foraging mostly by themselves. Even mother seals and pups do not spend a significant amount of time together (only about 39 days during nursing) and

weaning occurs rather abruptly when the mother seal leaves her pup and swims offshore to feed (Kenyon and Rice 1959; Wirtz 1968; Johnson and Johnson 1984).

Nevertheless, NMFS agrees that interactions with fisheries, including interactions with fishing boats, represent a serious recovery issue. For this reason, NMFS has proposed, under Alternatives 3 and 4, seal behavior modification programs intended to address this issue. Seal behavior modification programs are described in Sections 2.5 and 5.4. Please also see the response to comments FISH 01, FISH 06 and FISH 08 for more relevant information.

INT 08 We need to help Hawaiian monk seals by ending human-seal interaction as it contributes to population decline. Chronic disturbance may cause seals to abandon haul-out sites important for maturation.

Response: One of the recovery actions specified in the Recovery Plan for the Hawaiian Monk Seal (NMFS 2007) is to "reduce the likelihood and impact of human disturbance". As explained in PEIS Section 5.6.1, the Marine Mammal Response Network supports the Hawaiian Monk Seal Recovery Program by responding to monk seal haul-outs to protect seals from disturbance and alert the public that a seal is resting on the beach. Response network activities that do not involve direct interaction with monk seals are not included in the alternatives considered in the PEIS because they have been authorized under a separate permit, but are analyzed in the cumulative impact analysis of the Final PEIS As described in Section 5.6.1, the Marine Mammal Health and Stranding Response Network was analyzed in a separate NEPA evaluation which was published in 2009. Section 5.4 of this Final PEIS describes the plan for the development of a behavior modification program to help minimize seal-human interactions. NMFS considers the impact of the proposed action together with other monk seal conservation activities, including volunteer outreach, in the cumulative impact analysis of the Final PEIS. Also see response to BEH 09.

INT 09 More human-monk seal interactions are only going to lead to more prosecutions of Hawaiians and fishermen.

Response: Please see response to comment REG 05.

MGT Management

MGT 01 I support Hawaiian monk seal recovery but I do not support NMFS's role in the recovery. NMFS should not be the lead agency on this project. A joint task force should be developed which should include true Hawaiian practitioners, community members, and ocean users so NMFS would not be making decisions in a vacuum.

Response: The leadership role and responsibility of NMFS in Hawaiian monk seal recovery is specified in federal law (ESA and MMPA). NMFS agrees, however, that close coordination and collaboration with other government and

non-government partners and stakeholders is essential for successful Hawaiian monk seal recovery. Public involvement and solicitation of public comments is incorporated in many aspects of the NMFS recovery program, including during the process of applying for federal permits and PMNM permits for various recovery activities. The Hawaiian Monk Seal Recovery Team also includes members of the Hawaiian community and ocean users. Plans for NMFS to engage Hawaiian practitioners and other community members are discussed in Section 5.6 of the PEIS.

MGT 02 Community-based resource management has been very successful in Hawai'i and now is an opportunity to train people to address your concerns with Hawaiian monk seals. NMFS could learn from the experts who know the coastline and oceans better than anyone.

Response: NMFS agrees. NMFS places a high priority on the uses of community-based resource management strategies for the purposes of Hawaiian monk seal recovery. Section 5.6 of the PEIS presents various ways in which NMFS will engage local communities, including community members who have special knowledge and expertise relevant to Hawaiian monk seal recovery.

MGT 03 Moloka'i needs protection from commercial fishermen and others that come from off-island to take or use our resources. People of Moloka'i should have some say in whether or not people can fish here.

Response: The purpose of this PEIS is to analyze the recovery actions proposed for Hawaiian monk seals, and the PEIS does not address general issues concerning public access to fishing resources.

MGT 04 NMFS must coordinate with other departments in the federal and state government and communicate better to successfully manage resources and work with the community.

Response: NMFS places a high priority on coordination with other federal and state government agencies. NMFS intends to continue to coordinate and collaborate closely with our government partners, including NMFS's Office of National Marine Sanctuaries and the State of Hawai'i, DLNR. Please also see the response to comment ALT 20. Although NMFS is the agency with the mandate and responsibility to recovery Hawaiian monk seals, NMFS recognizes that successful recovery of the species will depend on coordination with federal and state partner agencies. PEIS Section 1.8 describes the involvement of other agencies involved in the PEIS. USFWS and Hawai'i DLNR were invited to be cooperating agencies in the PEIS process, but both declined the invitation. Section 5.6 of the PEIS describes NMFS' plans to coordinate with stakeholders and communities. NMFS always strives to improve coordination with partners and continued communication to successfully manage our shared resources around the Hawaiian Islands.

MGT 05 The PEIS should address the need for supplemental funding to support the preferred alternative, the likelihood this funding will be secured, and the extent to which a lack of funding could limit critical research and recovery activities.

Response: Please see the response to comment GEN 13.

MGT 06 Will the State of Hawai'i have sufficient resources to be able to enforce these new management measures to protect seals?

Response: No new rules or regulations are included in the actions proposed in the PEIS. NMFS has provided grants to the State of Hawai'i DLNR, under a cooperative agreement and joint enforcement agreement, in part to support Hawaiian monk seal recovery and enforcement of Hawaiian monk seal protections specified in the ESA and MMPA.

MGT 07 Federal budget constraints must be considered for this project. Why implement a program that will fail unless it receives a large amount of federal funding?

Response: NMFS will only implement actions for which it is allocated adequate funding. Please also see comment GEN 13 for information relevant to this comment.

MGT 08 Is it normal or natural to cordon off sections of beach around a monk seal? It may be safer for the seal or for humans but is it natural?

Response: See response to BEH 09. NMFS believes that Hawaiian monk seals and humans can safely coexist and share the beaches and ocean, in part, because this is already occurring in several places around Hawai'i. NMFS is committed to Hawaiian monk seal recovery, as well as human safety, and believes that the response network program that helps to notify and educate beachgoers about Hawaiian monk seals supports this mission. When NMFS cordons off sections of beach around a monk seal, it is to allow the seal the ability to exhibit its natural behaviors (*e.g.*, resting, nursing) without being harassed by humans, and for public safety. NMFS will continue to use an adaptive management approach in providing protection to monk seals and guidance to the public along Hawai'i's beaches and shorelines. Cordoned off areas, or seal protection zones (SPZs), are erected and managed by NMFS and government partners on a case-by-case basis depending on specific criteria and guidelines that consider the location, the individual seal(s), levels of human use, etc. NMFS policy calls for the use of SPZs only when certain criteria are met. The harassment of monk seals by humans is illegal for a reason – human actions that alter the behavior of endangered species can harm the animals' ability to survive.

MGT 09 There is a wonderful opportunity to educate the public through the Hawaiian Monk Seal Response Team. It would be helpful if the Response Team was given some sort of badge of authority, a shirt or jacket with the NMFS logo,

or a flag or sign that we could place in the sand explaining that we are volunteers for NMFS.

Response: The Marine Mammal Response Network is a NMFS program not part of the action alternatives analyzed in this PEIS. However, it is standard policy for trained volunteers who have completed a certain number of hours and regularly respond to monk seal haul-outs to wear a shirt identifying them as a member of the NMFS-approved Response Network. Volunteers are invaluable to NMFS' Hawaiian monk seal recovery efforts, helping to inform and educate beachgoers about the seals with which we share our beaches and ocean, and by doing so, helping to keep humans and monk seals safe. Shirts or jackets are provided to response volunteers to identify them as trained and authorized response network members, but this does not confer any authority or permission to "take" or approach more closely to monk seals than the general public. However, the identification helps direct beachgoers to a vetted source of information, and helps the recommendations of the volunteer regarding safe viewing to carry more weight. If trained volunteers need shirts, they should coordinate with their respective Island Response Coordinator.

MGT 10 It is critical that NMFS work with the State Legislature on the objectives of this program.

Response: NMFS provided an informational briefing regarding the PEIS and the proposed re-designation of Hawaiian monk seal critical habitat to members of the Hawaiʻi State Legislature on November 18, 2011. NMFS will continue to provide relevant information and seek the views of the Hawai`i State government regarding Hawaiian monk seal recovery.

MGT 11 How will the public know what NMFS's progress on this proposed action will be? What if these actions fail - how far will NMFS go to intervene? At what point will the program be deemed successful?

Response: Please see the response to BIO 04. NMFS will provide updates on the progress of the Hawaiian monk seal recovery program, including progress on implementing the actions proposed in the PEIS via the NMFS PIRO website, news media advisories, public presentations, community meetings and other methods of community engagement, many of which are described in Section 5.6 of the PEIS. Regarding how far NMFS will go to intervene, NMFS will only implement actions that have been carefully assessed in the PEIS or otherwise subjected to review and analysis as specified in NEPA and all other applicable laws and regulations, such as the ESA and MMPA. Regarding how the success of the program will be measured, several evaluation criteria are specified in the PEIS (please see Sections 5.2 - 5.4, and Appendix F of the Final PEIS), and additional criteria will be specified in the required ESA-MMPA permit, which NMFS must obtain prior to implementing the actions proposed in the PEIS.

PUB Public Coordination

PUB 01 Public outreach to further explain more about the monk seal's decline will help the public understand the uniqueness of the situation and build support for the project. Community support is essential for this project to be successful. The project is progressing too fast.

Response: NMFS agrees that community support is essential for the recovery of the Hawaiian monk seal to be successful. NMFS began outreach efforts for the PEIS in October 2010 with the beginning of the public scoping period (details can be found in the Draft PEIS Appendix B). After the scoping period, while NMFS was incorporating the public comments and preparing the Draft PEIS, NMFS held numerous "talk story sessions" and information sharing sessions with government partners, stakeholders, and community members on all populated islands (except Niihau) to provide information and answer questions regarding the need for, and potential impacts of, the proposed actions. Although NMFS staff learned a great deal from these meetings, they were held to have informal discussions with stakeholders and were not documented for the record as part of the official NEPA public process. NMFS's goal is to ensure that all future management and recovery efforts are as successful as possible by staying engaged with, and responsive to, Hawaii's communities. Section 5.6 of the Final PEIS describes the range of NMFS planned or ongoing activities to coordinate with stakeholders and communities. Please also see the response to PUB 03.

PUB 02 NMFS should coordinate with the community to select release sites and provide continued outreach to make sure people understand the status of the project. Continued public outreach on a regular basis is necessary for this project to be successful.

Response: Section 5.2 of the Final PEIS and Appendix F describe the monitoring plan for the two-stage translocation process and how NMFS has developed a decision framework to support decision-making and assessment at each stage of the process. NMFS emphasizes that recipient sites would be carefully chosen with public input. The details of the decision framework are covered in depth in Appendix F. Note that while Alternative 4 was Preferred in the Draft PEIS, Alternative 3 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 seals from the NWHI and releasing them in the MHI. However, translocations may occur within the MHI under Alternative 3, and community input would be considered when conducting those translocations.

Section 5.6 of the Final PEIS describes the range of NMFS' planned or ongoing activities to coordinate with stakeholders and communities. Also, as described in Section 1.6 and Chapter 5 of the Final PEIS, site-specific activities will be

evaluated against the analyses presented herein for future NEPA compliance and the appropriate level of NEPA review will be completed accordingly.

PUB 03 In the past, NMFS has done a terrible job at communicating with community members and practitioners, despite promises made at town hall meetings and public hearings. NMFS has never led a well-coordinated outreach effort. It fails to be seen how NMFS can successfully communicate the status of activities with the monk seal recovery program. The public outreach on the PEIS and critical habitat for monk seals has been very disappointing.

Response: NMFS is committed to continually improving outreach efforts. The NEPA process is an information disclosure and gathering process to include the public in the decision-making of federal agencies. NMFS began this process with the scoping period in October-November 2010.

Although not documented for the record as part of the official NEPA process, NMFS held numerous informational meetings with government partners, stakeholders, and members of the community to discuss the proposed actions. NMFS held 20 meetings with federal, state, and county government agency staff (e.g. DLNR, HIHWNMS, County Parks & Rec, WESPAC, OHA), 17 meetings with nearly 200 stakeholders (e.g. tour operators, fishermen, coastal property managers, Aha Kiole), 14 town hall meetings on 6 islands to answer questions, and 6 meetings with over 140 response volunteers.

Once the Draft PEIS was released in August 2011, NMFS held 6 formal public hearings on 5 islands to receive public comments. In an effort to do this, even after the official public comment period for the PEIS closed, NMFS conducted a televised briefing for two committees of the state House of Representatives, and has sent a letter with an update about the PEIS and critical habitat processes (along with background information) to every state legislator, mayor, and county council member. NMFS will continue its efforts to involve and engage the community and appreciates suggestions for how to better accomplish this. Section 5.6 of the Final PEIS describes the range of NMFS planned or ongoing activities to coordinate with stakeholders and communities.

PUB 04 Has NMFS met with local and state government officials? What outreach efforts have been done as part of this PEIS? It is not clear what level of public scoping took place.

Response: See response to MGT 04, PUB 01, and PUB 03 for information regarding public scoping and coordination with government officials. A detailed description of the public scoping process can be found in Appendix B of the Draft PEIS.

PUB 05 Better use of the media is needed to effectively reach our communities. Propose notification in newspapers should be published on this project. The meetings seem to have come up quickly. I have not seen any banners

or heard radio announcements about public hearings. It is critical that NMFS connect with communities and does not appear sneaky.

Response: NMFS acknowledges that announcements and notification about upcoming public meetings are important. During the scoping period starting in October 2010, NMFS published paid public notices in 7 newspapers on 5 islands. Notices were published 14 days in advance of each public scoping meeting, and again 7 days prior to the meeting date. Public Service Announcements (PSAs) were also sent to 7 television and radio stations, but airing of those announcements is at the discretion of the station. The same procedure was followed for the comment period following publication of the Draft PEIS. Announcements of the meetings were also sent out on different email mailing lists and listserves for several different organizations and community groups.

Finally, a press release was issued when the Draft PEIS was released and several print articles were published in local newspapers (*e.g.,* the *Honolulu Star-Advertiser*, *Moloka'i Dispatch, Honolulu Weekly,* and *The Garden Island*), as well as print stories picked up by the national press and television stories on local news stations. NMFS will continue its efforts to communicate with communities and improve notification of important issues.

PUB 06 When will the public be able to view comments and testimony and what has been done to address our concerns?

Response: As described in the beginning of this Comment Analysis Report, this report provides a summary of the public comments received on the Draft PEIS during the comment period and NMFS' responses to those comments as required by NEPA. Where changes were made in the Final PEIS, NMFS has specifically noted such in the responses to comments included in this report.

PUB 07 NMFS should produce an informative video about the monk seal's decline and the proposed recovery actions. This video could be shown at film festivals, ball park movie nights, and on airplanes for tourists coming to visit Hawai'i.

Response: NMFS agrees that outreach is a very important strategy for Hawaiian monk seal recovery and that films, in particular, provide a visually engaging medium for conveying information to the public. NMFS has co-produced a video presenting information relevant to the proposed seal behavior modification activity and other impact mitigation measures related to human-seal interactions. This video can be viewed at: http://www.fpir.noaa.gov/PRD/prd_good_neighbors.html. NMFS acknowledges this comment and will take it into consideration when planning outreach projects in the future.

PUB 08 People are financially stretched right now and feel threatened by this project. The more fishermen and kupuna NMFS can coordinate with to promote the proposed actions, the more successful it will be.

Response: See response to PUB 03. NMFS recognizes that coordination with the community is an essential component of Hawaiian monk seal recovery. NMFS is committed to working with the fishermen, *kupuna*, and communities that are directly affected by monk seals to work toward productive solutions for coexistence. Section 5.6 of the Final PEIS describes the range of NMFS planned or ongoing activities to coordinate with stakeholders and communities.

PUB 09 Why can't we provide comments on critical habitat during this public comment period?

Response: As discussed in Section 1.9.1 of the PEIS, revising monk seal critical habitat is a separate federal action with a different process. The PEIS and critical habitat processes are similar because each action relates to the recovery of Hawaiian monk seals and requires public engagement. However, these actions are subject to differences in administrative process, because these actions are guided by different provisions of the ESA.

The revision of critical habitat was prompted by a petition, which under section 4 of the ESA compels an agency response based on the best available information. If a revision is warranted, NMFS may identify critical habitat in areas occupied by the species (i.e. within the range) and/or in areas not currently occupied by the species but necessary for survival and recovery. Once designated, federal agencies must consult with NMFS or USFWS, as appropriate, to ensure that any action that they fund, permit, or carry out will not destroy or adversely modify critical habitat. Existing monk seal critical habitat is described as part of the environmental baseline (Chapter 3) and the proposed revision is evaluated as part of the cumulative effects assessment in Chapter 4.

This PEIS looks at the effects from the federal government funding, permitting, and carrying out research and enhancement activities on the species itself, the Hawaiian monk seal. There are different requirements for the two processes. Activities carried out on monk seals are also regulated by the MMPA, AWA, and other laws described in PEIS Section 1.5. In addition, an ESA consultation must be done to make sure that the federal actions carried out on monk seals, as described in the PEIS, will not jeopardize the existence of monk seals or destroy or adversely modify monk seal critical habitat.

Please visit this website for more information on critical habitat: http://www.fpir.noaa.gov/PRD/prd_critical_habitat.html

PUB 10 Why didn't NMFS have a public meeting in Hana about this project?

Response: NMFS held an informational community meeting in Hana on July 21, 2011 to discuss the PEIS and proposed redesignation of Hawaiian monk seal critical habitat, although this meeting was not documented for the record as part of the official NEPA or critical habitat designation process. NMFS held the formal public hearing for the Draft PEIS in Kihei to reach a larger portion of the Maui community. In total, NMFS held a total of two informational town hall style meetings (in Hana andKihei) and one public hearing (in Kihei) on Maui. NMFS held a total of 14 informational, town hall-style meetings on 6 islands (not documented for the record as part of the NEPA process) and 6 NEPA public hearings across the state. See Response to PUB 03.

PUB 11 Despite all the public opposition that continues to be expressed at these meetings and in comments, it still seems as if they are being ignored. It seems like this is already a done deal.

Response: NMFS is aware of opposition among members of the public to various current and proposed Hawaiian monk seal recovery activities. NMFS has and will seriously consider all substantive public comments in the development, assessment, and implementation of the Hawaiian monk seal recovery program. Public support for an endangered species recovery program, such as the Hawaiian monk seal recovery program, is desirable for recovery purposes, and significant efforts have been and will be taken by NMFS to effectively address legitimate concerns.

While NMFS acknowledges opposition among some members of the public, NMFS has also received numerous supportive public comments regarding the actions proposed in the PEIS and regarding the Hawaiian monk seal recovery program in general. Decisions regarding implementation of any recovery action proposed in the PEIS will be based on the strength of the recommendation and on which alternative meets the purpose and need identified and which best contributes to the recovery of the monk seal.

REG Regulatory

REG 01 Please explain when the Section 106 consultation process will be initiated and subsequently completed in accordance with the National Historic Preservation Act. We cannot concur with a determination of no effect on cultural and historic properties as stated in the PEIS. Additional documentation on the effects on cultural and historic properties is needed.

Response: In fulfilling its responsibilities under Section 106 of the NHPA NMFS undertook a compliance process (See Appendix B) which included consultation with Native Hawaiian Organizations (NHO) and individuals that attach traditional religious and cultural significance to eligible or listed historic properties that have the potential to be affected by the undertaking associated with monk seal recovery as outlined in this PEIS. The intent of the consultation

was to identify historic properties potentially affected by the undertaking and to seek ways to avoid, minimize, or mitigate any adverse effects on those properties.

NMFS held eleven community meetings were held on six islands between October 29 and December 13, 2013. The announcement for these meetings was sent out via the monk seal listserv, and to everyone on the PEIS email contact list. The meeting announcement, along with an invitation to consult, was also sent to DLNR PIO, HIHWNMS, PMNM, OHA, WESTPAC, SHPD, and to a list of NHOs, including Association of Hawaiian Civic Clubs, Island Burial Councils, and Hui Malama I Na Kupuna O Hawai'i Nei. Notices ran in major newspapers around the state.

The NHPA Section 106 consultation was completed in compliance with the NHPA and a determination of no historic properties affected was made. On November 14, 2013 NMFS made available to the public, via its website, a separate document (Appendix B) describing the results of the Section 106 consultation process. This document was sent to the Hawaii State Historic Preservation Officer (SHPO) on November 12, 2013 (see Appendix A). NMFS received no response from SHPO regarding the determination. The document describing the NHPA 106 process was also sent to all consulting parties on November 19, 2013 (see Appendix A).

REG 02 This PEIS is not in compliance with federal and State of Hawai'i laws such as the Coastal Zone Management Act or Hawai'i Environmental Protection Act (HEPA). Specifically, a cultural impact assessment has not been prepared.

Response: NMFS will continue to comply with all applicable laws, including the CZMA. Section 5.6 of the PEIS provides an overview of the coordination and consultation NMFS has conducted and will continue to conduct related to the Hawaiian monk seal recovery program. An assessment of potential cultural impacts is presented in Section 4.8 of the Final PEIS and additional information can be found in Appendix K, which presents a detailed cultural impact assessment.

REG 03 This PEIS must comply with the Admissions Act and explain how the proposed action will benefit Native Hawaiians and the general public. NMFS has a mandate to work with Native Hawaiians and protect Native Hawaiian access.

Response: The activities proposed under the PEIS are fully compliant with and authorized by federal law. Both MMPA and ESA authorize NMFS employees, in the performance of official duties, to undertake activities that take or harass protected species and marine mammals under certain circumstances that will aid in the conservation of those species, including research and enhancement.

NEPA requires NMFS to consider the impact of the proposed activity on communities and cultural resources, which appears in sections 3.4.6 and 4.8.4 of

the PEIS. In addition, NMFS has revised the cultural impact assessment section of the PEIS (Section 4.8) and presents further cultural impact assessment in Appendix K. NMFS has completed the NHPA compliance process for the actions proposed in Alternative 3, the Preferred Alternative (see Appendix B).

NMFS also intends to engage Native Hawaiians and other key stakeholders via the measures described in Sections 5.5 and 5.6 in the PEIS. Refer to REG 01 and CUL 02 for more information on NEPA and the NHPA processes.

REG 04 State law already protects monk seals so there is no need for federal law enforcement to overlap with state enforcement. Designation of the MHI as critical habitat is not necessary to assist law enforcement in protecting monk seals.

Response: No new federal regulation is proposed in this PEIS. Federal and State law enforcement agencies (such as NOAA Office of Law Enforcement and State of Hawai'i DLNR Division of Conservation and Resources Enforcement) routinely coordinate on law enforcement related to Hawaiian monk seals, pursuant to a joint enforcement agreement under the ESA. Refer to Response to PUB 09 regarding critical habitat designation.

REG 05 Having more seals in the MHI is going to lead to more prosecutions of fishermen, Hawaiians, and residents. People are going to be fined, incarcerated, or get injured by seals.

Response: NMFS recognizes the importance of fishing to many Hawai'i residents, and does not agree that more seals in the MHI would likely result in more prosecution of fishermen, Hawaiians, or other residents. The evidence to date indicates that while the Hawaiian monk seal population has increased substantially in the MHI over the past several years, no substantial increase in prosecutions has occurred.

NMFS has worked, and will continue to work, with fishermen, fishing clubs, and others in the fishing community to promote co-existence among Hawaiian monk seals, fishermen, and fisheries. NMFS has developed guidelines (available via the NMFS PIRO web site: http://www.fpir.noaa.gov/Library/PRD/Hawaiian%20monk%20seal/HMS-fishing_guidelines-FINAL-PUBLIC.pdf), in consultation with DLNR, that are intended to prevent or minimize monk seal interactions with fishing gear and thereby reduce the chances of possible ESA or MMPA violations.

REG 06 If monk seals die in fishing nets, is that going to lead to a ban on fishing? If seals wind up dead on the beach with ulua hooks in their throats, is NMFS going to ban ulua fishing? Will there be more restrictions on fishing grounds? What will be the impact on beach goers?

Response: NMFS recognizes the importance of fishing to many Hawai'i residents and is not proposing any new ban or restriction on any type of fishing in this PEIS. Please see response to comment REG 05.

REG 07 Hawai'i does not need any more rulemaking or critical habitat expansions.

Response: No new federal law or rule is proposed in this PEIS. Federal agencies are required to comply with NEPA and analyze the effects of their proposed actions on the environment. In this case, NMFS is applying for a new permit (not a proposed regulation or rule) for research and enhancement that involves the take of Hawaiian monk seals under the ESA and MMPA. Thus, the PEIS is the environmental analysis of the proposed activities in the permit application that is required by NEPA. Please also see the response to comment PUB 09 regarding critical habitat.

REG 08 When a seal beaches itself, the area around it is closed. If you increase the number of seals in the MHI, every time a seal beaches itself the beach is going to be closed. This will affect families who want to spend time at the beach.

Response: Please see responses to MGT 9, SOC 6, SOC 7, and SOC 08.

REG 09 The Endangered Species Act precludes NMFS from choosing Alternative 2. The only reason Alternative 2 is part of the PEIS is because NEPA requires it.

Response: NMFS does not agree with this comment. The ESA requires federal agencies to develop and implement recovery plans for the conservation and survival of the species. To that end, NMFS prepared a recovery plan that contains measurable criteria for achieving recovery goals. Nothing in the ESA requires that NMFS implement any particular alternative that has been analyzed in this EIS. However, we believe implementation of the Preferred Alternative is most consistent with the objectives outlined in the recovery plan.

REG 10 NMFS's voluntary guidelines for fishermen only serve as mitigating factors in an investigation or enforcement action for an unintended species interaction.

Response: Please see response to comment REG 05.

REG 11 Under Hawai'i Statutes it is a Class C felony to "take" a monk seal. I do not recall any exemption for "take" due to permits.

Response: The activities proposed under the PEIS are fully compliant with and authorized by federal law. Under the Section 104 of the MMPA and Section 10 of the ESA, there are exceptions to the moratoria and prohibitions on taking marine mammals and threatened and endangered species. These exceptions include permits for scientific research and enhancement, and other activities. NMFS employees have federal permits under the MMPA and ESA authorizing them to harass or otherwise take protected species for scientific research and enhancement purposes. The State of Hawaii also issues special exemption permits allow persons or organizations to conduct certain activities that would normally be prohibited.

REG 12 Under Field Manual 2710, NMFS must follow the laws of the land and as a Hawaiian national, I do not give consent for this project.

Response: The activities proposed under the PEIS are fully compliant with and authorized by federal law. Both MMPA and ESA authorize NMFS employees, in the performance of official duties, to undertake activities that take or harass protected species and marine mammals under certain circumstances, including research and enhancement.

REG 13 NMFS can renew their permits any time they want so it doesn't matter what we say in our comments about this program. They are going to do what they want.

Response: This comment is not accurate. In order to obtain an ESA-MMPA permit to do research and enhancement activities on an endangered marine mammal, researchers must go through a rigorous process with each application that is submitted. This process typically takes a year to complete. This includes submitting a detailed application justifying and describing the proposed activities, having the application subject to public and expert review, and completing the necessary consultations and environmental analyses. NMFS must take into consideration substantive comments received on a permit application that are relevant to the ESA and MMPA permitting requirements, which are summarized in this document and Section 2.11.

The ESA-MMPA permit process is subject to additional requirements, as shown in Section 1.5, which lists all the federal laws that researchers must abide by in order to work with monk seals. Some laws require additional permits to carry out this work and others require consultations (*e.g.*, the ESA) and environmental review (*e.g.*, NEPA).

The permit cannot be issued until the PEIS Record of Decision and ESA consultation are complete. As described in Section 2.11, scientific research and enhancement permits may be issued for a maximum of five years from the date of

issuance. The five-year period may be extended by a minor amendment up to 12 months, but such extension by a minor amendment may not authorize an increase in the number of animals taken, or changes to the geographic locations or species. Any major change to a permit requires the same process as applying for a new permit, including the 30-day public comment period and any necessary consultations and environmental analyses.

SOC Socioeconomic Effects of Hawaiian Monk Seal Research and Enhancement

SOC 01 The economic assessment is incomplete and incorrect. The PEIS summary of potential impacts lists a beneficial impact of the proposed project for tourism. Not everyone views seals in the MHI as positive. The fishing community does not view seals as positive. Having more seals in the MHI is going to hurt the economy.

Response: An assessment of potential economic impacts is presented in Section 4.8 of the Draft PEIS. The assessment of impacts on recreation and tourism (PEIS Section 4.8.5) and fisheries (PEIS Sections 4.8.1 - 4.8.3) associated with Alternatives 3 and 4 include consideration of important mitigation measures, including a seal behavior modification program and a fisheries interactions mitigation program. These mitigation measures are expected to address many concerns regarding adverse impacts caused by monk seals interacting with humans.

NEPA requires that impacts be assessed based on the best available information related to actual impacts. Negative views or perceptions regarding Hawaiian monk seals or the proposed alternatives would not necessarily lead NMFS to predict adverse impacts unless these views or perceptions would likely manifest as actual adverse impacts on the resources being assessed. A recent public survey conducted throughout Hawai'i did not find a widespread or majority negative view of Hawaiian monk seals among fishermen surveyed. Nevertheless, NMFS has revised sections of the PEIS related to fisheries impacts (Sections 4.8.1 – 4.8.3).

The public survey report is available at the following URL: http://www.fpir.noaa.gov/Library/PRD/Hawaiian%20monk%20seal/MonkSeal_SurveyResults_Final.pdf.

SOC 02 This project is the epitome of environmental injustice yet the PEIS states that there is a negligible impact on environmental justice. Not considering cultural impacts is environmental injustice. The potential to remove fish and poi is not a negligible impact.

Response: Most of the proposed actions in this PEIS involve direct intervention with seals in the NWHI (e.g. vaccinations, monitoring, tagging, deworming). None of these actions is expected to affect cultural resources in the MHI. Please note that while Alternative 4 was Preferred in the Draft PEIS,

Alternative 3 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 seals from the NWHI and releasing them in the MHI. Nevertheless, NMFS understands that there are interactions between some seals and humans in the MHI, and that some people feel that their ability to catch fish is being impacted by monk seals. However, the PEIS analyzes the impact of the various alternatives on the environmental baseline that includes the monk seals already in the MHI (PEIS Section 4.8).

For the purposes of a NEPA analysis, the term "environmental justice" refers to the requirement that federal agencies evaluate whether a proposed action would have a disproportionally high adverse impact on low income populations, minority populations or Indian tribes (CEQ (1997a). NMFS analyzed potential effects of the proposed action on resources such as fisheries, cultural resources and historic properties. Based on the best available information, NMFS determined that the anticipated environmental effects that could potentially raise environmental justice concerns (as defined above) would be negligible and not likely to be disproportionately borne by native Hawaiians, other minority populations, and/or low-income populations. Nor would any of these effects appreciably exceed effects to the general population. For more description of the analysis and summary of effects, please see sections 4.8.4, 4.8.6 and 3.4.6 of the Final PEIS. Please also refer to REG 01 to address NEPA and the National Historic Preservation Act. Most of the proposed actions in this PEIS involve direct intervention with seals in the NWHI (e.g. vaccinations, monitoring, tagging, deworming). None of these actions are expected to affect cultural resources in the MHI.

Regarding the last statement of the comment, Hawaiian monk seals are carnivores so while they eat fish and invertebrates in the ocean, they do not eat taro (grown inland in freshwater), poi (dish made from cooked taro), limu, or other plants or algae. Updated information about monk seal consumption and the potential overlap with fisheries are provided in Final PEIS Sections 4.8.1 through 4.8.3. In addition to the specific actions covered in the PEIS, NMFS is committed to working with communities in the MHI to assess the current impacts of monk seals already in the MHI and work to manage impacts as the resident monk seal population continues to naturally increase.

SOC 03 The economy in Hawai'i is not doing well. Many tourists say the highlight of their trip in Hawai'i is to see a monk seal. More tourists means more jobs in hotels and restaurants. Saving monk seals will help the environment and tourism.

Response: Please see the response to SOC 01. Many people visit Hawai'i to enjoy the unique experiences and unique natural resources, including viewing

Hawaiian monk seals, that make Hawai'i special and unlike anywhere else in the world. Like many of Hawai'i's other endemic species, Hawaiian monk seals can be found nowhere else in the world and visitors often find it to be a memorable experience when they share the beach or ocean with an endangered seal during their visit. NMFS' analysis in the PEIS concluded that under Alternatives 3 and 4, the increase in the monk seal population (compared to Alternatives 1 or 2) would improve viewing opportunities, and thus have an impact on the experience of tourists visiting Hawai'i (Section 4.8.5.2 of the PEIS).

SOC 04 Given how badly our economy is doing right now, there are better ways to spend federal funding than to support this project.

Response: Annual federal funding allocated for Hawaiian monk seal recovery activities has yet to reach the level specified in the Hawaiian Monk Seal Recovery Plan. Nevertheless, NMFS appreciates the current overall fiscal climate in which our Hawaiian monk seal recovery program functions and will continue to pursue the best value with any and all allocated funds in compliance with all federal acquisition rules and regulations. In any event, NMFS is required by ESA and MMPA, within existing appropriations, to undertake those measures that are necessary to restore the monk seal population to a viable, self-sustaining level.

SOC 05 This project is not going to improve our quality of life in Hawai'i

Response: For purposes of this PEIS, NMFS is required to discuss the environmental impacts of the federal action that are reasonably expected to occur and to inform the public of reasonable alternatives which would avoid or minimize adverse impacts. NEPA is a procedural statute, which does not mandate particular results. The ESA recognizes that certain species of fish, wildlife, and plants in the United States have gone extinct because of economic growth and development without adequate concern for conservation. Other species such as the Hawaiian monk seal are in danger of extinction, and these animals are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people.

Hawaiian monk seals are the only seal in the world that live in a tropical coral reef ecosystem. Hawaiian monk seals are endemic to Hawai'i, meaning they are only found in Hawai'i and nowhere else in the world. Peer reviewed publications (Kittinger et al. 2011) have documented reports of monk seals sighted in the MHI going back to the 1800s, and archaeological remains of monk seals dating to AD 1400 - 1700 were found on the Island of Hawai'i.

Although not as prominent in Native Hawaiian culture as other sea creatures, like sea turtles, recent research reveals that some Hawaiian families have traditional ties to monk seals and there are some historical Hawaiian cultural references to monk seals. This is presented in Appendices J and K of the PEIS. The protection and recovery of monk seals is important to the history and culture in Hawai'i and

to the ecosystem in the Hawaiian Islands. The loss of this species would represent the loss of a unique animal that is found nowhere else on earth.

SOC 06 The entire community and our natural resources are all going to be affected by this proposed action including fish, monk seals, fishermen, ocean users, residents, and Native Hawaiians. Monk seals are going to take over our beaches and oceans.

Response: Please see responses to INT 02, FISH01, and SOC 07. NMFS recognizes that there are concerns about the impact that Hawaiian monk seals may have on the MHI ecosystem and human uses of the ocean. This is an understandable concern, given that many introduced species have indeed become problematic invasive species in Hawaiʻi. However, monk seals are not alien species and the biology of slow-growing, native, tropical marine mammals (like the Hawaiian monk seal) is very different than the biology of Hawaiʻi's invasive alien species (e.g. fish, plants, and land mammals).

The Hawaiian monk seal is a long-lived species that reproduces slowly. Therefore, the population could not "explode" like alien species have in Hawaiʻi, or even grow to populations comparable to other seals or sea lions in other locations, like California sea lions on the mainland west coast. The current population in the MHI stands at about 200 individuals, and even by the year 2030, it is estimated there will still likely be less than ~700 seals in the MHI.

In their interaction with the marine environment, Hawaiian monk seals are a natural part of Hawaiʻi's coral reef ecosystems and have been so for several million years. Monk seals are generalist feeders, meaning they eat many different prey species, so their impact on any one species in the ocean is very small.

SOC 07 Recreation and tourism are going to be negatively affected by having more monk seals in the MHI. Right now, if a seal is on the beach, it is fenced off and people have to stay 150 feet away from the seal. If there are 350 seals in Hawaiʻi, that equals 52,500 feet of beach space that could be fenced off and cannot be used. If beaches are closed, the economy will be damaged.

Response: Please see responses to BEH 09, MGT 08, and SOC 03. The Hawaiian monk seal population is small, declining, and in danger of becoming extinct; therefore, the seals are protected by the ESA, MMPA, and other laws. These protections make it illegal for humans to disturb, harass, harm, or kill monk seals (or attempt to do so). In some cases, this means that people are asked to give seals a reasonable amount of space to rest, forage, or tend their pups, and to keep people safe. NMFS and the State of Hawaiʻi do not close entire beaches or areas of the ocean in the MHI because of monk seals. Signs, cones, and ropes on beaches are not a legal barrier that closes the beach. Rather, the signs notify beachgoers that there is a seal on the beach and that it is illegal to disturb the animal.

Federal guidelines suggest staying at least 150 feet away to avoid potentially violating the ESA or MMPA by disturbing the seal. In the MHI, most Hawaiian monk seals do not react strongly to human presence at a reasonable distance on the beaches they share, unless there is direct disturbance (*e.g.,* loud noises or yelling, approaching very closely, or attempting to touch the seal). As a result, the Marine Mammal Response Network members very rarely erect a "seal protection zone," or SPZ, a full 150 ft. away from the seal in each direction.

For "regular" haul-outs of seals coming onshore to rest, volunteers are asked to create a temporary SPZ of the minimum size necessary to prevent disturbance of the seal, allowing humans to have the maximum area possible for beach use and transit through the area. On extremely busy beaches, the area of the SPZ for the seal is often made even smaller to account for human use of the beach. Given the over 750 miles of coastline in the State of Hawai'i, and the fact that only a small number of the total seals are ever on shore simultaneously (usually each for a relatively short time), the presence of monk seals will not prevent humans from using the beaches.

SOC 08 How will the proposed action affect ocean and beach access? Will ocean users be pushed out of areas?

Response: See responses to SOC 06 and SOC 07.

SOC 09 The PEIS concludes that impacts on ocean users are negligible which is incorrect. NMFS must not be taking into account the translocation program to come to this conclusion.

Response: The assessment of impacts on ocean users engaged in recreation and tourism (Section 4.9.5) and fisheries (Sections 4.9.1 - 4.9.3) in the Draft PEIS associated with Alternatives 3 and 4 did include consideration of the proposed 2-stage translocation as well as other types of translocation. These assessments also included consideration of important mitigation measures, including a seal behavioral management program and a fishery interactions mitigation program. These mitigation measures are designed to address many concerns regarding adverse impacts caused by monk seals interacting with ocean users.

Moreover, NMFS revised sections of the Final PEIS related to fisheries impacts (Sections 4.8.1 -4.8.3) considering comments received regarding the Draft PEIS and further analysis conducted by NMFS.

Finally, please note that while Alternative 4 was Preferred in the Draft PEIS, Alternative 3 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 from the NWHI and releasing them in the MHI.

SOC 10 The people of Hana depend on the land and the ocean to survive.

Response: NMFS recognizes the strong relationships many Hana (Maui) residents have with the land and the ocean. NMFS also appreciates the support many Hana residents have provided in monitoring and responding to Hawaiian monk seals, including the seal pup known as "Koki," in and around Hana. The Draft PEIS predicted that implementation of the proposed actions would cause only negligible impacts on commercial and non-commercial use of land and ocean resources. Nevertheless, NMFS revised sections of the PEIS related to fisheries impacts (Sections 4.8.1 -4.8.3) considering comments received regarding the Draft PEIS and further analysis conducted by NMFS. The revised analysis also found that the alternatives in the PEIS would have negligible impact on fishery resources.

Finally, please note that while Alternative 4 was Preferred in the Draft PEIS, Alternative 3 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 from the NWHI and releasing them in the MHI.

TRAN Translocation

TRAN 01 Comments expressing general support for the translocation program. The Draft PEIS Appendix E provides a well-considered adaptive management approach to translocation. NMFS should move forward with this program as quickly as possible. This action is the most promising for slowing the decline.

Response: NMFS agrees with the comment that the translocation program is a promising alternative for slowing the decline of the monk seal population. While Alternative 4 was Preferred in the Draft PEIS, Alternative 3 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 seals born in the NWHI and releasing them in the MHI.

Alternative 4 would be infeasible at this time. NWHI pups, if 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.

NMFS would also conduct other 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. See also response to ALT 03.

TRAN 02 Comments opposing all translocations or translocating monk seals to the MHI. Translocating seals should only occur within the NWHI.

Response: Please see response to TRAN 06.

TRAN 03 The PEIS does not adequately address the impacts of more seals in the MHI and focuses too much on translocation as the preferred method for recovery. There is much public opposition to translocating seals to the MHI and this is cause for concern. At a minimum, the number of female pups should be limited to no more than six over the next five years.

Response: While Alternative 4 was Preferred in the Draft PEIS, Alternative 3 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 seals from the NWHI and releasing them in the MHI.

Alternative 4 would be infeasible at this time. NWHI pups, if 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. NMFS would also conduct other 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.

It is our goal to ensure that all future management and recovery efforts are as successful as possible by staying engaged with, and responsive to, Hawaii's communities. Based in part on input during the comment period, additional analysis of potential effects on fish and fishing resources are included in the final PEIS (Sections 4.8.1-4.8.3), though the analysis still concluded that all PEIS alternatives would have negligible impacts on fisheries. NMFS would also point out that two-stage translocation is one of many potential tools proposed for aiding recovery in the PEIS. These actions are described in the alternatives (Chapter 2). While NMFS hopes that two-stage translocation (as constrained under Alternative 3, the Preferred Alternative) will prove an effective tool, it will be conducted along with numerous other recovery actions.

TRAN 04 Translocating seals within the NWHI is faulty because we are only moving seals around in an environment that is not suitable for survival.

Response: Based on survival rates prevalent in most of the NWHI a few years ago, NMFS would have largely agreed with this comment. However, in 2009 and 2010, even when survival was generally poor in the six main NWHI subpopulations, successful translocations from French Frigate Shoals to Nihoa

Island were conducted and the translocated seals fared better than those pups that remained at French Frigate Shoals.

In the past few years, there are indications that juvenile survival rates at some NWHI sites have improved, suggesting that there may be merit in conducting translocations within the NWHI.

NMFS's approach is based on recognition that conditions for survival are highly variable and a specific action that may be without merit currently could be very helpful a few years in the future. The ability to take advantage of this variability and adapt the translocation program to prevailing conditions is a cornerstone of the two-stage translocation proposal (Final PEIS Appendix F). A variety of translocation actions could occur under the Final PEIS Preferred Alternative, including two-stage translocation *within* the NWHI, *within* the MHI, or from the MHI to the NWHI.

TRAN 05 NMFS states that the fish down alternative is not feasible due to logistics and cost but those would be the same issues associated with translocation. Translocation should be a last resort not a first choice.

Response: NMFS did not state that a fish down alternative was not feasible due to logistics or cost. In Section 2.11.1, the Draft PEIS states "There is currently a lack of sufficient information on NWHI food web dynamics to reliably predict whether predator reduction would be an effective method for improving juvenile monk seal survival without unintended consequences. Potential undesirable changes in predator-prey dynamics could be caused by fishing and therefore a more complete understanding of the system's trophic dynamics is required prior to undertaking any predator reduction experiment, whether locally or system wide. Therefore, given the available information, this alternative is not practical or feasible and will not be carried forward for analysis."

TRAN 06 Why does NMFS want to translocate monk seals to the MHI where they will be exposed to more threats such as interaction with humans, disease, and competition with fishermen? Seals should be translocated to the NWHI where they won't be killed by fishermen.

Response: While Alternative 4 was Preferred in the Draft PEIS, Alternative 3 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 seals born in the NWHI and releasing them in the MHI.

Alternative 4 would be infeasible at this time. NWHI pups, if 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. NMFS would also conduct other 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.

It should be noted that under the Preferred Alternative, a variety of translocation actions could occur, including two-stage translocation *within* the NWHI, *within* the MHI, or from the MHI to the NWHI. Appendix F of the Final PEIS presents the decision framework that will be used to determine the best option available given prevailing biological conditions and the constraints of the Preferred Alternative and the associated NMFS permit. Please also see response to ALT 03.

To help address the concerns mentioned in this comment regarding threats to seals in the MHI, NMFS has proposed actions such as behavioral modification (PEIS Sections 2.5 and 5.4) as well as outreach and education programs and other ongoing activities (PEIS Section 2.13 and 5.6). These actions are intended to help minimize negative interactions between seals and humans. Please also see response to BEH 04, BIO 07, BIO 05, GEN 14, and INT 02.

TRAN 07 How does NMFS plan to move the animals and what precautions are you going to take with handling? NMFS should carefully examine the procedures used to handling seals if it appears this could lead to mortalities.

Response: As described in Section 2.5 of the PEIS, NMFS has developed extremely conservative protocols for seal handling that are designed to achieve the research or enhancement objectives, while minimizing disturbance to other seals in the area, and the risk of harm to the seal and the human handlers. These protocols have been developed over a long and successful history of safely handling seals with very low risk to the animals involved (Baker and Johanos 2002).

TRAN 08 The abduction of monk seals from their neighborhood is cruel. These are sentient beings.

Response: Research studies indicate that Hawaiian monk seals that are translocated to areas of lower seal mortality fare better than do seals that are not translocated (Baker *et al* 2011). In most cases, beneficial results are observed, such as better survival, when compared to similar seals that are not translocated. Translocation would be conducted only to provide seals with better chances for survival so that they may mature and contribute to the recovery of the species.

TRAN 09 How does NMFS know that a monk seal is going to stay in the same place that it is moved? If you move them back to the NWHI, they are just going to come back to the MHI. What assurances can you make that all seals translocated will be recaptured?

Response: Please note that while Alternative 4 was Preferred in the Draft PEIS, Alternative 3 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 the Preferred Alternative, including two-stage translocation *within* the NWHI, *within* the MHI, or from the MHI to the NWHI.

A recent study published by NMFS (Baker *et al* 2011) reviewed almost 250 translocations of Hawaiian monk seals that were conducted for various reasons over several decades. The paper reports that translocated seals, especially the younger ones, tend to stay in the region where they are released. Past experience indicates that such a long-distance return (from the NWHI to MHI) is unlikely. Recently weaned pups tended to stay at the same beach area where they were released for weeks to months and then began moving around more. Adult males tended to leave their release sites very quickly, but did not return to where they originated. For example, 21 adult males were taken from Laysan Island to the MHI in 1994, and none returned to Laysan Island. Only one returned, temporarily to the NWHI (to Nihoa Island) and then came back to the MHI. NMFS expects that seals translocated in future actions under the Final PEIS Preferred Alternative, will behave similarly to those translocated in the past and will plan details of future translocations in part on this extensive history. However, if the seals behave differently than expected, NMFS will alter the translocation program accordingly.

Recapturing individual seals can indeed be difficult and this remains an important consideration regardless of the fact that under Alternative 3 (Preferred), no seals born in the NWHI will be translocated from the NWHI and released in the MHI. There are a number of considerations that make NMFS confident recaptures can be achieved. First, the number of seals that will need to be recaptured will be fewer than the number initially translocated because there will be some natural mortality in the intervening years. Second, NMFS has a population monitoring program that provides sighting information on tagged animals. Seals often show patterns in which they haul out at favorite beaches, and this will guide searching effort when it is time for recapture. Third, though it can require persistence, NMFS has a long history of successfully finding and recapturing target animals for various purposes. Still, it is possible that a seal may not be found when it is scheduled to be recaptured. If so, that seal will simply

remain on the search list and will be caught and translocated at the next opportunity.

TRAN 10 NMFS should consult with outside experts (i.e., captive facilities, Marine Mammal Commission, and Monk Seal Recovery Team) on the translocation program and review the progress of the program after a suitable period of time. It does not seem advisable at this stage to set strict criteria for terminating the program as the agency will likely need flexibility.

Response: NMFS has and will continue to consult with these and other outside experts as the translocation program is conducted. The decision framework described in Appendix F of the Final PEIS identifies a variety of adjustment and course changes that would be informed by new demographic information and evaluation of the translocations conducted to date. NMFS is sensitive to the possibility that setbacks and failures may occur unexpectedly and that terminating any enhancement effort too early is a risk. It is particularly important to gauge the effectiveness of the project based on results from multiple years rather than on observations from a single year, whether good or bad. The permit for this work would include a cap on the number of mortalities that could occur during translocations; as long as these mortalities were not reached, the translocations could proceed even in the event of some loss of seals.

TRAN 11 It is difficult to determine whether a soft release (when an animal is held at a release site to help it acclimate) or hard release (released immediately upon arrival) will be more successful. Thus, it will be important to tag animals before they are released at a site in order to track their movements. Depth recorders on translocated animals could also help with foraging studies.

Response: As described in Section 5.2 and Appendix F of the Final PEIS, all translocated seals will be tagged with plastic flipper tags and some will also be instrumented with tracking devices and dive recorders. These measures will greatly assist in evaluating the success of the program. The proportion of translocated seals that will be instrumented will be partially determined by available funding, but some prioritization is likely so that seals of particular interest (*e.g.*, release location, body condition, or other factors) can be tracked.

TRAN 12 NMFS should consider moving seals born in the MHI to the NWHI within the first year of the program to determine whether this phase of the program is successful and allowing managers to adjust the approach as necessary. This may also avoid a net change in the number of seals in the MHI, thus alleviating public concerns.

Response: While Alternative 4 was Preferred in the Draft PEIS, Alternative 3 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. Nevertheless, a variety of translocation

actions could occur under the Preferred Alternative, including two-stage translocation *within* the NWHI, *within* the MHI, or from the MHI to the NWHI.

Appendices F and H of the PEIS provide for the experimental movement of up to six juvenile seals annually (separate from the two-stage translocation program) in order to obtain some early information about the likely success and magnitude of survival decrements associated with the second stage of two-stage translocation. In addition, if seals in the MHI develop unmanageable behavior and persistently interact with people, they may be candidates for translocation to the NWHI. This would resolve their interactions with people and also inform NMFS about the success of translocations from the MHI to NWHI. Experimental translocations of seals could be conducted at any time, but will not necessarily precede translocations of weaned pups as described in Alternative 3 (Preferred).

TRAN 13 Weaned pups should only be translocated to communities that support this program; otherwise, they will not survive.

Response: While Alternative 4 was Preferred in the Draft PEIS, Alternative 3 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.

Alternative 4 would be infeasible at this time. NWHI pups, if 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. NMFS would also conduct other 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.

It is our goal to ensure that all future management and recovery efforts are as successful as possible by staying engaged with, and responsive to, Hawaii's communities. See PUB 02, PUB 03, and PUB 08. NMFS agrees that community support is essential recovery activities recovery actions to succeed.

TRAN 14 The decision-framework for translocation presented in Appendix E of the Draft PEIS should include community consultations and socioeconomic factors as part of decision-making.

Response: While Alternative 4 was Preferred in the Draft PEIS, Alternative 3 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. Because of this change, this respondent's specific concerns may be reduced. Nevertheless, a variety of translocation actions could still occur under Alternative 3 (Preferred), including, for example, translocation of seals within the MHI to alleviate risks to seals and to mitigate human-seal interactions. NMFS will continue to engage local communities when conducting such actions (see Chapter 5).

TRAN 15 In the description of translocation activities listed in Table 2.10, Alternative 3 indicates that seals age three or older that are native to the MHI may be moved to the NWHI in order to evaluate their survival rates. This differs from the description of activities under Alternative 4, which implies NMFS would move seals age three or older from the MHI to NWHI only if seals were originally from the NWHI and were now returning to their natal site. Table 2.10-1 appears to be inconsistent with the rest of the PEIS, and may give the reader a false impression of translocation plans under each alternative. If Table 2.10-1 is correct, then it is not clear why NMFS would be willing under Alternative 3 to take the risk of moving native MHI seals to the NWHI, where survival rates are much lower, but would not be willing to do this at the same time they are taking weaned pups down from the NWHI to the MHI during the first phase of translocation under Alternative 4. A diagram presenting the various scenarios of translocation would be extremely helpful.

Response: In Table 2.10, the translocation box for Alternative 4 states that it would include everything in Alternative 3 *plus* the additional items listed. Therefore, the translocation of seals to evaluate their survival (from MHI to NWHI) could be conducted under either Alternative 3 or 4. Further, this action is listed under both alternatives in Appendix H. (Also refer to the response to comment TRAN 12)

TRAN 16 It is unclear under Alternative 3 if animals evaluated for survival would be "problem animals" translocated from the MHI to the NWHI

Response: NMFS interprets this comment to pertain to the 6 seals per year that may be translocated to experimentally evaluate survival under Alternative 3 and 4 (Appendix H of the PEIS). These could be "problem" seals, but need not be. (Also refer to the response to comment TRAN 12).

TRAN 17 It is unclear how sites will be evaluated for their viability as nursery sites and which criteria will be used. Decisions should not just be based on survival but pup body condition, parasite loads, and other indications for successful foraging.

Response: NMFS believes that recent survival of seals at potential recipient sites provides the best "bottom line" indicator of how favorable that site may be for weaned pups. Survival (or mortality) is a process that integrates multiple factors such as foraging opportunities, health status, etc. In practice, any

outstanding factors that might influence the success or failure of the project, and which are not fully addressed in the stipulated criteria, will be considered.

REFERENCES

AVMA Guidelines for the Euthanasia of Animals: 2013 Edition (2013). American Veterinary Medical Association, Schaumburg, IL.

Baker, J.D. & Johanos, T.J. (2002). Effects of Research Handling on the Endangered Hawaiian Monk Seal. *Marine Mammal Science* 18:500-512.

Baker, J.D., Becker, B.L., Wurth, T.A., Johanos, T.C., Littnan, C.L., & Henderson , J.R. (2011) Translocation as a tool for conservation of the Hawaiian monk seal. Biological Conservation 144: 2692-2701.

Friedlander, A.M., & DeMartini, E.E. (2002). Contrasts in density, size and biomass of reef fishes between the Northwestern and the main Hawaiian islands: the effects of fishing down apex predators. Marine Ecology Progress Series 230:253–264.

Gobush, K.S., Baker J.D., & Gulland, F.M.D. (2011). Effectiveness of an antihelminthic treatment in improving the body condition and survival of Hawaiian monk seals. Endangered Species Research 15: 29-37.

Gobush, K.S., and Farry S.C. (2012). Aquatic Conservation: Marine and Freshwater Ecosystems 22: 751-761.

Johnson, P.A., & Johnson B.W. (1984). Hawaiian monk seal observations on French Frigate Shoals, 1980. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SWFC-50, 47 p.

Kenyon, K.W. & Rice, D.W. (1959). Life history of the Hawaiian monk seal. Pac Sci 13:215-252

Kittinger, J.N., Bambico, T.M., Watson, T.K., and Glazier, E.W. (2011). Historic and Contemporary Significance of the Endangered Hawaiian Monk Seal in Native Hawaiian Culture.

Mazur R.L. (2010). Does Aversive Conditioning Reduce Human-Black Bear Conflict? Journal of Wildlife Management 74(1):48-54; DOI: 10.2193/2008-163.

NMFS (2007). Recovery Plan for the Hawaiian Monk Seal (*Monachus schauinslandi*). Second Revision. National Marine Fisheries Service, Silver Spring, MD. 165 pp.

Reynolds, M.H., Berkowitz, P., Courtot, K.N., & Krause, C.M., eds. (2012). Predicting sea-level rise vulnerability of terrestrial habitat and wildlife of the Northwestern Hawaiian Islands: U.S. Geological Survey Open-File Report 2012–1182, 139 p.

Schultz, J.K., Baker, J.D., Toonen, R.J., Bowen, B.W. (2008). Extremely low genetic diversity in the endangered Hawaiian monk seal (*Monachus schauinslandi*). Journal of Heredity 100:25–33.

Schultz, J.K., J.D. Baker, R.J. Toonen, A.L. Harting, B.W. Bowen. (2010). Range-wide genetic connectivity of the Hawaiian monk seal and implications for translocation. Conservation Biology 25:124-132.

Sprague, R., Littnan, C., and Walters, J.S. (2013). Estimation of Hawaiian monk seal consumption in relation to ecosystem biomass and overlap with fisheries in the main Hawaiian Islands. U.S. Dept. of Commerce, NOAA Technical Memorandum NOAA-TM-NMFS-PIFSC-37.

Wirtz, W.O. (1968). Reproduction, growth and development, and juvenile mortality in the Hawaiian Monk Seal. Journal of Mammology. 49:229-238.

This page intentionally left blank.

Appendix C
Hawaiian Monk Seal Comment Submission Index

This page intentionally left blank.

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Alejandra Ramirez *Iao Intermediate*	268	10/1/2011	Wailuku Letters		ALT 03
Alex Malabey *Individual*	126	9/12/2011	Honolulu Public Hearing		CEF 01; FISH 06; GEN 01; PUB 01
Alika Yoakum *Iao Intermediate*	281	10/1/2011	Wailuku Letters		BIO 17; FISH 01
Alje Morelik *Iao Intermediate*	248	10/1/2011	Wailuku Letters		ALT 04; ALT 06; GEN 01
Amanda Kahalehoe *Individual*	209	9/27/2011	Hana letters		GEN 02; SOC 01

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Amber Burgos *Iao Intermediate*	340	10/1/2011	Wailuku Letters		ALT 03; ALT 05
Andrea Traurin *Fisherman*	173	9/15/2011	Kihei Public Hearing		GEN 02; GEN 05
Andrew Nicolas *Iao Intermediate*	320	10/1/2011	Wailuku Letters		ALT 04; ALT 05
Anonymous *Individual*	220		Letter (print/scan or electronic)		ALT 09; CUL 01; CUL 05
Ariana Elizares *Iao Intermediate*	323	10/1/2011	Wailuku Letters		ALT 04; FISH 14

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Azton Cayetano *Iao Intermediate*	262	10/1/2011	Wailuku Letters		ALT 04
Barbara Robeson *Individual*	18	8/24/2011	Email message		ALT 04
Basil Oshiro *Maui Cooperative Fishing Association*	34	9/17/2011	Email message		BIO 06; CUL 06; FISH 01; GEN 01; GEN 13; GEN 14; SOC 06; SOC 07; TRAN 02
	172	9/15/2011	Kihei Public Hearing		ALT 03; ALT 11; BIO 06; CUL 06; FISH 01; FISH 05; FISH 06; GEN 02; GEN 03; INT 02; REG 06; TRAN 02
Beige Reinhardt *Iao Intermediate*	245	10/1/2011	Wailuku Letters		GEN 07

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
bk1492@aol.com *Individual*	22	8/15/2011	Email message		DIS 08; TRAN 02
Bonnie Jean Blackmore *Individual*	17	8/25/2011	Email message		GEN 02; GEN 05
Braden Ruiz *Iao Intermediate*	274	10/1/2011	Wailuku Letters		ALT 04; ALT 05
Brent Carman *Individual*	6	9/12/2011	Email message		BIO 08; GEN 01
Brian Kimata *Individual*	16	8/29/2011	Email message		ALT 12; BEH 06; BIO 06; GEN 02; INT 02; TRAN 02
	133	9/12/2011	Honolulu Public Hearing		ALT 02; ALT 09; FISH 01; MGT 11; TRAN 06; TRAN 09

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Bruce Ito *Individual*	27	9/15/2011	Email message		GEN 03; REG 06; TRAN 02
Bryant Nakagawa *Iao Intermediate*	237	10/1/2011	Wailuku Letters		ALT 04; GEN 01
Bryson Sakaj-Soto *Individual*	110	9/14/2011	Hilo Public Hearing		BEH 01; BEH 02; CUL 03; CUL 04; DIS 01; INA 05; INT 01; PUB 03; PUB 05; TRAN 06; TRAN 07
Cailee Gomes *Iao Intermediate*	315	10/1/2011	Wailuku Letters		ALT 04
Carl Berg *Surfer Foundation, Kauai Chapter*	95	9/17/2011	Lihue Morning Public Hearing		ALT 03; CEF 01; CUL 10; DIS 01; DIS 03; DIS 08; DIS 09; FISH 08; GEN 03; TRAN 02

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Carl Jellings *Fisherman*	141	9/12/2011	Honolulu Public Hearing		BIO 07; BIO 09; BIO 11; FISH 01; FISH 06; FISH 11; FISH 15; GEN 03
Chad Kubo *Commerical Fisherman; Recreational Fisherman*	122	9/17/2011	Lihue Afternoon Public Hearing		ALT 02; BIO 01; BIO 15; GEN 02
Chaniya Silva *Iao Intermediate*	278	10/1/2011	Wailuku Letters		ALT 04; ALT 05; FISH 03; INA 11
Chayse Tamaki *Iao Intermediate*	243	10/1/2011	Wailuku Letters		ALT 04; FISH 09
Chaz Edlao *Iao Intermediate*	263	10/1/2011	Wailuku Letters		ALT 03

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Cheryl Lovell-Obatak *Individual*	116	9/17/2011	Lihue Afternoon Public Hearing		REG 01
Cheryl Obatake *Individual*	44	10/17/2011	Email message		CUL 06; CUL 11; PUB 05
Chris Kadooka *Individual*	1	9/14/2011	Email message		BIO 04; BIO 09; GEN 05; GEN 06; INA 12; MGT 11; TRAN 02
Chris Lish *Individual*	40	10/16/2011	Email message		GEN 01
Christian Eugenio *Iao Intermediate*	301	10/1/2011	Wailuku Letters		ALT 01; ALT 03; ALT 07; ALT 08

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Clariza Tabag *Iao Intermediate*	326	10/1/2011	Wailuku Letters		ALT 03
Clyde W. Namu'o *DLNR Office of Hawaiian Affairs*	64	10/17/2011	Attachment		CUL 02; CUL 11; ECO 07; GEN 01; INT 02; REG 01; REG 10; TRAN 03
Conrad Cordeiro *Iao Intermediate*	298	10/1/2011	Wailuku Letters		ALT 04; ALT 06
Conrad Ventura *Individual*	169	9/15/2011	Kihei Public Hearing		ALT 11; CUL 07; GEN 02
Cora Schnackenberg *Individual*	193	9/13/2011	Molokai Public Hearing		BIO 15; CUL 01; CUL 02; CUL 06; FISH 05; GEN 02; INA 07; INA 08; PUB 03; TRAN 16

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Cory Harden *Individual*	107	9/14/2011	Hilo Public Hearing		ECO 05; FISH 03; GEN 01; PUB 02
Craig Mitchell *Individual*	13	8/29/2011	Email message		GEN 02; TRAN 02
Daisy Franco R. *Iao Intermediate*	319	10/1/2011	Wailuku Letters		ALT 04
Dan Dennison *Individual*	4	9/13/2011	Email message		GEN 01
Daniel K. Corpuz *Iao Intermediate*	235	10/1/2011	Wailuku Letters		GEN 01

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Danny Domingo, Jr. *Iao Intermediate*	294	10/1/2011	Wailuku Letters		ALT 03; ALT 05; ALT 06; ALT 08
Danny Teixeira *Individual*	5	9/12/2011	Email message		FISH 01
Darrell Tanaka *Recreational fisher*	19	8/23/2011	Email message		BIO 06; FISH 01; FISH 04
Darren-Lee Tamura-Lynch *Iao Intermediate*	341	10/1/2011	Wailuku Letters		ALT 03
David Kareo Kaimanaokealoha Prais *Individual*	162	9/15/2011	Kihei Public Hearing		ALT 09; FISH 01; FISH 04; GEN 05

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
David Lee *Iao Intermediate*	251	10/1/2011	Wailuku Letters		ALT 03; ALT 04; ALT 06; FISH 14
David-John Fernandez *Iao Intermediate*	275	10/1/2011	Wailuku Letters		ALT 03; ALT 05; FISH 17
Dayna McGinnis *Iao Intermediate*	313	10/1/2011	Wailuku Letters		ALT 04; ALT 05
Daynette Morikawa *State Representative for the South and West side of Kauai*	42	10/6/2011	Email message		ALT 09; BIO 15; DIS 01; FISH 05; FISH 06; GEN 01; GEN 02; TRAN 01
Dayton K Hoewaa *Iao Intermediate*	253	10/1/2011	Wailuku Letters		ALT 03

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Dean Ogoshi *Individual*	130	9/12/2011	Honolulu Public Hearing		ALT 11; ALT 19; FISH 01; FISH 06
Dean Sensui *Individual*	148	9/12/2011	Honolulu Public Hearing		ALT 11; BIO 09; FISH 06; GEN 02; INT 09; TRAN 02
Debbie Takayama *Individual*	106	9/14/2011	Hilo Public Hearing		BEH 01; BIO 04; DIS 06; GEN 01; GEN 03
Deigan Cadiz-Aceret *Iao Intermediate*	266	10/1/2011	Wailuku Letters		ALT 03
Dennis Eguchi *Individual*	104	9/17/2011	Lihue Morning Public Hearing		ALT 01; ALT 02; CEF 01

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Dennis Kamikawa *Commercial Fisherman*	140	9/12/2011	Honolulu Public Hearing		BIO 09; FISH 01; TRAN 02
Desiree Nelson *Iao Intermediate*	234	10/1/2011	Wailuku Letters		ALT 04; FISH 03; GEN 01
Dezlin Helekahi-Park *Individual*	205	9/27/2011	Hana letters		FISH 01
Diana R. Faulve *Iao Intermediate*	290	10/1/2011	Wailuku Letters		ALT 03; ALT 04
Diane Gabumpa *Iao Intermediate*	337	10/1/2011	Wailuku Letters		ALT 04; FISH 03

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Dillon *Iao Intermediate*	302	10/1/2011	Wailuku Letters		ALT 04
DMSOPR.PMRF *Individual*	36	9/16/2011	Email message		BIO 07; ECO 06; FISH 05; GEN 02
Dr. David Y. Tsunehiro, Jr *Individual*	86	10/25/2011	Letter (print/scan or electronic)		BIO 15; FISH 06; GEN 02; INT 06
Earle Medeiros, Jr. *Individual*	151	9/15/2011	Kihei Public Hearing		ALT 09; ALT 11; CUL 07; FISH 01; GEN 02; INT 02; REG 08; TRAN 02
Earle Medeiros, Sr. *Individual*	155	9/15/2011	Kihei Public Hearing		ECO 01; ECO 03; FISH 01; FISH 05; GEN 02; SOC 05; TRAN 02

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Ed Watamura *Waialua Boat Club, President*	128	9/12/2011	Honolulu Public Hearing		BIO 10; ECO 01; FISH 15; INT 02; INT 06; REG 08; TRAN 02
Eddie Tanaka *Individual*	195	9/13/2011	Molokai Public Hearing		BIO 06; CEF 02; FISH 01; FISH 06
Eduardo *Iao Intermediate*	231	10/1/2011	Wailuku Letters		ALT 04; ALT 06; FISH 03
Eduardo Benitez *Iao Intermediate*	241	10/1/2011	Wailuku Letters		ALT 04
Elizabeth Nailling **Elizabeth Nailling** *Individual*	41	10/16/2011	Email message		GEN 05; GEN 14; TRAN 03

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Emily Mckeon *Iao Intermediate*	327	10/1/2011	Wailuku Letters		ALT 03
Emma Kaimiola *Iao Intermediate*	271	10/1/2011	Wailuku Letters		ALT 03; ALT 06; FISH 14
Emmsley James Drake *Individual*	98	9/17/2011	Lihue Morning Public Hearing		GEN 02; INT 03; REG 05; SOC 06
Eric Waggeman *Commercial fisherman*	136	9/12/2011	Honolulu Public Hearing		ALT 02; FISH 15; GEN 05
Errik Agdeppa *Iao Intermediate*	261	10/1/2011	Wailuku Letters		ALT 08

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Eunice Bea *Iao Intermediate*	317	10/1/2011	Wailuku Letters		GEN 01
Foster Ampong *Individual*	168	9/15/2011	Kihei Public Hearing		CEF 02; CEF 04; CUL 06; GEN 02; TRAN 02
Frank Farm *Individual*	144	9/12/2011	Honolulu Public Hearing		ALT 01; ALT 08; ALT 09; ALT 23; BIO 09; BIO 15; FISH 06; INT 09
Garyn Tuquero *Iao Intermediate*	318	10/1/2011	Wailuku Letters		ALT 03; CUL 12; FISH 17
George R. Harker *Individual*	12	8/30/2011	Email message		BIO 17; REG 07; REG 11

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
George R. Harker *Individual*	67	10/17/2011	Attachment		BEH 09; BIO 07; BIO 17; FISH 01; FISH 05; GEN 05; REG 04; REG 07
Gina Bondi *Individual*	49	12/11/2010	Letter (print/scan or electronic)		MGT 09
Glenn Jose *Iao Intermediate*	236	10/1/2011	Wailuku Letters		ALT 04; FISH 17
Gordon LaBedz *Individual*	91	9/17/2011	Lihue Morning Public Hearing		DIS 03; FISH 17; GEN 05; TRAN 08
Gordon LaBedz, MD *Individual*	45	10/17/2011	Email message		BEH 07; DIS 03; GEN 01; INT 01; INT 02; TRAN 08

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Greg Holzman *Hawaiian Ocen Users*	33	9/17/2011	Email message		CEF 01; GEN 03; SOC 09
Commercial Fisherman	96	9/17/2011	Lihue Morning Public Hearing		ALT 15; CEF 01; GEN 03; TRAN 02
Hawaiian Ocean Users	119	9/17/2011	Lihue Afternoon Public Hearing		ALT 11; ALT 13; CEF 01; INA 04; TRAN 01; TRAN 03
Guy Naehu *Individual*	183	9/13/2011	Molokai Public Hearing		MGT 02; SOC 06
Hailama *Individual*	159	9/15/2011	Kihei Public Hearing		FISH 05

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Hailee Yoshida *Iao Intermediate*	226	10/1/2011	Wailuku Letters		ALT 03; ALT 05; ALT 06; ALT 08
Halona Kaopuiki *Individual*	190	9/13/2011	Molokai Public Hearing		ALT 11; FISH 01; GEN 03; INA 07
Heidi Webber *Individual*	147	9/12/2011	Honolulu Public Hearing		ALT 01; ALT 03; ALT 04; ECO 04; FISH 06; FISH 17; GEN 12; INA 09; INT 05; INT 08
Helen Strang *Individual*	23	8/15/2011	Email message		BIO 06; BIO 15; CEF 02; CEF 03; CUL 01; INT 01; PUB 11
	32	9/19/2011	Email message		BIO 04; BIO 06; BIO 07; BIO 15; CEF 02; CEF 03; CUL 07; FISH 01; GEN 02; GEN 04; INT 02

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Henry H Dinh *Iao Intermediate*	322	10/1/2011	Wailuku Letters		ALT 04; FISH 03
Hong Seko *Individual*	146	9/12/2011	Honolulu Public Hearing		ALT 09; GEN 01; GEN 03; INT 02
Hope Kallai *Individual*	70	10/17/2011	Attachment		ALT 02; ALT 12; BEH 05; CEF 01; CEF 02; CEF 04; CUL 02; CUL 10; GEN 02; GEN 03; INA 12; MGT 07; REG 02; TRAN 02
	118	9/17/2011	Lihue Afternoon Public Hearing		ALT 09; ALT 12; CEF 02; CEF 03; CUL 02; FISH 01; FISH 02; INA 03; PUB 03; REG 02; SOC 01; SOC 02
Icane (sp?) Helekahi-Krinn (sp?) *Individual*	203	9/27/2011	Hana letters		FISH 01; SOC 07

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Irene Bowie *Maui Tomorrow Foundation, Executive Director*	73	10/17/2011	Attachment		ALT 04; ALT 22; BIO 08; CUL 12; FISH 05; FISH 17; GEN 01; PUB 01
	174	9/15/2011	Kihei Public Hearing		ALT 04; BIO 08; CEF 02; CUL 12; PUB 01
Isaac Pena *Iao Intermediate*	233	10/1/2011	Wailuku Letters		ALT 04; FISH 03; GEN 01
Isaiah K Pu-Akim *Individual*	202	9/27/2011	Hana letters		FISH 01
Jacelyn Wiggers *Iao Intermediate*	227	10/1/2011	Wailuku Letters		ALT 04; FISH 03

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Jackie Frost *Individual*	35	9/17/2011	Email message		GEN 01; PUB 07; PUB 08
Jackie Kanna *Individual*	99	9/17/2011	Lihue Morning Public Hearing		PUB 03; PUB 04; PUB 05; PUB 06
Jacob Platiro *Iao Intermediate*	276	10/1/2011	Wailuku Letters		ALT 03; ALT 05; FISH 03
Jaden Texeira *Iao Intermediate*	335	10/1/2011	Wailuku Letters		ALT 03; FISH 14
James Foster *Individual*	198	9/13/2011	Molokai Public Hearing		ALT 09; BIO 09; BIO 15; ECO 02; FISH 07; GEN 02; TRAN 02

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
James Kanaka *Commercial Fisherman*	180	9/15/2011	Kihei Public Hearing		GEN 02; GEN 05; TRAN 02
James Melcher *Individual*	191	9/13/2011	Molokai Public Hearing		FISH 05
James Oneha *Individual*	31	9/19/2011	Email message		ALT 08; BIO 06; ECO 04; FISH 05; INT 02
Jane Cho *Iao Intermediate*	336	10/1/2011	Wailuku Letters		ALT 03
Jason Kagihara *Individual*	15	8/29/2011	Email message		BIO 06; BIO 15; FISH 01; SOC 01

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Jaynalee Hoopai *Individual*	204	9/27/2011	Hana letters		FISH 01; SOC 06; SOC 10
Jeffrey L. Pabello *Iao Intermediate*	289	10/1/2011	Wailuku Letters		ALT 04; ALT 05; FISH 03
Jennifer Kline *Individual*	8	9/3/2011	Email message		GEN 01
Jerry L. Chang; Donovan M. Dela Cruz *State Representaive; State Senator*	74	9/12/2011	Letter (print/scan or electronic)		ALT 02; ALT 03; ALT 16; GEN 06
Jessica Teel *Individual*	10	9/2/2011	Email message		ALT 04; BEH 01; GEN 01; SOC 03

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Jimmy Gomes *Commercial Fisherman*	176	9/15/2011	Kihei Public Hearing		ALT 14; CEF 01; GEN 02; REG 07; REG 13; SOC 06; SOC 07
Johanna Kamaunu *Individual*	163	9/15/2011	Kihei Public Hearing		FISH 01; FISH 06; FISH 15; GEN 02; INA 07; SOC 06
John Bondi *Individual*	50	12/11/2010	Letter (print/scan or electronic)		MGT 09
John Dumo *Iao Intermediate*	293	10/1/2011	Wailuku Letters		ALT 04; ALT 05
John Meston *Commercial Fisherman*	178	9/15/2011	Kihei Public Hearing		ALT 14

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Joie Victoria-Dyment (sp?) *Individual*	211	9/27/2011	Hana letters		FISH 01; GEN 03; SOC 07
Jon Kamikawa *Commercial fisherman*	131	9/12/2011	Honolulu Public Hearing		GEN 05; INT 06; INT 07
Jora May-Ann Kasikiaiakealoha Tolentino-Smith *Individual*	218		Letter (print/scan or electronic)		GEN 11
Jordan Keahi *Iao Intermediate*	342	10/1/2011	Wailuku Letters		ALT 02; ALT 04
Jose Bulatao, Jr. *Individual*	53	9/13/2011	Attachment		BIO 07; CUL 03; ECO 06; MGT 06; SOC 08

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Joshua Acidera *Iao Intermediate*	224	10/1/2011	Wailuku Letters		ALT 03; ALT 05
Joyce R Schaunaman *Individual*	84	10/1/2011	Letter (print/scan or electronic)		ALT 04; TRAN 13
Joyclynn Costa *Individual*	165	9/15/2011	Kihei Public Hearing		GEN 02; INT 04; MGT 11; REG 12
Judy Caparida *Individual*	188	9/13/2011	Molokai Public Hearing		FISH 01
Justin Arcano *Iao Intermediate*	328	10/1/2011	Wailuku Letters		TRAN 01

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Justin J. Perreira *Iao Intermediate*	287	10/1/2011	Wailuku Letters		ALT 04; ALT 05; FISH 03
Justin Ngan *Iao Intermediate*	312	10/1/2011	Wailuku Letters		ALT 04
Justine Rosemund *Individual*	214	9/27/2011	Hana letters		BIO 09; GEN 05
Kaeo Sclafani *Iao Intermediate*	304	10/1/2011	Wailuku Letters		ALT 04; ALT 06; FISH 03; SOC 03
Kaipo Paschoal *Iao Intermediate*	297	10/1/2011	Wailuku Letters		ALT 03

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Kaitlin Smith *Iao Intermediate*	334	10/1/2011	Wailuku Letters		ALT 03
Kalani Kapuniai *Individual*	102	9/17/2011	Lihue Morning Public Hearing		FISH 01; GEN 02; INT 04
Kamanu Lind *Individual*	207	9/27/2011	Hana letters		FISH 01
Kanalu Andrade *Iao Intermediate*	321	10/1/2011	Wailuku Letters		ALT 04; ALT 06; BIO 15; GEN 01; TRAN 01
Kaniloa Kamaunu *Individual*	164	9/15/2011	Kihei Public Hearing		CUL 06; SOC 08

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Kanoelani Babcock *Iao Intermediate*	240	10/1/2011	Wailuku Letters		ALT 04; ALT 06; FISH 03
Karen Holt *Individual*	186	9/13/2011	Molokai Public Hearing		CUL 05; FISH 17; MGT 03
Kate Ligot *Iao Intermediate*	303	10/1/2011	Wailuku Letters		ALT 04; FISH 03
Kathleen Goforth *Environmental Review Office Communities and Ecossyems Dvision, Manager*	68	10/17/2011	Attachment		ALT 04; DIS 01; GEN 08; INT 02; INT 05; MGT 05
Kawehi Kaikala *Individual*	157	9/15/2011	Kihei Public Hearing		CUL 06; FISH 05; FISH 06; GEN 02; PUB 10

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Kawika Cutcher *Individual*	94	9/17/2011	Lihue Morning Public Hearing		ALT 12; BIO 07; CUL 06; CUL 07; CUL 08; ECO 03; FISH 01
	217	8/31/2011	Letter (print/scan or electronic)		ALT 03; ALT 12
Kawoka Stoner *Individual*	208	9/27/2011	Hana letters		CUL 06
Kayla Takakura *Iao Intermediate*	314	10/1/2011	Wailuku Letters		ALT 04; ALT 05; BIO 02; FISH 03
Kaylee Pahukoa *Iao Intermediate*	225	10/1/2011	Wailuku Letters		ALT 04

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Kealoha Pisciotta *KAHEA: Hawaiian-Environmental Alliance, President*	109	9/14/2011	Hilo Public Hearing		BEH 01; MGT 01; PUB 01; REG 03; TRAN 05
Keirsha Vasquez *Iao Intermediate*	258	10/1/2011	Wailuku Letters		ALT 04; ALT 06
Keko Bonk *PONO; Save Our Seals*	137	9/12/2011	Honolulu Public Hearing		ALT 04; BIO 08; ECO 07; GEN 01; GEN 09
Kelci Nicolas *Iao Intermediate*	310	10/1/2011	Wailuku Letters		ALT 04
Kelvin Ching *Individual*	142	9/12/2011	Honolulu Public Hearing		ALT 09; FISH 01; FISH 06; GEN 05; TRAN 02

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Kema Kanakaole *Individual*	160	9/15/2011	Kihei Public Hearing		CEF 02; FISH 01; FISH 15; GEN 05; INT 06
Ken Taylor *Individual*	124	9/17/2011	Lihue Afternoon Public Hearing		ECO 02
Ken Tobita *Iao Intermediate*	332	10/1/2011	Wailuku Letters		ALT 03
Keo Chun *Iao Intermediate*	259	10/1/2011	Wailuku Letters		ALT 04; ALT 06; SOC 10
Keoki Puaoi *Individual*	25	8/3/2011	Email message		FISH 17; TRAN 02

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Kesaia Tangitau *Iao Intermediate*	311	10/1/2011	Wailuku Letters		ALT 03; ALT 04
Kiara Alo-Racadio *Iao Intermediate*	239	10/1/2011	Wailuku Letters		ALT 09; FISH 03
Kiara Cummings-Carone *Iao Intemediate*	309	10/1/2011	Wailuku Letters		GEN 01
Kimberley Marcelo *Iao Intermediate*	249	10/1/2011	Wailuku Letters		ALT 04; ALT 05; GEN 01
Kimverly Rosal *Iao Intermediate*	273	10/1/2011	Wailuku Letters		ALT 03; SOC 03

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Kitty M. Simmons *Western Pacific Regional Fishery Management Council. Executive Director*	59	10/14/2011	Attachment		ALT 09; BEH 03; FISH 11; FISH 12; FISH 13; GEN 01; INA 10; PUB 01; PUB 02; TRAN 12; TRAN 14
Koa Kualaau-Abbey *Iao Intermediate*	329	10/1/2011	Wailuku Letters		TRAN 01
Kouchi *Individual*	79	9/14/2011	Letter (print/scan or electronic)		ALT 01; ALT 02; ALT 03
Krystal Kennedy *Individual*	212	9/27/2011	Hana letters		FISH 01; INT 04; SOC 06
kuleanavalley@yahoo.com *Individual*	21	8/15/2011	Email message		PUB 09

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Kuloloio *Individual*	171	9/15/2011	Kihei Public Hearing		BIO 15; CUL 06; CUL 07; INA 07; PUB 04
Kyla Borja *Iao Intermediate*	331	10/1/2011	Wailuku Letters		ALT 04
Kyle Felix *Iao Intermediate*	339	10/1/2011	Wailuku Letters		ALT 03; ALT 04
Kyra Watanabe *Iao Intermediate*	238	10/1/2011	Wailuku Letters		ALT 04; ALT 05; FISH 09; FISH 17
Laurel Muehlhausen *Individual*	9	9/2/2011	Email message		REG 07

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Layne Nakagawa *Commercial fisherman*	175	9/15/2011	Kihei Public Hearing		ALT 11; FISH 01; FISH 15; GEN 02
Leah Rudin *Iao Intermediate*	264	10/1/2011	Wailuku Letters		ALT 04
Lehua Park *Individual*	154	9/15/2011	Kihei Public Hearing		CEF 02; CUL 06; FISH 01; INT 01
Leland Hunter *Individual*	166	9/15/2011	Kihei Public Hearing		BEH 04; TRAN 02
Les Hata *Fisherman*	132	9/12/2011	Honolulu Public Hearing		BEH 02; BIO 09; BIO 12; INT 02; INT 06; INT 07

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Lexus Kaleikini-Teixeira *Iao Intermediate*	272	10/1/2011	Wailuku Letters		ALT 04; ALT 05
Lihau Ka'ahanui-Kepano *Iao Intermediate*	279	10/1/2011	Wailuku Letters		GEN 01
Lily Engh *Iao Intermediate*	255	10/1/2011	Wailuku Letters		ALT 04; ALT 05; FISH 01
Lindsey Yamasaki *Iao Intermediate*	288	10/1/2011	Wailuku Letters		ALT 03
Lloyd Miyashiro *Individual*	120	9/17/2011	Lihue Afternoon Public Hearing		GEN 01; SOC 03; TRAN 01

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Loeka Elizares *Iao Intermediate*	256	10/1/2011	Wailuku Letters		ALT 04; GEN 01
Loretta Ritte *Individual*	184	9/13/2011	Molokai Public Hearing		ALT 11; ECO 08; TRAN 02
Lori Buchanan *Individual*	196	9/13/2011	Molokai Public Hearing		ALT 09; ALT 14; INA 07; PUB 02
Luka Masuda *Iao Intermediate*	325	10/1/2011	Wailuku Letters		ALT 02; ALT 08
Lyn McNutt *Individual*	113	9/17/2011	Lihue Afternoon Public Hearing		ALT 09; ALT 11; CEF 01; ECO 01; ECO 02; INA 01; INA 02

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Lynn Everett *Individual*	206	9/27/2011	Hana letters		REG 08
Malia Kahuhu *Individual*	152	9/15/2011	Kihei Public Hearing		CUL 06; CUL 07; FISH 01; FISH 05; FISH 15; GEN 02
Marcus R. Oshiro *State Representative, District 39*	52	9/12/2011	Attachment		ALT 02; GEN 02; TRAN 02
Marjorie Ziegler *Conservation Council for Hawaii*	139	9/12/2011	Honolulu Public Hearing		ALT 04; GEN 01; MGT 11
Mark Oyama *Individual*	101	9/17/2011	Lihue Morning Public Hearing		ALT 17; BIO 07; FISH 05; SOC 07

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Mark Richardson *Marine Conservation Institute*	62	10/16/2011	Attachment		ALT 04; BIO 11; DIS 10; DIS 11; DIS 12; DIS 13; FISH 14; INA 10; INA 11; TRAN 01; TRAN 11; TRAN 15; TRAN 16; TRAN 17
Marlene Kaahui *Individual*	167	9/15/2011	Kihei Public Hearing		CEF 01; CEF 02; CEF 03; GEN 01; GEN 02; SOC 01
Mary Ellen Bryant *Individual*	149	9/12/2011	Honolulu Public Hearing		FISH 01; GEN 01; GEN 04; PUB 03; SOC 06; TRAN 02
Matt Ito *Individual*	2	9/13/2011	Email message		FISH 01; INT 02
Mavis Olivera-Medeiros *Individual*	156	9/15/2011	Kihei Public Hearing		CUL 06; FISH 01

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
McKenzie *Iao Intermediate*	252	10/1/2011	Wailuku Letters		ALT 04; FISH 09
Melissa Greenberg *Aloha Mission for Animals*	123	9/17/2011	Lihue Afternoon Public Hearing		ALT 04; BIO 02; DIS 04; DIS 05; GEN 01; TRAN 01; TRAN 04
Individual	125	9/17/2011	Lihue Afternoon Public Hearing		BIO 15; BIO 16; PUB 01
Mervin Dudoit *Individual*	189	9/13/2011	Molokai Public Hearing		ALT 09; BIO 06; CUL 01; FISH 01; FISH 04; GEN 02; GEN 15
Micah Buchanan *Individual*	185	9/13/2011	Molokai Public Hearing		GEN 01; GEN 02

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Micah Quinto *Iao Intermediate*	232	10/1/2011	Wailuku Letters		ALT 04; ALT 05; FISH 03; GEN 01
Michael Drake *Individual*	97	9/17/2011	Lihue Morning Public Hearing		GEN 03; PUB 11; TRAN 02
Michael E. Krupnick *Individual*	29	9/14/2011	Email message		TRAN 02
Mikayla Tsutsui *Iao Intermediate*	324	10/1/2011	Wailuku Letters		ALT 03; ALT 05; ALT 06
Mikiala Kalalau-Keaulana *Individual*	216	9/27/2011	Hana letters		CUL 06; SOC 10

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Milan Yasso *Iao Intermediate*	307	10/1/2011	Wailuku Letters		ALT 03; ALT 05; ALT 06
Mitchell Taketa *Individual*	43	9/22/2011	Email message		ALT 09; BIO 09; BIO 15
Moanikeala Akaka *Individual*	111	9/14/2011	Hilo Public Hearing		GEN 04; PUB 01
Moku Naeole *Iao Intermediate*	246	10/1/2011	Wailuku Letters		ALT 03; BIO 09
Myranda Nishioka *Iao Intermediate*	269	10/1/2011	Wailuku Letters		ALT 04; ALT 06; FISH 14

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Natasha Tome *Iao Intermediate*	242	10/1/2011	Wailuku Letters		ALT 03
Nathaniel Layaoen *Iao Intermediate*	282	10/1/2011	Wailuku Letters		ALT 03; FISH 17
Nicholas Kaili *Iao Intermediate*	285	10/1/2011	Wailuku Letters		ALT 04
Nigel Mayfield *Iao Intermediate*	316	10/1/2011	Wailuku Letters		ALT 03; DIS 01
Nina Monasevitch *Individual*	39	10/16/2011	Email message		ALT 10; ALT 14; ALT 18; BEH 08; DIS 08; GEN 01; GEN 02; TRAN 02

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Noah Hoopaifeliciano *Individual*	213	9/27/2011	Hana letters		FISH 01
Noah Magbual *Iao Intermediate*	250	10/1/2011	Wailuku Letters		ALT 04; ALT 05
Norm Ham *Individual*	150	9/15/2011	Kihei Public Hearing		ALT 11; FISH 01
Norman R and Bonita Swift *Individual*	14	8/29/2011	Email message		GEN 02; TRAN 02
Patience Helekahi Moore *Individual*	200	9/27/2011	Hana letters		BIO 15; ECO 01; FISH 01

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Paul K Chong *Individual*	26	9/15/2011	Email message		ALT 01; ALT 02; ECO 03
Paula Farm *Individual*	221	9/12/2011	Honolulu Public Hearing		
Peter Lopez *Local fisherman*	92	9/17/2011	Lihue Morning Public Hearing		REG 04; REG 06; SOC 04
Phillip Tanner; Elizabeth Tanner *Individual*	85	9/7/2011	Letter (print/scan or electronic)		ALT 16
Pi'ilani Chaves *Iao Intermediate*	280	10/1/2011	Wailuku Letters		FISH 03

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Pilialohalani Kalwaiwaa *Individual*	199	9/13/2011	Molokai Public Hearing		BIO 07; FISH 01; GEN 01
Preston Lau *Individual*	145	9/12/2011	Honolulu Public Hearing		FISH 01; GEN 05; INT 06
Puili Cockett *Individual*	210	9/27/2011	Hana letters		SOC 07
Punel-ei Manini *Individual*	103	9/17/2011	Lihue Morning Public Hearing		CUL 09; GEN 02
Raisa Bermudez *Iao Intermediate*	260	10/1/2011	Wailuku Letters		ALT 04; ALT 05

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Rajen *Iao Intermediate*	244	10/1/2011	Wailuku Letters		ALT 03
Ralph Sharp *Individual*	170	9/15/2011	Kihei Public Hearing		ALT 12; FISH 05; GEN 02
Randall Paragas *Iao Intermediate*	295	10/1/2011	Wailuku Letters		ALT 04
Rene Siracusa *Malama O puna, President*	105	9/14/2011	Hilo Public Hearing		BIO 03; GEN 01
Renz Vergara *Iao Intermediate*	277	10/1/2011	Wailuku Letters		ALT 04; ALT 05; ECO 07; GEN 01; TRAN 01

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Richard *Iao Inermediate*	299	10/1/2011	Wailuku Letters		ALT 04
Richard McCarty *Individual*	182	9/15/2011	Kihei Public Hearing		PUB 11
Rob Parsons *Individual*	179	9/15/2011	Kihei Public Hearing		BIO 08; FISH 03; FISH 17
Ron Kapaku *Individual*	177	9/15/2011	Kihei Public Hearing		ALT 02; FISH 01; GEN 02; GEN 05; TRAN 02; TRAN 09
Ron Tam *Individual*	37	10/17/2011	Email message		ALT 01; ALT 08; BIO 04; GEN 14; INA 10; MGT 04; PUB 03; TRAN 09

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Ronald Tam *Individual*	127	9/12/2011	Honolulu Public Hearing		ALT 01; ALT 08; GEN 07; GEN 14; INA 02; PUB 04; SOC 01; TRAN 09
Roxanne rapuaimohalaikalani Stewart *Individual*	108	9/14/2011	Hilo Public Hearing		MGT 01; MGT 02; PUB 03; TRAN 05
Roy Morioka *Individual*	135	9/12/2011	Honolulu Public Hearing		BIO 15; CEF 03; INT 01; INT 08; REG 09
Samuel Keohuhu *Individual*	215	9/27/2011	Hana letters		FISH 01; SOC 05
Scott English *Individual*	153	9/15/2011	Kihei Public Hearing		ALT 09; FISH 01; GEN 02; REG 06

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Sharon Har *State Representative, 40th District*	138	9/12/2011	Honolulu Public Hearing		ALT 01; ALT 02; ALT 13; BIO 14; GEN 01; GEN 07; INT 02; MGT 10; TRAN 06
Sharon Pomroy *Farmer/Fisher*	100	9/17/2011	Lihue Morning Public Hearing		ALT 09; DIS 02; FISH 05; FISH 09; GEN 03; MGT 04; TRAN 02
Sharon Young *Humane Society of the United States*	69	10/17/2011	Attachment		ALT 04; ALT 18; BEH 01; FISH 10; INA 09; INT 05; TRAN 01; TRAN 07; TRAN 12
Shayna Perry *Individual*	158	9/15/2011	Kihei Public Hearing		CUL 06; FISH 01; GEN 02
Shelley *Iao Intermediate*	283	10/1/2011	Wailuku Letters		GEN 01

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Skippy Young *Individual*	161	9/15/2011	Kihei Public Hearing		ALT 09; BIO 08; CUL 06; ECO 02; GEN 03; GEN 05; TRAN 02
Sonny Tavares *Individual*	201	9/27/2011	Hana letters		FISH 01
Sonovia Ernest *Iao Intermediate*	230	10/1/2011	Wailuku Letters		ALT 04; GEN 01
Stephanie Sparks *Individual*	72	10/17/2011	Attachment		ALT 09; ALT 18; ALT 21; ALT 23; BIO 05; FISH 06; FISH 13; GEN 02; GEN 10; INA 08; INA 09; INA 11; INT 02; TRAN 01
Steven Arce *Individual*	197	9/13/2011	Molokai Public Hearing		ALT 11; GEN 02; TRAN 02

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Steven Hurt *Individual*	112	9/14/2011	Hilo Public Hearing		BIO 05; DIS 02; INA 06; TRAN 02
Stuart Silva, Jr. *Iao Intermediate*	296	10/1/2011	Wailuku Letters		ALT 04
Sydney Green *Iao Intermediate*	270	10/1/2011	Wailuku Letters		ALT 03; FISH 06; TRAN 02
Teihani Frost *Iao Intermediate*	330	10/1/2011	Wailuku Letters		ALT 04
Tevita Hafoka *Iao Intermediate*	254	10/1/2011	Wailuku Letters		ALT 04

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Thomas Nizo *Individual*	93	9/17/2011	Lihue Morning Public Hearing		ALT 02; ECO 01; FISH 01
Tim Kallai *Individual*	117	9/17/2011	Lihue Afternoon Public Hearing		CUL 01
Timothy Ragen *Marine Mammal Commission*	81	10/24/2011	Letter (print/scan or electronic)		ALT 04; DIS 07; ECO 04; ECO 05; TRAN 01; TRAN 10; TRAN 11; TRAN 12
Timothy Robinson *Individual*	38	10/17/2011	Email message		ALT 04; CUL 12; DIS 07; GEN 01; PUB 01; PUB 03; TRAN 01
Tony Costa *Hawaii National Fishermen, spokesperson*	143	9/12/2011	Honolulu Public Hearing		ALT 02; FISH 16; TRAN 02

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Tracy Kubota *Individual*	134	9/12/2011	Honolulu Public Hearing		ALT 02; INA 07; INT 06; MGT 08; TRAN 02
Trystin Hooper *Iao Intermediate*	333	10/1/2011	Wailuku Letters		FISH 03; FISH 14
Tyler Caliva *Iao Intermediate*	286	10/1/2011	Wailuku Letters		ALT 03; ALT 08
U'ilani Kapu *Kuleana Ku'ikahi LLC, Presdient*	80	10/16/2011	Letter (print/scan or electronic)		ALT 02; GEN 03; REG 07; TRAN 02
Ventura *Individual*	87	10/20/2011	Letter (print/scan or electronic)		GEN 03; SOC 01

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Vicki McCarty *Individual*	181	9/15/2011	Kihei Public Hearing		GEN 02; INT 06; PUB 11
Wade Lee *Individual*	187	9/13/2011	Molokai Public Hearing		ALT 11; CUL 01; CUL 02; ECO 04; FISH 05; GEN 02; TRAN 09
Walter Naki *Individual*	194	9/13/2011	Molokai Public Hearing		ALT 09; FISH 01; INT 02; REG 05
	219		Letter (print/scan or electronic)		ALT 09; ALT 18; FISH 01; REG 05
Warren Von Arnswald *Recreational Fisherman; Waialua Boat Club*	129	9/12/2011	Honolulu Public Hearing		ALT 02; BEH 04; CEF 01; CEF 02; FISH 06; INT 04; PUB 05; SOC 06

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Warren Wataya *Individual*	121	9/17/2011	Lihue Afternoon Public Hearing		ALT 03; FISH 01; GEN 02; GEN 03
William J. Aila, Jr *DLNR, Chairperson Board of Land and Natural Resources*	75	10/17/2011	Letter (print/scan or electronic)		ALT 03; ALT 04; ALT 12; ALT 20; BEH 06; BIO 13; GEN 01
William King *Individual*	30	9/19/2011	Email message		ALT 09; BIO 15; CUL 06; FISH 06; GEN 02; INT 02; INT 07
William Michael Provost *Individual*	7	9/5/2011	Email message		GEN 01; TRAN 01
Yamille Vincente *Iao Intermediate*	308	10/1/2011	Wailuku Letters		TRAN 06

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Name/Organization	Submission Number	Received On	Submission Source	Number of Substantive Comments	* Concern Codes
Zaclyn Kekona-Cramer *Iao Intermediate*	306	10/1/2011	Wailuku Letters		ALT 04; ALT 05; FISH 09; FISH 14
Zeenat Mian *Individual*	28	9/14/2011	Email message		FISH 17; GEN 01

* Some commenters expressed the same concern in more than one of their comments. In these cases, only one instance of a Concern Code is shown

Appendix D
Drugs Currently Used or Proposed to be Used During Hawaiian Monk Seal Research and Enhancement Activities

- Page Intentionally Left Blank -

DRUGS CURRENTLY USED OR PROPOSED TO BE USED DURING HAWAIIAN MONK SEAL RESEARCH AND ENHANCEMENT ACTIVITIES

The following table lists the drugs currently used or proposed to be used in Hawaiian monk seals, possible adverse effects including any observed in Hawaiian monk seals, and the pharmacokinetics of each drug (i.e., known information on how the body affects the drug, including how the drug is absorbed, distributed, the rate of action and duration of effect, chemical changes in the body, and effects and routes of excretion of metabolites). Information in the table is from Plumb (2008) or other references if noted. More detailed information on each drug can be found in Plumb (2008).

