Prepared for:

National Oceanic and Atmospheric Administration
National Marine Fisheries Service

Programmatic Environmental Impact Statement

Chapter 2: Alternatives

Final PEIS for Hawaiian Monk Seal Recovery Actions

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2.0 ALTERNATIVES

2.1 INTRODUCTION

This chapter describes a reasonable range of alternatives that meet the purpose and need of the proposed action to implement recovery activities involving research and enhancement on Hawaiian monk seals. Evaluation of these proposed alternatives is presented in Chapter 4.

The National Marine Fisheries Service (NMFS) has, in accordance with guidance from the Council on Environmental Quality (CEQ) on implementing the National Environmental Policy Act (NEPA) (40 Code of Federal Regulations [CFR] Part 1500), developed four alternatives for evaluation in this PEIS. These include the no action alternative as well as an array of activities involving various levels of research and enhancement on Hawaiian monk seals. According to CEQ, "reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant" (CEQ 1981). The four alternatives analyzed in this Programmatic Environmental Impact Statement (PEIS) were developed in light of this guidance.

Section 1502.14 of NEPA requires federal agencies to explore all reasonable alternatives including the alternative of no action. The no action alternative provides a benchmark, enabling decision makers to compare the magnitude of environmental effects of the action alternatives. In addition to No Action (Alternative 2), NMFS has evaluated three other alternatives: Alternative 1 Status Quo (*e.g.,* what is currently permitted), Alternative 3 Limited Translocation (an expanded research and enhancement program with limited scope of seal translocations, and Alternative 4 Enhanced Implementation (same as Alternative 3 but with expanded scope of translocation).

As described in Section 2.4, and in line with CEQ guidance (40 CFR 1501.7), NMFS has considered comments received during the scoping period and public comment period on the Draft PEIS in determining the significant issues related to the proposed action to be considered during development of the alternatives presented herein.

2.2 RELATION OF ALTERNATIVES EVALUATED TO THE STATEMENT OF PURPOSE AND NEED

The alternatives evaluated in this PEIS must achieve the objectives of the proposed action as stated in the purpose and need (Section 1.2), without

violating federal environmental statutes and regulations described in Section 1.5. Thus, comparing the alternatives to the stated purpose and need, as well as technical and economic practicality and feasibility, serves as a means to filter alternatives that may be carried forward for detailed analysis. Any alternative that fails to meet the agency's purpose and need or federal environmental statutes and regulations, need not be carried forward for further consideration in the PEIS. NEPA states that for alternatives eliminated from detailed study in the PEIS, the agency must describe reasons for why alternatives were eliminated (Section 2.12). As previously stated, evaluation of the no action alternative is required in a PEIS (40 CFR 1502.14).

2.3 *RELATION OF ALTERNATIVES TO THE RECOVERY PLAN*

The Hawaiian Monk Seal Recovery Plan (NMFS 2007) provides guidance to the agency on specific information needs and actions that may contribute towards species recovery. The recovery plan serves as a guide only and does not commit the agency to the actions listed in the plan, nor does it bind the agency to only those activities listed as long as proposed activities may justifiably contribute towards species recovery. The research and enhancement priorities listed in the 2007 Hawaiian Monk Seal Recovery Plan provided a general framework for activities listed in the range of alternatives analyzed in this PEIS. For additional detail on the Hawaiian Monk Seal Recovery Plan, please refer to Section 3.3.1.8.

2.4 *PUBLIC COMMENTS CONSIDERED IN DEVELOPING ALTERNATIVES*

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.

The alternatives presented in the Draft PEIS were based on comments received during the scoping period (October 1 – November 30, 2010) and on permitted past and existing research and enhancement activities. The alternatives also included new concepts that have not yet been permitted, but based on existing information, may contribute to species recovery.

Substantive comments received on the Draft PEIS during the scoping process and the public comment period raised issues that have been addressed or incorporated into this PEIS and the alternatives evaluated. Table 2.4-1 below provides an overview of substantive comments received on the PEIS alternatives and indicates where they are addressed in the Final PEIS. The complete Comment Analysis Report is included in Appendix C and it includes additional

information about the public comments received and provides agency responses to comments. The report summarizing comments received during the scoping process was included in the Draft PEIS and is available on the project website: http://www.nmfs.noaa.gov/pr/permits/eis/scoping_summary_report.pdf.

Table 2.4-1 ***Summary of public comments on alternatives and section where comments on alternatives are addressed in this Final PEIS.***

Comment Summary	Sections in the PEIS Where Issue Is Discussed	General Description of Revisions Made
Support or opposition to specific alternatives	• 2.6 Alternatives Carried Forward for Analysis	• 2.6 - Additional information is provided on the total number of weaned monk seal pups that could be translocated under Alternatives 3 and 4.
Support for including predator control and captive seal rehabilitation facility in the NWHI	• 2.12 Alternatives Not Carried Forward for Analysis	• 2.12 – Additional information has been added about the rationale for eliminating alternatives such as predator control on the NWHI.
Issues associated with impact analysis of alternatives	• 4.8.1 through 4.8.4 Environmental Consequences of Alternatives for Resources Evaluated	• 4.8.1-4.8.3 – Additional information and analysis of fishery impacts. • 4.8.4 – Additional information and analysis of impacts to cultural resources and historic properties.

2.5 *RESEARCH AND ENHANCEMENT COMPONENTS OF THE ALTERNATIVES*

The following is a narrative describing each of the research and enhancement components found in the alternatives.

Land-based surveys and observations: Population monitoring of Hawaiian monk seals is fundamentally based upon visual sightings of uniquely identifiable seals. The seals are identifiable by natural characteristics (scars, pelage marks, etc.) or applied marks (flipper tags, temporary pelage bleach marks). The accumulation of resightings are used to estimate abundance, age- and sex-structures, survival and reproductive rates, cause of mortality, movement rates, behavior, etc. Land-based surveys are the source of most of the observations. This typically involves a researcher walking the shoreline where seals are on land or swimming nearshore, approaching seals to read tags or taking photographs to document identifying marks.

Observers remain as far away as possible from seals during monitoring activities to obtain the necessary data, using binoculars and telephoto lenses as necessary for documentation, and only approach closely, *e.g.*, within 1 meter (3 feet [ft]), when necessary. The field staff is trained to be unobtrusive and use techniques to avoid disturbance appropriate to the environment in which the seal is

encountered whenever seals may alert to human presence. Seals are specifically given a wide berth when they are judged especially susceptible to disturbance, such as lactating females or molting individuals. Data recorded on land-based surveys include date, time, location, and a variety of information about each individual seal encountered (size, sex, tag information [letter/number, condition, color, tag location], bleach marks, body condition, molt status, whether the seal was disturbed by the researcher, association with other seals, any injuries, and sometimes behavior). Digital photographs help identify each seal by matching with previous photographs catalogued in a multi-year digital image database. During land surveys, researchers also opportunistically collect fecal and spew samples for diet analysis, shed (molted) skin for genetic studies, and on rare occasions, urine for health studies.

All alternatives allow for expanded use of remotely-operated cameras set up at seal landing areas in order to augment surveillance with minimum human presence. Cameras would be placed at designated vantage points and powered with photovoltaic systems. Images would be transmitted via satellite or stored digitally on site for later retrieval. Remote camera systems would allow for greater vigilance at sites where specific threats are a concern (*e.g.,* male aggression, shark predation) and would also augment basic population data in sites that are difficult for observers to access (*e.g.,* Nihoa Island). These systems have the advantages of efficiently collecting large amounts of data while reducing the level of human disturbance.

Autonomous, amphibious rover vehicles could be used improve assessment and monitoring operations in certain situations (*e.g.*, crowded narrow pupping beaches, islands that are difficult to land on). Terrestrial rovers with mounted video cameras could be used to identify and photograph monk seals or potentially assess injuries at a distance of approximately 3 ft. The use of rovers has not been tried with monk seals so their application would be in two phases. The first would be to test the vehicles suitability in near shore environments for collecting current or better quality assessment data and monitor their potential for disturbing monk seals and other wildlife. If the rovers prove successful they will be used more broadly on an "as needed" basis to supplement traditional methods.

Vessel surveys and observations: Typically, these are conducted from small boats that may cruise shorelines from several hundred feet or more offshore until seals are sighted. The boat then approaches more closely at a slow speed to allow for observation through binoculars and photographic documentation. The current permit allows a minimum approach distance of 33 ft. To mitigate disturbance, any indication of seal response or awareness of vessels are carefully observed and approach is adjusted to minimize the potential for disturbance. Vessel-based surveys are usually conducted in cases where researchers cannot land safely either due to sea conditions or terrain or in sites with restricted access. Also, surveys may be conducted from boats as a precaution if researchers

judge that landing (*e.g.,* on a tiny sand spit) might cause unnecessary disturbance to seals. The data collected on vessel surveys are similar to that collected on land-based surveys, except that typically less detail can be recorded for each seal because visibility is limited.

Aerial surveys and observations: Surveys are conducted from aircraft (airplanes and helicopters) in areas difficult to reach otherwise. Aerial surveys can be an efficient method to survey long stretches of shoreline with sparse seal presence in a short period of time. Aerial surveys are mostly conducted in the Main Hawaiian Islands (MHI), where aircraft and fuel are much more available compared to the NWHI. Typically, surveys are conducted by flying offshore of shorelines until a seal is spotted, then circling (or hovering, if helicopter-based) to observe and photograph. Minimum distance from the survey aircraft to seals under the current permit is 500 ft (vector combination of vertical and horizontal distance). This distance may be reduced in proposed Alternative 3 or 4 because experience has shown that monk seals rarely take notice of aircraft that approach much more closely, probably because unlike other pinnipeds (*e.g.,* harbor seals), monk seals have not evolved with aerial predators. Also, surveys may be conducted from small, unmanned remotely operated aircraft which have even less potential to disturb. In rare occurrences when a seal may appear to respond to aircraft presence, aircraft distance is increased until the seal settles down. Like vessel surveys, data collected on aerial surveys are similar to that collected on land-based surveys, except that lesser detail can typically be recorded for each seal because visibility is limited.

Sample collection and use of tissues from opportunistically encountered carcasses: Dead seals provide information on the health and ecology of the species. Examination of tissue samples can reveal illnesses which afflicted the seal, the cause of death, exposure to other pathogens, provide genetic material for a variety of applications, provide samples for assessing contaminant exposure and information on diet. Carcasses of seals are necropsied in a standard manner and specific to Hawaiian monk seals, with protocols refined as appropriate for specific samples to be taken, appropriate method of sample storage, and sample analyses. Specimens are retained according to the condition of the carcass. If the animal has recently died and the carcass is in good condition, samples from all major organs are retained and life history and morphometric data are recorded. If the carcass is in poor condition, a limited set of data is collected, including size (measurements), sex, and general description. Skulls are retained for subsequent measurement and additional skeletal materials may be retained. In most cases, carcasses are found in isolation and can be obtained and examined without risk of disturbing any other seals. In cases where other seals are present, researchers approach stealthily and remove the carcass to an isolated area to minimize incidental disturbance. In the NWHI, carcasses are typically buried; in the MHI, they are usually buried, cremated or disposed of at a waste facility. Salvaged parts may be used to enhance survival of pups (after necropsy, using seal tissue as bait for permitted shark removals).

Protocols for capture and handling: Many of the research and enhancement activities described below necessarily involve capturing, restraining and handling the seals. 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). Capture and handling protocols consider factors such as environmental conditions, status and health of the seals, capabilities of the capture team and presence of other seals in the area. Procedures conducted on captured seals minimize pain, risk of physical harm, and chance of disease transmission.

