UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

FEB 16 2010

To All Interested Government Agencies and Public Groups:

Under the National Environmental Policy Act (NEPA), an environmental review has been performed on the following action.

TITLE: Environmental Assessment for Issuance of a Permit (File No. 13430) for Research on Marine Mammals

LOCATION: Coastal waters and on pinniped rookeries and haul outs of Washington and Oregon

SUMMARY: The action is issuance of a permit under the Marine Mammal Protection Act and Endangered Species Act to the National Marine Mammal Laboratory, Seattle, Washington, for research to provide information necessary for stock assessments and for management of Pacific harbor seals, California sea lions, and northern elephant seals in Washington and Oregon, including management of marine mammal predation on threatened and endangered salmon. The research involves aerial, vessel, and ground-based population surveys and capture of animals for collection of biological samples and attachment of scientific instruments. These activities will result in short-term adverse impacts on specified numbers of target and non-target animals, and small scale transitory and recoverable impacts on the physical environment over the five year duration of the permit.

RESPONSIBLE OFFICIAL:

James H. Lecky
Director, Office of Protected Resources
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
1315 East-West Highway, Room 13821
Silver Spring, MD 20910
(301) 713-2332

The environmental review process led us to conclude that this action will not have a significant effect on the human environment. Therefore, an environmental impact statement will not be prepared. A copy of the finding of no significant impact (FONSI) including the supporting environmental assessment (EA) is enclosed for your information.

Printed on Recycled Paper

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

**Finding of No Significant Impact**
**Issuance of Scientific Research Permit No. 13430**

Background

In June 2008, the National Marine Fisheries Service (NMFS) received an application for a permit (File No. 13430) from the National Marine Mammal Laboratory, Seattle, WA, (Responsible Party: Dr. John Bengtson, Director) to conduct research on marine mammals in Washington and Oregon. In accordance with the National Environmental Policy Act, NMFS has prepared an Environmental Assessment (EA) analyzing the impacts on the human environment associated with permit issuance (Final Environmental Assessment for Issuance of Permit (File No. 13430) for Research on Marine Mammals; 2010). The analyses in the EA support the findings and determination below. NMFS has chosen to issue a permit for activities as described in Alternative 2 of the EA.

Analysis

National Oceanic and Atmospheric Administration Administrative Order 216-6 (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality (CEQ) regulations at 40 C.F.R. 1508.27 state that the significance of an action should be analyzed both in terms of "context" and "intensity." Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ's context and intensity criteria. These include:

1) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in Fishery Management Plans?

> Issuance of a permit as described in Alternative 2 of the EA is not reasonably expected to cause substantial damage to ocean and coastal habitats or essential fish habitat (EFH). Issuance of permits for research on marine mammals has no direct impacts on the biological or physical environment.
>
> Conduct of the research authorized by the permit is not likely to result in permanent or large-scale damage to components of ocean and coastal habitat in the action area. Use of nets or pens in the water to capture animals, and ingress or egress of researchers accessing field sites may cause localized disturbance of substrate. The effects of such disturbance would be transitory and recoverable.
>
> Conduct of the research authorized by the permit is not likely to affect EFH because it does not involve nor will it result in activities that have been shown to affect EFH including disturbance or destruction of habitat from stationary fishing

Printed on Recycled Paper

gear, dredging and filling, agricultural and urban runoff, direct discharge, or the introduction of exotic species.

2) Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

Issuance of permits for research on marine mammals has no direct impacts on the biological or physical environment, and thus the proposed action is not expected to affect biodiversity or ecosystem function.

The research authorized by the permit is not likely to alter foraging patterns, dietary preferences, or relative distribution or abundance of species groups within the area. The research activities will not affect nutrient flux, primary productivity, or other factors related to ecosystem function in the area.

3) Can the proposed action reasonably be expected to have a substantial adverse impact on public health or safety?

Issuance of permits for research on marine mammals has no direct impacts on the biological or physical environment, nor does it affect public health or safety.