In addition to the drugs in the table below, supportive fluids such as electrolytes, dextrose, and sodium bicarbonate may be administered at the discretion of the attending veterinarian in response to adverse reactions to capture, handling, and drug administrations. Over the next 10 years, new drugs may become available or other drugs may be prescribed for use in Hawaiian monk seals by the attending veterinarian. Information on such new drugs would be provided by PIFSC to the OPR Permits Division and may be incorporated into the protocols if indicated by the attending veterinarian. Possible adverse effects of any new drugs would be weighed against the benefits of using the drugs for each case. Also, if any of the drugs listed in Table C-1 or any new drugs are used and severe adverse effects are reported in Hawaiian monk seals, the drugs would be discontinued or dosages modified per recommendation by the attending veterinarian.

This page intentionally left blank.

Table C-1 Information On Drugs Proposed For Use in Hawaiian Monk Seals During Research and Enhancement Activities

Drug Name	Dosage/Route of Administration	Use in Hawaiian monk seals	Possible Adverse Effects	Pharmacokinetics
Atropine Sulfate	0.02 -0.2 mg/kg IM, IV, SC (CRC Handbook)	To treat bradycardia (slowed heart rate) or cardiac arrest; may be used as a pre-anesthetic to reduce respiratory secretions and block vagal mediated dive reflex.	Generally dose related; mild effects in healthy patients; severe effects with high or toxic doses include gastrointestinal (constipation, vomiting), central nervous system (CNS). Benzodiazepines may potentiate adverse effects (Veterinary Drug Handbook, 4th Ed., Plumb) Used on numerous occasions in Hawaiian monk seals with no adverse reactions reported (NMFS unpubl. data). Used extensively in other pinnipeds during anesthesia with no observed side effects (Haulena and Heath 2001)	Well absorbed with peak effects on heart rate within 3-4 minutes; metabolized in liver and 30-50% of dose excreted unchanged in urine. Half-life (the time required for the concentration of the drug to reach half of its original value) in humans is 2-3 hours.
Ceftiofur crystalline free acid	6.6 mg/kg IM (Meegan et al. 2010)	Long-acting cephalosporin antibiotic for prophylactic treatment of injuries and treatment of infections.	Usually not serious and low occurrence; mild transient pain and possibility of abscess at injection site; diarrhea; hypersensitivity reactions include rash, fever, or anaphylaxis. Used in Hawaiian monk seals with no adverse effects (Permit No. 10137-07, NMFS, unpub. data). No adverse reactions reported after use in	Half-life in cattle is 8-12 hours with peak levels after 30-45 minutes of intramuscular (IM) injection. A study at The Marine Mammal Center (Sausalito, CA) on 10 California sea lions resulted in maximum plasma concentrations at 24 hours post-IM injection; plasma drug levels

Drug Name	Dosage/Route of Administration	Use in Hawaiian monk seals	Possible Adverse Effects	Pharmacokinetics
			humpback whales, California sea lions, northern elephant seals, and harbor seals (Gulland pers. comm.).	at lower levels would likely be maintained for 5-8 days post-injection (Meegan et al. 2010).
Dexamethasone	0.2 - 1 mg/kg (CRC Handbook)	A glucocorticoid used for treatment of shock; may be used to treat adrenal insufficiency, inflammation, and other maladies.	Usually associated with long-term administration and manifested as clinical signs of hyperadrenocorticism; can retard growth in young animals; when given short-term, unlikely to cause significant harmful effects, even in massive doses. Few instances of use in Hawaiian monk seals with no adverse reactions reported (NMFS unpubl. data).	Half-life in dogs is 2-5 hours; biologic activity can persist for ≥ 48 hours.
Diazepam	0.1-0.25 mg/kg IV	A benzodiazepine used as a sedative (anxiolytic, muscle relaxant, hypnotic) for capture events; may be used as an appetite stimulant or anti-convulsant.	Dogs may exhibit CNS excitement; in horses may cause muscle weakness and ataxia; in cats may cause irritability, depression, aberrant demeanor. Routinely used sedative in Hawaiian monk seals with no adverse reactions reported (NMFS unpubl. data).	Highly lipid soluble and widely distributed throughout the body; readily crosses blood-brain barrier and is highly bound to plasma proteins; metabolized in liver to active metabolites nordiazepam, temazepam, and oxazepam, which are eliminated primarily in urine.
Doxapram HCL	2-5 mg/kg IV (CRC Handbook) Administered at 5 ml (pups/juveniles) and 10 ml	A CNS/respiratory stimulant used to treat respiratory arrest; may also be administered during/after anesthesia.	Hypertension, arrhythmias, seizures, and hyperventilation, which are most probable with repeated or high doses. Increases myocardial oxygen demand and reduces cerebral blood flow. Few instances of use in Hawaiian	After intravenous (IV) injection, onset of effect in humans and animals within 2 minutes; in dogs, rapidly metabolized and excreted as metabolites in urine within 24-48 hours after administration. Serum half-life

Drug Name	Dosage/Route of Administration	Use in Hawaiian monk seals	Possible Adverse Effects	Pharmacokinetics
	(subadults/adults)		monk seals with no adverse reactions recorded (NMFS unpubl. data).	in dogs is 2.5-3.2 hours and in humans is 20-50 hours.
Emodepside + Praziquantel	0.11 to 0.19 ml/kg	Topical antiparasitic (nematocide + cetocide) used to treat intestinal roundworms and tapeworms.	Most common side effects in cats include skin and gastrointestinal reactions. Used in captive and wild Hawaiian monk seals with no adverse reactions recorded (NMFS unpublished data).	In cats: rapidly absorbed through skin and into systemic circulation after dermal administration; serum concentrations detectable for praziquantel after 1 hour (peak at 6 hours) and for emodepside after 2 hours (peak at 2 days); detectable for up to 28 days following administration.
Epinephrine	0.05-0.2 mg/kg IV, IM, SC, pericardial, intratracheal	Treatment for cardiac arrest with resuscitation; may also be used to treat anaphylaxis.	Anxiety, tremors, excitability, vomiting, hypertension (with overdose), arrhythmias, high levels of uric acid in blood, and lactic acidosis (with prolonged use or overdosage). Few instances of use in Hawaiian monk seals with no adverse reactions reported (NMFS unpubl. data).	Well absorbed following IM or subcutaneous (SC) injection; onset of action following SC injection is 5-10 minutes; immediate action following IV injection; does not cross blood-brain barrier; actions end by uptake into sympathetic nerve endings; metabolism in liver and other tissues to inactive metabolites.
Fenbendazole	11mg/kg twice (CRC Handbook)	An antiparasitic agent for treating intestinal roundworms.	Generally no adverse effects at normal doses; hypersensitivity secondary to antigen release by dying parasites may occur, especially with high doses; vomiting reported infrequently in dogs and cats ; well tolerated at doses up to 100x recommended.	Marginally absorbed after oral administration; metabolized to active compound oxfendazole and sulfone; in sheep, cattle, and pigs, 44-50% of a dose is excreted unchanged in feces, and <1% in urine.

Drug Name	Dosage/Route of Administration	Use in Hawaiian monk seals	Possible Adverse Effects	Pharmacokinetics
			Used in research field trial in Hawaiian monk seals and in captive care; no adverse effects reported from use but difficult to administer orally in field setting (NMFS Permit No. 10137 Hawaiian Monk Seal Deworming Project: Year One Summary).	
Flumazenil	0.05-0.1 mg/kg Flumazenil would be administered IV at a dosage of 2.5 ml (pups/juveniles) and 5.0 ml (subadults/adults), repeated if necessary	A benzodiazepine antagonist used to reverse effects of sedative overdose (diazepam or midazolam).	In humans, injection site reactions, vomiting, cutaneous vasodilatation, vertigo, ataxia, and blurred vision; deaths have been associated with its use in humans having serious underlying diseases; large IV overdoses have rarely caused symptoms in otherwise healthy humans. Used in Hawaiian monk seals with no adverse reactions reported; trials with captive monk seals proved effective in reversing effects of midazolam (NMFS unpubl. data).	Administered with rapid IV injection with therapeutic effects within 1-2 minutes; rapidly distributed and metabolized in liver; half-life in humans is approximately 1 hour.
Furosemide	2-5 mg/kg (CRC Handbook)	A diuretic used to treat congestive heart failure or pulmonary edema.	May induce fluid and electrolyte imbalances; reported to cause hearing loss in cats and dogs given high IV doses; other effects include gastrointestinal problems, anemia, weakness, restlessness. Few instances of use in Hawaiian	In dogs, the elimination half-life is approximately 1-1.5 hours; in humans, the diuretic effect takes place within 5 minutes and peak effects 30 minutes after IV injection.

Drug Name	Dosage/Route of Administration	Use in Hawaiian monk seals	Possible Adverse Effects	Pharmacokinetics
			monk seals with no adverse reactions reported (NMFS unpubl. data).	
Ivermectin	200 microgram/kg	An antiparasitic agent for treating intestinal roundworms; used as a heartworm preventative in captive monk seals.	Species-specific adverse effects generally from dying microfilaria or other larva, for example, swelling and itching in horses, shock-like reactions in dogs, and paralysis and staggering in cattle; may cause neurologic toxicity in mice and rats with doses slightly more than prescribed; may cause death, lethargy, or anorexia in birds. Used in captive care of Hawaiian monk seals to treat intestinal worms and used routinely on permanently captive monk seals with no adverse reactions reported (NMFS unpubl. data; Annual Report for Permit No. 455-1760).	Oral doses absorbed up to 95%; greater bioavailability after SC administration but more rapidly absorbed after oral administration; well distributed to most tissues except in cerebrospinal fluid thus reducing its toxicity; metabolized in liver and primarily excreted in feces; less than 5% is excreted in urine; elimination half-life for dogs is 2 days.
Lidocaine HCL	1-3 ml 2 % topically	A local anesthetic used to reduce pain from skin incisions such as blubber biopsies.	At usual doses, serious adverse reactions are rare; most common are dose-related and rare, including CNS reactions, transient nausea and vomiting, and cardiac effects. Routinely used in Hawaiian monk seals during biopsy sampling with no adverse reactions reported (NMFS unpubl. data).	Lidocaine has a high affinity for fat and adipose tissue and is bound to plasma proteins; rapidly metabolized in liver to active metabolites; less than 10% of an injected dose is excreted unchanged in urine.
Midazolam	0.1-0.15 mg/kg IV, IM	An injectable benzodiazepine	Few adverse effects have been reported in humans including effects	Rapidly and nearly completely absorbed after IM injection;

Drug Name	Dosage/Route of Administration	Use in Hawaiian monk seals	Possible Adverse Effects	Pharmacokinetics
		used as a sedative for capture events or as a preanesthetic.	on respiratory and cardiac rates and blood pressure; other effects reported in humans include pain on injection, local irritation, headache, nausea, vomiting, and hiccups. Possibility of respiratory depression is principal concern in veterinary patients. Used in wild and captive Hawaiian monk seals with no adverse reactions reported; trials with captive monk seals indicated midazolam safe and effective (NMFS unpubl. data; Annual report for Permit No. 455-1760).	highly protein-bound and rapidly crosses the blood-brain barrier; metabolized in liver; elimination half-life in dogs averages 77 minutes and in humans is approximately 2 hours.
Praziquantel	10 mg/kg (CRC Handbook)	An anticestodal antiparasitic used to treat intestinal tape worms.	In dogs, oral dosing can cause anorexia, vomiting, lethargy, or diarrhea but incidence is less than 5%; greater incidences from injectable in dogs including pain at injection site, vomiting, drowsiness, and staggering gate. Used in research field trial (oral and IM) and in captive care (oral) of Hawaiian monk seals; no adverse effects reported from oral use in captive care; difficult to administer orally in field setting; swellings resulted from IM injections in field use (NMFS unpubl. data; Gobush et al. 2011).	Rapidly and nearly completely absorbed after oral administration; peak serum levels in dogs between 30-120 minutes; distributed throughout the body, crossing intestinal wall and blood-brain barrier into CNS; metabolized in liver and excreted primarily in urine; elimination half-life in dogs is 3 hours.

Drug Name	Dosage/Route of Administration	Use in Hawaiian monk seals	Possible Adverse Effects	Pharmacokinetics
Prednisolone sodium succinate	1 mg/kg	A glucocorticoid used for treatment of shock; may be used to treat adrenal insufficiency and other maladies.	Usually associated with long-term administration and manifested as clinical signs of hyperadrenocorticism; can retard growth in young animals; when given short-term, unlikely to cause significant harmful effects, even in massive doses. Few instances of use in Hawaiian monk seals with no adverse reactions reported (NMFS unpubl. data).	Biologic half-life is 12-36 hours.
Sodium pentobarbital	1 ml/10 lbs. into extradural vein	Humane euthanasia by attending veterinarian of moribund seals, or as a last resort to remove aggressive male seals.	Barbiturates depress the CNS in descending order starting with the cerebral cortex and loss of consciousness progressing to anesthesia; with overdose, deep anesthesia progresses to apnea due to depression of the respiratory center, followed by cardiac arrest (AVMA 2013). Used to effectively euthanize one aggressive adult male in 1991.	Onset of action within 1 minute after IV administration. Distributes rapidly to all body tissues with highest concentrations in brain and liver.

This page intentionally left blank.

REFERENCES

AVMA Guidelines for the Euthanasia of Animals: 2013 Edition (2013). American Veterinary Medical Association, Schaumburg, IL.

Gobush, K.S., Baker J.D., & Gulland F.M.D. (2011).Effectiveness of an antihelminthic treatment in improving the body condition and survival of Hawaiian monk seals. Endangered Species Research 15: 29-37.

Haulena, M. and R.B. Heath. 2001. Marine mammal anesthesia. In: CRC Handbook of Marine Mammal Medicine, Second Edition, L.A. Dierauf and F.M.D. Gulland (eds.), CRC Press LLC, Boca Raton. Pp. 655-688.

Meegan, J., W. Collard, G. S. Grover, N. Pussini, B. Van Bonn, F. Gulland. 2010. Ceftiofur pharmacokinetics. Abstract in the International Association for Aquatic Animal Medicine 2010 Proceedings.

Plumb, D.C. 2008. Veterinary Drug Handbook, Sixth Edition. Blackwell Publishing, Minnesota. 1120p.

This page intentionally left blank.

Appendix E
Hawaiian Monk Seal Vaccination Review Plan

This page intentionally left blank.

Vaccination – Objectives and Justification

Current information suggests infectious disease is not limiting recovery of the Hawaiian monk seal. However, the species is rare, has very low genetic diversity and may have been buffered from exposure to many mammalian diseases due to its isolation in the Hawaiian Archipelago for millions of years. Together, these factors raise great concern that outbreaks of diseases to which monk seals have not been previously exposed could have devastating impacts.

Proactive efforts to mitigate the potential or eventual negative effects of infectious disease on monk seals include vaccination studies to determine the safety and efficacy of vaccines against specific pathogens considered most likely to spread to monk seals (e.g., morbillivirus and West Nile Virus). Captive studies would include both monk seals and surrogate species, and potentially free-ranging Hawaiian monk seals. If such research indicates that the vaccines are safe and effective, they may be administered preventatively or in response to an outbreak, to wild or rehabilitating seals.

Epidemic diseases (referred to as epizootics when occurring in animals rather than humans) are diseases that occur at a time or place that they do not usually occur, or with a greater frequency than expected in a certain period. Severe epidemics may reduce host population density to such an extent that stochastic events or previously unimportant ecological factors may further reduce the host population size (Harwood and Hall 1990). For example, canine distemper dramatically reduced black-footed ferret (*Mustela nigripes*) populations in Wyoming, bringing them to extinction in the wild (Thorne and Williams 1988); and, avian malaria reduced native Hawaiian honeycreeper (*Hemignathus parvus*) populations to such small numbers that many were finally eliminated by predation or habitat loss (Warner 1968).

Infectious diseases, especially those that are newly introduced to naïve populations of animals, can cause mass illness and mortality. The best means of preventing the spread of infectious disease among animals are vaccinations. Vaccines are available for two viruses that have been identified as high risks to Hawaiian monk seals: morbillivirus and West Nile virus. Background surveys conducted on Hawaiian monk seals support that they remain naïve to both viruses. These two viruses are the current focus of vaccination research and response planning for Hawaiian monk seals.

Morbilliviruses—These viruses, specifically phocine distemper virus (PDV) and canine distemper virus (CDV), have caused mass die offs of phocids. During 1988, approximately 18,000 (70% of the population) harbor seals (*Phoca vitulina*) in Europe died from PDV infection (Heide-Jørgensen *et al*. 1992). A second outbreak of PDV occurred in the North Sea in 2002, which killed over 20,000 harbor seals (Jensen *et al*. 2002). Outbreaks of canine distemper (CDV) killed 5-10,000 Baikal seals (*Pusa sibirica*) in 1987-1988 (Grachev *et al*. 1989), 10,000 Caspian seals *(P. caspica)* in 2000 (Kennedy *et al*. 2000) and may have been responsible for the deaths of 2,500

crabeater seals (*Lobodon carcinophagus*) in the Antarctic in 1955 (Laws and Taylor 1957). While a morbillivirus was isolated from Mediterranean monk seals (*Monachus monachus*) that died during an epidemic, its importance relative to biotoxins in causing mortality remains controversial (Hernandez *et al.* 1998). While the susceptibility of Hawaiian monk seals to morbilliviruses is unknown, due to the devastating effects these viruses can have on phocids, there is a need to better understand and prepare for such an event in Hawaii.

West Nile Virus—This virus caused the death of a captive monk seal at SeaWorld San Antonio, Texas, and has caused mortality in captive harbor seals in the mainland U.S. To date this virus has not been identified in wild marine mammals, although it is present along the eastern seaboard and southern California. This mosquito-borne virus is currently not present within Hawaii, and the State has rigorous surveillance and response plans for this virus due to its public health importance. Although neither single cases of disease nor epidemics of West Nile Virus have been reported in wild marine mammals to date, the death of a monk seal in Texas from this infection indicates monk seals are susceptible. Thus, the possibility of extensive mortality in monk seals exists if the virus were to be introduced to Hawaii, warranting a response plan to such a scenario.

Available vaccines—Vaccines currently used for prevention of viral diseases in domestic animals can be divided into three types:

- Vaccines based on a dead inactivated virus;
- Vaccines using live attenuated viruses; and
- Vaccines consisting of recombinant viruses.

Vaccines using a dead virus are considered the safest because the virus cannot replicate in the host or cause disease; however, this lack of replication often means that the immune response generated following vaccination is short-lived and may not be protective. Live vaccines typically generate the most effective immune response. When used in species other than the one for which the vaccine was developed, live vaccines present the risk of the virus replicating in the host and either causing disease in the vaccinated animal, or being shed in secretions and becoming infective to contact animals. One vaccine proposed for use under this permit is an inactivated West Nile virus vaccine (Innovator, Fort Dodge) that has been used regularly to date on Hawaiian monk seals in captivity in San Antonio, Texas, with no adverse reactions observed (Workshop to Evaluate the Potential for Use of Morbillivirus Vaccination in Hawaiian Monk Seals, Final Report 2005).

Recombinant virus vaccines use a vector virus that does not typically infect the target host but expresses antigens from the pathogen of interest to stimulate an immune response against it. A recombinant vaccine to CDV (monovalent recombinant canary pox vector expressing canine distemper virus antigens, Purevax, Merial) licensed for use in ferrets in the U.S., is now used extensively in zoological collections (Bronson et al. 2007) and is proposed for use in research and enhancement activities under this permit. It is the only distemper vaccine recommended by the American Association of Zoological Veterinarians for use in non-domestic carnivores including mustelids (http://www.aazv.org). It is approved generically for animal use in the

State of Hawaii. Safety and efficacy trials with this CDV vaccine have been conducted on four captive harbor seals and on one captive Hawaiian monk seal. These preliminary studies demonstrated that the vaccine is safe, and antibodies to canary pox were detected after a second (booster) dose. This vaccine has also proven to be a safe and effective prophylactic treatment for captive southern sea otters (*Enhydra lutra nereis*) (Jessup et al. 2009).

Research and Enhancement—Vaccination

Vaccination Methods: Up to 1,100 monk seals (essentially the entire species) could be vaccinated if the need were to arise and safe, effective vaccines were available to meet that need. The following describes the proposed approach to vaccine studies and vaccination.

Vaccine research

To prepare for and respond to an epidemic caused by morbilliviruses or West Nile virus, the following research is proposed.

Surveillance for morbillivirus and West Nile infections—To enable detection of novel viral infections in the Hawaiian monk seal population, there is a need to routinely and actively monitor for infections. Monitoring wild monk seals for these viruses may include tests for antibodies against the virus in blood (e.g., enzyme linked immunosorbent assays), tests for actual virus in blood, feces, or nasal swabs (e.g., polymerase catalyzed reaction assays), and syndrome-based surveillance. Sample and data collection for these tests would be covered by health assessment studies described in the Final PEIS.

Assess the safety and efficacy of the recombinant CDV vaccine—Currently, one captive Hawaiian monk seal has been vaccinated against morbillivirus. Vaccination of additional Hawaiian monk seals would better elucidate their ability to mount a proper immune response, the number of vaccines (including boosters) needed to generate this response, and the duration of immunity against morbilliviruses. Vaccination of additional captive Hawaiian monk seals will be pursued with partners under separate permits, including the Waikiki Aquarium and Sea World San Antonio, which have both applied to conduct this research under their own permits. Authorization to conduct vaccine research on monk seals in other facilities that do not have permits to conduct the research are being sought by NMFS.

Post-Vaccination Antibody Response (PVAR) Methods for Permanently Captive Monk Seals

Captive seals can serve as a model to establish vaccine antibody response for Canine distemper virus (CDV) and West Nile virus (WNV). For CDV, the use of Purevax (Meriel) would be used (a monovalent recombinant canary pox). Recombinant vaccines pose less risk than use of a live virus. The WNV vaccine is a product made by Fort Dodge of inactivated WNV. As an inactivated virus, it cannot be shed and therefore does not require a closed system. In addition, the recombinant canary pox has been tested in harbor seals at Sea World (by Pam Yochem) and no virus shedding was detected (Dr. Frances Gulland, personal communication).

To assess the effectiveness of the vaccines, serum antibody samples must be taken throughout the year. It is proposed to collect serum on days 0, 28, 42 and 365 to monitor antibody formation.

Day 0 serum collection will occur prior to vaccination to provide baseline values for each animal. Vaccination for both CDV and WNV will occur after the serum is collected. Along with serum samples, duplicate nasal swabs will be obtained. A follow up vaccine will be given on day 14, but no blood sample will be taken at this time. Each vaccine is given subcutaneously in a 1 ml dose, administered twice, fourteen days apart. To minimize restraint and handling time of the seals, the serum collections on days 0 and 365 may also serve as annual blood sampling for the seals regular health monitoring. Additional handling and sedation will occur on days 28 and 42 post-vaccination to obtain the serum and nasal swabs only.

For both routine health monitoring and the PVAR study, blood samples will be obtained through the use of chemical sedation if deemed necessary by the attending veterinarian and light physical restraint. Sedation would be achieved with either diazepam (0.2 mg/kg IV) or midazolam (0.2 mg/kg IM) and blood collected from the extradural sinus or interdigital webbing vein. Flumazenil will be kept on hand for emergency use to reverse diazepam or midazolam sedation if necessary. However, it will not be used routinely as the half-life is less than that of the sedative drugs. Blood samples and nasal swabs will be obtained. At some facilities, seals may be trained for voluntary blood sampling. In addition, vaccination of future monk seals brought into temporary captive care (under the MMHSRP permit) may be conducted during the research phase.

Outbreak response for seals in the wild

Vaccination of monk seals may occur either in response to an outbreak or prophylactically in the absence of disease in Hawaii. Once a minimum of five captive seals has been vaccinated with no adverse effects identified, a prophylactic vaccine trial should be developed in the MHI. However, until this trial has been performed, a response plan is needed in case of disease events that could significantly increase the risk of morbillivirus disease in monk seals, due to their critically endangered status. A series of different disease parameters in Hawaiian monk seals, other marine mammals and domestic animals have been identified that could trigger a vaccination response in Hawaiian monk seals.

HMSRP proposes to vaccinate in response to disease outbreaks as diagnosed by a series of triggers described below. If the risk of morbillivirus or West Nile virus epidemics to monk seals changes from the current situation, this approach may be modified.

<u>*Morbillivirus*</u>

Triggers

A *confirmed* case is an animal with pneumonia, or encephalitis, or lymphadenitis, or dermatitis, with morbillivirus detected in tissues by PCR or immunohistochemistry, and its identity confirmed by nucleic acid sequencing.

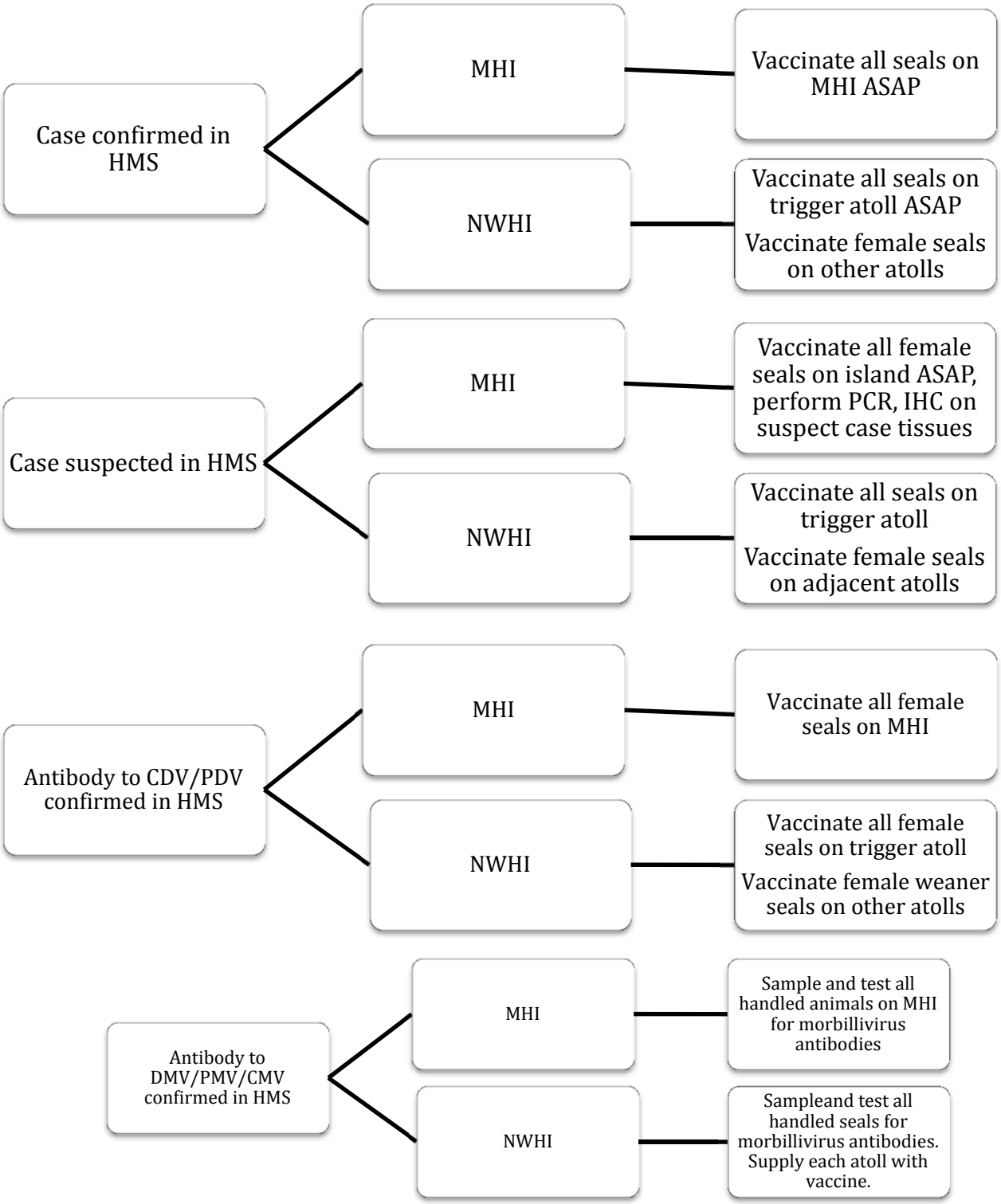
A *suspect* case is an animal with severe pneumonia or encephalitis associated with syncitial cells and inclusion bodies detected on histology, with either a positive PCR or

immunohistochemistry result. Detection of antibody occurs when serum neutralization test results are greater than 1:16.

Responses to each disease parameter are summarized in the decision tree below. Each response is made by weighing the advantages and disadvantages, and recognizing that a second trigger occurring during a response may increase the level of response. Detection of antibody implies that exposure is occurring, but lack of disease would imply seals have developed resistance to the exposure. Thus vaccination response would be at a lower level than that to a detected case.

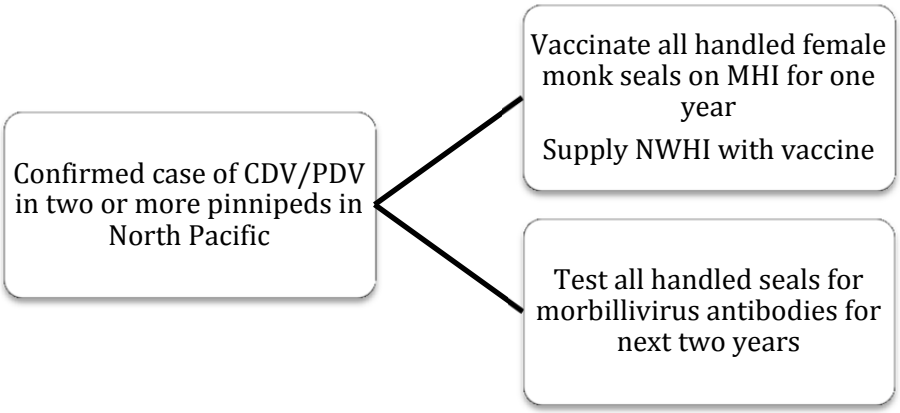
All vaccination responses would be maintained for one year. During response, surveillance for morbillivirus infection through necropsy of dead animals and serology of handled live animals will be prioritized by NMFS. Following vaccination, all vaccinated animals would be blood sampled and tested for morbillivirus antibodies within one year of vaccination unless pregnant.

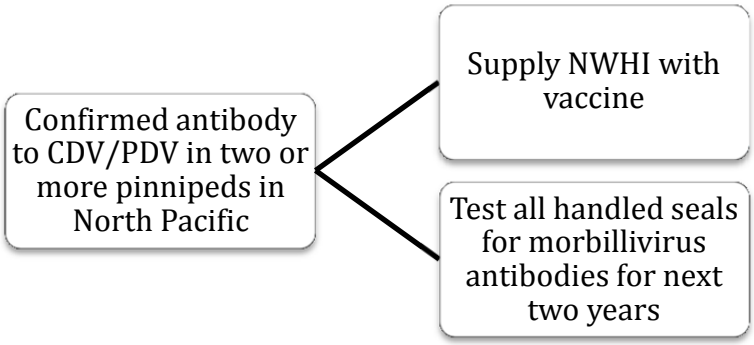
Triggers in Hawaiian Monk Seals

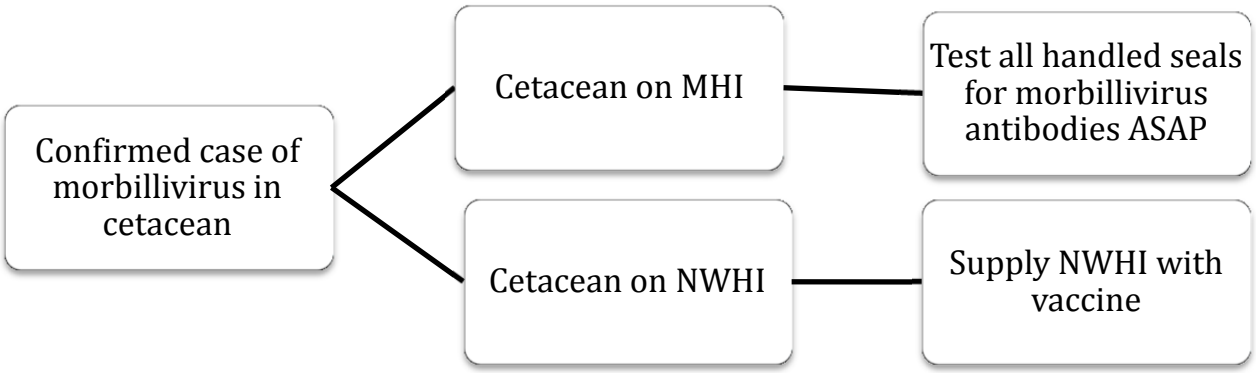


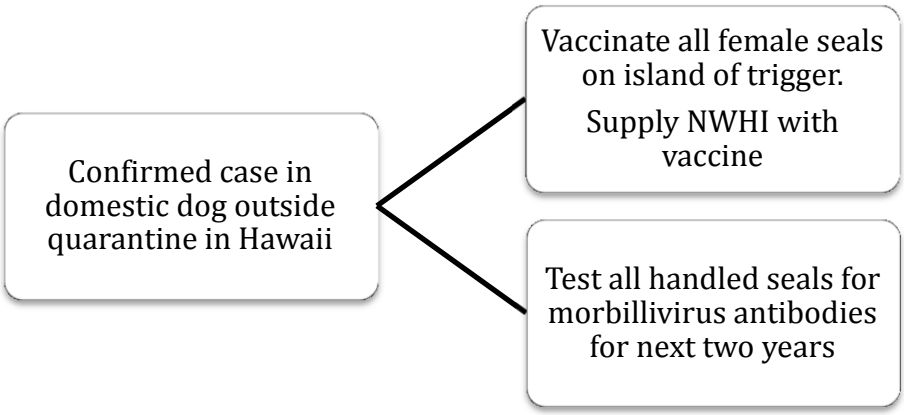
Triggers in Other Mammals

Morbillivirus associated disease in seals to date worldwide is believed to have resulted from transmission of virus from other seal species and domestic dogs (Grachev et al 1989, Jensen et al. 2002). Thus diseases in these species are considered risk factors for monk seals. Morbillivirus disease has not been reported to date in pinnipeds of the North Pacific, nor in mammals on the Hawaiian Islands, despite its prevalence in seals in Europe and the Atlantic (see above), and in domestic dogs in the continental United States. If morbillivirus disease was detected in pinnipeds in the North Pacific, the risk of Hawaiian monk seal exposure to morbillivirus infections would be heightened due to occasional movement of pinnipeds from other regions of the North Pacific to Hawaii. A small number of northern elephant seals have been documented in Hawaii and in 2012 a female northern fur seal landed on Oahu. Movement of other pinnipeds to Hawaii occurs unpredictably, and vaccination takes time to perform and achieve protective immunity. Thus, triggers that suggest pinniped morbillivirus disease could reach Hawaii at random times have been identified to trigger vaccination. Triggers that could occur in mammals other than pinnipeds have also been identified.









Results of the response to the first trigger event will be used to refine responses to subsequent trigger events. In particular, records will be taken on:

- Time between trigger and administration of first and second dose of vaccine;
- Number of seals vaccinated;
- Time required to vaccinate all or most animals on island;
- Age distribution of vaccinated animals; and
- Resightings of vaccinated animals
- Any indication of adverse reaction to vaccination.

West Nile Virus

The epidemiology of West Nile Virus differs significantly from that of morbilliviruses, as it is a vector borne zoonotic virus rather than a directly spread animal pathogen. This virus caused the death of a captive monk seal at SeaWorld San Antonio, Texas, and has caused mortality in captive harbor seals in the mainland U.S. To date this virus has not been identified in wild

marine mammals, although it is present along the eastern seaboard and southern California. As this mosquito-borne virus is currently not present within Hawaii, the State has rigorous surveillance and response plans for controlling this virus due to its public health importance. Although neither single cases of disease nor epidemics of West Nile Virus have been reported in wild marine mammals to date, the death of a monk seal in Texas from this infection indicates monk seals are susceptible. Thus, the possibility of extensive mortality in monk seals exists if the virus were to be introduced to Hawaii, warranting a response plan to such a scenario

Trigger

A case of West Nile virus in the Hawaiian Archipelago in humans or wildlife, with activation of the State emergency response for West Nile virus control could trigger implementation of West Nile virus vaccinations in wild Hawaiian monk seals.

Response

As vaccination of Hawaiian monk seals to WNV has occurred with proven safety for over 5 years in 8 captive monk seals in Texas, the risk of vaccination against WNV is minimal, apart from risks associated with approach and injection.

In response to a detected case of WNV in any species in Hawaii, all accessible seals on the MHI would be vaccinated with West Nile virus vaccine (Innovator, Fort Dodge), starting with the island on which the case was identified. Vaccine would be transported to each NWHI and used if the outbreak is not controlled in the MHI within 2 months.

<u>Potential prophylactic vaccination</u>

The best way to protect Hawaiian monk seals against these viral infections is to vaccinate prior to population-wide exposures. This is especially true if multiple doses of vaccines are required to gain immunity against infections, or if immunity responses take weeks to months to develop. Conversely, vaccines that mount short-term responses against infections or have higher risks of side effects may best be delivered only in the face of population-wide exposures. Based upon the information gained from research and any outbreak response, it will be determined whether prophylactic or solely response-driven vaccinations against morbillivirus and West nile virus are needed.

REFERENCES

Aguirre A., Keefe, T. J., et al. 2007. Infectious disease monitoring of the endangered Hawaiian monk seal. *Journal of Wildlife Diseases* 43: 229-241.

Bronson, E., S. Deem, C. Sanchez, C., and S. Murray. 2007. Serologic response to a canarypox-vectored canine distemper virus vaccine in the giant panda (*Ailuropoda melanoleuca*). *Journal of Zoo and Wildlife Medicin*e 38: 363-366.

Grachev, M.A., V.P. Kumarev, et al. 1989. Distemper virus in Baikal seals. *Nature* 338: 209.

Harwood, J., and A. Hall. 1990. Mass mortality in marine mammals: Its implications for population dynamics and genetics. Trends in Ecology and Evolution 5: 254-257.

Heide-Jorgensen, M.P., T. Harkonen, and P. Aberg. 1992. Long term effect of epizootic in harbor seals in the Kattegat-Skagerrak and adjacent areas. *Ambio* 21: 511-516.

Hernández, M., I. Robinson, A. Aguilara, L.M. González, L.F. López-Jurado, M.I. Reyero, E. Cacho, J. Franco, V. López-Rodas, and E. Costas. 1998. Did algal toxins cause monk seal mortality? Nature 393: 28-29.

Jensen, T., M. van de Bildt, et al..2002. Another phocine distemper outbreak in Europe. *Science* 297: 209.

Jessup, D.A., M.J. Murray, D.R. Casper, D. Brownstein and C. Kreuder-Johnson. 2009. Canine distemper vaccination is a safe and useful preventative procedure for southern sea otters (*Enhydra lutris nereis*). *Journal of Zoo and Wildlife Medicine* 40:705-710.

Kennedy, S., J.A. Smyth, P.F. Cush, S.J. McCullough, G.M. Allan, and S. McQuaid. 1988. Viral distemper now found in porpoises. *Nature* 336: 21.

Laws, R.M., and R.F.J. Taylor. 1957. A mass mortality of crabeater seals *Lobodon carconiphagus* (Gray). Proceedings of the Zoological Society of London 129: 315-325.

Thorne, E.T., and E.S. Williams. 1988. Disease and endangered species: the black-footed ferret as a recent example. Conservation Biology 2:66-74.

Warner, R.E. 1968. The role of introduced diseases in the extinction of the endemic Hawaiian avifauna. The Condor 70:101-120.

Appendix F
Proposed Translocation Plan

This page intentionally left blank.

TWO-STAGE TRANSLOCATION: A PROPOSAL FOR ENHANCEMENT OF THE ENDANGERED HAWAIIAN MONK SEAL[1]

Context and Scope

The National Marine Fisheries Service (NMFS) is proposing a novel strategy for boosting juvenile Hawaiian monk seal survival. The proposal involves temporarily translocating weaned female pups from subpopulations with relatively low juvenile survival to alternate sites where juvenile survival is much higher, then returning them several years later. The objective is to reduce early mortality of these individuals, which is exceptionally high in the first two years of life and is thought to be the primary factor limiting population recovery. The proposed translocations would ideally preserve sufficient reproductive potential within monk seal subpopulations maintaining the capability for more rapid growth should conditions currently constraining survival eventually relax. Given recent trends for this species (4% annual decline in abundance), this logic is admittedly optimistic, but some improvement in natural survival will surely be required if the species is to avoid extinction.

Recent survival rates suggest the most favorable option (purely in terms of demography) would involve temporarily moving seals from the remote Northwestern Hawaiian Islands (NWHI) to the main Hawaiian Islands (MHI), an initiative that involves some controversy related to socio-economic issues (See Final PEIS Appendix C).

As described below, the proposed translocation program is but one of several actions, currently underway or proposed, to conserve the Hawaiian monk seal. All of these actions have been, or will soon be, subject to scrutiny for NEPA clearance, MMPA/ESA permitting, IACUC approval, and Recovery Team and Marine Mammal Commission review. Most of these activities have a long history of positive application to monk seals or demonstrated precedent in other wildlife management or conservation programs.

In contrast, the proposed translocation program is novel in many respects and deserves special consideration. Social and economic concerns associated with translocations will be thoroughly analyzed and addressed during the PEIS and permitting processes. However, the PIFSC further commissioned a special Society for Conservation Biology (SCB) review of the science of its proposed translocation strategy. The PIFSC recognizes that the proposed two-stage translocation program has unique features in terms of its design, execution and underlying scientific principles when compared to 'traditional' translocation or reintroduction programs. As such, the SCB review was intended to evaluate the scientific support for the proposed strategy. While recognizing that the translocation program would occur as one element of a more comprehensive research and enhancement program, the scope of that review was relatively narrowly focused on translocation science.

---

[1] An earlier version of this document was prepared for a Society for Conservation Biology (SCB) blue ribbon panel review of the science supporting two-stage translocation. Some of the comments and suggestions arising from the SCB review (completed 7 February 2011) have been incorporated into the current version of this document. Other suggestions, such as providing a wider range of metrics for evaluating two-stage translocation benefits, were incorporated directly into Chapter 4 of the Final PEIS. Portions of this analysis were published in Baker *et al.* 2013.

Background

Distribution and Population Status

The Hawaiian monk seal ranges throughout the entire Hawaiian Archipelago with rare occurrences recorded at Johnston Atoll, approximately 800 km south of Hawaii (Figure 1). The species is structured in a metapopulation consisting of eight NWHI subpopulations, which together comprise roughly 85% of total abundance; the remainder is distributed amongst the MHI. The monk seal subpopulations display varying degrees of demographic independence but are linked through regional environmental correlation as well as migration (Baker *et al.* 2007, Baker and Thompson 2007, Schultz *et al.,* 2010). A proxy for movement rates among subpopulations (the proportion of tagged seals seen at other than their natal site during their lifetime) ranges from 4% to 18% depending upon the site (Schultz *et al.,* 2010). Effective migration has apparently been sufficient to preclude any discernable genetic population structure, such that the species is comprised of a single panmictic population (Schultz *et al.* 2009, Schultz *et al.,* 2010).

Total Hawaiian monk seal abundance is approximately 1,100 individuals with subpopulations ranging from roughly 50 to 200 seals each. The overall population abundance is falling by an estimated 4% per year. The six most-studied subpopulations in the NWHI (French Frigate Shoals, Laysan Island, Lisianski Island, Pearl and Hermes Reef, Midway Atoll and Kure Atoll) are currently declining with estimated intrinsic rates of increase (λ) ranging from 0.89 to 0.96 (Baker *et al.* 2011*a*). Necker and Nihoa Islands appear to be stable or increasing, however the demographics at these two sites are relatively poorly characterized due to their difficult access and historically relatively small contribution to total abundance. In contrast, the MHI population is increasing with an estimated λ of 1.07.

Poor post-weaning juvenile survival is the primary driver of the population decline in the NWHI and, conversely, favorable survival in the MHI contributes to that region's robust growth. Recent survival to age curves (l_x) demonstrate the divergent survival regimes operating between the NWHI and MHI (Figure 2). Chronic poor juvenile survival for time periods ranging from 10-20 years in the NWHI have resulted in degraded age structures exhibiting an over-representation of newborns and older seals, with few juveniles and young adults.

Age-specific fecundity (m_x) has been rather well characterized for three NWHI subpopulations (Harting *et al.* 2007, Figure 3). The curves vary among these sites and tend to be somewhat lower than for other pinnipeds. There is some evidence that MHI seals enjoy earlier maturation and higher reproductive rates, at least among the younger adults (Baker *et al.* 2011*a*). Nevertheless, survival rates are the primary factor determining population status and trends at present.

Causes of population decline

The 2007 Recovery Plan for the Hawaiian Monk Seal (NMFS 2007) identified three "crucial" threats to the species:

- **Food limitation,** the primary cause of low juvenile survival.

- **Entanglement** in marine debris, which affects all ages and sexes, but disproportionately involves juvenile seals.
- **Shark predation,** particularly Galapagos shark predation on pups at French Frigate Shoals.

Another set of second tier "serious" threats include infectious disease, terrestrial habitat loss in the NWHI (especially due to sea level rise), intra-specific male aggression, and human interactions especially in the MHI (disturbance, fishery interactions, etc.).

While certain of these threats can have important sporadic or localized impacts (*e.g.*, male aggression) or have *potential* for widespread, devastating impacts (epidemic disease), it is generally agreed that the primary cause of the current decline is food limitation leading to unsustainably high levels of juvenile mortality (Antonelis *et al.* 2006, Baker 2008). Insufficient availability of prey for young seals may be mediated through poor or variable overall system productivity, competition with other top predators (Baker *et al.* 2007, Polovina 2008, Baker and Johanos 2004, Parrish *et al.* 2008), or both. In any case, because the diagnosis indicates a deficiency in the ecosystem that is leading to the demise of young monk seals, there are no simple or certain remedies. Thus, a set of novel tools, including a new translocation approach, is being proposed. Below we describe past, ongoing and future planned interventions to provide some context for the translocation proposal that is the focus of this review.

Past and current demographic research and monitoring

Due to steep declines in abundance following surveys in the late 1950s, the Hawaiian monk seal was listed as endangered under the United States Endangered Species Act (ESA) in 1976. Efforts to monitor the species and foster its recovery began in the early 1980s, led by the NMFS as prescribed by the ESA. Monk seal population assessment has focused on determining abundance, age and sex structures, survival rates, reproductive rates, and causes of injury and mortality. The Hawaiian monk seal thus has the distinction of being the subject of a long-term and thorough demographic study on a par with that undertaken for any large, free-ranging mammal in the world. Relying on the rich data set accumulated from over two decades of research, a suite of demographic parameter estimates has been updated annually for six NWHI subpopulations, with less data available from Necker and Nihoa Islands, and more recently, data from the MHI. Summarized demographic data are typically available for review within a few months after annual field seasons have ended. Further, robust investigations of foraging behavior and monk seal health and disease are ongoing. This rich, two-decade plus research data set is essential for evaluating past recovery efforts and designing future measures. A primary focus of the research program has naturally been to discover and, when possible, mitigate natural and anthropogenic threats to the species.

Future proposed interventions

Despite many past efforts and those ongoing, the monk seal's status continues to erode. These efforts have no doubt slowed the species' decline, but it is broadly agreed that more must be done to save the species from further deterioration and ultimately, extinction. Because the primary driver of decline is low juvenile survival, successful interventions must be directed toward the early life stages: pups and juveniles. However, due to the condition of age structures

and vital rates in the NWHI as described above, the number of pups available for intervention is projected to rapidly decline (Figure 4). This realization heightens the sense of urgency to begin interventions before the opportunity to effect meaningful improvement expires.

Many past and current efforts will be continued into the foreseeable future as these measures have clear and direct benefits. These include, but are not limited to, disentangling seals caught in marine debris, removing fishing hooks from seals, large-scale removal of potentially entangling marine debris from beaches and reefs, and mitigating Galapagos shark predation and intra-specific male aggression when needed. Some translocations, already authorized, will continue. For example, within-atoll translocation of weaned pups from high shark predation islets to historically safer islets at French Frigate Shoals is a successful tool for mitigating post-weaning Galapagos shark predation. In the MHI, pups that wean in high human-use areas isolated from other seals may also be translocated to more favorable sites when deemed beneficial. Finally, translocation of adult males is one option authorized for mitigating male seal aggression.

The robust Hawaiian monk seal research effort will continue and expand in the future. This program is focused on four broad areas: population monitoring, foraging ecology, health studies and survival enhancement research. The full details of the research program are beyond the scope of this document, but it is important to recognize that each element of research inquiry is integrated into the goal of species' conservation. Investigations serve to identify threats, characterize underlying factors that influence survival and reproduction, design interventions, and evaluate the success of conservation measures.

Coupled with the research program is an expanding management effort, primarily focused on the MHI. The management program, led by the NMFS Pacific Islands Regional Office entails stranding response, public outreach and education, and legal/regulatory issues.

Another anticipated expansion is in the area of captive care of monk seals. In collaboration with the Marine Mammal Center in Sausalito, NMFS is pursuing expanded capacity for captive care facilities. Care would be provided to seals brought into temporary captivity under the authority of the NMFS Marine Mammal Health and Stranding Response Program. Captive care efforts would be limited to animals deemed in need of medical intervention.

In addition to the foregoing measures, a set of new research and enhancement tools is under consideration to promote recovery of the Hawaiian monk seal. These include:

- Two-stage translocation
- De-worming
- Vaccination research
- Behavioral modification

The proposed two-stage translocation program is the subject of this paper and SCB review, however the other three initiatives will be described briefly.

De-worming is currently being investigated as a means for improving free-ranging juvenile seal survival by temporarily reducing gastrointestinal parasite burden. If this approach is determined to be feasible and effective, it may be used as an enhancement tool.

Vaccination research is meant to address potential disease (*e.g.*, morbillivirus and West Nile Virus) outbreaks that could devastate Hawaiian monk seals. If the safety and efficacy of specific vaccines are established, then these could be used either prophylactically or as a response tool to contain an outbreak.

Behavioral modification research addresses a range of measures primarily intended to prevent or mitigate human-seal interactions. Occasionally seals become socialized to humans in the MHI and because of the dangerous nature of their interactions with people, these seals have typically been translocated from the MHI or brought into permanent captivity. Seals also interact with fishers, sometimes to the detriment of the former (hooking, entanglement, shooting) and the latter (loss of catch, damaged gear). Tools to prevent or alter such behavior will be in greater demand as the MHI monk seal population continues to grow. As the tools and protocols for effective behavior modification are refined, they will become an integral component of monk seal management in the MHI.

Two-stage Translocation

Basic concepts

According to the "IUCN Guidelines for Reintroduction", translocation is defined as "*deliberate and mediated movement of wild individuals or populations from one part of their range to another*" (IUCN 1998). Translocation has proven to be one of several useful tools in the Hawaiian monk seal conservation effort (Baker *et al.* 2011*b*). The NMFS is proposing a novel approach to further apply translocation to enhance the Hawaiian monk seal population. Translocating individuals would have one or more of the following objectives:

1) Increase individual fitness (especially survival).
2) Improve the species status (*e.g.*, abundance, population reproductive value).
3) Maintain meta-population structure for long-term resiliency.

The fundamental concept underlying application of translocation is to address mismatches between local environmental conditions and distribution of seals among subpopulations. For example, some pups wean at subpopulations where they experience high mortality, apparently largely due to insufficient prey resources. Thus, many of these neonates perish, whereas, because of spatial variability among sites, they might have survived elsewhere. This would be tolerable under different conditions. That is, if the monk seal population were large and if mean environmental conditions were more favorable (although still punctuated with periods of unfavorable conditions), the meta-population might achieve a sort of dynamic stability across the entire range. The current situation, however, is not sustainable because the number of monk seals is perilously low and steadily declining. Further, adverse conditions have largely prevailed for a decade or more, and natural dispersal occurs at far too slow a rate to effect a more optimal distribution.

Translocation, then, is a tool that could mitigate population decline by accelerating dispersal of young animals from areas of low survival (referred to as "donor" or "natal" sites) to areas of higher survival (referred to as "recipient" or "nursery" sites). This approach could achieve objectives 1 and 2 above. Nonetheless, if translocations are conducted at an appropriate scale for a sufficient number of years, some potentially negative consequences must be addressed. For example, donor populations may become unacceptably depleted or exhibit skewed sex ratios (as only females will be selected for translocation). Moreover, moving too many seals to recipient sites might result in overcrowding and adversely impact vital rates. For these reasons, some translocation measures will also be taken to achieve objective 3 above.

The proposed two-stage translocation approach is illustrated by the following. The NMFS Pacific Islands Fisheries Science Center (PIFSC) currently holds a permit to translocate weaned pups among NWHI subpopulations to improve their probability of survival. Unfortunately, all the primary NWHI subpopulations are experiencing relatively low juvenile survival (Figure 2) such that the potential efficacy of translocation amongst those subpopulations is uncertain. However, present conditions are favorable in the MHI, suggesting that the greatest positive effects of translocation could be achieved by moving weaned pups from the NWHI to the MHI. While juvenile survival in the NWHI is low, those seals that reach adulthood enjoy survival rates comparable to those in the MHI (Baker and Thompson 2007; Baker *et al.* 2011*b*). Thus, given recent survival rates, the most effective scenario would likely involve moving weaned female pups from NWHI subpopulations to the MHI in order to increase the proportion surviving (first stage of translocation). Subsequently, animals that have achieved adult survival rate levels (*i.e.*, age 2 or 3 yr and older, following Baker and Thompson 2007 and Baker *et al.* 2011*a*) would be returned from the MHI to their natal NWHI subpopulations (second stage translocations). The latter action will serve to rebalance population distribution to avoid excessive depletion of donor subpopulations, ensure the MHI does not become over-populated, and prevent problems associated with male-biased sex ratios at donor sites. Further, should environmental conditions become more favorable in the future, this return translocation would serve to fortify subpopulation age structures, positioning them to exploit improved conditions and achieve positive growth. Without the second stage of the translocation process, donor subpopulations would likely become sufficiently depleted from prolonged low recruitment that population growth would be very slow, even in newly favorable environmental conditions.

It must be emphasized that while the preceding translocation scenario (*i.e.*, NWHI to MHI and return) is suggested by current conditions, future conditions may well dictate other approaches. For example, when juvenile survival is sufficiently high at any NWHI subpopulation, these NWHI subpopulations might be considered for receipt of translocated weaned pups. Likewise, if MHI conditions deteriorate significantly in the future, moving weaned pups from the MHI to the NWHI might be beneficial. Thus, it is critical to underscore that while the underlying translocation strategy is consistent, the particulars will necessarily be adaptive in accordance with prevailing monk seal demographics and environmental conditions. Furthermore, the realized success of translocations is uncertain. Because of the dynamic state of the system and the uncertainty of outcomes, the translocation program would be guided by a complex and adaptive decision framework.

Genetic considerations

Strong genetic population structure can imply local adaptation across a species' range. When planning translocations in such a context, the risk of diluting local adaptation is of critical importance. In contrast, the Hawaiian monk seal's lack of population structure coupled with observed levels of natural movement amongst subpopulations indicate that translocations may be conducted without fear of genetic consequences (Schultz *et al.* 2010).

Decision framework

A host of complex and interacting issues arise from three fundamental features of the proposed translocation program:

1) The program will, by design, occur over a span of several years.
2) Environmental and, perhaps in smaller subpopulations, demographic stochasticity lead to variable and unpredictable monk seal survival rates over time and space.
3) This is a novel recovery strategy the outcomes of which are uncertain, and there is potential for unintended (including undesirable) outcomes.

The remainder of this document focuses on the design, execution, and evaluation of two-stage translocation supported by a decision framework and simulation modeling. The decision framework and modeling reflect an attempt to consider all relevant inputs to inform actions and foresee and minimize the risks of undesirable translocation outcomes.

The critical importance of the accumulated monk seal demographic database and the continued stream of annual monitoring data cannot be over-emphasized. Existing survival and age/sex structure information will be the primary basis for determining when to conduct translocations and between which subpopulations. 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.

The skeleton of the decision framework is depicted in two flow charts, one for each stage of translocation (Figure 5). A narrative follows, which travels through each step in the flow charts. Next, explicit risks of undesirable outcomes are described and components of the decision framework that mitigate those risks are presented.

Translocation of weaned female pups (Figure 5a)

The flow charts in Figure 5 are color-coded to help illustrate the decision-making process. Green boxes represent decision points or actions that progress toward translocation, whereas orange boxes indicate circumstances where translocations are suspended. Yellow boxes represent information inputs that influence decisions. Lastly, red numbers serve as references for orienting the following narrative with the chart.

Step 1 (in Figure 5a) is to evaluate whether there is a "substantial and consistent" difference in juvenile survival between at least two subpopulations. This indeed is the primary motivator for the entire translocation scheme. The two elements of this evaluation, "substantial" and "consistent" require further explication.

The magnitude of the difference in survival suggests a maximum expected benefit that could be conferred by translocation. For example, if survival for a given age class at two hypothetical subpopulations were 0.30 at site *a* and 0.70 at site *b*, then at best we could anticipate a 0.40 (0.70-0.30) improvement in the survival of seals moved from site *a* to *b*. The greater the survival differential, the more compelling the case is for translocation. However, establishing a concrete threshold for when translocation is worth doing is problematic, because we have insufficient experience with this intervention approach to reliably anticipate outcomes. Nevertheless, we require some guidelines to begin with, which will be refined as experience accumulates. The earliest age when translocations might occur is at weaning, and monk seals tend to achieve adult survival rates at approximately age 3 yr. Thus, an appropriate period for comparing survival amongst subpopulations is from weaning to age 3 yr. Initially, we will examine survival for this period among subpopulations but not hold to thresholds, which would be arbitrary if established *a priori*. While it could be argued that any improvement in survival is valuable, no matter how small, potential decrements to survival associated with translocation (see simulation modeling section) might subtract from the expected benefits of being placed in a more favorable environment. For initial trials the survival differential will be sufficiently large to allow the potential for considerable survival decrements to translocated seals without the action causing harm (*i.e.*, improvements should exceed decrements).

The concept that differential survival should be consistent before translocation is warranted arises from the observation that juvenile monk seal survival rates are notoriously variable among sites and from year to year. Previous analysis has shown that there is only weak autocorrelation in first year survival between years, such that poor survival in one year does not provide much predictive power about the next cohort's survival prospects (Baker and Littnan 2008). Not only do survival rates fluctuate, but estimates have associated error, in part because the cohort size at individual sites can be very low. In order to avoid having our translocation decisions constantly chasing last year's rates, we propose evaluating survival differential using the most recent available three years at each site. As with the magnitude threshold, this approach will be refined as information on outcomes is collected.

Thus, in Step 1, using the stochastic simulation model described in subsequent sections, we evaluate whether there is a sufficient differential in survival from weaning to age 3 yr measured over the past three years among subpopulations. If not, then continued monitoring of vital rates (**Step 2**) is prescribed. If yes, then we proceed to **Step 3**.

At **Step 3**, we ask whether the project has been ongoing for at least 2 years. If not, there are not yet any candidates for the return translocations, so we proceed directly to **Step 6**. However, if the project has been conducted for at least 2 years, we evaluate **Step 4**, whether return translocations of 2+ yr-old seals previously moved as weanlings are occurring as planned. Examples of conditions which might result in failure to return seals as planned would be an emerging concern about a pathogen affecting either subpopulation, unanticipated logistical problems or other factors as described below. If seals are not being returned as planned, then weaned pup translocations are suspended (**Step 5**) until whatever is impeding return translocations is resolved. This decision is intended to both avoid overloading a recipient site with immigrants and preventing over-depletion and sex ratio imbalance at donor sites that are not being replenished.

At **Step 6**, the donor and recipient subpopulations are determined. This will typically be a simple matter of selecting the two sites with the lowest and highest survival, respectively. However, there may be cases where more than one site has similarly low or high survival, such that weaned pups could be drawn from or delivered to more than one site. As in Step 1, simulation modeling will be conducted to evaluate expected benefits associated with selecting various combinations of donor and recipient sites. If weaned pups have been translocated to the proposed recipient site in recent years, the survival performance of the former translocatees will inform this decision.

Step 7 is a critical juncture where the number of seals to be translocated is determined. This decision is influenced by numerous factors indicated by the yellow boxes. The *smallest* number indicated by any of these factors should be the *maximum* number considered for translocation. For example, the "number of weaned female pups in healthy condition" at the prospective donor site sets a clear upper bound on the potential number available for translocation. Likewise, logistical constraints (ship deck space, ship availability, funding, etc.) might also limit the number that can be translocated. Further, the number deemed prudent to translocate in any one year may be influenced by societal factors (especially in the MHI). Regardless, when the program is new, it will be prudent to start small with approximately 5 weaned pups, gradually increasing to at most 10 per year in the first several years. Finally, the capacity for the prospective recipient sites(s) to absorb a cadre of additional weaned pups must be considered. This will largely be assessed by evaluating trends in juvenile survival. For example, first year survival post-weaning appears to be sensitive to worsening conditions. Thus, if a trend towards deteriorating survival is observed, this would suggest translocating fewer numbers of new pups. Lastly, social factors (public attitudes) may indicate that receiving sites within the MHI can absorb fewer additional seals than might be concluded on biological grounds alone.

Once the target number is determined, seals will be captured at their natal sites (**Step 8**) and screened for a variety of health parameters including indications of infectious disease (**Step 9**). Health screening protocols evolve with techniques and perceived potential for specific diseases. However, PIFSC has established protocols for health screening translocated weaned pups, which are periodically reviewed and which have been applied as recently as 2009. Seals which do not pass the health screen will either remain at liberty at the natal site or will be brought into captive care if deemed in need of medical attention (**Step 10**). Those that pass the health screen will be transported to their destination, released, and closely monitored (initially with telemetry) (**Step 11**). Past experience has shown that direct release of weaned pups in appropriate habitat (*i.e.*, at sites where other pups have previously been weaned and survived) is a successful strategy (Baker *et al.* 2011*b*).

Translocation of seals age 2 yr and older (Figure 5b)

The second stage of the proposed translocation involves repatriation of seals, previously translocated as weaned pups, which have achieved adult survival rates (2 or 3+ yr-olds). The precise age when young seals achieve adult survival rates is not fixed and may depend on factors such as their body condition at weaning and environmental conditions where they spend their first few years of life. The optimal age for returning seals is therefore not known, but will be informed by experience as the translocation program is conducted. Thus, some previously translocated seals may be returned at age 2 yr, but all would be slated for return by

the time they reach age 3 yr. Figure 5b depicts the flow chart for the return translocation, with color-coding and notation conforming to that in Figure 5a.

Step 1 is reached when translocations have occurred two years or more previously, so that there are potential translocatees available for repatriation. At **Step 2**, we assess whether the survival prospects for 2-yr-olds, 3-yr-olds and adults in the seals' natal region are roughly as high or higher than in the current location. The reasoning here is that while juvenile survival varies greatly among subpopulations, adult rates tend to be more similar and less variable. For example, although juvenile survival is currently much lower in the NWHI than in the MHI (Figure 2), adult survival in the NWHI is comparable or just slightly lower than that in the MHI (Baker *et al.* 2011*a*). Thus, the two-stage translocation effectively protects subjects from the high mortality they would have otherwise experienced as juveniles in their natal regions, and returns them at an age when they will likely experience relatively high survival. The two translocations, then, confer a net benefit on translocatees even if they experience slightly lower survival as adults when repatriated in their natal regions. The expected magnitude of this net benefit will be assessed using simulation modeling as described in subsequent sections.

Alternatively, if adult survival at the natal region is considerably lower, then return translocations would be suspended (**Step 3**) and additional weaned pup translocations from the donor population in question would also cease (see Figure 5a, **Step 5**). It is conceivable that in rare cases other factors might provide a compelling incentive for translocating 2+ yr old seals even if adult survival at the natal site is sub-optimal. For example, addressing an imbalanced sex ratio or some other deficit might influence the disposition of these young female seals. If adult survival at the natal region remains comparable to, or higher than, the current location, we proceed down the path to return previous translocatees to their natal region (**Step 4**). The number of age 2+ yr-olds to potentially return is simply determined as the number of surviving previously translocated weaned pups (**Step 5**). Based upon the body condition of individual seals and taking into account survival of any seals previously translocated at age 2 yr and prevailing survival rates at the natal area, some 2-yr-olds may be returned. Again, all seals age 3 yr and older would be slated for return.

The next important decision is to confirm that returning seals to the site of origin is indeed appropriate and prudent at the present time (**Step 6**). This deliberation is influenced by multiple factors (yellow boxes). For example, if seals have been returned in previous years, the survival performance of those earlier returnees will be considered before additional seals are repatriated. More broadly, the capacity of the natal region to absorb returnees will be assessed as indicated by survival rates of all ages at the site, as well as current abundance relative to historical levels. Disease risk is another consideration. If a known disease is present at the natal subpopulation, but is absent from the seals' current location, then it would not be appropriate to expose returnees and thus risk their survival. If it is deemed inadvisable to return seals to the preferred (natal) location, then an alternate nearby location may be chosen, so long as that location is deemed prudent according to the above criteria. Finally, male-biased sex ratios have led to male aggression-related mortality in the past, and interventions to adjust sex ratio have successfully lowered this threat (Johanos *et al.* 2010). Thus, there may be cases where returning seals to a site, not necessarily their birth location, could be used to ameliorate male-biased sex ratios. If no appropriate release location is identified, then return translocations of 2+ yr-olds will be suspended (**Step 3**).

Once the release location(s) have been confirmed, the subject seals will be brought into captivity (**Step 7**, *in situ* pens/cages in the NWHI; permanent captive facilities in the MHI). At this point, the seals will be health screened as described above and also held in quarantine for a prescribed period; likely approximately two weeks, depending upon veterinary protocols to be developed (**Step 8**). The primary purpose of quarantine is to confirm absence of active disease and minimize the chance of transmitting a disease into a return site where that disease may be absent. The quarantine period may be shortened when moving animals between subpopulations where disease surveillance indicates that the prevalence of exposure to a suite of pathogens is equivalent. Quarantine is expected to be most important when moving seals from the MHI to the NWHI, as some diseases may occur in the former region but not the latter because of the presence of feral and domesticated animals in the MHI.

Seals which fail to pass the health screen or quarantine will be released at the capture site or brought into captive care if appropriate (**Step 9**). Otherwise, they will be transported, released and closely monitored (initially with telemetry) (**Step 10**).

Minimizing risk of undesirable outcomes

A variety of risks are inherent in any intervention in wild populations, including the proposed two-stage translocation. Risk minimization will be achieved through program design, intensive monitoring and evaluation, and the adaptive decision framework described above. Below, we address how the risk of an extensive list of conceivable potential ill effects will be minimized.

Table E-1. Risks and concerns that may affect the outcome and evaluation of two-stage translocations in Hawaiian monk seals.

Issue	**Risk or Concern**	**Mitigating Factors**
Condition of weaned pups (*e.g.*, axillary girth), is positively related to survival prospects.	Selection of weaned pups for translocation may not be representative (i.e only viable, healthy pups will be selected), so that project evaluation may be difficult.	Small, but otherwise healthy pups will not be excluded from translocation. Only non-viable, emaciated or wounded animals will be avoided. Post-hoc analysis will control for condition of both translocated and non-translocated pups.
Depletion of donor subpopulations.	If weaned pups are continuously taken from a site, abundance may fall to an unacceptably low level, with the potential that: i) Seals no longer play a "functional" role in the system. ii) Competitors may occupy the monk seal niche and inhibit population re-establishment. iii) "Empty" environment	Depletion should only be short-term and moderate because 2+ yr-olds will be returned to the donor population. This, in fact, should increase rather than deplete the donor population after return translocations commence. Moreover, should intra-specific competition lessen at the donor site, juvenile survival should consequently increase. This will reduce the survival differential between sites and automatically regulate further weaned pup translocations.

	could be a wasted opportunity for growth if intra-specific competition is low.	
Development of male-biased sex ratios	Removal of female pups will eventually manifest in male-biased sex ratios, leading to increased male aggression toward adult females and juveniles.	Weaned female pups will be returned to natal sites prior to sexual maturity. Presumably they will have enjoyed higher survival than (non-translocated) males. Ultimately, the two-stage translocation should result in some female bias for effected cohorts. If in fact the translocated females fare poorer than their male counterparts or cannot be repatriated for any reason, weaned pup translocations would be suspended as described in the decision framework. This could result in male bias for a few affected cohorts, but this would be a small portion of the total population.
Capacity of recipient site to absorb immigrants.	Overshooting carrying capacity could lead to a crash of the recipient population.	Recipient site demographics will be closely monitored, especially for declining juvenile survival. If this is observed, the differential survival between donor and recipient sites decreases, so that translocations slow or cease, thus correcting the problem.
Translocated seal survival	Weaned pups taken from their natal sites may not fare as well as natives at the recipient site. Returned 2+ yr-old returnees may not survive as well as those who have survived from birth at their natal site.	Past experience (Baker *et al.* 2011*b*) has shown that recently weaned pups are amenable to translocation and have survival rates indistinguishable from pups born at release sites. Sites where pups have been weaned and survived will be selected as release locations for weaned translocation pups. Experience translocating juvenile seals is limited. Repatriates to their natal regions may have both disadvantages and advantages relative those that have grown up there. Two or three-year-old seals may experience greater effect of capture stress than has been the case with weaned pups. Returnees may be disadvantaged by having to learn to forage in a new area, which may have less prey availability than where they grew up. However, because returnees

		spent their first 2 or 3 years in more favorable habitat, their body condition should be better than non-translocated seals in their natal region, thus providing a survival advantage. In both cases (weaned pups and returnees), survival will be monitored and translocation plans appropriately adapted as described in the decision framework.
Infectious disease	Translocating seals may result in spreading disease faster than would occur naturally.	Health screening of all translocated seals, coupled with appropriate quarantine of returnees will minimize risk of transporting infectious agents. Moreover, disease surveillance will be ongoing throughout the species range to detect emerging disease outbreaks. At present, there does not appear to be strong differences in exposure throughout the range, perhaps with the exception of some diseases (leptospirosis, toxoplasmosis) more prevalent in the MHI than the NWHI.

Simulations to evaluate benefits from two-stage translocations

Model Design

The monk seal stochastic simulation model was used to compare and evaluate the expected outcomes from a representative set of translocation scenarios. Details of the model structure and mechanics are provided in Harting (2002) and only the fundamental features are described here.[2] At its core, the model is a mechanistic, stochastic, metapopulation model with provisions for handling uncertainties in input parameters and modeled processes. The model is heavily data driven, capitalizing on the demographic and life history data collected over more than two decades in the NWHI and, more recently, the incipient demographic data set for the MHI. Necker and Nihoa Islands (NWHI) are relatively data poor and have historically comprised a small portion of total abundance, and are therefore not included in simulations. The model provides multiple options for simulating natural perturbations (survival catastrophes, birth catastrophes, shark predation, and aggressive male interactions) and management interventions (captive rearing/release, translocations, shark removals, and other). It produces a diverse array of outputs suitable for evaluating simulation outcomes including abundance, realized growth rate, multiple demographic descriptors, and assorted metrics specific to whatever intervention

[2] Additional details about the simulation model are also provided in Appendix M of this PEIS

scenario was executed. The primary output is site-specific, with summary diagnostics for the entire system and the two main regions (NWHI and MHI).

For the purposes of this analysis, certain model components were disabled, including the option for density dependent adjustment of demographic rates. While that feature of the model is certainly important when performing long-term projections, the precise manner in which density dependence operates on the monk seal population is unknown and its influence can overwhelm and obscure the effects of all other factors included in the simulation scenario.

For the NWHI, age-specific survival rates used for model input were derived from fitting the Siler survivorship curve to observed rates from the most recent three data years. Separate curves were fit for each of the 6 sites. For the simulations, parameter uncertainty was handled by random sampling Siler parameters from the variance/covariance matrix from the parameter fitting. Age-specific reproductive rates were estimated from pooling pupping data from 1990 to the present using methods described in Harting *et al*. (2007). As with survival rates, parameter uncertainty was handled by randomly sampling a unique set of correlated parameters from the fitted distributions. In the model, survival and reproduction are determined stochastically for each individual in the population by binomial sampling (testing a uniform random number in the range [0,1] against the age-specific survival rate). Migration is also determined stochastically for each individual according to the fitted movement rate for each age class. Each simulation was initialized with the most recent starting age/sex distribution for each NWHI site.

As compared to the NWHI, data from which to estimate vital rates and population composition are much more limited for the MHI. A detailed description of the methods used to fit both survival and reproductive rates for the MHI are provided in Baker *et al.* (2011*a*). Where data were lacking (*e.g.*, reproductive rates of older MHI females), some inference and extrapolation was necessary based on patterns observed in the NWHI. Uncertainty in parameter estimates was handled in the same manner as for the NWHI, with unique parameters drawn from their fitted distributions at the start of each simulation.