NMFS has a long-standing conservative approach to disturbance or capture of adult female seals. For example, no adult female is captured if she appears to be pregnant or is otherwise thought likely to be well into a pregnancy even if it is not visually apparent. The only exception is for a life-threatening situation such as a severe entanglement. Also, great pains are taken to minimize the disturbance of mother-pup pairs.

These protocols are arguably the most conservative and risk averse for any seal species in the world. Many prospective capture events are delayed or aborted entirely due to how conservatively perceived risks are assessed before the activity. Activities described below are performed using these conservative, risk-averse protocols.

Marking (tagging, bleaching): Researchers apply a variety of marks to facilitate both short- and long-term identification of individual seals, which is the most critical foundation of the population monitoring database. The most commonly applied marks are lettered and numbered flipper tags. Flipper tags are applied to weaned pups and to older individuals that may not have been tagged previously. Under some alternatives, pre-weaned pups may be flipper-tagged if pups are still nursing at the time researchers depart field camps in the NWHI. Tags would be re-applied to individual seals whose tags have become lost, broken, or excessively worn, in order to maintain the individual identities of these animals.

When captured for flipper tagging, seals are manually restrained by hand or in a net, then two plastic Temple Tags® (4 centimeters [cm] x 2 cm) are inserted through holes punched in the webbing between two digits of each rear flipper. During retagging old broken or unreadable tags may be removed. Restraint time averages approximately 5 minutes and does not exceed 15 minutes. After flipper tags have been applied, but while the seal is still under restraint, a Passive Integrated Transponder (PIT) tag is typically injected. These are the same kind of "chip" commonly inserted in domestic dogs and cats to facilitate identification. Most PIT tags would be injected just below the skin in the lateral lumbar area.

The injection site is cleansed with Betadine® and alcohol prior to PIT injection. The unique identifying code of each chip can later be determined using portable, hand-held readers, thereby providing long-term maintenance of identity even if flipper tags are lost.

A limited number of weaned pups may also be marked with a small sonic tag. Galapagos shark predation at French Frigate Shoals has drastically decreased pup survival for more than a decade. The primary purpose of sonic tagging is to gain information to aid in reducing this predation on weaned pups. Movements of pups and proximity to sonic-tagged sharks for the time period just after weaning is monitored via sonic tags attached to flipper tags. Receiving stations "listen" for both shark and seal sonic tags and record them when they are in range. These data are used to better inform management actions aimed at reducing shark predation, such as culling sharks. Sonic tags are deployed concurrent with standard flipper tagging of weaned pups. The sonic tag is attached onto one additional flipper tag during standard tagging procedures. The sonic tags are 2.4 cm long and weigh 3.6 grams (g). The sonic tag is about the size of the temple tag and is attached to the flipper tag with two small zip ties and epoxy.

Bleach marking seals' pelage (fur) is another integral part of individual monk seal identification. An over-the-counter cosmetic hair lightener is applied from a squeeze applicator (similar to a condiment dispenser) usually without disturbance to seals asleep on the beach. Marks remain on the seals' pelages until the annual molt, with a maximum duration of one year. Bleach is never applied to a part of the pelage that the seal could reach with a fore flipper, to ensure that the animal cannot rub any bleach on its face or in its eyes. Most of the seals to which marks are applied have been previously tagged and have an identity assigned. The presence of a highly visible bleach mark facilitates re-identification of an individual from a much greater distance than would otherwise be the case if researchers relied on flipper tags alone. Thus, there is less need to approach bleached seals closely, thereby reducing disturbance.

The technique for marking monk seals in the wild involves moving stealthily towards a sleeping seal and applying a unique identifier (usually a number) to the seal's pelage on the back or side. A bleach ring or "girdle" is also applied over the seal's circumference in the vicinity of the tail. The purpose of the girdle is to facilitate subsequent detection by observers that a seal has been bleached, even if the animal is lying on the previously applied number.

Collect measurements to determine body condition of individuals:
Measurements of axillary girth and dorsal straight length are indicators of Hawaiian monk seal health and body condition. These data have proven especially useful for comparing condition of seals in different subpopulations and provide insight into the factors that affect survival and population trends. The measurements are typically made with a flexible tape measure. Seals are also

sometimes weighed by suspending the seal in a hoop or stretcher net from a hanging scale supported by a tripod. Blubber depth measurements are sometimes collected using a portable imaging ultrasound by applying light pressure to the skin to obtain images along the sides and back of the animal. Blubber depth measurements indicate condition and nutritional state by assessing fat stores in the body.

These measurements are almost always conducted along with other activities that involve capture and restraint. For example, girth and length are measured at the same time weaned pups are captured for tagging. Older animals are measured when they are captured for instrumentation, health screening or other reasons. Thus, these measurements (morphometrics, weights, and ultrasound) usually do not increase the number of seals captured or disturbed.

Sample collection from captured animals to determine health status and diet: A suite of samples is collected from live-captured monk seals. Seals may be sampled for standard health screening, which is normally done opportunistically whenever a seal is captured and sedated for other reasons (*e.g.*, telemetry studies); or, the seal may have a particular health issue that is being investigated (*e.g.,* an abscess or illness). Also, tissue samples can be instrumental in determining the dietary habits of monk seals through fatty acid and stable isotope analyses. Samples collected include blood, blubber biopsies, viral and microbial swabs from body orifices (eyes, nose, mouth, anus, genital orifice) and external wounds, and whiskers (for diet and hormone studies).

Seals captured for health screening are usually sedated with diazepam administered intravenously in the extradural vein or with an intramuscular injection of midazolam. Up to 90 milliliters (ml) of whole blood is collected from the extradural vein using a standard syringe and external T-connector. Blubber core samples (through the full depth of the blubber layer) are collected from the dorsal pelvic region using a sterile 6 millimeter (mm) biopsy punch. One or two whiskers may be collected by snipping them at the base (if seal is not sedated) or plucking (if sedated).

Total handling time varies depending upon the procedure, but would range from approximately 5 to 20 minutes. Seals may be captured for focused health investigations, but these samples are routinely collected from any seal sedated for any reason (*e.g.,* instrumentation described below). By combining sample collection with other procedures, the maximum information is obtained with the minimum risk and disturbance to seals.

Appendix D provides a list of 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). 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.

In addition to the drugs in Appendix D 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.

Infectious Disease Mitigation: 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.

Presently, the only permitted infectious disease mitigation (other than surveying exposure through sample collection described above) involves capturing seals with abscesses in order to open, drain and flush the affected area with water and hydrogen peroxide or similar disinfectant. This is rarely done, and usually involves weaned pups that develop infections presumably as a result of bite wounds inflicted by aggressive male seals. In many cases, the treatment allows the wound to heal and enhances the probability that affected seals will survive. Alternatives 3 and 4 involve the use of modern long-acting antibiotics to augment treatment of abscesses.

Alternatives 3 and 4 also include more proactive efforts to mitigate the potential or eventual negative effects of infectious disease on monk seals. Activities would 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 such vaccines are safe and effective, they may be administered preventatively or in response to an outbreak. Details on the Vaccination Plan can be found in Appendix E.

Conduct genetic sampling: Tissue (usually skin) samples are collected for genetic studies. Most genetic samples consist of small cylindrical skin punches that are a byproduct of flipper tag application. Genetic material may also be obtained from skin samples collected from carcasses or from shed molt samples

(see land-based surveys, above). Collection of genetic samples, therefore, does not require any additional handling or disturbance.

Attachment of scientific instruments: A variety of instruments are attached to monk seals in order to track their movements, assess habitat use, and study foraging and haulout behavior. Seals are captured, restrained and sedated with diazepam or midazolam, and health screening is conducted as described above. Instruments are then glued to the dorsal pelage using 10-minute epoxy or a similar adhesive. Instruments are either recovered during a subsequent recapture or fall off before or during molt. Total restraint time averages approximately 25 minutes, and does not exceed 60 minutes.

The type of instruments attached include but are not limited to Very High Frequency (VHF) radio tags, time-depth recorders, satellite- or cell-phone-linked (Global Positioning System [GPS] or Argos system) location or dive recorders, and seal-mounted video cameras (*e.g.,* Crittercam). These instruments provide a wealth of information and are used to research seals and are also sometimes applied during translocation procedures (see below) or in other cases where the movements of seals are of particular interest (*e.g.,* to monitor the near-term survival, movement and behavior of seals that have had fish hooks surgically removed). New and improved instruments are constantly being developed and will be utilized as appropriate.

De-worming: Gastro-intestinal parasites are common in pinnipeds, including Hawaiian monk seals. In young seals that are struggling to find sufficient prey, parasites may impact the seals' energy and nutrition available for maintenance, growth, development and ultimately, survival. NMFS is conducting research on the feasibility and effectiveness of reducing parasite burdens in free-ranging juvenile monk seals by administering de-worming drugs periodically, then measuring whether treated and control seals differ in their subsequent growth rates or survival. Seals are captured in a net, weighed, and either given a dose of de-wormer (treatment) or simply released (controls). Two different drugs were initially tested (fendbendazole and praziquantel), administered either orally or via intra-muscular injection. Repeated treatments are given to help ascertain the most effective regimen. To reduce the number of captures required for administering drugs, a topical de-wormer is being tested, because this method reduces the need for capture and disturbance.

If de-worming proves feasible and effective, under some alternatives it may be applied as an enhancement tool in the wild population and as a complement to translocations (see below) and captive care for rehabilitation (conducted by the MMHSRP).

Translocate animals to improve survival or alleviate male aggression: 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." Hawaiian monk seals are translocated to address a variety of threats:

Nursing, or pre-weaned pups separated from their mothers may be captured, and relocated to a prospective foster mother or back to their natural mother, respectively. Young pups that are prematurely weaned or otherwise separated from their mother suffer high rates of mortality. In these cases, intervention to restore nursing can enhance the pup's survival.

Weaned pups in locations where there is a severely reduced chance of survival, such as areas of high shark predation (*e.g.,* some islets at French Frigate Shoals), disease or contaminant exposure, or likelihood of human interaction (*e.g.,* hooking, entanglement, socialization, disturbance in the MHI), may be moved to locations which present less risk. In such cases, pups born within the NWHI are translocated to other sites within the same NWHI atoll, and pups born within the MHI are moved to other beaches or islands in the MHI.

Weaned pups and juvenile seals in subpopulations where juvenile survival is low may be translocated to subpopulations with higher rates of juvenile survival. Survival at the original site may be relatively low due to insufficient prey availability (thought to be the primary cause of juvenile mortality), but may also be affected by other factors. The current permit allows for such translocations only among subpopulations *within* the NWHI. Alternative 4 would allow for more flexible application of this tool to move seals anywhere within the monk seal range. Alternative 3 would allow translocations anywhere within the monk seal range except Alternative 3 would not include translocating weaned pups from the NWHI to the MHI.

Also, Alternatives 3 and 4 allow for a return translocation of individuals back to their natal subpopulations once they have reached an age (2-3 years) when their survival probability is universally quite high. Details on this approach, referred to as *two-stage translocation*, can be found in Appendix F. The Health Screening and Quarantine Protocols for Hawaiian Monk Seal Translocation between Subpopulations is presented in Appendix G.

Alternatives 3 and 4 would allow for the experimental translocation of MHI-born seals age 2 years and older to the NWHI. This activity would approximate the return portion of two-stage translocation, and thus provide information on that aspect of the strategy without waiting for translocated seals to reach age 3 years. That is, it would evaluate how well seals that have grown up in favorable conditions (currently prevailing in the MHI) fare when taken at age 2 years or older to an area with less favorable conditions (currently prevailing in the NWHI).