Conduct of the research authorized by the permit is not expected to affect things typically associated with impacts on public health and safety such as traffic and transportation patterns; noise levels; risks of exposure to hazardous materials and wastes; risks of contracting disease; risks of damages from natural disasters; or food safety.

4) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, their critical habitat, marine mammals, or other non-target species?

Issuance of permits for research on marine mammals has no direct impacts on the biological or physical environment, including endangered or threatened species, marine mammals, critical habitat, etc.

Conduct of the research authorized by the permit will directly and indirectly result in adverse effects on a specified number of animals targeted by the research, as well as non-target animals in the immediate vicinity of the research. Given the mitigation measures required by the permit, these adverse effects are likely to result only in transitory and recoverable changes in behavior and physiological parameters of the affected animals, including those listed as threatened or endangered, but are not expected to result in measurable effects on populations, stocks, or species.

Conduct of the permitted research is not expected to adversely affect critical habitat in the area because it will not result in more than localized disturbance of substrate, the effects of which will be transitory and recoverable.

5) Are significant social or economic impacts interrelated with natural or physical environmental effects?

Issuance of permits for research on marine mammals has no direct impacts on the biological or physical environment, thus there are no interrelated social or economic impacts.

Conduct of the permitted research will result in insignificant effects on the natural and physical environment, but there are no significant social or economic impacts interrelated with these effects. The research does not involve and is not associated with factors typically related to effects on the social and economic environment such as inequitable distributions of environmental burdens, differential access to natural or depletable resources in the action area. The research is conditioned to eliminate the potential for adverse impacts on local subsistence use of marine mammals.

6) Are the effects on the quality of the human environment likely to be highly controversial?

There is no controversy regarding whether issuance of permits for research on marine mammals has direct impacts on the biological or physical environment.

Some of the permitted research techniques have been the subject of public controversy for previous permits. That controversy was related to whether certain techniques were humane and whether certain research projects using those techniques were bona fide science. The likely adverse effects of such techniques are limited to a specified number of marine mammals targeted by the research and are predicted to involve transitory stress, pain and injury. There is no scientific controversy regarding whether or how such techniques will adversely affect individual animals.

7) Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers, essential fish habitat, or ecologically critical areas?

Issuance of permits for research on marine mammals has no direct impacts on the biological or physical environment, and the proposed action is not reasonably expected to affect unique or ecologically critical areas.

Conduct of the permitted research is not expected to substantially impact unique or ecologically critical areas. There are a number of places within the action area that could be considered unique or ecologically critical, including coastal

wetlands, a National Marine Sanctuary, several National Wildlife Refuges, State Parks, EFH, and ESA designated critical habitat. However, the research is not expected to cause more than localized disturbance of substrate, the effects of which would be transitory and recoverable.

8) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Issuance of permits for research on marine mammals has no direct impacts on the biological or physical environment.

The effects of the permitted research on the human environment are not highly uncertain and the research does not involve unique or unknown risks. The permitted research does not involve techniques for which the risks to and effects on the biological and physical environment cannot reasonably be predicted based on monitoring reports from previously permitted research and published literature on the effects of human activities on marine mammals and other wildlife.

9) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

Issuance of permits for research on marine mammals has no direct impacts on the biological or physical environment, and is not related to other actions with cumulatively significant impacts.

Conduct of the permitted research is related to other federal actions, including the marine mammal research program carried out by the NMFS National Marine Mammal Laboratory, and management of marine mammals overall by NMFS. To be consistent with the purpose and policy of the Marine Mammal Protection Act, the federal statute under which the research program and management actions are undertaken, these actions must be carried out in a manner that promotes conservation of the species and the ecosystems of which they are a part and thus cannot result in significant adverse impacts on the environment.

10) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

Issuance of permits for research on marine mammals has no direct impacts on the biological or physical environment, including the above mentioned places and resources.