Translocation Scenarios

As described in the decision framework section of this document, the specific translocation scenario to be undertaken in a given year will be determined according to the most recent data available for each subpopulation. Results from preceding translocation efforts, logistics to accomplish the translocation and other considerations will also enter into the decision-making calculus. In a given year, the optimal translocation scenario might involve any combination of single or multiple donor and nursery sites. Further, the number of seals collected and translocated to each site will vary. It is not our intent to present and evaluate the full complement of translocation scenarios that might be undertaken, but rather to present a small set of representative scenarios that illustrate the salient aspects of this intervention strategy and highlight some of the variables and uncertainties that influence the expected outcome. In practice, prior to initiating an action, additional simulations and ancillary analyses will be undertaken to inform NMFS about the relative benefits that might accrue from various translocation scenarios in a given year.

We present results from nine scenarios. These include one "baseline" scenario that involves no translocation and which serves as the basis of comparison for the other scenarios. This scenario

is indicative of what would be expected if current vital rates remain applicable for the duration of the 10-year model projection, and no major perturbations or interventions alter the population trajectory.

The remaining simulations are divided into two sets of four simulations each: one set of cross-region translocations (from French Frigate Shoals (FFS) to MHI), and another set of within-NWHI translocations (FFS to Laysan Island (LAY)). These sites were selected primarily based on the current survival differential of the species' main breeding sites as estimated from the most recent (2010) data. Considering only the NWHI, FFS has consistently had the poorest juvenile survival of any site (l_3 = 0.137), while LAY currently has had much better juvenile survival rates (l_3 = 0.331), although, as with other NWHI sites, LAY has historically demonstrated considerable inter-annual variability (Figure 2). In contrast to all NWHI sites, the MHI has demonstrated the best juvenile survival of any breeding site (l_3 = 0.641).

For all scenarios, we simulated the collection of 10 female pups annually for 5 years at FFS and subsequent release at the nursery site (MHI or LAY). Although the model allows for mortality while in transport, for these simulations there was no deduction for captive mortality and the number of seals released was the same as the number collected. This is consistent with the very low levels of translocation mortality reported by Baker et al. (2011*b*). In actual translocations to the MHI, the specific island and release site will be chosen on the basis of past suitability for native pup survival as well as other (social) considerations. However, for purposes of estimating demographic rates, there is no distinction among sites in the MHI and hence the MHI release site was treated generically for the translocation simulations.

Once released, the translocated pups are presumed to merge with the native-born seals, but the model has provisions for a first-year survival decrement of translocatees as compared to the native born seals at the release site. The concept underlying this survival decrement is based primarily on data supporting a positive relationship between weaning girth and first year survival, although the shape of that relationship varies over time and space (Baker 2008). Weaned pups in the MHI exhibit higher survival than in the NWHI and also MHI pups wean in far better condition on average than in the NWHI. Therefore, if we were to translocate NWHI weaned pups to the MHI, we would not necessarily expect them to enjoy the average survival rate of native pups, but rather the survival rate of *similarly-sized* pups in the MHI, as predicted by the fitted relationship between size (girth) and survival in the MHI. The average girth of 70 weaned pups born at FFS during 2007-2009 was 103.7 cm. Pups in the MHI with this girth would have an expected survival rate of 0.69. The overall survival rate of pups born in the MHI is 0.77, so that the expected decrement for FFS pups translocated to the MHI would be 0.69/0.77 = 0.90. This value was used for the survival decrement in certain translocation scenarios. To encompass the full range of possibilities, additional scenarios were run using no survival decrement for the first year after release at the nursery site. In a review of a variety of past translocation experiences, Baker *et al.* (2011*b*), found that translocated weaned pups enjoyed survival rates indistinguishable from native born seals in the same area.

For all simulation years subsequent to the first year after release, translocated seals shared the same survival rate as native-born seals with survival determined stochastically as described above. However, the model maintains separate "accounting" for the translocated seals so that the number of seals stochastically surviving to each age is tracked.

The model provides the option to return seals to their natal site at a specified age. For all of the simulated translocations described herein, seals were returned at age 3 yr. While some seals may in fact be returned at age 2 yr, for illustration purposes it is helpful to simulate returns at a single age. Additionally, for assessing the largest effects of two-stage translocation, it is informative to simulate the case in which all seals would be returned at age 3 yr. This scenario has the greatest lasting effect on the natal population and the greatest transient effect on the nursery population abundance. At this stage of the simulations, another survival decrement can be optionally applied to represent differential success relative to non-translocated seals left on site. As with the previous nursery site survival decrement, the return decrement applies only to the first year after release. The appropriate magnitude for this decrement is uncertain, but multiple factors might act to steer this adjustment in opposing directions. Returning seals will initially be unfamiliar with the new environment and it might take some time for them to orient to prime foraging and haulout areas. The available prey may also differ between the two areas. Returning seals may have less experience with sharks and competitors, especially if they grew up in the MHI. Finally, because there has been little experience translocating seals of this age, there may be some increased mortality due to stress of captivity. In contrast to the preceding negative considerations, and in accordance with the intent of the translocation to place seals in a more favorable environment, returning seals may be larger and healthier than seals that developed on site. This factor would positively affect survival of these seals.

Due to uncertainty regarding the relative roles that each of these factors might play in the survival prospects of returning seals, the simulations allowed for two different return decrements: no decrement (*i.e.*, same survival as native born seals), and a 29% decrement (multiplier of 0.71) relative to native seals. The latter decrement was derived from observations of the survival of seals collected at FFS for captive care treatment and later released at Kure Atoll or Midway Atoll. While those seals had a survival rate of 71% as compared to native seals, that reduction may be more severe than is expected in the current case. The captive care seals had no foraging experience prior to release, and were age 1 yr (rather than age 3 yr) when released. Nonetheless, we believe that the two values we used (100% and 71% of native survival) are reasonable estimates to bracket the range of plausible decrements that could be expected.

Combining the two values for each of the two survival decrements, and allowing for the two different geographic scenarios (FFS to MHI, and FFS to LAY), gives a total of 8 translocation scenarios plus the single baseline (no translocation) scenario (Table 2).

Table 2. Simulation scenarios to evaluate expected outcomes from two-stage monk seal translocations. All scenarios involved 10 seals translocated per year for 5 consecutive years, with all survivors returned to their natal site at age 3 yr. Populations were initialized at current age/sex status and projected forward 10 years.

Survival multipliers 1st year after release*		Locations (natal site to nursery site)	
Nursery (recipient) site	**Natal (source) site**	**FFS to MHI**	**FFS to LAY**
1.0	1.0	Scenario 1a	Scenario 2a
0.90	1.0	Scenario 1b	Scenario 2b
1.0	0.71	Scenario 1c	Scenario 2c
0.90	0.71	Scenario 1d	Scenario 2d

* Values in each cell are multiplied by operative rate for like age-class seals at the release site to provide an adjusted survival rate applicable to the treated seals.

Metrics for evaluation

It is important that a proper metric, or set of metrics, be identified to evaluate the outcomes from the translocation simulations. In the long term, critical metrics include total population abundance, metapopulation structure and extinction risk. These measures clearly depend on a wide range of factors (many of which are represented in the model along with their associated uncertainties), which collectively account for the substantial variability in outcomes characteristic of long-range projections. Although conducting long-range projections, and perhaps full population viability analysis (PVA), is vitally important in the strategic design of monk seal recovery, it is not our intent to undertake such an analysis here. Rather, we are primarily interested in near-term projections and metrics that are most useful for revealing the influence of the proposed translocations, and which minimize the confounding influence of other factors (density dependence, environmental stochasticity, etc.) that might mask the directs effects of the translocations.

Among the obvious metrics for assessing results from the simulations is raw population abundance or realized growth rate from the first to final years of the simulations. While these values are certainly informative, we believe that they can be misleading because they fail to address one of the salient limitations in the NWHI subpopulations, that of a depauperate age structure. As described in the background section, the protracted period of low juvenile survival has led to an ageing breeding population and dwindling cohort sizes. Barring a natural improvement in juvenile survival, or an intervention that addresses the same, that pattern is expected to continue for the foreseeable future.
Within that context, it is appropriate that the simulations be evaluated according to some metric associated with population age structure. *Reproductive value* (v_x), and the related *population reproductive value* (V_{pop}), provide informative measures for this purpose. Age-specific reproductive value (Eqn. 1) reflects the probable future reproductive output of an individual female now of age x in terms of newborn equivalents.

This value is given by:

$$v_x = \frac{\lambda^x}{l_x} \sum_{i=x}^{\max} \frac{\phi_i}{\lambda^i} \qquad (1)$$

where □ is the intrinsic growth rate, l_x is the survivorship to age x, and □$_x$ is the age-specific net maternity function ($l_x m_x$).

Reproductive value is a particularly useful descriptor for comparing the relative demographic contributions expected from individuals of different ages. It incorporates information on both the likelihood of survival to each reproductive age, as well as the expected reproductive output of an individual of age x and all future ages. It is less useful for comparing across lifetables (that is, among different populations) since it is scaled in terms of newborns for the unique lifetable applicable to that particular site. For monk seal populations, v_x attains a maximum at around age 5-7, but varies in maximum value from over 7 newborn equivalents (FFS) to under 3 newborn equivalents (MHI) (Figure 6). The difference between these two sites is largely attributable to the fact that at FFS, newborn pups stand a poor chance of reaching the age of reproductive maturity, whereas the prospects for pups born at the MHI are relatively high.

Whereas v_x is a property of the lifetable and does not reference the current population state, *population reproductive value* (V_{pop}) extends the concept by incorporating information on the current population size and age/sex composition. This parameter is the sum of the age-specific reproductive values for all of the females currently in the population:

$$V_{pop} = \sum_{x=0}^{\max} v_x n_x \qquad (2)$$

where v_x is the age-specific reproductive value of an individual of age x, and n_x is the number of individuals of age x currently in the population. One can think of V_{pop} as analogous to the quantity of potential energy stored in the population, which is likely to translate into future pup production. This metric is particularly *apropos* for our purposes because we do not believe that any single intervention, including translocations, will be capable of effecting a major improvement in total population abundance. We do believe, however, that by targeting our interventions on age-structure adjustments, we can fortify the population so that it is capable of a rapid response should environmental conditions more conducive to population growth eventually arise.

Using these two demographic measures as our primary metrics, what we hope to achieve through translocation is to increase the number of females in those age classes having the highest v_x. In aggregate, those additional females will act to increase V_{pop}. This concept is best illustrated graphically (Figure 7). Here we see the resulting age structure from a hypothetical translocation scenario, as compared to the baseline, no-translocation projection. The increase in number of females aged 5-9 yr corresponds to the age classes with the highest v_x at FFS (dotted line and right y-axis). By taking those seals to a more favorable nursery site, they will effectively circumvent the intense survival bottleneck affecting non-translocated seals left on-site.

Simulation Results

Effects of the translocations at the nursery site

Because the translocated seals were returned to their natal site at age 3 yr for the simulations, the effects of the translocations at the nursery site were ephemeral (Figure 8a). As expected, final abundance at the nursery site was the same with or without the translocations, but the mean population trajectory was elevated while the project was underway (years 1-8) as compared to the baseline trajectory. This observation holds true for all 8 translocation scenarios. This pattern of no net effect is based on the assumption that the addition of a small number of seals at the nursery site (maximum of 30 at any time, age pup through age 2) will not result in density-dependent reductions in survival at the nursery site. Further, the imported seals were "removed" prior to attaining reproductive maturity and therefore produced no pups at the nursery site. Because the translocations elicited no net change at the nursery site, the remainder of this review will focus on effects at the natal site.

Effects of the translocations at the natal site

For all scenarios, the natal population (FFS) was initialized at the current (2010) population size of 194 seals. The mean abundance declined under all simulation scenarios, including both the baseline (Bsl) and all translocation scenarios. In the no-translocation scenario (Bsl Figure 9), the abundance dropped to 93 seals at the end of the 10-year projection (52% decline). The projected decline is largely driven by loss of senescent seals and a declining cohort size from fewer breeding females. Although the benefits derived from translocations were not sufficient to fully compensate for the population decline forecast for this site, the final abundance with translocation ranged from 96 to 112 seals, depending on which site was used as the nursery (MHI or LAY) and which set of survival decrements was applied. The highest abundance (112 seals) was achieved when the seals were taken to the MHI and no survival decrements were applied.

When viewed in terms of their effects on *population reproductive value* (V_{pop}), returns from the simulated translocations were more impressive. However, as with final abundance, none of the translocations were sufficient to offset the expected decline from all other factors (Figure 10). Initially (year 1) the FFS population has V_{pop} of approximately 360 newborns (this value varies each simulation due to random age assignments of seals having unknown ages, such as those first identified as adults). Under the no-translocation scenario (Bsl), the V_{pop} is expected to decline to less than 165 newborn equivalents. In contrast, under the various translocation scenarios, V_{pop} ranged from 181 to 263 newborn equivalents. As with final abundance, the greatest returns were achieved through the MHI translocation scenarios (T1a to T1d in Figures 9-11), but even the least favorable translocation scenario (T2d; LAY with both survival decrements) produced a 10% improvement in V_{pop} as compared to the baseline scenario.

Yet another way to view the returns from the translocations is by inspecting the proportional change in V_{pop} from year 1 to year 10 of the scenarios (Figure 11). With no intervention, in 10 years the FFS subpopulation is expected to have only about 45% of the reproductive potential of the initial population. Under the most favorable translocation scenario (T1a), approximately

73% of V_{pop} is preserved, with the remaining translocation scenarios yielding between 50% and 70%.

Interpretation of Simulation Results

It is evident from the simulations that FFS is likely to undergo a significant decline in both abundance and reproductive capacity with or without focused intervention. The best that can be achieved through translocation is to moderate the decline and reinforce the population so that it has enough resilience to capitalize on improved conditions should they occur, and to initiate a slow natural recovery which might be bolstered by additional interventions. The simulations described above are all focused on a single subpopulation, FFS, which currently has the poorest juvenile survival and lowest intrinsic growth rate of any breeding site. The general pattern described for FFS, along with the expected benefits from translocation, are applicable to all of the NWHI subpopulations. The magnitude of the benefit conferred through translocation will vary according to the current status of the subpopulation and the survival differential between whichever natal and nursery site are selected for treatment, as based on the decision framework presented above.

The specifics of the 8 simulation scenarios we described were chosen to illustrate the range of benefit that might be realized from two-stage translocation. Although the specifics of these scenarios were hypothetical, it is worth considering which among them we believe to be the most realistic. For the FFS to MHI translocations (T1a – T1d in Figures 9-11), there is a reasonable expectation that the first survival decrement (0.90 multiplier for the first year after release) will apply due to the smaller size and inferior condition of FFS pups relative to MHI pups. The post-return decrement is less certain; it is likely that the 0.71 survival multiplier is overly severe, as it was based on a set of captive care seals released at age 1 yr and having no prior foraging experience. These observations lead us to conclude that the actual benefit from translocation to the MHI would be intermediate between scenarios T1b and T1d.

We can apply the same logic to the LAY translocations (T2a to T2d in Figures 9-11). First, the initial decrement is likely to be less than the 0.90 multiplier because seals born at FFS and LAY are more similar in size and condition than are seals born at FFS and MHI (as used to calculate the 0.90 decrement). Therefore the actual multiplier is expected to be less severe than that prescribed by the 0.90 value used for the MHI. Similarly, because the seals will be returned to habitat that is similar to that in which they developed (*e.g.,* in terms of predators and competitors), the returning decrement could arguably be less severe than that for seals transferred from the MHI to FFS. It is reasonable to expect that *some* decrement will be incurred as the seals orient to the new area, so that the correct value for the second multiplier will lie between 0.71 and 1.0 but probably on the higher end of that range. This logic leads us to conclude that the most realistic scenario is a composite of scenarios T2a, T2b and T2c.

There is another very important consideration with regard to the FFS to LAY translocations and which may be applicable to any within-NWHI translocation scenario. In contrast to the MHI, each of the NWHI subpopulations is currently declining. Consequently, it is questionable whether any of these sites could accommodate additional seals without causing further depression in survival rates. Further, substantial inter-annual variability in vital rates in the NWHI may make it difficult to identify which combination of sites might reliably produce a

positive outcome in a given year. This same variability could also make it difficult to discern whether any downturn in demographic performance was related to translocation efforts or attributable to normal stochastic variation. There are, however, clear advantages to within-NWHI translocations. Confining the interventions to the NWHI circumvents potential problems with human-seal interactions and public resistance to importing, even if only temporarily, additional seals. Disease and quarantine concerns might also be less intense in the context of exclusively within-NWHI translocations.

Addressing uncertainty in post-return decrements to survival

The simulated benefits of two-stage translocations are strongly influenced by the magnitude of decrements applied to survival of translocated seals after each translocation stage. The decrement values used for the simulations were extrapolated from the best available data and are a reasonable expected range based on existing information. There has been considerable experience translocating weaned pups (Baker et al., 2011*b*) and much analysis of the relationship between weaning girth and survival (Baker 2008), so that the expected range of survival decrements applied to translocated weaned pups is well supported. However, there is much greater uncertainty associated with the decrement applied to 3-yr-old seals returned to their natal subpopulations. Given this uncertainty, it is informative to consider how large a survival penalty translocated seals could incur before their survival matched, or was inferior to, that of non-translocated seals at the natal site. This threshold decrement value can be estimated from observed survival rates for seals at the natal and nursery sites (Table 3).

Table 3. Age-specific survival rates for recent years at FFS, LAY and MHI. The rates in the first column represent survival from weaning to Age 1.

	Weaning to 1 yr	**1 yr to 2 yr**	**2 yr to 3 yr**	**3 yr to 4 yr**
FFS	0.359	0.567	0.941	0.895
LAY	0.681	0.537	0.917	0.938
MHI	0.841	0.859	0.910	0.891

In the above simulations, FFS served as the donor site and MHI or LAY served as the nursery sites. Seals were returned seals to their natal site at age 3 yr, at which point a survival decrement was applied for the first year after return (from age 3 to 4 yr). Therefore the value of greatest interest for evaluating translocation is survivorship from weaning to age 4, designated as l_4* (the asterisk serves to distinguishes this parameter from the customary l_4 which measures survival from birth to age 4), which is the product of the age-specific survival rates in Table 3):

$$l_4^* = p_0 * p_1 * p_2 * p_3 \qquad (3)$$

where p_0 is the survival rate from weaning to age 1 and p_1-p_3 s are age-specific survival rates for the respective ages. Substituting the survival rates for ages 0-3 yr at FFS (Table 3) into Equation 3 gives $l_4^* = 0.171$. Accordingly the objective of the translocations is to improve on that rate such that the translocated seals do better than those "control" seals left at the natal site.

The operative survival schedule for the translocated seals is a composite of the survival rates for ages 0-2 yr at the nursery site, and age 3 yr at the return site. Additionally, we have incorporated two survival decrements that apply, respectively, to age 0 yr (weaning, when the seals are first released at the nursery site) and age 3 yr (after they are returned). The operative survival schedule for the translocated seals is then:

$$l_4^* = (p_0 * d_1) * p_1 * p_2 * (p_3 * d_2) \qquad (4)$$

where p_0, p_1, and p_2 are the survival rates for weaning through 2 yr at the nursery site; p_3 is the survival of age 3 yr seals at the return site; d_1 is the survival decrement for pups during the first year after release, and d_2 is the survival decrement at the return site for the first year after release.

The most severe d_1 survival decrement used for the simulations was 0.90, derived from examining the survival of MHI pups of comparable girth to average FFS pups. However, because the difference in weaning girths among the NWHI subpopulations is far less than the difference between NWHI and MHI pups, a d_1 value of 0.90 may be overly severe for translocations between NWHI subpopulations. Yet, to determine survival decrement thresholds, we can conservatively set d_1 to a fixed constant = 0.90, leaving only decrement d_2 as an unknown:

$$0.171 = (p_0 * 0.90) * p_1 * p_2 * (p_3 * d_2) \qquad (5)$$

where 0.171 is the aforementioned l_4^* for FFS-born, non-translocated seals. This equation serves as the basis for calculating the threshold return decrement, d_2, that demarcates a net benefit from net harm associated with two-stage translocation.

For FFS to MHI translocations, substituting MHI survival rates for p_0 through p_2, and the FFS rate for p_3 in Equation 5 gives:

$$0.171 = (.841 * 0.90) * 0.859 * 0.910 * (0.895 * d_2) \qquad (6)$$

Solving for d_2 gives a return decrement value of 0.324. This means that, given recent survival rates at FFS and MHI, seals translocated from FFS to MHI as pups and returned at age 3 yr would do better than non-translocated seals if their realized survival for the first year after return is at least 32% that of non-translocated seals.

For FFS to LAY translocations, substituting LAY survival rates for p_0 through p_2, and the FFS rate for p_3 gives:

$$0.171 = (.681 * 0.90) * 0.537 * 0.917 * (0.895 * d_2) \qquad \text{(Eq. 7)}$$

Solving for d_2 gives a return decrement value of 0.635. This means that, given recent survival rates at FFS and LAY, seals translocated from FFS to LAY as pups and returned at age 3 yr would do better than non-translocated seals if their realized survival for the first year after return is at least 63% that of non-translocated seals.

The preceding calculations of expected survival decrement thresholds are point estimates which do not account for high inter-annual variability which characterized monk seal survival, or the demographic stochasticity associated with small sample sizes (reflected in Fig. 9-11).

Nonetheless, these estimates suggest that there is a sizable safety buffer for MHI translocations and a marginal safety buffer for within-NWHI translocations even if the lowest value used in the above simulations (0.71) was overly optimistic. The actual degradation in survival could be more severe than assumed and the translocated seals are still likely to perform better than seals left at their natal site.

The intent of two-stage translocation is not to merely "break even" but rather to confer enough benefits on the managed subpopulation to warrant the effort, expense and risk involved. Whether or not a particular translocation plan is advisable must still be determined according to the expected benefits (abundance, V_{pop}, and other metrics) likely to accrue from implementing that plan. However, the threshold values provide a valuable reference for maintaining a standard of "doing no harm" with the proposed program.

Under two-stage translocation, the earliest data about the actual return survival decrement would likely not be available until the fourth year of the project, when the survival of the first group of 3-yr-old seals returned to their natal sites would be evaluated. Some information could be available in the third year if some 2-yr-olds are returned. Relevant information could, however, be collected by initiating some limited experimental translocation of juvenile seals. The experiment may first involve moving a small number of seals (at least age 2 yr) among areas of the NWHI where foraging conditions or success are thought to be comparable. This would help evaluate the potential combined effects of translocation on this age-class, without the confounding influence of a marked change in habitat quality. Subsequently, older juveniles might then be moved from an area with relatively low competition and predator densities (e.g., the MHI at present) to areas with greater competition and higher predator densities (NWHI). This would provide information about how older juveniles respond to being released in unfamiliar environments with more challenging conditions relative to where they grew up.

Conclusion

The two-stage translocation strategy described and analyzed above is but one tool in a suite of interventions now planned or proposed to promote monk seal conservation. Unfortunately, none of these interventions, whether undertaken singly or in concert, are sufficient to fully compensate for the projected decline in the species. Although we know of no direct precedents for two-stage translocation, and there are many unknowns that accompany its implementation, we think that this approach will be indispensable to the overall recovery effort.

Two-stage translocation is a novel strategy that should produce not merely an ephemeral boost in abundance, but, more importantly, will preserve essential reproductive potential within the population. This intervention will be flexible and adaptable, with the specific form it assumes each year informed by the most recent data on demographic performance at each site. This flexibility will allow demographic issues throughout the system to be addressed, whereas some prior interventions have focused on specific mortality factors at individual sites. Those interventions are vitally important to the welfare of specific subpopulations, but they lack the scope to insulate the population from further system level decline and perhaps extinction.

The decision framework represents how the translocation program is expected to be conducted. Similarly, the simulations provide the best assessment of the returns that could be achieved through translocation. Once the program is underway, both the model inputs and details of the

decision framework will be iteratively refined to reflect new observations from incoming data. Accordingly, we intend to embark on this project with the utmost caution, initially as a small-scale experiment to refine the protocols, evaluate the early results, and modify and scale up the program as appropriate.

The need to identify beneficial interventions does not end with translocation, as the NMFS will continue to identify other creative strategies to arrest the population decline. But such a solution has proven elusive, and given the current trends, it would be imprudent to defer decisive action while the quest for that ultimate remedy goes forward. It is our hope that the need for translocations, along with the need for all other intrusive measures, will eventually yield to natural processes, as the trajectory of the monk seal population begins its ascent to a sustained and full recovery. In the interim, it is incumbent on NMFS to take the steps necessary to ensure that the population is not indifferent to any improvement in natural conditions, but retains the capacity to respond accordingly.

References

Antonelis GA, Baker JD, Johanos TC, Braun RC, Harting AL (2006) Hawaiian monk seal (*Monachus schauinslandi*): status and conservation issues. Atoll Research Bulletin 543:75-101.

Baker JD, Johanos TJ (2004) Abundance of the Hawaiian monk seal in the main Hawaiian Islands. Biological Conservation 116:103-110.

Baker JD, Thompson PM (2007) Temporal and spatial variation in age-specific survival rates of a long-lived mammal, the Hawaiian monk seal. Proceedings of the Royal Society B 274:407-415.

Baker JD, Polovina JJ, Howell EA (2007) Apparent link between survival of juvenile Hawaiian monk seals and ocean productivity. Marine Ecology Progress Series 346:277-283.

Baker JD (2008) Variation in the relationship between offspring size and survival provides insight into causes of mortality in Hawaiian monk seals. Endangered Species Research 5:55-64.

Baker JD, Littnan CL (2008) Report of the Hawaiian Monk Seal Captive Care Workshop, Honolulu, Hawaii, June 11–13, 2007. Pacific Islands Fish. Sci. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96822-2396. Pacific Islands Fish. Sci. Cent. Admin. Rep. H-08-02, 42 p.

Baker, J.D., Harting, A.L., Wurth, T.A., Johanos, T.C. (2011*a*). Dramatic shifts in Hawaiian monk seal distribution predicted from divergent regional trends. Marine Mammal Science 27:78–93.

Baker, J.D., Becker, B.L., Wurth, T.A., Johanos, T.C., Littnan, C.L., & Henderson , J.R. (2011*b*) Translocation as a tool for conservation of the Hawaiian monk seal. Biological Conservation 144: 2692-2701.

Baker, J.D., Harting, A.L., Littnan, C.L. (2013). Two-stage translocation strategy for improving juvenile survival of Hawaiian monk seals. Endangered Species Research. 21: 33–44.

Harting AL (2002) Stochastic simulation model for the Hawaiian monk seal. PhD thesis, Montana State University, Bozeman, MT.

Harting AL, Baker JD, Johanos TC (2007) Reproductive patterns of the Hawaiian monk seal. Marine Mammal Science 23:553-573.

IUCN (1998) Guidelines for re-introductions. Prepared by the IUCN/SSC Re-introduction Specialist Group. IUCN (http://www.iucnsscrsg.org/).

Johanos TC, Becker BL, Baker JD, Ragen TJ, Gilmartin WG, Gerrodette T (2010) Impacts of sex ratio reduction on male aggression in the critically endangered Hawaiian monk seal *Monachus schauinslandi.* Endangered Species Research 11:123–132.

Polovina JJ, Chai F, Howell EA, Kobayashi DR, Shi L, Chao Y (2008) Ecosystem dynamics at a productivity gradient: A study of the lower trophic dynamics around the northern atolls in the Hawaiian Archipelago. Progress in Oceanography 77:217-224.

Parrish FA, Marshall GJ, Buhleier B, Antonelis GA (2008) Foraging interaction between monk seals and large predatory fish in the Northwestern Hawaiian Islands. Endangered Species Research 4: 299-308.

Schultz JK, Baker JD, Toonen RJ, Bowen BW (2009) Extremely low genetic diversity in the endangered Hawaiian monk seal (*Monachus schauinslandi*). Journal of Heredity 100:25–33.

Schultz JS, Baker JD, Toonen RJ, Harting AL, Bowen BW (2010) Range-wide genetic connectivity of the Hawaiian monk seal and implications for translocation. Conservation Biology.

Figure 1. The Hawaiian Archipelago and Johnston Atoll

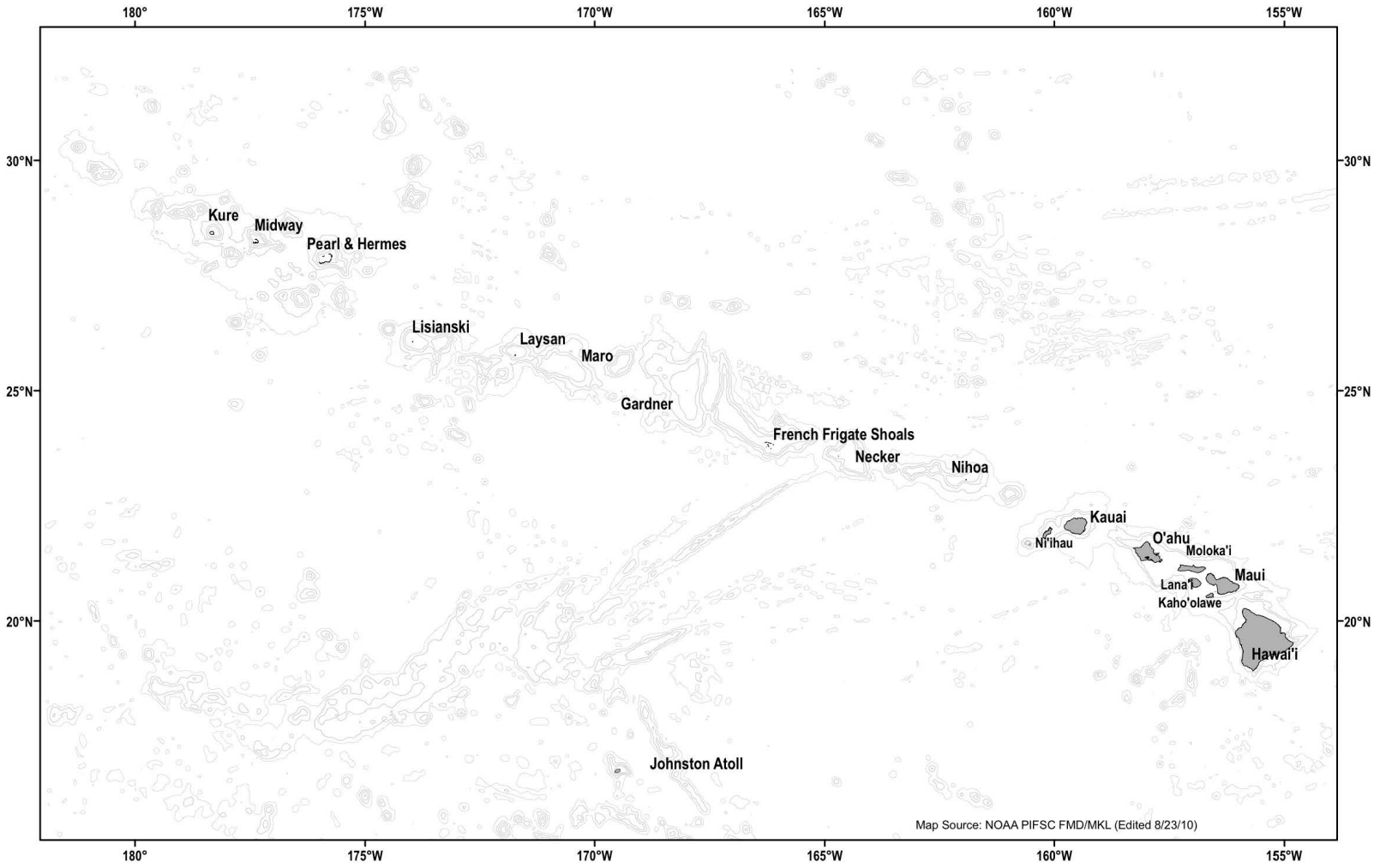


Figure 2. Cumulative survival probability curves (l_x) for the six Northwestern Hawaiian Islands subpopulations (solid lines), based upon recent (2006-2008) rates, and all available data in the main Hawaiian Islands (dashed lines). From Baker *et al.* (2011*a*).

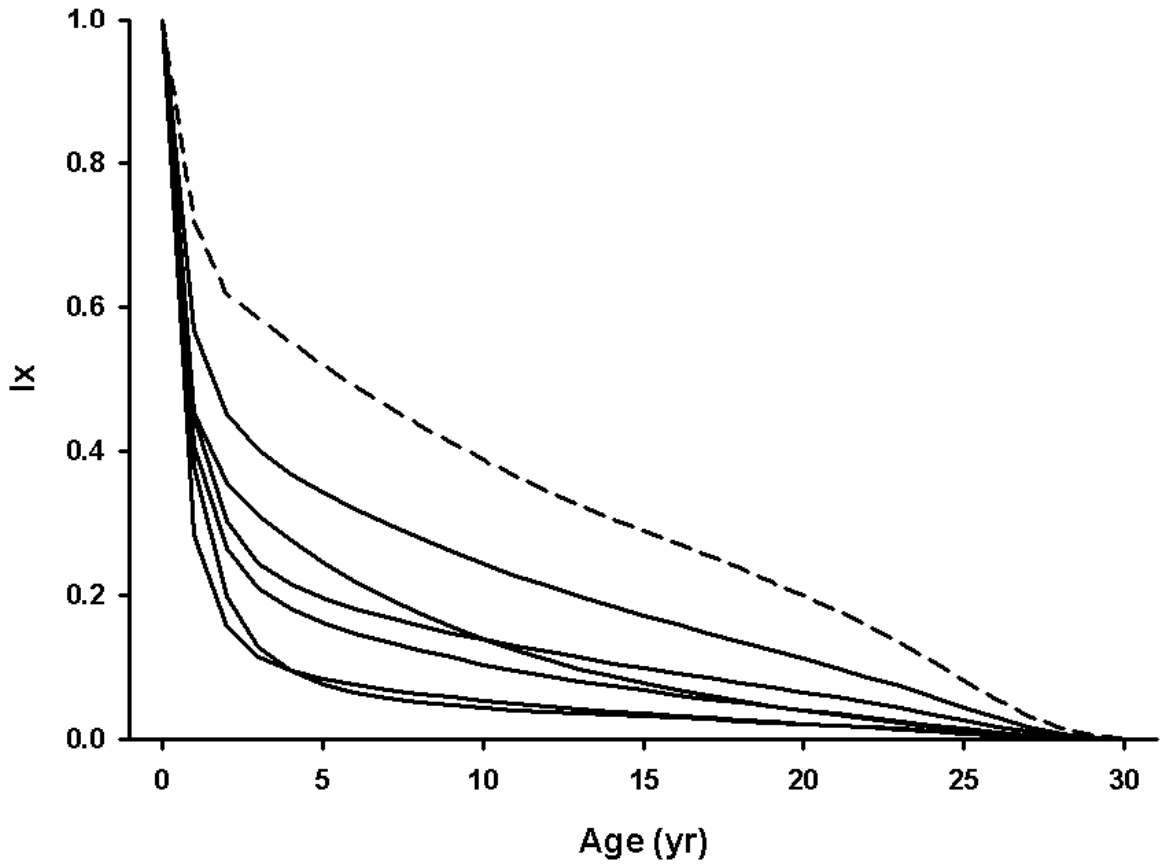


Figure 3. Fitted age-specific reproductive curves for three subpopulations of Hawaiian monk seals (LAY= Laysan Island, FFS=French Frigate Shoals, LIS=Lisianski Island).

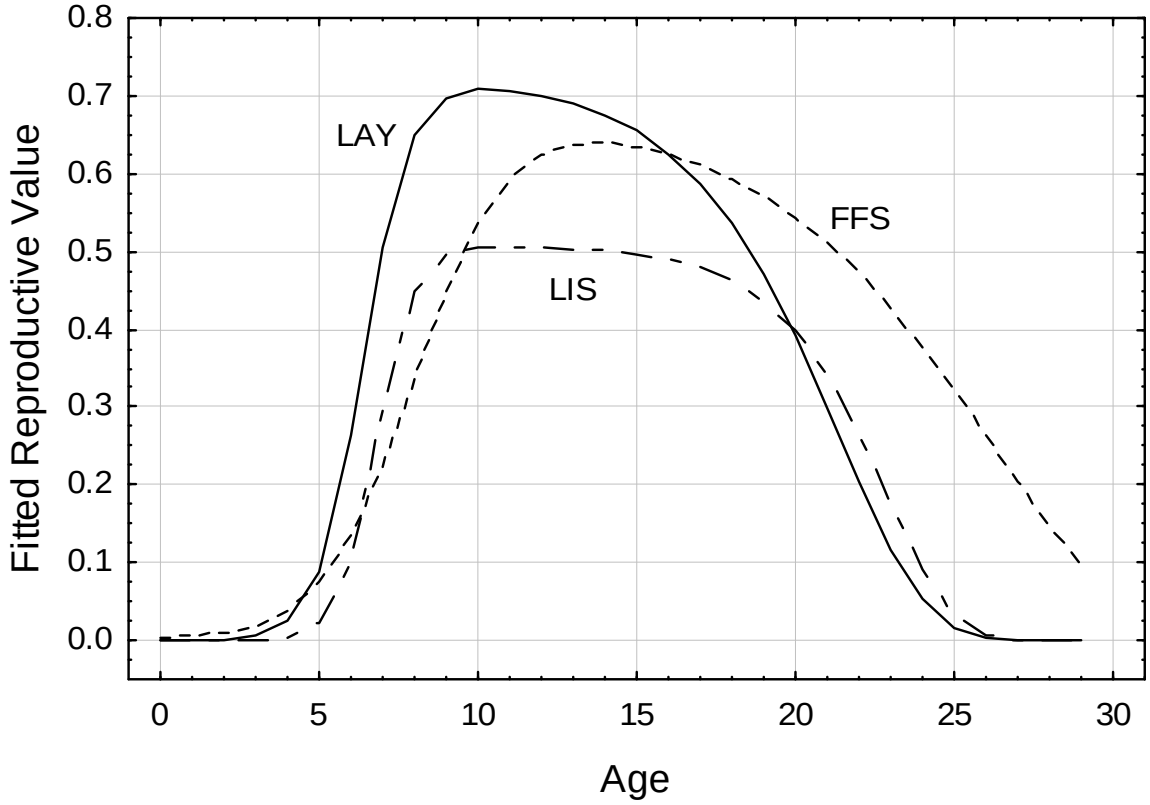


Figure 4. Simulation model projection of future Hawaiian monk seal pup production at six NWHI subpopulations pooled. Values are mean number of pups born in each simulation year in a 20-year projection.

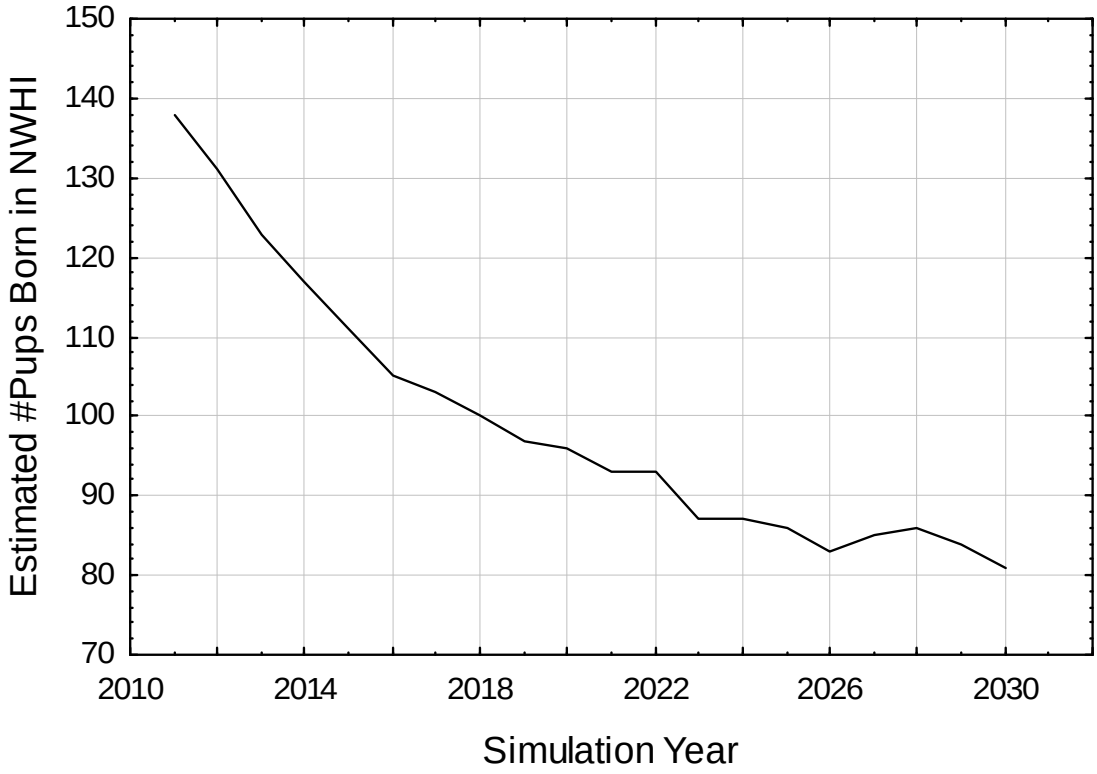


Figure 5a. Flow chart depicting decision framework for translocation of weaned Hawaiian monk seal pups.

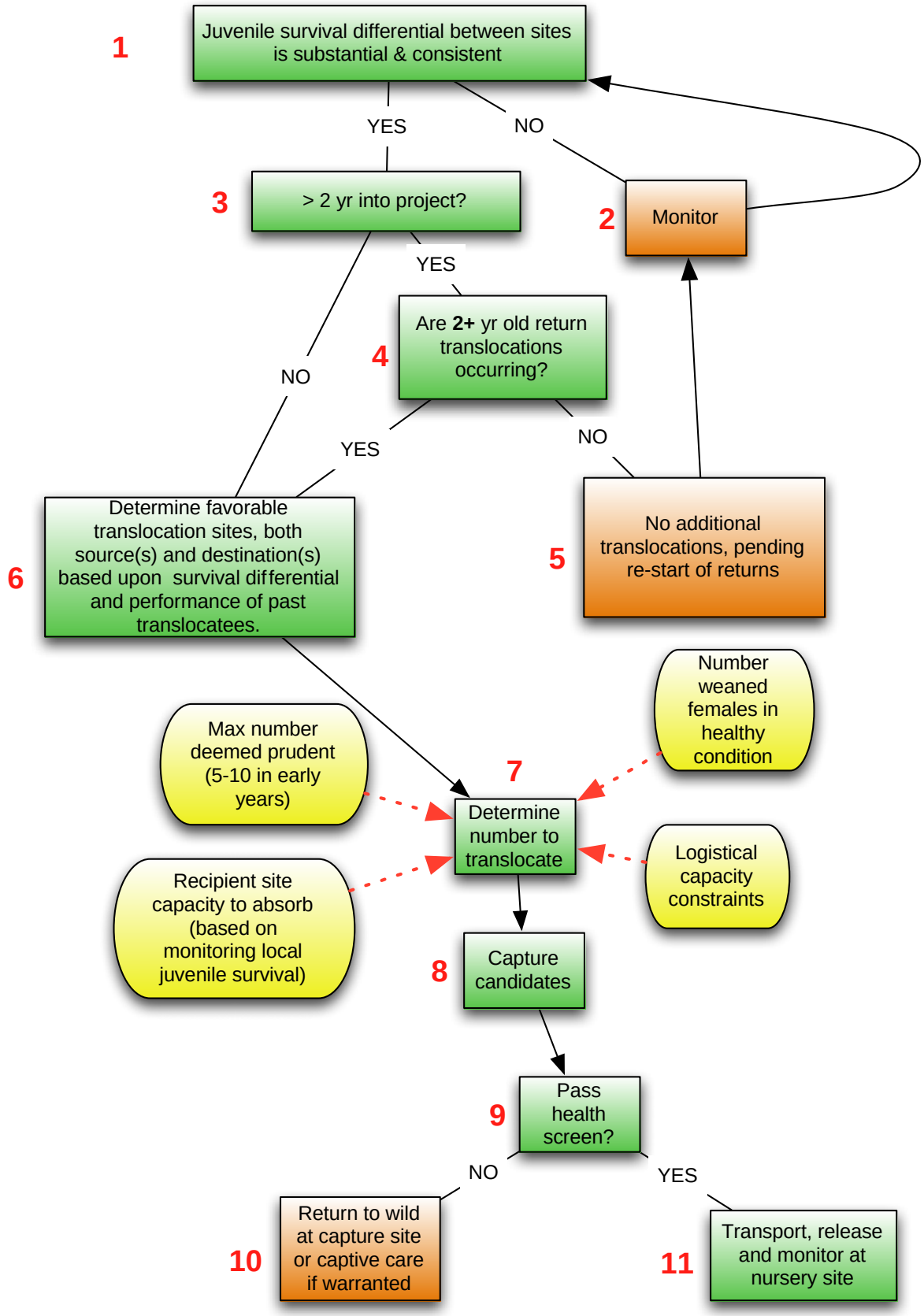


Figure 5b. Flow chart depicting decision framework for translocation of 2+ yr-old Hawaiian monk seals.

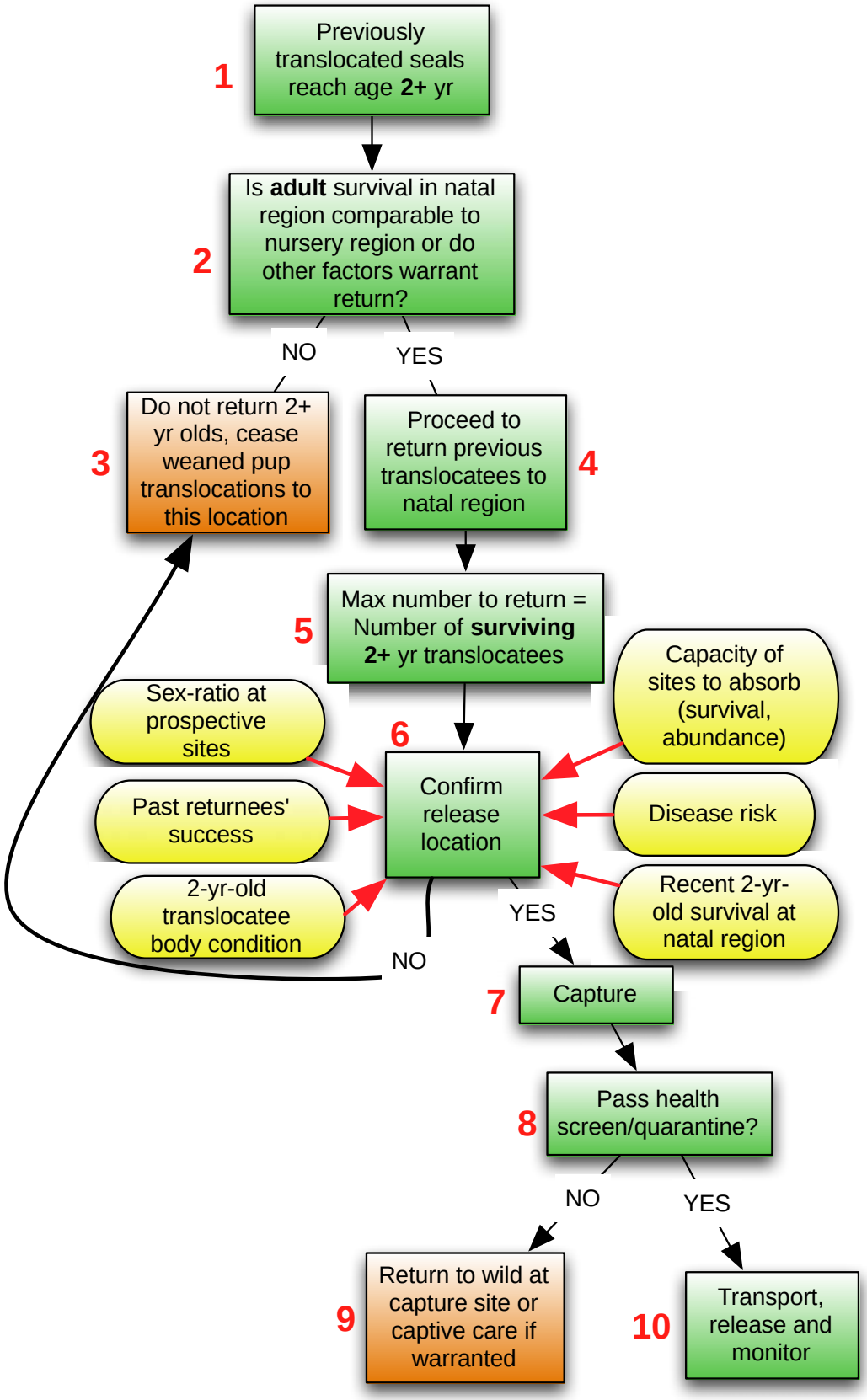


Figure 6. Contrasting age-specific reproductive value curves for French Frigate Shoals and main Hawaiian Islands MHI monk seals.

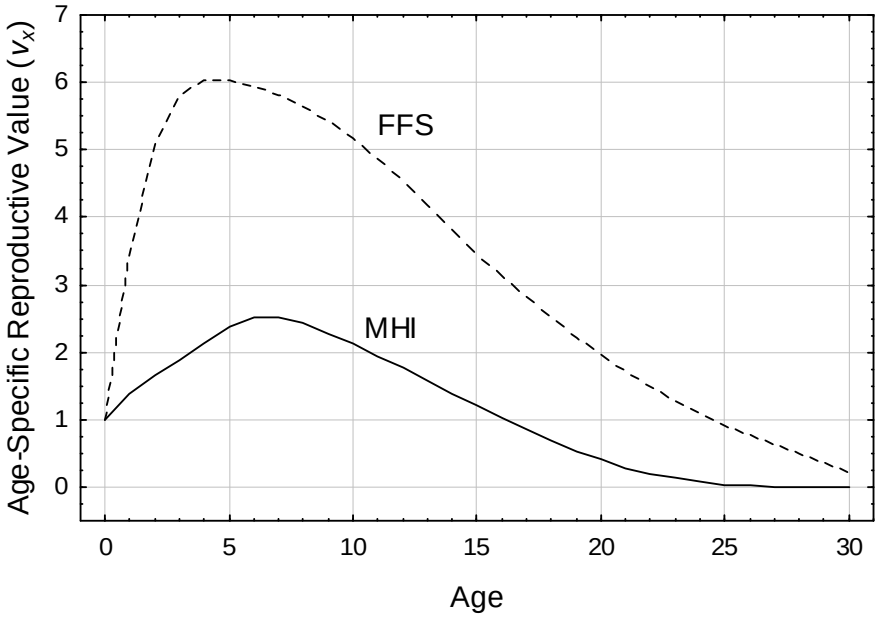


Figure 7. Age structure modification at natal site associated with a representative two- stage translocation. In this hypothetical scenario, translocated seals grow up at a nursery site and are returned to the natal site at age 3, with this treatment repeated for 5 consecutive years.

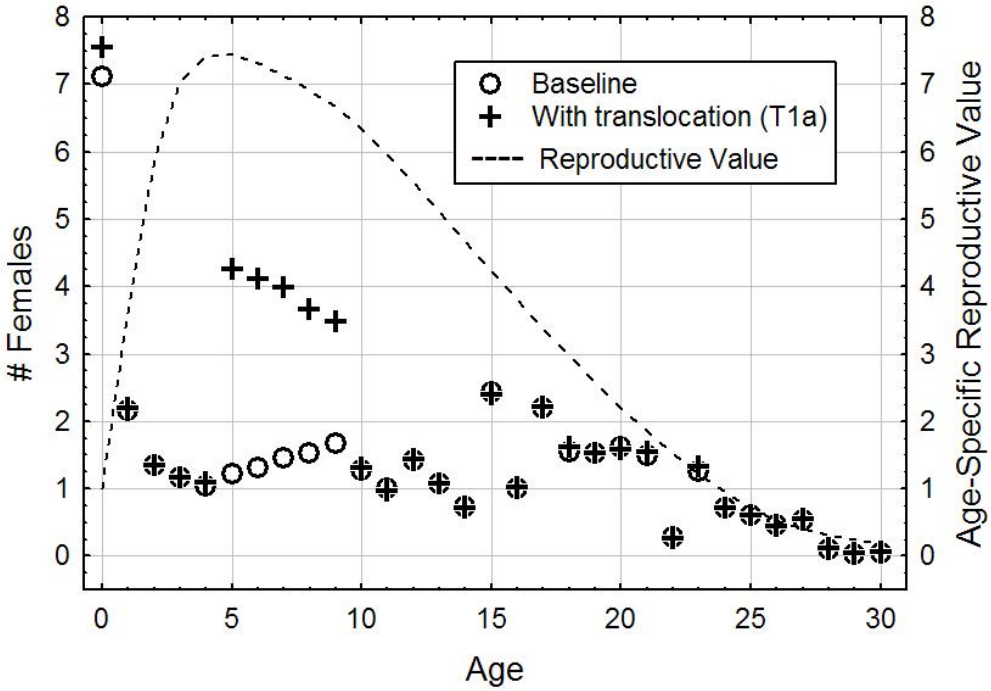
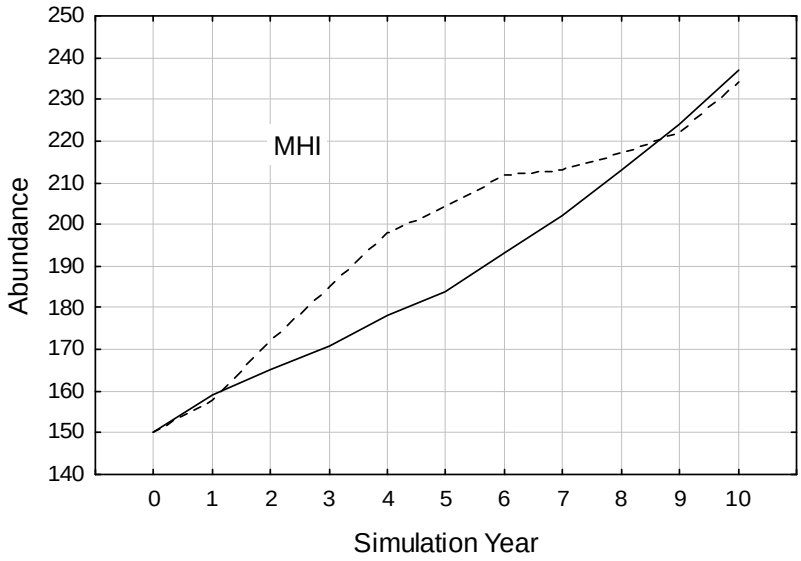


Figure 8. Simulation trajectories at the nursery (MHI) and natal (FFS) sites for a representative translocation scenario. Lines represent mean abundance at each time step, with translocation (dotted line) and without translocation (solid line). The salient difference at the nursery site is an ephemeral elevation in mean abundance during the years the project is underway.

8a. Nursery site (MHI)



8b. Natal site (FFS)

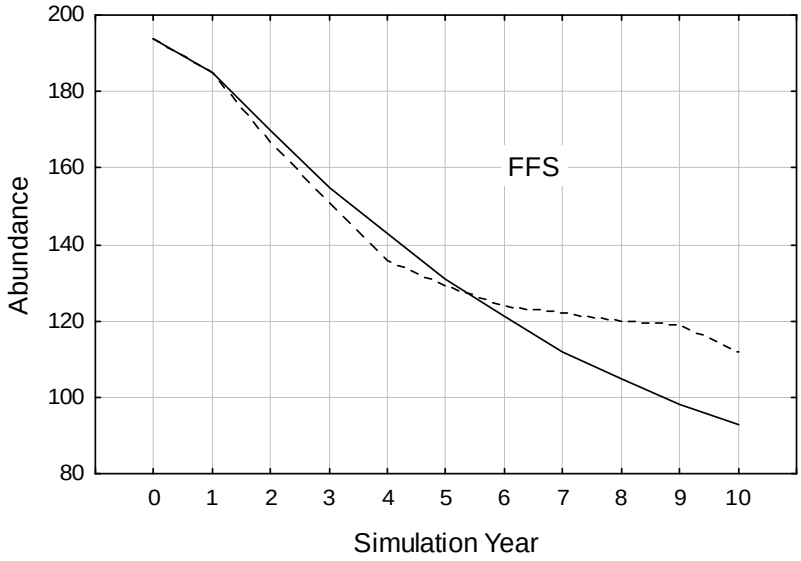


Figure 9. Mean abundance (with 5% and 95% tails) at the natal site (FFS) for the baseline (Bsl) and 8 translocation scenarios. Scenarios differ in the nursery location and survival decrements as described in Table 2.

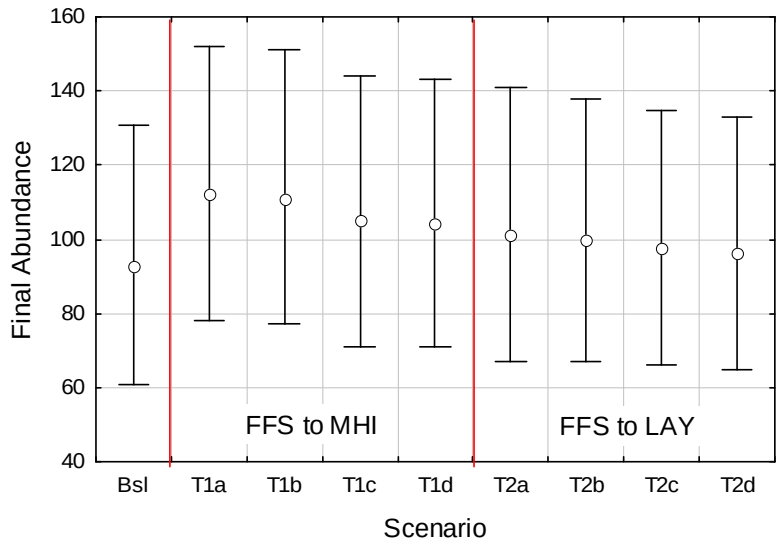


Figure 10. Population reproductive value (V_{pop} with 5% and 95% tails) at the natal site (FFS) for the baseline (Bsl) and 8 translocation scenarios. Scenarios differ in the nursery location and survival decrements as described in Table 2.

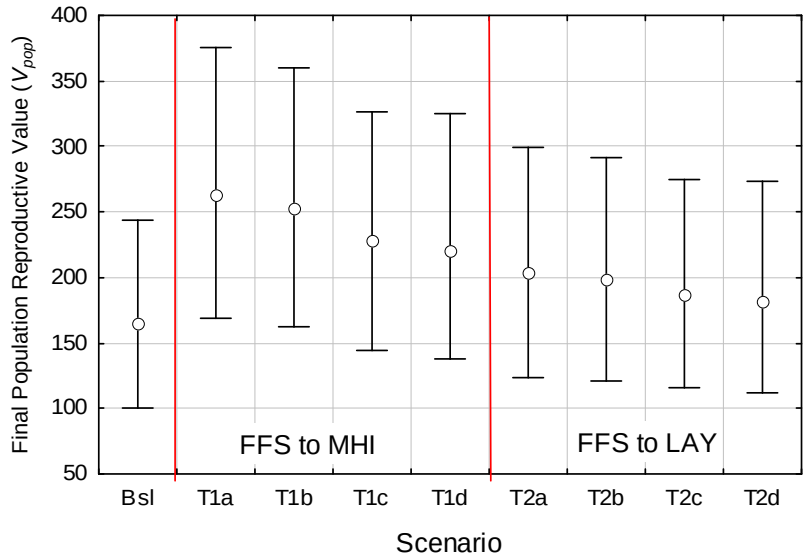
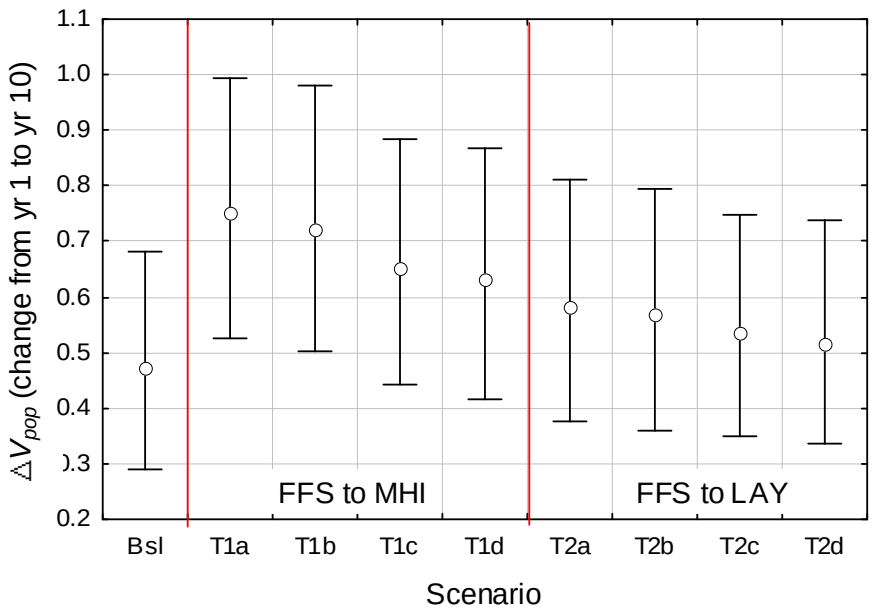


Figure 11. Change in Population Reproductive Value (□ V_{pop}) at FFS from year 1 to year 10 of baseline and translocation simulation scenarios. Scenarios differ in the nursery location and survival decrements as described in Table 2.



Appendix G
Health Screening and Quarantine Protocols for Hawaiian Monk seal Translocation Between Subpopulations

This page intentionally left blank.

HEALTH SCREENING AND QUARANTINE PROTOCOLS FOR HAWAIIAN MONK SEAL TRANSLOCATION BETWEEN SUBPOPULATIONS

These protocols support NMFS' translocation actions. These protocols are intended for any seal translocations between subpopulations (e.g., two-stage translocations or experimental juvenile translocations), as opposed to rapid and short distance translocations (within atolls or within the main Hawaiian Islands, MHI). Separate protocols are included for translocating different age classes of seals and are applicable to any locations in the Hawaiian Archipelago.

These protocols are subject to refinement and change based on experience that will accrue during the next decade, veterinary consultation, emergence of new testing procedures, disease risks, etc. Protocols will be reviewed annually and updated as required to refine protocols and improve implementation.

Weaned Pup Translocations

Steps involved in weaned pup translocations include:

1) Selection and capture of seals, health screening, and attachment of tracking instruments.
2) Recapture and transport to vessel/aircraft.
3) Transport to destination site.
4) Release of seals at new location.
5) Post-release monitoring.

Transport Vessels: A variety of transportation modes will be used including large vessels (NOAA ships, other chartered vessels), airplanes, helicopters, automobiles, and other as appropriate depending on location and available resources.

Specific Protocols:

1) *Selection and capture of seals, health screening and attachment of tracking instruments.* Any weaned pup at the designated source site will be considered a candidate for selection, as long as it exhibits no apparent signs of disease, injury or any other factors that may compromise survival. Relatively recently (i.e., less than a month previous) weaned pups may be favored for selection as they are more likely to remain at the release location longer than those that have weaned earlier (Baker et al. in review). Seals will undergo health screening and a subset will be instrumented with a tracking device approximately 1-4 days prior to transport. Seals will be captured using standard practices (by hand or using a hoop net). Blood may be collected without sedation or seals will be sedated.

Seals will be evaluated using the current standard health screen. This may be modified as deemed necessary due to specific disease concerns in source and recipient subpopulations, up to date testing procedures and veterinary consultation. Current practice includes:

Blood Analysis

1) Field analysis:
    a. WBC count – Unoppette system

b. RBC count – Unoppette system
c. WBC differentials, platelets – Microscope and archive extra unstained smear
d. Hematocrit/ PCV – Microhematocrit centrifuge
e. Hemoglobin
f. Serum chemistry (Na, K, Cl, BUN, Creat, Ca) – I-Stat kit
g. Glucose – Glucometer and test strips
h. BUN - Azostix

2) Lab analysis (frozen 0.5-1.0 mL aliquots of serum, stored in liquid nitrogen dewar in the field)
a. Serum chemistry – send to IDEXX
b. Tier 1 testing, which currently includes: morbillivirus, seal herpes 1, Toxoplasma, and fecal culture.

3) Banked blood samples stored in liquid nitrogen dewar in the field
a. Remaining serum (or at least 4 aliquots)
b. Whole blood (Na heparin and EDTA)
c. EDTA plasma, buffy coat, and RBC
d. Na heparin plasma, buffy coat, and RBC
e. PAX gene blood RNA tube (for biotoxins)

Swab processing:
1) In the field place all swabs in the liquid nitrogen dewar after collection
2) Lab analysis
a. 1 nasal and 1 rectal swab in Avian Influenza transport media (frozen) – send to National Wildlife Health Center in Madison
b. 2 dry swabs from the eyes, nares, mouth, genital orifice, rectum and any external wounds
c. 1 swab of any abnormal tissue in viral transport media (if deemed appropriate)

Blubber Biopsies:
Put in liquid nitrogen dewar in the field
1) 1 for toxicology (Teflon container)
2) 1 for fatty acid analysis (cyrovial)

Other Sampling:
1) Any other sampling deemed necessary by the PI or attending veterinarian.

External Exam
1) Physical Exam
a) Assessment for external wounds
b) Auscultation of lungs, heart

c) Examine eyes, nose, ears etc. (damage, disease, moisture)

2) Morphometrics

a. Girth

b. Length

c. Weight

Samples not analyzed in the field will be stored, shipped, and analyzed as described in the current monk seal permit.

If, based on veterinarian's physical exam and immediately available test results, seals do not show any signs of injury or illness, some may be instrumented with appropriate telemetry equipment to monitor them after release. This device will assist post-release monitoring until the opportunity to visually survey the seals arises.

If seals do show physical signs of injury or illness, the attending veterinarian will determine whether to sedate for full biomedical sampling or to treat the injury or illness. These animals will be covered under the health assessment portion of the PIFSC research and enhancement permit, or under the MMHSRP permit depending on the treatments required.

After this handling, seals will either be released and allowed to freely range until capture for transport or will be held in a shore pen (approximately 1-4 days). Allowing seals to freely move will minimize any stress seals may experience being held in a captive shore pen. Holding in shore pens allows for better assessment of animals health and reduces effort of relocating seals within the atoll. The decision to use pens or allow seals to free-range prior to transport will depend on conditions at the field site, results of physical examination and transport logistics. If seals are allowed to range freely, prior to the second capture the seals will be visually assessed for any outward signs of injury or illness. If the attending veterinarian determines the animal to be unhealthy, either after physical examination and/or evaluation of blood sample, then the animal will not be translocated.

2) Recapture and transport to vessel/aircraft.

Weaned pups will be captured using standard techniques for the transport of weaners. If transport involves a small boat shuttle to a larger ship, animals will be restrained in a stretcher net by two trained seal biologists and placed on the deck inside the small boat. Seals will then be transported directly to the vessel. Water will be available onboard to cool the seal when needed. The number of seals that may be transported at one time in the small boat will be dependent the specific boat's capacity.

There should be adequate area that no seals are piled on top of each other and that there is a reasonable amount of space for researchers to operate to cool and move seals as necessary.

Seals will be taken onto the vessel by lifting the entire small boat by crane up to the mid-ship low railing access on the port side of the vessel (or the safest method depending on the vessel being used). One biologist will remain with the seal during lifting. Seals will

be hand lifted from the small boat onto the vessel and brought to their cages.

The distances between cages will be wide enough to allow biologists to move between, prevent spread of urine and feces between cages, and allow the free flow of air. The cages will be strapped to the deck to prevent sliding if rough seas develop. Seals will be placed on a blue tarp, removed from the stretcher net and lifted manually into the cages. Seals will be held separately. A saltwater hose is located near the cage and ice is available for cooling off seals in the heat of the day. Cage openings will be accessible to allow access to animals if medical care or treatment is needed in transit.

If transport is via automobile to aircraft, similar but more logistically simple procedures will apply. Seals will be captured in the same way. Unless it is not feasible, the seals will be transported in cages (again while being observed and with water for cooling available) in automobiles and likewise aboard aircraft.

3) Transportation to destination site

The transportation of seals between subpopulations could be done via boat, plane, car, or other reasonable mode of transportation. Multiple modes of transport can be used at any time. During all transports, the animals will be escorted by a veterinarian and sufficient staff to be able to respond to an emergency.

Transport via ship:

During transport the deck(s) holding the seals will be off limits to anyone except seal biologist monitoring the animals, the veterinarian and ships safety officers. No physical contact with seals will be made unless a problem arises in which a seal needs to be restrained for examination or treatment (see contingency plan below). If physical contact is made, protocols for handing seals in the wild will be followed as described in the permit application and as written in the Hawaiian monk seal Field Research Manual for safe handling of seals and minimizing risk of disease transmission (e.g., clean coveralls that have been soaked in bleach solution, wash hands, etc). Observers will look for a variety of threats, indications of stress or disease, and ways to mitigate both while observing the animal:

a) Entrapment/entanglement in cage
b) Abnormal discharge from body orifices
c) Abnormal respiration
d) Abnormal behavior
e) Modifying ambient temperatures to prevent overheating
f) Enforce security-preventing disturbance by people on ship
g) Monitor for ship equipment/supplies posing risk to seals.

Seals will be monitored 24 hrs a day while on the ship. Observers will watch for changes in external behavioral/health parameters. Initially upon be loaded onto the boat the seals will be closely observed for signs of acute stress (e.g. continued high respiration and heart rate, agitated behavior, shaking). Descriptive and medical observations will be collected for each individual seal. The

following types of data will be recorded:

a) Observation form to be annotated at the end of each shift with significant findings; summary form to be completed by veterinarian daily.
b) Summary form to be completed at the end of each 2-hour shift
c) Eye exam form - only if eye issue is observed

Veterinary exam sheet will also be filled out by the attending vet prior to release.

4) Release of seals.

The protocols for releasing seals will be dependent on conditions at the selected release site(s).

General Considerations:

- Most releases will be on shore at a beach selected based on suite of criteria including, but not limited to:
    - site where pups have weaned and survived in past
    - ideally where conspecifics of similar age are present or frequent
    - if in MHI, then isolated from human contact
- Immediately after release seals will be monitored on shore for as long as logistically practicable.

If the site is a remote island or beach and landing by small boat is treacherous then this strategy will be considered (this will only be done in rare circumstances):

The vessel will approach the release site and attempt to get as close as possible to minimize distance traveled by small boats. Seals will be removed from their cages and placed on a blue tarp. They will be captured using a stretcher net and brought to the small boat, which will be held by the crane at the portside mid-ship low railing access (or other technique deemed safest and depending on vessel). Seals will be transported on the floor of the small boat and the boat will be lowered into the water for a near-shore release of seals.

The small boat will attempt to get within at least 100 m of shore but closer if conditions allow. This will mean the boat will be in shallow water with emergent land clearly visible for seals to navigate by. Two biologists will lift the seal over the rail of the safe boat, lowered to the surface of the water and one side of the stretcher net dropped allowing the seal to swim away. Safety lines will be tied to the boat side bar of the stretcher net and connected to the SAFE boat. This will keep the stretcher net from sinking and will cause the net to open releasing the seals if it should be dropped. An additional crewmember will be prepared with snorkel gear to help in the water if something needs to be done in the water.

If the site can be accessed by truck or other vehicle the following should be considered:

- Time of transport should be minimized so animals should be moved be

transported during peak traffic times

- Animals will be escorted in the back of the truck by monk seal specialists to monitor the animals' health and welfare during transport
- Water will be available to cool the seal during transport
- A veterinarian and emergency gear will be available should an animal need assistance
- A back up/escort vehicle will be accompany the transport in case a vehicle should breakdown, so the animal(s) can continue to be moved

5) Post Release Monitoring

a. Remote Monitoring

Movement and diving behavior of seals instrumented with tracking devices data will be compared to data concurrently collected from native seals or to pre-existing data on seals of similar age to determine whether translocated seal behavior is within the normal observed range.

b. Resighting

Attempts to resight translocated seals will be made during regular population monitoring effort or intensified observation at the release subpopulation. The level of observation effort will vary largely depending upon the accessibility, logistics and cost of mounting surveys. Subsequently, haulout behavior and survival of translocated versus native seals of the same age will be compared.

Translocation of older seals

The following protocols pertain to the translocation of juvenile or sub-adultHawaiian monk seals (e.g., involved in the second stage of two-stage translocation). Similar protocols will be applied to translocation of aggressive adult male monk seals. Any seal older than 1 yr, which has been identified for translocation for any of the purposes proposed under the PEIS, may be subject to these protocols. Once identified for translocation, subjects will be considered further if they exhibit no apparent signs of disease, injury or any other factors that may compromise survival[1].

Steps involved in translocation of older seals may include some, but not necessarily all, of the following:

1) Selection and capture of seals for health screening and attachment of tracking instruments.
2) Quarantine
3) Transport
4) Release of seals at new location.
5) Post-release monitoring

[1] Aggressive adult male selected for translocation to mitigate harm to other seals may nevertheless be selected even if compromised in some way.

Transport Vessels: Same as for weaned pups

Specific Protocols:

1) Selection and capture of seals for instrumentation and health and disease screening.

Procedures will be as described above for weaned pups with the following exceptions. Older seals will typically be captured with a stretcher or hoop net and transported in cages appropriate to their body size. Because older seals are far more mobile than weaned pups, they will usually be held in shore pens after initial capture until transport to the destination. As with weaned pups, seals which do not pass their health screen will not be translocated. If appropriate, they may be brought in for treatment under the MMHSRP or released on site if deemed appropriate by the attending veterinarian. Further, aggressive adult males deemed inappropriate for translocation may be brought into permanent captivity or euthanized according to the currently existing research and enhancement permit.

2) *Quarantine Period*
When transporting seals from the MHI to the NWHI, a period of quarantine may be necessary to reduce the likelihood of transferring a disease between the two regions. Quarantine holding will be done at a facility, on board a ship or in shore pens depending on the situation and facilities availability. The quarantine period should be long enough for the analysis of biomedical samples or longer than the prepatent period for the demonstration of clinical signs for the diseases of greatest concern. Two weeks is the generally accepted period and this period could include the transport period. Specific quarantine protocols are described in greater detail in a subsequent section.

3) Transportation to release site

Transportation of seals will follow the protocols established for weaned pups.

4) *Release of seals at new location.*

Release of seals will follow the protocols established for weaned pups.

5) Post Release Monitoring

Monitoring will be conducted as described for weaned pups.

Injury/Illness during transport:

If during transport a seal becomes sick or injured it will be cared for in transit by veterinary and husbandry staff, equipped with emergency drugs, antibiotics, intubation equipment, fluids for hydration, and IQF herring if tube feeding is necessary. The compromised seal(s) monitored 24 hours/day until it can be delivered to a captive care facility.

Captive care will be conducted using established protocols refined and developed with recent captive care activities for Hawaiian monk seals and other pinniped under the authority of the MMHSRP permit. Eventual release of the seal will be determined according to standards of the MMHSRP.

Detailed Hawaiian Monk Seal Quarantine Protocol
The following are quarantine protocols that will be followed during the captive holding of Hawaiian monk seals, for example during translocation quarantine periods. Quarantine will typically occur in a captive facility, but these protocols can be adapted for use in a shore pen situation if needed. In such cases, reference to "pools" or "tanks" would apply to separate shore pens.

To date, no infectious disease that can be spread horizontally between seals has been found to cause clinical disease in Hawaiian monk seals. The following protocol takes this into consideration and is designed to reduce the risk of transmission of disease from outside sources to seals under human care. These sources include domestic animals and terrestrial wildlife (both directly and indirectly via fomites). Because humans act as fomites and because habituation of temporarily held monk seals is of paramount concern, every effort should be made to minimize human contact with releasable seals.

I. QUARANTINE

A. QUARANTINE DEFINITION AND OBJECTIVES

1. Quarantine refers to "any isolation or restriction on travel or passage imposed to keep contagious diseases, insect pests, etc. from spreading."
2. Hawaiian monk seals held in captive care must be maintained under strict quarantine at all times. Quarantine measures between individual seals are at veterinary discretion based on health assessment findings.
3. All personnel involved in the feeding, handling, and care of these seals must be properly trained in quarantine procedures by an experienced staff. Quarantine procedures should always be clearly posted.

B. APPROVED DISINFECTING AGENTS

1. Dilute (10%) bleach, accelerated hydrogen peroxide or Nolvasan solution may be used. Practices differ slightly for each type of disinfecting agent and adherence to these practices is crucial to adequate quarantine.
2. The preferred agent is accelerated hydrogen peroxide (brand name: Accel) because it is less toxic than bleach and has a shorter contact time than bleach and Nolvasan.
3. CONTACT TIME is the most important aspect of disinfection. Each agent should be allowed to contact the surface that is being disinfected for the following minimum amounts of time:
    a. Bleach: 10 minutes
    b. Nolvasan: 10 minutes
    c. Accel: 5 minutes

4. When using bleach, either in footbaths or otherwise, it is imperative that organic matter (feces, dirt, etc.) be removed from the surface FIRST. Bleach will not adequately disinfect in the presence of such debris.

C. NMFS QUARANTINE POLICY

Quarantine from Outside Sources

1. All equipment used in the quarantine facility, including feeding, handling, clothing and medical supplies MUST be:
    a. Used exclusively for monk seals
    b. Properly sanitized after each use

2. **NO VISITORS** are allowed in monk seal quarantine area unless previous approval is granted by the permit holder (Charles Littnan) and the on-site supervisor. This approval is granted on a case-by-case basis.

3. Any person working with wild or domestic animals or visiting another animal care facility on the same day must shower and change clothes before and/or after entering the seal enclosures.

4. Gloves should be worn anytime a seal (or biological samples) will be handled. Thoroughly wash hands with soap after handling seals or biological samples.

5. **FOOTWEAR**:
    a. No street shoes are to be worn inside enclosures.
    b. Closed-toe footwear designated for "monk seal quarantine" should be kept at the lower entrance to each enclosure. This footwear should be used in the enclosures at all times and nowhere else. Breathable footwear (such as crocs) is permitted unless the wearer will be in standing water contaminated with biological matter (*i.e.,* feces). Rubber boots should be worn to completely protect the feet from biological matter in these instances, such as during tank cleaning.
    c. Footwear described above should be dipped in a footbath and scrubbed upon entry into and exit from the pool area. A footbath and long handled scrub brush should be kept at the bottom of the steps, inside the gate of each enclosure.

6. **PROTECTIVE CLOTHING:**
    a. Any person that will potentially come in direct contact with seals must wear clothing that is designated for monk seal quarantine use only. This clothing can include coveralls, tee shirts and shorts/pants.
    b. All quarantine clothing should be kept clean and remain at Ford Island in a designated area away from potential sources of contamination. It should never be worn when handling other species or animals outside of Ford Island.
    c. Clothing should also be changed before and after handling any sick individual seals.
    d. Protective clothing worn during procedures should be washed and disinfected at the end of each day.

7. Any new equipment or tools brought into the quarantine area must first be disinfected.

Seal Isolation

These measures should be followed if sick and healthy seals are housed at the same facility concurrently:

1. Use separate cleaning and feeding supplies, footwear and clothing exclusively for the sick seal unless instructed otherwise by the attending veterinarian.

2. Veterinary approval is required for any movements of seals between enclosures or when combining more than one seal in a tank.
3. If a seal requires isolation, follow the Potential Disease Outbreak Protocol.

II. OBSERVATIONS AND CONDUCT AROUND SEALS

A. OBSERVATIONS

1. In the morning and prior to each feed, conduct a thorough inspection of the seals and pens before proceeding with further activity. Following each feed or handling event, monitor the seals' behavior closely. Perform a final inspection before leaving for the day.
2. Throughout the day, use the cameras to observe each seal at least every 60 minutes. Observe and record the condition and activity level of the seal. Record the presence, color, consistency and amount of feces, urine, and spew (and the ID of the seal that produced it, if known). Look for any harmful debris in or around pens.
3. Note anything unusual in a seal's appearance (eye discharge or cloudiness, nasal discharge, bite wounds, etc.) and behavior (lethargic, unresponsive, stereotypic behaviors, etc.). Notify attending veterinarian and animal care manager immediately of any abnormal changes in a seal's health.
4. Succinctly record any observations on the Daily Observation Sheet, including the time and observer's initials. Frequently used acronyms: BAR = bright, alert, and responsive; QAR = quiet, alert, and responsive.

B. CONDUCT AROUND THE SEALS AT ALL TIMES

Every possible effort should be made to minimize the habituation of the seals by reducing human-seal interactions.

1. Do not enter enclosures unless absolutely necessary.
2. When in enclosures, **DO NOT MAKE PHYSICAL CONTACT WITH SEALS** unless necessary for procedures requiring handling. Minimize going into the enclosure and the amount of time you spend in the enclosure as much as possible.
3. Minimize talking and noise when working with or near the seals and the enclosure. Move slowly and avoid startling gestures.
4. Whenever possible, observers should remain as inconspicuous and unobtrusive as possible to observe seals' normal behaviors in captivity and minimize their stress in captivity.
5. Each person entering an enclosure with the seal should be carrying a herding board, which should within arms-reach at all times.
6. Outside of feeding sessions seals may display undesirable behaviors. Record these observations and follow these instructions:
   a. Approaching too closely or too rapidly
      → Use a herding board to keep the seal away
   b. Mouthing hoses, brooms, or boots
      → Discourage this by preventing opportunities for seals to bite at these objects
   c. Stereotypic behaviors (repetitive splashing, slapping at the walls of the enclosure, pattern swimming)
      → These are a sign of boredom and may be reduced by providing seals with approved environmental enrichment devices (EEDs). Objects such as marine debris that the seals may encounter once returned to their natural habitat should not be used as EEDs so that they do

not associate these objects with food or play. A good example of an EED is sinking a milk crate that has fish stuck in the holes or providing some of their daily caloric needs through "fishsicles."

III. CLEANING THE QUARANTINE AREA

A. DISHES

1. Wash all dishes used for feeding and handling with dish soap and water. Scrub the inside of all feeding tubes using a tube brush. Rinse thoroughly.
2. Place all dishes in a dish sanitizer. If a dish sanitizer is not available, the following steps should be followed after step 1, above:
    a. Soak or spray all equipment (bolus syringes, knives, tongs, cutting boards, etc.) with disinfectant according to section I.B. ("Approved Disinfecting Agents") above.
    b. Rinse all dishes thoroughly to remove the disinfectant.
    c. Allow all dishes to air-dry.
    d. Stomach tubes should be washed with soap and water, rinsed thoroughly, and then boiled for 10 minutes.
3. Bolus Syringe Care: after the syringes have been washed and dried as described above, lubricate the O-ring with mineral oil and put the syringes back together for safe storage. Be careful when handling the syringes as they are fragile and can crack easily.

B. DAILY CLEANING AND MAINTENANCE

Seal Enclosure Cleaning

1. Do not allow seals to mouth or bite brooms or hoses.
2. Never allow equipment to remain unattended in an occupied seal enclosure. Return all equipment to its storage area after use.
3. Always keep enclosure gates bolted.
4. When cleaning, take the opportunity to look for vomit, diarrhea and observe the feces for consistency and parasites. Always record observations form in the seal's chart and make special note of any unusual findings.
5. Every morning, inspect the entire pen enclosure for any scat, urine, fish parts, and wind-blown debris. If necessary, use a broom and fresh water hose to clean the seal enclosure. Thoroughly rinse all fish scales, blood, and debris from the decks, walls, and ledge of the enclosure and walkway with the fresh water hose after each feed. Special care should be taken to clean scales from doors, door handles, and bolts.
6. Before leaving in the evening, the deck and pool walls and floor should be hosed down and any spattered blood, scales, scat, or other debris should be scrubbed away.

Footbaths and Walkways

1. Rinse off the walkway and stairs leading to the seal enclosure at least once a day. Scrub the walkway with broom, disinfectant and water as needed.
2. Refill footbaths as needed depending on choice of disinfectant (usually once per 1-2 days for Accel). When using bleach, footbaths should be refilled anytime organic material is present.
3. If using bleach, add 1 cup bleach to 1 gallon of water and be sure to have a final water rinse before the pen entrance.

Fish House Cleaning

1. Freezers and refrigerators must remain clean and neat at all times. All feeders are responsible for maintaining freezer cleanliness on a daily basis. Keep freezers free of ice buildup as much as possible.
2. Wipe down all counter and table surfaces after each feeding. Be especially mindful of cleaning any fish scales and spattered blood from the all surfaces after each feeding.
3. Mop the food prep room floor after the morning feeding.
4. Empty the garbage daily.

C. WEEKLY CLEANING

Seals should be crated/kenneled and weighed once weekly using the forklift. Weekly cleaning can be done during this time. Use a net to scoop the seals out of the water and herding boards to direct them into the holding area. Be sure to keep the seals wet, shaded and monitor their behavior regularly.

Seal Enclosure

The monk seal pools should be drained and the pools, walls, ledges, doors, and stairways cleaned once a week using accelerated hydrogen peroxide disinfectant (preferred) and a large, soft-bristled brush.

1. Drain pool, empty all footbaths.
2. Spray and use disinfectant to scrub all surfaces (pools, walls, ledges, doors, stairways).
    a. If using bleach solution instead of hydrogen peroxide, all organic matter must be rinsed away first and be careful to direct the rinse water toward the drain holes at the corners of the enclosure, away from seals because (bleach is a skin and eye irritant).
3. Allow appropriate amount of contact time for the disinfectant used (see above).
4. Hose off all surfaces, then close drain and turn on the water inflow.
5. Refill footbaths and when pool is full, return seals to enclosure.
6. Thoroughly rinse and put away all cleaning equipment.
7. Record the seals' behavior, the duration spent in the holding area, and any other relevant information from the cleaning event (scat, spew, urine, etc.) on the observations form in each seal's chart.