Seals with unmanageable human interactions may be taken from the MHI to the NWHI under Alternatives 3 and 4. Occasionally, individual seals in the MHI develop habitual patterns of seeking out humans and interacting with them,

sometimes in ways that constitute a public safety risk and a risk to individual seals. Research to develop tools to prevent and mitigate human interactions with individual seals is proposed (see below). However, there are likely to be cases in the future, as there have been in the past, where despite all efforts to alter seal or human behavior, the interactions persist. In such cases, unmanageable seals could be translocated from the MHI to the NWHI, where they could continue to live in a wild population that is isolated from human contact.

Aggressive male monk seals, either acting singly or in groups, can severely injure other monk seals of any age or sex, but typically their victims are either weaned pups or adult females. When such males are identified as confirmed or highly suspect aggressors, they may be translocated to alternate sites where they would be less likely to cause harm. Other tools for mitigating male aggression include hazing, removal to permanent captivity or, as a last resort, lethal removal. Under some alternatives, chemical alteration to reduce aggression may be explored (see discussion about behavior modification).

Appropriate methods for translocation vary greatly depending upon the age and size of the animals involved and the distances and geographic circumstances. For example, nursing pups are typically captured by hand and may be carried on foot to lactating females, whereas aggressive adult males may need to be captured in a hoop net, sedated, placed in a cage and transported great distances in a combination of small boats, large sea-going ships, airplanes or automobiles. Protocols have been developed by the NMFS over the past several decades to safely and successfully transport live seals (Baker *et al*. 2011b).

During translocation projects, it will sometimes be necessary to temporarily hold seals captive on the beach (especially in the NWHI). For example, when collecting seals from a given subpopulation, the subjects may need to be gathered together over the course of several days so that they can subsequently be efficiently and safely transported to a ship or plane. Likewise, seals may be held at their destination for some time prior to release. The primary structure for temporary holding (longer than approximately 2 days) will be shoreline pens, measuring up to approximately 24 ft x 80 ft. Approximately 30 percent (%) of the surface area will include water at least 2 ft deep at lowest tide. The remainder of the pen would be intertidal and dry resting area above the high water line. No more than 5 seals would be held in a pen at any one time. In some instances requiring short temporary captivity (*e.g.,* less than 2 days), a shaded holding pen may be erected in the vicinity of the field station, and seals would be wetted down periodically.

Pens will be constructed from plastic or metal (typically mesh) material, approximately 4-ft high, supported by approximately 10 ft x 2-3 in diameter steel pipe driven into the sand at approximately 8-10 ft intervals. Pipe or water filled fire hose will be used to secure the bottom of the fencing material. Plastic ties will fix the fencing to the support piping and bottom weights, and windbreaks will be

erected along the fence as necessary. Fence perimeters (in and out of water) will be monitored at least twice daily, and will be repaired or changed as necessary to prevent escape or injurious entrapment. Alternate but comparable construction materials or pen configurations may be used within the range of dimensions described above. Finally, temporary holding cages with a much smaller footprint (*e.g.,* less than 8-ft long x 4-ft wide x 4-ft high) may be used for transport and holding (*e.g.,* up to one week in cage for transport and holding). Pens would be erected only when needed and dismantled as soon as they are no longer required.

Supplemental feeding following captive care: Captive care or rehabilitation of Hawaiian monk seals in need of medical attention (*e.g.,* stranded, prematurely weaned or emaciated seals), can be conducted under the authority of the NMFS Marine Mammal Health and Stranding Response Program (MMHSRP). Thus, this type of captive care is not an activity proposed in this PEIS. However, Alternatives 3 and 4 do propose to complement captive care with supplemental feeding of seals after they have been released in the NWHI. The concept is to provide a more gradual transition from captivity (where seals will have been fed) to independence (where seals will need to forage for themselves). The training to take food from people in captivity would be bridged to a wild context, such that released seals could be gradually "weaned" from human support rather than making an abrupt transition. This may improve the survival prospects of seals following captive care.

Such supplemental feeding of wild seals would occur only in the NWHI where human presence is minimal. It would not be conducted in the MHI, to avoid the problem of these seals approaching members of the public as a food source. Supplemented seals would receive Individually Quick Frozen (IQF) herring in quantities of up to 5% of body weight as frequently as once per day or at longer intervals for up to 1 year. This technique has not been tried with monk seals to date. Much would depend on the seals' behavior, as they would need to make themselves available to be fed.

To "wean" the animal while keeping it in good body shape, feeding may be more regular (daily) and involve higher rations at the start of the supplementation, then gradual reduction. It is important to note that the supplemented seals would be pre-trained to approach on cue for feeding, thus non-target seals would very likely not try to obtain provisions. Any uneaten portion of herring offered to a seal would be collected and disposed of properly to keep any waste out of the natural environment.

Mitigate fishery and human/domestic animal interactions: Marine debris and derelict fishing gear have been well documented to entangle Hawaiian monk seals, which have one of the highest documented entanglement rates of any pinniped species. Marine debris entanglement causes harm to seals by drowning,

causing severe wounds, and restricting behavior (including swimming, diving and foraging). Whenever it can be safely accomplished, seals are disentangled.

Monk seals also get hooked by derelict and actively fished gear, almost exclusively in the MHI. Hooks may be embedded in the body, in and around the mouth or are sometimes ingested. Hookings can cause pain, injury and mortality in monk seals and, like entanglement, hooks are removed whenever it can be accomplished safely.

Seals which are observed to be entangled by nets, lines, or other marine debris are freed by either of two methods: (1) Animals would be captured by hand or net, restrained, disentangled (by hand or by using a cutting implement), and freed; or (2) The entangling item would be cut free using a cutting implement by hand (while the seal is asleep) or attached to a pole, with no restraint of the animal. The selected technique depends upon the particular circumstances of each case. Hooks would be removed from seals by similarly restraining the animal and removing the hook by hand, often with the aid of de-hooking tools designed specifically for this purpose. The seals sometimes require sedation on the beach, and, if necessary, are brought into temporary captivity for surgical hook removal by a veterinary staff, requiring general anesthesia.

Behavior Modification: In addition to entanglement and hooking interactions, seals in the MHI sometimes become socialized or habituated to people or domesticated animals. Such interactions may involve humans provisioning seals with food, seals taking catch from fishers, play or aggressive behavior between people, pets and seals, etc. These interactions can be dangerous for all participants. Historically, NMFS typically intervenes by first attempting to haze or harass habituated seals away from high-risk areas, and then, if the behavior persists, by translocating the seal to locations where there are more seals and less human interaction. As each interaction situation entails a unique set of circumstances and complications, a variety of methods may be necessary to resolve each situation, including a suite of methods generally referred to as behavioral conditioning or behavior modification.

Alternatives 3 and 4 involve research to prevent or reduce these interactions. Techniques may involve aversive conditioning, where seals behaving in an undesirable fashion are exposed to unpleasant (but not harmful) experiences in order to discourage the undesired behavior. A variety of aversive and disruptive stimuli may be considered for behavioral modification. While the specific stimuli would be varied they would fall under the following general categories:

- Visual and aural disruptive stimuli: These are stimuli that are intended to stop a seal from its current behavior. It could be any type of aural or visual stimulus (like waving palm fronds) that disrupts a behavior or displaces a seal from an area.

- Tactile harassment: This includes any technique that repels seals or stops a behavior by direct contact, including prodding with blunt objects (*e.g.*, poles), crowding boards, or low-velocity objects tossed or projected, etc.

- Acoustic harassment and deterrents: designed to cause temporary annoyance, discomfort or to frighten seals to displace them from specific locations where conflict occurs. This could include seal crackers (similar to a small firework), underwater speakers, etc.

- Chemical: This includes any chemical that may be used to alter the taste of prey seals obtain in an undesirable ways (*e.g.,* by depredating fishers' catch, bait or gear) or is used to cause temporary minor discomfort to seals to displace them from an area or stop particular behaviors.

In addition to aversive stimuli, positive reinforcers may also be researched and developed to replace the reinforcement of interacting with humans. Tools and techniques would be developed in a careful experimental fashion, and if proven safe and effective, applied as appropriate. If behavioral modification allows a seal that might otherwise be translocated or brought into captivity to live out its life in the wild, it could be a valuable tool for species recovery.

In addition, aggressive adult male seals may be hazed away from conspecific victims by field staff approaching, vocalizing or otherwise making noise, prodding with a long pole, or throwing objects (*e.g.*, rocks, coral, sticks, debris). Care will be taken not to harm or cause severe pain to the male. The objective is to distract the target animal and frighten him away rather than to cause harm or pain. However, the risk of death to a conspecific outweighs any risk of injury to the adult male.

Mortality incidental to research activities: Despite NMFS's excellent record of safely handling Hawaiian monk seals, there is always some finite risk of mortality inherent in research activities that involve handling seals. Since 2000, one such unintentional research-related mortality has occurred.

In addition to unintentional mortalities, moribund/unhealthy seals may be humanely euthanized or die incidental to handling. Most health screening research involves sampling seals that appear healthy. Severely ill or compromised seals are very rarely encountered. Yet such seals may be critical to sample in order to understand the source of their illness and, more importantly, to recognize disease outbreaks that may threaten the broader population. Euthanasia may occur if an experienced on-site veterinarian determines there is a high probability of the death of an animal due to the injury or disease condition. In such instances, seals would be captured, sedated and biologically sampled as described above for health assessments. Thereafter, seals would be injected with a lethal dose of Beuthanasia® (sodium pentobarbital) into the extradural vein at a dose of 1 ml/10 pounds (lb). Immediately after the animal has succumbed, a complete necropsy would be conducted, with samples saved from all major

organs. Because of the presence of barbiturates in the carcasses, all soft parts not retained would be collected in plastic bags for subsequent environmentally safe disposal (*e.g.,* incineration).

Mortality or removal from wild population for enhancement activities: As described above, aggressive male monk seals can cause serious injuries or mortality to other seals, most notably adult females and weaned pups. When males are identified as having seriously injured or killed another seal, they may be translocated as described above. However, if translocation is not a preferred option, aggressive males may be brought into permanent captivity or, as a last resort, humanely euthanized following the procedures outlined in the previous section.

Some of the alternatives involve ambitious efforts to enhance Hawaiian monk seal populations, through means such as two-stage translocation, de-worming, vaccination, and behavioral modifications. All of these activities involve increased handling of seals and some involve temporary captivity and transport. These activities would be undertaken to improve monk seal survival, but also entail additional risks. Therefore, there is potential that seals may die unintentionally as a result of these enhancement activities. Since 2000, two monk seals have died in captive facilities during enhancement activities (one weaned pup awaiting disease screen results associated with a translocation, and one juvenile held for captive care).

Mitigate adult male aggression using chemical intervention: Adult male aggression is of particular concern when the perpetrator displays an abnormal focus on young animals, with frequent, repeated, and severely aggressive behavior that threatens the young animals' life. As described above, the NMFS is permitted to mitigate adult male seal aggression by a variety of means. Males identified as aggressors may be hazed, translocated, brought into permanent captivity or as a last resort, lethally removed. Each of these methods has drawbacks.

Translocation works best if the aggressors can be taken somewhere where they do not persist in harming other seals or elicit other problems. In the past, male monk seals were translocated from the NWHI to Johnston Atoll (1984 and 1998) or to the MHI (1994), sites chosen because they harbored few or no other seals. Currently, Johnston Atoll is the only site within the species natural range which has few or no seals. However, past experience suggests that seals taken to Johnston Atoll do not persist there. Permanent captivity is effective; however, captive facilities that are willing and able to indefinitely care for adult male monk seals are rare. Lethal removal is also effective, but the NMFS has used this extreme measure very judiciously and considers it a regrettable last resort. Adult males may be euthanized if they have been identified as killing or seriously injuring a conspecific, and if translocation and permanent captivity were not feasible options.