Conduct of the permitted research will not affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places because none are present in the action area and the effects of the research are limited to resources within the action area. Conduct of the permitted

research will not cause loss or destruction of significant scientific or historical resources as none are present. Gray whales in the action area may be considered a significant cultural resource, as they are a traditional subsistence animal for the Makah Tribe. However, the permit is conditioned to eliminate the potential for adverse impacts on local subsistence use of marine mammals.

11) Can the proposed action reasonably be expected to result in the introduction or spread of a non-indigenous species?

Issuance of permits for research on marine mammals has no direct impacts on the biological or physical environment, and is not reasonably expected to result in the spread or introduction of non-indigenous species.

Conduct of the permitted research is not reasonably expected to result in the spread or introduction of non-indigenous species. The research involves handling animals in the wild, but not transporting animals among locations. The research may involve movement of vessels, or researchers and their equipment, among water bodies. Organisms can be transmitted from stream to stream, or bay to bay, on research equipment, including shoes. However, the research will occur within state waters of Washington and Oregon, or on land-based pinniped sites, and there are no known non-indigenous species in these areas that are likely to be introduced by the research to an area where they do not currently exist.

12) Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

No. Issuance of the permit enables the applicant to conduct research on marine mammals consistent with provisions of the Marine Mammal Protection Act, Endangered Species Act, and applicable regulations. These provisions are applicable to all such permits and decision to issue. It does not involve an irreversible or irretrievable commitment of resources, limit the choice of reasonable alternatives for future decisions, or otherwise represent a decision in principle about future considerations.

13) Can the proposed action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

No. Issuance of the permit will be consistent with provisions of the Marine Mammal Protection Act, Endangered Species Act, and applicable regulations.

Conduct of the research may require the applicant to secure additional federal, State or local permissions, e.g., access to State Parks. NMFS did not identify any components of the research that would preclude obtaining such permissions.

14) Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

Issuance of permits for research on marine mammals has no direct impacts on the biological or physical environment, and the proposed action cannot reasonably be expected to result in cumulative adverse effects substantially affecting target or non-target species.

Conduct of the permitted research will result in adverse impacts on a specified number of target animals and on non-target animals in the immediate vicinity of the research. These adverse impacts are expected to be transitory and recoverable and, when considered in combination with other actions or factors affecting the species, not likely to result in significant impacts on the species or the environment.

DETERMINATION

In view of the information presented in this document, and the analyses contained in the EA prepared for issuance of Permit No. 13430, it is hereby determined that permit issuance will not significantly impact the quality of the human environment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environmental Impact Statement for this action is not necessary.

FEB 16 2010

James H. Lecky
Director, Office of Protected Resources

Date

**Final Environmental Assessment**
**for**
**Issuance of Permit (File No. 13430) for Research on Marine Mammals**

January 2010

---

| | |
|---|---|
| **Lead Agency**: | USDC National Oceanic and Atmospheric Administration<br>National Marine Fisheries Service, Office of Protected Resources |
| **Responsible Official:** | James H. Lecky, Director, Office of Protected Resources |
| **For Further Information Contact**: | Office of Protected Resources<br>National Marine Fisheries Service<br>1315 East West Highway<br>Silver Spring, MD 20910<br>(301) 713-2289 |
| **Location**: | Coastal Washington and Oregon |

**Abstract**: The National Marine Fisheries Service (NMFS) proposes to issue a permit for research on marine mammals in the wild, pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 et seq.). The permit would be valid for five years from the date of issuance and would exempt the permit holder from the MMPA's prohibition against "taking" marine mammals in the wild, allowing researchers authorized by the permit to conduct bona fide scientific research consistent with the purpose and policy of the MMPA. The permit would cover research on Pacific harbor seals (*Phoca vitulina*), California sea lions (*Zalophus californianus*), and northern elephant seals (*Mirounga angustirostris*) within coastal waters and on pinniped rookeries and haul outs of Washington and Oregon. Research activities being evaluated include aerial, vessel, and ground surveys; capture for collection of tissue samples, attachment of scientific instruments and application of marks (flipper tags, brands, etc.); and playback experiments. These research activities may result in "takes" of marine mammals by capture, attempted capture, and level B and level A (including mortality) harassment as defined in the MMPA and NMFS regulations (50 CFR 216.4). This environmental assessment is being prepared to determine whether the proposed action has the potential to cause significant environmental impacts.