D. QUARTERLY CLEANING

Every 3 months, and particularly before the rainy season or forecasted heavy rainfall, the shade structure should be rinsed (if removable, it should be removed and scrubbed) to remove dust and debris. Rinse water should not go into an enclosure if it is occupied by a seal – remove the seal as with weekly cleaning procedures. Clean enclosure per weekly cleaning instructions after cleaning the shade structure.

IV. WATER SAMPLING SEAL TANK

Sampling should occur on the same day and time each week at least a couple of days after the weekly enclosure cleaning. Collect one sample from each occupied pool and one from the inflow in addition to a temperature control sample collected from the pool.

These samples are submitted to Hawaii Food & Water Testing Lab (HF&WTL) for total coliform testing.

1. Be as sterile as possible: wear gloves, do not open lid to bottle until immediately before collection, do not contaminate inside of lid or bottle, don't set the lid down, etc.
2. Collect the inflow sample by removing the lid and holding the bottle under the water inflow to fill it. Decant any excess water being careful not to touch the lip of the bottle or the lid.
3. Sample the pool (pool and temp control sample) 180^0 from the water inlet. With the lid still in place, submerge the bottle about 1 foot deep. Unscrew the lid underwater with the bottle positioned counter-current to fill the bottle. Replace the lid underwater. Remove the bottle from the water and decant the excess water being careful not to contaminate the bottle or lid.
4. Immediately place the samples in the small red cooler with blue ice (provided by HF&WTL) for transport to the lab. If transport is not immediate, place the samples in the refrigerator (sampling fridge, not fish storage fridge). Store sample bottles in the cooler and ice pack in freezer until next sampling.
5. Complete all the necessary paperwork and be sure to label each bottle (pool, inflow, temp control).
6. Results submitted on Tuesday are usually faxed to us, c/o Angie Kaufman, on Thursday or Friday. These counts should not exceed 1000 MF/100ml. If fecal coliform counts exceed 1000 MF/100ml, results are reported to Robert Dollar by phone; sampling must be repeated within 24 hours. Promptly notify the veterinary staff if counts are above 1000 MF/100ml.
7. Enter the date, time, coliform count, and any pertinent comments in the HMS Water Testing spreadsheet.

DIRECTIONS TO HF&WTL
2688 B Kilihau St.
Honolulu, HI 96819
Ph: 836-5558
Fax: 836-5509
contact: Wendy

Open Mon.-Friday, 8am-5pm
Located in Mapunapuna near the airport. Go east (towards the airport) on Nimitz Hwy & turn left on Kakoi St then right on Kilihau St (2688B Kilihau St.). It's the 3rd grey building on the left.

V. SEAL ILLNESS/EMERGENCY CARE

1. In case of an emergency or suspected illness, refer to the phone list and call the attending veterinarian or veterinary technician immediately to relate symptoms or circumstances of emergency or illness. Follow the emergency chain-of-command protocol.
2. A veterinarian or trained veterinary staff will perform any needed blood sampling.
3. A crash kit and emergency drugs will be kept at all facilities when seals are present. All other medical supplies for blood sampling, fluid and antibiotic administration, monk seal medications, and additional medical supplies are kept at the Vet Lab Ford Island.

EXAMPLE **Physical Examination Form**
Circle as appropriate

Body outline: Swelling, Wound, Change from previous day
If yes, describe: _____

Flippers: Normal use of all 4 flippers with full-range of motion, Favoring one flipper (describe), Lacerations, Swelling, Ulcers/sores, Signs of pain or discomfort

Discharges: Ears, Nares, Eyes, Umbilicus, Rectum, Vagina, Other
If yes, describe amount:_____ mL, Color:_____,
Consistency:_____

Feces: Describe amount:_____ mL, Color:_____,
Consistency:_____

Urine: Color:_____

Eyes:

Right: Discharge: Clear tears, Crustiness around eyes, Purulent discharge Redness or congestion of conjunctiva, Swelling of conjunctiva, Prominence of third eyelid, Corneal opacity/ cloudiness, Corneal ulcer, Lacerations, Swelling of eyelids, Squinting or photosensitivity, Any obvious loss of vision

Left: Discharge: Clear tears, Crustiness around eyes, Purulent discharge Redness or congestion of conjunctiva, Swelling of conjunctiva, Prominence of third eyelid, Corneal opacity/ cloudiness, Corneal ulcer, Lacerations, Swelling of eyelids, Squinting or photosensitivity, Any obvious loss of vision

Mouth: Color of mucous membranes: Pink, Red, Pale pink/White
Teeth: Broken, Erupting. List site:_____

Behavior: Alert, Bright, Lethargic, Depressed, Active, Inactive, Stereotypic behavior, Disorientation, Vocalizations, Other abnormal behavior for each individual seal, Any marked change from previous days
Describe:_____

Other comments (environmental conditions, respiration rate, heart rate, etc.):

_____
_____
_____
_____
_____
_____

Animal ID: _____ **Date:**_____ **Name of Observer:**_____
Time:_____

Appendix H
Hawaiian Monk Seal Research and Enhancement Proposed Levels of Take for PEIS Alternatives 1, 3, and 4

This page intentionally left blank.

Appendix H, Table 1: Activities Proposed under the Alternative 1, Status Quo.

Table 1. Proposed annual takes of Hawaiian monk seals under the Status Quo Alternative. Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles. Activities would occur under Permit No. 10137 through June 2014, and the same activities are proposed to be permitted beyond 2014 under this alternative.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
1. Monitoring	Any	Both	150	3	Disturbance from visual observation and photo-identification during ground monitoring and vessel and aerial surveys (including unmanned aerial and amphibious vehicles); and from installation and repair of remote video cameras	MHI	Annually at any time of year.
			50	1		Nihoa Is.	
			50	1		Necker Is.	
			250	5		French Frigate Shoals	
			10	1		Gardner Pinnacles	
			250	3		Laysan Is.	
			225	3		Lisianski Is.	
			200	3		Pearl and Hermes Reef	
			100	2		Midway Atoll	
			150	2		Kure Atoll	
			5	1		Johnston Atoll	
2a. Tagging	Any except nursing pups, lactating or obviously pregnant females.	Both	30	3	Restraint, tagging (flipper and PIT), collect flipper plugs, morphometrics (length and girth), whisker sampling (cut)	MHI	Annually at any time of year (predominantly during summer field camps).All of the animals may also be taken by Tasks 1 and 3.Weaned pups in the MHI may also have ultrasound performed concurrent with flipper tagging. At French Frigate Shoals, 35 weaned pups of either sex may have a sonic tag deployed on a third flipper tag (annually over three years).
			25	1		Nihoa Is.	
			15	1		Necker Is.	
			150	3		French Frigate Shoals	
			75	3		Laysan Is.	
			50	3		Lisianski Is.	
			50	3		Pearl and Hermes Reef	
			25	2		Midway Atoll	
			35	2		Kure Atoll	
			1	1		Johnston Atoll	
2b. Retagging	Any except nursing pups, lactating or obviously pregnant females.	Both	100	1	Restraint, retagging (flipper), flipper plugs, morphometrics, whisker sampling (cut)	Hawaiian Archipelago	Annually at any time of year. Seals may have been taken by monitoring (Task 1) and may have been tagged in previous years.

Table 1. Proposed annual takes of Hawaiian monk seals under the Status Quo Alternative. Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles. Activities would occur under Permit No. 10137 through June 2014, and the same activities are proposed to be permitted beyond 2014 under this alternative.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
3. Marking	Any	Both	75	2	Temporary bleach marking	MHI	Annually at any time of year. All of the animals may also be taken by monitoring (Task 1) and tagging (Task 2).
			30	2		Nihoa Is.	
			30	2		Necker Is.	
			250	2		French Frigate Shoals	
			250	2		Laysan Is.	
			225	2		Lisianski Is.	
			200	2		Pearl and Hermes Reef	
			100	2		Midway Atoll	
			150	2		Kure Atoll	
			5	1		Johnston Atoll	
4. Health Screening and Foraging Studies	Any healthy seal excluding lactating females with pups and nursing pups	Both	70	2	Restraint, sedation, tagging, blood sampling, swabs, blubber biopsy, whisker sampling (cut without sedation or pull with sedation), weight, morphometrics, ultrasound, instrumentation	Hawaiian Archipelago	Annually any time of year. Sixty (60) healthy seals may be instrumented. Recaptures for instrument removal and sampling. All animals may have been taken by Tasks 1-3.
	Any unhealthy seal excluding lactating females with pups and nursing pups	Both	30	2	Restraint, sedation, tagging, blood sampling, swabs, blubber biopsy, whisker sampling (cut or pull), morphometrics, ultrasound, treatment (lance and cleanse abscesses), humane euthanasia or incidental mortality of 10 moribund animals	Hawaiian Archipelago	Annually at any time of year. Includes humane euthanasia of up to 10 moribund or severely injured seals at discretion of veterinarian authorized over a five-year period. All animals may have been taken by Tasks 1-3.

Table 1. Proposed annual takes of Hawaiian monk seals under the Status Quo Alternative. Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles. Activities would occur under Permit No. 10137 through June 2014, and the same activities are proposed to be permitted beyond 2014 under this alternative.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
5. Intestinal Parasite Treatment	Pups ≥ 120 days post-weaning and juveniles up to age 3	Both	200	4	Restraint, weight, morphometrics, ultrasound, fecal collection (voided feces, fecal loop, or digital extraction), whisker sampling (cut), anti-helmintic treatment	Hawaiian Archipelago	Annually, year-round; may be combined with other capture activities. Medical treatments authorized at discretion of consulting/attending veterinarian.
				8	Additional anti-helmintic treatments via topical application without capture and restraint		
6. Translocation	Nursing pup	Both	20	6	Capture, restraint, and relocation by hand to natural mother or prospective foster mother, whisker sampling (cut)	Hawaiian Archipelago, Johnston Atoll	Establishing/re-establishing maternal association. Annually at any time of year but predominantly during summer field camps. Most takes will occur in the NWHI (intra-island/atoll).
	Weaned Pup	Both	35	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, fecal, whisker sampling – cut or pull), and relocation from high risk areas via boat, ship, vehicle, or air craft	Hawaiian Archipelago, Johnston Atoll	Risk alleviation. Annually at any time of year. Most takes occur at French Frigate Shoals (intra-atoll) or within the Main Hawaiian Islands.

Table 1. Proposed annual takes of Hawaiian monk seals under the Status Quo Alternative. Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles. Activities would occur under Permit No. 10137 through June 2014, and the same activities are proposed to be permitted beyond 2014 under this alternative.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
	Weaned Pup	Both	6	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, fecal, whisker sampling – cut or pull), instrumentation, temporary holding, translocation from areas of low survival via boat and ship	NWHI	Seals may be translocated within the NWHI.
7. Adult Male Removal	Adult	Male	10	2	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, fecal, whisker sampling – cut or pull), instrumentation/trans-location, permanent captivity, or euthanasia	Hawaiian Archipelago; Johnston Atoll	Up to 10 males may be removed over a five year period. Euthanasia via IV sodium pentobarbital, captive penetrating bolt, or gunshot.
8. Disentangle	Any	Both	As warranted (likely not to exceed 25/year)	>1	Disentanglement and dehooking (with or without capture, sedation, and release); whisker sampling (cut or pull)	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year. All animals may have been taken by Tasks 1-3.
9. Conduct Necropsies	Any	Both	As warranted	1	Necropsy any seal found dead, that died during restraint, or that was euthanized. After necropsy, use seal tissue as bait for permitted shark removals to enhance seal survival.	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year.
10. Opportunistic Retrieval of samples	Any	Both	Unlimited samples	Unlimited samples	Collect parts (placentae, scats, spews, and molted fur/skin) from haul out areas	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year but predominantly during summer field camps.

Table 1. Proposed annual takes of Hawaiian monk seals under the Status Quo Alternative. Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles. Activities would occur under Permit No. 10137 through June 2014, and the same activities are proposed to be permitted beyond 2014 under this alternative.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
11. Import and Export Parts	Any	Both	Unlimited import/ export	Unlimited samples	Export (and re-import) Hawaiian monk seal samples. Import (and re-export) Mediterranean monk seal specimens for research related to monk seal conservation	World-wide (including but not limited to Canada, the Netherlands, Scotland, Greece, Australia)	Annually at any time of year.
12. Incidental harassment of monk seals	Any	Both	200	2	Incidental harassment during any research and enhancement activity	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year. Total incidental harassment over all activities.
13. Unintentional Mortality	Any	Both	2	1	During any research or enhancement activity	Hawaiian Archipelago; Johnston Atoll	Four unintentional mortalities over a five-year period not to exceed 2 deaths in any one year.

Appendix H, Table 2: Activities Proposed under Alternative 3 – Limited Translocation (Preferred Alternative).

Table 2. Proposed annual takes of Hawaiian monk seals under Alternative 3 – Limited Translocation (Preferred Alternative). Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
1. Monitoring (Research)	Any	Both	250	5	Disturbance from visual observation and photo-identification during ground monitoring (including terrestrial/amphibious unmanned vehicles), vessel and aerial surveys (including unmanned aerial vehicles); and from installation and repair of remote video cameras	MHI	Annually at any time of year.
			100	3		Nihoa Is.	
			75	3		Necker Is.	
			250	5		French Frigate Shoals	
			10	1		Gardner Pinnacles	
			400	5		Laysan Is.	
			275	5		Lisianski Is.	
			400	5		Pearl and Hermes Reef	
			150	5		Midway Atoll	
			200	5		Kure Atoll	
			5	3		Johnston Atoll	
2.a Tagging (Research)	Any except most nursing pups, lactating or	Both	60	3	Restraint, tagging (flipper and PIT), collect flipper plugs, vibrissae, morphometrics (length and girth), ultrasound	MHI	Annually at any time of year (predominantly during summer field camps).
			25	3		Nihoa Is.	

Table 2. Proposed annual takes of Hawaiian monk seals under Alternative 3 – Limited Translocation (Preferred Alternative). Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
	obviously pregnant females.		15	3		Necker Is.	Seals may also be taken by Tasks 1 and 3. Seals may also have ultrasound performed concurrent with flipper tagging At French Frigate Shoals, 35 weaned pups of either sex may have a sonic tag deployed on a third flipper tag. Any remaining nursing pups at end of field season may be tagged.
			100	3		French Frigate Shoals	
			75	3		Laysan Is.	
			70	3		Lisianski Is.	
			70	3		Pearl and Hermes Reef	
			50	3		Midway Atoll	
			50	3		Kure Atoll	
			5	3		Johnston Atoll	
2.b Retagging (Research)	Any except most nursing pups, lactating or obviously pregnant females	Both	100	1	Restraint, retagging (flipper), flipper plugs, vibrissae, morphometrics	Hawaiian Archipelago	Annually at any time of year. Seals may have been taken by disturbance (Task 1) and may have been tagged in previous years.
3. Marking (Research)	Any	Both	150	3	Temporary bleach marking	MHI	Annually at any time of year. All of the animals may also be taken by disturbance (Task 1) and tagging (Task 2).
			60	3		Nihoa Is.	
			30	3		Necker Is.	
			250	3		French Frigate Shoals	
			250	3		Laysan Is.	

Table 2. Proposed annual takes of Hawaiian monk seals under Alternative 3 – Limited Translocation (Preferred Alternative). Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
			250	3		Lisianski Is.	
			250	3		Pearl and Hermes Reef	
			100	3		Midway Atoll	
			150	3		Kure Atoll	
			5	3		Johnston Atoll	
4.a Health Screening and Instrumenta -tion (Research)	Any healthy seal excluding lactating females with pups and nursing pups	Both	100	2	Restraint, sedation, tagging, sampling (blood, swabs, blubber biopsy, vibrissae), weight, morphometrics, ultrasound, instrumentation	Hawaiian Archipelago and Johnston Atoll	Annually any time of year. Sixty (60) healthy seals may be instrumented. Recaptures for instrument removal and sampling. All animals may have been taken by Tasks 1-3.
4.b Health Screening, Treatment, and Instrumenta tion (Research and Enhanceme nt)	Any unhealthy seal excluding lactating females with pups and nursing pups	Both	30	2	Restraint, sedation, tagging, sampling (blood, swabs, blubber biopsy, vibrissae), bleach marking, treatment if needed (lance abscesses, administer long-acting antibiotic), weight, morphometrics, ultrasound, instrumentation, humane euthanasia or incidental mortality of 10 moribund animals	Hawaiian Archipelago and Johnston Atoll	Annually at any time of year. Includes humane euthanasia of up to 10 moribund or severely injured seals at discretion of veterinarian over a five-year period. All animals may have been taken by Tasks 1-3.

Table 2. Proposed annual takes of Hawaiian monk seals under Alternative 3 – Limited Translocation (Preferred Alternative). Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
4.c Health Screening, Treatment, and Instrumentation (Enhancement)	Any unhealthy seal excluding lactating females with pups and nursing pups	Both	As warranted (est. < 30)	As directed by vet	Restraint, treatment (lance abscesses, administer long-acting antibiotic), sedation, vibrissae, bleach marking, and instrumentation	Hawaiian Archipelago and Johnston Atoll	Annually at any time of year. All animals may have been taken by Tasks 1-3. May also occur during health screening of unhealthy seals.
5.a Intestinal Parasite Treatment (De-worming Research and Enhancement)	Pups ≥ 120 days post-weaning and juveniles up to age 3	Both	300	8	Restraint, weight, morphometrics, ultrasound, fecal collection (voided feces or fecal sample collected via fecal loop or digital extraction); up to 4 deworming treatments using oral or injectable drugs; up to 4 post-treatment monitoring takes at regular intervals (visual assessments and recapture for weight, morphometrics, and fecal sampling)	Hawaiian Archipelago and Johnston Atoll	Annually, year-round. Treatments may be combined with other activities requiring restraint and sedation Medical treatments authorized at discretion of consulting/attending veterinarian. If monthly treatment determined effective during research phase, capture/restraint for follow up sampling and morphometrics would be discontinued and only topical treatment would be administered.
				4	Restraint, weight, morphometrics, ultrasound, fecal collection (voided feces, fecal loop, or digital extraction), and topical anti-helmintic treatment		
				8	Additional topical anti-helmintic treatments via topical application without capture and restraint (up to 12 monthly treatments annually via topical anti-helmintic);		

Table 2. Proposed annual takes of Hawaiian monk seals under Alternative 3 – Limited Translocation (Preferred Alternative). Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
6.a Translocation to Save Abandoned Pups (Enhancement)	Nursing pup	Both	As warranted (est. < 20)	6	Capture, restraint, and relocation by hand to natural mother or prospective foster mother	Hawaiian Archipelago, Johnston Atoll	Establishing/re-establishing maternal association. Annually at any time of year but predominantly during summer field camps. Most takes will occur in the NWHI (intra-island/atoll).
6.b Translocation to Alleviate Risks (Enhancement)	All	Both	As warranted (est. < 60)	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, and relocation from high risk areas via boat, ship, vehicle, or air craft	Hawaiian Archipelago, Johnston Atoll	Risk alleviation. Annually at any time of year. Translocations within or between any subpopulations in the species range allowed. Pups near weaning (e.g., within a few days of the mother leaving) and that are at high risk of mortality may be translocated. Seals may also be hazed away from dangerous locations.
6.c Two-Stage Translocation (Enhancement)	Weaned Pup	Both	20	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, translocation from areas of low survival via boat, ship, vehicle, or aircraft	Hawaiian Archipelago, Johnston Atoll	Enhance survival: 1st stage of two-stage translocation. Annually at any time of year. Mostly females, but males when warranted. **Translocations within the NWHI or from the MHI to the NWHI, are allowed, *but not from the NWHI to MHI*.** Details to be determined through application of decision framework in Appendix A.
	Juvenile and Sub-adult	Both	30	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, translocation via boat, ship, vehicle, or air craft	Hawaiian Archipelago, Johnston Atoll	Enhance survival: 2nd stage of two-stage translocation. Annually at any time of year. Mostly females, but males when warranted.

Table 2. Proposed annual takes of Hawaiian monk seals under Alternative 3 – Limited Translocation (Preferred Alternative). Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
					Surviving juveniles that had been translocated as weaned pups returned to their natal or other suitable site (includes seals from 1st stage of translocation that remained at recipient site until at least age 2 yr).		Translocations within or between any subpopulations in the species range allowed. *Note that seals originally born in the MHI and previously taken to the NWHI may be returned to the MHI.* Details to be determined through application of decision framework in Appendix A.
6.d Translocation for Research	Juvenile, sub-adult and adult	Both	6	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, translocate between subpopulations	Hawaiian Archipelago, Johnston Atoll	Research to determine survival of translocated juveniles to inform two-stage translocation enhancement. Annually at any time of year. Translocations within or between any subpopulations in the species range allowed. Seals with unmanageable behavior in the MHI may be translocated to the NWHI as part of this study.
7.a Adult Male Removal (Enhancement)	Adult	Male	20	2	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation/translocation, permanent captivity, or euthanasia	Hawaiian Archipelago; Johnston Atoll	Up to 20 males may be removed annually, but only 10 lethal removals over a five-year period. Taste aversion testing may occur on adult male seals brought into captivity.
7.b Adult Male Hazing (Enhancement)	Adult	Male	As warranted (est. <10)	As warranted (est. <10)	Haze	Hawaiian Archipelago; Johnston Atoll	Aggressive males may be hazed away from conspecific victims in cases of immediate risk of injury or death or when specific males repeatedly attack conspecifics.

Table 2. Proposed annual takes of Hawaiian monk seals under Alternative 3 – Limited Translocation (Preferred Alternative). Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
8. Disentangle and Dehook (Enhancem ent)	Any	Both	As warranted (est. < 75)	As warranted	Disentanglement and dehooking (with or without capture, sedation, and release); collect vibrissae	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year. All animals may have been taken by Tasks 1-3.
9. Conduct Necropsies (Research)	Any	Both	As warranted	1	Necropsy any seal found dead, that died during restraint, or that was euthanized. After, use seal tissue as bait for permitted shark removals	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year.
10. Opportunis tic Retrieval of Samples (Research)	Any	Both	1,100	Unlimited samples	Collect parts (placentae, scats, spews, and molted fur/skin) from haul out areas	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year but predominantly during summer field camps.
11. Import and Export Parts (Research)	Any	Both	Unlimited import/ export	Unlimited samples	Import/export/receive	World-wide (including but not limited to Canada, the Netherlands, Scotland, Greece, Australia)	Annually at any time of year. Export (and re-import) Hawaiian monk seal samples collected under the authority of this permit. Import (and re-export) Mediterranean monk seal specimens for research related to monk seal conservation.
12. Supplement al Feeding	Pup or Juvenile	Both	12	Unlimited	Supplemental feeding of post-rehabilitated seals	NWHI	Annually at any time of year seals may be fed at daily or longer intervals for up to one year.

Table 2. Proposed annual takes of Hawaiian monk seals under Alternative 3 – Limited Translocation (Preferred Alternative). Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
(Enhancement)							
13. Behavioral Modification (Research and Enhancement)	Any	Both	20	As warranted (est. <20)	Intentional harassment for behavior modification. Aversive conditioning and other methods including but not limited to: Capture restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, translocation, temporary holding; hazing using visual, audible and tactile means; impeding movement with barriers, etc. Chemical taste aversion with lithium chloride in captivity only.	MHI	Annually at any time of year. Prevent seals from socializing with humans; alter behavior of seals socialized to humans or behaving in a manner dangerous to the seal or public safety. Seals may be brought into temporary captivity for taste aversion research. Experimental protocols to determine optimal methods.
14. Vaccinations (Research and Enhance-ment)	Any	Both	1,100	4	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), and administration of vaccine	Hawaiian Archipelago	Annually at any time of year.

Table 2. Proposed annual takes of Hawaiian monk seals under Alternative 3 – Limited Translocation (Preferred Alternative). Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
15. Incidental harassment of monk seals (Research and	Any	Both	400	3	Incidental harassment during any research and enhancement activity including opportunistic sample collection	Hawaiian Archipelago; Johnston Atoll	Total incidental harassment over all activities.
16.a Unintentional Mortality (Research)	Any	Both	2	1	During any research activity	Hawaiian Archipelago; Johnston Atoll	Four unintentional mortalities over a five-year period not to exceed two deaths in any one year.
16.b Unintentional Mortality (Enhancement)	Weaned pup	Both	2	1	During any enhancement activity	Hawaiian Archipelago; Johnston Atoll	Four unintentional mortalities over a five-year period not to exceed two deaths in any one year.
	Juvenile/ subadult	Both	4	1	During any enhancement activity	Hawaiian Archipelago; Johnston Atoll	Eight unintentional mortalities over a five-year period not to exceed four deaths in any one year.
	Adult	Male	2	1	During any enhancement activity	Hawaiian Archipelago; Johnston Atoll	Four unintentional mortalities over a five-year period not to exceed two deaths in any one year.

Appendix H, Table 3: Activities Proposed under Alternative 4 – Enhanced Implementation.

Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 – Enhanced Implementation. Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
1. Monitoring (Research)	Any	Both	250	5	Disturbance from visual observation and photo-identification during ground monitoring (including terrestrial/amphibious unmanned vehicles), vessel and aerial surveys (including unmanned aerial vehicles); and from installation and repair of remote video cameras	MHI	Annually at any time of year.
			100	3		Nihoa Is.	
			75	3		Necker Is.	
			250	5		French Frigate Shoals	
			10	1		Gardner Pinnacles	
			400	5		Laysan Is.	
			275	5		Lisianski Is.	
			400	5		Pearl and Hermes Reef	
			150	5		Midway Atoll	
			200	5		Kure Atoll	
			5	3		Johnston Atoll	
2.a Tagging (Research)	Any except most nursing pups,	Both	60	3	Restraint, tagging (flipper and PIT), collect flipper plugs, vibrissae, morphometrics (length and girth), ultrasound	MHI	Annually at any time of year (predominantly during summer field camps).
			25	3		Nihoa Is.	

Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 – Enhanced Implementation. Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
	lactating or obviously pregnant females.		15	3		Necker Is.	Seals may also be taken by Tasks 1 and 3. Seals may also have ultrasound performed concurrent with flipper tagging At French Frigate Shoals, 35 weaned pups of either sex may have a sonic tag deployed on a third flipper tag. Any remaining nursing pups at end of field season may be tagged.
			100	3		French Frigate Shoals	
			75	3		Laysan Is.	
			70	3		Lisianski Is.	
			70	3		Pearl and Hermes Reef	
			50	3		Midway Atoll	
			50	3		Kure Atoll	
			5	3		Johnston Atoll	
2.b Retagging (Research)	Any except most nursing pups, lactating or obviously pregnant females	Both	100	1	Restraint, retagging (flipper), flipper plugs, vibrissae, morphometrics	Hawaiian Archipelago	Annually at any time of year. Seals may have been taken by disturbance (Task 1) and may have been tagged in previous years.
3. Marking (Research)	Any	Both	150	3	Temporary bleach marking	MHI	Annually at any time of year. All of the animals may also be taken by disturbance (Task 1) and tagging (Task 2).
			60	3		Nihoa Is.	
			30	3		Necker Is.	
			250	3		French Frigate Shoals	

Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 – Enhanced Implementation. Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
			250	3		Laysan Is.	
			250	3		Lisianski Is.	
			250	3		Pearl and Hermes Reef	
			100	3		Midway Atoll	
			150	3		Kure Atoll	
			5	3		Johnston Atoll	
4.a Health Screening and Instrumentation (Research)	Any healthy seal excluding lactating females with pups and nursing pups	Both	100	2	Restraint, sedation, tagging, sampling (blood, swabs, blubber biopsy, vibrissae), weight, morphometrics, ultrasound, instrumentation	Hawaiian Archipelago and Johnston Atoll	Annually any time of year. Sixty (60) healthy seals may be instrumented. Recaptures for instrument removal and sampling. All animals may have been taken by Tasks 1-3.
4.b Health Screening, Treatment, and Instrumentation (Research and Enhancement)	Any unhealthy seal excluding lactating females with pups and nursing pups	Both	30	2	Restraint, sedation, tagging, sampling (blood, swabs, blubber biopsy, vibrissae), bleach marking, treatment if needed (lance abscesses, administer long-acting antibiotic), weight, morphometrics, ultrasound, instrumentation, humane euthanasia or incidental mortality of 10 moribund animals	Hawaiian Archipelago and Johnston Atoll	Annually at any time of year. Includes humane euthanasia of up to 10 moribund or severely injured seals at discretion of veterinarian over a five-year period. All animals may have been taken by Tasks 1-3.

Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 – Enhanced Implementation. Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
4.c Health Screening, Treatment, and Instrumentation (Enhancement)	Any unhealthy seal excluding lactating females with pups and nursing pups	Both	As warranted (est. < 30)	As directed by vet	Restraint, treatment (lance abscesses, administer long-acting antibiotic), sedation, vibrissae, bleach marking, and instrumentation	Hawaiian Archipelago and Johnston Atoll	Annually at any time of year. All animals may have been taken by Tasks 1-3. May also occur during health screening of unhealthy seals.
5.a Intestinal Parasite Treatment (De-worming Research and Enhance-ment)	Pups ≥ 120 days post-weaning and juveniles up to age 3	Both	300	8	Restraint, weight, morphometrics, ultrasound, fecal collection (voided feces or fecal sample collected via fecal loop or digital extraction); up to 4 deworming treatments using oral or injectable drugs; up to 4 post-treatment monitoring takes at regular intervals (visual assessments and recapture for weight, morphometrics, and fecal sampling)	Hawaiian Archipelago and Johnston Atoll	Annually, year-round. Treatments may be combined with other activities requiring restraint and sedation Medical treatments authorized at discretion of consulting/attending veterinarian. If monthly treatment determined effective during research phase, capture/restraint for follow up sampling and morphometrics would be discontinued and only topical treatment would be administered.
				4	Restraint, weight, morphometrics, ultrasound, fecal collection (voided feces, fecal loop, or digital extraction), and topical anti-helmintic treatment		
				8	Additional topical anti-helmintic treatments via topical application without capture and restraint (up to 12 monthly treatments annually via topical anti-helmintic);		

Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 – Enhanced Implementation. Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
6.a Translocation to Save Abandoned Pups (Enhancement)	Nursing pup	Both	As warranted (est. < 20)	6	Capture, restraint, and relocation by hand to natural mother or prospective foster mother	Hawaiian Archipelago, Johnston Atoll	Establishing/re-establishing maternal association. Annually at any time of year but predominantly during summer field camps. Most takes will occur in the NWHI (intra-island/atoll).
6.b Translocation to Alleviate Risks (Enhance-ment)	All	Both	As warranted (est. < 60)	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, and relocation from high risk areas via boat, ship, vehicle, or air craft	Hawaiian Archipelago, Johnston Atoll	Risk alleviation. Annually at any time of year. Translocations within or between any subpopulations in the species range allowed. Pups near weaning (e.g., within a few days of the mother leaving) and that are at high risk of mortality may be translocated. Seals may also be hazed away from dangerous locations.
6.c Two-Stage Transloca-tion (Enhance-ment)	Weaned Pup	Both	20	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, translocation from areas of low survival via boat, ship, vehicle, or aircraft	Hawaiian Archipelago, Johnston Atoll	Enhance survival: 1st stage of two-stage translocation. Annually at any time of year. Mostly females, but males when warranted. **Translocations within the NWHI, from the MHI to the NWHI, or from the NWHI to the MHI are allowed.** Details to be determined through application of decision framework in Appendix F.
	Juvenile and Sub-adult	Both	30	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, translocation via boat, ship, vehicle, or air craft	Hawaiian Archipelago, Johnston Atoll	Enhance survival: 2nd stage of two-stage translocation. Annually at any time of year. Mostly females, but males when warranted.

Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 – Enhanced Implementation. Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
					Surviving juveniles that had been translocated as weaned pups returned to their natal or other suitable site (includes seals from 1st stage of translocation that remained at recipient site until at least age 2 yr).		Translocations within or between any subpopulations in the species range allowed. *Note that seals originally born in the MHI and previously taken to the NWHI may be returned to the MHI.* Details to be determined through application of decision framework in Appendix F.
6.d Translocation for Research	Juvenile, sub-adult and adult	Both	6	3	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, temporary holding, translocate between subpopulations	Hawaiian Archipelago, Johnston Atoll	Research to determine survival of translocated juveniles to inform two-stage translocation enhancement. Annually at any time of year. Translocations within or between any subpopulations in the species range allowed. Seals with unmanageable behavior in the MHI may be translocated to the NWHI as part of this study.
7.a Adult Male Removal (Enhancement)	Adult	Male	20	2	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation/translocation, permanent captivity, or euthanasia	Hawaiian Archipelago; Johnston Atoll	Up to 20 males may be removed annually, but only 10 lethal removals over a five-year period. Taste aversion testing may occur on adult male seals brought into captivity.
7.b Adult Male Hazing (Enhance-ment)	Adult	Male	As warranted (est. <10)	As warranted (est. <10)	Haze	Hawaiian Archipelago; Johnston Atoll	Aggressive males may be hazed away from conspecific victims in cases of immediate risk of injury or death or when specific males repeatedly attack conspecifics.

Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 – Enhanced Implementation. Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
8. Disentangle and Dehook (Enhancem ent)	Any	Both	As warranted (est. < 75)	As warranted	Disentanglement and dehooking (with or without capture, sedation, and release); collect vibrissae	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year. All animals may have been taken by Tasks 1-3.
9. Conduct Necropsies (Research)	Any	Both	As warranted	1	Necropsy any seal found dead, that died during restraint, or that was euthanized. After, use seal tissue as bait for permitted shark removals	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year.
10. Opportunis tic Retrieval of Samples (Research)	Any	Both	1,100	Unlimited samples	Collect parts (placentae, scats, spews, and molted fur/skin) from haul out areas	Hawaiian Archipelago; Johnston Atoll	Annually at any time of year but predominantly during summer field camps.
11. Import and Export Parts (Research)	Any	Both	Unlimited import/ export	Unlimited samples	Import/export/receive	World-wide (including but not limited to Canada, the Netherlands, Scotland, Greece, Australia)	Annually at any time of year. Export (and re-import) Hawaiian monk seal samples collected under the authority of this permit. Import (and re-export) Mediterranean monk seal specimens for research related to monk seal conservation.
12. Supplement al Feeding	Pup or Juvenile	Both	12	Unlimited	Supplemental feeding of post-rehabilitated seals	NWHI	Annually at any time of year seals may be fed at daily or longer intervals for up to one year.

Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 – Enhanced Implementation. Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
(Enhance-ment)							
13. Behavioral Modificatio n (Research and Enhance-ment)	Any	Both	20	As warranted (est. <20)	Intentional harassment for behavior modification. Aversive conditioning and other methods including but not limited to: Capture restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), instrumentation, translocation, temporary holding; hazing using visual, audible and tactile means; impeding movement with barriers, etc. Chemical taste aversion with lithium chloride in captivity only.	MHI	Annually at any time of year. Prevent seals from socializing with humans; alter behavior of seals socialized to humans or behaving in a manner dangerous to the seal or public safety. Seals may be brought into temporary captivity for taste aversion research. Experimental protocols to determine optimal methods.
14. Vaccination (Research and Enhance-ment)	Any	Both	1,100	4	Capture, restraint, sedation, sampling (blood, swabs, blubber biopsy, vibrissae), and administration of vaccine	Hawaiian Archipelago	Annually at any time of year.

Table 3. Proposed annual takes of Hawaiian monk seals under Alternative 4 – Enhanced Implementation. Locations: Hawaiian Archipelago=Main Hawaiian Islands (MHI) and adjacent islets, Northwestern Hawaiian Islands (NWHI), and Johnston Atoll. MHI=Hawaii, Maui, Molokai, Kahoolawe, Lanai, Oahu, Kauai, and Niihau. Also all smaller islands and offshore islets, including, but not limited to, Kaula Rock, Lehua, Molokini, etc. NWHI=Nihoa Island (Is.), Necker Is., French Frigate Shoals, Laysan Is., Lisianski Is., Pearl and Hermes Reef, Midway Atoll, Kure Atoll, Gardner Pinnacles.

Task	Size (Age)	Sex	No. Seals Taken/ Year	No. Takes/ Seal/Year	Type of Takes	Locations	Dates/Time Period And Details
15. Incidental harassment (Research and Enhance-ment)	Any	Both	400	3	Incidental harassment during any research and enhancement activity including opportunistic sample collection	Hawaiian Archipelago; Johnston Atoll	Total incidental harassment over all activities.
16.a Unintentional Mortality (Research)	Any	Both	2	1	During any research activity	Hawaiian Archipelago; Johnston Atoll	Four unintentional mortalities over a five-year period not to exceed two deaths in any one year.
16.b Unintentional Mortality (Enhance-ment)	Weaned pup	Both	2	1	During any enhancement activity	Hawaiian Archipelago; Johnston Atoll	Four unintentional mortalities over a five-year period not to exceed two deaths in any one year.
	Juvenile/ subadult	Both	4	1	During any enhancement activity	Hawaiian Archipelago; Johnston Atoll	Eight unintentional mortalities over a five-year period not to exceed four deaths in any one year.
	Adult	Male	2	1	During any enhancement activity	Hawaiian Archipelago; Johnston Atoll	Four unintentional mortalities over a five-year period not to exceed two deaths in any one year.

This page intentionally left blank.

Appendix I
Disposition of Marine Mammal Parts/Biological Samples

This page intentionally left blank.

DISPOSITION OF MARINE MAMMAL PARTS/BIOLOGICAL SAMPLES

Following federal regulations (50 CFR 216.37 Marine mammal parts) governing the transfer of marine mammal parts taken or imported under permit is required in all research and enhancement permits that authorize sample collection. 50 CFR 216.37 specifies the following:

With respect to marine mammal parts acquired by take or import authorized under a permit:

(a) Marine mammal parts are transferrable if:

(1) The person transferring the part receives no remuneration of any kind for the marine mammal part;

(2) The person receiving the marine mammal part is:

(i) An employee of NMFS, the U.S. Fish and Wildlife Service, or any other governmental agency with conservation and management responsibilities, who receives the part in the course of their official duties;

(ii) A holder of a special exception permit which authorizes the take, import, or other activity involving the possession of a marine mammal part of the same species as the subject part; or

(iii) In the case of marine mammal parts from a species that is not depleted, endangered or threatened, a person who is authorized under section 112(c) of the MMPA and subpart C of this part to take or import marine mammals or marine mammal parts;

(iv) Any other person specifically authorized by the Regional Director, consistent with the requirements of paragraphs (a)(1) and (a)(3) through (6) of this section.

(3) The marine mammal part is transferred for the purpose of scientific research, maintenance in a properly curated, professionally accredited scientific collection, or education, provided that, for transfers for educational purposes, the recipient is a museum, educational institution or equivalent that will ensure that the part is available to the public as part of an educational program;

(4) A unique number assigned by the permit holder is marked on or affixed to the marine mammal part or container;

(5) The person receiving the marine mammal part agrees that, as a condition of receipt, subsequent transfers may only occur subject to the provisions of paragraph (a) of this section; and

(6) Within 30 days after the transfer, the person transferring the marine mammal part notifies the Regional Director of the transfer, including a description of the part, the person to whom the part was transferred, the purpose of the transfer, certification that the recipient has agreed to comply with the requirements of paragraph (a) of this section for subsequent transfers, and, if applicable, the recipient's permit number.

(b) Marine mammal parts may be loaned to another person for a purpose described in paragraph (a)(3) of this section and without the agreement and notification required under paragraphs (a)(5) and (6) of this section, if: (1) A record of the loan is maintained; and (2) The loan is for not more than one year. Loans for a period greater than 12 months, including loan extensions or renewals, require notification of the Regional Director under paragraph (a)(6).

(c) Unless other disposition is specified in the permit, a holder of a special exception permit may retain marine mammal parts not destroyed or otherwise disposed of during or after a scientific research or enhancement activity, if such marine mammal parts are: (1) Maintained as part of a properly curated, professionally accredited collection; or (2) Made available for purposes of scientific research or enhancement at the request of the Office Director.

(d) Marine mammal parts may be exported and subsequently reimported by a permit holder or subsequent authorized recipient, for the purpose of scientific research, maintenance in a properly curated, professionally accredited scientific collection, or education, provided that:

(1) The permit holder or other person receives no remuneration for the marine mammal part;

(2) A unique number assigned by the permit holder is marked on or affixed to the marine mammal specimen or container;

(3) The marine mammal part is exported or reimported in compliance with all applicable domestic and foreign laws;

(4) If exported or reimported for educational purposes, the recipient is a museum, educational institution, or equivalent that will ensure that the part is available to the public as part of an educational program; and

(5) Special reports are submitted within 30 days after both export and reimport as required by the Office Director under 216.38.

Appendix J
Historical and Contemporary Significance of the Endangered Hawaiian Monk Seal in Native Hawaiian Culture

This page intentionally left blank.

Historical and Contemporary Significance of the Endangered Hawaiian Monk Seal in Native Hawaiian Culture

Monk seals hauled out on the beach at Nuʻalolo Kai, Nā Pali, Kauaʻi (photo: J. Kittinger)

Prepared for:

Protected Species Division (PSD), Pacific Islands Regional Office (PIRO) of the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service

By

Impact Assessment, Inc.
Pacific Islands Office
367-C Kapaloala Place
Honolulu, HI 96813
impactassessment@hawaii.rr.com

Title: Historical and Contemporary Significance of the Endangered Hawaiian Monk Seal in Native Hawaiian Culture

Authors: John N. Kittinger[1,*]; Trisann Māhealani Bambico[1]; Trisha Kehaulani Watson[2]; Edward W. Glazier[1]

Affiliations:
[1] Impact Assessment, Inc., Pacific Islands Office, 367-C Kapaloala Place, Honolulu, HI 96813, USA
[2] Honua Consulting, P.O. Box 61395, Honolulu, HI 96839, USA
* corresponding author: Email: jkittinger@gmail.com; Ph: +1 808-397-9077

About this Report

The following report is based on research activities supported by a grant from the Pacific Islands Regional Office (PIRO) of the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (Solicitation #: PIRO-10-0558). The research findings presented herein may be used to support the Protected Species Division's longstanding goals to protect and recover endangered and threatened species of sea turtles, monk seals, and cetaceans in the Pacific Islands region as mandated by the Endangered Species Act (ESA) and Marine Mammal Protection Act (MMPA).

This proposal was prepared by the Pacific Islands Office of Impact Assessment, Inc. (IAI). IAI has specialized in socioeconomic and sociocultural dimensions of marine fisheries and related coastal zone management issues since 1980, with a specific focus on assessment and monitoring of social and economic changes associated with management of public trust resources.

Suggested citation:

> Kittinger JN, Bambico TM, Watson TK, and Glazier EW (2011). Historical and contemporary significance of the endangered Hawaiian monk seal in Native Hawaiian culture. A report prepared for the NOAA Pacific Islands Regional Office. Impact Assessment, Inc., Honolulu.

For further information direct inquiries to:

John N. (Jack) Kittinger, PhD
Lead Scientist & Assistant Director
Impact Assessment Inc., Pacific Islands Office
367-C Kapaloala Place
Honolulu, HI 96813 USA

Phone: +1 808-397-9077
Email: jkittinger@gmail.com

Acknowledgements

We thank first and foremost the Native Hawaiian cultural practitioners and community members who have shared their mana‘o with us. *The knowledge, perceptions and information about monk seals and Native Hawaiian culture described herein belong to these respondents and their communities*. To protect respondents’ identities, all information presented herein is kept anonymous. We also thank Bill Gilmartin, Bud Antonelis, Puakea Nogelmeier, Loren E. McClenachan, Bob Rechtman, and Craig Severance who have shared their knowledge about monk seals and Hawaiian communities with us. This research was supported by competitive grants from the Protected Species Division, Pacific Islands Regional Office, National Marine Fisheries Service, and we thank Jeffrey Walters for their support. Any errors or omissions belong to the authors alone.

Abstract

The Hawaiian monk seal is highly endangered but relatively little is known about the socio-cultural significance of the species in Native Hawaiian communities. Accurate assessment of historical and modern socio-cultural values and perspectives is needed to inform conservation and recovery planning for the species, particularly since the species is not universally well-regarded by ocean users. We conducted extensive archival research and oral history interviews to characterize past and current human-monk seal relationships in the Hawaiian archipelago. Though the prehistoric period remains poorly understood, our findings suggest that monk seals were likely rare but not unknown to Hawaiians in the late 19th and early 20th centuries. References are made to monk seals in Hawaiian-language newspapers, traditional knowledge forms, and in familial histories. Our findings also suggest that the species is not uniformly known in contemporary Native Hawaiian communities and that perspectives about the nature and significance of the monk seal appear to be related to place-specific histories and specific groups of knowledgeable persons. We introduce the concept of 'cultural endemism' to characterize this pattern of socio-cultural heterogeneity. This information may prove useful in crafting culturally appropriate management plans for the species and for developing effective outreach activities to engage coastal communities and ocean users.

Key Words: endangered species; wildlife conflict; cultural endemism; historical ecology; human-environment interactions

Introduction

The successful management and recovery of endangered species is dependent on a diverse set of social factors and conditions that shape human interactions with those species and the environments they occupy (Kellert, 1986, Kellert, 1985). In many cases, economic, technological, demographic, institutional, perceptual and political forces will determine the prospects for successful species recovery and stewardship (Bath, 1998, Jacobson and Duff, 1998). Despite this, most endangered species programs focus primarily on the biological aspect of endangered species, and in comparison relatively little research is directed toward human dimensions of endangered species (Jacobson and Duff, 1998, Kellert, 1985).

Social and perceptual factors are especially important in understanding how human societies interact with endangered species and their habitats in places characterized by human-wildlife conflict (Bentrupperbaumer et al., 2006, Tarrant et al., 1997, Clark et al., 1994). Conflict can develop through a myriad of different pathways but commonly stem from the social values, norms and perceptions that structure human-environmental interactions. Kellert (1985:529), identifies the full range of values that society derives from endangered wildlife, and categorizes seven discrete types, including: 1) naturalist/outdoor recreational; 2) economic; 3) moral or existence; 4) scientific; 5) utilitarian; and 6) cultural, symbolic and historical values. These values, like other social phenomena, are not static but evolve through time as societies change.

Social science research can be used to characterize the full range of social values, meanings and perceptions of endangered species and can also provide important baseline information that can be used to assess changes in these values and perceptions over time. Social assessments can be applied to determine the likelihood of success of different proposed conservation actions or to aid in the development of more effective public education and outreach programs. Such data are potentially valuable for resource managers and management programs seeking to engage more effectively with communities in species recovery and conservation efforts.

Human values and perceptions are strongly influenced by the socio-cultural setting and knowledge systems that develop in a place-based manner. This is particularly true in the Pacific Islands and similar settings where indigenous cultures developed in-depth traditional ecological knowledge systems and close relationships with the physical environments that provided goods, values and services upon which they depended. In Polynesian communities, the values and perceptions of species and the ecosystems in which they are embedded are strongly influenced by traditional socio-cultural practices, uses, and knowledge systems. Ecosystem constituents are primarily viewed not as independent units, but as part of an interconnected system in which human are embedded as natural constituents and stewards of environmental conditions (Glazier, 2011, Jokiel et al., 2011, Handy and Pūkui, 1972).

Certain marine and terrestrial species can, however, take on unique meanings and significance, which in turn mediate the way human societies interact with those species and its associated habitats. For example, many Pacific Islander cultures developed customary restrictions on use of sea turtles which served to limit harvest and conserve the species (Rudrud, 2010, Allen, 2007). Socio-cultural values and perceptions have evolved as island communities have been subjected to changing socio-economic, political and institutional conditions, and as a result there is a need

to understand how past relationships with endangered species affect current and future conservation efforts. This is particularly important for endangered species, many of which are threatened with extinction due to human activities.

The purpose of this article is to characterize the historical and contemporary significance of monk seals in Native Hawaiian culture. Monk seals are highly endangered and since they gained protection under the Endangered Species Act their populations have been increasing in the main Hawaiian Islands. This has led to increased conflicts with ocean users – particularly fishers – which have resulted in some cases in intentional killings of monk seals. Below, we provide a background context for the study and describe the social-ecological parameters of human-monk seal interactions in Hawai‘i. Next, we describe our mixed methodology and present the detailed results of our research. Finally, we discuss the significance of our findings and how the socio-cultural significance of endangered species can be applied to current challenges in conservation and species recovery planning. We introduce the concept of ‘cultural endemism’ to characterize the place-specific context and socio-cultural factors that influence indigenous societies relationships with natural resources. It is hoped that the research findings can help inform culturally-appropriate conservation planning for endangered species and enhance understanding of the human dimensions of wildlife and ecosystems.

Background

The Hawaiian Islands were among the last places on Earth to be colonized by humans. Voyaging Polynesians arrived in Hawai‘i centuries ago (Wilmshurst et al., 2011) and thereafter they established complex societies and resource production systems that supported a dense human population with complex sociopolitical systems (Kirch, 1985, Vitousek et al., 2004). Polynesians introduced exotic species and utilized both terrestrial and marine ecosystems for basic subsistence, altering endemic populations of fauna and flora and transforming natural ecosystems into cultural land- and seascapes in the process (Burney et al., 2001, Athens, 2009, Maly, 2001, Kaneshiro et al., 2005, Kittinger et al., *In review*).

Hawaiian monk seals are estimated to have inhabited the Hawaiian archipelago for approximately 14 million years and thus the species has adapted to long-term geologic changes in the archipelago (Kenyon and Rice, 1959). Monk seal habitats include shallow water reef habitat for pupping, weaning and foraging, sandy beach areas for hauling out, and deeper reef areas for foraging (Kenyon and Rice, 1959, NMFS, 2007). Hawaiian monk seals are apex predators in coral reef environments, but exhibit extreme sensitivity and vulnerability to human stressors, which renders the species vulnerable to local extirpation and extinction (Ragen and Lavigne, 1999, Ragen, 1999, Kenyon, 1972, Kenyon, 1980, Gilmartin, 2002). The Hawaiian monk seal population is currently comprised of approximately 1,200 individuals and is declining at a rate of approximately 4% per year (Antonelis et al., 2006, NMFS, 2007).

Currently, the majority of Hawaiian monk seals are found in the remote and primarily uninhabited Northwestern Hawaiian Islands (NWHI), but a smaller population is growing in the Main Hawaiian Islands (MHI) (Baker and Johanos, 2004) (Figure 1). Monk seals in the MHI are increasing in number and this region is where the majority of human-monk seal conflicts have

occurred. Monk seal recovery is not universally supported in Hawaiian communities, and some ocean users view the species as a nuisance or threat to traditional activities such as subsistence fishing. For example, three monk seals were recently killed by apparent intentional shooting, and foul play cannot be ruled out in the recent deaths of at least three other seals. These conflicts are a major concern for long-term conservation and recovery planning for the species, particularly considering the continuing decline in NWHI populations and increase in the populated MHI.

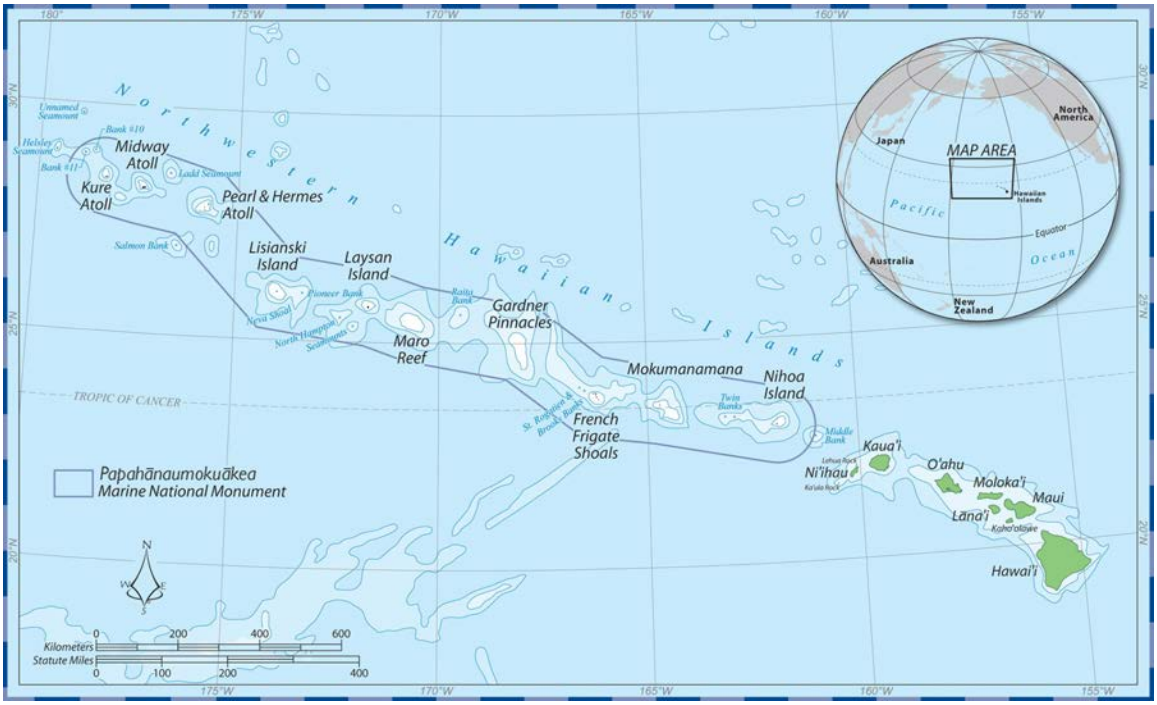


Figure 1: Map showing the Hawaiian Archipelago, comprised of the inhabited high islands of the main Hawaiian Islands (in green) and the uninhabited reefs, banks, and atolls of the Northwestern Hawaiian Islands, which are protected as part of the Papahānaumokuākea Marine National Monument. Map courtesy of the NOAA Papahānaumokuākea Marine National Monument Office.

Methods

To characterize the historical and contemporary significance of the endangered Hawaiian monk seal, we employed two primary methods, including: 1) archival research and document analysis and, 2) ethnographic and oral history interviews with Native Hawaiian community members, elders (*kūpuna*) and cultural practitioners. Archival research efforts targeted a broad range of historical and contemporary information about human-monk seal interactions and cultural significance of the species in documents retrieved from various institutional and online repositories. The research targeted both English-language and Hawaiian-language sources, including the extensive collection of archived Hawaiian-language newspapers and sources in existing compilations of historical documents (Hiruki and Ragen, 1992, Balazs and Whittow, 1979). English-language archival sources also included:

a. Published archaeological reports, containing zooarchaeological faunal assemblages and midden contents;
b. Archival and historical documents containing anecdotal or descriptive data (e.g. reports from naturalists, missionaries and explorers; whaler's logbooks; historical newspapers);
c. Published ethnographic information (e.g. recorded oral histories; interviews with elders); and,
d. Contemporary ecological data (e.g. population studies; genetic studies).

Our research also involved an exhaustive search in Native Hawaiian language newspapers for references to the Hawaiian monk seal. Newspaper searches were conducted in online databases of published and searchable newspapers (Ulukau, 2003, Alu Like Inc. et al., 2006). The Hawaiian-language newspapers are an unparalleled resource in terms of the volume of material and richness of description provided by Native Hawaiian contributors (Nogelmeier, 2010a), and only ~10% of published newspapers have been electronically scanned and made searchable (Nogelmeier, 2010b). As part of the search process, a list of Hawaiian language terms for the monk seal was developed and the etymology of these terms was investigated. All references were translated into English, categorized in terms of the type of account (e.g. fishing story, legend, chant, prayers, etc.) and then analyzed, resulting in an interpretation of each account and its meaning or significance in Native Hawaiian culture.

We also conducted unstructured ethnographic and oral history interviews with 30 Native Hawaiian community members, cultural practitioners and elders (*kūpuna*). Respondents involved in the research were known to possess extensive knowledge of endemic Hawaiian species, marine and coastal environments, and historic and contemporary cultural practices or knowledge that may have some association with monk seals. Interviews focused on historical and contemporary cultural connections with the monk seal among Native Hawaiian communities, as determined through respondents' oral testimonies or reported statements about past and current relationships with the species. These oral traditions consist of a rich pool of collective memories among that encompass an inherited culture in Native Hawaiian communities (Kikiloi, 2010). Respondents were identified through a social network sampling process (Hanneman, 2001), which allowed us to identify and characterize interviewees who are particularly knowledgeable of or experienced with monk seals or Native Hawaiian cultural knowledge systems (cf. Romney et al., 1986).

Interviewees were comprised of respondents who exhibited a broad and sometimes conflicting range of views on the monk seal. This purposive sampling of respondents allowed us to characterize a multiplicity of perspectives among community members, which can reveal different values and information that exist in different social groups and knowledge systems (Shackeroff et al., 2011). The interview methods used by the researchers followed existing standards in social science research (Bernard, 2006, Kvale, 1996, Seidman, 1998). Interviews were conducted in a manner that was culturally appropriate and which respected the traditional ecological knowledge systems of the respondents (Shackeroff and Campbell, 2007).

Interview data were analyzed using an iterative approach to describe, categorize and interpret our qualitative interview data. Most interviews were audio- or video-recorded and, together with

notes taken during the interviews, responses were coded into topical categories. We adopted an iterative methodology that is utilized commonly in grounded theory approach, a method that allows the researcher to develop theory on the research topics addressed while simultaneously grounding the results in empirical observations or data (Glaser and Strauss, 1967, Schatzman, 1991, Thomas and James, 2006). Our methods, however, focused more on an inductive analysis to systematically determine patterns in our respondents' narratives rather than on theory generation. The iterative methodology employed was designed to establish rigor in the analysis of our qualitative information (Baxter and Eyles, 1997, Barbour, 2001).

In addition to interviews, we also sought other evidence of monk seals in Native Hawaiian cultural knowledge, including Hawaiian historical accounts, chants (*oli*) songs (*mele*), prayers (*pule*), existing oral histories, place names, and other traditional and customary knowledge forms. We also engaged in other ethnographic research methods including site visits and participant observation in Hawaiian communities and places with names potentially referencing monk seals.

Results

Our research uncovered a diversity of information about historical and contemporary relationships between Hawaiian communities and the monk seal. Below, we discuss our findings discovered through different sources and research efforts. Additional material referenced in these sections is included in the Appendix. It should be noted that although our research included a comprehensive search of sources of cultural knowledge, additional information may still be waiting to be discovered in extant Hawaiian literature and traditional knowledge forms. In addition to this, several respondents also noted that much of the information we sought about monk seals was deliberately kept *hūnā*, or secret, in keeping with tradition and because such knowledge had been improperly used in the past.

English-Language Archival Sources

The results of archival research in English language sources have been published elsewhere (Watson et al., 2011), but a brief overview of these findings and additional description is provided here for context and comparison with other research results. Our research in this diverse set of sources suggests that seal populations were probably locally extirpated in the MHI within the first century after Polynesian settlement (~AD 1250-1350). Pre-human seal populations probably never exceeded 15,000 individuals, which constitutes a small and vulnerable population for a large mammal (Watson et al., 2011). Remains of monk seals in archaeological deposits are limited to just a few sites that primarily date to the historic period (Rechtman, 2011, Office of Hawaiian Affairs, 2010, Rosendahl, 1994), but this evidence suggests that monk seals were opportunistically taken by prehistoric Polynesian hunters. Though several theories still exist, the most likely explanation based on the available evidence is that seal populations were probably rapidly diminished in Hawaiian prehistory by human hunters and harassment by their commensal mammals (particularly dogs [*Canis familiaris*]).

One of the periods that is the least well understood are the first decades after western contact before the Hawaiian language was translated into a written form (AD 1778-1830). During this period, whaling, sealing and other trading vessels increasingly frequented the archipelago and trade between Hawaiian communities and foreigners intensified (Ii, 1993, Kamakau, 1992). Hawaiians became involved in the seal trade as early as 1811 (Ii, 1993), and were conscripted as sailors on whaling and sealing vessels by Hawaiian monarchs (Naughton, 1983, Beechert, 1991, Kuykendall, 1938, Kuykendall, 1957). This period also witnessed major changes in the relationship between commoners and the land, including the abolishment of the traditional Hawaiian religious system (Ralston, 1984, Seaton, 1974), which included restrictions on some marine species (Titcomb, 1972, Beckley, 1883).

Despite several detailed English-language accounts of the Hawaiian Islands that date to this period, no descriptions of seals were recorded in the main Hawaiian Islands (Appendix). This strongly suggests rarity, particularly given many early descriptions come from whalers and sealers that would have been interested in harvesting seals for their oil, or from explorers and naturalists who described other social and environmental contexts in great detail. Of these early descriptions, however, it remains difficult to disentangle which sealing cargoes were derived from ventures outside of Hawaiian waters (e.g. Alaska, the Pacific Northwest, and the California coast) and those which may have been comprised of monk seal populations from Hawaiian waters (Kuykendall, 1929). When seals were discovered several decades later in the remote and uninhabited northwestern Hawaiian Islands, several sealing voyages were undertaken (Cobb, 1905). Seals were also taken opportunistically in the NWHI during this period by visiting ships, including ones bearing Hawaiian monarchs (e.g. Anonymous, 1857). Few monk seals survived the sealing ventures of the 19th century, resulting in near-extinction and extreme rarity throughout the archipelago in the early 20th century (Hiruki and Ragen, 1992).

Hawaiian-Language Newspapers

The Hawaiian-language newspapers are an unparalleled resource in terms of the volume of material and richness of description (Nogelmeier, 2010a). Our search consisted of identifying Hawaiian terms for monk seals and the etymology of these terms. Next, we located articles containing these terms in online databases of digitized Hawaiian-language newspapers (Ulukau, 2003, Alu Like Inc. et al., 2006) and translated these accounts (Appendix).

We discovered many terms for monk seals in our search in Hawaiian-language dictionaries, archives and newspapers, including: *ʻīlioholoikauaua, ʻioleholoikauaua, ʻīlioholoikauaua-a-Lono, ʻīlioheleikauaua, ʻīlioholoikekai, ʻaukai, holoikauaua, hulu, sila*, and *kila* (Table 1). The most commonly used term, *ʻīlioholoikauaua*, roughly translates to "dog running in the rough [seas]" (Pūkui and Elbert, 1986). Two other commonly referenced terms, "*sila*" and "*kila*," are Hawaiian versions of the word 'seal,' and probably date to the post-contact era. Several previously unknown terms were also discovered, including "*hulu*," which is defined in an earlier dictionary as "seal, named for its valuable fur" (Pūkui and Elbert, 1971). This term was also used by some respondents in interviews to reference monk seals (Watson, 2010). Another term "*ohulu*," is defined as a seal hunter (Parker, 1922). The term "*palaoa*" commonly references whales, but in a traditional chant, it may also apply to other marine mammals including monk seals (Nerveza 2010). Some respondents knew of other names for the monk seal, but declined to

provide the names because of worries about how the names would be used. A full list of Native Hawaiian terms for monk seals and their meanings is provided in Table 1.

Most references to monk seals in Hawaiian-language newspapers use the term *ʻīlioholoikauaua* and date to the mid to late 19th century (Appendix). References to monk seals are primarily used in a neutral tone with little description. For example, writers used the term *ʻīlioholo-ikauaua* to reference seals in translations of English works. Other descriptions use the same term to describe seals on sealing voyages to Alaska and the US Pacific northwest on which Native Hawaiians served as crew members. One writer describes a trip to the arctic where the crew were kept warm by "the pelt of the *ʻīlio-holo-i-ka-uaua* and the other slippery, furry animals," while another writer describes the Arctic as "Just snow is what is seen there, no plants; the polar bear is still important, with the *ʻīlioholoikauaua*, and the sea elephants." Other writers used the term *ʻīliokai* or *ʻīlio o kai* (seadog) and *sila* (seal) in descriptions of sealing expeditions. "These accounts provide little information about the cultural relationship with monk seals but do provide evidence that the name was known to Hawaiian writers during a time in which seals were rare in the Hawaiian Islands. Other references are more telling of cultural relationships, and several contain negative connotations. For example, one writer implores fellow Hawaiians not to "slacken in their moral resolve like the *ʻīlioholoikauaua*," and another writer uses the term loosely as an insult (Appendix). These references provide some evidence that the monk seal was not always viewed in a positive manner, though the context does not provide enough description in order to determine why these views were held.

The Hawaiian language newspapers also provide some evidence that monk seals were harvested and consumed as part of customary practice. For example, one writer writes in a story "what are the things you think we eat here? Turtle liver, shark fin, and the broiled meat of the *ʻīlioholoikauaua*." Another writer suggests that monk seal furs were collected as part of customary tribute to the land managers (*Konohiki*), writing, "and then, they lay down these things the *Konohiki* (land manager) requested: pig, dog, cloth, fiber, fur (ʻo ka hulu), fishing net, everything. These are the goods that we exhibited in ancient days" (Appendix). These descriptions, though limited, suggest that monk seals were harvested for their meat and fur.

Table 1

Term	Definition	Reference / Notes
ʻĪlioholoikauaua	Seal, dog running in the roughness [rough seas]	Pūkui and Elbert, 1986 / entry does not appear in the online dictionary (Ulukau, 2003)
ʻioleholoikauaua*	A rat running beside the wave	Beckwith, 1951
ʻĪlioholoikauaua-a-Lono	The dog running at the voice of Lono	Fornander, 1916-1920 (Vol. IV, pg. 273) / Only known reference
ʻĪlioheleikauaua	The dog running in the waves	Andrade, 2008
ʻĪlioholoikekai	The dog running in the sea	Moʻolelo (oral traditions) from kūpuna and kumu (elders & teachers)
ʻaukai	Seafaring	Moʻolelo (oral traditions) from kūpuna (elders)
holoikauaua	"iʻoa Pearl and Hermes Reef [NWHI]. Lit., [Hawaiian monk seal that] swims in the rough."	Kōmike Huaʻōlelo (2003)
hulu	seal, named for its valuable fur	Pūkui and Elbert, 1971
sila / kila	Hawaiian versions of the English word ʻseal.ʼ	Kōmike Huaʻōlelo (2003) / It is probable that use of this term did not begin until after foreign contact
ohulu (ō-hū'-lu)	"O, to spear; and hulu, fur or feathers. A seal hunter."	Parker, 1922 / Entry does not appear in the online dictionary (Ulukau, 2003)
he ilio o ke kai	Seal	Andrews, 1865
sila pūhuluhulu	Fur seal	Kōmike Huaʻōlelo (2003)
sila Hawaiʻi	Hawaiian monk seal	Kōmike Huaʻōlelo (2003)
ʻĪliopiʻi	"Dog running up and down"; Place name: cape & bay, Kalaupapa peninsula	Hawaiian language newspapers; maps

Table 1: Native Hawaiian terms for the monk seal. Definitions and references are provided, including information derived from other archival and interview research efforts on these terms.

***** There have been several changes in the definitions of some terms in Hawaiian language dictionaries over time (Elbert, 1954). For the term *ʻiole*, one edition of the Hawaiian dictionary defines the term as, "**ʻiole**. 1. Hawaiian rat (*Rattus exulans*); introduced rat, mouse (Oink. 11.29); rodent (see *ʻiole-lāpaki, ʻiole-manakuke, ʻiole-puaʻa*); mole (Isa. 2.20). **hōʻiole**. To behave like a rat. *Fig*., to steal, cheat, lie in wait in order to assail. 2. Name for a sinker of a squid lure." (Pūkui and Elbert, 1971). A later edition of the same dictionary contains the following definition, "**ʻiole** n. 1. Hawaiian rat (Rattus exulans); introduced rat, mouse (Oihk. 11.29); rodent (see *ʻiole lāpaki*, *ʻiole manakuke*, *ʻiole puaʻa*); mole (Isa. 2.20); <u>considered by some an ʻaumakua</u>. Cf. *piko pau ʻiole*, *haumakaʻiole*, *paʻipaʻiʻiole*, *papaʻiole*, *ʻuwīʻuwī* 3. **hōʻiole** To behave like a rat; ratlike. *Fig.*, to steal, cheat, lie in wait in order to assail. (PNP kiole)" (Pūkui and Elbert, 1971, <u>emphasis added</u>). The reason for the change in definition is unknown, but

noteworthy in that the later definition specifies that the animal is known to be an *ʻaumakua*. *ʻAumakua* are "family or personal gods, deified ancestors who might assume the shape of…[various animals]" (Pūkui and Elbert, 1986).

Traditional Cultural Sources

In addition to archival and interview research, other sources of cultural knowledge were accessed and reviewed to ascertain information about Hawaiian monk seals. These sources included *mele* (songs), *oli* (chants), *moʻolelo* (oral traditions), and other traditional knowledge forms. One such source is the Kumulipo, a detailed chant that chronicles the creation story, genealogy and mythology of ancient Hawaiʻi (Beckwith, 1951). Previously it was not believed that any references to the monk seal were found in the Kumulipo, but the term "*ioleholoikauaua*" in one section may reference the Hawaiian monk seal (Appendix). The description of the *ioleholoikauaua* as "a rat running beside the wave," is reminiscent of monk seals and the description of the monk seal in this section of the Kumulipo is also consistent with other descriptions and perceptions of monk seal behavior found in Hawaiian language sources.

The monk seal is also mentioned in the *moʻolelo* (oral tradition) about the Legend of Hawaii-loa. In this story, the monk seal is described as *ʻīlioholoikauaua-a-Lono*, and is associated with the Hawaiian god Lono:

> After Light had been created or brought forth from the *Po* (the darkness or chaos) the gods looked upon the empty space (*ka lewa*) and there was no place to dwell in. They then created the heavens for themselves. Three heavens did they create or call into existence by their word of command. The uppermost heaven was called "*Lani-Makua*," the one next below was called "*he Lani o Ku*," and the lowest was called "*he Lani o Lono*."
>
> * * *
>
> The first man, generally called Kumu Honua, had a number of names – already mentioned; he was a tall, handsome, majestic looking person, and so was his wife. He was along upon the land for about one century (*kipaelui* or *kihipea*) before his wife Lalo Honua was created.
>
> Among the animals enumerated in the legend as dwelling in peace and comfort with Kumu Honua in Kalani i Hauola were:
>
> Ka puaa nui Hihimanu a Kane (the large Hihimanu hog of Kane); ka ilio nui niho oi a Kane (the large sharp-toothed dog of Kane); <u>ka ilio holo i ka uaua a Lono (the dog running at the voice of Lono)</u>; ka puaa maoli (the common hog); ka ilio alii a Kane (the royal dog of Kane); na moo (lizards)… (Fornander, 1916-1920), <u>emphasis added</u>).

This reference is the only known description of the linkage between the god Lono and the monk seal and the only known account of the term "*ka-ilio-holo-i-ka-uaua-a-Lono*." The association with Lono is also interesting because dogs are typically associated with the god Kane and many other ocean animals are associated with the god Kanaloa.

Another reference to the monk seal may exist in the *moʻolelo* (oral tradition) about the god Hiʻiakaikapoliopele (Hiʻiaka), whose travels through the archipelago are recorded in a lengthy and detailed chant. In a translated version of the chant, Hiʻiaka describes an area on the island of Oʻahu (Kaʻōʻio Point): "there is a plain on the inland side and dangerous waters seaward, a place renowned in the saying, 'Lie calmly in the sea of your chief.' As we go along we will reach Makaua, land of the Maʻakua rain. That is where the ʻīlio hā of Kāne dwells, named Kauhikeʻīmakaokalani, an uncle of ours" (Nogelmeier, 2006), emphasis added). In the story that follows, Hiʻiaka describes, " ʻīlio hā is like saying ʻīlio kāhā, an oversized, hulking dog, the same way a pig can be oversized. It means it is huge, heavy, plump, and fleshy. But this dog-uncle of ours you see there has the body of a massive dog, and the largest expanse of his fur is on his head and neck…" (Nogelmeier, 2006).

Though it is unknown if this description explicitly refers to monk seals, the description of the ʻīlio hā as "huge, heavy, plump, and fleshy" and as an "oversized" dog is reminiscent of the physical appearance of monk seals. Unlike the previous *moʻolelo*, in this story the seal-like animal is associated with the Hawaiian god Kane, who is traditionally associated with dogs.

Hawaiian Place Names

Hawaiian place names serve a variety of functions but commonly convey cultural information and associations with geographical features (Pūkui et al., 1974). Place names are often understood, interpreted, and perpetuated within traditional *moʻolelo* (oral traditions) that developed in a place-based manner. We performed a search through cartographic and archival sources to identify places in the Hawaiian Islands that potentially reference monk seals. We also undertook several site visits at places believed to be named for monk seals, and captured additional information about these place-names in interviews with local residents and through personal observations.

Several sites in the Hawaiian archipelago were found to possess names that likely reference the Hawaiian monk seal and many other sites were found with names warranting more investigation. One site is located on the remote Kalaupapa peninsula on the rugged north coast of Molokaʻi, which has functioned since historical times as an isolated colony for persons with Hansen's disease. A small cape and bay in the area, named ʻĪlio-piʻi, is translated literally as "climbing dog" (Pūkui et al., 1974). The historical name seems appropriate, as monk seals commonly pup on beaches in this area in modern times. Another site, Lae o Ka ʻĪlio, is located in the Hāʻena community on the rural north shore of Kauaʻi island. Andrade (2008) writes that Lae o Ka ʻĪlio translates to "the headland of the dog," and "refers to the endangered Hawaiian monk seal known to Hawaiians as *ʻīlio hele i ka uaua* (dog running in the rough seas). Residents saw seals there even in the days before the federally established laws now protecting them caused a dramatic increase in their numbers in the main Hawaiian islands" (Andrade, 2008). Finally, the modern name Holoikauaua has been given to Pearl and Hermes Atoll in the NWHI (Kōmike Huaʻōlelo, 2003). The name "celebrates the Hawaiian monk seals that haul out and rest" at the atoll (USFWS et al., 2008). Each of these place names possesses significant ecological importance for the monk seals in current context, and at least two, ʻĪlio-piʻi on Molokaʻi and Lae o Ka ʻĪlio on Kauaʻi, are historical names that likely reference places where monk seals were common in historical times.

Numerous additional sites throughout the archipelago may warrant more research, including: Kaneʻīlio, Kūʻīlioloa, and Puʻuanahulu. Pūkui notes that Puʻuanahulu was "perhaps named for a supernatural dog of that name; see Ka-lae-o-ka-ʻīlio" (Pūkui et al., 1974). The reference to Ka-lae-o-ka-ʻīlio reads: "points at Kona, Hawaiʻi; Kau-pō, Maui; northwest Molokai (also called ʻĪlio and Ka-ʻīlio). Lit., the cape of the dog. (At the Kona point in a sea pool is the body of Anahulu, a supernatural dog that was changed to stone by Pele. See Puʻu-anahulu)" (Pūkui et al., 1974). Lae o Ka ʻĪlio point on the northwest tip of Molokaʻi, also known as ʻĪlio point, bears similarity in name to the site in Kauaʻi. The Hawaiʻi Department of Land and Natural Resources has linked the ʻĪlio Point, or Kalaeokailio, to an ancient legend of a red dog, rather than a monk seal (DLNR, 2009 [citing Ne et al., 1992]), but monk seals are found in the area (Duvall II, 2009). Another place name is Kīpahulu in the Hāna district of Maui, but interviewees indicated this site was used by seabirds and did not know of any association with the monk seal. Finally, a *heiau* (ritual site) in the Waiʻanae district of Oʻahu island is named Kūʻilioloa ("The long dog form of Kū"), and *moʻolelo* about this site reference a dog that would bark at the ocean when enemies were coming. Respondents that identified this site said that although the name has *ʻilio* (dog) in it, it does not necessarily mean it was named after the monk seal.

Interviews in Native Hawaiian Communities

We interviewed a representative cross-section of individuals with different knowledge sets, resource use patterns, perspectives and expertise to uncover cultural information about the Hawaiian monk seal. We also reviewed existing interviews that focused on monk seals, marine environments and similar topics for context. All interviewees indicated that monk seals were relatively new to ocean users in the MHI, with the first personal observations dating to the 1940s and most respondents not indicating experiences with the monk seal until the 1960s or after. These observations were consistent with previously published ethnographic research among local fishermen and community elders (*kūpuna*) in the Hawaiian Islands suggesting perceived rarity among tenured ocean users until the past few decades (Maly and Maly, 2003a–d, 2004). Many respondents noted that their encounters with monk seals have increased in the past few decades, and these perceptions were similar to those expressed by some community members at public meetings about the monk seal (ERM – West Inc., 2011). A separate survey effort indicated that more than 80% of respondents had personally encountered monk seals in the MHI, but their knowledge of the species was relatively limited (SRGII, 2011).

Respondents exhibited a plurality of views regarding the monk seal, ranging from hostility or ambivalence to strong feelings of conservation and stewardship. This suggests lack of a consensus in the Native Hawaiian community regarding the monk seal and heterogeneity in perceptions and socio-cultural values associated with the species.

Among interviewees who expressed positive views about the monk seal, a small subset of indicated a strong socio-cultural association with the species. Some interviewees described families on Hawaiʻi and Oʻahu islands that consider the species to be *ʻaumakua*, the "family or personal gods, deified ancestors who might assume the shape of…[various animals]" (Pūkui and Elbert, 1986). *ʻAumakua* are traditionally protected by their associated families and various cultural protocols are followed to steward the relationships between the family and their spiritual

guardian. Notably, the monk seal is not named as a common *ʻaumakua* (Pūkui and Elbert, 1986), but this does not necessarily mean that the families have recently adopted this cultural association. *ʻAumakua* can be associated with families for many generations, reaching far back into history, or can be recent additions based on events that carry special cultural meaning and significance. Additionally, some communities have conducted spiritual ceremonies for monk seals during which the monk seal is recognized as part of the *ʻohana*, or family. Respondents have said that the details of such activities are deliberately kept *hūnā*, or secret.

Some respondents shared *moʻolelo* (oral traditions/stories) about monk seals that indicated a mythological association with the species. In one account from the island of Molokaʻi, a *kupuna* (community elder) told of a monk seal who appeared in the area in 1947 and washed up without a head. The *kupuna* indicated it was the work of Kauhuhu, the famed shark god of the area who patrolled the waters from Moananui to Pelekunu. Another *moʻolelo* from Hawaiʻi Island tells of a pair of lovers who suffered the wrath of the jealous shark god Kua. After his affections were spurned, he curses the woman, turning her into a monk seal and her male companion into a dragonfly so the two could not be together. The pair was later reunited in their human forms by the god Kū (Appendix). These *moʻolelo* indicate a historical cultural association with the monk seal, but appear to be limited to a few places where familial traditions have preserved the stories.

For some *kūpuna*, the specific origins of the animal and its significance in Hawaiian culture are irrelevant, as the traditional Hawaiian sense of stewardship extends to all species and the environment. One respondent, for example, expressed, "whether they are 'hānai' [adopted] or 'hānau' [born of, as in a son or daughter], monk seals are part of the ocean and we, humans, have an obligation to protect them." This perspective has also been shared by other community elders interviewed about the monk seal (Seldon and Lucas, 2010, Watson, 2010). These views indicate an modern, evolving socio-cultural significance ascribed to the species by some interviewees, who draw on traditional conceptions of environmental and resource stewardship in relation to the species.

While some Native Hawaiian community members hold positive views about the monk seal, others view the monk seal negatively and do not associate any cultural significance to the species historically or in modern times. Among these respondents, the seal is viewed as endemic to the NWHI but not to the MHI. Some respondents view the seal as an invasive species in the MHI and believe the seal should remain in the NWHI only. Respondents commonly cite the lack of Hawaiian cultural references to the seal in traditional chants, hula [dance] and other knowledge forms. Other respondents pointed to the lack of evidence that the monk seal was ever used for food, tools, weapons, fabrics, medicine, or combustible material. One respondent emphasized that, "everything in Hawaiʻi had a common use… since there was no [use], then it must not be native." Other respondents pointed to the lack of monk seal bones (*ʻiwi*) found in archeological excavations or petroglyphs (*kiʻi pōhaku*) depicting monk seals. Respondents on Maui were not aware of any place names, sacred sites (*wahi pani*) or fishing shrines (*koʻa*) named after the monk seal. They also mentioned that their *kūpuna* (elders) never mentioned the monk seal, and that they did not know of any families that regarded the monk seal as their *ʻaumakua* (spiritual family guardian).

The most commonly cited source of human-monk seal conflict is negative interactions with fishers (primarily men in Hawai‘i). Fishing has a long history in Hawai‘i and is embedded in the socio-cultural traditions and subsistence lifestyles of Hawaiian communities (Glazier, 2007, Titcomb, 1972). Monk seals are viewed by Native Hawaiian fishers and their families as direct competitors, in that they preferentially take fish specifically targeted by fishers. Many respondents believe that when interactions occur, they inhibit the ability of fishers to provide food for the household. Other fishers cite the aggressive behavior of monk seals as a major problem. Common interactions include seals taking fish off of lines or out of fishers' nets, but increasingly seals are interacting with boats and fishermen directly – in some cases, fishers have been bitten by monk seals. These interactions are viewed by some as impacting cultural fishing practices, and are further compounded by existing regulations that restrict fishing and the depleted condition of fisheries resources in the MHI.

Among respondents who view the species negatively, the belief that the monk seal is not endemic is exacerbated by the prohibitions against interacting with the seal. Some respondents state the perspective that modern cultural knowledge cannot be generated because the monk seal "cannot be touched and used for anything." Restrictions on use have precluded indigenous communities from perpetuating cultural traditions for other protected species such as sea turtles (Kinan and Dalzell, 2005, Rudrud, 2010). Ancient cultural knowledge is believed to be non-existent due to the recent arrival of the monk seal in the MHI, but respondents also suggested that modern knowledge of the seal will accrue with the current generation that is interacting with the monk seal. A key question among this group is how seals will be integrated into Hawaiian culture and what will the cultural exchange be with the species in the modern context.

In a few unique places in the archipelago monk seals are regarded as a natural part of the ecosystem and human-monk seal conflicts appear to be minimal (Figure 2). These areas tend to be rural and fairly isolated communities that are characterized by a higher degree of self-sufficiency, and where familial traditions and local decision-making processes are preserved. On Ni‘ihau Island, for example, monk seals became established nearly three decades ago. Community members discussed the social impacts associated with monk seal colonization (e.g, increased presence of sharks), and ultimately decided to act as stewards of the animals (Robinson, 2008). As a result, a sub-population has become established and residents have developed a stewardship ethic towards the species. A similar situation is occurring in the isolated Kalaupapa community on Moloka‘i Island, where another sub-population is thriving in the MHI, and where community residents largely leave seals alone. In these communities, fishers and other ocean users will move away from areas where seals are visible in order to minimize interactions.

Figure 2: ‘Īliopi‘i point, Kalaupapa peninsula, Moloka‘i, a rural community that has developed a relatively conflict-free relationship with monk seals. As a result, monk seals have flourished in this area. Photo by Patrick Doyle.

Discussion

Findings of the archival research component of this project suggests that the Hawaiian monk seal was likely extirpated in the main Hawaiian Islands soon after voyaging Polynesians settled in the archipelago. Though several other competing hypotheses remain (Watson et al., 2011), based on our review of the available information the most likely explanation is that seal populations were probably rapidly diminished by human hunters and harassment from their commensals. This theory has been advanced before in several forms (e.g. Kenyon, 1980), but to our knowledge has not been substantiated with a comprehensive review and analysis of archival sources. Monk seals remained rare in the MHI through the early historical period, and were hunted to near extinction once populations were discovered in the NWHI. In the post-sealing era of the early 20th century, various human perturbations in the NWHI kept populations relatively low until the species was protected under the Endangered Species Act in the 1970s (Kenyon, 1972, Kenyon, 1980). Starting in approximately the mid-1990s seal populations have increased in the MHI, leading to increased conflicts with ocean users (Baker and Johanos, 2004).

Cultural Endemism and the Heterogenous Production of Knowledge

Our research on the socio-cultural significance of the species suggests that the monk seal is not uniformly known among Native Hawaiian communities. There is little evidence that monk seals played a significant role in traditional Hawaiian culture in prehistoric (<AD 1778) or historical times. The cultural references to the monk seal that were found appear to be sequestered in specific knowledge systems ascribed to either a specific geographic location, familial association or oral tradition. Cultural information about the species is also inconsistent in Native Hawaiian cultural knowledge forms. For example, the reference to *ka-ʻīlio-holo-i-kauaua-a-Lono* associates monk seals with the god Lono, while other *moʻolelo* point to an association with a different god (e.g. Kū; Kane) or to a local demi-god or place name. Knowledge thus appears to be heterogenous in distribution among Native Hawaiian knowledge domains.

We advance the notion of 'cultural endemism' to explain how socio-cultural knowledge domains evolve and are maintained in society. We define cultural endemism as the set of socio-cultural values, norms, practices and traditions that develop in a place-specific context for a discrete or set of linked natural or anthropogenic phenomenon. The development of cultural endemism for a species appears to be a result of reciprocal interactions, whereby the most vulnerable taxa are reduced faster than the development of a cultural profile, and high-value resources that are more resistant to initial impacts become more fully integrated into traditions, values and practices (Kittinger et al., *In Review*).

Our research on the monk seal suggests that although the monk seal is biologically endemic, the species is not uniformly culturally endemic in Hawaiian communities. This heterogeneity can be explained by two processes, including: 1) Species rarity and non-uniform distribution in prehistoric and historic times, and; 2) The dispersed mode of traditional knowledge production in Hawaiʻi. Historical patterns of anthropogenic impacts likely caused the monk seal to become rare ecologically in the MHI shortly after Polynesian settlement, and this pattern persisted into

the post-contact and modern eras. Ecological rarity likely precluded the uniform development of a cultural profile for monk seals and further integration into Native Hawaiian cultural practices and traditions. In some areas, monk seals have been incorporated into cultural lore and memory, but these cultural references appear to be rare and not widely known to the broader Native Hawaiian community.