All the above approaches can also be logistically complex and quite expensive, factors which also limit their viability. Finally, in cases where the identity of male aggressors is suspected, but not unequivocal, permanent removal efforts (captivity and euthanasia) are not appropriate. It would be desirable to develop another tool for mitigating male aggression that was effective, humane, feasible, affordable and reversible.

In the 1990s, some experimentation to chemically alter testosterone levels of adult male Hawaiian monk seals using a gonadotropin-releasing hormone (GnRH) agonist (decapeptyl) was done with both captive and wild seals. The results indicated that treated males usually responded by exhibiting lower testosterone levels (Atkinson *et al.* 1986; Atkinson and Gilmartin 1992). However, the studies did not address whether or not aggressive behavior was reduced. Other drugs (*e.g.,* Desolorelin) have also been used in a variety of species to reduce testosterone production and aggression. Alternatives 3 and 4 include research to better elucidate the potential use of GnRH agonists as a tool for mitigating adult male monk seal aggression. Research would likely involve both captive trials and research on free-ranging male seals. If the method proves effective, it could be used as an alternative to temporarily alter aggressive behavior of specific male seals in order to enhance survival of adult females and immature seals.

Captive holding for research and enhancement: Seals may be held in temporary captivity for various reasons. For example, aggressive adult male seals removed from the wild for permanent captivity may be held in temporary holding facilities and cared for until transport to a permanent holding facility occurs. Or, seals may be brought into temporary captivity for specific research studies such as taste aversion trials (as part of the behavioral modification program). Research studies described in this section may also occur on seals already in permanent captivity (NMFS 2006). As mentioned above, during translocations, seals may be held in temporary pens or facilities prior to transport or for quarantine. However, captive care for purposes of rehabilitation is not included in the alternatives (this type of captive care is covered by the MMHSRP's permit and PEIS; NMFS 2009a).

2.6 ALTERNATIVES CARRIED FORWARD FOR ANALYSIS

The four alternatives carried forward for detailed analysis in Chapter 4 vary by the nature and extent of recovery activities, including the types and level (*i.e.,* number of animals or procedures) of research and enhancement that would be permitted under each different policy. These alternatives represent a reasonable range of research and enhancement options in accordance with the purpose and need described in Chapter 1 and fulfill the NEPA requirements for analyzing the No Action alternative.

There are two broad categories of research and enhancement activities that require permits:

(1) Research and enhancement that does not involve capture, handling or collection of tissue from live animals; and

(2) Research and enhancement that requires capture, handling or intrusive procedures on live animals.

Both categories have some potential for direct and indirect mortality. Table 2.6-1 contains additional detail on what general types of monk seal research and enhancement activities fall into each of these two categories. The type and amount of these activities would vary across the alternatives.

Table 2.6-1 Research and Enhancement Activities Requiring Permits

General Categories of Research and Enhancement Activities	
Activities that Do Not Require Capture, Handling, or Collection of Tissue from Live Animals	**Activities that Require Capture, Handling, or Collection of Tissue from Live Animals**
• Aerial, vessel, and ground surveys – conducted to count animals, bleach mark and resight animals that have been tagged or bleach-marked, and to document behavioral observations. • Scat and spew collection – occurs on islands/atolls and is used to identify recent prey consumed and intestinal parasites. Molted fur collected from islands/atolls is used for genetic analysis. • Collection of tissue samples from animals found dead; used for health/disease studies. • Hazing animals for their protection or the protection of conspecifics.	• Collection of morphometric measurements – includes external measurements of an animal (*e.g.,* length and girth). • Collection of tissue samples – *e.g.*, skin, blubber, or blood. Swabs from the eyes, nose, mouth, anus, genital orifice, and external wounds may be taken for health/disease screening. • Treatment of abscesses by manually lancing the abscess and flushing with water and hydrogen peroxide or similar disinfectant. • Treatment for parasites with injectable drugs. • Permanent or temporary marking of animals – includes plastic tags secured on the rear flippers, which are used to monitor animals, to facilitate recapture of sampled animals, and to determine vital rates. • Attachment of telemetry instruments – used to collect information on movement patterns and foraging behavior. • Translocation – transport of animals over ground, by vessel or airplane to areas to improve survival. • Temporary captivity – *e.g.*, temporary holding for quarantine during translocation.

Note: This table is meant to provide a general overview of these activities by category and does not include all activities. Additional detail on the proposed alternatives is provided in Table 2.10-1.

2.7 *ALTERNATIVE 1: STATUS QUO*

Under the Status Quo Alternative, the current NMFS Research and Enhancement Permit (10137, as amended) would continue until its expiration in 2014, and subsequent permits would be issued to continue research and enhancement activities according to the scope and methods currently permitted, with restrictions and mitigation measures required by the MMPA, ESA, and NMFS implementing regulations. In addition to these statutory and regulatory permit restrictions, the impact of proposed research and enhancement activities for Hawaiian monk seals must remain at a level below that which would jeopardize the continued existence of the species or result in adverse modification of critical habitat, as required by Section 7 of the ESA.

The levels and types of research and enhancement activities would be commensurate with what has previously been permitted as defined by the active NMFS permit 10137. New permits or permit amendments for levels and types of research the same as currently permitted would be approved unless it were determined that issuance would exceed the ESA jeopardy or adverse modification threshold when expected impacts were added to existing research, enhancement and other activities in the baseline at the time the application was received.

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

- Monitoring via ground, vessel, and aerial surveys; marking and photo ID;
- Health screening and instrumentation;
- De-worming research;
- Specimen collection and import/export of specimens;
- Disentanglement and dehooking;
- Adult male removal for enhancement; and
- Translocation for enhancement including:
    - Translocating abandoned nursing pups to a prospective foster mother or their natural mother within their birth island or atoll;

- Translocating weaned pups from a high risk area (*e.g.*, known shark predation) to a low risk area within the same island or atoll in the NWHI or Johnston Atoll; translocations in the MHI may be to a different location on the same island or to a different island in the MHI;

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

No new activities or expanded scope of existing activities would occur under the Status Quo Alternative.

2.8 ALTERNATIVE 2: NO ACTION

The No Action Alternative, which must be considered in an EIS according to CEQ regulations (40 CFR 1502.14), would only allow for status quo research and enhancement activities on Hawaiian monk seals to continue until the current permit (10137) expires in 2014. Thereafter 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 Permit No. 10137 when it expires, nor could that permit be amended to allow modifications in research or enhancement activities, sample sizes or objectives.

When the existing permit expires, all research and enhancement activities that require a permit would cease except for those activities covered under the MMHSRP permit as described in Sections 1.4, 1.7, and 1.9.3. Under the MMHSRP permit, NMFS could still respond to stranded or injured wild seals. No research on the wild population would occur under Alternative 2 including population monitoring, genetics, health assessment, and foraging research. Seals could not be approached nor captured to collect any new research data, and activities such as two-stage translocations to enhance survival and vaccination research and enhancement could not be conducted under this program.

Limited enhancement activities such as disentanglements and de-hooking seals, and hazing or translocating seals away from imminently harmful situations could be conducted under the MMHSRP permit. Incidental or intentional mortality due to enhancement activities would only be authorized during emergency response activities under the MMHSRP permit.

Scat and spew samples could be collected from vacant beaches, and seals could only be observed and photographed at distances and under conditions that are not likely to result in takes (and therefore would not require permits). Permits

and grants could also be awarded for receipt and use of tissues from animals that have been found dead and collected under the MMHSRP. Analysis of previously-collected samples and data could be conducted.

2.9 *ALTERNATIVE 3: LIMITED TRANSLOCATION (PREFERRED ALTERNATIVE)*

Under Alternative 3, all activities currently permitted under the status quo would continue, and new permits would be granted with expanded scope and methods, with restrictions and mitigation measures required by the MMPA, ESA, and NMFS implementing regulations.

As under Alternative 1, the impact of proposed research and enhancement activities for Hawaiian monk seals must remain at a level below that which would jeopardize the continued existence of the species or result in adverse modification of critical habitat, as required by Section 7 of the ESA.

Alternative 3 includes activities described in Section 2.7 in the Status Quo as well as new and expanded activities. These are provided in more detail in Table 2.10-1. The new and expanded activities include, but are not limited to:

- Vaccination studies and potential implementation of vaccines to mitigate infectious disease.
- Potential implementation of de-worming as an enhancement tool to improve juvenile Hawaiian monk seal survival.
- Expanded scope and number of seal translocations in addition to those in the status quo, including:
    - Taking seals with unmanageable human interactions from the MHI to NWHI.
    - Taking juvenile and older seals from the MHI to NWHI to examine their subsequent survival.
    - Implementing a two-stage translocation program whereby weaned pups are taken from areas of lower survival to areas of higher survival (within the NWHI, within the MHI, or from the MHI to NWHI, **but not from the NWHI to MHI**), with the option of returning them to their natal location or nearest appropriate site at age 2 years and older (see Figure 2.9-1). Note that seals originally born in the MHI and translocated to the NWHI may be returned to the MHI. Under this program, a maximum of 200 weaned seal pups could be translocated over a 10-year period (only 20 pups per year). While this number is the maximum number of seals allowable under an Alternative 3 permit, the actual number of weaned seal pups

potentially translocated as part of this two-stage program would likely be much lower.

  - Details of the translocations would be determined by a decision framework as described in Section 5.2 and Appendix F.

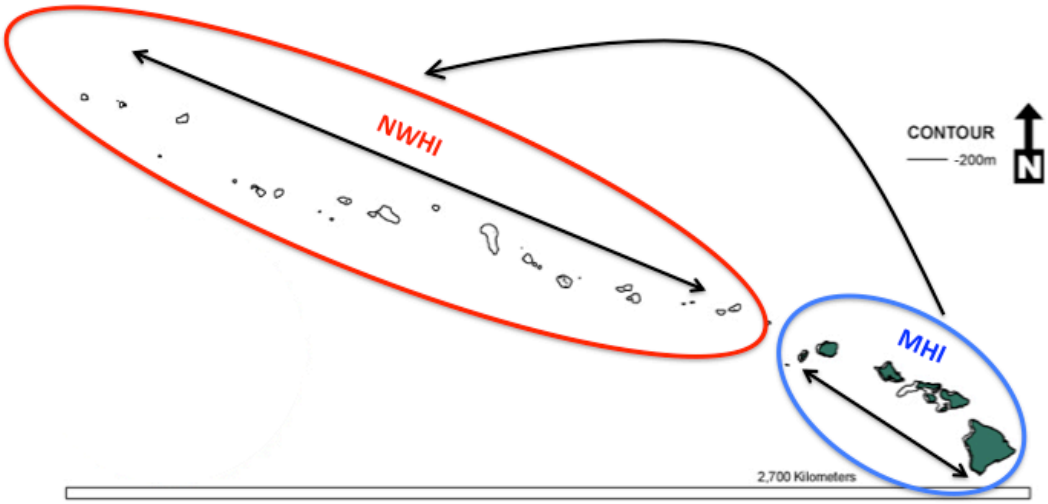
- Supplemental feeding of monk seals in NWHI locations where seals are released after being cared for in captivity (post-rehabilitation).
- Research to develop tools for modifying undesirable Hawaiian monk seal behavior related to interactions with humans and fishing gear in the MHI. If proven effective by research, these tools would be implemented.
- Chemical alteration of aggressive male monk seal behavior using a drug to reduce testosterone.

Relative to the status quo (Alternative 1), the new and expanded elements encompassed by Alternative 3 reflect the perspective of the 2007 Recovery Plan that actions over and above the status quo will be needed if the Hawaiian monk seal population is to stop declining and eventually recover. As such, this alternative maintains the activities currently permitted as well as the above list of new actions. It is important to recognize that all elements of the alternative, both status quo and novel, reflect recommendations of the Recovery Plan. The degree to which each element of this alternative would be implemented would depend upon funding levels and varying needs for specific actions, which will be informed by research and monitoring.