CONTENTS

**CHAPTER 1 PURPOSE OF AND NEED FOR ACTION....4**

**1.1 DESCRIPTION OF ACTION** ....4
*1.1.1 Background....4*
*1.1.2 Purpose and Need....5*
**1.2 OTHER NEPA DOCUMENTS THAT INFLUENCE SCOPE OF THIS EA** ....7
**1.3 SCOPING SUMMARY**....10
**1.4 APPLICABLE LAWS AND NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS** ....13
*1.4.1 National Environmental Policy Act ....13*
*1.4.2 Marine Mammal Protection Act ....13*
*1.4.3 Endangered Species Act....14*
*1.4.4 Animal Welfare Act....15*
*1.4.5 Magnuson-Stevens Fishery Conservation and Management Act....16*

**CHAPTER 2 ALTERNATIVES INCLUDING THE PROPOSED ACTION ....17**

**2.1 ALTERNATIVE 1 – NO ACTION**....17
**2.2 ALTERNATIVE 2 – PROPOSED PERMIT** ....18
**2.3 ALTERNATIVE 3 – PERMIT WITH SPECIAL AVOIDANCE MEASURES** ....19
**2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY**....20

**CHAPTER 3 AFFECTED ENVIRONMENT ....23**

**3.1 SOCIAL AND ECONOMIC ENVIRONMENT** ....23
**3.2 PHYSICAL ENVIRONMENT**....24
*3.2.1 Sanctuaries, Parks, and Refuges....25*
*3.2.2 Essential Fish Habitat ....27*
*3.2.3 Designated Critical Habitat....28*
**3.3 BIOLOGICAL ENVIRONMENT** ....29
*3.3.1 Target Marine Mammal Species....29*
*3.3.2 Non-target Aquatic Species ....32*
*3.3.3 Non-target Seabirds and Shorebirds ....37*
*3.3.4 Non-target Terrestrial Species....38*
*3.3.5 Hearing abilities of target and non-target aquatic species....38*

**CHAPTER 4 ENVIRONMENTAL CONSEQUENCES ....41**

**4.1 EFFECTS OF ALTERNATIVE 1: NO ACTION**....41
**4.2 EFFECTS OF ALTERNATIVE 2: PROPOSED PERMIT**....41
*4.2.1 Effects on Target Marine Mammal Species ....42*
*4.2.2 Effects on Non-target Aquatic Species....44*
*4.2.3 Effects on Non-target Seabirds and Shorebirds....45*
*4.2.4 Effects on Non-target Terrestrial Species....45*
**4.3 EFFECTS OF ALTERNATIVE 3: PERMIT WITH SPECIAL AVOIDANCE MEASURES** ....46
*4.3.1 Effects on Target Marine Mammal Species ....46*
*4.3.2 Effects on Non-target Aquatic Species....46*
*4.3.3 Effects on Non-target Seabirds and Shorebirds....46*
*4.3.4 Effects on Non-target Terrestrial Species....47*
**4.3 SUMMARY OF COMPLIANCE WITH APPLICABLE LAWS, NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS**....47
*4.3.1 Marine Mammal Protection Act ....47*
*4.3.2 Endangered Species Act....48*
*4.3.3 Animal Welfare Act....49*
*4.3.4 Magnuson-Stevens Fishery Conservation and Management Act....50*

**4.4 COMPARISON OF ALTERNATIVES** ..... 50
**4.5 MITIGATION MEASURES** ..... 50
**4.6 UNAVOIDABLE ADVERSE EFFECTS** ..... 50
**4.7 CUMULATIVE EFFECTS** ..... 51
*4.7.1 Research permits and other MMPA authorizations* ..... *51*
*4.7.2 Other human activities* ..... *52*
*4.7.3 Summary of cumulative effects* ..... *52*