Diversity and lack of consistency in cultural sources and contexts is also likely contributed to the dispersed manner in which knowledge is generated, maintained and built upon in Native Hawaiian communities. Traditionally, cultural knowledge systems accumulate at the local level through kinship networks and familial ties rooted in traditionally circumscribed communities, defined as mountain-to-sea systems based in single watersheds (*ahupuaʻa*). The local development of situated knowledge may have aggregated at higher levels through the indigenous governance systems that linked individual communities (*ahupuaʻa*) into regional districts (*moku*) and through the dispersal of cultural traditions. Because knowledge was preserved in non-written forms (e.g. oral, dance traditions), the production of knowledge resulted in a heterogenous, poly-rhetoric knowledge landscape with variation due to social and environmental geography (Nogelmeier, 2010a). The dispersed knowledge production system explains spatial variation in cultural practices and traditions, and is likely responsible for the different names, cultural associations and significance ascribed to monk seals. Ecological rarity may have further contributed to the development of different patterns of cultural endemism in geographically defined communities and may explain inconsistencies in oral traditions and names.

Though historically monk seals may no have been uniformly endemic to Native Hawaiians, the species is currently developing a more substantive cultural profile in contemporary Hawaiian communities. This is due in part to the increased occurrence of monk seals in the MHI, making them more common throughout the MHI. Perceptions of the monk seal appear to be dichotomous, with one epistemic community that views monk seals as alien and another set of communities that have retained, enhanced or engendered a Native Hawaiian cultural association with monk seals. Community members adverse to the monk seal associate little or no historical cultural references to monk seals, primarily include fishers and their families. Such persons tend to associate the monk seal with increased restrictions on cultural activities and practices, particularly fishing.

Communities that are developing a more substantive cultural profile for monk seals are dispersed and tend to be rural, somewhat isolated, and less integrated in the socio-economic systems that support urban communities in the archipelago. McGregor has termed such communities as cultural *kīpuka*, where traditional livelihoods, cultural practices and lifeways have persisted relatively untouched, and which provide the seeds by which Native Hawaiian culture is regenerated, relearned and revitalized in the setting of modern Hawaiʻi (McGregor, 2007). Kikiloi (2010) has posited that this process of re-learning and developing new knowledge is a fundamental aspect of sustaining a Hawaiian cultural identity and spiritual connections to land and place. Notably, integration of traditional knowledge systems with western conceptions and methodologies occurred historically (Beamer and Duarte, 2006) and is increasingly becoming common in the modern context (Jokiel et al., 2011).

Waldman has described a process of "eco-social anomie," where as species disappear, they lose both relevance to a society and the constituency to champion their revival, further hastening their decline (Waldman, 2010). In the case of the monk seal, the process appears to be the reverse. The re-colonization of the MHI by monk seals over the past few decades has enlivened user conflicts and has brought to the forefront conflicting values and perceptions of the species. The future development of a cultural profile for monk seals will depend largely upon how Hawaiian communities will interact with the species.

Applying Socio-Cultural Dimensions of Wildlife to Conservation

From a social perspective, understanding how humans interacted with protected species in the past and in contemporary communities can help inform modern management and conservation actions (Cordell et al., 1999, Tarrant et al., 1997, Watson et al., 2011). The management of endangered monk seal populations, for example, will likely depend in part on the ability of managers and their conservation programs to engage productively with island communities in stewardship and recovery efforts. Social research in these communities can provide critical information regarding the values and perceptions of local stakeholders, and archival research can help further clarify how human-monk seal relationships have changed through time.

As the monk seals have increased in the MHI, community concerns have emerged about the affect this increased population will have on valued cultural resources and subsistence activities, including fishing. Among some community members, there is a strongly held belief that the monk seal is not culturally endemic, which is a concern for species conservation efforts as interactions with ocean users are likely to increase. The MHI provide increased habitat and carrying capacity, particularly in the availability of sandy beaches (Ragen, 2002), and the establishment of small but growing rookeries in habitats in the MHI provide an important hedge against the possibilities of future major perturbations (e.g. hurricanes, oil spills). Among community members who hold adverse views about the monk seal, the limited information about historical cultural associations may help to alleviate some beliefs and misperceptions, but continued views of the monk seal as alien to Hawaiian culture are likely to persist among some community members and may have historical precedent in Hawaiian language newspapers and the Kumulipo. On the other hand, some communities have independently developed stewardship programs and have minimized human-monk seal conflicts.

This heterogeneity in values and perceptions among Hawaiian communities could help inform or pro-actively evaluate specific management actions. For example, the current practice of translocation of seals from the NWHI to the MHI is viewed as an egregious practice by many fishers, both because of the perceived threat of additional monk seals as competitors for fisheries resources, but also as evidence of the intrusion of federal government programs on local customs and practices. Translocations, and other management actions that may increase user conflicts, ideally should be evaluated within a spatial context to minimize conflicts with specific user groups and may also be aided through involvement of user groups and stakeholders in participatory decision-making processes.

In conclusion, it appears that ecological rarity may have precluded the consistent development of a cultural profile for monk seals in the Hawaiian archipelago. The species is not uniformly

culturally endemic in Hawaiian communities, but our research has revealed significant evidence of cultural associations and supports the notion that the species were not unknown to Hawaiian communities in historical times. The future of monk seal recovery will depend in part on the productive engagement of Hawaiian stakeholder groups, which can be aided by assessments of socio-cultural values, perceptions and practices associated with species and the environments in which they are embedded.

References

Allen, M.S. (2007) Three millennia of human and sea turtle interactions in remote Oceania. *Coral Reefs* **26,** 959-970.

Alu Like Inc., Hale Kuamoʻo, Bernice P. Bishop Museum (2006) Hoʻolaupaʻi: Hawaiian Nūpepa Collection. Online Database. [online] www.nupepa.org.

Andrade, C. (2008) *Hāʻena: Through the Eyes of the Ancestors,* University of Hawaiʻi Press, Honolulu.

Anonymous (1857) The French Man-o-War Eurydice...ʻelepani o ke kai. Ka Hae Hawaii [Hawaiian Language Newspaper], Book 7, pg. 25, 14 May 1857. Honolulu.

Antonelis, G.A., Baker, J.D., Johanos, T.C., Braun, R.C., Harting, A.L. (2006) Hawaiian monk seal (*Monachus schauinslandi*): status and conservation issues. *Atoll Research Bulletin* **543,** 75-101.

Athens, J. (2009) Rattus exulans and the catastrophic disappearance of Hawaiʻi's native lowland forest. *Biological Invasions* **11,** 1489-1501.

Baker, J.D., Johanos, T.C. (2004) Abundance of the Hawaiian monk seal in the main Hawaiian Islands. *Biological Conservation* **116,** 103-110.

Balazs, G.H., Whittow, G.C. (1979) Revised bibliography of the Hawaiian monk seal: Monachus schauinslandi Matschie 1905. Sea grant Miscellaneous Report UNIHI-SEAGRANT-MR-79-03, University of Hawaiʻi, Sea Grant College Program.

Barbour, R.S. (2001) Checklists for improving rigour in qualitative research: A case of the tail wagging the dog? *British Medical Journal* **322,** 1115-1117.

Bath, A.J. (1998) The role of human dimensions in wildlife resource research in wildlife management. *Ursus* **10,** 349-355.

Baxter, J., Eyles, J. (1997) Evaluating qualitative research in social geography: Establishing 'rigour' in interview analysis. *Transactions of the Institute of British Geographers* **22,** 505-525.

Beamer, B.K., Duarte, T.K.e. (2006) Mapping the Hawaiian Kingdom: a colonial venture? *Hawaiian Journal of Law and Politics* **2,** 34-52.

Beckley, E.M. (1883) Hawaiian fisheries and methods of fishing with an account of the fishing implements used by the natives of the Hawaiian Islands. *Advertiser Steam Print,* Honolulu.

Beckwith, M.W. (1951) *The Kumulipo: A Hawaiian Creation Chant,* University of Chicago Press, Chicago.

Beechert, E.D. (1991) *Honolulu: Crossroads of the Pacific,* University of South Carolina Press, Columbia, SC

Bentrupperbaumer, J.M., Day, T.J., Reser, J.P. (2006) Uses, meanings, and understandings of values in the environmental and protected area arena: A consideration of ìWorld Heritageî values. *Society & Natural Resources* **19,** 723-741.

Bernard, H.R. (2006) *Research methods in anthropology: qualitative and quantitative approaches,* AltaMira Press, Oxford, U.K.

Burney, D.A., James, H.F., Burney, L.P., *et al.* (2001) Fossil evidence for a diverse biota from Kauaʻi and its transformation since human arrival. *Ecological Monographs* **71,** 615-641.

Clark, T.W., Reading, R.P., Clark, A.L. (1994) *Endangered species recovery: finding the lessons, improving the process,* Island Press, Washington, DC.

Cobb, J.N. (1905) *The commercial fisheries of the Hawaiian Islands in 1903. Appendix to the report of the commissioner of fisheries to the secretary of commerce and labor for the year ending June 30, 1904. Pages 433-512*, Department of Commerce and Labor, U. S. Bureau of Fisheries, Government Printing Office, Washington, DC.

Cordell, H.K., Hoover, A.P., Super, G.R., Manning, C.H. (1999) Adding human dimensions to ecosystem-based management of natural resources. In: *Integrating Social Sciences with Ecosystem Management: Human Dimensions in Assessment, Policy, and Management*. (Eds. H.K. Cordell, J.C. Bergstrom), Sagamore, Champaign, IL, pp. 1-12.

DLNR. (2009) Draft Report for the ʻĪlio Point Natural Area Reserve. State of Hawaiʻi, Department of Land and Natural Resources (DLNR), Honolulu. [online] http://hawaii.gov/dlnr/dofaw/nars/reserves/molokai/ilio-point

Duvall II, F.P. (2009) *Management Documents: ʻĪlio and Koa Special Areas: ʻĪlio Point Molokaʻi*. State of Hawaiʻi, Department of Land and Natural Resources, Honolulu. [online] http://hawaii.gov/dlnr/dofaw/nars/reserves/molokai/ilio-point

ERM – West Inc. (2011) Scoping summary report: Hawaiian monk seal recovery actions programmatic EIS. National Marine Fisheries Service, Pacific Islands Regional Office. [online] http://www.nmfs.noaa.gov/pr/pdfs/permits/eis/01-31-2011_final_scoping_report.pdf

Fornander, A. (1916-1920) *Fornander Collection of Hawaiian Antiquities and Folk-Lore*, Memoirs of the Bernice P. Bishop Museum, Vol. 4-6. Bernice P. Bishop Museum Press, Honolulu.

Gilmartin, W.G. (2002) Responses of Hawaiian seals to human disturbance and handling. In: *Background Documents: Workshop on the Management of Hawaiian Monk Seals on Beaches in the Main Hawaiian Islands*. Marine Mammal Commission, National Marine Fisheries Service, Hawaii Division of Aquatic Resources, 29-31 October 2002, Koloa, Kauai, Part 7.

Glaser, B., Strauss, A. (1967) *The discovery of grounded theory: strategies for qualitative research*, Aldine, New York.

Glazier, E.W. (2007) Hawaiian fishermen. In: *Case Studies in Cultural Anthropology*. (Eds. G. Spindler, J. Stockard), Thomson/Wadsworth, pp. 1-145.

Glazier, E.W., editor. (2011) *Ecosystem-based fisheries management in the western Pacific*, Blackwell/Wiley, Hoboken, NJ.

Handy, E.S.C., Pūkui, M.K. (1972) *The Polynesian Family System in Kaʻu Hawaiʻi*, C. E. Tuttle Company, Rutland, VT.

Hanneman, R.A. (2001) Introduction to Social Network Methods. Online text for UCINET software. University of California, Riverside. Available online at http://faculty.ucr.edu/~hanneman/SOC157/NETTEXT.PDF

Hiruki, L.M., Ragen, T.J. (1992) A compilation of historical monk seal, Monachus schauinslandi, counts. U.S. Department of Commerce, NOAA Technical Memorandum NMFS, NOAA-TM-NMFS-SWFSC-172.

Ii, J.P. (1993) *Fragments of Hawaiian History*. Translated Hawaiian to English by Mary Kawena Pūkui, Dorothy B. Barrère, ed., Bishop Museum Press, Honolulu.

Jacobson, S.K., Duff, M.D. (1998) Training idiot savants: the lack of human dimensions in conservation biology. *Conservation Biology* **12,** 263-267.

Jokiel, P.L., Rodgers, K.S., Walsh, W.J., Polhemus, D.A., Wilhelm, T.A. (2011) Marine resource management in the Hawaiian Archipelago: the traditional Hawaiian system in relation to

the western approach. *Journal of Marine Biology* **2011,** Article ID 151682, doi:151610.151155/152011/151682.

Kamakau, S.M. (1992) *The people of old*. Translated from the newspaper Ke Au 'Oko'a by Mary Kawena Pūkui; arranged and edited by Dorothy B. Barrère; illustrated by Joseph Feher.

Kaneshiro, K.Y., Chinn, P., Duin, K.N., Hood, A.P., Maly, K., Wilcox, B.A. (2005) Hawai‘i’s mountain-to-sea ecosystems: social–ecological microcosms for sustainability science and practice. *EcoHealth* **2,** 349-360.

Kellert, S.R. (1985) Social and perceptual factors in endangered species management. *The Journal of Wildlife Management* **49,** 528-536.

Kellert, S.R. (1986) Social and perceptual factors in the preservation of animal species. In: *The preservation of species*. (Ed. B. Norton), Princeton University Press, Princeton, NJ, pp. 50-73.

Kenyon, K.W. (1972) Man versus the monk seal. *Journal of Mammalogy* **53,** 687-696.

Kenyon, K.W. (1980) No man is benign: the endangered monk seal. *Oceans* **13,** 48-54.

Kenyon, K.W., Rice, D.W. (1959) Life history of the Hawaiian monk seal. *Pacific Science* **13,** 215-252.

Kikiloi, K. (2010) Rebirth of an archipelago: sustaining a Hawaiian cultural identity for people and homeland. *Hūlili: Multidisplinary Research on Hawaiian Well-Being* **6,** 73-114.

Kinan, I., Dalzell, P. (2005) Sea turtles as a flagship species: different perspectives create conflicts in the Pacific islands. *Maritime Studies* **3,** 195-212.

Kirch, P.V. (1985) *Feathered gods and fishhooks: An introduction to Hawaiian archaeology and prehistory,* University of Hawai‘i Press, Honolulu.

Kittinger, J.N., Pandolfi, J.N., Blodgett, J.H., *et al.* (In review) Historical reconstruction reveals recovery in Hawaiian coral reefs. *PLoS ONE*.

Kōmike Hua‘ōlelo. (2003) Māmaka kaiao: a modern Hawaiian vocabulary: a compilation of Hawaiian words that have been created, collected, and approved by the Hawaiian Lexicon Committee from 1987 through 2000. University of Hawaii at Hilo. Hale Kuamo‘o. University of Hawaii Press, Honolulu.

Kuykendall, R.S. (1929) Some early commercial adventures of Hawaii. Thirty-Seventh Annual Report of the Hawaiian Historical Society, pp. 15-33. Honolulu.

Kuykendall, R.S. (1938) *The Hawaiian Kingdom, Vol. I: 1778-1854 foundation and transformation,* University of Hawaii Press, Honolulu, Hawaii, USA.

Kuykendall, R.S. (1957) *The Hawaiian Kingdom, Vol. II: 1854-1874, Twenty Critical Years,* University of Hawaii Press, Honolulu, Hawaii, USA.

Kvale, S. (1996) *Interviews: An Introduction to Qualitative Research Interviewing,* Sage, London.

Maly, K. (2001) Mālama Pono I Ka ‘Āina – An Overview of the Hawaiian Cultural Landscape. Kumu Pono Associates LLC, Lana‘i City, Hawai‘i.

Maly, K., Maly, O. (2003a) "Hana ka lima, ‘ai ka waha": a collection of historical accounts and oral history interviews with kama‘aina residents and fisher-people of lands in the Halele‘a-Napali region on the island of Kaua‘i. Kumu Pono Associates LLC, Hilo.

Maly, K., Maly, O. (2003b) He wahi mo‘olelo no na lawai'a ma Kapalilua, Kona hema, Hawai‘i: a collection of historical accounts and oral history interviews with elder kama‘aina fisher-people from the Kapalilua region of south Kona, island of Hawai‘i. Kumu Pono Associates LLC, Hilo.

Maly, K., Maly, O. (2003c) Volume 1: Ka hana lawaiʻa a me na koʻa o na kai ʻewalu: a history of fishing practices and marine fisheries of the Hawaiian Islands, compiled from Native Hawaiian traditions, historical accounts, government communications, kama'aina testimony and ethnography. Kumu Pono Associates LLC, Hilo.

Maly, K., Maly, O. (2003d) Volume 2: Oral History Interviews. Ka hana lawaiʻa a me na koʻa o na kai ʻewalu: a history of fishing practices and marine fisheries of the Hawaiian Islands, compiled from oral history interviews with kupuna and kamaʻaina. Kumu Pono Associates LLC, Hilo.

Maly, K., Maly, O. (2004) Ka hana lawaiʻa a me na koʻa o na kai ʻewalu: Summary of detailed findings from research on the history of fishing practices and marine fisheries of the Hawaiian Islands, compiled from Native Hawaiian traditions, historical accounts, government communications, kamaʻaina testimony and ethnography. Kumu Pono Associates LLC, Hilo.

McGregor, D. (2007) *Na Kuaʻaina: Living Hawaiian Culture*, Bishop Museum Press, Honolulu.

Naughton, E.M. (1983) Hawaiians in the Fur Trade: Cultural Influence on the Northwest Coast, 1811-1875. MA Thesis, Western Washington University.

Nerveza, T.L. (2010) Cultural significance of the Hawaiian Monk Seal. University of Hawaiʻi at Hilo, Pacific Aquaculture and Coastal Resources Center, Hilo.

NMFS (2007) Recovery Plan for the Hawaiian Monk Seal (*Monachus schauinslandi*). Second Revision. National Marine Fisheries Service (NMFS). Silver Spring, MD. [online] www.nmfs.noaa.gov/pr/species/mammals/pinnipeds/hawaiianmonkseal.htm

Nogelmeier, M.P. (2006) *Ka Moʻolelo O Hiʻiakaikapoliopele (The Epic Tale of Hiʻiakaikapoliopele) (M. Puakea Nogelmeier, translator),* Awaiaulu Press, Honolulu.

Nogelmeier, M.P. (2010a) *Mai Paʻa I Ka Leo: Historical Voice in Hawaiian Primary Materials, Looking Forward and Listening Back*, Bishop Museum Press, Honolulu.

Nogelmeier, M.P. (2010b) Personal communication to J. N. Kittinger, 2 Sept. 2010.

Office of Hawaiian Affairs (2010) Papakilo Database. Office of Hawaiian Affairs. [online] http://www.papakilodatabase.com

Parker, H.H. (1922) A Dictionary of the Hawaiian Language (by Lorrin Andrews, revised by Henry H. Parker). Board of Commissioners of Public Archives, Honolulu.

Pūkui, M. K., Elbert, S.H. (1971) *Hawaiian dictionary: Hawaiian–English and English–Hawaiian, 4th Edition*. University of Hawaiʻi Press, Honolulu.

Pūkui, M.K., Elbert, S.H. (1986) *Hawaiian dictionary: Hawaiian–English and English–Hawaiian*, University of Hawaiʻi Press, Honolulu.

Pūkui, M.K., Elbert, S.H., Moʻokini, E.T. (1974) *Place names of Hawaiʻi*, University of Hawaiʻi Press, Honolulu.

Ragen, T.J. (2002) The role of the main Hawaiian Islands in the recovery of the Hawaiian monk seal. In: *Background Documents: Workshop on the Management of Hawaiian Monk Seals on Beaches in the Main Hawaiian Islands*. Marine Mammal Commission, National Marine Fisheries Service, Hawaii Division of Aquatic Resources, 29-31 October 2002, Koloa, Kauai, Part 5.

Ragen, T.J., Lavigne, D.M. (1999) The Hawaiian monk seal: biology of an endangered species. In: *Conservation and management of marine mammals*. (Eds. J.R. Twiss Jr., R.R. Reeves), Smithsonian Institution Press, Washington, DC, pp. 224–245.

Ragen, T.R. (1999) Human activities affecting the population trends of the Hawaiian monk seal. In: *Life in the slow lane: ecology and conservation of long-lived marine animals*. (Ed.

J.A. Musick), Proceedings of the Symposium: Conservation of Long-Lived Marine Animals, Monterrey, CA, USA, 24 Aug 1997. American Fisheries Society Symposium 23, Bethesda, Maryland, pp. 183-194.

Ralston, C. (1984) Hawaii 1778-1854: some aspects of maka‘ainana response to rapid cultural change. *The Journal of Pacific History* **19,** 21-40.

Rechtman, R. (2011) Personal communication on monk seal remains recovered on Kohala coast, to J. N. Kittinger

Robinson, K. (2008) Letter from Keith Robinson, Ni‘ihau Ranch, to P. Dalzell, Western Pacific Regional Fishery Management Council, dated 8 July 2008.

Romney, A.K., Weller, S.C., Batchelder, W.H. (1986) Culture as consensus: a theory of culture and informant accuracy. *American Anthropologist* **88,** 313-338.

Rosendahl, P.H. (1994) Aboriginal Hawaiian structural remains and settlement patterns in the upland archeological zone at Lapakahi, Island of Hawaii. *Hawaiian Archaeology* **3,** 14-70.

Rudrud, R. (2010) Forbidden sea turtles: Traditional laws pertaining to sea turtle consumption in Polynesia (Including the Polynesian Outliers). *Conservation and Society* **8,** 84-97.

Schatzman, L. (1991) Dimensional analysis: notes on an alternative approach to the grounding of theory on qualitative research. In: *Social organization and social process: essays in honor of Anselm Strauss*. (Ed. D.R. Maines), Aldine, New York, pp. 303-314.

Seaton, S. (1974) The Hawaiian “kapu” abolition of 1819. *American Ethnologist* **1,** 193-206.

Seidman, I. (1998) *Interviewing as Qualitative Research: A Guide for Researchers in Education and the Social Sciences*, Teachers College Press, New York.

Seldon, R., Lucas, J.B. (2010) Na Mea Hulu: "A Privilege to See". www.youtube.com [online] http://www.youtube.com/watch?v=jJsuqUAU_to

Shackeroff, J.M., Campbell, L.M. (2007) Traditional ecological knowledge in conservation research: problems and prospects for their constructive engagement. *Conservation and Society* **5,** e343-360.

Shackeroff, J.M., Campbell, L.M., Crowder, L.B. (2011) Social-ecological guilds: putting people into marine historical ecology. *Ecology and Society* **16,** 52 [online] URL: http://www.ecologyandsociety.org/vol16/iss51/art52/.

SRGII (2011) Public perception and attitudes about the Hawaiian monk seal: survey results report. A report submitted to Protected Resources Division, NOAA Fisheries by Sustainable Resources Group Intn'l, Inc. (SRGII), Kailua.

Tarrant, M.A., Bright, A.D., Cordell, H.K. (1997) Attitudes toward wildlife species protection: assessing moderating and mediating effects in the value-attitude relationship. *Human Dimensions of Wildlife* **2,** 1-20.

Thomas, G., James, D. (2006) Reinventing grounded theory: Some questions about theory, ground and discovery. *British Educational Research Journal* **32,** 767-795.

Titcomb, M. (1972) *Native use of fish in Hawaii*, The University Press of Hawaii, Honolulu.

Ulukau (2003) Ulukau: Hawaiian electronic library. Online Database [online] www.wehewehe.org

USFWS, NOAA, State of Hawai‘i (2008) Papahānaumokuākea Marine National Monument. Monument Management Plan. U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), State of Hawai‘i, Department of Land and Natural Resources, Honolulu.

Vitousek, P.M., Ladefoged, T.N., Kirch, P.V., *et al.* (2004) Soils, agriculture, and society in precontact Hawaii. *Science* **304,** 1665-1669.

Waldman, J. (2010) The natural world vanishes: how species cease to matter. *Yale Environment 360*, 8 April 2010. [online] http://e360.yale.edu/content/feature.msp?id=2258

Watson, T.K. (2010) Ho‘ailona and the Coming of the Seals, Ho‘oulu Lahui Aloha 159 (Video). Office of Hawaiian Affairs, Honolulu. [online] http://www.oha.org/hla/HLA159/

Watson, T.K., Kittinger, J.N., Walters, J.S., Schofield, T.D. (2011) Culture, conservation and conflict: assessing the human dimensions of Hawaiian monk seal recovery. *Aquatic Mammals* **in press**.

Wilmshurst, J., Hunt, T.L., Lipo, C.P., Anderson, A.J. (2011) High-precision radiocarbon dating shows recent and rapid initial human colonization of East Polynesia. *Proceedings of the National Academy of Science USA* **108,** 1815-1820.

Appendix

Table of Contents

1.0 Kumulipo
2.0 Moʻolelo of Hiʻiakaikapoliopele (Hiʻiaka)
3.0 Moʻolelo of Pinao and Kamālama at Ka Lae o ka ʻĪlio, Hawaiʻi Island
4.0 Historical English Language and Translated Hawaiian Language Sources
5.0 Hawaiian-Language Newspapers
6.0 Reference Cited

1.0 Kumulipo

Kumulipo (Beckwith, 1951)
Ka Wa Eone / Chant Six

0539. O kupukupu kahili o Kua-ka-mano
Many new fines of chiefs spring up
0540. O kuku ka mahimahi, o ka pihapiha kapu
Cultivation arises, full of taboos
0541. O ka holo [a]na kuwaluwalu ka linalina
[They go about scratching at the wet lands
0542. Holi [a]na, hoomaka, hoomakamaka ka ai
It sprouts, the first blades appear, the food is ready] [?]
0543. Ka ai ana ka piipii wai
Food grown by the water courses
0544. Ka ai ana ka piipii kai
Food grown by the sea
0545. Ka henehene a lualua
Plentiful and heaped up
0546. Noho poopoo ka iole makua
The parent rats dwell in holes
0547. Noho pupii ka iole liilii
The little rats huddle together
0548. O ka hulu ai malama
Those who mark the seasons
0549. Uku lii o ka aina
Little tolls from the land
0550. Uku lii o ka wai
Little tolls from the water courses
0551. O mehe[u] ka akiaki a nei[a] haula
Trace of the nibblings of these brown-coated ones
0552. O lihilihi kuku
With whiskers upstanding
0553. O peepee a uma

They hide here and there
0554. He iole ko uka, he iole ko kai
A rat in the upland, a rat by the sea
0555. He ‘iole holo i ka uaua
A rat running beside the wave
0556. Hanau laua a ka Pohiolo
Born to the two, child of the Night-falling-away
0557. Hanau laua a ka Poneeaku
Born to the two, child of the Night-creeping-away
0558. He nenee ka holo a ka iole uku
The little child creeps as it moves
0559. He mahimahi ka lele a ka iole uku
The little child moves with a spring
0560. He lalama i ka iliili
Pilfering at the rind
0561. Ka iliili hua ohia, hua ole o ka uka
Rind of the ‘ohi‘a fruit, not a fruit of the upland
0562. He pepe kama a ka po, hiolo i hanau
A tiny child born as the darkness falls away
0563. He lele kama a laua o ka po nee aku
A springing child born as the darkness creeps away
0564. O kama a uli a kama i ka po, nei la
Child of the dark and child in the night now here
0565. Po--no
Still it is night

2.0 Mo‘olelo of Hi‘iakaikapoliopele (Hi‘iaka)

Translation by M. Puakea Nogelmeier (Nogelmeier, 2006:161-162)

As Hi‘iaka travels through O‘ahu on her way to Kaua‘i, she describes an area near Ka‘ō‘io Point: “there is a plain on the inland side and dangerous waters seaward, a place renowned in the saying, ‘Lie calmly in the sea of your chief.’ As we go along we will reach Makaua, land of the Ma‘akua rain. That is where the ‘īlio hā of Kāne dwells, named Kauhike‘īmakaokalani, an uncle of ours”

The translation continues:

> “Hey, dear friend!”
>
> Wahine‘ōma‘o responded, “Yes?”
>
> Then Hi‘iaka asked, as her hand indicated a ridge of steep cliffs descending sharply to the read, “Do you see that line of cliffs overgrown with ti leaves?” Wahine‘ōma‘o agreed that she did, and her friend asked again, “Do you see that stone lying there, shaped like an ‘īlio, a dog, with the head, the body, and all the features of a dog?”

Looking carefully at the stone her friend pointed out, Wahineʻōmaʻo could make out a great strong that looked just like a dog lying down with its head up, facing inland of the cliff. When Wahineʻōmaʻo had spotted the stone, she said, "Oh Hiʻi, I do see the stone you are talking about; it is like a great dog. But our dogs are tiny, and that one is huge. That is amazing. Was that rock craft like that by the people of this pace? What is the nature of that stone, my friend?"

"That is no stone carved by man, but rather the rock form of one of our uncles, one I mentioned to you. That is Kauhikeʻīmakaolani. He is the ʻīlio hā that Kane brought from Kahiki, and he is always seen yonder, at Kaʻōʻio Point, that high spot before one reaches the flatlands on the way to Kāneʻohe. The third place where he's often seen is at the mouth of Nuʻuanu Valley, where one enters Kahaukomo.

As I told you, this ʻīlio hā belongs to Kāne, and his lineage is recited, for he is from Kumuhonua and his wife Polohina. His lineage chant is a prayer memorized by our ancestors. Just so you will understand, I shall show you a bit of that prayer, and here it is."

And then Hiʻiaka recited the prayer below, shown here by the writer as a hay in this version of the Story of Hi`iaka.

[CHANT SIXTY-TWO]

The supernatural ʻīlio hā rules the island
Born of the royal ones, Kūhonua
Polohaina as his wife
Royal ones made scared by Kāne

"And what is an ʻīlio hā?" Wahineʻōmaʻo asked her friend.

"Yes, replied Hiʻiaka, going on to say, "There is much confusion among people about this thing, an ʻīlio hā. Some thought it was a form of moʻo [lizard], but that is not true. ʻĪlio hā is like saying ʻīlio kāhā, an oversized, hulking dog, the same way a pig can be oversized. It means it is huge, heavy, plump, and fleshy. But this dog-uncle of ours you see there has the body of a massive dog, and the largest expanse of his fur is on his head and neck …"

3.0 Moʻolelo of Pinao and Kamālama at Ka Lae o ka ʻĪlio, Hawaiʻi Island

The following is an oral tradition and story (*moʻolelo*) from a kūpuna interviewed on Hawaiʻi Island, near Ka Lae o ka ʻĪlio ("the cape of the dog"), about the monk seal. Names and some information have been withheld to protect the identity of the respondent.

Respondent:

I'm from Ka'ū [Hawai'i Island], but originally I come from Moloka'i, from the area called Kalama'ula. I relocated here [to Ka'ū] because of my husband. My husband was a cowboy by trade.

Today I'm going to share with you a little mo'olelo, a little story that comes from the opposite end called Ka Lae. A lot of people call this area South Point, but it's really Ka Lae.

Now in this area, there was this young woman and her name was Kamālama. And Kamālama had a good friend who she loved dearly and his name was Pinao.

Well Pinao and Kamālama were always happy together. They loved each other dearly.

But one day, Kua, the Shark God, he's traveling the moana, the ocean. He sees her [Kamālama] [heart fluttering motion]. Hū [oh] my goodness, he loves this young lady.

No. She don't want him at all.

Kua is very upset; and so Kua causes a pō'ino. He puts a curse on this young lady, Kamālama, and Pinao.

And, Kamālama no longer stays as a woman; but she withdraws to the ocean and she becomes an *'aukai*, a sea-god or a seal. And poor Pinao. Pinao who stands so very tall; now begin to bear wings and he begin to flutter and fly. He becomes a dragonfly. Auē! They no longer can be together.

And whenever Kamālama come up to the white sand, at this particular beach, she's not able to embrace her good friend Pinao. And Pinao, he comes and he flutters down upon her, and he is no longer able to hold her anymore.

Well, the god Kū, finally comes to realize what is happening; and he feels love and compassion for this young couple, for this young man and this young lady. And so what happens: Kū decides that this should not happen, that Kua's jealousy gets in the way. And so, the god Kū decides to make a new rule, and he says: when Nā Huihui [reference to the star cluster Nā-Huihui-a-Makali'i, otherwise known as Pleiades, whose rise & fall in the Hawaiian night skies marks the start and end of the Makahiki Season, generally from end Oct/beg Nov to end Jan/beg Feb] all the stars shine during these particular months then this young man and this young lady will be able to have the… This young man and this young lady will be able to share this time to Kū, to take on their human forms again, so that they will no longer be this dragonfly, nor will she be this *'aukai*, this seadog or this seal of the ocean.

And so from the months of October, November, December [until] part of February, they then take on this form, and they come back to who they really were; and they're able to enjoy each other's company, and to embrace each other once again.

And so this is the short story of Pinao and Kamālama. I'm not sure if that's what you was looking for.

I doubt if you're going to find it in any books, like you do [the mo'olelo of] Kauila because I heard this, again, from my father-in-law.

When he was here, he was busy sharing things. And he was trying to recall things and I didn't realize what he was doing is recalling because he was going to go on his journey [pass away]. He was going to leave us.

And so, um, most of the stories that I am sharing every now and then, I haven't seen it in any book. So, and, I haven't shared this, except for my own family. This is the first time I've shared it outside.

4.0 Historical English Language and Translated Hawaiian Language Sources

Early observations of the Hawaiian Islands were recorded by explorers, traders and merchants, whaling and sealing crew members and captains, missionaries and Native Hawaiians. These written accounts vary with respect to their description, but most contain information about coastal environments and social relationships with these ecosystems. Of the sources listed below (summarized in part by Marion Kelly in the forward to Freycinet, 1978), no references to the Hawaiian monk seal were found (Watson et al., 2011).

List of Sources:

Arago 1823, 1971
Bingham 1849
Broughton 1804
Byron 1826
Cook 1842; 1999; Cook and King 1784
Campbell 1825
Corney 1965
Ellis 1826
Eveleth 1829
Franchère 2007
Ii 1993
Kamakau 1961, 1976, 1992, 1993
Kotzebue 1821
Krusenstern 1821
La Pérouse 1807
Langsdorft 1817
Ledyard 1781
Lisiansky 1814
Malo 1951
Mathison 1825
Meares 1790
Mortimer 1791
Portlock & Dixon 1789
Quimper Benitez del Pino 1822

Stewart 1828
Turnbull 1813
Vancouver 1798, 1801

5.0 Hawaiian-Language Newspapers

Misc. Notes	‘Ōlelo Hawai‘i (Hawaiian)	English translation
KHH 1a before & 1a (& 1 b before & b/c)	**Ka Hae Hawai‘i** ‘Okatoba 19, 1859, 115 [‘Ao‘ao 6, Paukū 1] Ha‘awina XXIV. No ke kākau hō‘ike ‘ana i nā moku. Paukū 630. ‘A‘ole e pono ke kākau hō‘ike iā kekahi moku ma kēia Aupuni, ‘a‘ole ho‘i e mana‘o iā kekahi moku, he moku Hawai‘i i loa‘a nā pōmaika‘i i pili i nā moku Hawai‘i, ke ‘ole ‘o ia ka waiwai pono‘ī a kekahi kanaka kupa a mau kānaka ho‘okupa ‘ia paha o kēia Aupuni. Akā ho‘i, ‘o hiki nō ke kākau hō‘ike iā kekahi moku, i ho‘omākaukau ‘ia no ka lā… [‘Ao‘ao 1, Paukū 1 (ka hopena a ka paukū 630 ma luna a‘e)] …waia ‘ōkoholā, a no ka ‘imi ‘ana i nā **‘Īliokai**, ma ka moa[na] o ka mea nona kekahi hapa o ia moku, inā he kanaka kupa ia a he kanaka kupa ‘ole paha, a inā e noho pa‘a a[n]a ‘o ia i loko o kēia Aupuni. [‘Ao‘ao 2, Paukū 3] Paukū 636. Ma ke kākau hō‘ike ‘ana i kekahi moku, e like me ka ‘ōlelo a ka paukū ma luna a‘e nei, e koi aku ka Luna Dute Nui, i ka mea nāna i noi mai a ‘o ke kākau hō‘ike ‘ana, e hā‘awi mai ‘o ia i palapala ho‘opa‘a me nā hope kūpono i ka mana‘o o ka Luna Dute Nui, no nā dālā ‘a‘ole ‘emi mai ma lalo o nā haneri ‘elua, ‘a‘ole ho‘i ‘oi [a]ku i ‘elua tausani, e ho‘ohālike ‘ia e ka Luna Dute Nui me ka nui o nā tona o ka moku; e ‘ōlelo ana ia palapala ho‘opa‘a, e hana ‘ia ka palapala hō‘ike i ke kākau ‘ana no ka moku, āna i hā‘awi ‘ia ai wale nō, ‘a‘ole ho‘i e kū‘ai ‘ia, a e	**The Hawaiian Flag** October 19, 1859, 115 [Page 6, Paragraph 1] Article XXIV. Regarding writing bonds for vessels Paragraph 630. This vessels ought not be a written bond, without due consideration of this vessel, a Hawaiian vessel with all profits acquired belonging to Hawaiian vessels, when he refuses the due assets of a citizen and one who may become a citizen of this Kingdom. But also, a vessel may give written bond, prepared for the day… [Page 1, Paragraph 1 (end of paragraph 630 directly above)] …disgraced whaling, and for searching for the **seadog**, in the ocean of the one for whom is half of the vessel, if a citizen or not a citizen, and if permanently residing in this Kingdom. [Page 2, Paragraph 3] Paragraph 636. In bond writing for a vessel, similar to the language of the paragraph directly above, the Chief Customs Officer requires, of the one who request the bond writing, to give him an insurance policy with equitable legal surety as is the will of the Chief Customs Officer, for a sum not less than $200.00, and not too exceed $2,000.00, to be matched by the Chief Customs Officer with the larger part of the tonnage of the

Misc. Notes	ʻŌlelo Hawaiʻi (Hawaiian)	English translation
	hāʻawi lilo ʻole ʻia, a e hoʻolilo ʻia paha ma ke ʻano ʻē aʻe, i kekahi kanaka; a inā e lilo ia moku a pau, a ʻo kekahi hapa paha o ka moku, inā ʻaʻole ia he moku ʻōkoholā a moku ʻimi **ʻīlio o kai**, no kekahi haole a mau haole paha i kupa ʻole ma kēia ʻAupuni, a inā paha e pōʻino, a i lawe pio ʻia paha e kekahi ʻenemi, a i hoʻopau ʻia i ke ahi, a i wāwahi ʻia ka moku paha, a laila, e hoʻihoʻi ʻia mai ka palapala hōʻike i ka Luna Dute Nui, ma loko o nā Mālama ʻeono, ma hope iho o ia hoʻolilo ʻana o ka moku i ka ona ʻē, a ʻo kona pōʻino ʻana, a lawe pio ʻana, a pau ʻana i ke ahi, a wāwahi ʻana paha; Akā hoʻi, inā i lawe pio ʻia a pau i ke ahi, a pōʻino paha, a laila, e hoʻokuʻu ʻia nā mea i kākau inoa ʻia i ua palapala hoʻopaʻa la, inā e hoʻomaopopo i ka Luna Dute Nui, ʻaʻole e hiki, ke hoʻopakele i ka palapala hōʻike.	vessel; this insurance policy states, the insurance policy shall be done in writing for the vessel, only for what he was awarded, not to be sold, and not to be granted absolutely, or conveyed in a different manner, to a person; and if the entire vessel is transferred, or half of the vessel, or if it is not a whaling vessel and a **sea dog** investigating vessel, for a foreigner or foreigners not citizens in this Kingdom, or if damaged, or if abducted by an enemy, and consumed in a fire, or ship-wrecked, then, the insurance policy shall be returned to the Chief Customs Officer, within six months, after this transference of the vessel to a different owner, for his damage, abduction, consumption due to fire, or ship-wrecked; but also, if extinguished entirely by fire, or misfortuned, then, the things signed on this insurance policy shall be relinquished, as understood by the Chief Customs Officer, [who is] unable to be released from the insurance policy.

Misc. Notes	ʻŌlelo Hawaiʻi (Hawaiian)	English translation
KM 1a (& b/c)	4 Honolulu, Oʻahu Pōʻakahi, Maraki 19, 1894. **Ka Makaʻāinana** ***He Nūpepe ʻŌʻili Pule*** W.H. Kapu Luna Nui a Lunahoʻoponopono F.J. Testa (Hoke), Puʻukū. Pōʻakahi, Maraki 19, 1894. [ʻAoʻao 1, Kolamu 2, Paukū 2] Mai Pūlama Aku. ʻO ia nō kēia mākou e uwalo aku nei i nā hoa makaʻāinana a pau, mai pūlama aku i nā hana a kēia poʻe no ka mea pili i ka pono koho balota no nā ʻelele i ka ʻaha hana	4 Honolulu, Oʻahu Monday, March 19, 1894. **The Citizen** ***A Blessed Newspaper*** W.H. Kapu Chief Officer and Editor F.J. Testa (Hoke), Treasurer. Monday, March 19, 1894. [Page 1, Column 2, Paragraph 2] Don't Bother This is what we declare to all of the fellow residents, don't bother with the activities of this group because they are associated with the equal

	kumukānāwai a lākou. Ua lohe ʻia mai aia kā nā poʻe o na Kona a me Kaʻū, Hawaiʻi, ke pīkokoi nui lā e kākau inoa ma lalo o ka hoʻohiki a ua poʻe pākaha nei, a mākou nō hoʻi i hōʻaiʻai aku ai ma ka helu i hala i ka waiwai ʻole o ko ka lāhui kumu hana aku pēlā, no ka mea, ke hoʻokō, ʻo ka ʻāpono ʻana nō ia iā lākou nei, a lilo kā lākou nei ʻino i hana mai ai iā kākou i mea maikaʻi. ʻO kā mākou hoʻi e makemake nei, ʻo ia nō ko kākou kū mai nō i ka wā, ʻoiai, aia iā Amerika Huipū ʻia ka hana. No ka mea, ua ʻoiaʻiʻo loa nō kā mākou i hoʻomahuʻi aku ai inā kākou e kōkua ʻole aku, ʻaʻale loa lākou e ʻike ʻia mai a huli ke ao nei. ʻO ko kākou wā kēia e hōʻike ai i ko kākou lōkahi, ʻaʻohe manawa e aku nō kākou; a inā nō ʻo nā poʻe lawelawe ʻoihana Aupuni a poʻe naʻaua[o] paha ma lalo o lākou, ʻaʻohe nō ia o ka lāhui, akā, e hoʻokuʻu aku nō i kēlā poʻe a ʻaluʻalu aku i ko lākou pono e like lā me nā **ʻīlio holo i ka uaua**. Aka, no ka lāhui hoʻi, e unuhi mai nō a kaʻawale; a laila, lawe aku nō a kai hohonu, hoʻokuene pono iho ʻana i laila.	ballot election for the delegates in their constitutional labor convention. It was heard, there were the groups of Kona and Kaʻū, Hawaiʻi, largely gathering to register beneath the names of these crooks, and we also released in the list of offenses national concerns and such that are unbeneficial, because, when ratified, it will then be enforced by them, and their offenses will become worthless to our benefit. As for our needs, it's for us to rise to the time, while the United States is reasonable. Because, our impersonation was incredibly accurate, if we didn't render aid, they certainly wouldn't have been seen until the day was over. This is our time to demonstrate our unity, there is no time for us to run; else indeed the Kingdom officials and possibly the learned persons below them, truly without a nation, but, released to that group, will then slacken in their moral resolve like the **dog-running-in-the-rough-seas**. But, as for the nation, it will transform and separate; and then, truly be taken unto the depths of the ocean, and properly arranged there.

Misc. Notes	**ʻŌlelo Hawaiʻi (Hawaiian)**	**English translation**
LH a (&b)	**Lama Hawaiʻi** [ʻAoʻao 1, Kolamu 3, Paukū 3] No kekahi ʻaoʻao kahiko. Eia kekahi mea kupanaha a mākou: ʻo ke kūkini. Inā i ʻōlelo ʻia he mau kūkini: ʻapōpō, holo; a laila, hele maila kanaka he nui loa me ka waiwai, a pili a mau ihola, a laila, hele akula ua mau kanaka lā ʻelua a hiki i ka pahukū. Kūkini maila ua mau kanaka lā, a hopu i ka pahu kekahi, a laila, eo aʻela nāna. ʻOliʻoli ihola ka poʻe i kō. Akā, ʻo ka poʻe i eo, mihi ihola lākou i ke eo ʻana. Inā e ʻōlelo ke Konohiki i nā makaʻāinana, ʻapōpō kākou koʻele a pau, a ahiahi iho, hōʻike i ka waiwai:	**Hawaiian Torch** [Page 1, Column 3, Paragraph 3] Concerning an ancient way of life. Here is something wondrous for us: runners. If some runners said: tomorrow, is a race; and then a multitude of persons came with money, and continued to place bets down, and then, two of these persons then ran until they reached the goal. These people then raced, and grabbed the baton, and then, it was won for him. The people were then joyful for the triumph. But, as for the

	A laila, hana ihola lākou i ua mau mea nei a ke Konohiki i ʻōlelo mai ai: ʻo ka puaʻa, ʻo ka ʻīlio, ʻo ke kapa, ʻo ke olonā, ʻo ka **hulu**, ʻo ka ʻupena, ʻo kēlā mea kēia mea a pau. ʻO ia ka waiwai, a mākou i hōʻike ai i ka wā kahiko.	persons who lost, they apologized for losing. If the Konohiki said to the citizens, tomorrow we all walk until the evening to show the tribute: and then, they lay down these things the Konohiki requested: pig, dog, cloth, fiber, **fur**, fishing net, everything. These are the goods that we exhibited in ancient days.

Misc. Notes	**ʻŌlelo Hawaiʻi (Hawaiian)**	**English translation**
KA 1a (b/c/d)	30 **Ke Alaula** [ʻAoʻao 1, Kolamu 1, Paukū 1] …kou holoholona i mālama loa ai. ʻAi nō hoʻi ʻo Kauka Kaina i ka ʻīlio a me nā ʻiole i loaʻa iā lākou ma luna o ka moku. Loaʻa iā lākou ma nā ʻae kai nā **ʻīlio-holo-i-ka-uaua** a me nā ʻelepani kai. He makaʻu nā kamaʻāina Ekimo i kēia holoholona nui, akā make nō ia lākou i kekahi manawa. I ka hoʻi ʻana mai o Kauka Kalina i Piledelepia, hoʻopuka ʻo ia he buke moʻolelo o nā mea āna i ʻike ai ma ia ʻāina anu, a ua piha ia buke i nā kiʻi nani loa. Eia mai ke kiʻi o ka ʻelepani-kai.	30 **The Dawn** [Page 1, Column 1, Paragraph 1] ...your animal to attend. Doctor Kaina also eats dogs and rats they found on the ship. They catch on the seashore the **dogs-running-in-the-rough-seas** and the sea elephants. The local Eskimo are afraid of this big animal, but they also sometimes kill it. When Doctor Kaina returned from Philadelphia, he published a story book of the things he saw in this frozen land, and this book was filled with very beautiful pictures. Here is the picture of the sea elephant.
KA 2a (b/c)	**Ke Alaula** Honolulu, Novemaba, 1867 Buke II, Helu 8 [ʻAoʻao 1, Kolamu 2, Paukū 2] Kokoke aku lākou i ka Wēlau ʻĀkau. I ka noho ʻana o lākou i ka moku, holo aʻe kekahi poʻe o lākou i ka ʻākau ha[u] aku ma luna o nā holopapa i kauō ʻia e nā ʻīlio. Ke ʻike lā ʻoukou ma ke kiʻi ma luna aʻe nei i ke ʻano o ka hoʻokaulua ʻia o nā ʻīlio, a hoʻohui ʻia lākou e kauō i ka holopapa. Noho iho ke kanaka ma luna o ka papa, a kauō māmā loa ʻia ʻo ia e nā ʻīlio ma luna o ka hau paʻa. I kekahi manawa ʻelima a ʻeono ʻīlio kā i hoʻopaʻa ʻia i ka papa; i kekahi hoʻi he nui aku – he ʻumikūmāmāhā a ʻumikūmāmāono paha.	**The Dawn** Honolulu, November 1867 Book II, Volume 8 [Page 1, Column 2, Paragraph 2] They are approaching the North Pole. When they were staying on the ship, a group of them went to the icy north on top of the sled dragged by the dogs. You see in the picture above the disposition of the harnessed dogs, and they are united to drag the sled. The people sit on top of the sled, and he is quickly sled by the dogs on top of the hard snow. One time five maybe six dogs were

	Holo aku kekahi poʻe o lākou i ka ʻākau a hiki i ka latitu 82° 30'. I laila ʻike aku lākou i ka Moana Anu ʻĀkau. ʻAkahi nō a launa kokoke aku kekahi i ka wēlau ʻākau e like me kēia – 450 wale nō mile koe a loaʻa aku nō. Akā, ʻaʻole nō he kanaka i hiki aku i laila, no ke anu loa – make e maʻi nō i ke anu. ʻAʻole i loaʻa iā lākou he wahi meheu no Sir Ioane Feranekelina. Ma hope loa mai ua loaʻa ʻia i kekahi poʻe ʻē a'e. ʻElua a ʻekolu paha o kēia poʻe a Kauka Kaina i loaʻa i ka maʻi a make; hoʻokahi i loaʻa i ke anu ma kekahi wāwae a ʻoki ʻia aku ka wāwae ; lilo hoʻi ʻelua manamana wāwae o kekahi. ʻO ko lākou kapa e mehana ai, ʻo ka ʻili o ka **ʻīlio-holo-i-ka-uaua** a me nā holoholona huluhulu paheʻe ʻē aʻe, e like me kā nā kānaka i hōʻikeʻike ʻia ma ke kiʻi ma luna aʻe nei.	secured to the sled; another time more – fourteen maybe fifteen. Some of them went to the north until the latitude 82° 30'. There they saw Arctic Ocean. It was the first time someone approached the end of the north pole like this – just 450 miles left until the end. But, there was no person that could go there, because of the extreme cold – becoming deathly ill because of the cold. They didn't find a trace of Sir John Franklin. A long time afterward, it was reached by other people. Two maybe three of these groups and Doctor Kaina got sick and died; one got frostbite on a foot and the foot was cut off; and two toes of one was lost as well. Their clothing to keep warm was the pelt of the **dog-running-in-the-rough-seas** and the other slippery, furry animals, like the men shown in the picture directly above.

Misc. Notes	**ʻŌlelo Hawaiʻi (Hawaiian)**	**English translation**
KN 1a (b/c)	**Ka Nonanona** Buke 1, Pepa 3, ʻAoʻao 9-01 ʻAugate 3, 1841; 3 ʻAukake 1841 [ʻAoʻao 1, Kolamu 2, Paukū 4] No Ka Ulu Moku ʻImi ʻĀina. I ka mālama o ʻOkatoba 1841, hiki maila ka ulu moku ʻimi ʻāina no Amerika huipū ʻia, ma Honolulu nei. ʻEhā moku, ʻo ka moku nui, (ʻo ka Winisani, a me ka Pīkaka) a ʻelua hoʻi moku nuku iho, (ʻo ka Naiʻa, a me ka Mālolo) a ʻo Kali Wilika ko lākou aliʻi nui. Ua ʻimi ʻāina nā ulu moku nei ma ka huina loa, a ua ʻike lākou i ka ʻāina nui ma laila, i ka lā 13 o Ianuari, 1840, ma ka latitu 65°30 Ionitu 104°24. Pōpilikia ʻia ko lākou holo ʻana ma kēlā moana hema, no ka nui loa o ka hau; me he mau moku ʻāina nui lā, e lana wale ana, a e huikau ana, ua hau paʻa nei ma kēlā wahi. Ili ka Pīkaka i ka moku hau, a	**The Multitude** Book 1, Paper 3, Page 9-01 August 3, 1841; 3 August 1841 [Page 1, Column 2, Paragraph 4] About the Land Exploration Fleet. In the month of October 1841, the land exploration fleet arrived from the United States of America, here in Honolulu. There were four ships, the large ships, (the Winisani, and the Pīkaka) as well as two nose diving ships [submarines?], the Dolphin, and the Flying Fish and Kali Wilika was their high commander. The fleet explored land in it's entire length, and they saw great lands there, on the 13th day of January, 1840, in the latitude 65°30' longitude 104°24'. Their progression was troubled upon that

	mai nāhāhā loa: ua pākela nō naʻe no ke akamai loa o kona kāpena ʻo Hudesona. Holo kokoke i kēlā ʻāina hema ka Winisani i 1700 mile a ʻike pinepine lākou i ka ʻāina; he ʻāina pali, paupū i ka hau, ʻaʻole kanaka, he mau walerusa, a me nā **sila** wale nō ko laila holoholona. Pau kēia;	Antarctic ocean, because of the expanse of the ice; like great big islets, just floating, haphazard, ice-locked in that place. The Pīkaka was run aground on an iceberg, and very nearly wrecked: we escaped because of the good judgment of his Captain Hudson. The Winisani approached that arctic land which is 1700 miles and they frequently saw land; a precipice, filled with ice, no people, just walruses and **seals** were the animals that belonged there. This is done;

Misc. Notes	**ʻŌlelo Hawaiʻi (Hawaiian)**	**English translation**
KNK 1a	**Ka Nūpepa Kūʻokoʻa** [ʻAo ʻao 1, Kolamu 1, Pauku 6] A i ka pō ʻana iho, hele akula ia i ka Halepule, me ke ʻeke ma luna o kona kua, he pūʻolo ma lalo o ka lima, a he ipu-kukui ma ka lima. He pāpaʻi ko loko o ke ʻeke, a he ihoiho kukui pokopoko ko loko o ka pūʻolo. I kona komo ʻana aku i loko o ka pā o ka Halepule, wehe aʻela ʻia hoʻokahi pāpaʻi mai loko aʻe o ke ʻeke, a hoʻopili ihola i ka ihoiho kukui ma luna o ke kua a hoʻokuʻu iho i lalo e kolo ai. A wehe aʻela ʻia i ka lua, i ke kolu, a pēlā aku, a hiki i ka pau ʻana o ka papaʻi o loko o ke ʻeke. Ma hope o ia, komo ihola ia he koloka lōʻihi ʻeleʻele, he kapa like ʻia me ko ka **Mōnaka** (Monk) a hoʻopili aʻela he ʻumiʻumi hina ma kona ʻauwae. No ia mea, ua ʻano ʻē loa aʻela ia, a hele akula. Ia wā, kani ka pele o ka Luakini i ka hora hope, hoʻomaka aʻela ka ʻAihue Akamai, e kāhea me ka leo nui, "E lohe ʻoukou e nā lawehala a pau loa! E lohe, e lohe! Ua hiki mai ka hopena o ka honua, a ua kokoke ka lā nui; e lohe, e lohe! ʻO ka mea e makemake ana e piʻi i ka lani me aʻu, e komo mai i loko o kēia ʻeke. ʻO Petero au, ka mea nāna e wehe a e pani ka puka o ka lani. E nānā aku ʻoukou i loko o ka pā i ʻike ʻoukou i ka poʻe make e hele ana i ʻō a i ʻaneʻi, e ʻohi ana i ko lākou mau iwi. E komo mai, e komo mai i loko i ke ʻeke; no ka mea, e nalo aku ana ka honua."	**The Independent Newspaper** [Page 1, Column 1, Paragraph 6] And when night came, he went into the Church, with the sack on top of his back, a bag below his arm, and a lamp in his hand. Crabs were inside of the sack, and short kukui-nut candles were inside of the bag. When he entered the yard of the Church, one crab was loosed from inside of the sack, and a kukui nut candle affixed on top of the back and it was released below to crawl. The second was then freed, the third, and so on, until all of the crabs inside of the sack were gone. After this, he put on a black, long cloak, a cloth likened to that of a **Monk's** and affixed a gray beard to his chin. With this, he was made very different, and then left. At this time, the bell of the Temple rang the last hour, and then the Cunning Thief began to call out with a loud voice, "Listen all of you sinners! Listen, listen! The end of the world has come, and the day of reckoning has approached; listen, listen! Those desiring to rise to heaven with me, come inside of this sack. I am Peter, the one who opens and closes the door of heaven. All of

		you look in the yard and you will see the dead, walking here and there, gathering their bones. Come, come inside of the sack; because, the world shall disappear."
KNK 2a (b/c/d)	**Ka Nūpepa Kūʻokoʻa** ***Ke Kilohana Poʻokela no ka Lāhui Hawaiʻi*** Buke III. Helu 51. Honolulu, Dekemaba 17, 1864. Nā Helu A Pau 100. [ʻAoʻao 1, Kolamu 4, Pauku 10] Ka Lāʻau Ka-umaka e pau ai ka Niniaole O Nā Maka Hūʻalu Pepeʻekue O W.H. Kalae-O-Kaena. E Ka Nūpepa Kūʻokoʻa E; Aloha ʻoe: -- Ua ʻikea iho ma kou ʻaoʻao 3 o ke Kahua kaua o ka lā 27 o ʻOkatoba, Helu 44 o ka Buke III o ke "Kilohana Poʻokela o ka Lāhui Hawaiʻi." Aia ma laila ka pehina (throwing/pelting, as of rain) mai nei a W.H. Kalaeokaena, i nā pōhaku ʻelekū pukapuka o nā hekili kuʻi-pāmalō a ua **ʻīlioholoikauaua** lā, ʻaluʻalu pāpaʻi niho kekē o Koholāloa; e hāhā pōʻele lā i ua iʻa lā o ka ʻāina āna (W.H.K.) e noho lā; me he Ihuanu lā e manaʻo ana e hina o ʻAiwohikupua, i ka hele wahi ʻana a kani ka pola o ka malo; ʻū! e olo hoʻi! hina lā ana kei! a ʻo paha e olo ka hina o ke ʻAʻaliʻikūmakani o Kaʻū iā ʻoe, e nā lāʻauohala kumu Pūhala neʻineʻi.	**The Independent Newspaper** ***The Foremost Champion for the Hawaiian Nation*** Book III, Number 51. Honolulu, December 17, 1864. The Numbers Until 100. [Page 1, Column 4, Paragraph 10] The Beloved Medicine that cured the waterlessness of the thick viscous membrane covering the eye of W.H. Kalae-O-Kaena (loose skin over the eyeball; slight viscous membrane covering the eye) Dear Independent Newspaper; Greetings to you: -- It was observed in your 3rd page of the war section on the 27th day of October, Number 44 of Book III of the "Foremost Champion for the Hawaiian Nation." There was W.H. Kalaeokaena's raining of the hole riddled basalt rocks [bullets] of the roaring thunder-with out rain [gun] upon this **dog-running-in-the-rough seas**; the misshapen crab claw of Koholāloa, ignorantly groping for this fish on the land where he (W.H.K.) lives; like the Ihuanu wind thinking to topple over ʻAiwohikupua, going somewhere until the flap of the loincloth sounds; ʻū! resounding! glorious toppling! and perhaps resounding the steady blowing of the ʻAʻaliʻikūmakani wind of Kaʻū to you, the hala leaves of the grove of the low-lying hala trees.
KNK 3a (b/c/d)	**Ka Nūpepa Kūʻokoʻa** Vol. 4, No. 26 29 June 1865 [ʻAoʻao 1, Kolamu 6, Paukū 7]	**The Independent Newspaper** Vol. 4, No. 26 29 June 1865 [Page 1, Column 6, Paragraph 7]

	He ʻAumoku hou, e holo ana ka Wēlau ʻĀkau. Ke hoʻomākaukau nei o Kapena Osbone (Osborne) o nā Moku manuwā o Beritania e holo i ka Wēlau ʻĀkau. Ua makemake ʻia i ʻelua mau moku māhu liʻiliʻi me nā kānaka he 120, a i ka Makahiki 1866 e hiki mai ana e holo ai ia. I loko o ke kau e holo aku lākou i ke Kaikūʻono o Bafine ma ke komohana o ʻĀinaʻōmaʻomaʻo, a hala loa aku i loko e like me ka lōʻihi o kahi e hiki ai ke hele aku. I loko o kēia mau makahiki aku ʻelua, e holo ana lākou me nā waʻapā a me nā koa na ka ʻīlio e kauō a hiki i ka Wēlau. ʻO kākou o ka poʻe hoʻi e noho nei i ka lā pumehana o Hawaiʻi nei, kai ʻike ʻole i ke anu o ia wahi. Ua ʻemi iho ka waidālā o ka hōʻailona māhu (thermometer) i kekahi manawa, i nā degere he 50 ma lalo o ka ʻole. He hau wale nō ka mea ʻike ʻia ma laila, ʻaʻole mea kanu; ʻo nā bea keʻokeʻo naʻe ka mea nui, me nā **ʻīlioholoikauaua**, a me nā ʻelepani o ke kai. I loko nā kānaka o nā hale hau e noho ai me nā lole hulu, a ʻo kā lākou ʻai o ka ʻiʻo momona me ka ʻaila a me kekahi mau mea ʻē aʻe. Ma laila e lilo ai ka bia a me kekahi mau wai ona ʻē aʻe i mea ʻoʻoleʻa me he pōhaka lā. I ka wā hoʻoilo, he pō lōʻihi ko lākou no nā mālama he nui wale, i ahona iki i ka mahina, no ka mea, he kōnane maikaʻi loa ka mahina ma laila, a me kekahi mālamalama ʻano ʻē ma laila ia kapa ʻia ka Aurora Borealisa (Aurora Borealis) a ʻo ka Mālamalama ʻĀkau. Ma ka Wēlau ma laila ka pō no nā mālama ʻeono, a me ka lā no nā mālama ʻeono. Inā e hiki ʻiʻo ʻo Kapena Osebone ma ia wahi, e kaulana nō kona inoa, no ka mea, ʻo ia ke kanaka mua i hiki ma laila.	A new fleet, sailing to the North Pole. Captain Osborne is preparing the British battleships to sail to the North Pole. Two small steamships were wanted with 120 men, and in the coming year 1866 he will set sail. During the summer they will sail through Baffin Bay in the west of Greenland, and stay awhile in there like the length of one who comes and goes. Within these two years, they will go with sleds and guards for the dogs to tow until they arrive at the Pole. We are to be sure the ones living here in the warmth of Hawaiʻi, unacquainted with the chill of this place. The mercury of the thermometer lowered once to 50 degrees below zero. Just snow is what is seen there, no plants; the polar bear is still important, with the **dogs-running-in-the-rough-seas**, and the sea elephants. Inside, the people stay in igloos with fur clothing, and as for their food it is rich meat and oil and other things. There, beer and alcoholic drinks become as hard as stone. In the winter, they have a long night for many months; the moon is a little better, because, the moon there has very good clear, bright moonlight; and there is a kind of strange light there named the Aurora Borealis otherwise known as the Northern Lights. At the Pole it's night there for six months, and day for six months. If Captain Osborne actually goes there, his name will be truly famous, because, he will be the first man to go there.
KNK 4a (b/c/d)	**Nūpepa Kūʻokoʻa** ***Ke Kilohana Poʻokela no ka Lāhui Hawaiʻi,*** Buke XV, Helu 8, Honolulu, Pōʻaono, Feberuari 19, 1876, Nā Helu a pau 742. [ʻAoʻao 1, Kolamu 4, Paukū 8] "Ba," i uilani aʻe ai o Nede me nā ʻano huhū: "he aha kāu i manaʻo ai no nā mea a	**Independent Newspaper** ***The Foremost Champion for the Hawaiian Nation,*** Book XV, Number 8, Honolulu, Saturday, February 19, 1876, The numbers until 742. [Page 1, Column 4, Paragraph 8] "Ba," queried Nede in anger:

	kākou e ai ai maʻanei? He ake honu, he lālā manō, a me nā ʻiʻo kōʻala ʻia o ka **ʻĪlioholoikauaua**."	"what are the things you think we eat here? Turtle liver, shark fin, and the broiled meat of the **Dog-running-in-the-rough-seas**.
KNK 5a (b/c/d/e)	**Nūpepa Kūʻokoʻa** ***Ke Kilohana Poʻokela no ka Lāhui Hawaiʻi,*** Buke 15, Helu 12 18 Malaki 1876 [ʻAoʻao 1, Kolamu 2, Paukū 16]	**Independent Newspaper** ***The Foremost Champion for the Hawaiian Nation,*** Book 15, Number 12 18 March 1876 [Page 1, Column 2, Paragraph 16] **ʻĪliopiʻi** – cape & bay, Kalaupapa peninsula, *lit. climbing dog*.
KNK 6a (b/c/d)	**Nūpepa Kūʻokoʻa** ***Ke Kilohana Poʻokela no ka Lāhui Hawaiʻi,*** Buke XV, Helu 32, Honolulu, Pōʻaono, Augate 5, 1876, Ka Helu a pau 766. He ʻIwakālua Tausani Legue Ma Lalo O Ke Kai! --Nā Mea-- Kupanaha O Ka Moana! Ke Ala O Ka Mea Huna --A ʻO Ka Mea-- Pohihihi O Ka 1866! Mahele 1 Mokuna XVI He Ululāʻau Moana. [ʻAoʻao 1, Kolamu 2, Paukū 8] Aia ma kēia wahi, he mea e ka lehulehu o nā iʻa liʻiliʻi o kēlā me kēia ʻano, i kūpono ʻole no ke kī ʻana me nā pōkā. A no ka lelehu loa o nā iʻa liʻiliʻi, ua hiki pono ʻole iaʻu ke ʻike aku i nā mea nui; akā, ʻo Kapena Nimo, ua ʻike akula nō ia i kekahi holoholon[a] nui, he otera ka ʻino, he holohona ʻano like me ka **ʻĪlio holo-ikauaua**; a ʻo ke kī koke akula nō ia no ia o ua Kapena Nimo, a mae ana ua holoholona nei. He ʻelima kapuaʻi kona loa, a he mea hoʻi i makemake nui ia, no ka nani o kona hulu. ʻO nā kapa i hana ʻia no loko mai o ia ʻano hulu, he $400.00 ke kumukūʻai. Ua ʻike nui ia nā kapa o kēia ʻano ma nā mākeke o Rusia a me Kina. ʻO kahi noho nui o kēia ʻano holoholona, aia ma ka Moana Pakipika ʻĀkau.	**Independent Newspaper** ***The Foremost Champion for the Hawaiian Nation,*** Book XV, Number 32, Honolulu, Saturday, August 5, 1876, The number until 766. 20,000 Leagues Under The Sea! --The-- Wonders of the Ocean! The Path Of Secret --And -- Mystery of 1866! Section 1 Chapter XVI A Fleet At Sea. [Page 1, Column 2, Paragraph 8] In this place is something of a multitude, a variety of little fish, for which it is illegal to shoot with bullets. And because of the very duskiness of the little fish, I couldn't properly see the larger things; but, Captain Nimo then saw a large animal, a vicious otter, an animal somewhat like the **dog-running-in-the-rough-seas** (seal); and Captain Nimo then shot it, and this animal slumped over. It is five foot long, and something for which it is greatly desired, is the beauty of its coat. Blankets made from this type of fur is a costly $400.00. Blankets of this type are largely seen in the markets of Russia and China. The place where this type of animal mainly inhabits is the

		North Pacific Ocean.
KNK 7a (b/c)	**Nūpepa Kūʻokoʻa** ***Ke Kilohana Poʻokela no ka Lāhui Hawaiʻi,*** Buke 18, Helu 11 15 Malaki 1879 [ʻAoʻao 1, Kolamu 3, Pauku 18]	**Independent Newspaper** ***The Foremost Champion for the Hawaiian Nation,*** Book 18, Number 11 15 March 1879 [Page 1, Column 3, Paragraph 18] **ʻĪliopiʻi** – cape & bay, Kalaupapa peninsula, *lit. climbing dog*.

6.0 References Cited

Arago, J. (1823) *Narrative of a voyage around the world in the Uranie and Physcienne corvettes, commanded by Captain Freycinet, during the years 1817, 1818, 1819, and 1820,* Treuttel and Wurtz, London.

Arago, J. (1971) *Narrative of a voyage around the world*, N. Israel and Da Capo Press, Amsterdam and New York.

Beckwith, M.W. (1951) *The Kumulipo: A Hawaiian Creation Chant,* University of Chicago Press, Chicago.

Bingham, H. (1849) *Residence of twenty-one years in the Sandwich Islands,* Hezekiah Huntington, Hartford.

Broughton, W.R. (1804) *A voyage of discovery to the north Pacific ocean...in the years 1795, 1796, 1797, 1798,* T. Cadell & W. Davies, London.

Byron, L.G.A. (1826) *Voyages of H.M.S. Blonde to the Sandwich Islands...1824-1825,* Murray, London.

Campbell, A. (1825) *A voyage round the world from 1806 to 1812,* Allen & Watte, Roxbury, MA.

Cook, J. (1842) *The voyages of Captain James Cook round the world,* William Smith, 113, Fleet Street, London.

Cook, J. (1999) *The journals of Captain James Cook on his voyages of discovery / edited by J.C. Beaglehole,* Woodbridge, UK and Rochester, NY: Boydell Press; Sydney: in association with Hordern House.

Cook, J., King, J. (1784) A voyage to the Pacific Ocean : ... for making discoveries in the Northern Hemisphere ... in the years 1776, 1777, 1778, 1779 and 1780. W. and A. Strahan, London.

Corney, P. (1965) *Early voyages in the North Pacific, 1813-1818,* Ye Galleon Press, Fairfield, Wash.

Ellis, W. (1826) *Narrative of a Tour Through Hawaii, Or Owhyhee; with Remarks on the History, Traditions, Manners, Customs, and Language of the Inhabitants of the Sandwich Island,* For the author, by H. Fiser, son, and P. Jackson.

Eveleth, E. (1829) *History of the Sandwich Islands with an account of the American Mission established in 1820,* American Sunday School Union, Philadelphia.

Franchère, G. (2007) *Narrative of a voyage to the northwest coast of America in the years 1811, 1812, 1813, and 1814, or, The first American settlement on the Pacific,* IndyPublish.com, Boston.

Freycinet, L.C.D.d. (1978) *Hawaii in 1819: a narrative account by Louis Claude Desaulses de Freycinet (Ella L. Wiswell, translater; notes and comments by Marion Kelly),* Pacific Anthropological Records No. 26, Department of Anthropology, B. P. Bishop Museum, Honolulu.

Ii, J.P. (1993) *Fragments of Hawaiian History. Translated Hawaiian to English by Mary Kawena Pūkui, Dorothy B. Barrère, ed.,* Bishop Museum Press, Honolulu.

Kamakau, S.M. (1961) *Ruling chiefs of Hawaii,* Kamehameha Schools Press, Honolulu.

Kamakau, S.M. (1976) *The works of the people of old: Na hana a ka poʻe kahiko,* Translated by Mary Kawena Pūkui, Edited by Dorothy B. Barrere. Bishop Museum Press, Honolulu.

Kamakau, S.M. (1992) The people of old. Translated from the newspaper Ke Au ‘Oko‘a by Mary Kawena Pūkui; arranged and edited by Dorothy B. Barrère; illustrated by Joseph Feher.

Kamakau, S.M. (1993) *Tales and traditions of the people of old= Na Mo'olelo a Ka Po'e Kahiko / Samuel Mānaiakalani Kamakau ; translated from the newspapers Ka Nupepa Kuokoa and Ke Au Okoa by Mary Kawena Pūkui; edited by Dorothy B. Barrère*, Bishop Museum Press, Special Publication #94, Honolulu.

Kotzebue, O.v. (1821) *Voyage of discovery in the south seas and to Behring's Straits in search of a north-east passage; undertaken in the years 1815, 16, 17, and 18, in the ship Rurick,* Sir Richard Phillips and Co., London.

Krusenstern, A.J.v. (1821) *Voyage autour du Monde, Fait dans les Annees 1803, 1804, 1805, et 1806... sure les Vaisseaux la Nadiejada et la Neva, Commandes par M. de Krusenstern...*, Librairie de Gide fils, Paris.

La Pérouse, J.-F.o.d.G. (1807) A voyage round the world, performed in the years 1785, 1786, 1787 and 1788, by the Boussole and Astrolabe. 3rd edn. Lackington, Allen, London.

Langsdorft, G.H.v. (1817) *Voyages and Travels in Various Parts of the World, 1803-7*, Colburn, London.

Ledyard, J. (1781) *Journal of Captain Cook's Last Voyage to the Pacific Ocean on Discovery...1776-9.,* Newbery, London.

Lisiansky, U. (1814) A voyage round the world, in the years 1803, 4, 5, 6. S. Hamilton, Weybridge, Surrey, London.

Malo, D. (1951) *Hawaiian Antiquities (Mo‘olelo Hawaii),* Bernice P. Bishop Museum, Honolulu.

Mathison, G.F. (1825) *Narrative of a visit to Brazil, Chili, Peru and the Sandwich Islands, during the years 1821-22...,* Charles Knight, Pall Mall East, London.

Meares, J. (1790) *Voyages made in the years 1788 and 1789, from China to the north west coast of America,* Lopographic Press, London.

Mortimer, G. (1791) *Observations and remarks made during a voyage to the Islands of Teneriffe, Amsterdam, Maria's Island near Van Diemen's Land, Otaheite, Sandwich Islands, Owhyhee, the Fox Islands on the north west coast of America, Tinian, and from thence to Canton in the brig Mercury commanded by John Henry Cox,* Cadell, London.

Nogelmeier, M.P. (2006) *Ka Mo‘olelo O Hi‘iakaikapoliopele (The Epic Tale of Hi‘iakaikapoliopele) (M. Puakea Nogelmeier, translator),* Awaiaulu Press, Honolulu.

Portlock, N., Dixon, G. (1789) *A voyage around the world... in 1785-1788, in King George and Queen Charlott*, Stockdale & Goulding, London.

Quimper Benitez del Pino, M. (1822) *Islas de Sandwich : descripcion sucinta de este archipiélago, nombre que les dió su célebre descubridor, el Capitan Cook / reconocidas por el teniente de fragata de la Armada nacional D. Manuel Quimper Benitez del Pino*, E. Aguado, Madrid.

Stewart, C.S. (1828) *Journal of a residence in the Sandwich islands during... 1823, 1824, and 1825, with notes by W. Ellis,* H. Fisher, Son, & P. Jackson, Newgate Street, London.

Turnbull, J. (1813) *A voyage round the world, in the years 1800, 1801, 1802, 1803, and 1804: in which the author visited Madeira, the Brazils, Cape of Good Hope, the English settlements of Botany Bay and Norfolk Island; and the principal islands in the Pacific Ocean,* A. Maxwell, London.

Vancouver, G. (1798) Views of the Sandwich and other islands [electronic resource] / W. Alexander, delt., from sketches made on the spot ; B.T. Pouncy, sculp., J. Edwards & G. Robinson, London.

Vancouver, G. (1801) *A voyage of discovery to the North Pacific ocean, and round the world; … in the years 1790, 1791, 1792, 1793, 1794, and 1795, in the Discovery sloop of war, and armed tender Chatham, under the command of Captain George Vancouver. Vol I-IV,* Printed for John Stockdale, London.

Watson, T.K., Kittinger, J.N., Walters, J.S., Schofield, T.D. (2011) Culture, conservation and conflict: assessing the human dimensions of Hawaiian monk seal recovery. *Aquatic Mammals* **in press**.

Appendix K
Cultural Impact Assessment

This page intentionally left blank.

APPENDIX K
CULTURAL IMPACT ASSESSMENT
FOR THE
HAWAIIAN MONK SEAL
PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Pacific Island Regional Office

Portions prepared under contract by:
Pacific Legacy, Inc

September 2013

This page intentionally left blank.

TABLE OF CONTENTS

1.0 INTRODUCTION **1**

1.1 Project Overview 1
1.2 Relevant Statutes and Agency Regulations 1
1.2.1 National Environmental Policy Act 1

2.0 PROJECT BACKGROUND **2**

2.1 Hawaiian Monk Seal Recovery Program 2
2.2 Hawaiian Monk Seal 2
2.3 Project Area 3
2.3.1 Main Hawaiian Islands 3
2.3.2 Northwestern Hawaiian Islands 3
2.4 Previous Studies 7
2.4.1 Cultural Significance Report and Previous PEIS Cultural Impact Analysis 8
2.4.2 Relevant Associated Cultural Impact Assessments 8
2.5 Scope of Work and Objectives 8

3.0 METHODOLOGY **11**

3.1 Archival Research 11
3.2 Public Consultation 11

4.0 ACTIVITIES RELATED TO HAWAIIAN MONK SEAL RECOVERY **13**

4.1 Current Activities 13
4.2 Activities Proposed In PEIS 13
4.3 Tasks Associated With Proposed Alternatives 14

5.0 NATIVE HAWAIIAN AND COMMUNITY CONSULTATION **17**

5.1 The Consultation Process 17
5.2 Findings from Previous Consultations 17
5.2.1 Concerns Expressed 17
5.2.2 The Question of Stewardship 18
5.3 Community Meetings 18
5.3.1 Meeting Schedule 19
5.3.2 Summary of Community Meetings 19
5.4 Identified Cultural Resources and Customary Practices 21
5.4.1 Cultural Resources 21
5.4.2 Cultural Practices 22
5.5 Issues Raised During Community Meetings 23
5.5.1 Concerns Not Directly Related To Cultural Resources or Practices 23
5.5.2 Concerns Regarding Cultural Resources and Practices 25
5.5.3 General Comments Made During the Community Meetings 26
5.6 Mitigation Measures Recommended During Community Meetings 28
5.6.1 Consultation 28

6.0 ASSESSMENT OF CULTURAL IMPACTS **31**

6.1 Potential Effects to Cultural Resources 31
6.2 Potential Effects to Traditional Cultural Practices 32
6.3 The Hawaiian Monk Seal as a Cultural Resource 32
6.4 Effects of Proposed Alternatives 33
6.5 Summary of Impacts 35

7.0 MITIGATION MEASURES 37

7.1 Training in the Recognition and Avoidance of Cultural Resources 37
7.2 Coordination With Stakeholders and Communities 37
7.3 Outreach and Collaboration with Subsistence Fishers 37

8.0 REFERENCES 39

APPENDIX A 41

Announcement of Community Meetings 41

APPENDIX B .....

LIST OF FIGURES

Figure 1. Project area for the Monk Seal Programmatic Environmental Impact Statement (map courtesy NOAA). 5
Figure 2. Northwestern Hawaiian Islands (map courtesy NOAA). 7

1.0 INTRODUCTION

1.1 PROJECT OVERVIEW

This Cultural Impact Assessment has been prepared as part of efforts undertaking by National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), Pacific Islands Regional Office (PIRO), Protected Resources Division (PRD) to comply with National Environmental Policy Act of 1969 (NEPA). This document is intended to inform the cultural impact analysis section of the Hawaiian Monk Seal Programmatic Environmental Impact Statement (PEIS). It will assist NMFS in the identification and mitigation of potential adverse impacts of monk seal recovery actions, as detailed in the PEIS, on Native Hawaiian traditional and cultural practices and resources.

This Cultural Impact Assessment was prepared in compliance with the statutory requirements of NEPA. To the maximum practicable extent the document also follows the specifications of the State of Hawaiʻi Revised Statute (HRS) Chapter 343 Environmental Impact Statements law, as laid out in the State of Hawaiʻi Department of Health's Office of Environmental Quality Control (OEQC) Guidelines for Assessing Cultural Impacts as adopted by the Environmental Council, State of Hawaiʻi, on 19 November 1997.

1.2 RELEVANT STATUTES AND AGENCY REGULATIONS

Under relevant national statutes and regulations, federal agencies have the responsibility to ensure effective stewardship of the cultural resources that may be impacted by their actions. The Code of Federal Regulations (Federal Code) implements these federal statutes. Prior to implementing the monk seal recovery actions proposed in the PEIS, NMFS is required to comply with both NEPA and the National Historic Preservation Act (NHPA). This Cultural Impact Assessment addresses the cultural requirements of NEPA. The requirements for NHPA Section 106 consultation as stipulated in the NHPA are addressed in a separate document presented in Appendix B of the PEIS.

1.2.1 National Environmental Policy Act

NEPA, as codified in 42 U.S.C. §§ 4321 et seq., § 4331(a)(4) (2012), requires, in part, the consideration, discussion, and analysis of possible impacts to cultural resources as part of the human environment. It enjoins federal agencies to use all practicable means to preserve important historic, cultural, and natural aspects of our national heritage (NEPA 42 USC § 4331 Sec. 101). For this PEIS, the NEPA requirement is implemented though the Federal Code provisions for environmental impact statements, 40 C.F.R. §§ 1502, § 1502.16(g) (2012).

According the Federal Code, the PEIS is required to discuss the potential impacts that all of the proposed alternatives may have on cultural resources, including analysis of the proposed actions, any unavoidable adverse impacts if the proposals are implemented, the relationship of the short-term uses of the environment to the maintenance and enhancement of long-term use, and any irreversible or irretrievable commitment of resources involved in the proposals if they are implemented.

2.0 PROJECT BACKGROUND

2.1 HAWAIIAN MONK SEAL RECOVERY PROGRAM

NMFS is the federal agency responsible for management of Hawaiian monk seals, under the Endangered Species Act (ESA) (16 United States Code [U.S.C.] 1531 et seq.) and the Marine Mammal Protection Act (MMPA) (16 U.S.C. 1361 et seq.). NMFS funds, permits, and conducts research and enhancement activities on Hawaiian monk seals in the Northwestern Hawaiian Islands (NWHI) and main Hawaiian Islands (MHI).

Populations of the Hawaiian monk seal (*Monachus schauinslandi*) have experienced a prolonged decline. In 1976, NMFS listed Hawaiian monk seals as "endangered" under the ESA (41 Federal Register [FR] 51611) and "depleted" under the MMPA. NMFS implements recovery activities (research and enhancement) for Hawaiian monk seals to promote the conservation and recovery of the species population to levels at which ESA protection is no longer needed. NMFS has proposed new research and enhancement activities for Hawaiian monk seals and analyzed a reasonable range of alternatives in a draft Programmatic Environmental Impact Statement (PEIS), published in August 2011. These activities include monitoring, tagging, limited on-site medical treatment and the temporary translocation of seals between islands to enhance juvenile survival. This Cultural Impact Assessment will help to inform the Final PEIS and will be included as an appendix.

The intent of the PEIS is to evaluate, in compliance with NEPA (42 U.S.C. 4321 et seq.) and the NOAA Administrative Order (NAO) 216-6, the potential direct, indirect, and cumulative impacts on the human environment of the alternative approaches to implementing recovery actions, including research and enhancement activities and the subset of actions requiring permits, under the Hawaiian monk seal recovery program. The intent of this Cultural Impact Assessment is to assess the potential impacts of the actions proposed in the PEIS on cultural resources, practices, and beliefs, and to identify measures to minimize the adverse impacts of the proposed alternatives.

Several actions in the PEIS may have the potential to affect cultural resources and traditional practices within the Hawaiian archipelago. Cultural resources and the traditional practices associated with their use may be located both along the shoreline and within inshore waters. The present project focuses on identifying Native Hawaiian concerns regarding the potential impacts of the NMFS Hawaiian monk seal recovery actions on cultural resources and traditional practices significant to Native Hawaiians.

2.2 HAWAIIAN MONK SEAL

The Hawaiian monk seal is among the rarest of all marine mammals. It is endemic to the islands of the Hawaiian chain and found nowhere else on earth. Hunted to the brink of extinction in the late 19th century, Hawaiian monk seals have been declining in population since the late 1950s. The monk seal population is currently declining overall. While the larger monk seal population in the NWHI is shrinking, the population within the MHI is growing.
At present, the majority of monk seals live in six main breeding subpopulations located within

the NWHI on Kure Atoll, Midway Islands, Pearl and Hermes Reef, Lisianski Island, Laysan Island, and French Frigate Shoals. Smaller breeding sub-populations also occur on Mokumanamana (Necker) and Nihoa Islands. Monk seals have also been observed at Gardner Pinnacles and Maro Reef. Monk seals are also found within the MHI where births have occurred on many of the major islands. As a general rule, Hawaiian monk seals are relatively solitary and do not congregate in large groups as do other seal species such as sea lions and harbor seals. Monk seals occupy a range of marine and coastal habitats. They frequent the waters surrounding atolls, islands, and areas farther offshore on reefs and submerged banks. Monk seals are also found using deepwater coral beds as foraging habitats. They often haul-out on land to rest during the day, and prefer sandy, protected beaches surrounded by shallow waters when pupping.

Hawaiian monk seals are apex predators within the coral reef environment. They are primarily benthic foragers, feeding along the sea bottom on a variety of prey including fish, cephalopods, and crustaceans, although their diet varies depending upon location, sex, and age. Recent research undertaken by NMFS has attempted to estimate the food consumption of the current population of Hawaiian monk seals within the MHI and to compare the families of fish found in the monk seal diet and those targeted by recreational and subsistence fisheries (Sprague et al., 2013). The findings of the study indicate that although monk seals consume some of the same fish species as traditional subsistence fishers, the amount of these resources consumed is minimal when compared with that consumed by apex predatory fish.

2.3 Project Area

The Project Area for the PEIS encompasses the range where Hawaiian monk seals are found throughout the Hawaiian Archipelago, including the MHI, the NWHI, and Johnston Atoll (Figure 1). It includes portions of the open-ocean and near-shore environment where monk seals may be found, as well as the shore zone of the islands, islets and atolls that make up the Hawaiian Archipelago and Johnston Atoll. For the purposes of NEPA, the shore zone generally includes those terrestrial areas 5 meters inland from the line where the shore meets the sea. In addition, secondary use areas, such as research field camps in the NWHI, are also considered for inclusion.