The distinctive feature of Alternative 3 is that while translocation as a tool for conserving Hawaiian monk seals would be expanded, translocations of weaned pups from the NWHI to the MHI would not be permitted. However, seals born in the MHI and previously taken to the NWHI may be returned to the MHI in the second stage of two-stage translocations.

Public notice of receipt of a new 5-year permit application submitted by PIFSC (File No. 16632) was published in the *Federal Register* on March 1, 2013 for a 45-day comment period (78 FR 13863). This permit application includes all activities for Alternative 3 described in Table 2.10-1 and Appendix H. This includes activities in the status quo as well as the new and expanded activities listed above.

Figure 2.9-1 Alternative 3 Limited Translocation Options (Preferred Alternative). Weaned pups may be moved from areas of lower to higher survival within the NWHI, within the MHI, or from the MHI to NWHI. Seals may be returned to their natal area after they are 2 years old.



2.10 ALTERNATIVE 4: ENHANCED IMPLEMENTATION

The enhanced implementation alternative would encompass all the activities permitted under Alternative 3 listed in the previous section, with the addition of the option for temporary translocation of weaned pups from the NWHI to the MHI as follows.

- Expanded scope and number of seal translocations, including:
    - Implementing a two-stage translocation program whereby weaned pups are taken from areas of lower survival to areas of higher survival anywhere within the Hawaiian Archipelago, ***including between NWHI and MHI (i.e., greater flexibility than under Alternative 3)***. This could equate to a total of 200 weaned seal pups translocated over a 10-year period with a maximum of 60 translocated seal pups potentially located in the MHI during year 3 of the translocation process. Similar to Alternative 3, while this number is the maximum number of seals allowable under Alternative 4, the actual number of weaned pups potentially translocated as part of this 2-stage program would likely be much lower.
    - At age 2 or 3 years, any surviving translocatees would be returned to the NWHI (see Figure 2.10-1). Details of the translocations would be determined by a decision framework as described in Section 5.2 and Appendix F.

The only difference between Alternative 4 and Alternative 3 (Preferred) is that Alternative 4 would also allow for two-stage translocation of weaned pups from the NWHI to the MHI and their subsequent return at age 2 or 3 yr to the NWHI. This distinction would allow for maximal flexibility to take advantage of the potential benefits of two-stage translocation, because weaned pups could be moved to wherever their survival chances are best. The same, strict quarantine protocols identified in Alternative 3 would be required for returning seals to the NWHI from the MHI, where seals are exposed to domestic and feral mammals.

Figure 2.10-1 ***Alternative 4 Translocation Options. Weaned pups may be moved from areas of lower to higher survival within the NWHI, within the MHI, from the NWHI to the MHI or from the MHI to NWHI. Seals may be returned to their natal area after they are 2 years old. Identical to Alternative 3 options except that weaned pups can be moved from the NWHI to the MHI.***

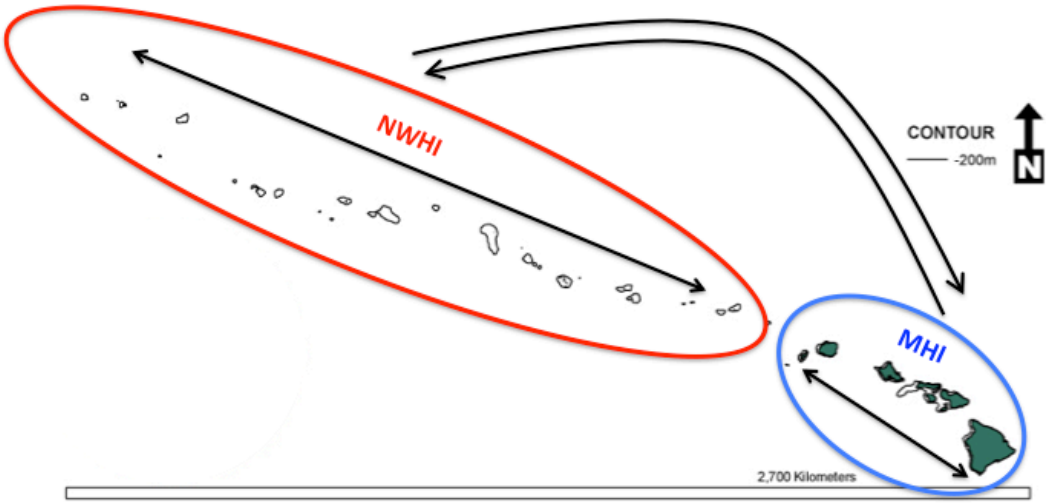


Table 2.10-1 Proposed Alternatives

Classification	Research/Enhancement Activity	Alternative 1 - Status Quo; Currently-permitted activities would continue after 2014 with no increased efforts or new activities allowed.	Alternative 2 - No Action; No Permit after 2014; activities currently permitted would not be authorized after 2014.	Alternative 3 - Limited Translocation (Preferred Alternative)	Alternative 4 - Enhanced Implementation Alternative
Activities that do not involve capture, handling, or collection of tissues from live animals	*Land-based surveys and observations* *(Research)*	• Currently-permitted land-based surveys in the Hawaiian Archipelago and Johnston Atoll would continue after 2014. • Continue annual monitoring, including close approach for observing, counting and photographing marked and unmarked seals, in the NWHI, and analyze and report findings. • Collection of molt, scat, spew and placentae and could continue after 2014. • Up to 1,440 seals may be approached annually (total for aerial-, vessel- and land-based surveys.) • Installation, operation and maintenance of remote cameras to obtain photographs and video images of seals to augment data otherwise requiring researcher presence on site • Use of small, unmanned amphibious vehicles (*e.g.*, rover).	• Same as Status Quo except no new permits or authorizations after 2014.	• Same as Status Quo **plus**: • Additional surveys above number permitted in Status Quo could be authorized.	• Same as Alternative 3
	Sample collection and use of tissues from encountered carcasses *(Research)*	• Currently-permitted necropsies, sample collection, worldwide export/import of necropsy samples for analysis, and studies on carcasses would continue after 2014. • Use salvaged tissue as bait for permitted shark removals.	• Same as Status Quo except no new permits or authorizations issued after 2014.	• Same as Status Quo.	• Same as Status Quo
	Vessel surveys and observations *(Research)*	• Currently-permitted vessel-based surveys in the Hawaiian Archipelago and Johnston Atoll would continue after 2014. • Continue vessel surveys including close approach for observing, counting and photographing marked and unmarked seals. • Up to 1,440 seals may be approached annually (total for aerial-, vessel- and ground-based surveys.)	• Same as Status Quo except no new permits or authorizations after 2014.	• Same as Status Quo, **plus**: • Additional surveys above number permitted in Status Quo could be authorized.	• Same as Alternative 3
	Aerial surveys and observations *(Research)*	• Currently-permitted aerial surveys in the Hawaiian Archipelago and Johnston Atoll would continue after 2014. • Continue aerial surveys including approach from 500 ft for observing, counting and photographing marked and unmarked seals. • Optimize survey techniques using small, unmanned aerial vehicles to conduct aerial surveys (from ≥ 10 ft) where access is limited. • Up to 1,440 seals may be approached annually (total for aerial-, vessel- and ground-based surveys.)	• Same as Status Quo except no new permits or authorizations after 2014.	• Same as Status Quo, **plus**: • Additional surveys above number permitted in Status Quo could be authorized. • Approach closer than 500 ft may be authorized based on typically observed lack of seal response to aircraft.	• Same as Alternative 3
	Incidental harassment during any Research or Enhancement Activity	• Currently-permitted incidental harassment in the Hawaiian Archipelago and Johnston Atoll would continue after 2014. • Non-target seals may be harassed incidental to research and enhancement (e.g., during captures, non-target seals nearby may be disturbed). • Up to 200 seals may be incidentally harassed annually.	• Same as Status Quo except no new permits or authorizations issued after 2014.	• Same as Status Quo, **plus**: • Additional harassment above number permitted in Status Quo could be authorized.	• Same as Alternative 3

Classification	Research/Enhancement Activity	Alternative 1 - Status Quo; Currently-permitted activities would continue after 2014 with no increased efforts or new activities allowed.	Alternative 2 - No Action; No Permit after 2014; activities currently permitted would not be authorized after 2014.	Alternative 3 - Limited Translocation (Preferred Alternative)	Alternative 4 - Enhanced Implementation Alternative
Activities that require capture, handling, or procedures on wild seals	*Marking (tagging, bleaching)* *(Research)*	• Currently-permitted marking of seals in the Hawaiian Archipelago and Johnston Atoll would continue after 2014. • Approach seals to mark fur with temporary bleach marks. • Capture, restrain, and sedate (if needed), seals to apply flipper, PIT and sonic tags. • Up to 536 seals of any size or sex (except lactating females and nursing pups) can be tagged. Up to 35 weaned pups at French Frigate Shoals can be tagged with sonic tags annually for up to 3 years. • Up to 1,315 seals may be approached and bleached.	• Same as Status Quo except no new permits or authorizations issued after 2014.	• Same as Status Quo, plus: • Number of animals above that permitted in Status Quo could be authorized for marking. • Pre-weaned pups could be tagged if still nursing at end of field season.	• Same as Alternative 3
Activities that require capture, handling, or procedures on wild seals	*Collect measurements to determine body condition* *(Research)*	• Currently-permitted morphometric measurements in the Hawaiian Archipelago and Johnston Atoll would continue after 2014. • Seals may be captured (by hand or net) and restrained to obtain weight, length, girth, and blubber thickness via ultrasound • Performed concurrently with flipper tag marking, health assessments, and de-worming.	• Same as Status Quo except no new permits or authorizations issued after 2014.	• Same as Status Quo, **plus**: • Number of animals above that permitted in Status Quo could be authorized for body condition assessment. • Captive seals could be used to test methods.	• Same as Alternative 3
	Sample collection from captured seals to determine health status and diet *(Research)*	• Currently-permitted sample collection from captured seals in the Hawaiian Archipelago would continue past 2014. • Up to 70 healthy and 30 unhealthy seals (except lactating females and nursing pups) annually may be captured, restrained, handled, sedated and sampled (skin/blubber biopsy, blood, whiskers, swab all orifices). • Flipper tagging and ultrasound performed in conjunction with sampling.	• Same as Status Quo except no new permits or authorizations issued after 2014.	• Same as Status Quo, **plus**: • Additional number of seals, samples/procedures above number permitted in Status Quo could be authorized. • Captive seals could be sampled.	• Same as Alternative 3
	Infectious Disease Mitigation *(Research and enhancement)*	• Currently-permitted mitigation of infectious disease would continue after 2014. • Lance and treat abscesses on up to 30 seals annually. • Monitor for disease as part of other tissue collection and morphometric studies as described above.	• Same as Status Quo except no new permits or authorizations issued after 2014.	• Same as Status Quo, **plus:** • Conduct vaccination studies including research on safety and efficacy of vaccines for infectious diseases. • Studies could include captive studies with surrogate species, captive studies with Hawaiian monk seals and free-ranging Hawaiian monk seals. • If research indicates vaccination is safe, conduct wide-spread vaccination of wild seals as either a stand-alone activity or in conjunction with translocation and deworming, or with captive care for rehabilitation under the Marine Mammal Health and Stranding Response Program. • Treat injured seals in the wild with antibiotics. • Additional samples/screening above number permitted in Status Quo could be authorized as deemed necessary.	• Same as Alternative 3
	Conduct Genetic Sampling *(Research)*	• Currently-permitted genetic sampling in the Hawaiian Archipelago and Johnston Atoll would continue after 2014. • Skin samples may be obtained during flipper tagging and tissue sampling activities, and shed molted skin may be collected.	• Same as Status Quo except no new permits or authorizations issued after 2014.	• Same as Status Quo **plus**: • Number of animals above that permitted in Status Quo could be authorized for genetic sampling. • Captive seals could be sampled.	• Same as Alternative 3