**CHAPTER 5 LIST OF PREPARERS** ..... **53**

**LITERATURE CITED** ..... **54**

**APPENDIX A: ACTIVE RESEARCH PERMITS AFFECTING THE TARGET SPECIES** ..... **56**

**APPENDIX B: PERMIT CONDITIONS** ..... **60**

**APPENDIX C: TABLE OF TAKES AS REQUESTED BY APPLICANT** ..... **73**

**APPENDIX D: DESCRIPTION OF NON-TARGET TERRESTRIAL SPECIES IN ACTION AREA** ..... **81**

# CHAPTER 1 PURPOSE OF AND NEED FOR ACTION

## *1.1 DESCRIPTION OF ACTION*

In response to receipt of an application (File No. 13430) from the National Marine Mammal Laboratory, Seattle, WA, (Responsible Party: Dr. John Bengtson, Director), NMFS proposes to issue a permit for research on marine mammals in the wild, pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 et seq.), the regulations governing the taking and importing of marine mammals (50 CFR Part 216), the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et seq*.), and the regulations governing the taking, importing, and exporting of endangered and threatened species (50 CFR Parts 222-226). The permit would exempt the holder from the MMPA's prohibition against "takes"[1] of marine mammals during conduct of authorized research.

### *1.1.1 Background*

Section 117 of the MMPA directs the Secretaries of Commerce and the Interior to prepare, review, and revise stock assessments for each marine mammal stock that occurs in waters under jurisdiction of the United States. For all species of cetacean and pinniped, except walrus, that responsibility is delegated to NMFS. These assessments are to: describe the geographic range or the stock, including any seasonal or temporal variation; provide minimum population estimates, current and maximum net productivity rates, and current population trends; estimate the annual human-caused mortality and serious injury for strategic[2] stocks, and other factors that may be causing a decline or impeding recovery of the stock, including effects on habitat and prey; describe the commercial fisheries that interact with the stock; categorize the status of the stock as either strategic or as one that has a level of human-caused mortality and serious injury that is not likely to cause the stock to be reduced below its optimum sustainable population; and estimate the potential biological removal level for the stock. Once prepared, stock assessments are to be reviewed periodically (as specified in the MMPA) and revised if the review indicates that the status of the stock has changed or can be more accurately determined.

Information used to prepare and revise stock assessments comes from research on the subject marine mammals stocks and data collected from monitoring of fisheries and subsistence harvests. NMFS Science Centers, including the National Marine Mammal Laboratory (operating under the Alaska Fisheries Science Center), conduct a variety of research related to marine mammal stock assessments. This research is not exempt from the MMPA's prohibition on taking, except when authorized by a permit issued pursuant to Section 104 of the MMPA.

---

1 Under the MMPA, "take" is defined as to "harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect." [16 U.S.C. 1362(18)(A)]

2 Under the MMPA, the term "strategic stock" means a marine mammal stock for which the level of direct human-caused mortality exceeds the potential biological removal level; which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; or which is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA.

### *1.1.2 Purpose and Need*

It is the policy of the MMPA that marine mammals "should be protected and encouraged to develop to the greatest extent feasible commensurate with sound policies of resource management." As the federal agency with jurisdiction over all cetacean and pinniped (except walrus) species, NMFS has a responsibility to implement the MMPA to protect and conserve marine mammals under its jurisdiction using "sound policies of resource management." Sound policies are those that are reasoned, or logically valid, or otherwise rely on good judgment. Such reasoned or logical principles for management of marine mammals necessarily rely on adequate and appropriate information about the marine mammals and the environmental factors that influence their populations. The purpose of issuing research permits is to facilitate *bona fide* research on marine mammals, the results of which is likely to contribute to the basic knowledge of marine mammal biology or ecology or is likely to identify, evaluate, or resolve conservation problems[3]. Research is needed because "there is inadequate knowledge of the ecology and population dynamics of such marine mammals and of the factors which bear upon their ability to reproduce themselves successfully." [16 U.S.C. 1361; Section 2: Findings and Declaration of Policy]