2.3.1 Main Hawaiian Islands

The eight main islands of the Hawaiian chain include the high volcanic islands of Hawaiʻi, Maui, Kahoʻolawe, Lānaʻi, Molokaʻi, Oʻahu, Kauaʻi and Niʻihau, which rest at the southeastern end of the archipelago. The areas within these MHI potentially affected by the monk seal recovery actions address in the PEIS include the shoreline areas and the immediate offshore zone.

2.3.2 Northwestern Hawaiian Islands

The NWHI consist of those islands, atolls, rocks, reefs and shoals that lie to the northwest of the MHI. Also known as the Leeward Islands, the NWHI extend approximately 1,240 miles (2,000 kilometers) from the island of Nihoa in the southeast to Kure Atoll in the northwest (Figure 2).

This page intentionally left blank.

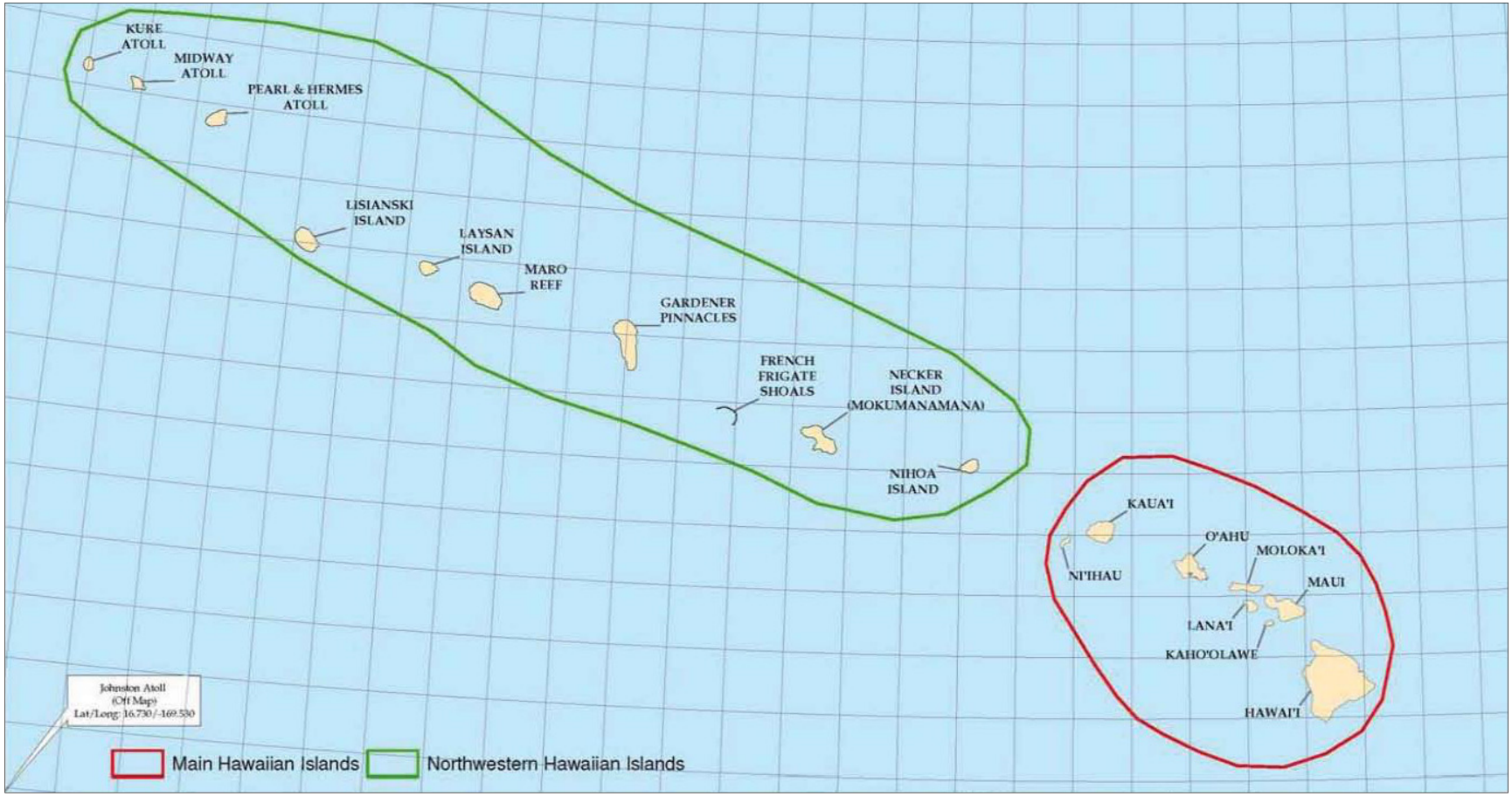


Figure 1. Project area for the Monk Seal Programmatic Environmental Impact Statement (map courtesy NOAA).

This page intentionally left blank.

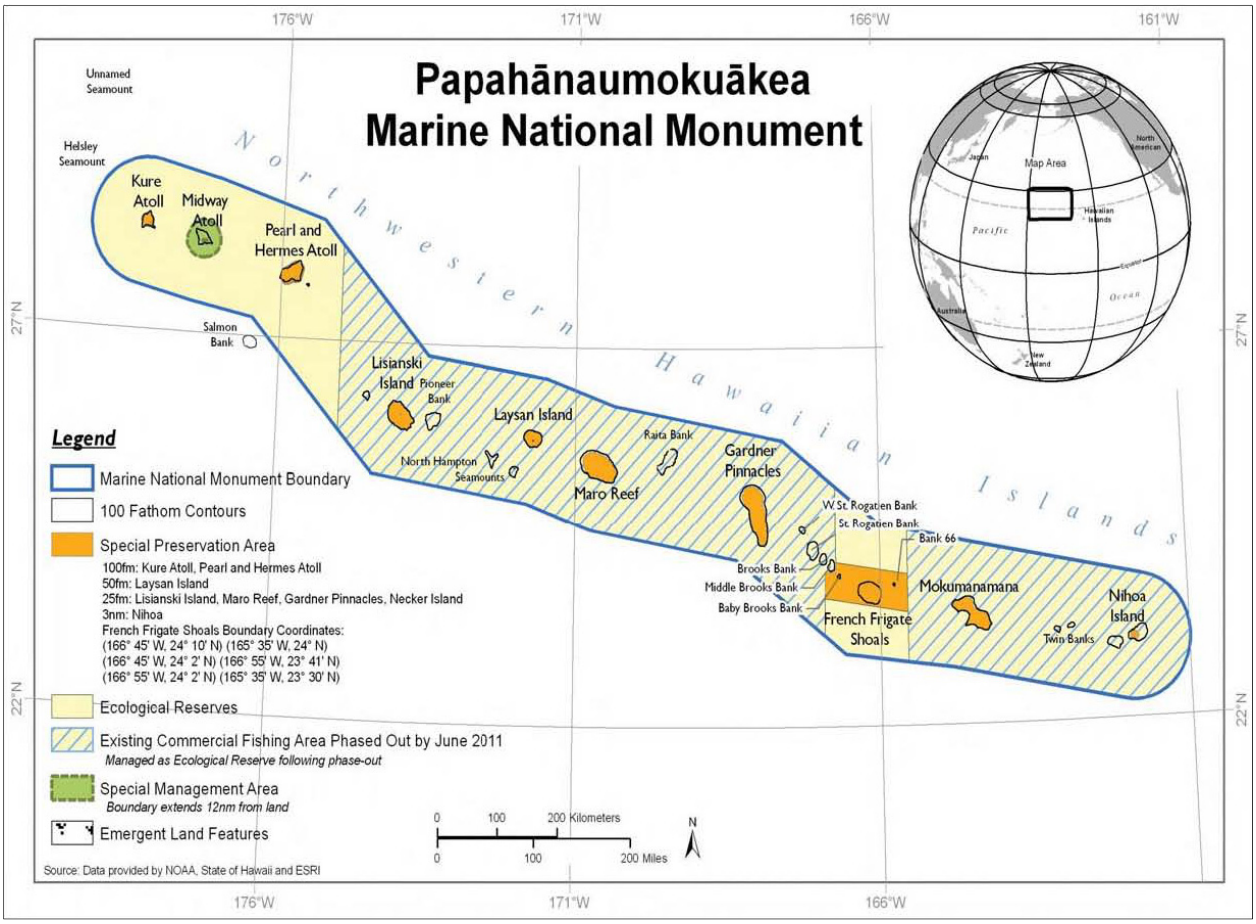


Figure 2. Northwestern Hawaiian Islands (map courtesy NOAA).

In 2006, the entire NWHI were included within the Papahānaumokuākea Marine National Monument, which was created by Presidential Proclamation 8031 on June 15, 2006 under the authority of the Antiquities Act of 1906 (16 U.S.C. §§ 431-433). The Monument, which encompasses an area of approximately 142,948 square miles (370,234 square kilometers), includes the ten main islands and atolls that make up NWHI and the surrounding waters. Its boundaries begin 125 miles west of the main Hawaiian Island of Kaua‘i. Papahānaumokuākea Marine National Monument is the largest protected area in the United States, as well as the world’s largest fully protected marine area. On 30 June 2010, the World Heritage Committee of the United Nations Educational, Scientific and Cultural Organization (UNESCO) unanimously inscribed Papahānaumokuākea as a mixed (i.e., cultural and natural) site. The management of the Monument is under the co-trusteeship of the NOAA, the U. S. Fish and Wildlife Service and the State of Hawai‘i.

2.4 Previous Studies

Several previously existing studies were taken into consideration in preparing this Cultural Impact Assessment. The two studies described below were particularly significant.

2.4.1 Cultural Significance Report and Previous PEIS Cultural Impact Analysis

As part of ongoing efforts to understand cultural knowledge and concerns regarding Hawaiian monk seals, NMFS funded a report under contract, entitled *Historic and Contemporary Significance of the Endangered Hawaiian Monk Seal in Native Hawaiian Culture*, 2011. The report was prepared by John Kittinger, Trisann Māhealani Bambico, Trisha Kehaulani Watson, and Edward W. Glazier (Kittinger et al. 2011; the results of this research were also published in Kittinger et al. 2011 and Watson et al. 2011). This report is included as Appendix J of the Final PEIS, and served as a reference for the section of the Draft PEIS analyzing potential cultural impacts.

2.4.2 Relevant Associated Cultural Impact Assessments

In 2008, the State of Hawaiʻi Department of Land and Natural Resources (DLNR), Division of Aquatic Resources prepared a Cultural Impact Assessment associated with the proposed implementation of the Papahānaumokuākea Marine National Monument Management Plan (MMP), and the Environmental Assessment (EA) for proposed MMP activities. The development of the draft sanctuary management plan for the NWHI involved extensive consultation with the Native Hawaiian community and Native Hawaiian cultural practitioners (State of Hawaiʻi 2008:22). This Cultural Impact Assessment has relevance for the present study as it outlines many of the Hawaiian cultural resources, beliefs and practices associated with the NWHI. Elements of this study have therefore been incorporated in the present report.

2.5 Scope of Work and Objectives

The objectives of the present Cultural Impact Assessment were to assist NMFS in revising relevant sections of the Draft PEIS to produce the Final PEIS. This was undertaken, in part, to fulfill statutory obligations under NEPA to assess potential impacts to cultural resources during the planning and implementation of the Hawaiian Monk Seal Recovery Program. This report focuses on identifying Native Hawaiian concerns regarding the potential impacts of NMFS Hawaiian monk seal recovery actions on traditional cultural resources, beliefs and practices. Potential effects on historic properties and traditional cultural properties have been dealt with in a separate document (Final PEIS Appendix B) detailing the NHPA Section 106 consultation carried out in association with the monk seal recovery action PEIS.

The preparation of this Cultural Impact Assessment involved extensive research into the historic interactions between monk seals and Native Hawaiians, and the cultural significance that monk seals may have held within traditional Hawaiian society. Research was also undertaken to identify traditional Hawaiian activities that may be affected by monk seal recovery actions. A series of public meetings were conducted to elicit input from Native Hawaiian individuals and organizations and other concerned parties regarding the cultural resources, practices and beliefs potentially affected by the proposed actions.

Several sections of the Final PEIS reflect revisiosn to the Draft PEIS based upon the findings of this Cultural Impact Assessment. These sections include:

Section 3.0 Affected Environment
  3.4 Social and Economic Environment

3.4.6 Cultural Environment
Section 5.0 NEPA Compliance, Implementation, and Adaptive Management of the Preferred Alternative
5.6 Recommendations for Coordination with Stakeholders and Communities
5.6.1 Native Hawaiian and Community-Based Programs

Additional sections have been added to the Final PEIS to address the impacts of the proposed actions on cultural resources and traditional cultural practices. These include:

Section 4.0 Environmental Consequences
4.4 Steps for Determining Level of Impact
4.4.3 Impact Criteria for Socioeconomic Resources
Impact Criteria for Cultural Resources and Traditional Cultural Practices
4.9 Social and Economic Environment
4.9.4 Cultural Resources and Traditional Cultural Practices
Section 5.0
5.5 Mitigating Potential Impacts to Cultural Resources and Historical Properties
5.5.2 Training in the Recognition and Avoidance of Cultural Resources and Historic Properties
5.5.4 Northwestern Hawaiian Islands

This page intentionally left blank.

3.0 METHODOLOGY

The intent of this Cultural Impact Assessment is to identify cultural resources, and religious and/or traditional practices that may be affected by the actions proposed in the PEIS for Hawaiian monk seal recovery actions, to determine the potential adverse impacts of these actions, and to develop acceptable mitigation measures to avoid, offset, or minimize these impacts. Preparation of the Cultural Impact Assessment involved a combination of scholarly research and analysis, public consultation, and collaboration with various agencies, organizations and individuals.

3.1 ARCHIVAL RESEARCH

Archival research undertaken as part of this study involved a detailed examination of a variety of available resources. These resources included transcribed traditional *oli* (chants), *mele* (songs), *moʻolelo* (stories, legends, and traditional history), *ʻōlelo noʻeau* (proverbs and traditional sayings), traditional place names, accounts from early visitors to the islands, Hawaiian language newspaper articles, historic documents, maps and photos, archaeological reports, and other previous research reports.

Research was conducted at a range of relevant institutions as well as in the personal collections of the researchers. Sources Institutions and sources used include:

- State Historic Preservation Division Library — Archaeological reports and maps;
- Bishop Museum Library and Archives —Hawaiian Ethnographic Notes including Mary K. Pukui translations of Hawaiian newspaper articles of 1800s, photos, tape recordings, interviews, maps;
- University of Hawaiʻi at Hilo Esther Moʻokini Library Hawaiian Collection — Journals, books, maps, reports; and
- Online sources of Hawaiian Language Newspapers including Ulukau Hawaiian Electronic Library, Ka Paʻa Moʻolelo, University of Hawaiʻi Archives Digital Archives Collection — Land use, place names, *moʻolelo.*

The purpose of the research was to attempt to trace the historic interactions between monk seals and Native Hawaiians through time and to determine the cultural significance that monk seals held in traditional Hawaiian culture. The findings of this research are summarized briefly in Section 6.3 and presented in detail in Appendix B of this document.

3.2 PUBLIC CONSULTATION

As part of the consultation for this Cultural Impact Assessment, a series of community meetings were held at various venues on the islands of Molokaʻi, Lānaʻi, Maui, Hawaiʻi, and Oʻahu. The purpose of these meeting was to provide the public with the opportunity to offer information on the cultural resources and traditional practices that may be affected by the recovery actions outlined in the monk seal PEIS and to enable Native Hawaiian organizations and other interested parties to assist in developing strategies for the mitigation of impacts resulting from these proposed actions. The results of these community meetings are discussed in Section 5.0.

This page intentionally left blank.

4.0 ACTIVITIES RELATED TO HAWAIIAN MONK SEAL RECOVERY

4.1 CURRENT ACTIVITIES

The existing permit issued to the NMFS Pacific Islands Fisheries Science Center (PIFSC) under the Marine Mammal Protection Act (MMPA-ESA Permit No. 10137-05) authorizes research and enhancement activities on Hawaiian monk seals. These activities, which include aerial, vessel, and ground surveys, sample collection, medical treatment, marking of animals, attachment of telemetry instruments, translocation and temporary captivity are listed in Table 2.10-1 of the PEIS. The PIFSC is authorized to undertake these activities each year through June of 2014, at which time the existing permit will expire.

4.2 ACTIVITIES PROPOSED IN PEIS

The proposed alternatives for Hawaiian monk seal recovery actions are addressed in detail in Sections 3.7 to 3.10 of the PEIS and in Table 2.10-1. They are briefly summarized below.

Proposed Alternatives

Alternative 1 involves the continuation of currently authorized activities past 2014. Research and enhancement activities allowed under this alternative are listed in Table 2.10-1 of the PEIS. No new activities or expanded scope of existing activities would occur under this status quo alternative. Under Alternative 1 the translocation of seals would only take place within the MHI or within the NWHI. There would be no translocation of seals from the NWHI to the MHI or from the MHI to the NWHI. Activities conducted under Alternative 1 include aerial, vessel and land-based surveys, and some handling and transportation of Hawaiian monk seals. Boats and land vehicles will be used to transport researchers and possibly animals. Researchers will cross beach and dune areas on foot to reach monk seal locations. Recovery activities will be conducted throughout the APE, in the MHI, NWHI, and on Johnston Atoll. Researchers will seasonally (typically April or May through August) occupy existing camp sites in the NWHI.

Alternative 2: Under Alternative 2, presently authorized activities as permitted under the existing permit (10137) will continue until 2014. However, once the present permit expires the only research and enhancement activities carried out would be those that either do not require a new permit or are allowed under the provisions of the MMPA's MMHSRP (Title IV, 16 U.S.C. 1421) and the permit held by the MMHSRP. No new permit would be issued to replace 10137 when it expires

Alternative 3: Alternative 3 is the preferred alternative and encompasses the range of actions considered most promising for fostering monk seal recovery in the next several years. Under Alternative 3, all activities currently permitted would continue, and new permissions would be granted with expanded scope and methods, with restrictions and mitigation. Additional actions would include increased handling of Hawaiian monk seals. Alternative 3 would also include a seal behavior modification program intended to prevent or reduce human-monk seal interactions. Also under Alternative 3 the scope and number of seal translocations would also be expanded (see PEIS Section 3.9). This would include

the translocation of Hawaiian monk seals within the MHI or within the NWHI, as well as the translocation of a limited numbers of seals from the MHI to the NWHI. As a result, boat and land vehicle activity, as well as shoreline activities, would be greater under Alternative 3 than under Alternatives 1 or 2.

Alternative 4: This alternative would encompass all of the activities permitted under Alternative 3 with the addition of the option for temporary translocation of weaned pups from the NWHI to the MHI as described in Section 3.10 of the PEIS. The increased capture and transport of the seals under Alternative 4 would result in increased boat and land vehicle traffic, as well as pedestrian traffic to and from the capture site.

4.3 TASKS ASSOCIATED WITH PROPOSED ALTERNATIVES

1. Translocation

This activity involves the temporary or permanent translocation of weaned pups, juveniles and sub-adults, and adult males within or between subpopulations within the species range. For Alternatives 1 and 2, this includes translocations within the NWHI and within the MHI, but not between the NWHI and the MHI. Alternative 3 also includes translocations from the MHI to the NWHI. Under Alternative 4 this also includes temporary translocations from the NWHI to the MHI.

Tasks Involved: Translocation within the NWHI and (under Alternative 4) from the NWHI to the MHI

Capture of the seal:

Seals are captured by manual physical restraint, herding (sometimes with plywood boards), and placed in nets or cages for transport. The removal cage (for adults) or net (for pups) is transported to the capture site by boat and is hand-carried from the boat to the seal's location on the beach. Depending on the size of the seal, two to four NOAA staff will be present to carry the cage or carrier and to monitor the seal. There is no large-scale movement of sand or digging.

Transport to the release site:

The captive seal is then hand-carried to the release site or to the waiting boat for transport to the release site.

Release of the seal:

The capture process is reversed at the release site, whether from a net or cage. The captive seal is hand-carried from the boat to the release site. Pups are typically released on the beach above the water-line. Depending on the size of the seal, two to four NOAA staff will be present to carry the cage or net and to monitor the seal.

Translocation within the MHI and (under Alternative 4) from the MHI to the NWHI

Capture of the seal:

Seal cages are typically transported to the capture site by truck. As a seal is usually translocated from an area of human population to a more remote locale, the capture site is likely to have nearby vehicle parking for the truck, as in the case of a beach park, or at least nearby access to a

paved road. No off-road vehicle access is involved. The cage (for adults) or net (for pups) is hand-carried from the truck to the seal's location on the beach. Depending on the size of the seal, two to four NOAA staff will be present to carry the cage or carrier and to monitor the seal. There is no large-scale movement of sand or digging.

Transport to the release site:
The captive seal is hand-carried to the waiting truck or boat for transport to the release site. The cage is typically not carried a long distance due to its weight. As the release site is usually remote, seals are often transported by boat.

Release of the seal:
The capture process is reversed at the release site, whether from a net or cage. The captive seal is hand-carried from the boat to the release site. Pups are typically released on the beach above the water-line. Depending on the size of the seal, two to four NOAA staff will be present to carry the cage or net and to monitor the seal.

2. <u>Carcass Removal</u>
Removal of a deceased animal in the MHI involves collection of the carcass and its transport to a necropsy facility. The site is accessed according to the same process outlined above for translocation via truck for a populated area or boat for a remote area. When the site is remote, two to four NOAA staff may be required to hike from the road, producing cross-country pedestrian traffic.

This activity in the NWHI involves access to the site and carcass removal by boat or on foot. Some necropsies are conducted where carcasses are found in the NWHI (without transporting the carcass).

3. <u>Other Activities</u>
Other activities proposed in the Alternatives (see Chapter 2 of the PEIS), including disentanglement, health assessment, etc., may involve pedestrian traffic or boat traffic to access the seals. The sites would be accessed according to the same process outlined above for translocation via truck for a populated area or boat for a remote area. When the site is remote, two to five NOAA staff may be required to hike from the road, producing cross-country pedestrian traffic.

This activity in the NWHI involves access to the site by boat.

This page intentionally left blank.

5.0 NATIVE HAWAIIAN AND COMMUNITY CONSULTATION

5.1 THE CONSULTATION PROCESS

The community consultation for this Cultural Impact Assessment consisted primarily of a series of public meetings held on various islands. These meetings were intended to provide the public with the opportunity to offer information and raise concerns regarding the cultural resources and traditional practices that may be affected by the proposed Hawaiian monk seal recovery actions. The results of these meetings were combined with the results of interviews and consultations undertaken as part of the original Draft PEIS.

5.2 FINDINGS FROM PREVIOUS CONSULTATIONS

As has been mentioned (Section 2.4.1), a series of unstructured ethnographic and oral history interviews were conducted with thirty Native Hawaiian community members, cultural practitioners and *kūpuna* to gather information on the role that monk seals played in traditional Hawaiian culture and to document the views of these informants regarding the potential impacts of monk seal recovery actions. The results of these interviews were presented and discussed in the report included as Appendix J of the Final PEIS (Kittinger et al. 2011).

The authors of this study found substantial differences in the views of the various individuals interviewed. "While some Native Hawaiian community members hold positive views about the monk seal, others view the monk seal negatively and do not associate any cultural significance to the species historically or in modern times" (Kittinger et al. 2011:17). Their conclusion was that, "Respondents exhibited a plurality of views regarding the monk seal, ranging from hostility or ambivalence to strong feelings of conservation and stewardship. This suggests lack of a consensus in the Native Hawaiian community regarding the monk seal and heterogeneity in perceptions and socio-cultural values associated with the species" (Kittinger et al. 2011:16).

5.2.1 Concerns Expressed

A number of concerns were expressed by individuals consulted during this previous study. While the most commonly expressed concern was the impacts of monk seal presence on traditional subsistence fishing, there were other concerns raised as well.

Traditional Subsistence Fishing

The authors of the 2011 study (Kittinger et al. 2011) found that the most commonly mentioned conflicts between humans and Hawaiian monk seals centered on traditional subsistence fishing practices. The report mentions that, "Monk seals are viewed by Native Hawaiian fishers and their families as direct competitors, in that they preferentially take fish specifically targeted by fishers. Many respondents believe that when interactions occur, they inhibit the ability of fishers to provide food for the household. Other fishers cite the aggressive behavior of monk seals as a major problem. Common interactions include seals taking fish off of lines or out of fishers' nets, but increasingly seals are interacting with boats and fishermen directly – in some cases fishers have been bitten by monk seals. These interactions are viewed by some as impacting cultural fishing practices, and are further compounded by existing regulations that restrict fishing and the depleted condition of fisheries resources in the MHI" (Kittinger et al. 2011:18).

Cultural Integration
Another source of concern raised during informant interviews was the restrictive nature of Federal regulations regarding Hawaiian monk seals. Several of those interviewed felt that Federal regulations restricted the ability of Native Hawaiians to interact with monk seals as part of their natural environment. It was expressed that only through direct interaction could monk seals be integrated into contemporary Hawaiian culture. "Among respondents who view the species negatively, the belief that the monk seal is not endemic is exacerbated by the prohibitions against interacting with the seal. Some respondents state the perspective that modern cultural knowledge cannot be generated because the monk seal "cannot be touched and used for anything." Restrictions on use have precluded indigenous communities from perpetuating cultural traditions for other protected species such as sea turtles. Ancient cultural knowledge is believed to be nonexistent due to the recent arrival of the monk seal in the MHI, but respondents also suggested that modern knowledge of the seal will accrue with the current generation that is interacting with the monk seal. A key question among this group is how seals will be integrated into Hawaiian culture and what will the cultural exchange be with the species in the modern context" (Kittinger et al. 2011:18).

5.2.2 The Question of Stewardship
The authors of the study found that positive reactions to monk seal presence were more common in relatively isolated rural communities. They note some communities have taken on themselves the role of stewards, looking after the health and wellbeing of their resident monk seal population. The report notes that, "In a few unique places in the archipelago monk seals are regarded as a natural part of the ecosystem and human-monk seal conflicts appear to be minimal. These areas tend to be rural and fairly isolated communities that are characterized by a higher degree of self-sufficiency, and where familial traditions and local decision-making processes are preserved. On Niʻihau Island, for example, monk seals became established in the 1970s. Community members discussed the social impacts associated with monk seal colonization (e.g., increased presence of sharks), and ultimately decided to act as stewards of the animals. As a result, a sub-population has become established and residents have developed a stewardship ethic towards the species. A similar situation is occurring in the isolated Kalaupapa community on Molokaʻi Island, where another sub-population is thriving in the MHI, and where community residents largely leave seals alone. In these communities, fishers and other ocean users will move away from areas where seals are visible in order to minimize interactions" (Kittinger et al. 2011:18).

5.3 Community Meetings

As part of the preparation of the present Cultural Impact Assessment, a series of community meetings were announced and held on six of the eight MHI (the exceptions were Niʻihau and Kahoʻolawe). The purpose of these meetings was to seek community input on the proposed Hawaiian monk seal recovery actions as presented in the Draft PEIS. Information sought included potential adverse effects to historic properties and/or traditional cultural properties, as well as information on potential impacts to cultural resources and practices that might result from implementation of Hawaiian monk seal recovery actions. The press release announcing these meetings is included in Appendix A of this document.

These meetings were planned, convened, and facilitated by Dr. Paul Cleghorn from Pacific

Legacy. Members of NMFS staff participated in each meeting, providing information and responding to concerns expressed by those attending.

5.3.1 Meeting Schedule

All meetings were held at public venues (elementary, middle or high schools) between 6:00 and 8:00 pm to allow them to be attended by individuals who worked or attended school during the day. The meetings were held at eleven venues on six islands.

Molokaʻi	
Kaunakakai (29 October 2012)	Molokaʻi High School
Lānaʻi	
Lānaʻi City (30 October 2012)	Lānaʻi High and Elementary School
Kauaʻi	
Waimea (7 November 2012)	Waimea High School
Kapaʻa (8 November 2012)	Kapaʻa Middle School
Maui	
Hāna (14 November 2012)	Hāna High School
Lāhainā (15 November 2012)	Lāhaināluna High School
Hawaiʻi	
Hilo (27 November 2012)	Hilo High School
Kona (28 November 2012)	Kealakehe Elementary
Oʻahu	
Waiʻanae (11 December 2012)	Waiʻanae High School
Waialua (12 December 2012)	Waialua High and Intermediate School
Waimānalo (13 December 2012)	Waimānalo Elementary and Intermediate School

5.3.2 Summary of Community Meetings

It was found that each meeting possessed its own tenor, and often its own particular area of interest, depending upon the individuals attending. The greatest number of concerns and the strongest opposition to the actions proposed in the DPEIS were expressed at meetings in Kapaʻa, Hāna, and Lāhainā.

Molokaʻi (Kaunakakai, 29 October 2012)

Only three members of the public attended the Molokaʻi meeting. NMFS staff provided the background information on the project, as well as information on seal behavior, especially as it relates to seal movement and seal observations on Molokaʻi. No concerns were expressed or issues raised.

Lānaʻi (Lānaʻi City, 30 October 2012)

A total of four members of the public attended the Lānaʻi meeting. Numerous concerns were raised, and NMFS staff spent time answering questions and addressing concerns.

Kauaʻi (Waimea, 7 November 2012)

A total of four members of the public attended the Waimea, Kauaʻi meeting. The meeting was lively and productive. The group was more interested in discussing traditional activities than historic resources.

Kaua‘i (Kapa‘a, 8 November 2012)

A total of 16 members of the public attended the Kapa‘a, Kaua‘i meeting. The meeting started out with several attendees expressing displeasure regarding the poor advertising of the meeting. They felt it should have been on all of the radio stations and in the newspaper. A tape recording was made of the meeting because NOAA had been informed that some of the people intended to present their views in ‘*olelo Hawai‘i* (the Hawaiian language), and the tape was made so that these presentations could later be translated by Pacific Legacy staff. Only one young boy (approximately 10 to 12 years old) presented a statement in ‘*olelo Hawai‘i*. There was a great deal of anger and frustration expressed at the meeting, but the attendees would not allow NMFS staff to provide them any numbers or information. They accused NOAA of not listening to the people. The main sentiment brought away from the meeting was that the meeting participants strongly feel that the translocation of seals will alter their lifestyle and they are adamantly opposed to any activity that would increase the number of seals in their area.

Maui (Hāna, 14 November 2012)

A total of 18 members of the public attended the Hāna, Maui meeting. Some participants expressed their frustration that this was the third or fourth meeting held on Maui regarding monk seals, and it does not seem that NOAA is listening to the feelings of the community. They felt that repeatedly coming into the community and asking the same questions, without addressing their answers, was insulting to the community. There is deep frustration that NOAA keeps coming back asking the same questions and wanting to do the same things without acknowledging that the community is opposed to these actions. This sense of a federal agency not listening permeated the meeting.

The community is adamant that they do not want any new seals brought into the area and are not happy about the seals that are already here. The overriding sentiment appeared to be that the community wants seals to be taken from the MHI to the NWHI. This point, with slight variations (relocate seals anywhere but here) was repeated many times. It is their sincere belief that monk seals are not native to the area and are causing adverse impact to their lives. Minimally they would like to see no actions taken regarding existing seal populations -- let nature run its course. If the seals survive, ok if they perish, ok.

There is a strong sense by a least some members of the community that the seal recovery program is a means for the U.S. Federal Government to exert greater control over the people of Hawai‘i. There is a strong lack of trust and a strong sense of suspicion. The overriding sentiment was that the community objects to a federal agency coming into their home telling them what to do.

Maui (Lāhainā, 15 November 2012)

A total of six members of the public attended the Lāhainā, Maui meeting. The general feeling of the attendees was that monk seals should not be translocated into the MHI. There was concern that an increase in Hawaiian monk seal populations would result in an increase in sharks and shark attacks. As one attendee expressed it, “We understand that seals are having survival problems and we are sorry for this. BUT, we need to be more concerned with the survival and quality of life of Hawaiians.”

Hawai‘i (Hilo, 27 November 2012)

A total of seven members of the public attended the Hilo, Hawai‘i Island meeting. The initial emphasis of public questions was on seal biology and seal populations. This discussion focused mainly on the management of species. There were a number of questions regarding carrying capacity and concern that by attempting to increase the monk seal population within the MHI NOAA was placing the interests of seals before the interests of fishermen. It seemed to be a productive meeting with many participants satisfied with the answers to their questions and concerns. Many useful suggestions were made by participants regarding what NOAA could do to educate and involve the public.

Hawai‘i (Kona, 28 November 2012)

A total of four members of the public attended the Kona, Hawai‘i Island meeting. The meeting consisted of about an hour long conversation about possible scenarios of human - seal interactions at the time of the first Polynesian settlement. Also, other general aspects about Hawaiian prehistory and adaptation to the land were discussed. All very interesting topics, but none of them pertained to the issues at hand.

O‘ahu (Wai‘anae, 11 December 2012)

A total of six members of the public attended the Wai‘anae, O‘ahu meeting. There was some discussion regarding the impact of seals on traditional fishing practices, and fishermen indicated that they had seen seals go after some of the same fish as subsistence fishers using hook and line.

O‘ahu (Waialua, 12 December 2012)

A total of three members of the public attended the Waialua, O‘ahu meeting. One attendee was a NOAA staffer unassociated with the project, while the remaining two were a Hawai‘i State staffer and a State Representative. The meeting consisted of an informal discussion about the NOAA program with the State Official’s representative. No issues were raised.

O‘ahu (Waimānalo, 13 December 2012)

A total of five members of the public attended the Waimānalo, O‘ahu meeting. Most of the concerns expressed in the meeting related to seals interfering with subsistence and commercial fishing activities. It was pointed out by one of the participants that commercial fishing grew out of traditional subsistence fishing practices.

5.4 Identified Cultural Resources and Customary Practices

Participants attending the public meetings identified several cultural resources and customary practices that they felt would be affected by the proposed Hawaiian monk seal recovery actions.

5.4.1 Cultural Resources

Participants in the community meetings identified a number of types of cultural properties that might be affected by the activities proposed in the PEIS. These included:

Coastal *heiau* (religious sites)
Ko‘a (fishing shrines)
Traditional stacked stone walls
Sand dunes containing buried cultural deposits

Iwi kāhiko (ancient human remains)
Fishponds
Fishing Villages

5.4.2 Cultural Practices
Participants in the community meetings also identified a number of cultural practices, and by inference cultural resource areas, that might be affected by the activities proposed in the PEIS. These included:

<u>Traditional Gathering Activities</u>
Limu (seaweed) collecting
'Opihi (limpet) collecting
Hau'ukeuke (an edible sea urchin) collecting
Wana (sea urchin) collecting
Crabbing
Ula (lobster) collecting

<u>Traditional Gathering Resource Areas</u>
Limu (seaweed) collecting sites
'Opihi (limpet) collecting sites
Hau'ukeuke (sea urchin) collecting sites
Wana (sea urchin) collecting sites
Crabbing sites
Ula (lobster) holes

<u>Traditional Fishing Activities</u>
Throwing net
Hook and line
Spear fishing
Trolling

<u>Traditional Fishing Resource Areas</u> (some individuals felt that these might be threatened by the increased presence of seals)
Moi holes
Āholehole fishing areas
Menpache fishing areas

One fisherman on O'ahu said that he has seen monk seals go after red and pink snapper (*Ōpakapaka* and Onaga). With the Onaga, he said that the seal would repeatedly toss the fish into the air and hit it again and again. Once the fish is pretty pulverized it is swallowed whole. Another fisherman has witnessed seals consuming puffer fish, trigger fish, and *Ōpakapaka*/Onaga.

They also noted that a detailed study of traditional fishing practices within the Hawaiian Islands has been undertaken by Kepā and Onaona Maly. The report of this study, Ka Hana Lawai'a a me Nā Ko'a o Nā Kai 'Ewalu (A History of Fishing Practices and Marine Fisheries of the Hawaiian Islands Compiled From Native Hawaiian Traditions), includes information

obtained through archival research into Native Hawaiian traditions, historical accounts, government communications, *kamaʻāina* testimony and ethnography (Volume I), as well as oral history interviews with *kūpuna* and *kamaʻāina (*Volume II) (Maly and Maly 2003). It was suggested that NOAA use this report as a reference in understanding and mitigating for subsistence gathering and fishing.

In addition to traditional marine resource use, there are traditional activities related to the gathering of terrestrial plants that live near the shore for medicinal and other uses. Two examples that were raised during community meetings are:

> *Heialoa*, a vine or creeper that has a yellow flower used for the treatment of a variety of ailments including cancer.
>
> Name unknown, possibly *kokoʻolau*, a woody bush with a yellow flower, the root of which is used to treat sore throats.

5.5 Issues Raised During Community Meetings

The community meeting held throughout the islands elicited a wide range of public comments and concerns. A number of the concerns expressed did not deal directly with cultural or historic resource issues, but were more informational questions regarding human and monk seals interactions. The following concerns were expressed during the various community meetings. During the meetings, NMFS staff engaged in dialogue regarding the concerns and offered additional perspectives and information. Many of these concerns/questions are addressed in responses to comments of the Draft PEIS provided in the Final PEIS. It is important to note that some of the concerns outlined here involve assumptions based in incorrect information, or state information as fact that is not supported by any evidence. The meeting(s) at which each concern was raised has been noted in parenthesis. Different individuals attending different meetings sometimes expressed similar concerns. In these cases the concerns have been synthesized into one.

5.5.1 Concerns Not Directly Related To Cultural Resources or Practices

(*Note: A comprehensive Comments Analysis Report is provided in Appendix C of the Final PEIS. The report provides a summary of all public comments NMFS received regarding the Draft PEIS and provides responses to those comments. Many of the concerns presented below are addressed in the Comments Analysis Report.*)

<u>General Concerns</u>

Concern: What are NOAA's goals for monk seal recovery? (Hilo)

Concern: We do not know enough about the impact that the translocation of monk seals from the NWHI to the MHI will have. (Lāhainā)

Concern: What impact is the present population of the MHI having on fish populations and the natural environment? (Hāna)

Concern: Will coral reefs be impacted by monk seal translocations to the MHI? (Hāna)

Concern: Brackish water estuaries are nutrient/algae rich, which provide food for small fish, which are eaten by larger fish and so on. A seal coming into this area will have a tremendous impact on this fragile system. (Hāna)

Concern: A fisherman stated that he had been at a meeting where there was proposed a bag limit of two menpache (squirrel fish) per certain period. He felt that this was being proposed to leave more menpache for seals. He wants to know what the carrying capacity for seals is in the MHI. (Hilo)

Concern: One participant asked what is monk seals' feeding behavior at night? Fish sleep at night, so it is easier hem to be for caught by seals at night. Seals haul out onto the shore during the day. (Lāhainā)

Concern: If a large population of seals congregates on one island, say Niʻihau, and they become a problem for the owner, there would be a serious problem. What would NOAA do about this? (Hilo)

Concern: If NOAA's target is to ultimately have a monk seal population of 500 seals in the MHI (20 years out) we will need an extensive educational program for locals as well as tourists for everyone's safety. (Lāhainā)

Concern: In 1994, 21 aggressive male seals were translocated from Laysan Island in the NWHI to the MHI. Did the federal agency responsible for this action have the appropriate permits for this action? When NOAA has been asked this question before, there was no response. (Hilo)

Concern: The individual asking the previous question also wanted to know what impact these 21 make seals have on the local seal population? (Hilo)

Concern: What is the proposed ratio of males to females for the translocations proposed in the DPEIS? (Hilo)

Concern: Concern was expressed that adult seals who grew up in the MHI, after translocation to the NWHI will return to the MHI. (Hilo)

<u>Concerns Regarding the Specifics of the PEIS</u>
Concern: The DPEIS does not directly address the cumulative impacts of its proposed actions. (Lānaʻi)

Concern: A concern was raised regarding the designation of critical habitat. The question was, once a critical habitat is identified, how does this affect traditional practices such as fishing? (Lānaʻi)
Concern: Concern was expressed that the community really does not know what kind of numbers are be considered for Monk seal relocation. How many seals make up the resident populations within the MHI? How many are being considered for relocation? Why is relocation necessary -- most think that "being in the wild out in the NWHI" would be preferable to being in areas where there is human activity. (Lānaʻi)

Concern: The Draft PEIS needs to consider and evaluate economic, social, and cultural aspects of the project. What is the status of these considerations? (Hilo)

Concerns Regarding Seal Survival

Concern: If seals are translocated into the MHI from the NWHI and raised without the danger of shark predations, when they are taken back to the NWHI they will not have the survival skills to handle sharks. They will quickly become shark bait and be killed. (Lāhainā)

Concern: With larger numbers of seals being brought into the MHI there will be a greater risk of barges and other vessels hitting seals. Shipping companies should be required to obtain inadvertent take permits. (Hilo)

Concerns Regarding Public Safety

Concern: If more seals are brought to the MHI, will this will attract more sharks, which in turn could cause a greater number of shark attacks, posing a safety issue for humans. There was also the suggestion that there are a growing number of sharks and shark attacks. (Waimea, Kapaʻa, Hāna, Lāhainā)

Concern: The increase in the number of seals in the MHI will result in an increase in interactions between humans and seals with a resulting increase in the risk to public safety (e.g., seals biting humans). (Lāhainā, Hilo)

Concerns Regarding Monk Seal/Human Interaction

Concern: There was an instance where a family group went to the beach of a day of activities and someone came forward waving their arms and telling them that there was a seal present and that the group would have to leave. (Waimea)

Concern: Seals can and have hauled themselves out on boat launch sites, and vessels on trailers had to leave without launching. The seals need to be herded away. (Waimea)

Concern: If at the beach, a seal bites a child, then the father gets a gun and kills the seal, is the father liable for prosecution? (Kapaʻa)

Concern: A few participants expressed the concern that monk seals are becoming more aggressive towards fishers and divers, stealing fish and intimidating people. (Waimānalo)

Concern: Fishers are afraid to report hooking of seals, as there is a general conception that fishers are bad and that their nets and hooks harm seals. This fear is being fostered by NOAA. (Waimānalo)

5.5.2 Concerns Regarding Cultural Resources and Practices

(*Note: A comprehensive Comments Analysis Report is provided in Appendix C of the Final PEIS. The report provides a summary of all public comments NMFS received regarding the Draft PEIS and provides responses to those comments. Many of the concerns presented below are addressed in the Comments Analysis Report.*)

Concerns include that the increased number of seals in the MHI may impact traditional fishing practices, reduce catches, and attract monk seals to fishponds.

Concerns Regarding Traditional Fishing

Concern: The increase in monk seal populations resulting from the translocation of seals to the MHI will adversely impact subsistence fishing resources, including ocean and reef fish, ʻ*opihi* (limpets), lobster, *heʻe* (octopus), crab, and *limu* (seaweed). Part of the concern is with long term impacts, which the individuals concerned were not confident are fully known. (Kapaʻa, Hāna, Waimānalo)

Concern: Another question raised was whether, if a monk seal is translocated to a specific beach or shore line area, does this prevent fishers from carrying on the traditional practice of fishing (including hook and line fishing as well as throw-net fishing) at that locale? This concern was brought up on more than one occasion during community meetings. (Lānaʻi)

Concern: A similar question was, if a seal approaches a fisher's camp (fishing and camping being considered cultural practices), does the fisher need to move his camp or can the fisher stay because it is the seal that is approaching him? (Hilo)

Concern: Monk seals will patrol a beach area (swimming back and forth opposite the beach) before landing. Fishers are convinced that this patrolling scares off fish, so that people fishing there will haul in their lines and leave. (Waimea)

Concern: The fishing of *akule* in Hāna Bay by surround them is a traditional practice unique to Hāna. This is not practiced every year and the numbers of *akule* have dwindled. There is a concern that greater numbers of monk seals will impact this practice. (Hāna)

Concern: Monk seals can take fish off lines and off diver's strings. (Waiʻanae)

Concern: There have been occasions where a group of commercial fishers was conducting surround catches when a couple of large monk seals come into the area and scare the fish away. The current changes and the catch opportunities are lost. (Waimānalo)

Concerns Regarding Historic Properties

Concern: One participant asked that if a fishpond is on the National Register of Historic Places and a monk seal enters the pond, where does the jurisdiction lie, with the NHPA and the protection of the historic property or with the Endangered Species legislation and the protection of the seal? A variation to this was the question of, if a monk seal enters a fishpond what is the best way to remove the seal and minimize impact to the pond. It was suggested that NMFS staff and volunteers be trained in removing seals from fishponds. (Hāna, Lāhainā)

Concern: What happens when a seal arrives at a Traditional Cultural Property, such as Moʻokini or Moku Ula, and becomes a problem. (Lāhainā)

5.5.3 General Comments Made During the Community Meetings

Among the general comments made by individuals attending the community meeting were the following.

A mother with several children did not want the seals translocated to the MHI, nor does she want any interference with the natural behavior of seals -- no moving, herding, harassing. Some participants expressed the sentiment that we should leave the seals alone and not intervene. Let nature take its course. There was concern expressed that the proposed action was a form of animal husbandry that used methods to manage a species rather that allowing nature to take its course.

A fisherman from Kaua‘i stated his feeling that NOAA was putting the welfare of seals above the welfare of people. Other participants questioned whether NOAA was placing a higher priority on seals than on fishermen.

Some individuals expressed a strong feeling that the translocation of seals will have an impact on the total lifestyle of Native Hawaiians.

An elderly man from Kaua‘i (born 1926) expressed his strong opposition to relocating seals from NWHI to the MHI. He said that this will deplete the fish populations. He suggested that seals translocated to islands in the south. There was a very strong feeling among some participants in the community meetings that if translocation is needed, the seals should be translocated elsewhere. Some of the possibilities suggested included Christmas Island, the Line Islands, Palmyra, Johnson, and Micronesia.

It was expressed by some individuals that while NOAA may consider the monks seals to be endangered, Hawaiians may see them as invasive. That monk seals are not native to the MHI, that they will destroy marine resources, and do not belong here.

Some participants stated that monk seals are not a part of the Hawaiian’s cultural heritage.

One participant said that, we understand that seals are having survival problems and we are sorry for this. But, we need to be more concerned with the survival and quality of life of Hawaiians. There seems to be more effort to protect seals (and tourists) than there are to protect Hawaiians.

There seemed to be a general feeling among many participants in the community meetings that the public was unaware of the rules governing monk seal and human interactions. Many individuals felt that NOAA needed to make a greater effort to communicate and explain these rules to the general public.

It was also felt that misinformation is the biggest problem. Various number have been heard about how many seals are present in the MHI; how many are to be translocated there; what is the target number of seals in the MHI; people having to move or not use an area because of a seal’s presence. People need proper information and meeting participants felt that it is NOAA’s responsibility to furnish that information.

5.6 MITIGATION MEASURES RECOMMENDED DURING COMMUNITY MEETINGS

A number of possible mitigation measures were recommended by individuals attending the community meetings. These included:

Education of NOAA Staff and Volunteers
It was recommended that all personnel associated with the undertaking go through an orientation program that would include training in:

- Recognition and identification of cultural sites.
- Proper behavior around identified sites.
- How to report the presence of newly discovered sites.
- Getting seals out of fishponds.

This training may need to be repeated every so many years.

Public Education and Involvement
It was suggested that there is a need for a series of presentations by NOAA regarding what is allowed in terms of human/ monk seal interactions. This would include the restrictions on approach to seals, both in the water and hauled out, people's rights of access to beaches occupied by monk seals, and use of marine resources when monk seals are present. There was a general feeling that NOAA needed to create an educational process to inform the local public. This could also extend to education of *malahini* (visitors), which might include a video on airplanes for tourists coming to Hawai'i regarding proper behavior around whales, seals, etc.

It was recommended that NOAA work with local fishers and other beach users to determine and clarify the proper behavior around seals. It should empower ocean users to take care of seals through an educational program. NOAA also needs to provide clarification to the public of all laws and regulations governing seals and other endangered species. Education is the key. NOAA needs to determine and then communicate what impact seals (and other species such as turtles) have on the ecosystem. We need to look at the entire ecosystem and the role of the seals in this. Are there benefits from the seals? Maybe seals go after and consume invasive species. We need more community education. We need to foster a community management system.

5.6.1 Consultation
It was suggested that NOAA have a cultural representative for each *moku* (district) on each island. Input should be sought from each *moku* individually.

It was also suggested that if a seal needs to be removed from a sensitive cultural area, such as a fishpond, that NOAA contact the *kahu* (caretaker) of that site or a community contact/expert to get direction about such things as the best way to access the site, where to stage activities, where

to place the cage for the seal, etc. A protocol should be developed to govern this community consultation prior to an activity, and a list of community contacts should be developed.

Change in Fishing Rules
Upon learning that one of the reasons why monk seals are not surviving well in the NWHI is over-competition from *ulua* (jacks), it was suggested that fishing for *ulua* in the NWHI be allowed to lower the numbers of this predictor fish. The feeling was that this would solve many

problems; more fish for Hawaiians, better habitat for seals in the NWHI, and finally the possible resettling of seals away from the MHI.

Measures Not Directly Related to Cultural Concerns
During the community meeting a number of suggestions and recommendations were made that did not directly relate to the protection of historic properties or cultural practices. These included:

> NOAA needs to follow up with people who call NOAA to report a seal issue.
>
> NOAA needs to provide greater public involvement in working with seals (tagging, vaccinating, etc.) and in the initial viewing of critter cam footage to include more than just High School students.

This page intentionally left blank.

6.0 ASSESSMENT OF CULTURAL IMPACTS

The NEPA requires NMFS, as part of its PEIS, to consider the potential impacts that the proposed Hawaiian monk seal recovery actions may have on cultural resources. This includes consideration of any unavoidable adverse impacts to cultural resources or traditional cultural practices should the proposals put forward in the PEIS are implemented.

A range of cultural resources and traditional cultural practices have the potential to be affected by monk seal recovery actions proposed under the PEIS. These potential impacts can take two forms: 1) impacts resulting directly from the conduct of the recovery actions themselves, and 2) impacts resulting from the activities of seals influenced by the recovery actions, for example, seals that have been translocated or seals that have been intervened with using seal behavior modification techniques.

Three categories of activities under the proposed Hawaiian monk seal recovery plan have the potential to affect cultural resources and traditional practices:

1. Increased off-road land pedestrian traffic in remote areas to access the seals.
2. Increased vessel traffic to access the seals on remote beaches.
3. Increased human-seal interactions due to the translocation of seals (particularly from the NWHI to the MHI under Alternative 4).

6.1 POTENTIAL EFFECTS TO CULTURAL RESOURCES

Cultural resources that may be affected by activities associated with Hawaiian monk seal recovery are present in both shoreline areas (these include coastal plants and seaweeds traditionally gathered for their edible and medicinal properties), and offshore areas (these include marine fauna traditionally fished or gathered).

Among the resources located within the shoreline portion of the APE (25 meters inland from the line where the shore meets the sea) are native strand plants that are traditionally gathered for their medicinal properties. These fragile shoreline plants (such as *hinahina*, *pa'u o Hi'iaka*, and *kauna'oa*) could be accidentally damaged by pedestrian activities associated with monk seal observation, handling and translocation.

Cultural resources present within the inshore portion of the project area (waters up to 300 meters off from the shoreline) include fish, shell fish, and other marine organisms traditionally collected for food. These resources are much less likely to be directly affected by monk seal recovery activities, though it is possible that patches of edible *limu* (seaweed) could be disturbed during boat landings.

The increased presence of Hawaiian monk seals within the MHI as a result of translocation (particularly translocation from the NWHI to the MHI as proposed under Alternative 4) or other recovery actions has the potential to affect marine resources. Monk seals feed on some of the fish and shellfish species that were traditionally collected by Hawaiian fishers (Sprague et al., 2013). There has been public concern that increased Hawaiian monk seal presence within the MHI could result in a depletion of fish stocks, directly impacting the livelihood of those practicing traditional subsistence fishing. A detailed analysis of the impacts of all PEIS

alternatives on subsistence fishing is presented in Section 4.9.2 of the PEIS. The analysis concluded that all alternatives, including Alternative 4, were likely to have negligible impact on subsistence fishing.

6.2 Potential Effects to Traditional Cultural Practices

Due to the temporary and transient nature of the physical activities associated with Hawaiian monk seal recovery as proposed in the PEIS, it is unlikely that customary practices such as fishing, gathering, swimming, or surfing will be significantly affected by recovery activities themselves.

Some concern has been expressed that an increase in Hawaiian monk seal populations due to the translocation of seals (primarily the temporary translocation of seals from the NWHI to the MHI under Alternative 4) and other recovery actions will adversely affect traditional subsistence fishing activities. There has also been concern that subsistence fishers would have their activities disrupted by the presence of federally protected monk seals occupying the shorelines of their chosen fishing grounds. Again, these concerns were considered in a detailed analysis of the impacts of all PEIS alternatives on subsistence fishing (Section 4.9.2 of the PEIS). The analysis concluded that all alternatives, including Alternative 4, were likely to have negligible impact on subsistence fishing.

6.3 The Hawaiian Monk Seal as a Cultural Resource

Considering the research and analysis presented by Reeve et al. in Appendix B of this document, available archaeological evidence indicates that for much of the period from the arrival of the first Polynesian voyagers up until Western contact, the Hawaiian monk seal was not abundant within the MHI, and there was little direct contact between monk seal populations and human populations. Extensive ethnohistoric research also presented in Appendix B supports this supposition regarding monk seal presence and human interaction in the MHI, and asserts that traditional cultural significance of Hawaiian monk seals was minimal as a result. Kittinger et al. (2011, 2012) ascribe a greater level of cultural significance than that indicated by the authors of Appendix B. However, Kittinger and co-authors also conclude traditional cultural significance varied extensively from place to place in the MHI, and in general, the significance of Hawaiian monk seals was very limited compared to that of other living marine resources, such as sharks or sea turtles.

With relatively limited research on the subject conducted to date, it is likely that researchers and Hawaiian cultural practitioners will continue to explore the traditional and contemporary cultural significance of Hawaiian monk seals. However, considering the information available at present, including the available research and input from the community meetings described in Section 5, NMFS has assumed that the cultural significance of Hawaiian monk seals was, and is, relatively limited for the purposes of this impact assessment. As a result of this apparent limited significance, assessing potential impacts on monk seals as a cultural resource was not prioritized in preparation of this Cultural Impact Assessment. Rather, priority was placed on assessing the potential impacts on the wide variety of cultural resources and practices that are well known and broadly accepted to have strong cultural significance.

6.4 EFFECTS OF PROPOSED ALTERNATIVES

Alternative 1 – Status Quo

Alternative 1 involves the continuation of currently authorized monk seal recovery activities past 2014. These include activities, such as monitoring and some sample collection that do not involve the capture and handling of seals, as well as activities that do involve the capture and handling of seals, such as marking, measuring, sample collection, de-worming, disentanglement, removal, and translocation. Under this alternative, the translocation of seals only takes place within the MHI or within the NWHI. There is no translocation of seals from the NWHI to the MHI or from the MHI to the NWHI.

Activities conducted under Alternative 1 (as described in Section 4.2) include aerial, vessel, and land-based surveys, and some handling and transportation of Hawaiian monk seals. Boats and land vehicles will be used to transport researchers and possibly animals. Researchers will cross beach and dune areas on foot to reach monk seal locations. Recovery activities will be conducted throughout the APE, in the MHI, NWHI, and on Johnston Atoll. Researchers will seasonally (typically April or May through August) occupy existing camp sites in the NWHI.

Direct impacts to cultural resources that could occur under Alternative 1 within the MHI include the disturbance, damage, or destruction of coastal plants (such as *hinahina*, *pa'u o Hi'iaka*, and *kauna'oa*) that are used in *lā'au lapa'au* (traditional medicine). This could occur if researchers drive over or walk through areas where these plants grow. Training of researchers and volunteers to recognize and avoid native strand flora should serve to mitigate these potential impacts.

Activities involved in the observation or translocation of monk seals, as conducted under Alternative 1 are unlikely to directly impact marine resources (fish, shellfish and other marine organisms) that are traditionally gathered for food. The only exception is the possibility that boat landings could disturb beds of *limu kohu* (*Asparagopsis sanfordiana*), *limu loloa* (*Gelindium spp.*), and other edible sea weeds that were traditionally gathered along the shoreline. Again, this potential impact can be mitigated by training researchers and volunteers to recognize and avoid these resources.

As part of its Hawaiian monk seal recovery program and other community coordination efforts, NMFS has developed a network of Hawaiian cultural practitioners and *kūpuna* (elders) to advise NMFS on cultural matters and to conduct cultural protocols during Hawaiian monk seal response and other monk seal management and recovery-related activities. This network of culturally knowledgeable individuals can assist in developing a cultural awareness training program for monk seal researchers and volunteers.

Permits are presently required for access to conduct Hawaiian monk seal research and enhancement activities within the limits of the Papahānaumokuākea Marine National Monument. Any activities associated with monk seal recovery actions undertaken within the NWHI must 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).

Under the terms of the Monument permit, researchers and volunteers involved in monk seal recovery actions are required to coordinate their activities with Monument staff to insure that they do not adversely impact any of the Monument's cultural resources. Within the NWHI, existing camp sites will be used and established cultural protocols put in place by the Monument will be followed.

As noted above, impacts of Alternative 1 on subsistence fishing are expected to be negligible (see Section 4.9.2 of the PEIS).

Alternative 2 – No Action
Under Alternative 2, presently authorized activities as permitted under the existing permit (10137) will continue until 2014. After 2014 there would be no permitted field research to monitor Hawaiian monk seal populations, implement de-worming, conduct translocation, etc. During the execution of the current permit through 2014, the potential impacts to cultural resources and traditional practices would be the same as for Alternative 1, and the same precautions are would be adopted. After the current permit expires, activities would be limited to remote observation and some collection of samples from materials left by monk seals. No monk seal translocation or handling would occur. Therefore, after 2014, Alternative 2 would involve less boat and land vehicle traffic, and less shoreline activity. The likelihood that shoreline resources would be directly impacted would be greatly reduced. Cultural awareness training for researchers and volunteers involved in monk seal recovery actions would still be conducted to help mitigate potential direct impacts. As noted above, impacts of Alternative 2 on subsistence fishing are expected to be negligible (see Section 4.9.2 of the PEIS).

Alternative 3 – Limited Translocation (Preferred Alternative)
Under Alternative 3 currently authorized activities under Alternative 1 would be continued and additional activities would be conducted. These additional actions would include increased handling of Hawaiian monk seals for vaccination, deworming, and other activities. Alternative 3 would also include a seal behavior modification program intended to prevent or reduce human-monk seal interactions. This program would serve to mitigate some of the potential impacts of translocation and other recovery actions on cultural resources and customary practices by reducing interactions between seals and people engaged in cultural practices such as subsistence fishing and other ocean use activities. Also under Alternative 3 the scope and number of translocations would be expanded. This would include the translocation of monk seals within the MHI or within the NWHI, as well as the translocation of a limited numbers of seals from the MHI to the NWHI. As a result, boat and land vehicle activity, as well as shoreline activities, would be greater under Alternative 3 than under Alternatives 1 or 2. The direct impacts of this increased activity on cultural resources could be successfully mitigated through the implementation of the training program described under Alternative 1. As noted above, impacts of Alternative 3 on subsistence fishing are expected to be negligible (see Section 4.9.2 of the PEIS).

Alternative 4 – Enhanced Implementation
Alternative 4 would encompass all of the activities permitted under Alternative 3, as well as two-stage translocation of Hawaiian monk seal pups from NWHI to MHI, and then back to the NWHI when the seals reach the age of two to three years. This project would be implement using a decision framework described in Appendix F of the PEIS. The increased capture and

transport of the seals under Alternative 4 would result in increased boat and land vehicle traffic, as well as pedestrian traffic to and from capture sites. The mitigation measures indicated under Alternatives 1 and 3 should ensure that impacts to cultural resources remain minimal to negligible. As noted above, impacts of Alternative 4 on subsistence fishing are expected to be negligible (see Section 4.9.2 of the PEIS).

6.5 SUMMARY OF IMPACTS

As described above, the research and enhancement activities proposed under Alternatives 1, 2, 3, and 4 could result in minor direct and indirect impacts on cultural resources and traditional cultural practices within the affected environment. Current and proposed research and enhancement activities would occur infrequently in limited areas along the shorelines of both the MHI and the NWHI. Due to the restricted nature of these activities, the direct impacts would also be limited and considered minor adverse at most. The mitigation measures mentioned above and described in Section 7 would serve to further minimize these potential impacts.

Impacts of all alternatives on subsistence fishing are expected to be negligible (see Section 4.9.2 of the PEIS).

This page intentionally left blank.

7.0 MITIGATION MEASURES

The potential impacts to cultural resources and customary practices from Hawaiian monk seal recovery actions proposed in the PEIS prepared by NOAA NMFS were found to be minimally adverse (see Table 4.10-10 of the PEIS). These potential impacts are expected to be significantly mitigated by the implementation of a series of measures outlined below.

7.1 Training in the Recognition and Avoidance of Cultural Resources

At least one NMFS staff and volunteer trained in recognition and avoidance of cultural resources will accompany every team conducting monk seal recovery activities in the field. These personnel will receive training in the recognition of shoreline cultural resources such as strand dwelling plants utilized in traditional medicine or edible sea weeds that were traditionally gathered along the shoreline. Such resources could be minimally impacted by pedestrian or boat traffic associated with monk seal recovery related activities. Personnel on hand with knowledge of these resources would allow NMFS teams to recognize and avoid impacting them. Participants in this training would include selected NMFS staff involved in the planning and carrying out of monk seal recovery actions as well as specific trained volunteers and NMFS-funded coordinators participating in the Marine Mammal Response Network. This training may be conducted in conjunction with training in the recognition and avoidance of historic properties, presented in the report of the NHPA Section 106 consultation, which is included as Appendix B of the Final PEIS.

7.2 Coordination With Stakeholders and Communities

NMFS intends to further develop and maintain close coordination with fishers, Native Hawaiians and other stakeholders to facilitate implementation of the proposed Hawaiian monk seal 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. This community collaboration will serve to foster consideration of traditional Hawaiian conservation and management practices, and enhanced incorporation of Native Hawaiian cultural practices and protocols in the NMFS Hawaiian monk seal recovery program. Native Hawaiian cultural practitioners may be included in the Hawaiian Monk Seal Recovery Team (see Section 5.6.2 of the PEIS) and will be involved in both the Main Hawaiian Islands Hawaiian Monk Seal Management Plan (see Section 6.6.3 of the PEIS) and in Partnership Grants (see Section 5.6.5 of the PEIS) as available funding allows.

7.3 Outreach and Collaboration with Subsistence Fishers

NMFS has a tradition of working with fishers in Hawai‘i on a variety issues related to fisheries management and conservation, and has recently begun partnering with government agencies, non-government organizations, and individual fishers to develop collaborative efforts supporting monk seal recovery in the MHI. Through its Protected Species Cooperative Conservation program, NMFS has awarded a grant (under Section 6 of the Endangered Species

Act) to the Hawai‘i Department of Land and Natural Resources (DLNR) to support Hawaiian monk seal (and sea turtle) conservation activities, including outreach and response coordination activities with local fishers.

NMFS has also recently developed a set of guidelines and recommendations for fishers to help prevent and mitigate monk seal interactions with fisheries. As a result of recent meetings and correspondences with individual fishers based on Kaua‘i, Moloka‘i and Maui, NMFS has plans to enhance its collaboration with fishers to protect seals from hooking and entanglement as well as to reduce seal depredation and other adverse impacts on fishing gear and catch. One initiative under consideration is a pilot program intended to partner with a small group of boat and shore-based fishers to document and mitigate fishery-seal interactions associated with the various types of fishing gear and methods used extensively in the MHI.

8.0 REFERENCES

Kittinger, John N., Trisann Māhealani Bambico, Trisha Kehaulani Watson, and Edward W. Glazier

2011 *Historic and Contemporary Significance of the Endangered Hawaiian Monk Seal in Native Hawaiian Culture*. Report prepared by Impact Assessment, Inc. for the National Oceanographic and Atmospheric Administration and included as Appendix K of the Draft Programmatic Environmental Impact Statement for Hawaiian Monk Seal Recovery Actions.

2012 Sociocultural Significance of the Endangered Hawaiian Monk Seal and the Human Dimensions of Conservation Planning. In *Endangered Species Research*, Vol. 17: 139-156.

Sprague, Rachel S., Charles L. Littnan and Jeffrey S. Walters

2013 Estimation of Food Consumption by Hawaiian Monk Seals in Relation to Ecosystem Biomass and Prey Overlap with Fisheries in the Main Hawaiian Islands. U.S. Dep. Commer., NOAA Tech. Memo., NOAA-TM-NMFS-PIFSC-37, 42 p. + Appendices.

State of Hawai‘i Department of Land and Natural Resources

2008 Cultural Impact Assessment, Papahānaumokuākea Marine National Monument Management Plan.

Maly, Kepā and Onaona Maly

2003 Ka Hana Lawai‘a a me Nā Ko‘a o Nā Kai ‘Ewalu, A History of Fishing Practices and Marine Fisheries of the Hawaiian Islands. Compiled from Native Hawaiian Traditions. Volume 1: Archival Research, compiled from Native Hawaiian traditions, historical accounts, government communications, *kama‘āina* testimony and ethnography. Volume 2: Oral history interviews, compiled from oral history interviews with *kūpuna* and *kama‘āina*. Prepared by Kumu Pono Associates for The Nature Conservancy.

Watson, Trisha Kehaulani, John N. Kittinger, J. S. Walters, and T. D. Schofield

2011 Culture, Conservation, and Conflict: Assessing the Human Dimensions of Hawaiian Monk Seal Recovery. In *Aquatic Mammals* 27(3), pp. 386-396.

This page intentionally left blank.

APPENDIX A
ANNOUNCEMENT OF COMMUNITY MEETINGS

COMMUNITY INPUT SOUGHT ON NOAA'S PROPOSED HAWAIIAN MONK SEAL RECOVERY ACTIONS*

NOAA Fisheries and Pacific Legacy, Inc., are holding a series of community meetings seeking community input on proposed Hawaiian Monk Seal Recovery actions. Specifically, we are seeking information on potential adverse effects to historic properties and/or traditional cultural properties (e.g., archaeological sites), as well as information on potential impacts to cultural resources and practices (e.g., fish ponds and fish pond operation) that may result from implementation of actions proposed in the Draft Programmatic Environmental Impact Statement (PEIS) for Hawaiian Monk Seal Recovery. Examples of the proposed actions include capture, veterinary treatment, transportation, and release of monk seals on shorelines throughout the Hawaiian archipelago. Input from community meetings around the State will be incorporated into a revised Cultural Impact Assessment for the PEIS and will form an important component of NOAA's compliance with the National Historic Preservation Act Section 106. The Draft PEIS is available for review at:
http://www.nmfs.noaa.gov/pr/permits/eis/hawaiianmonkseal.htm

MEETING SCHEDULE
(all meetings to be held between 6:00 – 8:00 pm)

Moloka'i	
Kaunakakai (29 October 2012)	Moloka'i High School
Lāna'i	
Lāna'i City (30 October 2012)	Lāna'i High and Elementary School
Kaua'i	
Waimea (7 November 2012)	Waimea High School
Kapa'a (8 November 2012)	Kapa'a Middle School
Maui	
Hāna (14 November 2012)	Hāna High School
Lāhainā (15 November 2012)	Lāhaināluna High School
Hawai'i	
Hilo (27 November 2012)	Hilo High School
Kona (28 November 2012)	Kealakehe Elementary
O'ahu	
Wai'anae (11 December 2012)	Wai'anae High School
Waialua (12 December 2012)	Waialua High and Intermediate School
Waimānalo (13 December 2012)	Waimānalo Elementary and Intermediate School

* THE PURPOSE OF THESE MEETINGS IS TO GATHER INPUT AND CONSULT WITH INTEREST PARTIES FOR THE PREPARATION OF A CULTURAL IMPACT ASSESSMENT (CIA) AND COMPLIANCE WITH THE NATIONAL HISTORIC PRESERVATION ACT SECTION 106 FOR THE HAWAIIAN MONK SEAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT.

For further information or to request sign language interpretation or other auxiliary aids, please contact Paul Cleghorn at cleghorn@pacificlegacy.com, (808) 263-4800 (phone), or (808) 263-4300 (fax). These meetings are accessible to people with disabilities.

Contact: Paul L. Cleghorn
Pacific Legacy
Phone: (808) 263-4800
Fax: (808) 263-4300

30 Aulike Street, Suite 301
Kailua, HI 96734
cleghorn@pacificlegacy.com

NOAA FISHERIES

PRESS RELEASE

COMMUNITY INPUT SOUGHT ON NOAA'S PROPOSED HAWAIIAN MONK SEAL RECOVERY ACTIONS*

NOAA Fisheries is holding a series of community meetings seeking community input on proposed Hawaiian monk seal recovery actions. Specifically, we are seeking information on potential adverse effects to historic properties and/or traditional cultural properties (e.g., archaeological sites), as well as information on potential impacts to cultural resources and practices (e.g., fish ponds and fish pond operation) that may result from implementation of actions proposed in the Draft Programmatic Environmental Impact Statement (PEIS) for Hawaiian Monk Seal Recovery. Examples of the proposed actions include capture, veterinary treatment, transportation, and release of monk seals on shorelines throughout the Hawaiian archipelago. Input from community meetings around the State will be incorporated into a revised Cultural Impact Assessment for the PEIS and will form an important component of NOAA's compliance with the National Historic Preservation Division Section 106. The Draft PEIS is available for review at: http://www.nmfs.noaa.gov/pr/permits/eis/hawaiianmonkseal.htm

MEETING SCHEDULE
(all meetings to be held between 6:00 – 8:00 pm)

Maui

Hāna (14 November 2012)	Hāna High School
Lāhainā (15 November 2012)	Lāhaināluna High School

Hawai'i

Hilo (27 November 2012)	Hilo High School
Kona (28 November 2012)	Kealakehe Elementary

O'ahu

Wai'anae (11 December 2012)	Wai'anae High School
Waialua (12 December 2012)	Waialua High & Intermediate School
Waimānalo (13 December 2012)	Waimānalo Elementary & Intermediate School

*** THE PURPOSE OF THESE MEETINGS IS TO GATHER INPUT AND CONSULT WITH INTERESTED PARTIES FOR THE PREPARATION OF A CULTURAL IMPACT ASSESSMENT (CIA) AND COMPLIANCE WITH THE NATIONAL HISTORIC PRESERVATION ACT SECTION 106 FOR THE HAWAIIAN MONK SEAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT.**

For further information or to request sign language interpretation or other auxiliary aids, please contact Paul Cleghorn at cleghorn@pacificlegacy.com, (808) 263-4800 (phone), or (808) 263-4300 (fax). These meetings are accessible to people with disabilities.

This page intentionally left blank.

APPENDIX B
THE HAWAIIAN MONK SEAL IN TRADITIONAL HAWAIIAN CULTURE

Prepared by:
Lora L. Nordtvedt Reeve, J.D., M.S., M.B.A.
Rowland B. Reeve, M.A.
and
Paul L. Cleghorn, Ph.D.

Pacific Legacy, Inc.
30 Aulike Street, Suite 301
Kailua, HI 96734
(808) 263-4800

Prepared for:
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Pacific Island Regional Office

August 2013

ACKNOWLEDGEMENTS

In preparing this report, Pacific Legacy was greatly assisted by a number of individuals and organizations, all of whom contributed in some way to the information contained in this report. The work was funded by the National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Pacific Islands Regional Office, Protected Resources Division as part of their efforts to protect and perpetuate the indigenous population of endangered Hawaiian monk seals. We are grateful for the assistance provided by the Protected Resources Division staff at various stages in the project. We are grateful to the information provided by the various members of the Society for Hawaiian Archaeology, particularly Dr. Sara Collins and Dr. Robert Rechtman. The staff of the Hawaiʻi office of the State Historic Preservation Division, Dr. Theresa Donham, Mr. Michael Vitousek, and Mr. Sean Naleimaile, provided their expertise on a number of occasions. We are also grateful to the staff of the Bishop Museum Archives for their assistance in researching the cultural history of the Hawaiian monk seal.

1.0 INTRODUCTION

To support the National Marine Fisheries Service (NMFS) in preparation of a Cultural Impact Assessment for the Hawaiian Monk Seal PEIS, extensive research and analysis was undertaken to better understand the role that monk seals may have played in traditional Hawaiian society. As part of this research, a thorough examination was made of both archaeological and archival resources. The evidence of seal remains recovered from archaeological excavations conducted within the Hawaiian Islands was examined. Dictionaries and other references were scoured to identify the various Hawaiian language terms used for the Hawaiian monk seal, as well as for other types of seals. A search was made of references to seals in traditional oli (chants) and moʻolelo (stories, legends, and traditional histories), as well as in the accounts of early Western visitors, articles in Hawaiian language newspapers, and other historic documents. A review of more contemporary references to Hawaiian monk seals and their significance was also conducted. The results of this research and analysis are presented below.

2.0 THE EARLY PRESENCE OF MONK SEALS IN THE HAWAIIAN ISLANDS

The Hawaiian monk seal (*Monachus schauinslandi*) is among the most evolutionarily ancient of the living members of the Phocidae family of true seals (Culliney 2006:108). They appeared in the eastern North Atlantic approximately 15 million years ago and then dispersed westward to the Caribbean and Central America (Lowry et al. 2011:397, Fyler et l. 2005:1276). Biologists continue to debate when monk seals may have reached the Hawaiian Islands, with estimates ranging from 15 million to 3.5 million years ago (Lavigne 1998:1, Fyler et l. 2005:1276). One of the closest relatives to the Hawaiian monk seal was the now-extinct Caribbean monk seal. It is likely that the ancestors of the Hawaiian monk seal moved from the Caribbean Sea into the Pacific Ocean through the Central American Seaway, which was located near the present Isthmus of Panama, and which closed approximately 3 million years ago (Lavigne 1998:1, Fyler et l. 2005:1276). At some time following their entry into the Pacific, a founder population of monk seals established itself in Hawaiʻi (Culliney 2006:109).

While the prevailing opinion among marine mammal scientists and the National Marine Fisheries Service is that monk seals have occupied the entire Hawaiian archipelago since the time of their initial arrival, direct physical evidence of their presence within the MHI is limited (Ragen 1999:184). This limited evidence has led to some debate as to whether monk seal populations occupied the waters of the MHI at the time of the arrival of the first Polynesian voyagers (Ragen 2003:1).

Bishop Museum zoologist Alan Ziegler, who analyzed the faunal remains recovered from numerous archaeological excavations conducted within the MHI (with the exception of Lānaʻi, Kahoʻolawe and Niʻihau) between 1986 and 1999, found no monk seal bones in any of the midden assemblages he examined (one exception, the upland Lapakahi site, is noted below; Sara Collins, pers. comm.). This led him to state, in his 2002 book *Hawaiian Natural History, Ecology, and Evolution* (2002) that, "The absence of skeletal material from both paleontological and archaeological sites on the MHI suggests that, for obscure reasons, the species [Hawaiian monk seals] may always have been scarce in the vicinity of large young islands of the

archipelago, preferring instead the small sandy atolls" (Zeigler 2002:244).
There exists no biological reason why monk seals would prefer the "small sandy atolls" of the NWHI to the "larger young islands" of the MHI. Both the NWHI and the MHI posses a somewhat similar range of marine habitats including beaches on which to haul out and sheltered reefs in which to hunt for food (Ragen 1999:184 and Ragen 2003:1). It has been estimated that if monk seals were distributed throughout the Hawaiian archipelago prior to the arrival of the first Polynesians, "they may have comprised a metapopulation of perhaps 13, 14, or more colonies" (Ragen 1999:184). Given these estimates, how do we account for the scarcity of monk seal remains in paleontological and archaeological assemblages as noted by Zeigler?

The lack of paleontological evidence for the presence Hawaiian monk seals within the MHI is not surprising. Given their aquatic nature, and the fact that they seldom haul out further inland than the high tide line, it seems unlikely that the skeletal remains of Hawaiian monk seals would have been naturally incorporated into the terrestrial fossil assemblage. Monk seal carcasses are more likely to have been carried by the tide back into the sea where they would have been consumed by predators and their bones scattered over the sea bottom to be ground to sand by the action of the waves or incorporated into the bottom sediments (Ragen 1999:184).

The relative scarcity of monk seal bones in archaeological assemblages is more problematic and requires more detailed investigation. If monk seal populations were relatively abundant within the MHI at the time of the arrival of the first Polynesians, the animals would have offered a readily available food source that would be expected to be exploited by these early settlers, as well as by their descendants. One would therefore expect to find monk seal remains among the food debris excavated at traditional Hawaiian residence structures, particularly at those sites dating from the early settlement period. To date, monk seal remains have only been recovered from two confirmed traditional archaeological contexts. As discussed below (and summarized in the conclusions presented in Section 8), more detailed analysis reveals factors and considerations that may in part account for the relative absence of documented archeological evidence of monk seal presence within the MHI at the time of first Polynesian arrival.

3.0 Evidence Of Monk Seal Remains In Archaeological Deposits

In the preparation of this report, an effort was made to identify all of the instances in which Hawaiian monk seal remains have been recovered from archaeological excavations within the MHI. As has already been mentioned, Dr. Alan Zeigler, the staff zoologist at the Bernice Pauahi Bishop Museum, made identifications of faunal assemblages from a number of archaeological excavations conducted in the MHI (with the exception of Lānaʻi, Kahoʻolawe and Niʻihau) between 1986 and 1999. The faunal remains were from archaeological sites excavated by researchers from the Bernice Pauahi Bishop Museum, Cultural Surveys Hawaiʻi, Inc., the International Archaeological Research Institute, Inc., and Paul H. Rosendahl, Inc. None of the assemblages examined by Dr. Zeigler (with the exception of the upland Lapakahi site discussed below) was found to contain any seal bone or bone that could be identified as marine mammal (Sara Collins, pers. comm.).

The authors of this study also consulted Dr. Sara Collins, an archaeologist and authority on human and faunal osteology who has examined and identified the remains from numerous

archaeological excavations in Hawaiʻi. Dr. Collins indicated that she had never come across any seal bone in any of the collections she has examined. She noted, however, that it is possible that seal bone could be present among the literally millions of bone fragments identified as "medium mammal" or "large mammal" recovered from excavations over the decades since attempts were first made to identify faunal remains in archaeological assemblages.

Dr. Marshall Weisler has conducted analyses of excavated faunal material from early deposits at all archaeological sites on the western third of Molokaʻi Island (which now possesses a small but viable Hawaiian monk seal population) and has found no seal remains (Weisler 2013, pers. comm.). He is of the opinion that if monk seals were present when Hawaiians resided along the shoreline of West Molokai, then the bones of monk seals should be present within the archaeological deposits, but they are not. Although the monk seal population within the MHI may never have been very large, one would still expect to find a bone or two in the early deposits which were extensively excavated on West Molokaʻi (Weisler 2013, pers. comm.).

After extensive inquiry, which included a search of the available literature and consultation with various members of the archaeological community in Hawaiʻi, a total of four instances were found in which identified seal bones are known to have been recovered from archaeological deposits.

- A single seal rib bone was reported from a pre-Contact house site in upland North Kohala (Lapakahi) on the island of Hawaiʻi.
- A single sternum was excavated from the site of Nuʻalolo Kai on the island of Kauaʻi.
- Seal phalanges were recovered from a post-Contact deposit at a Hawaiian house site in coastal North Kohala.
- A complete seal carcass was found in a pit during excavation of a subsurface cultural deposit in Wailuku on the island of Maui.

<u>Lapakahi</u>
Excavations conducted by Dr. Paul Rosendahl at Site 7402, a large earthen residential platform in upland Lapakahi in the district of North Kohala on the island of Hawaiʻi yielded a portion of a single rib bone identified as belonging to a Hawaiian monk seal. The site is situated in the midst of upland agricultural fields traditionally used for the cultivation of dryland crops. It consisted of an earthen platform with an L-shaped windbreak wall along its rear. The entire structure measures approximately 15 by 6 meters. Excavations into the interior of the platform revealed the presence of multiple fire hearths and yielded an abundance of cultural material suggesting that the platform served as the foundation for a pole and thatch occupation structure (Rosendahl 1972:247-263). The single seal bone was recovered from one of the wall trenches. Also recovered from the site were bones of the Polynesian rat (*Rattus exulans*), dog (*Canus familiaris*), pig (*Sus scrofa*), numerous unidentified medium-sized mammal bones, and the bones of domestic chicken (*Gallus, gallus*) and medium sized duck (Rosendahl 1972: 257-258). A single radiocarbon date recovered from 10 to 15 centimeters below ground surface yielded a range at one standard deviation of A. D. 1418 to 1618, 1466 to 1666 and 1538 to 1738, placing the occupation of the structure within the pre-Contact period somewhere between A. D. 1418 and 1738.

The excavations in upland Lapakahi were undertaken in association with the University of

Hawai‘i. In Chapter V of his dissertation (Rosendahl 1972: 325), Rosendahl indicates that Dr. Alan Ziegler identified the mammal and bird remains from the Lapakahi midden. Some of the mammal bone recovered from the site appeared to represent debitage (wastage) from the manufacture of bone artifacts. Given this evidence of bone tool manufacture, it is possible that the single seal rib bone was brought onto the site to serve as raw material for tool making rather than as food. Seal bone is denser than that of land mammals such as dog and pig, but not as dense as other marine mammals like whales or dolphins (Sara Collins 2013, pers. comm.). It can be used in the manufacture of bone fishhooks or similar items.

Nu‘alolo Kai

The valley of Nu‘alolo Kai is located on the remote Na Pali coast of the island of Kaua‘i. In 1958, 1959, 1960, and 1964 researchers from the Bernice Pauahi Bishop Museum under the direction of Dr. Kenneth Emory conducted excavations at Site 50-30-01-196, set of stone faced terraces located beneath the sheltering overhang of the valley's eastern cliffs. Due to its location, in the rain shadow of these cliffs, excavators found the site to possess excellent preservation conditions, and managed to recover perishable objects such as wood and textiles. Their excavations encountered buried structural floors, fire hearths and other subsurface features, as well as numerous traditional artifacts. The cultural deposit at Site 196 extended to a depth of nearly 2 meters below the ground surface (Graves et al. 2005:1). In the early 1990s, archaeologists from the University of Hawai‘i compiled a comprehensive computerized inventory of the cultural materials recovered from the site, including many objects not previously documented (Graves et al. 2005:1). Radiocarbon dates suggest that the earliest occupation of the site may have taken place around A.D. 1290 to 1450 (Graves et al. 2005:37). The presence of historic artifacts in the upper most levels indicates that the site continued in use up into the post-Contact period.

The Site 196 complex was originally divided during excavation into four major architectural features (K2, K3, K4 and K5). The bulk of the Bishop Museum excavations were conducted in K3, a complex located toward the center of the site that consists of at least two and possibly four terraces separated by stone faced retaining walls (Graves et al. 2005:4). During the excavation, soil was sifted through ¼ inch screens so as to recover artifacts and faunal remains (Graves et al. 2005:6). Recent analysis of the faunal material excavated by both the Bishop Museum and later by the University of Hawai‘i conducted by Dr. Julie Field identified a single monk seal bone from the site. This bone, an adult sternum, was recovered from somewhere between the surface and 29 inches depth in unit H5 of site K3. The sternum was unmodified. Existing dates associated with this level of the deposit puts it very late, at or after A.D. 1700 (Field 2013:pers. comm.).

The upland Lapakahi site and Site 196-K3 at Nualolo Kai appear to be the only known archaeological sites within the MHI dating from the period prior to Western contact at which seal remains have been found.

North Kohala

Hawaiian monk seal bones were also recovered by archaeologist Dr. Robert Rechtman at a Hawaiian household in coastal North Kohala that appears to date from the historic period (1850s to 1860s). The identification of the remains was made with the assistance of several pinniped experts, including Thomas Wake. Rechtman notes that, "A single front right

intermediate phalanges of a juvenile monk seal was found during data recovery excavations at SIHP [State Inventory of Historic Places] Site 25006, a mid-nineteenth century house site situated along the North Kohala coastline in Kukuipahu Ahupuaʻa. This site appears to have been a Hawaiian household based on design and cultural material present. The bone was recovered near a hearth feature, but does not appear to represent dietary remains. Rather, this item seems to have been used in conjunction with ritual or ceremonial activity as it has been modified with the incision of a stick-figure image on its flat ventral side (Rechtman in prep.). Any interpretation of this incised image and its possible significance must await further analysis and investigation by Rechtman.

Wailuku

An entire articulated monk seal carcass was discovered during data recovery excavations of a buried cultural deposit (State Inventory of Historic Places site number 50-50-04-4127) conducted in 1996 prior to road improvements along Lower Main Street in Wailuku on the island of Maui. The work was conducted by Eric M. Fredericksen and Demaris L. Fredericksen (Fredericksen and Fredericksen 1996). These excavations uncovered two cultural layers that were overlaid by one to two meters of imported fill soil associated with the historic Kahului Railroad and the paving of Lower Main. The articulated skeleton of a juvenile Hawaiian monk seal was found within an elongated basin-shaped excavated pit (Test Unit 2A, Feature 8). The fill of the pit consisted of clean sand and did not contain any cultural material. The skull of the seal appeared to have been severely fractured, perhaps by a blow to the head. "There was no evidence that indicated that the seal had been collected for food. Rather, it appears that the seal had been laid on its back or left side and intentionally buried" (Fredericksen and Fredericksen 1996:21, 50).