Classification	Research/Enhancement Activity	Alternative 1 - Status Quo; Currently-permitted activities would continue after 2014 with no increased efforts or new activities allowed.	Alternative 2 - No Action; No Permit after 2014; activities currently permitted would not be authorized after 2014.	Alternative 3 - Limited Translocation (Preferred Alternative)	Alternative 4 - Enhanced Implementation Alternative
	Attachment of scientific instruments *(Research and enhancement)*	• Currently-permitted attachment of scientific instruments in the Hawaiian Archipelago would continue after 2014. • Capture, restrain, and sedate seals to attach (glue to pelage) telemetry devices, including but not limited to: GPS, satellite trackers, dive recorders, VHS tags and "Crittercam." • Up to 60 healthy seals (except lactating females and nursing pups) can be instrumented in conjunction with health and disease studies. • Some translocated seals may be instrumented.	• Same as Status Quo except no new permits or authorizations issued after 2014.	• Same as Status Quo, **plus:** • Additional instrumentation above number and type permitted in Status Quo could be authorized. • Captive seals could be used to test instruments.	• Same as Alternative 3
Activities that require capture, handling, or procedures on wild seals	*De-worming* *(Research and enhancement)*	• Currently-permitted studies and treatment (through topical treatment, injections or oral treatment) for intestinal parasites in the Hawaiian Archipelago would continue after 2014. • Capture (by hand or net) and restrain seals to weigh and measure, treat for intestinal parasites, fecal sample, and conduct ultrasound measurements to determine if treatment is effective. • Up to 200 seals (up to age 3 years) can be treated for intestinal parasites.	• Same as Status Quo except no new permits or authorizations issued after 2014.	• If treatment for intestinal parasites is deemed effective, conduct widespread treatment of young seals to reduce overall parasite loads with additional treatments above number permitted in Status Quo. • New treatments could be used as they become available. • Could be done in conjunction with translocation and vaccination. • Captive seals could be treated.	• Same as Alternative 3
	Translocate seals to improve survival or alleviate male aggression *(Enhancement)*	• Currently-permitted translocation to aid abandoned nursing pups, mitigate shark predation or human interaction, or mitigate male aggression would continue after 2014. • Capture (net or hand), restrain, handle, transport, and release seals by various methods. • Up to 20 nursing pups annually that have been abandoned or have been switched between two lactating females may be captured, restrained by hand or net, and relocated to a prospective foster mother or back to their natural mother, respectively. • Up to 35 weaned pups annually may be captured, restrained, sedated, sampled, instrumented, and translocated via boat, vehicle or aircraft from a high risk area (*e.g.,* shark predation or anthropogenic threats) to a low risk area within the same island or atoll in the NWHI or Johnston Atoll, or within the MHI. • Up to 6 weaned pups annually may be translocated (using methods as described above) within the NWHI from areas of poor juvenile survival to areas with higher rates of juvenile survival. • Up to 10 aggressive adult males over a 5-year period may be captured, restrained, sedated, sampled, instrumented and translocated via boat, vehicle or aircraft or placed in permanent captivity to improve survival of immature seals and females.	• Same as Status Quo except no new permits or authorizations issued after 2014.	• Same as Status Quo **with following differences:** • Translocate seals with unmanageable human interactions out of the MHI as needed. • Translocate ≥2-year-old seals from the MHI to NWHI to evaluate survival rates. • Additional translocations within the NWHI or within the MHI above number permitted in Status Quo could be authorized. • Translocate up to 20 weaned pups annually from areas with low prospective juvenile survival to areas with higher juvenile survival within the NWHI, within the MHI or from the MHI to NWHI (instead of only within the NWHI as under Status Quo). **This *excludes* moving seals born in the NWHI to MHI**. This could equate to a total of 200 weaned seal pups translocated over a 10-year period though this number is not likely to be reached (see Section 2.9). • For two-stage translocations, NMFS will use a decision framework for determining the source and recipient sites as well as other aspects of translocations, *with a prohibition* on translocation of weaned pups from the NWHI to the MHI. • Option to return previously translocated seals ≥2 years old back to their original site or nearest appropriate alternative site. Note that seals born in the MHI and previously translocated to the NWHI may be returned to the MHI in the second stage of two-stage translocations.	• Same as Alternative 3 **with following differences**: • Translocate up to 20 weaned pups annually from areas with low prospective juvenile survival to areas with higher juvenile survival **anywhere within the Hawaiian Archipelago**, ***including*** **from the NWHI to MHI** (*i.e.,* greater flexibility than under Alternative 3). This could equate to a total of 200 weaned seal pups translocated over a 10-year period with a maximum of 60 translocated seal pups in the MHI during year 3 of the translocation process. While this could be the maximum number permitted, it is not likely this many weaned seal pups would be translocated (see Section 2.10). • NMFS will use a decision framework for determining the source and recipient sites (see Appendix F) as well as other aspects of translocations. • Option to return previously

Classification	Research/Enhancement Activity	Alternative 1 - Status Quo; Currently-permitted activities would continue after 2014 with no increased efforts or new activities allowed.	Alternative 2 - No Action; No Permit after 2014; activities currently permitted would not be authorized after 2014.	Alternative 3 - Limited Translocation (Preferred Alternative)	Alternative 4 - Enhanced Implementation Alternative
					translocated seals ≥2 years old back to their original site or nearest appropriate alternative site.
	Supplemental Feeding	• Not authorized.	• Not authorized.	• Supplemental feeding of monk seals in NWHI locations where seals are released after being cared for in captivity (post-rehabilitation).	• Same as Alternative 3.
	Mitigate Fishery and Human/Domestic Animal Interactions and alter aggressive male behavior *(Research and enhancement)*	• Currently-permitted approach and disentanglement of any seals in the Hawaiian Archipelago or Johnston Atoll from marine debris would continue after 2014. • Fishing hooks embedded in seals may also be removed. • Restraint and sedation may be used as necessary to accomplish these tasks on an unlimited number of seals (*i.e.,* as warranted). • Translocating seals away from high risk areas such as where human/domestic animal interactions or adult male aggression threaten a seal is covered above in Translocations.	• Same as Status Quo except no new permits or authorizations issued after 2014.	• Conduct research to develop tools for modifying undesirable Hawaiian monk seal behavior related to interactions with humans, domestic animals, and fishing gear in the MHI. This includes research on captive and wild and seals. • If research indicates that aversive conditioning or other methods are effective in reducing interactions with humans, domestic animals, and fishing gear, then implement these tools, particularly in the MHI as needed. • Chemically alter aggressive male monk seal behavior using a testosterone agonist. This includes research on captive and wild seals. If research indicates methods are effective, implement in the wild as needed. • Additional disturbances/harassment above number permitted in Status Quo could be authorized as needed.	• Same as Alternative 3
Potential direct and indirect mortality from research and enhancement	*Mortality incidental to research and enhancement activities*	• Currently-permitted incidental mortality during authorized research and enhancement not to exceed two seals any age or sex annually, up to four over five years would be authorized after 2014.	• Same as Status Quo except no new permits issued after 2014.	• Additional mortality incidental to enhancement (but not research) activities may be authorized.	• Same as Alternative 3
	Intentional lethal collection and permanent removal of seals from the wild for research (moribund seals) or enhancement (adult males)	• Currently-permitted euthanasia of aggressive adult males and any moribund seals in the Hawaiian Archipelago or Johnston Atoll could continue after 2014. • Up to 10 aggressive adult males may be euthanized over a 5-year period to improve survival of immature seals and adult females (total includes translocating aggressive males). • Up to 10 moribund seals of any age/sex may be humanely euthanized and sampled for diagnosis over a 5-year period.	• Same as Status Quo except no new permits issued after 2014.	• Same as Status Quo	• Same as Status Quo

2.11 *ELEMENTS COMMON TO ALL ALTERNATIVES*

Some elements of the alternatives, such as the use of new technology, can be applied under any of the alternatives[1] as appropriate. The following methods would be common to all research and enhancement permits:

- Protocols for capture and handling of monk seals;
- Application of new technologies, as appropriate, to improve results or minimize disturbance;
- Optimization of survey techniques including, but not limited to, timing and coordination;
- Research on existing data sets such as population modeling, etc.;
- Research on existing tissue samples including skin, muscle, blubber, blood, swabs, placentae, etc.; and
- Collection of samples from prey species for potential contaminant monitoring.

Additionally, there are statutory and regulatory requirements for MMPA/ESA permits common to all alternatives, such as:

- Regulatory requirements for issuing and amending permits;
- General permit terms and conditions;
- Mitigation measures to minimize impacts and ensure compliance with the MMPA and ESA;
- Monitoring requirements to determine the status of individual animals after they have been handled and the effects of research related disturbance on the island or atoll, especially in relation to the incidence of serious injury and mortality;
- Requirements for timely dissemination of research results and notification of publications;
- Types of information required in annual and final reports; and

[1]Note that under Alternative 2, No Action, the current MMPA/ESA Research and Enhancement Permit would expire in June 2014.

- Duration of permits.

This section presents requirements for permits common to all alternatives.

2.11.1 *GENERAL PERMIT ISSUANCE REQUIREMENTS (50 CFR 216.34)*

- Permit applicants must demonstrate that the proposed activity is:
    - Humane[2] and does not present unnecessary risks to the health and welfare of marine mammals;
    - Consistent with all restrictions in 50 CFR 216.41;
    - Conducted consistent with the purposes and policies in Section 2 of the ESA; and
    - By itself or with other activities, will not likely have a significant adverse impact on the species.
- The applicant's expertise, facilities, and resources must be adequate to successfully accomplish the objectives and activities stated in the application.
- If a live animal will be held captive or transported, the applicant's qualifications, facilities, and resources must be adequate for the proper care and maintenance of the marine mammal.
- Any import or export of marine mammals or parts will not result in the taking of marine mammals or marine mammal parts beyond those authorized by the permit.
- The opinions or views of persons knowledgeable of the marine mammals that are the subject of the application or of other matters germane to the application will be considered.

2.11.2 *SCIENTIFIC RESEARCH AND ENHANCEMENT PERMIT ISSUANCE REQUIREMENTS (50 CFR 216.41)*

- Permit applicants must demonstrate that:

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[2] Humane means the method of taking, import, export or other activity that involves the least possible degree of pain and suffering practicable to the animal involved (50 CFR 216.3).

    - The proposed activity furthers a bona fide scientific or enhancement purpose.
    - If the lethal taking of marine mammals is proposed:
        - Non-lethal methods for the research are not feasible; and
        - For depleted, endangered, or threatened species, the results will directly benefit that species, or will fulfill a critically important research need.
    - Any permanent removal of a marine mammal from the wild is consistent with any applicable quota established by the Director, NMFS OPR.
    - The proposed research will not likely have significant adverse effects on any other component of the marine ecosystem of which the affected species is a part.
- For endangered species:
    - The proposed research cannot be accomplished using a species that is not endangered.
    - The proposed research, by itself or in combination with other activities will not likely have a long term direct or indirect adverse impact on the species.
    - The proposed research will either:
        - Contribute to fulfilling a research need or objective identified in a species recovery or conservation plan;
        - Contribute significantly to understanding the basic biology or ecology of the species, or to identifying, evaluating, or resolving conservation problems for the species; or
        - Contribute significantly to fulfilling a critically important research need.
- For proposed enhancement activities:
    - Only living marine mammals and marine mammal parts necessary for enhancement of the survival, recovery, or propagation of the affected species may be taken, imported, exported, or otherwise affected under an enhancement permit. Marine mammal parts include clinical specimens or other biological samples required for the conduct of breeding programs or the diagnosis or treatment of disease.
    - The activity must likely contribute significantly to maintaining or increasing distribution or abundance, enhancing the health or welfare of the species, or ensuring the survival or recovery of the

species in the wild.