For marine mammals listed as threatened or endangered under the ESA, permits issued for scientific purposes allow an exception to the prohibitions of section 9 of the ESA provided such exception is consistent with the purpose and policy of the ESA. The purpose of the ESA is to provide a means and a program for the conservation of listed species. It is the policy of the ESA that federal agencies should seek to conserve listed species and use their authorities to promote the conservation purpose of the statute. The ESA defines conserve and conservation as using all methods and procedures necessary to bring listed species to the point at which the measures provided under the ESA are no longer necessary. When the protective measures of the ESA are no longer considered necessary for the conservation of the species, the species is considered recovered. By definition, those methods may include activities associated with "scientific resources management" such as research and census. Thus, the purpose of issuing permits for research on threatened and endangered species of marine mammals is to promote recovery of those species.

The objective of the research is to provide information necessary for stock assessments and for management of Pacific harbor seals (*Phoca vitulina*), California sea lions (*Zalophus californianus*), and northern elephant seals (*Mirounga angustirostris*) in Washington and Oregon, including management of marine mammal predation on threatened and endangered salmon. The applicants propose investigations in the following eight areas:

(1) abundance and distribution of harbor seals
(2) food habits and foraging ecology of harbor seals
(3) ecology of contaminants, environmental toxins and infectious pathogens in harbor seals
(4) harbor seal life history parameters
(5) population substructure of harbor seals in Washington and Oregon

---

3 The MMPA's definition of *bona fide* research also includes "results of which likely would be accepted for publication in a [refereed] scientific journal." NMFS assumes that research which contributes to the basic knowledge of marine mammal biology or ecology or identifies, evaluates, or resolves conservation problems would be acceptable for such publication, but research that does not accomplish these things would not likely be considered for publication.

(6) abundance, distribution and health of California sea lions in Washington and Oregon
(7) California sea lion food habits and predation on threatened, endangered, and/or depleted fish stocks in Washington and Oregon
(8) abundance, distribution and health of northern elephant seals

The research proposed by the applicant would involve: surveys of rookeries and haulouts; capture of animals for collection of tissue samples, attachment (or retrieval) of scientific instruments or identification tags, and application of pelage marks; and playbacks of sound underwater. The following is a brief discussion of the need for these specific types of research as they relate to the eight areas proposed by the applicant for investigation.

Need for Surveys

Determining abundance and distribution of pinnipeds typically requires some type of population survey. Aerial surveys, in which animals are counted from photographs taken as the survey plane flies over a site, provide the broadest geographic coverage with the least amount of effort. However, depending on the resolution of the photograph, these surveys may only provide total counts, with no information on age or sex structure of the population. Vessel surveys of pinnipeds on land are more labor intensive (taking more time to cover smaller areas), but can give better resolution on the age and sex structure of the surveyed population, including by allowing researchers to get close enough to read brands or other marks on individual animals. Ground surveys, conducted from cover of blinds, rocks, etc., are also more labor (time) intensive than aerial surveys, but allow researchers to observe brands, tags, or other marks, as well as behaviors. Surveys are needed to address areas #1, 6, and 8 in the above list of investigations proposed by the applicant.

Need for Capture

It is possible to collect some types of tissue samples (skin, blubber, muscle) remotely, without capturing individual animals. However, collection of many of the types of tissue samples proposed by the applicant requires capture and restraint of individual animals. For example, blood samples cannot be collected remotely, nor can whiskers, membrane swabs, or milk. Similarly, while it is possible to remotely mark pinnipeds (e.g., by thrown paint pellets), such marks are not usually permanent or distinctive enough for individual animal identification, as is required for some of the proposed longitudinal studies. Further, it is not possible to remotely attach scientific instruments of the types proposed to pinnipeds. In addition, many of the proposed studies attempt to link parameters such as age, size, sex, etc. to the samples or data collected. For these types of study, it is necessary to capture individual animals to take measurements and do examinations to determine age, sex, etc. Capture of individual animals is needed to address areas #2 through 8 in the above list of investigations proposed by the applicant.