The pit in which the remains of the seal rested appeared to have been dug down from the lower levels of Layer I, a 15 to 19 centimeter deep disturbed soil layer containing a mix of pre-Contact and historic material, and into Layer II, an undisturbed pre-Contact deposit dated to between AD 1570 and 1780 (Fredericksen and Fredericksen 1996:19,49). In the area of the feature, the upper 8 to 12 centimeters of Layer I contained pieces of coal and fragments of early 20th century bottle glass. Food debris and indigenous artifacts (a basalt abrader and a fragment of volcanic glass) were also found in Layer I (Fredericksen and Fredericksen 1996:19). It is not clear from the archaeological evidence exactly when the pit containing the seal remains was dug, but it seems probable that it may have been excavated some time in the early historic period. The juvenile monk seal, its skull crushed, appears to have been placed in the hole and buried over. Whether any meat was removed from the carcass prior to its deposition is also uncertain.

3.1 Analysis

Confirmed archaeological evidence of Hawaiian monk seal presence within the MHI prior to Western contact is limited. It consists of a single monk seal rib bone excavated at an upland house site and a sternum recovered from a coastal occupation deposit. Neither of these bones was recovered from particularly early contexts. The inland Lapakahi site may date to somewhere between A.D. 1418 and 1738, while the Nuʻalolo Kai deposit appears to date at or after A.D. 1700. The monk seal remains recovered could derive from individuals belonging to a resident population within the MHI or they could represent stray animals that found their way down to the MHI from the NWHI. The Nuʻalolo Kai sternum could alternately be from an animal caught by Kauaʻi residents fishing up in the NWHI.

The question of butchery adds another complication to the archaeological equation, and may in part account for the scarcity of Hawaiian monk seal remains in traditional archaeological contexts. An adult Hawaiian monk seal measures from approximately 6 to 7 feet in length and can weigh between 300 to 500 pounds. Even a juvenile seal would be difficult to carry for any distance. It seems unlikely therefore, given its size and weight, that a seal killed for food would be transported from the shoreline where it was killed to the hunter's place of residence for butchering. It is more likely that the seal carcass would be butchered on the beach and only the meat carried to the consumption site. Alternately, an *imu* (earth oven) could have been dug into the sand and the entire carcass cooked in situ. It is unlikely, given wave disturbance and other natural factors, that such a preparation site would survive archaeologically. This butchering strategy may help to account for the scarcity of monk seal remains at traditional occupation sites.

In contrast to the relative scarcity of seal remains from Hawaiian sites, seal bones have been found at 174 archaeological sites in Aotearoa (New Zealand), the only other Polynesian island group where seals are endemic (Smith 1989:78). Seal populations are presently (and appear in the past to have been) much more abundant in Aotearoa than in the Hawaiian archipelago, and thus would be more common in the archaeological record. Ethnographic data and archaeological reconstructions of pre-Contact butchering methods in Aotearoa suggest that seal flesh was commonly separated from the bones at kill sites prior to transportation or preservation (Smith 1985:11-15). Seal bones would therefore not be expected to be found at consumption sites located at a considerable distance from the kill site, though fresh seal meat on the bone was apparently transported over shorter distances (Smith 1989:81). There are also indications that certain seal species had a much greater geographic distribution in the pre-Contact period than at present. It has been suggested that human predation was a contributing factor to this shrinkage of their natural ranges (Smith 1989:100-101).

Direct human predation appears to be a major factor in observed changes in the distribution of seal populations in Aotearoa. Seals of various ages were actively hunted, particularly juveniles and subadults. This appears to have led to the extirpation of local populations in several areas (Smith 1989:101). A similar scenario may have occurred with monk seals in the MHI. It seems probable that on their arrival in Hawai'i, the early Polynesian voyagers found a native population of Hawaiian monk seals occupying the MHI. This resident population of seals would have offered a ready source of easily obtainable protein. As suggested by Timothy Ragen (Ragen 1999:185), intensive hunting by humans, as well as disturbance by other recently introduced land mammals (such as the Polynesian dog), may have led to a dramatic drop in seal numbers and the eventual local extirpation of the resident seal population in the MHI. A somewhat similar scenario has been offered to explain the extinction of the various species of native ground birds that were present within the MHI prior to human arrival.

Given the estimated small size of any such an indigenous seal population, it appears possible that intensive hunting over a period of one or two generation might have killed off, or driven away, any pre-existing native population of Hawaiian monk seals. The archaeological evidence of this extirpation would be limited to sites dating to the very early period of human occupation of the archipelago.

Up until recently it was the general opinion of the archaeological community that the initial

Polynesian settlement of the Hawaiian Islands took place some time between approximately 300 and 750 AD (Kirch 2011;3). This estimation was based upon radiocarbon dates recovered from what were considered to be early colonization period layers present within a small number of coastal sites. Recent refinements to the radiocarbon chronology have led to the reevaluation of this estimate. It is presently believed that the initial Polynesian discovery and colonization of the archipelago may have occurred between approximately 1000 and 1200 AD (Kirch 2011;3). The only identified archaeological sites within the MHI which may date to this early colonization period are the Bellows dune site (O18) at Waimānalo, Oʻahu (Pearson 1971); the Puʻu Aliʻi (H1) sand dune site at South Point, Hawaiʻi Island, and the nearby Waiahukini Shelter (H8) at Waiahukini, Hawaiʻi Island (Emory and Sinoto 1969). None of these sites have been found to contain monk seal remains.

4.0 Traditional Perspectives on the Hawaiian Monk Seal

The archaeological evidence would seem to indicate that for much of the period from the arrival of the first Polynesian voyagers up until Western contact the Hawaiian monk seal was not abundant within the MHI, and there was little direct contact between monk seal populations and human populations. This conclusion seems to be supported by the ethnohistorical evidence.

The consumption of seal meat is not mentioned in either traditional or early historic accounts of Hawaiian cultural practices, suggesting that it did not form a significant component of the Hawaiian diet. While traditional *kapu* (prohibitions) restricted the consumption of certain food items at certain times of the year or by certain segments of the population (pork and some varieties of bananas were among the foods prohibited to women: Malo 1951:29), there is no evidence in the traditional literature to suggest that seal meat was considered *kapu*. Monk seal remains do not appear in Hawaiian material culture as raw materials for tools or other objects. There are no traditional artifacts that are known to have been made from seal bone, skin or teeth. While dog tooth ornaments were fairly common (Buck 1964:553-561) and both porpoise (Buck 1964:546) and whale (Buck 1964:535-538) teeth are known to have been made into neck ornaments, there are no recorded instances of seal teeth being worn as ornamentation. Seal bone may have been used in the manufacture of fishhooks and other bone tools (as was dog, pig, whale and even human bone), but if so, no such tools have been directly identified.

The absence of images of monk seals in traditional Hawaiian petroglyphs can not necessarily be taken as an indicator of their physical absence from the MHI. Although certain animals, such as dogs, turtles and, to a lesser extent, chickens, appear commonly as motifs in Hawaiian rock art, other domestic animals, such as pigs, appear only rarely, if at all (Cox and Stasack 1970:19). There are no known petroglyph depictions of dolphins or whales, and only one possible symbol representing a shark (Cox and Stasack 1970:68), and yet these animals, particularly the shark, appear commonly in the traditional literature, and are known to have been both hunted and revered by traditional Hawaiian society (Reeve 1991).

Even if a local population of Hawaiian monk seals did not exist within the MHI during the pre-Contact period, it would be reasonable to expect that the existence of monk seals would have been known to the early Hawaiians. Archaeological evidence for an early Polynesian presence on the islands of Nihoa and Mokumanamana (Necker) in the NWHI suggests that the early

voyagers explored (and settled) at least a portion of the Leeward Chain and would have come in contact with the resident population of monk seals. The occupation of the higher of the Leeward Islands appears, however, to have taken place relatively early in the Polynesian settlement of the Hawaiian Archipelago and not to have been very prolonged. Following this initial period, contact with monk seals may have been restricted to a relatively small number of fishermen visiting the fishing grounds of the NWHI from Kaua‘i and Ni‘ihau.

To further investigate the role (if any) that monk seals may have played in traditional Hawaiian culture prior to Western contact, an examination was made of Hawaiian language sources.

4.1 Hawaiian Terms for Monk Seal

If the existence of the Hawaiian monk seal was generally known to the pre-Contact human population of the MHI then one would expect there to be one relatively standardized name used to refer to these marine mammals. This does not appear to have been the case. Instead, when one examines the range of Hawaiian dictionaries and other language sources one finds a variety of words used to refer to seals. Since, however, all of these written sources date to the post-Contact period, after the traditionally oral language was transformed into a written one, it becomes even more difficult to determine which terms may have been traditional and which came into use after Western contact when Hawaiian sailors were introduced to seals resident in the NWHI and on the western coast of America.

In attempting to determine the common term(s) used in the Hawaiian language to refer to the Hawaiian monk seal, it is important to look at the earliest published Hawaiian texts, as well as the range of words and definitions presented in the various dictionaries prepared since the early years of Western contact.

In its traditional form *‘ōlelo* Hawai‘i is a spoken, rather than a written, language. Although various early Western explorers, beginning with Captain Cook, compiled rough vocabularies of Hawaiian words, it was not until the arrival of the Protestant missionaries in the early 1800s that any systematic attempt was made to translate the rich complexities of the spoken language onto a written page. The earliest Hawaiian dictionaries were prepared at Lāhaināluna Seminary which was founded in 1831 for the Christian education for young Hawaiian men. In 1845 the press at Lāhaināluna published Joseph S. Emerson and Artemis Bishop’s *He Hoakaolelo No Na Huaolelo Beritania I Me Kokua I Na Kanaka Hawaii E Ao Ana Ia Olelo*, a collection of English words and phrases with definitions in Hawaiian (Emerson and Bishop 1845).

In their book, Emerson and Bishop provide two definitions for the English word “seal”. The first of these, which appears to refer to the marine mammal, is “he ilio o ke kai” (Emerson and Bishop 1845:141). The Hawaiian *he* is the demonstrative used at the beginning of a phrase (Pukui and Elbert 1971:58), *‘īlio* is the word for dog (Pukui and Elbert 1971:92), *o* can be translated as “of” (Pukui and Elbert 1971:252), *ke* is the demonstrative often translated as “the” (Pukui and Elbert 1971:130), and *kai* means the sea (Pukui and Elbert 1971:107). Thus the term *he ‘īlio o ke kai* could roughly be translated as ‘the dog of the sea’.

The second definition given by Emerson and Bishop is “he wepa kapili palapala”. This term, which can be translated literally as ‘the wafer joining together paper”, appears to refer to the

wafer of wax (seal) affixed to official documents. The Hawaiian word *wepa* is a transliteration of the English word wafer (Emerson and Bishop 1845:179). The definition given by Emerson and Bishop for the verb seal is "e hoopaa i ka wepa" (the making fast by means of the wafer), while the noun for sealing wax is "he kepau kapili palapala me he wepa la" (the resin that joins together paper with the wafer) (Emerson and Bishop 1845:141). The secondary usage of the word seal in the English language to refer to a wax or printed seal affixed to a document can result in confusion for unwary individuals seeking early definitions for the Hawaiian names given to monk seals.

The most comprehensive of the early dictionaries published at Lāhaināluna was *A Dictionary of the Hawaiian Language*, compiled by Lorrin Andrews' in 1865. In preparing his dictionary of roughly 15,000 words, Andrews, who was head of Lāhaināluna at the time, drew primarily on the writings of native Hawaiian speakers, as well as word lists and vocabularies compile by his fellow missionaries and native scholars such as Samuel Kamakau (Andrews 1895:iv-v).

In its section of "English-Hawaiian Vocabulary", Andrews' dictionary gives the definition of seal as "he ilio o ke kai" (Andrews 1865:546), using the same term employed by Emerson and Bishop. The term "he ilio o ke kai", however, does not appear in the "Dictionary of the Hawaiian Language" section of Andrews' work, nor is there any reference to seal under any form of the Hawaiian word "ilio".

As with Emerson and Bishop, Andrews lists the word "Seal" twice. The first definition, "he ilio o ke kai", appears to refer to the marine mammal, while the second, "e hoopaa i ka wefa" (*e hoʻopaʻa ka wefa*), literally 'to make fast by means of the wafer', refers to a wax or paper seal placed or printed on a document (Andrews 1865:546).

In 1887, *An English-Hawaiian Dictionary* was prepared by Howard R. Hitchcock (who also served as Principal of the Lāhaināluna Seminary) at the request of the Board of Education of the Kingdom of Hawaiʻi for use in the public schools. This dictionary gives the primary definition of the noun seal as "Ilio o ke kai", echoing both Emerson and Bishop, and Andrews (Hitchcock 1968:182). Secondary definitions listed include the terms "He sila" (literally "the seal", with *sila* being a Hawaiian adaptation of the English word seal) and "hoailona pai" (Hitchcock 1968:182). The Hawaiian word *hōʻailona* or *ʻailona* means a sign, symbol, emblem, or token of recognition (Pukui and Elbert 1971:10), while the word *paʻi* means to slap, clap or to print (Pukui and Elbert 1971:278). This would suggest that the term *hōʻailona paʻi* refers to printing a symbol or affixing a seal. The verb seal is translated by Hitchcock as "E sila" (Hitchcock 1968:182), which suggests that, at least in this case, the post-Contact word *sila* refers to a wax or paper seal, not to the animal. Hitchcock's is the first dictionary in which the term *kila* or *sila* occurs. Neither word appears in the original 1865 versions of Lorrin Andrews' *A Dictionary of the Hawaiian Language*.

In 1922, Lorrin Andrew's original dictionary was revised by the Reverend Henry Hodges Parker and republished under the direction of the Board of Commissioners of Public Archives of the Territory of Hawaiʻi. This new version incorporated definitions prepared by the missionary Lorenzo Lyons (1807-1886) and various other sources into the body of the original Andrews Dictionary. It also included the revision of many definitions and the inclusion of diacritical marks (Andrews 1922:iii-iv). This revised dictionary no longer contains an "English-Hawaiian Vocabulary", so there is no direct definition provided for the English word seal. As

with Andrews' original dictionary, the term "he ilio o ke kai" does not appear among the Hawaiian words, nor is there any reference to seal under any form of the word "ilio".

In 1940, Henry P. Judd published *The Hawaiian Language*, which contained a Hawaiian-English Vocabulary (Judd 1940). This vocabulary included neither *he ʻīlio o ke kai*, *ʻīlio o ke kai*, nor any term beginning with *ʻīlio* other than simply "ilio" meaning dog (Judd 1940:97).

Five years later, a English-Hawaiian, Hawaiian-English vocabulary was compiled by Henry P. Judd, Mary Kawena Pukui and John F. G. Stokes. In the English-Hawaiian vocabulary the authors differentiate seal "mammal" from seal "die". They provide two definitions for the word seal (mammal), "ʻiliʻo hoʻlo i Kauaua" and "uwaʻlo" (Judd et al. 1945:167). In their Hawaiian-English vocabulary, Judd, Pukui and Stokes translate "uwalo" as "to cry out" (Judd et al. 1945:311). They do not include "ʻiliʻo hoʻlo i Kauaua" in the Hawaiian-English vocabulary. In the English-Hawaiian vocabulary the terms given for seal (die) are "kiʻla" and "hōailōʻna paʻi", while to seal is given as "kiʻla" (Judd et al. 1945:311).

In their *Hawaiian Dictionary*, first completed in 1957, Hawaiian language scholars Mary Kawena Pukui and Samuel Elbert give the term for both seal "1. Emblem" and "2. Mammal". The term for seal (emblem) is given as "Kila" (Pukui and Elbert 1971:135), which is translated in the Hawaiian-English portion of the dictionary as "also Sila. Seal, deed, patent; sealed; to fix a seal" (Pukui and Elbert 1971:139). Alternate terms are "uwepa", "hoʻopaʻa", "kuni", and "hulu" (Pukui and Elbert 1971:135).

The term for seal (mammal) is given as "ʻĪlio-holo-i-kauaua" (Pukui and Elbert 1971:135). In the Hawaiian-English portion of the dictionary this is translated as "seal", literally "dog running in the toughness" (Pukui and Elbert 1971:93). The term, as they translate it, appears to be a combination of *ʻīlio*, the word for dog (Pukui and Elbert 1971:92); *holo* meaning "to run, sail, ride, go" (Pukui and Elbert 1971:72); *i* the participle "to, at, in, on, by, because of, due to, by means of" (Pukui and Elbert 1971:87); and *kauaua*, a term not directly found in the dictionary, but possibly a combining of *ka*, "the one" or "of" and *uaua*, "tough, sinewy, glutinous, viscid" (Pukui and Elbert 1971:335).

ʻĪlio-holo-i-kauaua is today the most common term in contemporary *ʻōlelo* Hawaiʻi used to refer to the monk seal. It is often translated as "the dog that runs in the rough seas" (Watson et a. 2011:390), though there is nothing in Pukui and Elbert's original translation to suggest that *kauaua* should be rendered as either rough or rough seas. This translation seems to derive more from a desire to explicate the somewhat confusing original translation, than from any linguistic reality. In their *Hawaiian Dictionary*, Pukui and Elbert provide the following Hawaiian terms for rough sea, "kai koʻo" and "ʻōkaikai" (Pukui and Elbert 1971:130). Under the term rough, "as sea or wind", they give "pikipikiʻō", "ʻāloʻaloʻa", "loʻaloʻa", "laʻolaʻo", "hāloʻaloʻa", "āulu", "olohiʻa", "pūkalakī", "kūʻulukū", "nalunalu", "ʻōnalunalu", "puleileho", and "maleuwō" (Pukui and Elbert 1971:130). None of these terms appear related to *kauaua*.

Pukui and Elbert's *Hawaiian Dictionary* is the first instance in which the term *ʻīlio-holo-i-kauaua* occurs in a Hawaiian language dictionary. It appears possible that Mary Kawena Pukui encountered the term when translating articles in Hawaiian language newspapers (see Section 4.1.4). The Hawaiian texts of these newspaper articles would not have included diacritical

marks indicating how the words were to be pronounced. The word would have appeared in print simply as "ilioholoikauaua". The word *uaua* can be pronounced one of four ways; as *uaua*, meaning either "tough, sinewy, glutinous" or "a variety of taro" (Pukui and Elbert 1971:335); as *u'au'a*, meaning "a tapa dyed with *'ōlena* (turmeric) or *noni*" (Pukui and Elbert 1971:335); as *'ua'ua*, a variant spelling of *'uwā'uwā*, which itself is an intensification of *'uwā*, which means "to shout, cry out, sound loud" (Pukui and Elbert 1971:346); or *'u'a'u'a* an intensification of *'u'a*, which means "useless, vain, to no profit" or "a coarse mat or tapa" (Pukui and Elbert 1971:334).

It is intriguing to recall that a slightly earlier Hawaiian vocabulary also prepared with the help of Mary Kawena Pukui (Judd et al. 1945) gives as an alternate name for the monk seal the word *uwalo*. This word it then translates as "to cry out" (Judd et al. 1945:311). The definition for *uwalo* (also given as *ualo*) provided by Pukui and Elbert is "to call out, as for help; to resound" (Pukui and Elbert 1971:346). This is very similar to the translation of word *'ua'ua*, which is an intensification of the word *'uwā*, "to shout, cry out, sound loud" (Pukui and Elbert 1971:346). Given the sonorous bark for which the monk seal is well known, it seems possible that an alternate interpretation of *kauaua* is *ka-'ua'ua*, the one that cries out.

The historian Abraham Fornander, who was fluent in Hawaiian and married to a chiefess of O'ahu, translates the phrase "holo i ka uaua" as "running at the voice" (see Section 5.4.3). It appears that he is interpreting the word used in the phrase as *'ua'ua*, rather than *uaua*. His translation also suggests that "ka-uaua" might be translated as "the voice". It is possible that this same version of the word appears in the name *'īlioholoikauaua*, and that this name for the Hawaiian monk seal might be translated as "the dog running (to, at, in, on, or by) the voice".

Although the terms mentioned above are the only ones that appear in the English-Hawaiian section of Pukui and Elbert's *Hawaiian Dictionary*, Another term that appears in the Hawaiian-English section is "hulu". Among the ten possible definitions given for this word is "8. Seal, named for its valuable fur. *Rare*" (Pukui and Elbert 1971:84). One of the more common definitions of *hulu* is "fur, wool, fleece, human body hair" (Pukui and Elbert 1971:84). This is the first appearance of the definition of seal for the word *hulu*. In his 1865 dictionary, Lorrin Andrews defines *hulu* as "a feather of a bird", "a bristle of a hog", "the hair of the body", "wool"(Andrews 1865:225). Parker's revision of Andrews' dictionary translates it as "a feather or feathers", "every kind of hair excepting the hair of the head", "wool", and "fleece" (Andrews 1922:214). Judd translates *hulu* as "feather, wool" (Judd 1940:96), while Judd, Pukui and Stokes translate *hulu* as "feathers, wool, hair in general" (Judd et al. 1945:244). Hitchcock gives as the Hawaiian term for fur, "Hulu palupalu" (Hitchcock 1968:93), (*palupalu* meaning soft) (Pukui and Elbert 1971:288).

In explaining the use of this evidently rare term, Pukui and Elbert suggest that the word *hulu* was used to refer to the seal due to "its valuable fur". This might suggest that the use of *hulu* to refer to seals developed during the early historic period, and that the word was used in reference to arctic fur seals that were being hunted at that time for their pelts. Sealing vessels often stopped in the Islands to re-provision, and Hawaiians were taken on as sailors on many of these vessels. It seems unlikely that the term *hulu* is a traditional name for the Hawaiian Monk

seal, which, being a resident of the tropics, does not possess the dense under-fur that characterizes its arctic cousins.

Some possible support for this suggestion can be found in Rev. Henry Hodges Parker's 1922 revision of Lorrin Andrews 1865 dictionary, which defines the noun "Ohulu (ō'-hū'-lu)" as meaning "A seal hunter", "O, to spear, and hulu, fur or feathers" (Andrews 1922:478). Pukui and Elbert provide a similar translation for "'ō hulu", "Seal hunter; to spear seals. *Lit.*, spear fur" Pukui and Elbert 1971:256). In contrast, Andrews' original 1865 dictionary defines "Ohulu" as "a person that sails or goes on the ocean; he kanaka *ohulu* no ka moana" (Andrews 1865:82). There is no mention in this earlier version of seal hunting. This definition seems to have been added to the dictionary by Parker, though it is not clear what his source was.

In recent years the Hawaiian Lexicon Committee has attempted to compile a list of Hawaiian words that have been created, collected, and approved by the Committee from 1987 through 2000. Their *Māmaka Kaiao: A Modern Hawaiian Vocabulary*, gives the Hawaiian word for seal as "Sila" (Kōmike Hua'ōlelo, 2003:349). The fur seal is identified as "Sila pūhuluhulu", while the monk seal is identified as "Sila Hawai'i". As with a number of words in the *Māmaka Kaiao*, these appear to be recent creations derived in part from their English equivalents.

In comparing the various words found in Hawaiian vocabularies and dictionaries since 1845, it appears that the earliest documented terms used to refer to monk seals are *he 'īlio o ke kai* and *'īlio o ke kai* (**Error! Reference source not found.**). Later alternate names include *uwalo*, *'īlioholoikauaua*, and *hulu*.

Table 1. Terms for Seal Found in Hawaiian Dictionaries and Vocabularies

Year	Source	Term	Possible Translation
1845	Emerson and Bishop, *He Hoakaolelo No Na Huaolelo Beritania*	he ilio o ke kai	the dog of the sea
1865	Lorrin Andrews, *A Dictionary of the Hawaiian Language*	he ilio o ke kai	the dog of the sea
1887	Howard R. Hitchcock, *An English-Hawaiian Dictionary*	ilio o ke kai	dog of the sea
1922	Lorrin Andrews, *A Dictionary of the Hawaiian Language* revised by Henry Parker	none	none
1945	Judd, Pukui and Stokes, *Introduction to the Hawaiian Language*	'ili'o ho'lo i Kauaua	uncertain
1945	Judd, Pukui and Stokes, *Introduction to the Hawaiian Language*	uwa'lo	"to cry out"
1957	Pukui and Elbert, *Hawaiian Dictionary*	'īlio-holo-i-kauaua	"dog running in the toughness"
1957	Pukui and Elbert, *Hawaiian Dictionary*	hulu	"seal, named for its valuable fur"
2003	Hawaiian Lexicon Committee, *Māmaka Kaiao*	sila	"seal (Sila pūhuluhulu, fur seal; Sila Hawai'i, monk seal)"

4.2 Place Names

In their various publications related to monk seals (Kittinger et al. 2011, Kittinger et al. 2012, Watson et al. 2012), Kittinger and his fellow authors identify a number of place names that they suggest are in some way associated with Hawaiian monk seals (**Error! Reference source not found.**). Many of these names include the word *'īlio*. In most cases, however, it seems more

reasonable to suggest that the names refer to or are in some way associated with dogs rather than seals.

Table 2. Place Names Identified by Kittinger et al. as Referring to Monk Seals

Place Name	Physical Feature	Location	Possible Translation	Association with Hawaiian Monk Seals
ʻĪlio-piʻi	Cape and bay	Kalaupapa, Molokai	"climbing dog" (Pūkui et al., 1974;56)	Modern observation of seals in the area
Lae o Ka ʻĪlio	Cape	Hāʻena, Kauaʻi	Cape of the dog	Modern observation of seals in the area
Ka-lae-o-ka-ʻīlio	Cape	Northwest Molokaʻi	The cape of the dog	Similarity to name of cape at Hāʻena, Kauaʻi
Ka-lae-o-ka-ʻīlio	Cape	Kaupō, Maui	The cape of the dog	No known association
Kāneʻīlio	Cape	Waianae, Oʻahu	"dog Kāne"	No known association
Puʻuanahulu	Hill	Kona, Hawaiʻi Island	"ten-day hill"	No known association
Holoikauaua	Atoll	Pearl and Hermes Atoll	running in the roughness	Modern name given to the island

ʻĪlio-piʻi

The name of this small cape and associated bay on the Kalaupapa peninsula of Molokaʻi can be translated as meaning literally "climbing dog" (Pukui et al., 1974). It has been mention as possibly having been named for the Hawaiian monk seal (Kittinger et al. 2011:15). The suggested evidence for this is the contemporary presence of seals in the area. Kittinger and his fellow authors state that, "The historical name seems appropriate, as monk seals commonly pup on beaches in this area in modern times" (Kittinger et al. 2011:15). The fact that the formerly populous, but now lightly populated Kalaupapa Peninsula, which is also a Federally protected National Historic Park, has become a common birthing area for Hawaiian monk seals is not surprising. The contemporary presence of monk seals in this area, however, does not necessarily infer that monk seals were present there during the pre-Contact period or that the area was named after them.

Since the place name ʻĪlio-piʻi refers to a cape and bay, it might be suggested that the area is more likely to be associated with seals than dogs. The traditional origins of such place names, however, are not always so simply perceived. The name of such a *wahi pana* (storied place) may come from some legendary or mythological or poetic association. An example of an unrelated but perhaps similar poetic association can be found in a traditional *hula alaʻapapa* (a form of dramatic hula) that comes from the epic story of Hiʻiaka, sister of the volcano goddess Pele, and her journey to Kauai. In describing the windward side of the island of Oʻahu the *hula mele* states:

> Ua holo-wai na kaha-wai;
> Ua ko-ká wale na pali.
> Aia ka wai la i ka ilina, he ilio,
> He ilio hae, ke nahu nei e puka
>
> Full run the streams, a rushing flood;
> The mountain walls leap with the rain.
> See the water climbing its bounds like a dog,
> A raging dog, gnawing its way to pass out. (Emerson 1909:59)

Lae o Ka ʻĪlio
In his book *Hāʻena: Through the Eyes of the Ancestors*, Carlos Andrade identify a cape on the rural north shore of Kauaʻi Island near Hāʻena as being associated with the Hawaiian monk seal. The traditional name of this cape (*lae*) can be literally translated as "the cape of the dog". The place name is also known in its abbreviated form, Ka-ʻīlio, which translates as "the dog" (Pukui et al. 1974:69). Andrade writes that Lae o Ka ʻĪlio, which he translates as "the headland of the dog," "refers to the endangered Hawaiian monk seal known to Hawaiians as ʻīlio hele i ka uaua (dog running in the rough seas). Residents saw seals there even in the days before the federally established laws now protecting them caused a dramatic increase in their numbers in the main Hawaiian islands" (Andrade 2008). Here again the association of the place name with seals rather than dogs is related to the historically recent observation of monk seals in the area rather than any traditional association.

Kittinger and his follow authors state that, "ʻĪlio-piʻi on Molokaʻi and Lae o Ka ʻĪlio on Kauaʻi, are historical names that likely reference places where monk seals were common in historical times" (Kittinger et al. 2011:15). As has been pointed out, there appears to be no direct evidence for this association other than the fact that monk seals have been noted in these areas in modern times. They also note that various other places throughout the archipelago may warrant more research to determine whether they are associated with the Hawaiian monk seal. The locations of these "places with names that potentially reference monk seals" are shown on a map in their 2012 paper (Kittinger et al. 2012:Figure1). Among the place names included are Lae o Ka ʻĪlio on northwest Molokaʻi; Ka Lae o Ka ʻĪlio at Kaupō, Maui; Kaneʻīlio point on the Waiʻanae coast of Oʻahu; Kūʻilioloa, also in Waiʻanae; Kaʻōʻio point on the windward coast of Oʻahu; and Puʻuanahulu in North Kona on Hawaiʻi Island.

Ka Lae o Ka ʻĪlio
Also known as ʻĪlio and Ka-ʻīlio (Pūkui et al., 1974:72), ʻĪlio Point, Lae o Ka ʻĪlio is a headland on the northwestern coast of Molokaʻi. Its name can be translated as "the cape of the dog" (Pūkui et al., 1974:72). Kittinger and his co-authors suggest that it is "possible the site was named for the frequent presence of monk seals, like its counterpart on Kauaʻi" (Kittinger 2011:16). Molokaʻi *kupuna* (elder) Harriet Ne, however, has stated that the point gained its name for its association with an ancient legend of a red dog (Ne et al. 1992, DLNR 2009).

Ka Lae o Ka ʻĪlio
Another Lae o Ka ʻĪlio marked in the Kittinger map is located at Kau-pō on Maui. Here again there is no know association between this cape, whose name can be translated as "the cape of the dog" (Pūkui et al., 1974:72), with the Hawaiian monk seal.

Kāneʻīlio
Kāneʻīlio, a point on the Waianae coast of Oʻahu, also appears on the Kittinger map. The place name, which literally means "dog Kāne", is said to be the site of a *heiau* (temple) "dedicated to Kū-ʻīlio-loa, a legendary giant man-dog" (Pukui et al. 1974:84). Kittinger and his fellow authors state that, "moʻolelo about this site [the heiau, which is also shown on their map] reference a dog that would bark at the ocean when enemies were coming." They admit that, "Respondents that identified this site said that although the name has ʻīlio (dog) in it, it does not necessarily mean it was named after the monk seal" (Kittinger et al. 2011:15).

Kūʻīlioloa
Kūʻīlioloa is the name of the *heiau* located at the extreme tip of Kāneʻīlio point on the Waiʻanae coast of Oʻahu. The name also appears on Kittinger's map. The literally translation of the name of this *heiau* is "long dog of Kū" (Pukui et al. 1974:129). The *heiau* appears to be "named for a legendary dog who protected travelers: later the qualities of a bad dog were unfairly attributed to him" (Pukui et al. 1974:129). Located along the coast, the *heiau* is surrounded on three sides by water (McAllister 1933:113). According to Elspeth Sterling and Catherine Summers, authors of *Sites of Oahu*, Kūʻīlioloa Heiau was partially destroyed by the U. S. Army which constructed a concrete bunker on the site during World War II. Its remains were still visible in 1954 (Sterling and Summers 1978:69). In the late 1970s, the *heiau* was rebuilt by the Waiʻanae community.

Historian Samuel Mānaiakalani Kamakau notes that "Lonokaʻeho came from Kahiki with his big dog Kūʻīlioloa" (Kamakau 1991:111). There are many traditions concerning Kūʻīlioloa who is sometimes described as "a dog with a human body and supernatural powers" (Beckwith 1970:347).

Puʻuanahulu
The hill of Puʻuanahulu, located on the inland slopes of the North Kona district of Hawaiʻi Island, also appears on the Kittinger map. The hill, whose name means literally "ten-day hill," is "perhaps named for a supernatural dog of that name" (Pukui et al. 1974:195). "The body of Anahulu, a supernatural dog that was changed to stone by Pele" rests in a sea pool along the Kona coast near Ka Lae o Ka ʻĪlio (Pukui et al. 1974:72). The *puʻu* (hill) of the supernatural dog Anahulu does not appear to be associated with the Hawaiian monk seal.

Holoikauaua
Holoikauaua is a modern Hawaiian name for the Pearl and Hermes Atoll is mentioned by Kittinger et al. The name is not an ancient one, but it was given to the atoll following the establishment of the Papahānaumokuākea Marine National Monument, in reference to the Hawaiian monk seals that frequent the area. The Monument Management Plan states that, "The name Holoikauaua celebrates the Hawaiian monk seals that haul out and rest here (USFWS et al. 2008).

There appears to be no direct evidence to suggest that any of the place names identified by Kittinger and his fellow authors are associated with the Hawaiian monk seal. The present study has been unable to find any place name within the MHI that can be directly related to monk seal presence during the traditional period or to any tradition or legend related to the Hawaiian monk seal.

4.3 References to Monk Seals in Traditional Literature
If a resident population of Hawaiian monk seals was present in the MHI throughout the pre-Contact period, one might expect to find mention of monk seals in oral literature of ancient Hawaiʻi. Although much of this literature was lost in the transition of *ʻōlelo* Hawaii from a spoken to a written language, much of it survived. An examination of the surviving written *oli* (chants not for dancing), *hula* (chants for dancing) and *moʻolelo* (stories, mythologies, legends and historical narratives) have yielded few definitive references seals. Only one *moʻolelo* was found that mentions the Hawaiian monk seal (see below). Much of Hawaiian traditional literature was never written down and has been passed through the generations within

individual families. These stories remain to a large extend inaccessible to the general researcher. As Kittinger and his fellow authors discovered during their interviews, "several respondents also noted that much of the information we sought about monk seals was deliberately kept *hūnā*, or secret, in keeping with tradition and because such knowledge had been improperly used in the past" (Kittinger et al. 2011:10).

The Kumulipo

The *ko'ihonua*, the great genealogical chants, trace back the ancestry of the *ali'i 'ōhana* (chiefly families) of Hawai'i through the generations. The most well known of these genealogical chants is the Kumulipo, which begins at the creation of the world and enumerates many of the plants and animals that were part of the Hawaiian cosmos. The Kumulipo mentions both land and sea creatures, often linking a land plant or animal with one from the sea.

> Hanau ka 'A'ala'ula noho i kai
> Kia'i ia e ka 'Ala'ala-wai-nui noho i uka (Beckwith 1972:188)
>
> Born was the 'Ala'ala moss living in the sea
> Guarded by the 'Ala'ala mint living on the land (Beckwith 1972:59)

Although the chant includes reference to other marine mammals, the *nai'a* (porpoise) in line 138 and the *palaoa* (whale) in line 251, the monk seal does not appear in any of its known names among the animals mentioned in the Kumulipo. Kittinger and his fellow researchers, however, have suggested the seal is referred in the sixth stanza of the chant.

The Kalākaua text reads:

> He 'iole ko uka, he 'iole ko kai
> He 'iole holo i ka uaua (Beckwith 1951:201)

The folklorist Martha Beckwith translated these lines as:

> A rat in the uplands, a rat by the sea
> A rat running beside the wave (Beckwith 1951:88)

The line "He 'iole holo i ka uaua" has been taken to refer to monk seals due to its similarity to the term *'īlioholoikauaua*. The word *'iole*, which appears in this line refers not to the dog (*'īlio*), but to the Polynesia rat (*'iole*) (Pukui and Elbert 1971:125). Thus the line has been translated by Beckwith as "A rat running beside the wave" (Beckwith 1951:88). Kittinger, Bambico, Watson and Glazier suggest that, "the description of the *ioleholoikauaua* as "a rat running beside the wave," is reminiscent of monk seals and the description of the monk seal in this section of the Kumulipo is also consistent with other descriptions and perceptions of monk seal behavior found in Hawaiian language sources" (Kittinger et al. 2011:14).

An alternate translation of the line is given by Hawaiian scholar Rubelite Kawena Johnson.

> A rat for the upland, a rat for the shore,
> A determined rat running tough. (Johnson 2000:23)

This line of the chant is but one of a series metaphorical references to the nibbling of rats. As Beckwith explains it in her commentary to the poem, "Kupihea is probably right in interpreting the spread of the rat family from upland to shore and their nibbling habits as symbolic of the rise of new lines of chiefs under whom taboos multiplied. Especially it refers perhaps to the land to landlords and these again to subordinate overseers, each taking toll from the crops…" (Beckwith 1951:86). This interpretation would tend to suggest that it is the *ʻiole* (rat) with its attendant symbolic meaning that is referred to here rather than the monk seal. The line's apparent connection to the Hawaiian monk seal is simply due to a similarity in the use of words and not a deliberate reference.

The Kumu Honua

A similar confusion of words has led Kittinger and his fellow authors to suggest that the Hawaiian monk seal is also mentioned in the traditions associated with Hawaiʻi-Loa and with the creation of the first man, Kumu Honua (there is some question as to whether this creation tradition was strongly influenced by Christian mythologies introduced in the years following Western contact; Barrera 1969). Judge Abraham Fornander, in his Collection of Hawaiian Antiquities and Folklore (traditional *moʻolelo* gather from Hawaiian authors to be used as source material in the writing of his multi-volume Account of the Polynesia Race) includes the "Legend of Hawaii-loa" which was "compiled and condensed in English from Kepelino and S. M. Kamakau". As part of this *moʻolelo* he refers to the tradition of Kumu Honua and describes the animals that were created to keep company with this first man in the Hawaiian Eden.

> Among the animals enumerated in the legend as dwelling in peace and comfort with Kumu Honua in Kalani i Hauola were:
>
> Ka puaa nui Hihimanu a Kane (the large Hihimanu hog of Kane); ka ilio nui niho oi a Kane (the large sharp-toothed dog of Kane); ka ilio holo i ka uaua a Lono (the dog running at the voice of Lono); ka puaa maoli (the common hog); ka ilio alii a Kane (the royal dog of Kane); na moo (lizards); na moo niho nui, niho oi, wawaka a Kane (the sharp, long toothed, iridescent lizard of Kane)… (Fornander 1919:273-274)

Fornander translates "ka ilio holo i ka uaua a Lono" as "the dog running at the voice of Lono." Although *ʻīlioholoikauaua* is one of the Hawaiian terms used for seal, its use here suggests that it appears in the legend as a descriptive of a dog rather than a seal. The god Lono is traditionally associated with lightning and the sound of rolling thunder (Beckwith 1970:41), thus the voice of Lono may be a poetic reference to thunder.

Interestingly, Fornander's early translation of the phrase "holo i ka uaua", "running at the voice", suggests that the word used in the phrase is *ʻuaʻua*, rather than *uaua*, and that "ka-uaua" might be translated as "the voice". It is possible that this same version of the word appears in the term used to refer to the Hawaiian monk seal, *ʻīlioholoikauaua*.

Hiʻiaka

Another proposed reference to the Hawaiian monk seal in traditional *moʻolelo*, as suggested by Kittinger, Bambico, Watson and Glazier, comes from The Epic Tale of Hiʻiakaikapoliopele as translated by Puakea Nogelmeier, professor of Hawaiian language at the University of Hawaiʻi at Mānoa (Nogelmeier, 2006). This *moʻolelo*, originally printed in the Hawaiian language newspaper *Hawaiʻi Aloha* and then in the *Ka Naʻi Aupuni* between July 1905 and November 1906,

recounts the journey of Hiʻiakaikapoliopele, sister of the volcano goddess Pele, and her companion Wahineʻōmaʻo, from Hawaiʻi Island to Kauaʻi to find and bring back Pele's lover Lohiau. As Hiʻiaka and her companion are passing along the Koʻolau coast of the island of Oʻahu, she points out a rock formation, "shaped like an *ʻīlio*, a dog, with the head, the body, and all the features of a dog?" (Nogelmeier 2006). Hiʻiaka explains that:

> That is no stone carved by man, but rather the rock form of one of our uncles, one I mentioned to you. That is Kauhikeʻīmakaolani. He is the *ʻīlio hā* that Kane brought from Kahiki, and he is always seen yonder, at Kaʻōʻio Point [Ka lae o ka ʻōʻio, the point of the bone fish, which marks the boundary between the districts of Koʻolau Poko and Koʻolau Loa (Pukui et al. 1974:72)], that high spot before one reaches the flatlands on the way to Kāneʻohe. The third place where he's often seen is at the mouth of Nuʻuanu Valley, where one enters Kahaukomo (Nogelmeier, 2006).
>
> When Wahineʻōmaʻo asks what is an *ʻīlio hā*, Hiʻiaka responds that, "ʻĪlio hā is like saying *ʻīlio kāhā*, an oversized, hulking dog, the same way a pig can be oversized. It means it is huge, heavy, plump, and fleshy. But this dog-uncle of ours you see there has the body of a massive dog, and the largest expanse of his fur is on his head and neck …" (Nogelmeier 2006).

Kittinger and his fellow authors see this description of the *ʻīlio kāhā* ("huge, heavy, plump, and fleshy ") as reminiscent of the physical appearance of the Hawaiian monk seal. In their *Hawaiian Dictionary*, Mary Kawena Pukui and Samuel Elbert define the word *kāhā* as "Large, fat, plump, as of a well-fed dog" (Pukui and Elbert 1970:103). This suggests that the term was used to refer to large dogs. There is nothing else in the *moʻolelo* to suggest that the *ʻīlio hā* was a monk seal rather than "a massive dog".

Moʻolelo of Pinao and Kamālama

There is at least one extant *moʻolelo* which does make mention of the Hawaiian monk seal. Unlike the previously mentioned *oli* and *moʻolelo*, which were set down in writing during the early historic period, this tradition was passed down orally and only recorded relatively recently. Included in the Appendix to the *Historic and Contemporary Significance of the Endangered Hawaiian Monk Seal in Native Hawaiian Culture* is the partial transcript on an interview in which a *kupuna* from the district of Kaʻū on the island of Hawaiʻi relates a *moʻolelo* regarding a seal that was told to her by her father-in-law (Kittinger et al. 2011:31).

The authors of the report indicate that, "The following is an oral tradition and story (*moʻolelo*) from a *kupuna* interviewed on Hawaiʻi Island, near Ka Lae o ka ʻĪlio ("the cape of the dog"), about the monk seal. Names and some information have been withheld to protect the identity of the respondent" (Kittinger et al. 2011:31).

> I'm from Kaʻū [Hawaiʻi Island], but originally I come from Molokaʻi, from the area called Kalamaʻula. I relocated here [to Kaʻū] because of my husband. My husband was a cowboy by trade. Today I'm going to share with you a little *moʻolelo*, a little story that comes from the opposite end called Ka Lae. A lot of people call this area South Point, but it's really Ka Lae. Now in this area, there was this young woman and her name was Kamālama. And Kamālama had a good friend who she loved dearly and his name was Pinao. Well Pinao and Kamālama were always happy together. They loved each other dearly. But one day, Kua, the Shark God, he's traveling the *moana*, the ocean. He sees her

> [Kamālama] [heart fluttering motion]. Hū [oh] my goodness, he loves this young lady. No. She don't want him at all. Kua is very upset; and so Kua causes a *pō*ʻ*ino*. He puts a curse on this young lady, Kamālama, and Pinao. And, Kamālama no longer stays as a woman; but she withdraws to the ocean and she becomes an ʻ*aukai*, a sea-god or a seal. And poor Pinao. Pinao who stands so very tall; now begin to bear wings and he begin to flutter and fly. He becomes a dragonfly. Auē! They no longer can be together. And whenever Kamālama come up to the white sand, at this particular beach, she's not able to embrace her good friend Pinao. And Pinao, he comes and he flutters down upon her, and he is no longer able to hold her anymore. Well, the god Kū, finally comes to realize what is happening; and he feels love and compassion for this young couple, for this young man and this young lady. And so what happens: Kū decides that this should not happen, that Kua's jealousy gets in the way. And so, the god Kū decides to make a new rule, and he says: when Nā Huihui [reference to the star cluster Nā-Huihui-a-Makaliʻi, otherwise known as Pleiades, whose rise & fall in the Hawaiian night skies marks the start and end of the Makahiki Season, generally from end Oct/beg Nov to end Jan/beg Feb] all the stars shine during these particular months then this young man and this young lady will be able to have the… This young man and this young lady will be able to share this time to Kū, to take on their human forms again, so that they will no longer be this dragonfly, nor will she be this ʻ*aukai*, this seadog or this seal of the ocean. And so from the months of October, November, December [until] part of February, they then take on this form, and they come back to who they really were; and they're able to enjoy each other's company, and to embrace each other once again. And so this is the short story of Pinao and Kamālama. I'm not sure if that's what you was looking for. I doubt if you're going to find it in any books, like you do [the *mo*ʻ*olelo* of] Kauila because I heard this, again, from my father-in-law. When he was here, he was busy sharing things. And he was trying to recall things and I didn't realize what he was doing is recalling because he was going to go on his journey [pass away]. He was going to leave us. And so, um, most of the stories that I am sharing every now and then, I haven't seen it in any book. So, and, I haven't shared this, except for my own family. This is the first time I've shared it outside" (Kittinger et al. 2011:31-32).

The narrator of this *mo*ʻ*olelo* states of Kamālama that after her transformation she "no longer stays as a woman; but she withdraws to the ocean and she becomes an ʻ*aukai*, a sea-god or a seal." The word used, ʻ*aukai*, means "to travel or swim by sea; seafaring; sailor" (Pukui and Elbert 1971:29, the word does not appear in Andrews 1865 dictionary, the term ʻ*īlio* ʻ*aukai* refers to a "sea dog, experienced sailor", or a "warship", Pukui and Elbert 1971:93). The term ʻ*aukai*, "to travel or swim by sea; seafaring" seems an apt description for a seal, though whether it is being used in the tale as a poetic descriptor or as a true name is uncertain.

Pinao is the Hawaiian work for dragonfly, while the name *ka mālama* can be roughly translated as the one who cares for (Pukui and Elbert 1971:214). Kamalama without the diacritical mark over the ā is the name of a star and means literally "the light", (Pukui and Elbert 1971:116).

The shark god Kua, mentioned in the story of Pinao and Kamālama appears in the *mo*ʻ*olelo* of Kaehuikimanoopuuloa (the little *ehu* colored shark of Puʻuloa) as related by Thomas G. Thrum in his *More Hawaiian Folk Tales*. Thrum translated and condensed the story from a version published in the Hawaiian language newspaper Au Okoa for November 24, 1870. Here he is described as "Kua, king-shark of Kona" (Thrum 1923:295). It is Kua who guides Kaehuikimanoopuuloa and his companions on their travels to distant Kahiki (Thrum 1923:303). A version of the same story is told by Padraic Colum in his *Legends of Hawaii* (Colum 1937:89).

5.0 Historical Perspectives on the Hawaiian Monk Seal

There is little evidence to suggest that the Hawaiian monk seal formed an important component of traditional Hawaiian culture. The early Western visitors to the MHI make no direct reference to them, nor do they appear in the works of early Hawaiian historians. With increasing Western contact, however, Hawaiians became acquainted with seals, both in the NWHI and along the western coast of America. From the early historic period onward references to seals begin to appear in Hawaiian language newspapers.

5.1 Early Hawaiian Historians

None of the early Hawaiian historians working to document their traditional culture in the first generations following Western contact make any direct mention of the Hawaiian monk seal. In his book *Moʻolelo Hawaiʻi* (translated from the Hawaiian by Nathaniel B. Emerson in 1898) the Hawaiian historian David Malo lists and describes the various domestic and wild animals present within the Islands before Contact. In describing these creatures, both indigenous and Polynesian introduced, he makes mention of the pig, dog, wild and domestic fowls, other wild birds, the bat, and various insects (Malo 1951:46). In describing fish and other sea animals he mentions the sea turtle, the shark, dolphins and whales, but makes no reference to seals (Malo 1951:47).

5.2 Hawaiian Language Newspapers

A number of Hawaiian language newspapers were published from the 1830s to the early 1900s. These newspapers, printed in *ʻōlelo* Hawaiʻi, provide a vast reservoir of information concerning Hawaiian culture. Since relatively few books, other than basic grammars and school texts, were published in the Hawaiian language at that time, the newspapers served as almost the sole outlet for any Hawaiian writing in his or her native tongue. As such, they functioned as repositories for traditional legends and cultural histories, venues for the discussion of current political issues, and resources on government laws and policies. Over the last decade, efforts have been undertaken by a number of organization and individuals to make the information contained in these newspapers available to the general public.

In order to determine how often and in what contexts references to seals appear in Hawaiian language newspapers, a search was made of the existing online databases of published newspapers. A list of articles found to contain references to seals is contained in **Error! Reference source not found.**.

Table 3. Articles From the Hawaiian Language Newspapers that Contain Any Reference to Seals, Listed in Chronological Order

Year	Source	Hawaiian Term	Possible Translation
1841, 3 August	Ka Nonanona	sila	seal
1859, 19 October	Ka Hae Hawaii	Iliokai, ilio o kai	seadog, dog of [the] sea
1864, 17 December	Ka Nupepa Kuokoa	ilioholoikauaua	dog running in the useless (not used to describe a seal)
1865, 25 May	Ka Nupepa Kuokoa	sila	seals
1865, 29 June	Ka Nupepa Kuokoa	ilioholoikauaua	dogs running in the rough seas
1867, 1 November	Ke Alaula	ʻīlio-holo-ika-	dog-running-in-the-rough-seas

		uaua	
1876, 19 February	Ka Nupepa Kuokoa	ʻĪlioholoikauaua	dog-running-in-the-rough-seas
1876, 5 August	Ka Nupepa Kuokoa	ʻīlio holo-ikauaua	dog-running-in-the-rough-seas
1894, 19 March	Ka Makaainana	ilioholoikauaua	dog-running-in-the-rough-seas
1924, 25 September	Elua Nupepa Kuokoa	uwalo	to cry out

A search of Hawaiian language newspapers revealed several references to seals, which were referred to by various names. In most cases the articles that mention seals refer either to sealing voyages or describing an account of travels in the arctic (one reference is contained in a Hawaiian translation of Jules Verne's *Twenty Thousand Leagues Under the Sea*). There do not appear to be any articles that directly address seals in traditional Hawaiian culture or the presence of seals within the MHI.

Kittinger, Bambico, Watson and Glazier identify one article, published in the February 1834 issue of the paper *Ka Lama Hawaiʻi* and entitled No Kekahi Aoao Kahiko (Concerning an Ancient Way of Life), which they propose, "suggests that monk seal furs were collected as part of customary tribute to the land managers (Konohiki)" (Kittinger et al 2011:12). The specific portion of the article that they cite for this interpretation reads:

> No kekahi aoao kahiko.
> Eia kekahi mea kupanaha a makou; o ke kukini. Ina i oleloia he mau kukini; apopo, holo; alaila, hele mai la kanaka he nui loa me ka waiwai, a pili a mau iho la, alaila, hele aku la ua mau kanaka la elua a hiki i ka Pahuku. Kukini mai la ua mau kanaka la, a hopu i ka pahu kekahi, alaila, eo ae la nana. Olioli iho la ka poe i ko. Aka, o ka poe i eo, mihi iho la lakou i ke eo ana. Ina e olelo ke Konohiki i na makaainana, apopo kakou koele a pau, a ahiahi iho, hoike i ka waiwai: Alaila, hana iho la lakou i ua mau mea nei a ke Konohiki i olelo mai ai, o ka puaa, o ka ilio, o ke kapa, o ke olona, o ka hulu, o ka upena, o kela mea keiamea a pau. Oia ka waiwai, a makou i hoike ai i ka wa kahiko.

It has been translated as:

> *Concerning an ancient way of life.*
> *Here is something wondrous for us: runners. If some runners said: tomorrow, is a race; and then a multitude of persons came with money, and continued to place bets down, and then, two of these persons then ran until they reached the goal. These people then raced, and grabbed the baton, and then, it was won for him. The people were then joyful for the triumph. But, as for the persons who lost, they apologized for losing. If the Konohiki said to the citizens, tomorrow we all walk until the evening to show the tribute: and then, they lay down these things the Konohiki requested: pig, dog, cloth, fiber, fur, fishing net, everything. These are the goods that we exhibited in ancient days.*
>
> (http://www.nupepa.org/gsdl2.5/cgi-bin/nupepa?e=q-0nupepa--00-0-0--010-TX--4--hulu+%22Eia+kekahi+mea+kupanaha%22---text---0-1l--1haw-Zz-1---20-about-%5bhulu+%22Eia+kekahi+mea+kupanaha%22%5d%3aTX--0013hulu+%22Eia+kekahi+mea+kupanaha%22-1-0000utfZz-8-00&a=d&c=nupepa&cl=search&d=HASH67c54d1f7df0e3ea4c2663.4)

A more appropriate translation of the list of offerings requested from the *makaʻāinana* (common people) by the *konohiki* (land manager) would be *ʻo ka puaʻa* (pigs), *ʻo ka ʻīlio* (dogs), *ʻo ke kapa* (bark cloth), *ʻo ke olonā* (cord of *olonā* fiber), *ʻo ka hulu* (feathers, these would have been the

brightly colored feathers of forest birds woven into the cloaks and helmets of the chiefs), *'o ka'upena* (fishing nets). Bird feathers are known to have been part of the duty collected by chiefs. This seems more likely than the pelts of monk seals.

The earliest known article in a Hawaiian language newspaper to mention seals appears in an August 1841 issue of the paper *Ka Nonanona* in an article entitled No Ka Ulu Moku Imi Aina (About the Land Exploration Fleet). The article tells of the arrival in the Islands of the ships of the U.S. Exploring Expedition under Captain Wilkes, and of the Expedition's travels in the Antarctic, which the writer describes as "filled with ice, no people, just walruses and seals were the animals that belonged there". In this article the words used for the Antarctic seals is "sila".

The newspaper *Ka Nonanona* for 3 August 1841 has an article entitled:

> No Ka Ulu Moku Imi Aina.
> I ka malama o Okatoba 1841, hiki mai la ka ulu moku ini aina no Amerikahuipuia, ma Honolulu nei. Eha moku, o ka moku nui, (i ka Winisani, a me ka Pikaka) a elua hoi moku nuku iho, o ka Naia, a me ka Malolo a o Kali Wilika ko lakou alii nui. Ua imi aina na ulu moku nei ma ka huina loa, a ua ike lakou i ka aina nui malaila, i ka la 13 o Ianuari, 1840, ma ka latitu 65°20 lonitu 104°24. Popilikia i a ko lakou holo ana ma kela moana hema, no ka nui loa i ka hau; me he mau moku aina nui la, e lana wale ana, a e hui kau ana, ua hau paa nei ma kela wahi. Ili ka Pikaka i ka moku hau, a mai nahaha loa: ua pakela no nae no ke akamai loa o kona kapena o Hudesona. Holo kokoke i kela aina hema ka Winisani i 1700 mile a ike pinepine; lakou i ka aina; he aina pali, paupu i ka hau, aole kanaka, he mau walerusa, a me na sila wale no ko laila holoholona. Pau keia; Holo mai aku la keia ulu moku imi aina, a i keia mai la iho nei i ka la 15 o Iune, hoi hou mai la ka Pikaka, o Hudesona ke alii a me ka Pulolo. Ua huli lakou i kekahi pae aina; (Kinimila ka inoa ma ka olelo Enelani.) aia ma ka poaiwaena, ma ke komohana hema mai ia nei aku. He pae moku liilii kela, he haahaa, a he ano loa ka holo ana o na moku ma kela wahi, no ka ike ole ia o na wahi papau a me na moku liilii. Aka, ua pau i ka huliia a me ka palapalaia na wahi pilikia olaila e ko ka Pikaka a.
>
> *About the Land Exploration Fleet.*
> *In the month of October 1841, the land exploration fleet arrived from the United States of America, here in Honolulu. There were four ships, the large ships, (the Vincennes, and the Peacock) as well as two nose diving ships, the Dolphin, and the Flying Fish and Charles Wilkes was their high commander. The fleet explored land in it's entire length, and they saw great lands there, on the 13th day of January, 1840, in the latitude 65°30' longitude 104°24'. Their progression was troubled upon that Anarctic [sic.] ocean, because of the expanse of the ice; like great big islets, just floating, haphazard, icelocked [sic.] in that place. The Pīkaka was run aground on an iceberg, and very nearly wrecked: we escaped because of the good judgment of his Captain Hudson. The Vincennes approached that arctic land which is 1700 miles and they frequently saw land; a precipice, filled with ice, no people, just walruses and seals were the animals that belonged there. This is done.*
>
> (http://ulukau.org/collect/nupepa/index/assoc/HASH41b7.dir/004_0_001_003_009_01_ful_18410803.pdf)

An article in an October 1859 issue of *Ka Hae Hawai'i*, entitled No Ke Kakau Hoike Ana I Na Moku (Regarding writing bonds for vessels) appears to be a discussion of government requirement for seagoing vessels, some of which are involved in the hunt for whales and seals ("a whaling vessel and a sea_dog investigating vessel"). The two terms for seal used in this article are "iliokai" (literally sea dog) and "ilio o kai" (dog of [the] sea). This usage is similar to

Emerson and Bishop's 1845 phrase "he ilio o ke kai" and Lorrin Andrews' 1865 dictionary's "he ilio o ke kai" (see Section 5.4.1). The article reads:

> Ha'awina XXIV
> No Ke Kakau Hoike Ana I Na Moku
> …waia okohola, a no ka imi ana i na iliokai, ma ka moa o ka mea nona kekahi hapa o ia moku, ina he kanaka kupa ia a he kanaka kupa ole paha, a ina e noho paa aha oia iloko o keia Aupuni….
>
> Pauku 636. Ma ke kakau hoike ana i kekahi moku, e Iike me ka olelo a ka pauku maluna ae nei, e koi aku ka Luna Dute Nui, i ka mea nana i noi mai ao ke kakau hoike ana, e haawi mai oia i palapala hoopaa me na hope kupono i ka manao o ka Luna Dute Nui, no na dala aole emi mai malalo o na haneri elua, aole hoi oi oku i elua tausani, e hoohalikeia e ka Luna Dute Nui me ka nui o na tona o ka moku; e olelo ana ia palapala hoopaa, e hanaia ka palapala hoike i ke kakau ana no ka moku, ana i haawiia'i wale no, aole hoi e kuaiia, a e haawi lilo ole ia, a e hooliloia paha ma ke ano e ae, i kekahi kanaka; a ina e lilo ia moku a pau, a o kekahi hapa paha o ka moku, ina aole ia he moku okohola a moku imi ilio o kai, no kekahi haole a mau haole paha i kupa ole ma keia Aupuni, a ina paha e poino, a i lawe pioia paha e kekahi enemi, a i hoopauia i ke ahi, a i wawahiia ka moku paha,….
>
> *Article XXIV.*
> *Regarding writing bonds for vessels*
> *…disgraced whaling, and for searching for the seadog, in the ocean of the one for whom is half of the vessel, if a citizen or not a citizen, and if permanently residing in this Kingdom.*
>
> *Paragraph 636. In bond writing for a vessel, similar to the language of the paragraph directly above, the Chief Customs Officer requires, of the one who request the bond writing, to give him an insurance policy with equitable legal surety as is the will of the Chief Customs Officer, for a sum not less than $200.00, and not too exceed $2,000.00, to be matched by the Chief Customs Officer with the larger part of the tonnage of the insurance policy shall be done in writing for the vessel, only for what he was awarded, not to be sold, and not to be granted absolutely, or conveyed in a different manner, to a person; and if the entire vessel is transferred, or half of the vessel, or if it is not a whaling vessel and a sea dog [dog of (the) sea] investigating vessel, for a foreigner or foreigners not citizens in this Kingdom, or if damaged, or if abducted by an enemy, and consumed in a fire, or ship-wrecked,....*
>
> (http://www.nupepa.org/gsdl2.5/cgi-bin/nupepa?e=q-0nupepa--00-0-0--010-TX--4--waia+okohola---text---0-1l--1haw-Zz-1---20-about-%5bwaia+okohola%5d%3aTX--0013waia+okohola-1-0000utfZz-8-00&a=d&c=nupepa&cl=search&d=HASH4055713b8bf3231b1dce80.3)

An article in a December 1864 issue of *Ka Nupepa Kuokoa* entitled Ka Lā'au Ka-umaka e pau ai ka Niniaole O Nā Maka Hū'alu Pepe'ekue O W.H. Kalae-O-Kaena (The Beloved Medicine that cured the waterlessness of the thick viscous membrane covering the eye of W.H. Kalae-O-Kaena (loose skin over the eyeball; slight viscous membrane covering the eye) is the first instance where we encounter the term "'īlioholoikauaua". Interestingly, this article does not directly refer to the Hawaiian monk seal, or any other kind of seal. Instead, the term "'īlioholoikauaua" appears to be a poetic or proverbial epithet referencing to a despised or ill thought of individual. The entire article is couched in a strongly poetic and allusive style (common to some forms of Hawaiian discourse). It is either saying that the individual is as despicable as a seal, or more likely, that he is like a dog running in *ka 'u'a'u'a*, where the word *'u'a'u'a* is an

intensification of ʻ*u*ʻ*a*, which means "useless, vain, to no profit". It seems likely that the phrase is being used here do characterize the individual as useless. The article reads:

> Ka Lāʻau Ka-umaka e pau ai ka Niniaole O Nā Maka Hūʻalu Pepeʻekue O W.H. Kalae-O-Kaena:
> E Ka Nūpepa Kūʻokoʻa E; Aloha ʻoe: -- Ua ʻikea iho ma kou ʻaoʻao 3 o ke Kahua kaua o ka lā 27 o ʻOkatoba, Helu 44 o ka Buke III o ke "Kilohana Poʻokela o ka Lāhui Hawaiʻi." Aia ma laila ka pehina (throwing/pelting, as of rain) mai nei a W.H. Kalaeokaena, i nā pōhaku ʻelekū pukapuka o nā hekili kuʻi-pāmalō a ua ʻīlioholoikauaua lā, ʻaluʻalu pāpaʻi niho kekē o Koholāloa; e hāhā pōʻele lā i ua iʻa lā o ka ʻāina āna (W.H.K.) e noho lā; me he lhuanu lā e manaʻo ana e hina o ʻAiwohikupua, i ka hele wahi ʻana a kani ka pola o ka malo; ʻū! e olo hoʻi! Hina lā ana kei! A ʻo paha e olo ka hina o ke ʻAʻaliʻikūmakani o Kaʻū iā ʻoe, e nā lāʻauohala kumu Pūhala neʻineʻi.
>
> *The Beloved Medicine that cured the waterlessness of the thick viscous membrane covering the eye of W.H. Kalae-O-Kaena (loose skin over the eyeball; slight viscous membrane covering the eye)*
> *Dear Independent Newspaper; Greetings to you: -- It was observed in your 3rd page of the war section on the 27th day of October, Number 44 of Book III of the "Foremost Champion for the Hawaiian Nation." There was W.H. Kalaeokaena's raining of the hole riddled basalt rocks [bullets] of the roaring thunder-with out rain [gun] upon this dog-running-in-the-rough-seas; the misshapen crab claw of Koholāloa, ignorantly groping for this fish on the land where he (W.H.K.) lives; like the Ihuanu wind thinking to topple over ʻAiwohikupua, going somewhere until the flap of the loincloth sounds; ʻū! resounding! glorious toppling! and perhaps resounding the steady blowing of the ʻAʻaliʻikūmakani wind of Kaʻū to you, the hala leaves of the grove of the low-lying hala trees.*
>
> (http://www.nupepa.org/gsdl2.5/cgi-bin/nupepa?e=q-0nupepa--00-0-0--010-TX--4--Kalaeokaena---text---0-1l--1haw-Zz-1---20-about-%5bKalaeokaena%5d%3aTX--0013Kalaeokaena-1-0000utfZz-8-00&a=d&c=nupepa&cl=search&d=HASHa71eb66cb3f9760b697503.1)

An 1865 article in *Ka Nupepa Kuokoa* entitled Ka Pepehi Kohola Ana Me Ka Mahu for which there is no present English translation appears to concern the hunting of whales. It refers to, "na kohola a me na sila", which very roughly translates as "the whales with the seals". Here again, the word for seal is "sila", a local adaptation of the original English word. The article reads:

> Ua ike iho makou maloko o na nupepa Sekotia i ka nui o ka pomaikai i loaa i na kanaka nona na moku mahu huila mahope ma ka lawaia kohola ana. Ua ikeia ua holo aku mai ke aina aku o Dunedi (Dundee) eono moku mahu ma na wahi hau e alualu ai i na kohola a me na sila (seal). Ua hoi mai lakou me na tona aila 645, a 107 1/2 tona pakahi, o ka hiku o ka moku ua poholo ma ia holo ana; oiai he umikumamalua moku mahu a he umikumamaono moku pea i hoounaia mai Pitaheke (Peterhead) aku, ua hoi mai lakou me na tona aila 388, aneane 38 tona aila ka oi o na moku mahu pakahi mamua o na moku pea.
>
> (http://www.nupepa.org/gsdl2.5/cgi-bin/nupepa?e=q-0nupepa--00-0-0--010-TX--4--Dundee+sila---text---0-1l--1haw-Zz-1---20-about-%5bDundee+sila%5d%3aTX--0013Dundee+sila-1-0000utfZz-8-00&a=d&c=nupepa&cl=search&d=HASHdaad27d6549274be043d7d.2)

A June 1865 article in *Ka Nupepa Kuokoa*is entitled He ʻAumoku hou, e holo ana ka Wēlau ʻĀkau (A new fleet, sailing to the North Pole) contains the first known instance in a Hawaiian language newspaper where seals are referred to as ʻīlioholoikauaua. The article discusses a British expedition to the North Pole and describes the arctic landscape. "Just snow is what is

seen there, no plants; the polar bear is still important, with the dogs-running-in-the-rough-seas (seals), and the sea elephants". The article reads:

> He ʻAumoku hou, e holo ana ka Wēlau ʻĀkau.
> Ke hoʻomākaukau nei o Kapena Osbone (Osborne) o nā Moku manuwā o Beritania e holo i ka Wēlau ʻĀkau. Ua makemake ʻia i ʻelua mau moku māhu liʻiliʻi me nā kānaka he 120, a i ka Makahiki 1866 e hiki mai ana e holo ai ia. I loko o ke kau e holo aku lākou i ke Kaikūʻono o Bafine ma ke komohana o ʻĀinaʻōmaʻomaʻo, a hala loa aku i loko e like me ka lōʻihi o kahi e hiki ai ke hele aku. I loko o kēia mau makahiki aku ʻelua, e holo ana lākou me nā waʻapā a me nā koa na ka ʻīlio e kauō a hiki i ka Wēlau. ʻO kākou o ka poʻe hoʻi e noho nei i ka lā pumehana o Hawaiʻi nei, kai ʻike ʻole i ke anu o ia wahi. Ua ʻemi iho ka waidālā o ka hōʻailona māhu (thermometer) i kekahi manawa, i nā degere he 50 ma lalo o ka ʻole. He hau wale nō ka mea ʻike ʻia ma laila, ʻaʻole mea kanu; ʻo nā bea keʻokeʻo naʻe ka mea nui, me nā ʻīlioholoikauaua, a me nā ʻelepani o ke kai. I loko nā kānaka o nā hale hau e noho ai me nā lole hulu, a ʻo kā lākou ʻai o ka ʻiʻo momona me ka ʻaila a me kekahi mau mea ʻē aʻe. Ma laila e lilo ai ka bia a me kekahi mau wai ona ʻē aʻe i mea ʻoʻoleʻa me he pōhaka lā. I ka wā hoʻoilo, he pō lōʻihi ko lākou no nā mālama he nui wale, i ahona iki i ka mahina, no ka mea, he kōnane maikaʻi loa ka mahina ma laila, a me kekahi mālamalama ʻano ʻē ma laila ia kapa ʻia ka Aurora Borealisa (Aurora Borealis) a ʻo ka Mālamalama ʻĀkau. Ma ka Wēlau ma laila ka pō no nā mālama ʻeono, a me ka lā no nā mālama ʻeono. Inā e hiki ʻiʻo ʻo Kapena Osebone ma ia wahi, e kaulana nō kona inoa, no ka mea, ʻo ia ke kanaka mua i hiki ma laila.
>
> *A new fleet, sailing to the North Pole.*
> *Captain Osborne is preparing the British battleships to sail to the North Pole. Two small steamships were wanted with 120 men, and in the coming year 1866 he will set sail. During the summer they will sail through Baffin Bay in the west of Greenland, and stay awhile in there like the length of one who comes and goes. Within these two years, they will go with sleds and guards for the dogs to tow until they arrive at the Pole. We are to be sure the ones living here in the warmth of Hawaiʻi, unacquainted with the chill of this place. The mercury of the thermometer lowered once to 50 degrees below zero. Just snow is what is seen there, no plants; the polar bear is still important, with the dogs-running-in-the-rough-seas, and the sea elephants. Inside, the people stay in igloos with fur clothing, and as for their food it is rich meat and oil and other things. There, beer and alcoholic drinks become as hard as stone. In the winter, they have a long night for many months; the moon is a little better, because, the moon there has very good clear, bright moonlight; and there is a kind of strange light there named the Aurora Borealis otherwise known as the Northern Lights. At the Pole it's night there for six months, and day for six months. If Captain Osborne actually goes there, his name will be truly famous, because, he will be the first man to go there.*
>
> (http://www.nupepa.org/gsdl2.5/cgi-bin/nupepa?e=q-0nupepa--00-0-0--010-TX--4--%22elepani+o+ke+kai%22---text---0-1l--1haw-Zz-1---20-about-%5b%22elepani+o+ke+kai%22%5d%3aTX--0013%22elepani+o+ke+kai%22-1-0000utfZz-8-00&a=d&c=nupepa&cl=search&d=HASH012b3f78fd6c3554bf830845.2)

An article in a November 1867 edition of the newspaper Ke Alaula, entitled Kokoke aku lākou i ka Wēlau ʻĀkau (They are approaching the North Pole) appears to concern another expedition to the North Pole. Once again the term "ʻīlio-holo-ika-uaua" is used to refer to arctic seals (in this case probably the fur seal). The article has two references to seals. "Their clothing to keep warm was the pelt of the dog-running-in-the-rough-seas and the other slippery, furry animals." "They catch on the seashore the dogs-running-in-the-rough-seas and the sea elephants. " The article reads:

Kokoke aku lākou i ka Wēlau ʻĀkau.
I ka noho ʻana o lākou i ka moku, holo aʻe kekahi poʻe o lākou i ka ʻākau ha[u] aku ma luna o nā holopapa i kauō ʻia e nā ʻīlio. Ke ʻike lā ʻoukou ma ke kiʻi ma luna aʻe nei i ke ʻano o ka hoʻokaulua ʻia o nā ʻīlio, a hoʻohui ʻia lākou e kauō i ka holopapa. Noho iho ke kanaka ma luna o ka papa, a kauō māmā loa ʻia ʻo ia e nā ʻīlio ma luna o ka hau paʻa. I kekahi manawa ʻelima a ʻeono ʻīlio kā i hoʻopaʻa ʻia i ka papa; i kekahi hoʻi he nui aku – he ʻumikūmāmāhā a ʻumikūmāmāono paha. Holo aku kekahi poʻe o lākou i ka ʻākau a hiki i ka latitu 82° 30′. I laila ʻike aku lākou i ka Moana Anu ʻĀkau. ʻAkahi nō a launa kokoke aku kekahi i ka wēlau ʻākau e like me kēia – 450 wale nō mile koe a loaʻa aku nō. Akā, ʻaʻole nō he kanaka i hiki aku i laila, no ke anu loa – make e maʻi nō i ke anu. ʻAʻole i loaʻa iā lākou he wahi meheu no Sir Ioane Feranekelina. Ma hope loa mai ua loaʻa ʻia i kekahi poʻe ʻē aʻe. ʻElua a ʻekolu paha o kēia poʻe a Kauka Kaina i loaʻa i ka maʻi a make; hoʻokahi i loaʻa i ke anu ma kekahi wāwae a ʻoki ʻia aku ka wāwae ; lilo hoʻi ʻelua manamana wāwae o kekahi. ʻO ko lākou kapa e mehana ai, ʻo ka ʻili o kaʻīlio-holo-ika-uaua a me nā holoholona huluhulu paheʻe ʻē aʻe, e like me kā nā kānaka i hōʻikeʻike ʻia ma ke kiʻi ma luna aʻe nei.

They are approaching the North Pole.
When they were staying on the ship, a group of them went to the icy north on top of the sled dragged by the dogs. You see in the picture above the disposition of the harnessed dogs, and they are united to drag the sled. The people sit on top of the sled, and he is quickly sled by the dogs on top of the hard snow. One time five maybe six dogs were secured to the sled; another time more – fourteen maybe fifteen. Some of them went to the north until the latitude 82° 30′. There they saw Arctic Ocean. It was the first time someone approached the end of the north pole like this – just 450 miles left until the end. But, there was no person that could go there, because of the extreme cold – becoming deathly ill because of the cold. They didn't find a trace of Sir John Franklin. A long time afterward, it was reached by other people. Two maybe three of these groups and Doctor Kaina got sick and died; one got frostbite on a foot and the foot was cut off; and two toes of one was lost as well. Their clothing to keep warm was the pelt of the dog-running-in-the-rough-seas and the other slippery, furry animals, like the men shown in the picture directly above.

(http://www.nupepa.org/gsdl2.5/cgi-bin/nupepa?e=q-0nupepa--00-0-0--010-TX--4--%22ilio+holo%22---text---0-1l--1en-Zz-1---20-about-%5b%22ilio+holo%22%5d%3aTX--0013%22ilio+holo%22-1-0000utfZz-8-00&a=d&c=nupepa&cl=search&d=HASHea9612c97115b1ddea12bb.1)

It continues:

…kou holoholona i mālama loa ai. ʻAi nō hoʻi ʻo Kauka Kaina i ka ʻīlio a me nā ʻiole i loaʻa iā lākou ma luna o ka moku. Loaʻa iā lākou ma nā ʻae kai nā ʻīlio-holo-i-ka-uaua a me nā ʻelepani kai. He makaʻu nā kamaʻāina Ekimo i kēia holoholona nui, akā make nō ia lākou i kekahi manawa. I ka hoʻi ʻana mai o Kauka Kalina i Piledelepia, hoʻopuka ʻo ia he buke moʻolelo o nā mea āna i ʻike ai ma ia ʻāina anu, a ua piha ia buke i nā kiʻi nani loa. Eia mai ke kiʻi o ka ʻelepani-kai.

...your animal to attend. Doctor Kaina also eats dogs and rats they found on the ship. They catch on the seashore the dogs-running-in-the-rough-seas and the sea elephants. The local Eskimo are afraid of this big animal, but they also sometimes kill it. When Doctor Kaina returned from Philadelphia, he published a story book of the things he saw in this frozen land, and this book was filled with very beautiful pictures. Here is the picture of the sea elephant.

(http://www.nupepa.org/gsdl2.5/cgi-bin/nupepa?e=q-0nupepa--00-0-0--010-TX--4--Ekimo+Piledelepia---text---0-1l--1haw-Zz-1---20-about-%5bEkimo+Piledelepia%5d%3aTX--0013Ekimo+Piledelepia-1-0000utfZz-8-00&a=d&c=nupepa&cl=search&d=HASHea9612c97115b1ddea12bb.2)

A February 1876 article in *Ka Nupepa Kuokoa* was one of a series that consisted of a Hawaiian translation of Jules Verne's book *Twenty Thousand Leagues Under the Sea*. In this section of the book, the harpooner Ned Land speaks with disgust of the food they eat on the *Nautilus*. One of these foods is broiled seal meat, "the broiled meat of the dog-running-in-the-rough-seas".

The newspaper *Ka Nupepa Kuokoa* (Buke XV, Helu 8, Feberuari 19, 1876) for 19 February 1876:

> "Ba," i uilani aʻe ai o Nede me nā ʻano huhū: "he aha kāu i manaʻo ai no nā mea a kākou e ai ai maʻanei? He ake honu, he lālā manō, a me nā ʻiʻo kōʻala ʻa o ka ʻĪlioholoikauaua."
>
> *"Ba," queried Ned in anger: "what are the things you think we eat here? Turtle liver, shark fin, and the broiled meat of the dog-running-in-the-rough-seas."*

An August 1876 article in *Ka Nupepa Kuokoa* consists of another chapter in the Hawaiian translation of Jules Verne's *Twenty Thousand Leagues Under the Sea*. Here Captain Nemo shoots "a large animal, a vicious otter, an animal somewhat like the dog-running-in-the-roughseas." The article reads:

> He ʻIwakālua Tausani Legue Ma Lalo O Ke Kai! Nā Mea Kupanaha O Ka Moana! Ke Ala O Ka Mea Huna A ʻO Ka Mea Pohihihi O Ka 1866! Mahele 1, Mokuna XVI, He Ululāʻau Moana.
> Aia ma kēia wahi, he mea e ka lehulehu o nā iʻa liʻiliʻi o kēlā me kēia ʻano, i kūpono ʻole no ke kī ʻana me nā pōkā. A no ka lelehu loa o nā iʻa liʻiliʻi, ua hiki pono ʻole iaʻu ke ʻike aku i nā mea nui; akā, ʻo Kapena Nimo, ua ʻike akula nō ia i kekahi holoholon[a] nui, he otera ka ʻino, he holohona ʻano like me ka ʻīlio holo-ikauaua; a ʻo ke kī koke akula nō ia no ia o ua Kapena Nimo, a mae ana ua holoholona nei. He ʻelima kapuaʻi kona loa, a he mea hoʻi i makemake nui ia, no ka nani o kona hulu. ʻO nā kapa i hana ʻia no loko mai o ia ʻano hulu, he $400.00 ke kumukūʻai. Ua ʻike nuai ia nā kapa o kēia ʻano ma nā mākeke o Rusia a me Kina. ʻO kahi noho nui o kēia ʻano holoholona, aia ma ka Moana Pakipika ʻĀkau.
>
> *20,000 Leagues Under The Sea! The Wonders of the Ocean! The Path Of Secret And Mystery of 1866! Section 1, Chapter XVI, A Fleet At Sea.*
> *In this place is something of a multitude, a variety of little fish, for which it is illegal to shoot with bullets. And because of the very duskiness of the little fish, I couldn't properly see the larger things; but, Captain Nimo then saw a large animal, a vicious otter, an animal somewhat like the dog-running-in-the-roughseas (seal); and Captain Nimo then shot it, and this animal slumped over. It is five foot long, and something for which it is greatly desired, is the beauty of its coat. Blankets made from this type of fur is a costly $400.00. Blankets of this type are largely seen in the markets of Russia and China. The place where this type of animal mainly inhabits is the North Pacific Ocean.*
>
> (http://www.nupepa.org/gsdl2.5/cgi-bin/nupepa?e=q-0nupepa--00-0-0--010-TX--4--%22ilio+holo%22---text---0-1l--1en-Zz-1---20-about-%5b%22ilio+holo%22%5d%3aTX--0013%22ilio+holo%22-1-0000utfZz-8-00&a=d&c=nupepa&cl=search&d=HASH01fba361bed4c4d8cd0da842.1)

In this article published in a March 1894 edition of *Ka Makaʻāinana* the term ʻīlio holo i ka uaua, which is used elsewhere to refer to directly to seals, is employed for its secondary meaning. The writer plays on meaning of the word *ʻuʻaʻuʻa* (useless, vain, to no profit) and the word *holo* (run), as well as the physical image of the seal. "This is our time to demonstrate our unity, there is no time for us to run; else indeed the Kingdom officials and possibly the learned persons below them, truly without a nation, but, released to that group, will then slacken in their moral resolve like the dog-running-in-the-rough-seas. But, as for the nation, it will transform and separate; and then, truly be taken unto the depths of the ocean, and properly arranged there." The term *ʻīlio holo i ka uaua* is used as a poetic metaphor for someone lacking in moral resolve. The article reads:

> Mai Pūlama Aku.
> ʻO ia nō kēia mākou e uwalo aku nei i nā hoa makaʻāinana a pau, mai pūlama aku i nā hana a kēia poʻe no ka mea pili i ka pono koho balota no nā ʻelele i ka ʻaha hana kumukānāwai a lākou. Ua lohe ʻia mai aia kā nā poʻe o na Kona a me Kaʻū, Hawaiʻi, ke pīkokoi nui lā e kākau inoa ma lalo o ka hoʻohiki a ua poʻe pākaha nei, a mākou nō hoʻi i hōʻaiʻai aku ai ma ka helu i hala i ka waiwai ʻole o ko ka lāhui kumu hana aku pēlā, no ka mea, ke hoʻokō, ʻo ka ʻāpono ʻana nō ia iā lākou nei, a lilo kā lākou nei ʻino i hana mai ai iā kākou i mea maikaʻi. ʻO kā mākou hoʻi e makemake nei, ʻo ia nō ko kākou kū mai nō i ka wā, ʻoiai, aia iā Amerika Huipū ʻia ka hana. No ka mea, ua ʻoiaʻiʻo loa nō kā mākou i hoʻomahuʻi aku ai inā kākou e kōkua ʻole aku, ʻaʻale loa lākou e ʻike ʻia mai a huli ke ao nei. ʻO ko kākou wā kēia e hōʻike ai i ko kākou lōkahi, ʻaʻohe manawa e aku nō kākou; a inā nō ʻo nā poʻe lawelawe ʻoihana Aupuni a poʻe naʻaua[o] paha ma lalo o lākou, ʻaʻohe nō ia o ka lāhui, akā, e hoʻokuʻu aku nō i kēlā poʻe a ʻaluʻalu aku i ko lākou pono e like lā me nā ʻīlio holo i ka uaua. Aka, no ka lāhui hoʻi, e unuhi mai nō a kaʻawale; a laila, lawe aku nō a kai hohonu, hoʻokuene pono iho ʻana i laila.
>
> *Don't Bother.*
> *This is what we declare to all of the fellow residents, don't bother with the activities of this group because they are associated with the equal ballot election for the delegates in their constitutional labor convention. It was heard, there were the groups of Kona and Kaʻū, Hawaiʻi, largely gathering to register beneath the names of these crooks, and we also released in the list of offenses national concerns and such that are unbeneficial, because, when ratified, it will then be enforced by them, and their offenses will become worthless to our benefit. As for our needs, it's for us to rise to the time, while the United States is reasonable. Because, our impersonation was incredibly accurate, if we didn't render aid, they certainly wouldn't have been seen until the day was over. This is our time to demonstrate our unity, there is no time for us to run; else indeed the Kingdom officials and possibly the learned persons below them, truly without a nation, but, released to that group, will then slacken in their moral resolve like the dog-running-in-the-rough-seas. But, as for the nation, it will transform and separate; and then, truly be taken unto the depths of the ocean, and properly arranged there.*
>
> (http://www.nupepa.org/gsdl2.5/cgi-bin/nupepa?e=q-0nupepa--00-0-0--010-TX--4--%22ilio+holo%22---text---0-1l--1en-Zz-1---20-about-%5b%22ilio+holo%22%5d%3aTX--0013%22ilio+holo%22-1-0000utfZz-8-00&a=d&c=nupepa&cl=search&d=HASH01c635aa1500b0d8bd2ec677.4)

An article by T. H. Poaha in *Elua Nupepa Kuokoa*, September 1924, describes the coast of California and refers to the presence of seals by the famous Cliff House. Here, interestingly, the word used for seal is "uwalo", as given by Henry P. Judd, Mary Kawena Pukui and John F. G. Stokes in their 1945 English-Hawaiian vocabulary. The article reads:

> Ma kela huakai makaikai, ua hoea aku la oia no ke Cliff House, kekahi o na wahi makaikai nui ia e na malihini, nani no kela wahi i ka nana aku; o ka mea ano nui ma keia wahi, o ia no ka makaikai ana i Ka pii mai o na uwalo mailoko mai o ke kai a noho iluna o kekahi pohaku nui.

The place name ʻĪliopiʻi appears occasionally in the Hawaiian language newspaper, but in each case it refers to the cape on Kalaupapa, Molokaʻi, and there is no reference to Hawaiian monk seals.

Although less than 10% of Hawaiian language newspaper articles have been transcribed and made searchable, it is still possible to draw some tentative conclusions based on the use of the various terms for seal in the articles to which we have access. The earliest known reference to seals appears in an article from 1841, four years prior to Emerson and Bishop's vocabulary. The author of this article refers to seals by the Hawaiian version of their English name, "sila". This might suggest that there was no generally agreed upon Hawaiian name for seal at that time.

Later articles give various names for seal; "iliokai" and "ilio o kai" (1859), "sila" (1865), "ilioholoikauaua" (1865, 1867, 1876, 1894), "uwalo" (1924). Most of these terms (or combinations of words similar to them) appear in the various Hawaiian dictionaries. It is interesting to note that the term *ʻīlioholoikauaua*, which is generally accepted today as the name for the Hawaiian monk seal, does not appear in use until the mid 1860s. None of the Hawaiian language articles identified mention the Hawaiian monk seal, and most make reference to either the Arctic or Antarctic seals.

5.3 Western Visitors

Beginning with the journals of Captain James Cook, the accounts of the early Western voyagers who visited Hawaiʻi provide us with detailed descriptions of the natural and cultural landscape of the islands. Nowhere in of these accounts is there any mention of Hawaiian monk seals being either directly observed or reported in the MHI.