  - The activity must be consistent with an approved recovery plan developed under Section 4(f) of the ESA.

- An enhancement permit may authorize the captive maintenance of an endangered marine mammal only if NMFS determines that:
  - The proposed captive maintenance will likely contribute directly to the survival or recovery of the species by maintaining a viable gene pool, increasing productivity, providing necessary biological information, or establishing animal reserves required to support directly these objectives; and
  - The expected benefit to the species outweighs the expected benefits of alternatives that do not require removal of marine mammals from the wild.
- NMFS may authorize the public display of marine mammals held under the authority of an enhancement permit only if:
  - The public display is incidental to the authorized captive maintenance;
  - The public display will not interfere with the attainment of the survival or recovery objectives;
  - The marine mammals will be held consistent with all requirements and standards that are applicable to marine mammals held under the authority of the Acts and the Animal Welfare Act, unless the Office Director determines that an exception is necessary to implement an essential enhancement activity; and
  - The marine mammals will be excluded from any interactive program and will not be trained for performance.
- NMFS may authorize non-intrusive scientific research to be conducted while a marine mammal is held under the authority of an enhancement permit, only if such scientific research:
  - Is incidental to the permitted enhancement activities; and will not interfere with the attainment of the survival or recovery objectives.

2.11.3 DURATION OF PERMITS (50 CFR 216.35 AND 216.39)

Scientific research and enhancement permits may be valid for a maximum of five years from the date of issuance (50 CFR 216.35[b]). The 5-year period may be extended up to 12 months beyond that established in the original permit via a minor amendment (50 CFR 216.39).

2.11.4 REPORTING REQUIREMENTS (50 CFR 216.38)

Permit Holders must submit annual, final, and special reports. Annual reports must be submitted to the Chief, Permits and Conservation Division (hereinafter "Permits Division"), Office of Protected Resources at the conclusion of each year for which a permit is valid. Annual reports are due 90 days after the end of each reporting period (either a calendar year or a 12-month period determined by field seasons). Each annual report must include the following:

- A table reporting the number of animals taken, by activity and location;
- Non-permitted species taken and observed effects;
- Problems or unforeseen effects encountered and steps to resolve such problems;
- Measures taken to minimize effects on animals and the effectiveness of these measures;
- Circumstances surrounding unintentional injuries or deaths of animals, and a description of how the animals were disposed;
- The physical condition of animals taken;
- The effects permitted activities had on animals;
- Steps taken to coordinate the activities with other permit holders;
- Preliminary findings and whether the goals were accomplished;
- Titles of reports, publications resulting from the reporting period; and
- Any incidental use of photographs, film, or other images.

Special or "incident" reports are required for events such as serious injury, mortality, and exceeding authorized take. Incident reports must be submitted to within two weeks of the incident and describe the events and steps that will be taken to reduce the potential for additional incidents.

Final reports must be submitted within 180 days after conclusion of research or expiration of the permit. Final reports must include the following:

- A description of how project goals were accomplished or an explanation of why they were not accomplished;
- A description of how the research or enhancement benefited the species, promoted recovery, or conserved the target species and fulfilled objectives listed in the Recovery Plan;
- Any problems or unexpected outcomes; and if permitted to use different methods, which worked best and why;
- A qualitative and quantitative description of the types of reactions target and non-target animals had, and whether the activities had any effects on habitat;
- Whether the mitigation measures employed were successful in minimizing or avoiding adverse impacts to target and non-target species, and any additional measures that might further minimize reactions;

- Efforts made to share data or collaborate with other researchers and a description of how the collaborations occurred;
- Publications or reports not listed in annual reports;
- Any new directions for future studies identified as a result of the research or enhancement;
- Any new or emerging technologies that could be used to further the research or enhancement; and
- An explanation of whether any permit conditions were difficult to comply with or were unclear; and whether the take numbers requested in the permit application were accurate and realistic.

2.11.5 MITIGATION AND CONDITIONS OF PERMITS AND AUTHORIZATIONS

Scientific research and enhancement permits issued under the MMPA and ESA require researchers to abide by general terms and conditions based on requirements of the statutes and regulations.

Activities authorized in a permit must occur by the means, in the areas, and for the purposes set forth in the permit application, and are limited by the terms and conditions in a permit. Permit noncompliance constitutes a violation and is grounds for permit modification, suspension, or revocation, and for enforcement action.

MMPA and ESA research and enhancement permits contain the following types of permit terms and conditions:

- Duration of permit;
- Number and kinds of protected species, locations and manner of taking;
- Qualifications, responsibilities, and designation of personnel;
- Possession of permit;
- Reports;
- Notification and coordination;
- Observers and inspections;
- Permit modification, suspension, and revocation; and
- Penalties and permit sanctions; and Acceptance of permit.

Descriptions of how mitigation measures would be incorporated into the research and enhancement programs must be included in the permit applications and are presented in Sections 2.7-2.10 for the various alternatives. Incorporation of terms and conditions in a permit also helps to mitigate possible adverse impacts to animals from the permitted activities.

In addition to general terms and conditions common to all research and enhancement permits, there are a number of special conditions for activities

conducted on pinnipeds, and specifically on Hawaiian monk seals. These are found within the conditions pertaining to the manner of taking. The section below details both the general and special terms and conditions common to permits issued under each alternative.

2.11.5.1 *DURATION OF PERMIT*

As described above, permits may be valid for a 5-year period. The Director, NMFS Office of Protected Resources, may extend the permit by one year via a minor amendment. Each permit has a specified expiration date.

Researchers are required to suspend permitted activities if serious injury or mortality of protected species reaches that allowed in the permit, or if authorized take is exceeded.

2.11.5.2 *NUMBER AND KINDS OF PROTECTED SPECIES, LOCATIONS AND MANNER OF TAKING*

Each permit contains a table outlining the number of animals authorized to be taken (by species and stock), and the locations, manner, and time period in which they may be taken.

Researchers working under a permit may take photographs and video incidental to research or enhancement, provided it does not result in takes. Photos and other media may be used in printed materials (including commercial or scientific publications) and presentations; a statement citing the permit number must accompany the images.

The Chief, Permits Division may authorize non-essential activities (*e.g.*, a documentary film crew). These activities must not influence the research or enhancement or result in takes. The Permit Holder and researchers cannot require compensation in return for allowing non-essential personnel to accompany researchers.

Researchers must comply with the following special conditions related to the manner of taking Hawaiian monk seals (these conditions pertain to the current research and enhancement Permit No. 10137):

- Carry out activities efficiently and use biologists experienced in capture and sampling techniques to minimize handling time and disturbance.
- Whenever feasible, take target animals or collect samples when no other seals are near, particularly mother/pup pairs.
- Immediately stop activities if the actions may be life threatening to a seal; if a seal has an adverse reaction, monitor and treat the animal as

determined by the attending veterinarian, principal investigator (PI) or a co-investigator (CI).

- Minimize disturbance when approaching seals, particularly mother/pup pairs, and stop if there is evidence that the activity is interfering with vital functions of any animal.
- If a pup is orphaned as a result of permitted activities, the pup must be humanely provided for (*i.e.*, placed in a Stranding facility for rehabilitation or humanely euthanized).
- Only experienced, well-trained personnel may perform intrusive procedures. For activities involving the use of sedatives, an experienced marine mammal veterinarian must be present.
- Use sterile disposable needles, biopsy punches, and other sampling tools or clean and disinfect non-disposable equipment.
- Monitor seals after disturbance or capture to ensure they resume normal behavior.
- The Permit Holder must provide updates on how deworming trials proceed and halt treatments if the health and welfare of the seals is compromised.
- An experienced veterinarian must conduct humane euthanasia and after necropsy, all parts not retained must be collected for environmentally safe disposal.
- Hawaiian monk seals used in captive research must be maintained and transported in compliance with the provisions of the Animal Welfare Act (AWA) and AWA implementing regulations.
- Contingency plans must be in place to prevent escape from temporary pens (*e.g.*, during extreme weather events) and to respond to escape (*e.g.*, search surveys).
- Prior to removing adult male seals from the wild into permanent captivity, a facility to permanently house the seal(s) must be identified,, and plans for temporary care of the animals prior to transfer to the permanent facility, if needed, must be submitted.

The above or similar conditions would apply to future permits (including File No. 16632; see Section 2.9), as deemed appropriate by the Director, Office of Protected Resources (50 CFR 216.36[b]).

All research and enhancement permits authorizing sample collection have requirements for the disposition of marine mammal parts/biological samples, outlined in Appendix I.

2.11.5.3 QUALIFICATIONS, RESPONSIBILITIES, AND DESIGNATION OF PERSONNEL

All research and enhancement permits identify by name the researchers (PI and CIs) authorized to participate in the permitted activities. Individuals conducting

permitted activities must possess qualifications commensurate with their roles and responsibilities. The roles and responsibilities of personnel operating under a permit are as follows:

- The Permit Holder is ultimately responsible for activities of individuals operating under the permit. Where the Permit Holder is an institution, the Responsible Party is the person at the institution who is responsible for the supervision of the PI.
- The PI is the individual primarily responsible for the taking, import, export and related activities conducted under the permit. The PI must be on site during activities conducted under this permit unless a CI is present to act in place of the PI.
- CIs are individuals who are qualified to conduct activities authorized by the permit without the on-site supervision of the PI. CIs assume the role and responsibility of the PI in the PI's absence.
- Research Assistants (RA) work under the direct and on-site supervision of the PI or a CI. RAs cannot conduct permitted activities in the absence of the PI or a CI and are not named in the permit.

Personnel involved in permitted activities must be reasonable in number and essential to conduct of the permitted activities. Essential personnel are limited to:

- Individuals who perform a function directly supportive of and necessary to the permitted activity (including operation of vessels or aircraft);
- Individuals included as backup for essential personnel; and
- Individuals included for training purposes.

Persons who require state or Federal licenses to conduct activities authorized under a permit (*e.g.*, veterinarians, pilots) must be duly licensed when undertaking such activities.

Permitted activities may be conducted on vessels or aircraft or in cooperation with individuals engaged in commercial activities, provided the commercial activities are not conducted simultaneously with the permitted activities, except with written approval of the Chief, Permits Division (*e.g.*, for documentary film making).

The Permit Holder cannot require or receive direct or indirect compensation from persons requesting to conduct activities under the permit. The Permit Holder or PI may designate additional CIs and must provide a copy of the letter designating the individual to the Permits Division on the day of designation.

2.11.5.4 POSSESSION OF PERMIT

Permits cannot be transferred or assigned to any other person. The Permit Holder and persons operating under the authority of a permit must possess a

copy of the permit when engaged in a permitted activity. A copy of the permit must be attached to any means of containment in which a protected species or protected species part is placed for purposes of storage, transit, supervision or care.

2.11.5.5 REPORTS

As described in Section 2.11.4 above, Permit Holders must submit annual, final, and incident reports, and papers or publications resulting from the activities authorized by a permit. Incident reports (*e.g.*, for serious injury, mortality, or exceeding authorized take) are due within 2 weeks of the incident. Annual reports are due 90 days after the end of each permit year, and final reports are due 180 days after the expiration of the permit or conclusion of research or enhancement. Section 2.11.4 presents information required in permit reports. Research results must be published or otherwise made available to the scientific community in a reasonable period of time.

2.11.5.6 NOTIFICATION AND COORDINATION

Permit Holders must provide written notification of planned fieldwork to the Pacific Islands Assistant Regional Administrator for Protected Resources at least 2 weeks prior to initiation of a field trip/season and must include the locations of the intended field study and/or survey routes, estimated dates of research, and number and roles of participants.