Need for Tissue Sampling

Blood samples are collected for a variety of analyses ranging from basic health assessment (including basic hematology and serum chemistry panels) to disease screening, immunology, and hormone studies. Membrane swabs are collected for virology and bacteriology studies. Milk samples collected from parturient females are analyzed for contaminants and pathogens. Skin and blubber samples are analyzed for contaminant and genomic studies, and blubber samples are

also analyzed for dietary studies. Whisker and hair samples are collected for stable isotope (related to dietary studies) and mercury concentration analyses. Scat samples are collected to describe the diet of harbor seals, and are also used to interpret data collected from instruments attached to individual seals. The various tissue samples are needed to address areas #2, 3, and 5 through 8 in the above list of investigations proposed by the applicant.

Need for Attachment of Instruments

Satellite-linked instruments, time-depth recorders, VHF radio tags, and acoustic tags are attached to individual animals to collect information on how they use their habitat and on the characteristics of the habitat itself. Each type of instrument is capable of collecting a different type of information. More than one type of instrument may be attached to a given animal at the same time, to collect complimentary types of information. In addition to instruments that are attached externally, some instruments (stomach temperature transmitters) are inserted into the stomach to collect information about feeding that is not collected by externally mounted instruments alone. Researchers need to attach instruments to animals to address areas #2 and 7 in the above list of investigations proposed by the applicant

Need for Attachment of Tags or Application of Other Marks

Studies of vital rates, seasonal movements, dispersal patterns, etc. are facilitated by the ability to identify individual animals, including animals of known age or sex. Some studies require marks that last the duration of a field trip (to avoid recapture or repeat sampling of animals at a given site on a given day), while others require marks that last for an entire season (to identify specific animals for repeat sampling within a season) or the life of the animal (for long-term studies). Researchers need to apply tags or other marks to animals to address areas #2, 4, 7, and 8 in the above list of investigations proposed by the applicant.

Need for Sound Playbacks

Researchers are investigating non-lethal methods of deterring marine mammals from feeding on threatened and endangered salmon. One method of deterrence involves acoustic harassment devices that produce sounds intended to repel marine mammals. Killer whales, which are known to prey on pinnipeds, produce sounds (vocalizations) that researchers propose may be suitable for deterrence of pinnipeds. Researchers need to broadcast recorded killer whale vocalizations to address area #7 in the above list of investigations proposed by the applicant.

## *1.2 OTHER NEPA DOCUMENTS THAT INFLUENCE SCOPE OF THIS EA*

The National Oceanic and Atmospheric Administration (NOAA) has, in NOAA Administrative Order 216-6 (NAO 216-6), listed issuance of permits for research on marine mammals as a category of actions that "do not individually or cumulatively have a significant effect on the human environment…" and which therefore do not require preparation of an environmental assessment (EA) or environmental impact statement (EIS)[4]. NMFS has determined that, under normal circumstances, issuance of such permits does not have a significant impact on the environment.

4 This is consistent with the CEQ regulations at 40 CFR §1508.4 defining categorical exclusion.

In reviewing individual permits for consistency with this categorical exclusion, NMFS has routinely concluded that the types of research activities in the proposed permit are consistent with NAO 216-6 categorical exclusion. Although these research activities have direct (caused by the action and occurring at the same time and place as the action) and indirect (caused by the action, but occurring later in time or farther removed in distance) effects on the individual marine mammals that are the subject of the permit, and on non-target animals exposed to the presence or actions of the researchers, these effects typically are found not to be individually or cumulatively significant. NMFS has also concluded in these reviews that these types of research activities do not have measurable effects on the social or economic environment, but can have direct, but not significant, effects on substrate (part of the physical environment) related to ingress or egress of researchers accessing field sites, or use of nets or pens to capture animals.