It was not until Western voyagers reached the NWHI that the first references to seals began to appear in their writings. In 1805 the Russian explorer Urey Lisiansky observed seals on a beach of the island that now bears his name, Lisianski Island near French Frigate Shoals (Lisiansky 1814). This appears to be the first record of the existence of the Hawaiian monk seal. Lisianski notes that four seals were killed and others were observed (Ragen 1999:186). In 1825 Benjamin Morrell, captain of the whaling ship *Tartar*, who provided the first detailed observations of most of the NWHI, reported what he thought were elephant seals on some of the islands (Morrell 1832:215-219; Ragen 1999:186). These were most likely monk seals. In 1827-28, the ship *Moller* documented seals on the newly discovered island of Laysan (Ragen 1999:186). The crews of ships wrecked in the NWHI, such as the *Parker* wrecked on Kure Atoll in 1842, the *Holder Borden* wrecked on Lisianski Island in 1844, and the *Signaw* wrecked on Kure Atoll in 1870, report taking seals for food, as did ships searching for guano deposits (the *Manuokawai* in 1857) or simply exploring the islands (the *Rodolph* in 1850) (Ragen 1999:186). The ship *General Siegel*, which was shark fishing in the NWHI in 1886 reports catching monk seals to use as bait (Ragen 1999:186).

5.4 Native Contact Between the MHI and the NWHI
While evidence appears to indicate that most of the native population of the MHI were not familiar with the Hawaiian monk seal prior to Western contact, the possibility exists that fishermen from some communities on Kaua‘i and Ni‘ihau may have encountered monk seals during fishing expeditions to the NWHI. That the knowledge of the existence of the NWHI was not widespread is evidenced by the reaction the small number of Hawaiians from the island of Kaua‘i who accompanied the Western exploring expedition that first "discovered" the islands. In 1788, Captain Colnett of the *Prince of Wales* became the first Westerner to chance upon the island of Nihoa, the closest of the NWHI to the main islands of the chain. Colnett had with him on board the *Prince of Wales*, "some natives of Attowai [Kaua‘i] who expressed great surprise that there should be land so near to these islands…of which not only themselves, but all their countrymen were totally ignorant" (Vancouver 1798:81-82).

According to the Robinson family who own the island of Ni‘ihau, the residents of that island had the capability to travel to Ka‘ula and Nihoa Islands by canoe, and some people from Ni‘ihau would spend three months in the summer on Nihoa Island until the late 1800s (Iversen et al. 1990:23). However, analyses of 113 whalers' logs visiting the NWHI from 1791 to 1878 contain no reference to Native Hawaiian fishermen (Iversen et al. 1990:22).

In 1857, King Kamehameha IV sailed to the leeward island of Nihoa aboard the Schooner *Manuokawai*. The ship's log records that, "At 10 a.m. went ashore (got upset in the landing). The King and Governor [Kekūanaō‘a] landed at the same time in a canoe…About a dozen seal were found on the beach and the King shot several of them" (Emory 1928:9). The Captain of the vessel, Captain Paty, gave the following account of their visit to Nihoa on April 27, 1857, ". . . on the sand beach ten or twelve hair seals were found; they didn't take much notice of us until His Majesty [King Kamehameha IV] had shot several, when they became more scared" (Kenyon and Rice 1959:216). On the king's return to Honolulu, he instructed Captain John Paty to survey the remainder of the NWHI and claim them for the government of the Kingdom of Hawai‘i. During that voyage, Paty noted that the beaches of the islands abounded with seals. On Nihoa he found a dozen seals hauled out on the single beach (Paty 1857:42-43).

5.5 Historic Hunting of Monk Seals in the NWHI
The earliest commercial hunting of seals in the NWHI appears to have occurred soon after they were first described by Lisiansky. In 1824, the brig *Aiona* returned to Honolulu following a sealing expedition to the NWHI (Bailey 1952:4). The taking of seals for their fur and oil had been begun as early as the mid-1700s along the Pacific Coast of the Americas. Various seals in North Pacific waters, including the Guadalupe fur seals, northern fur seals, California sea lions, and Stellar sea lions were slaughtered by the thousands for their fur, blubber and other body parts, while northern elephant seals were targeted for their thick blubber which was boiled down for oil (Ellis 2003:161-178). Like whale oil, the oil obtained from the blubber of seals was used for lamp fuel, lubricants, cooking oil, soap and innumerable other products.

In 1859, the bark 249 tons *Gambia* went sealing in the NWHI. She left Honolulu on April 26, and cruised among the Leeward Islands, returning on August 7. The *Gambia* is reported to have obtained 240 barrels of seal oil, 1,500 skins, a quantity of shark fins and oil (Anonymous 1859; Cobb 1902:496-497, Ragen 1999:186). How accurate these numbers are, and whether all of this cargo was obtained in the NWHI is still in question.

Within a relatively short span of years, the population of Hawaiian monk seals in the NWHI had been reduced so drastically that the seal grounds were deserted as the population was not large enough to make hunting the seals commercially viable. Guano diggers, bird hunters, and

whalers further depleted the remnant seal population during the late 1800s and early 1900s (Kenyon and Rice 1959:215).

Historic Reports of Monk Seals in the MHI

It has been possible to find only one clearly documented early historic case of a Hawaiian monk seal being reported from the MHI. In 1900 a monk seal was seen at Hilo Bay on the island of Hawaiʻi. "A sick or helpless seal was caught by the natives in Hilo Bay, Hawaii, towed ashore, killed and eaten. Unfortunately I was too late to secure any part of the animal for identification, but the natives assured me that solitary seals occurred on the coast about once in 10 years or so. They were very curious and asked many questions as to the habitat of the animal, its nature, food, and habits, about which they knew nothing" (H. W. Henshaw as quoted in Bailey 1952:5). The results of this encounter between native Hawaiians and the indigenous Hawaiian monk seal readily suggest why, at the time of Western contact, there was no resident population of monk seals in the MHI.

6.0 Contemporary Perspectives on the Hawaiian Monk Seal

6.1 Contemporary Names

In his book *The Hawaiian Monk Seal*, Patrick Ching notes that, "on the island of Niʻihau, a privately owned island where Hawaiian is the primary language, there are at least two names for the seal. According to Keith Robinson, whose family owns the island, "one is *sila*, derived from the word seal, and the other is *ʻīlio-holo-kai*, meaning 'the dog that runs in the sea'" (Ching 1994:7). While the term *sila* corresponds with the earliest documented name for seals found in the Hawaiian language newspapers, the latter term is similar to both the early dictionary term for monk seal, *he ʻīlio o ke kai*, and the later *ʻīlio-holo-i-kauaua* (see Section 4.1).

In their 2011 report on the *Historic and Contemporary Significance of the Endangered Hawaiian Monk Seal in Native Hawaiian Culture*, prepared for NOAA, John Kittinger, Trisann Māhealani Bambico, Trisha Kehaulani Watson and Edward W. Glazier mention that, "Moʻolelo (oral stories) with community elders (*kūpuna*) and native language speakers have confirmed" the use of the term *hulu* for the monk seal. Their informants also indicated "the use of the term *nā mea hulu* (the furry ones) for the monk seal species." They indicated that, "Some respondents knew of other names for the monk seal, but declined to provide the names because of worries about how the names would be used" (Kittinger et a. 2011:11).

6.2 Monk Seals as Family *ʻAumākua*

In their report of interviews conducted in 2011 under a grant from NOAA, Kittinger, Bambico, Watson and Glazier noted that; "Some interviewees described families on Hawaiʻi and Oʻahu islands that consider the species to be *ʻaumākua*, the "family or personal gods, deified ancestors who might assume the shape of…[various animals]" (Pukui and Elbert, 1986 [1971]). *ʻAumākua* are traditionally protected by their associated families and various cultural protocols are followed to steward the relationships between the family and their spiritual guardian. Notably, the monk seal is not named as a common *ʻaumākua* (Pukui and Elbert, 1986 [1971]), but this does not necessarily mean that the families have recently adopted this cultural association. *ʻAumakua* can be associated with families for many generations, reaching far back into history, or can be recent additions based on events that carry special cultural meaning and significance.

Additionally, some communities have conducted spiritual ceremonies for monk seals during which the monk seal is recognized as part of the *ʻohana*, or family. Respondents have said that the details of such activities are deliberately kept *hūnā*, or secret" (Kittinger et al. 2011:16-17).

In further clarifying this, the authors indicate that it was difficult to obtain specific information on this aspect of human-monk seal relationships as one knowledgeable individual passed away before they could be interviewed while another refused to be interviewed.

6.3 Mythological Associations

Kittinger and his co-authors also reported that, "Some respondents shared *moʻolelo* (oral traditions/stories) about monk seals that indicated a mythological association with the species. In one account from the island of Molokaʻi, a *kupuna* (community elder) told of a monk seal who appeared in the area in 1947 and washed up without a head. The *kupuna* indicated it was the work of Kauhuhu, the famed shark god of the area who patrolled the waters from Moananui to Pelekunu. Another *moʻolelo* from Hawaiʻi Island tells of a pair of lovers who suffered the wrath of the jealous shark god Kua [discussed in Section 4.3]. After his affections were spurned, he curses the woman, turning her into a monk seal and her male companion into a dragonfly so the two could not be together. The pair was later reunited in their human forms by the god Kū. These *moʻolelo* indicate a historical cultural association with the monk seal, but appear to be limited to a few places where familial traditions have preserved the stories" (Kittinger et al. 2011:17).

6.4 Stewardship

The authors of the 2011 study go on to note that, "For some *kūpuna*, the specific origins of the animal [the Hawaiian monk seal] and its significance in Hawaiian culture are irrelevant, as the traditional Hawaiian sense of stewardship extends to all species and the environment. One respondent, for example, expressed, "whether they are *hānai* [adopted] or *hānau* [born of, as in a son or daughter], monk seals are part of the ocean and we, humans, have an obligation to protect them." This perspective has also been shared by other community elders interviewed about the monk seal" (Kittinger et al. 2011:17).

6.5 The Monk Seal as Invasive Species

In contrast to the apparently symbiotic relationship between Hawaiians and monk seals suggested by some informants during the 2011 study, other individuals interviewed expressed a strongly negative reaction to monk seal presence. "Among these respondents, the seal is viewed as endemic to the NWHI but not to the MHI. Some respondents view the seal as an invasive species in the MHI and believe the seal should remain in the NWHI only. Respondents commonly cite the lack of Hawaiian cultural references to the seal in traditional chants, *hula* [dance] and other knowledge forms. Other respondents pointed to the lack of evidence that the monk seal was ever used for food, tools, weapons, fabrics, medicine, or combustible material. One respondent emphasized that, "everything in Hawaiʻi had a common use… since there was no [use], then it must not be native." Other respondents pointed to the lack of monk seal bones (*iwi*) found in archeological excavations or petroglyphs (*kiʻi pōhaku*) depicting monk seals. Respondents on Maui were not aware of any place names, sacred sites (*wahi pani*) or fishing shrines (*koʻa*) named after the monk seal. They also mentioned that their *kūpuna* (elders) never mentioned the monk seal, and that they did not know of any families that regarded the monk seal as their *ʻaumakua* (spiritual family guardian) (Kittinger et al. 2011:17).

7.0 IMPLICATIONS OF TRADITIONAL AND HISTORIC DATA

7.1 Multiple Names

The multiplicity of terms found in Hawaiian dictionaries, traditional *mo'olelo*, and Hawaiian language newspaper articles, would appear to suggest that there was not one generally accepted name for the Hawaiian monk seal. This, in turn, may indicate that monk seals were not widely or generally known to traditional populations.

The other marine and terrestrial mammals present within the archipelago prior to western contact are all generally identified by a single name. The domestic dog is known generally as *'īlio*, with variations on the name (*'īlio māku'e*, a native brown dog, *'īlio pe'elua*, a brindled dog, etc., Pukui and Elbert 1971:92-93) describing different types of dogs. The only traditional name for dog that does not include the word *'īlio*, *'apowai* also appears to relate to a specific type of dog ("a type of Hawaiian dog with solid grayish-brown body and nose tip and eyes of the same color, believed to love water and consequently offered as a sacrifice to *mo'o* water spirits", Pukui and Elbert 1971:27) and is not a general name. The same is true for the other mammals that accompanied the early Polynesian voyagers who initially settled the Hawaiian Islands such as the pig (*pua'a*; *pua'a hiwa* meaning a solid black pig, *pua'a 'ā'aua* meaning a young female pig, etc., Pukui and Elbert 1971:114), and the Polynesia rat (*'iole*; *'iole nui* meaning a large rat, Pukui and Elbert 1971:125). The native bat, which the Polynesians found here on their arrival, was known alternately as *'ōpe'ape'a*, *pe'a*, or *pe'ape'a* (Pukui and Elbert 1971:11, the word *pe'a* is also one of the names for a sail, Pukui and Elbert 1971:297).

Of the other marine mammals found in Hawaiian waters, the whale was known either as *koholā* or *palaoa* (Pukui and Elbert 1971:175). Forms of both of these terms are found throughout much of Polynesia and appear related to the proto-Polynesian word *tafura'a* (Richards 2008:1) and the early Polynesian word *paraoa* (Richards 2008:2). The dolphin is referred to as *nai'a* or *nu'ao* (Pukui and Elbert 1971:117).

The voyagers who first encountered these islands would not have been likely to possess a traditional name for seals, as there are no seal populations native to the islands of southern Polynesian (though fur seals are known to visit Tonga on rare occasions, Richards 2008:5). The only other Polynesian group to encounter local seal populations, the Māori who settled Aotearoa (New Zealand), had various names for seal depending upon the species they belonged to (fur seals, elephant seals, leopard seals) and the locality. Rhys Richards notes that, "Different groups of Māori used different names for the same marine mammal from district to district. Moreover, this transference phenomenon has several parallels among fish and birds. Many inshore fishermen know that Māori names for some fish species change bewilderingly from coast to coast, and from place to place" (Richards 2008:5). It appears that as Māori populations spread along the coasts of the large islands of Aotearoa dialectic differences developed and names changed. None of the known Māori names (fur seals: *pakakē*, *pakakā*, *kekeno*, *kakerangi*, *kakeraki*, *karewaka*, *oioi*, *tūpoupou*, *puhina*, *mimiha*, *popoikore*, elephant seals: *whakāhao*, *whakāhau*, *whakāhu*, *kautakoa*, *pākahokaho*, *poutoko*, *kake*, *kaki*, *ihupuku*, leopard seals: leopard seals: *rāpoka*, *popoiangore*, *poipoiangori*, *popoikore*, Richards 2008:5), bear any similarity to the documented Hawaiian language terms for seal. The likelihood is that these names developed indigenously as the Māori encountered the various pinniped species. The same might be suggested for Hawaiian names.

Several of the Hawaiian terms documented identify seals by their resemblance to a more familiar animal, the *'īlio* (the domestic dog), that had accompanied the early Polynesian voyagers who initially settled the Hawaiian Islands. It is interesting to note that several non-native mammals were given names based upon their rough similarity to the familiar dog. These include the skunk (*'īlio hohono*, literally "bad-smelling dog" Pukui and Elbert 1971:93), the beaver (*'īlio-hulu-pāpale*, literally "hat-fur dog" Pukui and Elbert 1971:93).

Though there is not enough existing evidence to conclusively determine whether monk seals were present within the MHI at the time of initial Polynesian settlement, the archaeological, linguistic and ethnographic evidence would seem to suggest that there was not a resident monk seal population extant within the MHI during the latter portion of the pre-Contact period. It is likely that contact between Native Hawaiians and monk seals during this period was limited to occasional encounters when far ranging individual would come down from the main population centers in the NWHI. Monk seals did not rise in the consciousness of Hawaiian culture until they were encountered in large numbers during the historic exploration of the NWHI.

8.0 CONCLUSIONS

Although monk seals appear to have been present within the Hawaiian archipelago as early as 3.5 million years ago, there is little direct evidence of human and monk seal interactions prior to Western contact, either in the archaeological record or the traditional literature.

Bones of Hawaiian monk seals are known to have been recovered from only four archaeological excavations conducted within the main Hawaiian Islands. Only two of these sites have been confirmed as dating from the period prior to Western contact. Although it has been suggested that this scarcity of seal remains from archaeological contexts may indicate that monk seals were not present within the MHI prior to the arrival of the first Polynesians (Zeigler 2002:244), it appears more likely that the Polynesian arrival itself resulted in a decrease in resident monk seal populations within the MHI (Ragen 1999:185).

Any tentative conclusions concerning monk seal presence in the MHI drawn from the archaeological evidence are complicated by several factors. Given its size and weight, if a monk seal was caught and butchered for food, it is most likely that the butchering would have taken place near to where the animal was killed, with the carcass being left on the beach and only the meat carried to the consumption site. Alternately, an *imu* (earth oven) could have been dug into the sand and the entire carcass cooked in situ. Either of these scenarios would have resulted in the bones of the animal not being transported to the occupation site and therefore not being incorporated into the archeological record.

Given the abundance of fragmentary and otherwise unidentified or unidentifiable medium mammal bones recovered from archaeological excavations conducted throughout the MHI, the possibility exists that seal bones recovered from some excavations have not been identified or categorized as such.

The scarcity of monk seal remains recovered from archaeological contexts may also simply reflect the relative abundance of monk seal populations. Given what we know of Hawaiian monk seal biology, seal populations present within the MHI at the time of first Polynesian contact would have consisted of only a few hundreds to no more than a few thousands of individuals. Their expected percentage represeantation within archaeological midden (food debris) assemblages would therefore be relatively small compared to the many thousands of individuals of other species of mammals, birds and fish that formed part of the early Hawaiian diet.

Identified archaeological sites dating from the early settlement period of Hawaiian prehistory, the time at which monk seals would be expected to be most numerous within the MHI, are relatively rare. The paucity of these sites would further decrease the sample size of potentially recovered monk seal remains.

While the archaeological evidence provides no definitive answer to the question of whether monk seals were present within the MHI at the time of Polynesian arrival, it does seem to indicate that they were not abundant within the MHI for much of period prior to Western contact. This conclusion is further supported by the ethnohistorical evidence.

The physical presence of monk seals within the MHI is not reflected in the material culture of Hawai‘i at the time of contact. Neither the bones nor the teeth of the Hawaiian monk seal appear to have been used in the creation of traditional tools or ornaments.

Unlike the mammals that arrived in Hawai‘i with the early Polynesian voyages, the dog (*‘īlio*), pig (*pua‘a*), and rat (*iole*), all of which were identified by a single Hawaiian name, seals were found to be referred to in *‘ōlelo* Hawai‘i (the Hawaiian language) by several different terms. Among there were *he ‘īlio o ke kai* (the dog of the sea, also *‘īlio o ke kai*), *‘īlio-holo-kai* (the dog that runs in the sea), *‘īlio-holo-i-kauaua* (dog running in the toughness), *uwa‘lo* (to cry out), *hulu* (fur; possibly a historic usage to refer to arctic fur seals), and *kila* or *sila* (an adaptation of the English word seal). With their furred bodies and bark-like calls, it is easy to see how seals were identified as the dogs of the sea. The range of different names used to refer to these animals, however, some of which were derived from the English term seal, might suggest that seals were not frequently encountered by the Hawaiians of the pre-Contact period.

References to seals in the traditional literature are relatively rare, and it is not until the historic period, when Hawaiian sailors began to take part in voyages to the arctic to capture fur seals for the China trade, and local vessels began actively hunting the newly discovered monk seal populations within the NWHI, that mentions of seals begin to appear with any regularity in Hawaiian language sources. Although the early accounts of Western visitors to the islands are replete with detailed descriptions of the various plants and animals they encountered, there appear to be no references to the presence of Hawaiian monk seals within the MHI. It is not until Western ships began visiting the NWHI that we be begin to encounter descriptions of the monk seal. All of these archaeological, ethnographic and archival sources would appear to suggest that throughout most of the pre-Contact and into the early historic period monk seals were not common visitors to the MHI.

Although it has been suggested (Zeigler 2002:244, Ragen 2003:1) that the original range of the indigenous Hawaiian monk seal may not have extended down into the MHI, this does not seem reasonable given the similarity in the marine environments of the NWHI and the MHI. Both areas would have offered a similar range of suitable habitats, an abundance of available food resources, and a relative scarcity of predators, at least until the arrival of humans.

A more likely scenario is that, soon after the arrival for the first Polynesian voyagers, the seal population of the MHI became extinct, in much the same manner as many species of indigenous Hawaiian land birds, through a combination of human predation and the impacts of the terrestrial mammals (rats, pigs, and dogs) that accompanied the voyagers from their homeland in southern Polynesia (Ragen 1999:185). Monk seals hauled out onto the beaches of these newly discovered islands would have offered an easily obtainable food source for the first settlers. It is also well documented that, as its name might imply, the monk seal does not adapt well to disturbance from dogs or humans (Ragen 1999). Those monk seals resident within the MHI that were not killed for food would most likely have translocated themselves to the NWHI where they were much less likely to be threatened or disturbed. The relatively small monk seal population that occupied the MHI could have been extirpated within a few generations. While stray individuals undoubtedly occasionally found their way down from the NWHI, it appears probable that there was not a significant resident monk seal population in the MHI throughout much of the pre-Contact period.

9.0 REFERENCES

Andrade, Carlos
2008 *Hāʻena: Through the Eyes of the Ancestors.* University of Hawaiʻi Press, Honolulu.

Andrews, Lorrin
1865 *A Dictionary of the Hawaiian Language: To Which is Appended an English-Hawaiian Vocabulary and a Chronological Table of Remarkable Events*. Henry M. Whitney, Honolulu.

Andrews, Lorrin
1922 *A Dictionary of the Hawaiian Language*. Revised by Henry H. Parker and prepared under the direction of the Board of Commissioners of Public Archives of the Territory of Hawaiʻi, Honolulu.

Anonymous
1859 Report of the voyage of the Hawaiian Bark Gambia. *The Polynesian*, August 13, 1859.

Bailey, Alfred M.
1952 *Museum Pictorial: The Hawaiian Monk Seal*. Denver Museum of Natural History, Denver.

Barrère, Dorothy B.
1969 *The Kumuhonua Legends: A Study of Late 19th Century Hawaiian Stories of Creation and Origins*. Dept. of Anthropology, Bernice P. Bishop Museum, Honolulu.

Beckwith, Martha Warren
1970 *Hawaiian Mythology*. University of Hawaiʻi Press, Honolulu.

1972 *The Kumulipo: A Hawaiian Creation Chant*. University of Hawaiʻi Press, Honolulu.

Bryan, W. A.
1915 *Natural History of Hawaiʻi*. The Hawaiian Gazette Company, Honolulu.

Buck, Peter H. (Te Rangi Hiroa)
1964 *Arts and Crafts of Hawaiʻi*. Bernice P. Bishop Museum Special Publication 45. Bishop Museum Press, Honolulu.

Ching, Patrick
1994 *The Hawaiian Monk Seal*. University of Hawaiʻi Press, Honolulu.

Cobb, J.N.
1905 *The commercial fisheries of the Hawaiian Islands in 1903. Appendix to the report of the commissioner of fisheries to the secretary of commerce and labor for the year ending June 30, 1904. Pages 433-512,* Department of Commerce and Labor, U. S. Bureau of Fisheries, Government Printing Office, Washington, D.C.

Colum Padraic
1937 *Legends of Hawaiʻi*. Yale University Press, New Haven.

Cox, Halley and Edward Stasack
1970 *Petroglyphs Hawai'i*. Bishop Museum Press, Honolulu.

Culliney, John L.
2006 *Islands in a Far Sea: The Fate of Nature in Hawai'i*. University of Hawai'i Press, Honolulu.

State of Hawai'i, Department of Land and Natural Resources (DLNR)
2009 Draft Report for the 'Īlio Point Natural Area Reserve. State of Hawai'i, Department of Land and Natural Resources (DLNR), Honolulu. Online at http://hawaii.gov/dlnr/dofaw/nars/reserves/molokai/ilio-point

Ellis, R.
2003 *The Empty Ocean*. Island Press/Shearwater Books, Washington, D.C.

Emerson, J. S. and A. Bishop
1845 *He Hoakaolelo No Na Huaolelo Beritania I Me Kokua I Na Kanaka Hawaii E Ao Ana Ia Olelo*. Mea Pai Palapala o ke Kulanui, Lāhaināluna Press.

Emerson, Nathaniel B.
1909 *Unwritten Literature of Hawaii: The Sacred Songs of the Hula*. Smithsonian Institute, Bureau of American Ethnology, Bulletin 38. Government Printing Office, Washington D.C.

Emory, Kenneth P.
1928 *Archaeology of Nihoa and Necker Islands*. Bernice Pauahi Bishop Museum Bulletin 53. Bishop Museum Press, Honolulu.

Emory, Kenneth P. and Yoshihiko Sinoto
1969 Age of the Sites in the South Point Area, Ka'ū, Hawai'i. *Pacific Anthropological Records 8*, Bishop Museum, Honolulu.

Evans, Mike
2008 Autochthony/Localization/Aboriginality and Island Peoples in the World System. Refereed Papers from the 3rd International Small Island Cultures Conference, Institute of Island Studies, University of PEI. Electronic document, http://sicri-network.org/ISIC3/i.%20ISIC3P%20Evans.pdf.

Fredericksen, Erik, Demaris Fredericksen, and Walter Fredericksen
1996 *Archaeological Data Recovery Report on Site 50-50-04-4127, Lower Main and Mill Streets, Wailuku Ahupua'a, Wailuku District, Maui Island, TMK 3-4-39: por. 81 & 82*. Prepared by Xamanek Researches for the County of Maui. Report on file in the State of Hawai'i Historic Preservation Division library Kapolei (SHPD Report No. M-00665).

Fyler, C. A., T. W. Reeder, A. Berta, G. Antonelis, A. Aguilar, and E. Androukaki
2005 Historical biogeography and phylogeny of monachine seals (Pinnipedia: Phocidae) based on mitochondrial and nuclear DNA data. *Journal of Biogeography* 32: 1267-1279.

Graves, Michael W., Julie M. Field, and Windy K. McElroy
2005 An Overview of Site 50-30-01-196, Nu‘Alolo Kai, Kaua‘i: Features, Excavations, Stratigraphy, and Chronology of Historic and Prehistoric Occupations. In *Nā Mea Kāhiko o Kaua‘i (Archaeological Studies in Kaua‘i)*, edited by Mike T. Carson and Michael W. Graves, pp. 149-187. Special Publication No. 2. Society for Hawaiian Archaeology, Honolulu.

Hawai‘i State Office of Environmental Quality Control
1997 Guidelines for Assessing Cultural Impacts. Electronic document, http://oeqc.doh.hawaii.gov/Shared%20Documents/Preparation_of_Hawaii_Environmental_Policy_Act_Documents/Guidance_on_Cultural_Impact/1997%20Cultural%20Impacts%20Guidance.pdf, accessed August 2012.

Hitchcock, H. R.
1968 *An English-Hawaiian Dictionary, With Various Useful Tables*. Charles E. Tuttle Co., Rutland, Vermont.

Iversen, R.T.B., T. Dye, and L. M. B. Paul
1990 Native Hawaiian Fishing Rights: a Report. Pacific Fisheries Consultants, Honolulu.

Johnson, Rubelite Kawena Kinney
2000 *The Kumulipo Mind: A Global Heritage In the Polynesian Creation Myth.* Rubelite Kawena Johnson, Honolulu.

Judd, Henry P.
1940 *The Hawaiian Language*. Honolulu Star Bulletin, Ltd., Honolulu.

Judd, Henry P., Mary Kawena Pukui, John F. G. Stokes
1945 *Introduction to the Hawaiian Language*. Tongg Publishing Company, Honolulu.

Kamakau, Samuel Mānaiakalani
1991 *Nā Mo‘olelo a ka Po‘e Kāhiko: Tales and Traditions of the People of Old*. Translated from the Newspapers *Ka Nupepa Kuokoa* and *Ke Au Okoa* by Mary Kawena Pukui, edited by Dorothy B. Barrère. Bishop Museum Press, Honolulu.

Kenyon, Karl W., and Rice, Dale W.
1959 Life history of the Hawaiian monk seal. In *Pacific Science*, Vol. 13, No. 3, pp. 215-252.

Kirch, Patrick V.
2011 When Did the Polynesians Settle Hawai‘i? A Review of 150 Years of Scholarly Inquiry and a Tentative Answer. In *Hawaiian Archaeology Journal*, Vol. 11.

Kittinger, John N., Trisann Māhealani Bambico, Trisha Kehaulani Watson, and Edward W. Glazier
2011 *Historic and Contemporary Significance of the Endangered Hawaiian Monk Seal in Native Hawaiian Culture*. Report prepared by Impact Assessment, Inc. for the National

Oceanographic and Atmospheric Administration and included as Appendix K of the Draft Programmatic Environmental Impact Statement for Hawaiian Monk Seal Recovery Actions.

2012 Sociocultural Significance of the Endangered Hawaiian Monk Seal and the Human Dimensions of Conservation Planning. In *Endangered Species Research*, Vol. 17: 139-156.

Kōmike Huaʻōlelo (Hawaiian Lexicon Committee)
2003 *Māmaka Kaiao: A Modern Hawaiian Vocabulary; A Compilation of Hawaiian Words That Have Been Created, Collected, and Approved by the Hawaiian Lexicon Committee from 1987 through 2000*. University of Hawaiʻi Press, Honolulu.

Lavigne, David M.
1998 Historical Biogeography and Phylogenetic Relationships Among Modern Monk Seals, *Monachus* spp. In *Monachus Science*. The Monachus Guardian, Vol.1(2). Electronic document, http://www.monachus-guardian.org/library/lavig98.pdf.

Lisiansky, Urey
1814 *A Voyage Round the World in the Years 1803–1806…in the Ship Neva*. John Booth, London.

Lowry, Lloyd F., David W. Laist, William G. Gilmartin, and George A. Antonelis
2011 Recovery of the Hawaiian Monk Seal (Monachus schauinslandi), A Review of Conservation Efforts, 1972 to 2010, and Thoughts for the Future. In *Aquatic Mammals* 37(3): 397-419.

Malo, David
1951 *Hawaiian Antiquities*. Translated by Nathaniel B. Emerson. Bishop Museum Special Publication 2. Bishop Museum Press, Honolulu.

Maly, Kepā and Onaona Maly
2003 Ka Hana Lawaiʻa a me Nā Koʻa o Nā Kai ʻEwalu, A History of Fishing Practices and Marine Fisheries of the Hawaiian Islands. Compiled from Native Hawaiian Traditions. Volume 1: Archival Research, compiled from Native Hawaiian traditions, historical accounts, government communications, *kamaʻāina* testimony and ethnography. Volume 2: Oral history interviews, compiled from oral history interviews with *kūpuna* and *kamaʻāina*. Prepared by Kumu Pono Associates for The Nature Conservancy.

McAllister, J. Gilbert
1933 *Archaeology of Oahu*. Bernice Pauahi Bishop Museum Bulletin 104. Bernice P. Bishop Museum, Honolulu.

Morrell, Benjamin
1832 *A Narrative of Four Voyages to the South Seas, North and South Pacific Ocean, Chinese Sea, Ethiopic and Southern Atlantic Ocean, Indian and Antarctic Ocean, From the Year 1822 to 1831*. J. and J. Harper, New York.

Ne, Harriet, G. Cronin, and T. Reffell

1992 *Tales of Moloka‘i: The Voice of Harriet Ne*. Published by Institute for Polynesian Studies, Lā‘ie, Hawai‘i.

Nogelmeier, M.P.
2006 *Ka Mo‘olelo O Hi‘iakaikapoliopele (The Epic Tale of Hi‘iakaikapoliopele*). Compiled and translated by M. Puakea Nogelmeier. Awaiaulu Press, Honolulu.

Papahānaumokuākea Marine National Monument (PMNM)
2011 Maritime Heritage Research, Education, and Management Plan: Papahānaumokuākea Marine National Monument. Prepared for the National Oceanographic and Atmospheric Administration, Honolulu.

Paty, J.
1857 Report of the Exploring Voyage of the Schooner *Manuokawai*. In *The Friend* 6(6).

Pearson, R. J., Patrick V. Kirch, and M. Pietrusewsky
1971 An Early Prehistoric Site at Bellows Beach, Waimānalo, O‘ahu, Hawaiian Islands. *Archaeology and Physical Anthropology in Oceania* 6(3), 204-234.

Pukui, Mary Kawena, Samuel Elbert
1971 *Hawaiian Dictionary*. University of Hawai‘i Press, Honolulu.

Ragen, Timothy J.
1999 Human Activities Affecting the PopulationTrends of the Hawaiian Monk Seal. In *Life In The Slow Line – Ecology and Conservation of Long Lived Marine Animals*, edited by J. A. Music, pp. 183-194. American Fisheries Society Symposium 23. American Fisheries Society, Bethesda, Maryland.

2003 The Role of the Main Hawaiian Islands in the Recovery of the Hawaiian Monk Seal. In *Workshop on the Management of Hawaiian Monk Seals on Beaches in the Main Hawaiian Islands*, 2002, cosponsored by the Marine Mammal Commission and National Marine Fisheries Service Hawai‘i Division of Aquatic Resources.

Reeve, Rowland B.
1991 Hawaiian Shark Traditions. In *Sharks Hawai‘i*. Bishop Museum Press, Honolulu.

Richards, Rhys
2008 Māori names for marine mammals: ngā ingoa o ‘ngā tamariki o Tinirau’. In *Tuhinga* 19:1–6. Museum of New Zealand, Te Papa Tongarewa.

Rosendahl, Paul H.
1972 Aboriginal Agriculture and Residence Patterns in Upland Lapakahi, Island of Hawai‘i. Unpublished Ph.D. dissertation, Department of Anthropology, University of Hawai‘i, Honolulu.

Smith, Ian W. G.

1985 Sea Mammal Hunting and Prehistoric Subsistence in New Zealand. Unpublished Ph.D. thesis, Department of Anthropology, University of Otago, New Zealand.

1989 Maori impact on the marine megafauna: Pre-European distributions of New Zealand sea mammals. In *Saying So Doesn't Make It So: Papers in Honour of B. Foss Leach* D. G. Sutton (ed.), Monograph 17, pp. 76-108. New Zealand Archaeological Association, Dunedin.

Sterling, Elspeth and Catherine Summers
1978 *Sites of Oahu*. Department of Anthropology, Department of Education, Bernice P. Bishop Museum, Honolulu.

Thrum, Thomas G.
1923 More Hawaiian Folktales: A Collection of Native Legends and Traditions. A. C. McClurg & Co., Chicago.

Tomich, P. Quentin
1986 *Mammals in Hawai'i: A Synopsis and Notational Bibliography*. Bernice Pauahi Bishop Museum Special Publication 76. Bishop Museum Press, Honolulu.

U.S. Fish and Wildlife Service (USFWS)
2008 Papahānaumokuākea Marine National Monument. Monument Management Plan. U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration (NOAA), State of Hawai'i, Department of Land and Natural Resources, Honolulu.

Vancouver, George
1798 *A Voyage of Discovery to the North Pacific Ocean and Round the World, 1790-1795, in the "Discovery" and "Chatham."* Volume 3. John Stockdale, London.

Watson, Trisha Kehaulani
2010 Ho'ailona and the Coming of the Seals, Ho'oulu Lahui Aloha 159 (Video). Office of Hawaiian Affairs, Honolulu. Electronic document, http://www.oha.org/hla/HLA159/.

Watson, Trisha Kehaulani, John N. Kittinger, J. S. Walters, and T. D. Schofield
2011 Culture, Conservation, and Conflict: Assessing the Human Dimensions of Hawaiian Monk Seal Recovery. In *Aquatic Mammals* 27(3), pp. 386-396.

Zeigler, Alan C.
2002 *Hawaiian Natural History, Ecology, and Evolution*. University of Hawa'i Press, Honolulu.

Appendix L
Part 1: PMNM 2011-001 Permit and Other Papahānaumokuākea Best Management Practices

This page intentionally left blank.

PAPAHĀNAUMOKUĀKEA
Marine National Monument

DEC 2 3 2010

Mr. Tom Edgerton
Superintendent, Papahānaumokuākea Marine National Monument
Department of Interior
U.S. Fish and Wildlife Service

Administrator (TBD)
Division of Aquatic Resources
Department of Land and Natural Resources
State of Hawaii

Mr. Paul Conry
Administrator, Division of Forestry and Wildlife
Department of Land and Natural Resources
State of Hawaii

Ms. T. 'Aulani Wilhelm
Superintendent, Papahānaumokuākea Marine National Monument
Department of Commerce
National Oceanic and Atmospheric Administration

ADDRESS:
Papahānaumokuākea Marine National Monument Office
6600 Kalaniana'ole Hwy, Suite 300
Honolulu, HI 96825

Dear Co-Trustee Representatives:

The National Oceanic and Atmospheric Administration (NOAA), the U.S. Fish and Wildlife Service (FWS), and the State of Hawaii (collectively, the Co-Trustees) have approved the issuance of permit number PMNM-2011-001 to conduct activities within Papahānaumokuākea Marine National Monument ("Monument") for conservation and management purposes. Activities are to be conducted in accordance with the permit application and all supporting materials submitted to the Monument, and the terms and conditions of permit number PMNM-2011-001 attached.

Your permit contains specific special conditions and reporting requirements. Please review them closely and fully comply with them while undertaking permitted activities.

If you have any questions about this permit please contact Ray Born at (808) 792-9488, Justin Rivera at (808) 397-2632, Lasha-Lynn Salbosa at (808) 397-2633 or Danielle Carter at (808) 397-2647. Thank you for your continued cooperation with NOAA, FWS, and the State of Hawaii.

William J. Aila Jr.
Interim Chairperson
Board of Land and Natural Resources
Department of Land and Natural Resources
State of Hawaii

Date

Thomas R. Edgerton 12/23/10

Tom Edgerton Date
Superintendent, Papahānaumokuākea Marine National Monument
Department of Interior
U.S. Fish and Wildlife Service

Affwartant for 12-22-10

T. 'Aulani Wilhelm Date
Superintendent, Papahānaumokuākea Marine National Monument
Department of Commerce
National Oceanic and Atmospheric Administration

PAPAHĀNAUMOKUĀKEA
Marine National Monument

DEC 2 3 2010

CONSERVATION AND MANAGEMENT PERMIT

Papahānaumokuākea Marine National Monument Co-Trustee Representatives:

Mr. Tom Edgerton
Superintendent, Papahānaumokuākea Marine National Monument
Department of Interior
U.S. Fish and Wildlife Service

Administrator (TBD)
Division of Aquatic Resources
Department of Land and Natural Resources
State of Hawaii

Mr. Paul Conry
Administrator, Division of Forestry and Wildlife
Department of Land and Natural Resources
State of Hawaii

Ms. T. 'Aulani Wilhelm
Superintendent, Papahānaumokuākea Marine National Monument
Department of Commerce
National Oceanic and Atmospheric Administration

ADDRESS:
Papahānaumokuākea Marine National Monument Office
6600 Kalaniana'ole Hwy, Suite 300
Honolulu, HI 96825

Permit Number:
PMNM-2011-001

Effective Date:
January 1, 2011

Expiration Date:
December 31, 2011

Project Title: Co-Trustee conservation and management activities in Papahānaumokuākea Marine National Monument

This permit is issued for activities in accordance with Proclamation 8031 ("Proclamation") establishing Papahānaumokuākea Marine National Monument ("Monument") under the Antiquities Act of 1906, 16 USC §§ 431-433 ("Antiquities Act") and implementing regulations (50 CFR Part 404). All activities must be conducted in accordance with the Proclamation and the regulations (attached). No activity prohibited by the Proclamation or 50 CFR Part 404 is allowed except as specified below. Chapter 13-60.5, Hawaii Administrative Rules remains in effect for activities in State waters.

Subject to the terms and conditions of this permit, the National Oceanic and Atmospheric Administration (NOAA), the U.S. Fish and Wildlife Service (FWS), and the State of Hawaii (collectively, the Co-Trustees) hereby authorize the permittee listed above to conduct conservation and management activities within the Monument. All activities are to be conducted in accordance with this permit. The permit application is incorporated into this permit and made a part hereof; provided, however, that if there are any conflicts between the permit application and the terms and conditions of this permit, the terms and conditions of this permit shall be controlling.

PERMITTED ACTIVITY DESCRIPTION:

The following activities are authorized by this permit:

1. ENTRANCE
   Permittees, their designated agency staff and contractors necessary for the permitted activities, as well as residents of Midway Atoll, may enter the Monument. See Permitted Personnel List (attached).

   All personnel must be identified and information provided to the Monument permit coordinators prior to entry to the Monument. The permittees shall ensure that any person assigned to any conservation and management activities allowed under this permit is qualified to perform the assigned role and is limited to the scope of their position and respective project, and all other applicable policies, protocols, permits, and regulations.

   All activities must be consistent with existing State and federal laws. As such, management agencies will confirm compatibility and consistency prior to the conduct of individual activities under this permit.

   The MMB may monitor activities under the permit. Any member of the MMB may, for a period not to exceed 48 hours, verbally require temporary modification or cessation of activities identified in the permit if, in the opinion of the MMB member, such action is necessary to limit effects on Monument resources beyond the intended scope of the permit, to protect governmental equipment, or to ensure the safety of personnel. Such action will be followed as soon as possible by MMB emergency consideration of the temporary permit modification or temporary permit cessation. If the MMB concurs with

the temporary action taken by the MMB member, the Co-Trustees may amend the permit with the necessary changes or withdraw it. A decision by the Co-Trustees to amend the permit or to allow the activity to continue unchanged will include the necessary findings that the activity and its effects satisfy Monument permit issuance criteria and do not risk the safety of governmental employees or damage to governmental equipment.

2. OPERATIONS
    a. Field station operations for resource conservation supported by on-site management.
    b. Facility maintenance activities for assets and facilities of the National Wildlife Refuge System and Kure Atoll and its agents necessary for meeting mission and purposes of the refuges, sanctuary, and Monument. Examples of activities to be undertaken include, but are not limited to:
        i. Maintenance and repair/replacement (e.g. carpentry, electrical, plumbing, welding, general construction) of facilities and their components;
        ii. Building and other facilities deconstruction and reconstruction;
        iii. Airport maintenance, including improvements such as runway lighting replacement and taxiway maintenance (including repaving and painting/marking);
        iv. Painting, including all preparation work such as scraping, washing, etc.; and
        v. Lead-based paint soil remediation, including removal of sand/soil from around many or all affected buildings and proper on-site containment of this material.
    c. Field camp supply and support activities, including but not limited to delivery and removal of supplies, people, waste, and/or assets necessary for operations.
    d. Operations and on-site review of activities, including but not limited to:
        i. Operations and on-site reviews by management and congressional personnel;
        ii. Agency site visits and meetings for management planning and programmatic assessments; and
        iii. On-site management and safety reviews to gauge implementation and effectiveness of Monument management programs.
    e. Operation, maintenance, and use of airfields and runways at Midway Atoll and Tern Island.
    f. Operation of vessels to provide access for conservation and management activities.
    g. Anchoring of authorized vessels on non-coral substrate only. Anchors must be lowered into place.
    h. Sustenance Fishing, as defined by 50 CFR Part 404.11 section (h); allowed only within Midway Atoll Special Management Area for on-island U.S. Fish and Wildlife Service (FWS) personnel and contractors.
    i. Activities involving personnel safety, fitness and health maintenance including, but not limited to:
        i. Jogging at Tern Island, French Frigate Shoals, and Midway Atoll; and

ii. Health and safety operations for personnel, volunteers, contractors, and visitors in the Monument including site safety reviews, adverse weather and emergency response procedures, safety protocols, and continuity of operations plans.

3. RESOURCE SURVEY AND MONITORING

Survey and monitoring of target species and habitats to evaluate status and trends for management purposes. The following activities in direct support of management, monitoring, and characterization may be conducted:

a. Placement, installation, and maintenance of scientific equipment, devices, markers, oceanographic instrument arrays, and remote viewing camera systems;
b. Non-lethal marking and tagging for monitoring purposes;
c. Visual, non invasive marking and tagging for monitoring purposes;
d. Collection of biological, chemical, climatological, or geological samples for: analysis in support of activities under approved management plans; restoration or recovery plans; base line inventory and monitoring of population trends; and habitat conservation and management;
e. Collection of biological voucher specimens that cannot be visually identified on the spot and/or may represent new geographic records or new species;
f. Physical surveys and collections for landfills, storage tanks, contamination, or other potentially hazardous artifacts associated with current and former occupation and use of the Northwestern Hawaiian Islands (NWHI); and
g. Habitat mapping activities for the production of accurate, high-resolution base maps where data collection methods may include optic, acoustic, and metal detector technologies, as well as land and dive operations for ground truthing.

4. NATURAL RESOURCE PROTECTION, RESTORATION AND REMEDIATION

Conduct management actions to promote conservation of Monument resources. This includes activities necessary to understand and carry out protection, restoration, and remediation of species and habitats, such as carrying out existing species recovery and restoration plans or accessing the Monument to conduct federally authorized activities under the Endangered Species Act (ESA).

Examples include, but are not limited to, Hawaiian Monk Seal Recovery Plan, the Laysan Island Ecosystem Restoration Plan (1998), the short-tailed albatross attraction project on Midway, the Laysan duck reintroduction project on Midway, the Nihoa Millerbird recovery project, *Verbesina* control, cattle egret control, rat control, and other non-native species control projects. Restoration, when and where appropriate, will be undertaken using the best available information about pre-disturbance conditions to establish goals. Activities may include:

a. Monk seal disentanglement and health response (including treatment and necropsy), translocation from areas of high risk to safer areas, reuniting nursing mothers and pups, and removal of aggressive males;
b. Population augmentation or reestablishment activities such as capture, translocation, reintroduction, and outplanting;

c. Invasive species controls by mechanical, chemical, and manual methods as needed; and
d. Investigation and monitoring of contamination in abiotic or biotic resources.

Removal of marine debris, trash, and other materials (land and ocean-based) that pose threats to Monument resources, including but not limited to derelict fishing gear. This may include:

a. Disentanglement of threatened and endangered species by authorized personnel, debris tracking via drifter buoys and Unmanned Aerial Vehicles, and monitoring of sites that have been cleared of debris for site recovery rates and effects of removal;
b. Location and removal of debris and hazardous materials. This may be through interagency agreements, such as the Department of Defense (DOD) Innovative Readiness Training (IRT), Formerly Used Defense Sites (FUDS), or the Base Realignment and Closure (BRAC) Programs. Efforts may include activities such as seafloor and island mapping, reconnaissance and removal of materials, and derelict vessel salvage and removal; and
c. Removal of sessile encrusting flora and fauna associated with marine debris.

Provide Emergency Response, Injury Assessment, Mitigation, Restoration, and Monitoring and Post-Response Management:

a. Activities as necessary for emergency response, injury assessment, mitigation, restoration, monitoring, and post-response management in coordination with appropriate federal and / or state resource agencies and as appropriate consistent with NOAA, USFWS, and State of Hawaii Damage Assessment and Restoration regulations, policies, and procedures (e.g., oil spills, ship groundings, damage assessments, monitoring alien species, monitoring coral bleaching events, collection of bleached coral or alien species); and
b. Activities in response to an unusual mortality event (including but not limited to threatened and endangered species, marine mammals, migratory birds), mass stranding, or other urgent species response.

5. CULTURAL AND HISTORICAL RESOURCE IDENTIFICATION AND PROTECTION

To identify, document, interpret, preserve, and protect the Monument's cultural and historic resources, the following activities may be conducted:

a. Collection of post-contact artifacts as needed subject to National Historic Preservation Act (NHPA) consultation when applicable;
b. Monitoring and surveying of historic sites;
c. Conservation of artifacts subject to NHPA consultation and appropriate approvals from other Federal agencies (e.g., U.S. Navy) when applicable;
d. Non-commercial filming and photographic activities for the purposes of further documenting and capturing the history of the NWHI;
e. Location of historic artifacts using passive side scan sonar, metal-detector, or (land-based) ground penetrating radar;

f. Returning seized Monument resources to their natural environment in coordination with appropriate federal and/or state resource agencies, including the Office of Hawaiian Affairs, as appropriate;
g. Maintenance, preservation, and perpetuation of Native Hawaiian cultural sites and practices per the National Historic Preservation Act, Native American Graves Protection and Repatriation Act, Archeological Resources Act, American Indian Religious Freedom Act and applicable sections of the Hawai'i State Constitution, Hawaii Revised Statutes and Hawaii Administrative Rules; and
h. Maintenance and preservation of historic sites on Midway Atoll.

6. OUTREACH AND EDUCATION

To cultivate an informed, involved constituency that supports and enhances conservation of the natural, cultural, and historic resources of the Monument, and to contribute to the Nation's science and cultural literacy, the following activities may be conducted:

a. Collection of information and experiences from the Monument to develop agency web pages, Navigating Change projects, Monument projects, etc;
b. Collection of debris and biological samples and specimens such as albatross boluses for education projects;
c. Conduct news media and VIP site visits to enhance public knowledge and understanding of Monument resources; and
d. Present environmental programs at Midway Atoll.

No further disturbance of the cultural or natural resources of the Monument is allowed.

PERMITTED ACTIVITY LOCATIONS:

Other than entrance into the Monument, the permitted activities listed above are allowed at the following locations:

The permittees may conduct conservation and management activities throughout Papahānaumokuākea Marine National Monument.

GENERAL TERMS AND CONDITIONS:

In accordance with the Proclamation and applicable regulations, the permitted activities listed above are subject to the following general terms and conditions:

1. The permittee must sign and date this permit on the appropriate line below. Once signed and dated, the permittee must provide a signed original copy to the Monument official identified below. The permit becomes valid on the date the last signature is obtained and shall remain valid until the expiration date on the permit.

   Permit Coordinator
   Papahānaumokuākea
   Marine National Monument
   6600 Kalaniana'ole Hwy. Suite 300
   Honolulu, HI 96825

2. This permit is neither transferable nor assignable and must be carried by the permittee while engaging in any activity authorized by this permit. All other persons entering the Monument under the authority of this permit must provide the name of the permittee or the permit number to any authorized enforcement or management personnel upon request.

3. This permit may only be modified by written amendment approved by the Co-Trustees. Modifications to this permit must be requested in the same manner as the original request was made. Any modifications requested by the permittee, such as adding or changing personnel to be covered by the permit or to change the activities that are allowed, must be made in writing.

4. This permit is subject to suspension, modification, non-renewal, or revocation for violation of the Proclamation, implementing regulations, or any term or condition of the permit. Any verbal notification of a violation from an authorized Monument representative may require immediate cessation of activities within the Monument. The issuance of a permit shall not constitute a vested or property right to receive additional or future permits. This permit may, in the sole discretion of the Co-Trustees, be renewed or reissued. However, there is no right to a renewal or re-issuance. Failure to fulfill permit requirements may affect consideration of future permit applications.

5. Permit terms and conditions shall be treated as severable from all other terms and conditions contained in this or any other ancillary permit. In the event that any provision of this permit is found or declared to be invalid or unenforceable, such invalidity or unenforceability shall not affect the validity or enforceability of the remaining terms or conditions of this permit.

6. This permit does not relieve the permittee of responsibility to comply with all federal, state and local laws and regulations. Activities under this permit may be conducted only

after any other permits or authorizations necessary to conduct the activities have been obtained.

7. The permittee may be held liable for the actions of all persons entering the Monument under the authority of this permit.

8. All persons entering the Monument under the authority of this permit are considered under the supervision of the permittee and may be liable in addition to the permittee for any violation of this permit, the Proclamation and implementing regulations in conjunction with this permit. The permittee must ensure that all such persons have been fully informed of the permit terms and conditions prior to entry into the Monument. Each such person must provide written acknowledgment to the permittee, prior to entry into the Monument, that he/she has received a copy of the permit, agrees to abide by all applicable terms and conditions, and may be liable for violations of the permit. The permittee shall maintain all signed acknowledgments and submit them with the summary report described in General Condition #22.b. An acknowledgement form is attached.

9. Notification of entry into the Monument must be provided at least 72 hours, but no longer than one month, prior to the entry date. Any updates to the list of personnel must also be provided at least 72 hours before entering the Monument. Notification of departure from the Monument must be provided within 12 hours of leaving the Monument. Notification may be made via e-mail or telephone by contacting: E-mail: nwhi.notifications@noaa.gov; Telephone: 1-866-478-6944; or 1-808-395-6944. No other methods of notification will be considered valid.

10. The permittee and any person entering the Monument under the authority of this permit shall, before entering the Monument, attend a cultural briefing or view designated cultural informational materials on Papahānaumokuākea regarding the region's cultural significance and Native Hawaiians' spiritual and genealogical connection to the natural and cultural resources. Persons entering the Monument at Midway Atoll may satisfy this requirement upon arrival.

11. All vessels (including tenders and dive boats), engines and anchor lines shall be free of introduced species prior to entry into the Monument. To ensure this, all vessels, engines and anchor lines shall be inspected for potential introduced species prior to departing the last port before entering the Monument. No later than 24 hours prior to entry, the permittee shall provide the Monument Permit Coordinator with a report prepared by the individual conducting the inspection that: a) sets forth when and where the inspection occurred; b) identifies any introduced species observed, including where found; c) summarizes efforts to remove any species observed; and d) certifies the vessel as free of all introduced species. The Monument Permit Coordinator shall review the report and, based on the review, may delay the entry into the Monument until all concerns identified by the Monument Permit Coordinator have been addressed.

12. All hazardous materials, biohazards and sharps, must be pre-approved by the Co-Trustees. For purposes of this permit, "hazardous material" has the same meaning as the

definition found at 49 CFR §105.5 (U.S. Department of Transportation). All hazardous materials, biohazards and sharps must be stored, used, and disposed of according to applicable laws and Monument-approved protocols. The permittee or a designated individual entering the Monument under the authority of this permit must be properly trained in the use and disposal of all such materials proposed. Proof of appropriate training may be required by the Co-Trustees. No such material may be left in the Monument after the departure of the permittee unless it has been previously approved by Monument staff. Immediately after the project is complete the permittee must remove all such materials from the Monument. The permittee will be responsible for all costs associated with use, storage, transport, training, disposal, or HazMat response for these materials.

13. All equipment or supplies brought into the Monument, or structures of any kind built in the Monument by the permittee are the responsibility of the permittee. All materials that are brought to the Monument by the permittee must be removed by the permittee except as otherwise permitted. Any permanent structures, equipment, or supplies that require maintenance, are determined to be unserviceable, or are a safety hazard, must be immediately repaired or removed from the Monument by the permittee. No structures, equipment, or supplies may be left in the Monument following the completion of the project except as listed in the permit.

14. If Monument staff is present at the field site, the permittee must meet with them before beginning permitted activities. Even with a valid permit, authorized Monument staff may prohibit entry into any location(s) within the Monument as they may deem appropriate to conserve or manage resources, particularly in areas where cumulative impacts of permitted activities are concentrated.

15. In order to facilitate monitoring and compliance, any person entering the Monument under the authority of this permit, including assistants and ship's crew shall, upon request by authorized Monument enforcement personnel, promptly: a) allow access to and inspection of any vessel or facility used to carry out permit activities; b) produce for inspection any sample, record, or document related to permit activities, including data, logs, photos, and other documentation obtained under, or required by, this permit; and c) allow inspection on board the vessel or at the permittee's premises of all organisms, parts of organisms, and other samples collected under this permit.

16. It is prohibited to possess or consume alcohol in the Hawaiian Islands National Wildlife Refuge in accordance with the refuge policy. Any violations will result in immediate removal of the offender from the Monument at the individual's own cost. Offenders may not be readmitted to the Monument.

17. All persons entering the Monument under the authority of this permit are responsible for the cost of removing themselves from the Monument at the conclusion of the term of the permit or upon revocation or suspension of the permit. All such persons are also responsible for the cost of removing themselves from the Monument in the event of a

necessary medical evacuation, emergency evacuation, including weather, or for the cost of any necessary search and rescue operation.

18. Except as expressly required by applicable law, the Co-Trustees are not liable for any damages to equipment or injuries to the permittee and persons entering the Monument under the authority of this permit. The permittee and any person entering the Monument under the authority of this permit shall release, indemnify, and hold harmless the National Oceanic and Atmospheric Administration, the Department of Commerce, the U.S. Fish and Wildlife Service, the Department of the Interior, the United States Government, the State of Hawaii, and their respective employees and agents acting within the scope of their duties from and against any claims, demands, actions, liens, rights, subrogated or contribution interests, debts, liabilities, judgments, costs, and attorney's fees, arising out of, claimed on account of, or in any manner predicated upon the issuance of this permit or the entry into or habitation upon the Monument or as the result of any action of the permittee or persons participating in the activity authorized by this permit. In the event that a government employee, acting in his official capacity, is the permittee, or is entering the Monument under the authority of this permit, then he shall be subject to all applicable federal and State laws that pertain to claims by or against him predicated upon the issuance of this permit or entry into or habitation upon the Monument.

19. Monument managers or their designees may verbally require the permittee to modify or cease activities not identified in this permit if, in the opinion of the managers or designees, such action is necessary to limit disturbance to or protect Monument resources, to protect government equipment, or to ensure the safety of personnel. After providing such verbal instructions, the managers or designees will provide the permittee with a written modification, suspension or revocation to this permit at the earliest practicable opportunity. The failure to follow verbal instructions or modified permit terms, or to cease activities upon suspension or revocation of this permit, may constitute a violation of this permit, the Proclamation, the regulations, or other applicable law.

20. Disturbance of any cultural or historic property, including but not limited to Native Hawaiian cultural sites, burials, archaeological deposits, maritime heritage sites, and WWII structures and features, such as stone walls and mounds, stone uprights, bunkers, batteries, camp sites, hospitals, housing areas, and radio towers; or the disturbance or collection of any historic or cultural materials and artifacts, including but not limited to bottles, dishes, cartridges, hospital materials, carvings, human remains, or Native Hawaiian bone or stone implements, found within the Monument, including the sale or trade in such items, is prohibited.

21. All Monument resources within the jurisdiction of the State of Hawaii are held in trust under the Hawai'i State Constitution, Article XI, Sec. 1. The State of Hawaii and the Government of the United States reserve ownership or control, as the case may be, of Monument resources, both living and nonliving, that may be taken or derived from those found in the Monument.

22. The permittee must satisfy the following reporting requirements:

a. Within thirty (30) days after the expiration date of this permit, the permittee must submit a summary report of activities conducted under this permit. The report shall be submitted using the Monument permit report template, if applicable.

b. For permitted vessels, the permittee having authority over the vessel must maintain and submit a cruise log within thirty (30) days after the expiration date of this permit. The log shall include but is not limited to: description of cruise activities, geographic locations of those activities, anchoring locations, and small boat dive locations. The permittee shall also maintain a daily vessel discharge log, which must be submitted with the cruise log.

c. Annual Report. The comprehensive annual report is a summary of all activities undertaken, including but not limited to: dates of all arrivals and departures from islands and atolls within the Monument, names of all persons involved in permitted activities, details of all specimens collected, handled, etc., any other pertinent information, GPS locations of all samples collected, transects, etc., results of work to date, copy of all data collected, and a proposed schedule of publication or production of final work. The report shall include a concise summary or abstract for use in Monument reports. Two hard copies and one electronic copy (Microsoft Word preferred, but not required), must be submitted to the Co-Trustees. The annual report is due by the end of the second week of January of the calendar year that follows the year that the permit was in effect or before a new permit is issued, whichever comes first. Subsequent annual reports are required each year until all data collected under research permits are fully analyzed.

d. For activities on State lands or within State waters, the permittee must submit a monthly report on the specified form.

e. The permittee may debrief the Co-Trustees following the completion of all activities in the Monument covered under this permit. The permittee may schedule the debriefing upon submitting the annual report.

f. The permittee must submit two copies of any article, publication, or other product created as a result of the information gained or work completed under this permit, including materials generated at any time in the future following expiration of this permit.

g. Any publications and/or reports resulting from activities conducted under the authority of this permit must include the notation that the activity was conducted under permit number PMNM-2011-001. This requirement does not apply to publications or reports produced by the news media.

h. All required submissions (including plans, logs, reports, and publications) shall be provided to the Monument official at the address indicated in General Condition #1.

23. All data acquired or created in conjunction with this permit will be submitted with the summary report, and annual report. Photographic and video material is considered data. The permittee retains ownership of any data, (including but not limited to any photographic or video material), derivative analyses, or other work product, or other copyrightable works, but the Federal Government and the State of Hawai'i retain a lifetime, non-exclusive, worldwide, royalty-free license to use the same for government purposes, including copying and redissemination, and making derivative works. The permittee will receive acknowledgment as to its ownership of the data in all future use. This requirement does not apply to data acquired or created by the news media.

24. Because photographic or video material that is created for personal use (i.e., not specifically acquired or created in conjunction with this permit) could unintentionally collect data that is also valuable for management purposes, the Co-Trustees reserve the right to request copies of any such material and the permittee agrees to provide a copy of such material within a reasonable time. The Co-Trustees may use such material for management purposes.

25. Any question of interpretation of any term or condition of this permit will be resolved by the Co-Trustees.

SPECIAL TERMS AND CONDITIONS:

1. This permit is not to be used for nor does it authorize the sale of collected organisms. Under this permit, the authorized activities must be for noncommercial purposes not involving the use or sale of any organism, by-products, or materials collected within the Monument for obtaining patent or intellectual property rights.

2. The permittees may not convey, transfer, or distribute, in any fashion (including, but not limited to, selling, trading, giving, or loaning) any coral, live rock, or organism collected under this permit without the express written permission of the Co-Trustees.

3. To prevent introduction of disease or the unintended transport of live organisms, the permittee must comply with the disease and transport protocols attached to this permit.

4. Tenders and small vessels must be equipped with engines that meet EPA emissions requirements.

5. Refueling of tenders and all small vessels must be done at the support ships and outside the confines of lagoons or near-shore waters in the State Marine Refuge

6. No fishing is allowed in State Waters except as authorized under State law for subsistence, traditional, and customary practices by Native Hawaiians.

7. If there is any Hawaiian monk seal or any other protected species in the area when performing any permitted activity, the activity shall cease until the animal(s) depart the area, except as permitted for specific management of that species.

8. To ensure the protection of Monument resources, the permittee must conduct all activities in accordance with the following Monument Best Management Practices and guidelines, as attached:
    a. Protocol for Acquiring Avian Blood Samples
    b. Human Hazards to Seabirds Briefing
    c. Boat Operations and Diving Activities
    d. Protocol to Reduce Impact to Laysan Finch
    e. General Storage and Transport Protocols for Collected Samples
    f. Special Conditions and Rules for Moving Between Islands and Atolls and Packing for Field Camps
    g. Protocols Necessary for Conducting Trolling Research and Monitoring
    h. Best Practices for Minimizing the Impact of Artificial Light on Sea Turtles
    i. Disease and Introduced Species Prevention Protocol for Permitted Activities in the Marine Environment
    j. Precautions for Minimizing Human Impacts on Endangered Land Birds
    k. Special Conditions and Rules for Small Boat Operations at Tern Island

9. All Permittees going to Midway will have shoes and luggage inspected for invasive species prior to departure or immediately upon arrival in Midway.

10. For all activities requiring landing on uninhabited islands an authorized staff escort trained for each particular uninhabited island will be included on the landing team.

11. Permittee is required to work in conjunction with the U.S. Fish and Wildlife Service regarding any arrangements at sites within the Hawaiian Islands and Midway Atoll National Wildlife Refuges, and with the State of Hawai'i Kure Atoll Seabird Sanctuary Manager at Kure Atoll. The Refuge Managers for the above locations listed in the Permitted Activity Locations section must be notified at least 72 hours and not more than 30 days prior to arrival. Upon departing, notification to the appropriate Refuge Manager is required. Contact information for notifications are listed below:
    a. French Frigate Shoals: Paula Hartzell, Tern Island Deputy Refuge Manager; email Paula_Hartzell@fws.gov, or telephone 808-792-9554.

    b. Midway Atoll: Acting Midway Refuge Manager, John Klavitter; email John_Klavitter@fws.gov, or telephone 808-954-4817.

    c. Laysan Island: Laysan Biotech, Cindy Rehkemper; email Cindy_Rehkemper@fws.gov and Laysanfws@stratosnet.com , or telephone 808-792-9487.

    d. Kure Atoll: State Seabird Sanctuary Manager, Cynthia Vanderlip; email kureatoll.dlnr@amosconnect.com.

Your signature below, as permittee, indicates that you accept and agree to comply with all terms and conditions of this permit. This permit becomes valid on the date when signed by the last Monument Official. Please note that the expiration date on this permit will not be extended by a delay in your signing below.

Thomas R. Edgerton 12/23/10

Mr. Tom Edgerton Date
Superintendent, Papahānaumokuākea Marine National Monument
Department of Interior
U.S. Fish and Wildlife Service

Administrator (TBD) Date
Division of Aquatic Resources
Department of Land and Natural Resources
State of Hawaii

Mr. Paul Conry Date
Administrator, Division of Forestry and Wildlife
Department of Land and Natural Resources
State of Hawaii

Ms. T. 'Aulani Wilhelm Date
Superintendent, Papahānaumokuākea Marine National Monument
Department of Commerce
National Oceanic and Atmospheric Administration

Your signature below, as permittee, indicates that you accept and agree to comply with all terms and conditions of this permit. This permit becomes valid on the date when signed by the last Monument Official. Please note that the expiration date on this permit will not be extended by a delay in your signing below.

Mr. Tom Edgerton — Date
Superintendent, Papahānaumokuākea Marine National Monument
Department of Interior
U.S. Fish and Wildlife Service

03JAN11

for Administrator (TBD) — Date
Division of Aquatic Resources
Department of Land and Natural Resources
State of Hawaii

Mr. Paul Conry — Date
Administrator, Division of Forestry and Wildlife
Department of Land and Natural Resources
State of Hawaii

Ms. T. 'Aulani Wilhelm — Date
Superintendent, Papahānaumokuākea Marine National Monument
Department of Commerce
National Oceanic and Atmospheric Administration

Your signature below, as permittee, indicates that you accept and agree to comply with all terms and conditions of this permit. This permit becomes valid on the date when signed by the last Monument Official. Please note that the expiration date on this permit will not be extended by a delay in your signing below.

Mr. Tom Edgerton — Date
Superintendent, Papahānaumokuākea Marine National Monument
Department of Interior
U.S. Fish and Wildlife Service

Administrator (TBD) — Date
Division of Aquatic Resources
Department of Land and Natural Resources
State of Hawaii

Paul J Conry — 1/3/11
Mr. Paul Conry — Date
Administrator, Division of Forestry and Wildlife
Department of Land and Natural Resources
State of Hawaii

Ms. T. 'Aulani Wilhelm — Date
Superintendent, Papahānaumokuākea Marine National Monument
Department of Commerce
National Oceanic and Atmospheric Administration

Your signature below, as permittee, indicates that you accept and agree to comply with all terms and conditions of this permit. This permit becomes valid on the date when signed by the last Monument Official. Please note that the expiration date on this permit will not be extended by a delay in your signing below.

Mr. Tom Edgerton — Date
Superintendent, Papahānaumokuākea Marine National Monument
Department of Interior
U.S. Fish and Wildlife Service

Administrator (TBD) — Date
Division of Aquatic Resources
Department of Land and Natural Resources
State of Hawaii

Mr. Paul Conry — Date
Administrator, Division of Forestry and Wildlife
Department of Land and Natural Resources
State of Hawaii

for — 1-11-11

Ms. T. 'Aulani Wilhelm — Date
Superintendent, Papahānaumokuākea Marine National Monument
Department of Commerce
National Oceanic and Atmospheric Administration

Attachments (15):

1. Papahānaumokuākea Marine National Monument Rules and Regulations
2. Maps of the Papahānaumokuākea Marine National Monument
3. Permit Acknowledgment Form
4. Permitted Personnel List
5. Protocol for Acquiring Avian Blood Samples
6. Human Hazards to Seabirds Briefing
7. Boat Operations and Diving Activities
8. Protocol to Reduce Impact to Laysan Finch
9. General Storage and Transport Protocols for Collected Samples
10. Special Conditions and Rules for Moving Between Islands and Atolls and Packing for Field Camps
11. Protocols Necessary for Conducting Trolling Research and Monitoring
12. Best Practices for Minimizing the Impact of Artificial Light on Sea Turtles
13. Disease and Introduced Species Prevention Protocol for Permitted Activities in the Marine Environment
14. Precautions for Minimizing Human Impacts on Endangered Land Birds
15. Special Conditions and Rules for Small Boat Operations at Tern Island

William J. Aila Jr.
Interim Chairperson
Board of Land and Natural Resources
Department of Land and Natural Resources
State of Hawaii

Thomas R. Edgerton 12/23/10

Tom Edgerton
Superintendent, Papahānaumokuākea Marine National Monument
Department of Interior
U.S. Fish and Wildlife Service

JJ Watland for 12-22-10

T. 'Aulani Wilhelm
Superintendent
National Oceanic and Atmospheric Administration
Papahānaumokuākea Marine National Monument

Appendix L
Part 2: Papahānaumokuākea Marine National Monument Special Conditions, Rules for Moving Between Islands and Atolls, and Packing for Field Camps

This page intentionally left blank.

The islands and atolls of the Papahanaumokuakea Marine National Monument (Monument) and the Hawaiian Islands National Wildlife Refuge are special places providing habitat for many rare, endemic plants and animals. Many of these species are formally listed as Endangered under the Endangered Species Act. Endemic plants and insects, and the predators they support, are especially vulnerable to the introduction of competing or consuming species. Such introductions may cause the extinction of island and reef endemics, or even the destruction of entire island or reef ecological communities. Notable local examples include: the introduction of rabbits to Laysan Island in 1902 which caused the extinction of numerous plant and insect species, and 3 endemic landbird species; the introduction of rats to many Pacific Islands causing the elimination of many burrowing seabird colonies; the introduction of the annual grass, sandbur, to Laysan Island where it has crowded out native bunch grass thus, eliminating nesting habitat for the Endangered Laysan finch; and, the introduction and proliferation of numerous ant species throughout the Pacific Islands to the widespread detriment of endemic plant and insect species.

Several of the islands within the Monument are especially pristine, and as a result are rich in rare and special plants and animals. Nihoa Island has at least 17 endemic and rare insect species, 5 Endangered plants and 2 Endangered birds. Necker Island has Endangered plants and 11 endemic insects. Laysan Island has Endangered plants, 9 endemic arthropods and the Endangered Laysan finch and Laysan duck. Other islands in the Monument such as Lisianski, and islets in Atolls such as Pearl and Hermes Reef and French Frigate Shoals provide homes for a variety of endemic and/or endangered species and require special protection from alien species.

Other Pacific Island such as Kure and the "high islands" (Oahu, Hawaii, Maui, Kauai, etc.) as well as, certain islands within Midway Atoll, Pearl and Hermes Reef and French Frigate Shoals have plants and/or animals that are of high risk for introduction to the relatively pristine islands discussed above. Of special concerns are snakes, rats, cats, dogs, ants and a variety of other insect and plant species. Harmful plant species of highest concern that we know of are *Verbesina encelioides, Cenchrus echinatus, and Setaria verticillata.*

The Co-trustees are responsible for the management and protection of the islands, reefs and wildlife of the Monument. No one is permitted to set foot within the Monument without the express permission of the Co-trustees through the permitting process. Because of the above concerns, the following restrictions on the movement of personnel and materials throughout the Monument exist.

The Following Conditions and Rules apply to the all islands within the Monument with the exception of those at French Frigate Shoals and Midway Atoll:

Definitions:

"**New**" means off the shelf and never used anywhere but the island in question.

"**Clothing**" is all apparel , shoes, socks, over and under garments.

"**Soft gear**" is all gear such as daypacks, fannypacks, packing foam or similar material, camera bags, camera/binocular straps, microphone covers, nets, holding or weighing bags, bedding, tents, luggage, or any fabric, fiber, paper or material capable of harboring seeds or insects.

1. Any personnel who will be landing boats, and staying within the boats, at any island should have clean clothes and shoes.

2. Any personnel going ashore at any island and moving inshore from the immediate area in which waves are breaking, or beyond the intertidal area, at the time of landing must have new footwear, new or island specific clothes and new or island specific soft gear. All must be frozen for at least 48 hours prior to landing.

3. Any personnel entering any vegetated area, regardless of how sparse the vegetation, must have new footwear, new clothes and new soft gear all frozen for at least 48 hours prior to landing.

4. To avoid transport of seeds from within small boats the following protocol should be followed. For islands with safe or sandy landing conditions, one should keep quarantine shoes/socks inside quarantine containers until the island is reached. One should go ashore bare foot, and then don the quarantine shoes. Non quarantine shoes should be removed in the small boat, put into a bucket or some kind of sealed container, and left enclosed in that container until the person departs the island. The sealed container, if clean on the outside, may go ashore, but should not be opened ashore. For landings which are rocky, rough, and relatively unsafe (such as Necker and Nihoa) for safety reasons, quarantine shoes should be donned when inside the small boats, but care should be taken to look for seeds and insects which may be in the small boat.

5. Soft gear may not be moved between islands. Hard gear must be thoroughly cleaned and frozen for at least 48 hours between islands.

6. During transit, clothing and gear coming off Kure, Midway, or any islet of French Frigate Shoals must be carefully sequestered to avoid contamination of gear bound for cleaner islands. Special care must be taken to avoid contaminating gear storage areas and quarters aboard transporting vessels with seeds or insects from these islands.

7. Regardless of origin or destination, inspect and clean all equipment, supplies, etc., just prior to any trip to the Monument. Carefully clean all clothing, footwear and softgear following use to minimize risk of cross contamination of materials between islands.

8. Pack supplies in plastic buckets with fitted lids or other sealable metal or plastic containers since they can be thoroughly cleaned inside and out. Cardboard is not permitted on islands. Cardboard boxes disintegrate in a short time and harbor seeds, animals, etc., which cannot be easily found or removed. Wood is not permitted unless sealed (painted or varnished) on all surfaces and frozen for 48 hours.

   Wooden boxes can also harbor insects and seeds and therefore are only allowed if well constructed (tight fitting seams are required). All wood must be treated, and inside and outside surfaces must be painted or varnished to provide a smooth, cleanable finish that seals all holes.

9. Freeze or tarp and fumigate then seal all equipment (clothes, books, tents, everything) just prior to departure. Food and cooking items need not be fumigated but should be cleaned and frozen, if freezable. Cameras, binoculars, radios, and other electronic equipment must be thoroughly cleaned, including internal inspection whenever possible, but do not need to be frozen or fumigated. Such equipment can only be packed in wooden crates if treated as in #2 above. Any containers must contain new, clean packing materials and be frozen or fumigated.

10. At present, Tern Island is the singular exception to the above rule, having less stringent rules due to the large number of previously established alien species. Careful inspection of all materials and containers is still required. However, it is acceptable to use wooden and cardboard containers for transporting supplies to Tem Island. Also, there is no requirement for freezing or fumigating items disembarked at Tem. Although requirements for Tem Island are more lax, the Refuge is still concerned about the possibilities of new introductions. Do not wear clothing to Tern Island that has been worn at Pearl and Hermes, Midway Atoll or Kure Atoll.

Additional Special Conditions for Travel to Nihoa and Necker (Mokumanamana) Islands: Nihoa and Necker are the most pristine locations in the Monument. Nihoa is home to the highest number of federally listed endangered species in the Monument. Many areas of these small rugged islands are inaccessible. Introduction of any alien species could have disastrous results in a very short time. It would be almost impossible to mount any kind of control or eradication program on these islands should an alien species become established. Because of these reasons, access to Nihoa and Necker are strictly limited, and rules governing entry are more stringent.

Access to Nihoa and Necker by permittees will only be allowed under the accompaniment and supervision of a U.S. Fish and Wildlife Service (USFWS) Representative. The representative, who shall be appointed by the U.S. Fish and Wildlife Service Monument Manager will work with permittees to assure careful compliance

with all rules for inspection, handling and preparation of equipment. The USFWS Representative will have the authority to control and limit access to various parts of the island to protect animals, plants and archaeological sites, especially endangered species. The USFWS Representative will have the authority to disallow access to the island, or order an immediate departure from the island if conditions for working on the island are not met or are violated in some way.

All field equipment made out of fabric material or wood must be new, and never previously used in the Northwestern or main Hawaiian Islands. Equipment previously purchased or made for use on Nihoa and Necker that has been carefully sealed and stored while away from Nihoa and Necker, and not used elsewhere, may also be brought onto the island. Rules for freezing and/or fumigating are as described for other sites in the Monument (see above).

Clothing, footwear (shoes, slippers, socks, etc.), daypacks (soft gear) must be new, unused, or previously only used on Nihoa (or Necker) and carefully sealed and stored while off of the island. Hard gear such as camera, and equipment must be thoroughly cleaned and inspected.

Additional Special Conditions for Travel Within Pearl and Hermes Atoll: In recent years *Verbesina encelioides* has been introduced to Southeast Island within Pearl and Hermes Atoll. This noxious weed has taken over a large portion of the island. To prevent the further spread of this weed to the other islets within this atoll the following precaution must be taken:

1. Every person should have one set of quarantine gear and clothing for Southeast Island and one set of quarantine gear and clothing for all other islets in the atoll. For instance the same clothing, and if needed camping gear, may be used at north and seal kittery, but anything used at southeast needs to stay off all other islets in the atoll. Do not use the outer islet clothing and gear on Southeast Island.

2. Carefully inspect small boats and their associated equipment when traveling between islets at Pearl and Hermes Atoll. Since folks likely take one anchor ashore and put one anchor in the water there is potential for seed dispersal on anchor lines as well as from within the small boats. This needs to be watched very carefully.

Additional Special Conditions for Food: Fresh foods such as fruits, vegetables, leafy vegetables and tubers are not permitted on quarantine enforced islands (Necker, Nihoa, Laysan, Garner Pinnacles, Lisianski and Pearl and Hermes Reef). Concern is not only that certain species such as tomatoes could easily become established but that decomposing organic waste can also harbor microbes and insects and can act as an introduction vector. Soil can contain many seeds, eggs, larvae, etc., and cannot be transported to or between islands. All other food that can be safely frozen (this does not apply to food in cans or glass jars) must be packaged in air tight containers just as all other gear and frozen for 48 hours.

Appendix L
Part 3: Procedures for Minimizing Impacts to Endangered Laysan Finch

This page intentionally left blank.

The following avoidance and minimization measures will reduce the risk of harm to the Laysan finch:

- To reduce the risk of inadvertent drowning of Laysan finch at the campsite:
- Buckets will always be overturned so that they cannot collect rainwater.
- Laundry buckets must have lids while laundry is soaking.
- Water-filled buckets for dish washing (or for any other purpose) will always be attended.
- Tarps *(e.g.,* those covering propane, etc.) will be tucked in tightly so that they cannot collect rainwater.
- Garbage cans used for desalinization will have netting placed between the can and the lid. Care will be taken to make sure the lids close properly; faulty positioning of hoses can interfere with proper closure.
- To minimize accidental entanglement of Laysan finches at the campsite:
- Fabric with loose threads will be burned to minimize the risk of Laysan finch entanglement. Laysan finch feet can become entangled when fabric is hung out to dry.
- Loose threads will be cut off tents and tarps.
- Anything with small mesh *(e.g.,* bird nets) will be put away to avoid Laysan finch entanglement.
- minimize impacts to Laysan finch from general camp activities and maintenance:
- Camp supplies and water jugs will be aligned with ample space between rows so that finches will not get trapped. Storage jugs will always be capped.
- Burn barrels must be attended at all times when burning trash. When not burning, any vents or rust-eaten holes in the barrel or lid will be covered *(e.g.,* with rocks).
- For stability reasons, buckets will not be stacked more than two high. Personnel will watch for leaning buckets or water jugs and level the sand beneath leaning buckets if necessary.
- Tents will be zipped at all times (day and night) so that finches cannot enter.
- Laysan finches will not be fed or allowed access to human food. Laysan finch dependency on the camp could potentially result in adverse impacts to the finches when campsites are dismantled.
- On the islands of Pearl and Hermes, Laysan finches appear to be limited by nest sites, therefore, they nest in debris (driftwood, plastic pipes, baskets, etc.). Thus, the beaches will not be cleaned or debris disturbed as this may destroy a nest. In an effort to prevent nesting in undesirable locations, camp gear must be checked daily during the nesting season (spring and summer) for signs that finches are building nests on or under gear. If it is determined nest building has begun, the nest site should be modified to prevent nest completion.

This page intentionally left blank.

Appendix M
Hawaiian Monk Seal Stochastic Model

This page intentionally left blank.

HAWAIIAN MONK SEAL STOCHASTIC SIMULATION MODEL

The monk seal stochastic simulation model is one of the primary tools used by the National Marine Fisheries Service (NMFS) Pacific Islands Fisheries Science Center (PIFSC) to perform quantitative analyses for research and management of the species. Historically, the model has been used for a variety of applications. The most common applications are: to make predictions about the future status of the population based on current demography, to evaluate the significance of specific mortality sources (such as shark predation or male aggression), and to evaluate the sensitivity and likely benefits derived from candidate interventions. Details of the model structure and mechanics are provided in Harting (2002), with the fundamental features summarized below.

At its core, the model is a mechanistic, stochastic, metapopulation model with provisions for handling uncertainties in input parameters and modeled processes. The model is heavily data driven, capitalizing on the demographic and life history data collected over more than two decades in the NWHI and, more recently, the incipient demographic data set for the MHI. Necker and Nihoa Islands (NWHI) are relatively data poor and have historically comprised a small portion of total abundance, and are therefore not included in simulations. The demographic data (reproductive, survival, and migration rates) used by the model are derived primarily from resightings of known-aged (or "cohort") seals first tagged as pups.

Demographic data are evaluated separately for each of the 7 breeding sites (six NWHI sites, plus the MHI) handled by the model. For the NWHI sites, Jolly-Seber survival estimates (Jolly 1965; Seber 1965) are calculated using the cohort resighting data as input, with separate estimates for two time periods: all years pooled, and most recent three years pooled. The latter estimates were used for all projections described in this PEIS. Siler's five-parameter competing risk model (Siler 1979, 1983) is then fit to the observed (Jolly-Seber) rates. For the model, parameter uncertainty is handled by random sampling Siler parameters from the variance/covariance matrix from the parameter fitting.

Age-specific reproductive rates are estimated from pooling pupping data from 1990 to the present using methods described in Harting *et al.* (2007). As with survival rates, parameter uncertainty is handled by randomly sampling a unique set of correlated parameters from the fitted distributions. In the model, survival and reproduction are determined stochastically for each individual in the population by binomial sampling (testing a uniform random number in the range [0,1] against the age-specific survival rate). Migration is also determined stochastically for each individual according to the fitted movement rate for each age class.

As compared to the NWHI, data from which to estimate vital rates and population composition are much more limited for the MHI. A detailed description of the methods used to fit both survival and reproductive rates for the MHI is provided in Baker *et al.* (2011). Where data are lacking (*e.g.*, reproductive rates of older MHI females), some inference and extrapolation is necessary based on patterns observed in the NWHI. Uncertainty in parameter estimates is handled in the same manner as for the NWHI,

with unique parameters drawn from their fitted distributions at the start of each simulation.

Each simulation is initialized with the most recent starting age/sex distribution for each site, as compiled from the most recent year's observations. Ages are ascribed different degrees of confidence depending on the age at which a seal was first identified. At the start of each simulation, the model randomly assigns all minimum-aged seals (those first identified as adults) a working age for initializing that simulation. The random age assignment is consistent with the estimated survival schedule for each site. Interatoll movement rates are also calculated from the annual resighting data, with different rates for each pups, juveniles, subadults, and adults.

The primary sequence of events during each simulation year is survival and reproduction, specific natural perturbations, migration between subpopulations, and management actions. The model provides multiple options for simulating natural perturbations (survival catastrophes, birth catastrophes, shark predation, and aggressive male interactions) and management interventions (captive rearing/release, translocations, shark removals, and other). The only perturbations and management actions to be included in the projections described in this PEIS were removal of aggressive males, removal (death) of females, and translocation. For the translocations, the model transfers the desired number of seals from the donor site to the recipient site, and tracks their annual survival until they are transferred back to the donor site. Survival rate decrements are applied to these seals as specified in the modeled scenario.

The model produces a diverse array of outputs suitable for evaluating simulation outcomes including abundance, realized growth rate, multiple demographic descriptors, and assorted metrics specific to whatever intervention scenario was executed. The primary output is site-specific, with summary diagnostics for the entire system and the two main regions (NWHI and MHI).

For the purposes of this analysis, certain other model components were disabled, including the option for density dependent adjustment of demographic rates. While that feature of the model is certainly important when performing long-term projections, the precise manner in which density dependence operates on the monk seal population is unknown and its influence can overwhelm and obscure the effects of all other factors included in the simulation scenario.

REFERENCES

Baker, J. D., A. L. Harting, T. A. Wurth, and T. C. Johanos. 2011. Dramatic shifts in Hawaiian monk seal distribution predicted from divergent regional trends. Marine Mammal Science 27:78–93.

Harting, A.L. 2002. Stochastic simulation model for the Hawaiian monk seal. Ph.D. dissertation. Montana State University, Bozeman. 328 pp.

Harting, A. L., J. D. Baker, and T. C. Johanos. 2007. Reproductive patterns of the Hawaiian monk seal. Marine Mammal Science 23:553-573.

Jolly, G.M. 1965. Explicit estimates from capture-recapture data with both death and immigration - stochastic model. Biometrika 52:225-247.

Seber, G.A.F. 1965. A note on the multiple-recapture census. Biometrika 52:249-259.

Siler, W. 1979. A competing-risk model for animal mortality. Ecology 60:750-757.

Siler, W. 1983. Parameters of mortality in human populations with widely varying life spans. Statistics in Medicine 2:373-380.

This page intentionally left blank.