Permit Holders must coordinate activities with other Permit Holders conducting the same or similar activities on the same species, in the same locations, or at the same times of year to avoid unnecessary disturbance of animals.

2.11.5.7 OBSERVERS AND INSPECTIONS

At the request of NMFS, the Permit Holder must allow an employee of NOAA or another designated other person to observe permitted activities. The Permit Holder must provide documents or other information relating to the permitted activities upon request.

2.11.5.8 MODIFICATION, SUSPENSION, AND REVOCATION

Permits are subject to suspension, revocation, modification, and denial in accordance with the provisions of subpart D [Permit Sanctions and Denials] of 15 CFR part 904.

The Director, NMFS Office of Protected Resources may modify, suspend, or revoke a permit in whole or in part:

- To make the permit consistent with a change in the regulations prescribed under Section 103 of the MMPA and Section 4 of the ESA;
- In a case in which a violation of the terms and conditions of the permit is found;
- In response to a written request from the Permit Holder;
- If NMFS determines that the application or other information pertaining to the permitted activities includes false information; and
- If NMFS determines that the authorized activities will operate to the disadvantage of threatened or endangered species or are otherwise no longer consistent with the purposes and policy in Section 2 of the ESA.

Issuance of a permit does not guarantee or imply that NMFS will issue or approve subsequent permits or amendments for the same or similar activities requested by a Permit Holder, including those of a continuing nature.

2.11.5.9 PENALTIES AND PERMIT SANCTIONS

A person who violates a provision of a permit, the MMPA, ESA, or the regulations at 50 CFR 216 and 50 CFR 222-226 is subject to civil and criminal penalties, permit sanctions, and forfeiture as authorized under the MMPA, ESA, and 15 CFR part 904.

NMFS is the sole arbiter of whether a given activity is within the scope and bounds of the authorization granted in a permit. The Permit Holder must contact the Permits Division for verification before conducting an activity if they are unsure whether an activity is within the scope of the permit. Failure to verify, where NMFS subsequently determines that an activity was outside the scope of the permit, may be used as evidence of a violation of the permit, the MMPA, the ESA, and applicable regulations in any enforcement actions.

2.11.5.10 ACCEPTANCE OF PERMIT

When a permit is issued by signature of the Director, Office of Protected Resources, the Permit Holder must date and sign the permit, and return a copy of the original signature to the Office Director. The permit is effective upon the Permit Holder's signing of the permit.

In signing a permit, the Permit Holder:

- Agrees to abide by all terms and conditions set forth in the permit, all restrictions and relevant regulations under 50 CFR Parts 216, and 222-226, and all restrictions and requirements under the MMPA, and the ESA;

- Acknowledges that the authority to conduct certain activities specified in the permit is conditional and subject to authorization by the Office Director; and
- Acknowledges that the permit does not relieve the Permit Holder of the responsibility to obtain any other permits, or comply with other Federal, State, local, or international laws or regulations.

2.11.6 MONITORING

All NMFS permits for research on pinnipeds require permit holders to conduct post-activity monitoring without causing further disturbance. As indicated above, Permit Holders conducting research on Hawaiian monk seals are required to monitor animals after disturbance or capture (*e.g.,* for signs of acute stress or injury, effects of administering drugs). The results of such observations are included in reports submitted to the OPR Permits Division. Monitoring protocols designed for the proposed research and enhancement activities are presented in Sections 2.5, 5.2 – 5.4, and Appendix F.

2.11.7 INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE

Federal mandates, including the United States Department of Agriculture (USDA) AWA of 1966 as amended (1985), and the Public Health Service (PHS) Policy on Humane Care and Use of Laboratory Animals established the requirements for oversight of animal research by an Institutional Animal Care and Use Committee (IACUC).

NMFS researchers applying for permits must submit with a permit application verification of IACUC approval and the protocols reviewed by the IACUC. The NMFS PIFSC submitted with their application File No. 16632 such verification.

The IACUC must be composed of at minimum three members, one of which must be a veterinarian "with experience in laboratory animal science and medicine who has direct or delegate program responsibility for activities involving animals at the research facility," and another who is not affiliated in any way with the facility other than being a member of the committee (9 CFR 2.31). If the committee consists of more than three members, no more than three members may be of the same administrative unit of the facility (9 CFR 2.31). The purpose and functions of the IACUC are to:

- Review, inspect, and prepare a report on the facility's program for humane care and use of animals and animal facilities at least once every 6 months;
- Review and investigate (if warranted) complaints concerning the care and use of animals at the facility;

- Make recommendations to the institutional office concerning the facility's animal program, facilities, or personnel training;
- Review, approve, require modifications to, or withhold approval of, any components, activities, or significant proposed changes in activities related to the care and use of animals, and;
- Be authorized to suspend any activities related to the care and use of animals (9 CFR 2.31).

While the AWA exempts field studies from full IACUC review and approval by an animal use committee, the field study exemption does not apply to any study that involves "an invasive procedure or that harms or materially alters the behavior of the animal under study" (NMFS 2010a).

To ensure adherence to the AWA and U.S. Government Principals for the Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training, NMFS established in 2010 three regional IACUC's as well as incorporated the IACUC review and approval process into any field studies not excluded from AWA exemption including any future permit requests for Hawaiian monk seal research and enhancement activities (NMFS 2010a; NFMS 2010b; Personal comm. with NMFS 2011).

NMFS IACUC standards require that any research conducted by a NMFS Principal Investigator be reviewed and approved by the regional NMFS IACUC (NMFS 2010b). NMFS IACUC standards also apply to any research conducted by a CI under a NMFS Principal Investigator, research funded by NMFS, and non-NMFS funded research (NMFS 2010b).

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 as CIs. The use of the UH IACUC by NMFS does not preclude the need for NMFS IACUC oversight (Personal comm. with NMFS 2011).

The UH IACUC is a body composed of volunteers consisting of veterinarians, biological and non-biological scientists, and local community representatives who are responsible for the oversight and evaluation of university activities involving vertebrate animals (UH IACUC 2002). The committee is responsible for:

- Reviewing activities involving vertebrate animals;
- Conducting semiannual inspections and program reviews;
- Investigating, reviewing and addressing concerns brought to the committee; and

- Managing issues concerning humane care, use, and alleged noncompliance (UH IACUC 2002).

The UH IACUC requires that vertebrate animal use be reviewed and approved by the committee prior to use occurring (UH IACUC 2002). The UH IACUC requires all applicants to submit to the committee:

- The species, number, and justification for the use of animals;
- A non-technical description of the project;
- A description of the procedures to be performed including use of anesthetics/analgesics, paralytic agents, surgeries, methods of restraint and euthanasia;
- A list of precautions to ensure humane care;
- A description of animal holding facilities, and;
- The final disposition of the animals (UH IACUC 2002).

2.12 ALTERNATIVES NOT CARRIED FORWARD FOR ANALYSIS

2.12.1 REDUCTION OF COMPETITION AND PREDATION IN THE NORTHWESTERN HAWAIIAN ISLANDS

Comments were submitted during scoping and public comment period requesting that an alternative 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 be considered in the PEIS. This proposal is based on the hypothesis that one of the primary factors limiting monk seal recovery in the NWHI is shark predation and direct or indirect competition with other top predators (*e.g.*, sharks and jacks). Mitigation of shark predation on monk seals is an ongoing activity that has been subject to previous NEPA analysis (NMFS 2012). The competition hypothesis is consistent with dietary information for these species that indicates a probable overlap with that of monk seals. Further, observations from Critter Cam deployments have revealed direct competition between monk seals and sharks and jacks (*i.e.*, harvesting prey items flushed by monk seals, also known as kleptoparasitism) (Parrish *et al.* 2008). One possibility is that the abundance of top-level predators in the NWHI may be unnaturally high due in part to supplemental food provided in discarded bait and bycatch from commercial fisheries that operated in the NWHI. However, the latter theory is largely conjectural and has yet to be fully validated by scientific research.

NMFS has considered reduction of competition and predation to benefit monk seals. 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. Undesirable changes in predator-prey dynamics could potentially 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. Compared to all other actions proposed in the alternatives carried forward for analysis, the result 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 necessarily benefit monk seals without having other unanticipated and undesirable environmental consequences. 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.

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. If after obtaining sufficient data to determine such action is warranted, we would conduct a separate NEPA analysis to fully address the potential effects of such environmental manipulation. However, given the currently available information, this alternative is not practical or feasible and will not be carried forward for analysis.

2.12.2 BUILD A HAWAIIAN MONK SEAL RESEARCH FACILITY OR AQUARIUM IN THE NORTHWESTERN HAWAIIAN ISLANDS

Comments were submitted during scoping and public comment period requesting that an alternative to build a research facility or aquarium for breeding, rearing and feeding monk seals in the NWHI be considered in the PEIS. The infrastructure necessary for constructing and operating such a facility in the NWHI would be expensive and logistically very challenging due to the remote nature of the NWHI. The NWHI are a U.S. 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. The current NMFS researchers in the field live in tents, bring up all food and water (stored in sealed buckets) to survive for several months, have only limited electricity from small solar systems, and no running water. Construction of a facility to hold monk seals in captivity in the NWHI could be possible at a site such as Midway Atoll, which has a working runway and considerable infrastructure. However the costs of constructing a holding facility with appropriate refrigeration for seal diet (and ability to have that diet delivered), adequate water filtration, staff accommodations, cost of transport, etc. would be several orders of magnitude more than the current NMFS research program budget. While a monk seal care facility is under construction by a non-

government entity (The Marine Mammal Center) on Hawaii Island in the MHI, building, operating and maintaining a facility on a scale sufficient for research, breeding, rearing and feeding captive monk seals in the NWHI is not reasonable..

2.13 ONGOING NOAA ACTIVITIES THAT ARE NOT PART OF THE PEIS ALTERNATIVES

Currently, the Pacific Islands Regional Office (PIRO) of NMFS implements activities that indirectly affect Hawaiian monk seals but are not considered elements of the PEIS alternatives evaluated herein either because they have been evaluated under separate NEPA compliance documents or are not considered part of the research and enhancement program (*e.g.*, education and outreach). Table 2.12-1 provides a list of these activities and links where additional information is available. These activities are considered in the analysis of cumulative effects presented in Chapter 4 (see Table 4.5-1).

Table 2.12-1 Ongoing NOAA Activities That Are Not Part of Alternatives

Classification	Activity
Sightings Network	• Opportunistic sightings and volunteer observation programs for Hawaiian monk seals in the MHI
Marine Mammal Health and Stranding Response Program	• Rehabilitation and release of stranded seals; • Health-related research on captive and rehabilitating seals (excluding vaccination research); and • Responding to unusual mortality events
Ecological studies	• Continue demographic and ecosystem modeling • Using LIDAR to collect elevation and bathymetry data for the NWHI • Conduct oceanographic studies to determine effects of oceanographic variability on prey abundance availability and foraging success
Habitat protection, loss mitigation and restoration	• Maintain current habitat protection or ensure that if status or jurisdiction changes protection is not diminished • Investigate rebuilding pupping habitat and evaluate possible colonization of Johnston Atoll • Ensure that monk seal concerns are included in all vessel grounding response plans • Provide rapid response, removal and monitoring of vessel groundings
Education/Outreach programs	• Hawaiian Monk Seal Recovery Team • Main Hawaiian Islands Management Plan • Outreach plan • Partnership grants for Hawaiian monk seal recovery • Incorporating community feedback into research and enhancement activities
Program to Remove Marine Debris	• Removal of hazardous debris from high entanglement risk zones • Develop working groups and education to help reduce the amount of debris

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