NMFS has prepared EAs and an EIS for issuance of permits for research on marine mammals under extraordinary circumstances, where use of a categorical exclusion is not supported, or when NMFS decided to prepare an EA to allow for a more detailed analysis of potential impacts to threatened or endangered species.. Since 2002, NMFS has prepared numerous EAs for issuance of permits for research on a variety of threatened and endangered marine mammal species, including threatened and endangered Steller sea lions, endangered monk seals, endangered humpback whales, and endangered northern right whales, to evaluate the potential for the research to adversely impact these marine mammal species listed under the Endangered Species Act (ESA). In each case, the analyses led NMFS to conclude that no significant environmental impacts will result from the proposed actions.

NMFS has also prepared several EAs for issuance of permits for research on marine mammals because of controversy about the potential environmental consequences of the research. In these instances, the research involved intentional exposure of marine mammals to acoustic stimuli (a.k.a. “active acoustics”), including playbacks of air gun and high- and mid-frequency sonar sounds. In each case, the analyses led NMFS to conclude that no significant environmental impacts will result from the proposed playbacks. NFMS has concluded that research on marine mammals has direct and indirect effects on the individual marine mammals that are the subject of the permit, and on non-target animals exposed to the presence or actions of the researchers. NMFS also concluded, based on past analyses, that these types of research activities, which are conducted from vessels at sea, do not have measurable effects on the physical, social or economic environment. Each of these EAs supported a finding of no significant impact.

In this case, NMFS considered prior NEPA analyses for issuance of similar scientific research permits and determined that an EA is the appropriate level of NEPA analysis for the proposed permit. Two previous NEPA documents prepared for issuance of permits for research on marine mammals are summarized below because the types of research activities and protocols are the same as or analogous to those proposed by the applicant for the permit that is the subject of this EA. In 2002, NMFS prepared an EA for Steller sea lion research permits because the scope and magnitude of the research was unprecedented and greater than generally expected for research on a single species, due largely to a substantial increase in Congressional funding. In 2005, NMFS prepared another EA to evaluate whether there was a potential for research at the increased levels carried forward from 2002 to adversely impact threatened and endangered Steller sea lions.

The following summarizes previous NEPA documents that informed the decision to initiate an EA for this proposed action and influenced the scope of this EA. Each summary includes a description of research activities in each prior proposed action (preferred alternative) that are relevant to the types of research proposed by the applicant for the permit that is the subject of this EA.

2002 Environmental Assessment on the Effects of NMFS Permitted Scientific Research Activities on Threatened and Endangered Steller Sea Lions.
In response to applications for permits to conduct research on threatened and endangered Steller sea lions, NMFS prepared an EA in 2002 to evaluate the effects of scientific research on these animals (NMFS 2002). The proposed action was to issue permits as requested by the applicants, and with a number of mitigation measures intended to minimize the potential for adverse impacts. Other measures included in the proposed action limited the duration of the permits to two years, to limit the duration of adverse impacts. In June 2002, the Assistant Administrator for Fisheries signed a Finding of No Significant Impact (FONSI), which concluded that issuance of the permits as described in the proposed action alternative would not significantly affect the human environment.

The types of research activities evaluated in the 2002 EA included studies to:

- provide additional information on seasonal prey consumption by Steller sea lions through analysis of scat collected at rookeries and haulouts;
- evaluate prey selection in free-ranging Steller sea lions for both western and eastern populations through an assessment of the presence of fatty acid signatures in blubber, and to investigate the distribution and abundance of sea lions in relation to temporal and spatial distributions of prey;
- study the hunting behavior and three-dimensional movements of Steller sea lions;
- collect information on the health status (e.g., morphometrics, body composition, immunology, epidemiology, endocrinology, viral serology), physiology (e.g., vitamin requirements, stress responses to capture, handling, and captivity), life history (e.g., ontogenetic and annual cycles, population dynamics), foraging behavior and habitat use of Steller sea lions; and
- continue monitoring the status, trends, health, condition, and vital paramaters of the Alaskan Steller sea lion population and identify causes of the population decline, including studies related to identifying habitat requirements and areas of special biological significance, management stocks, and investigating feeding ecology and factors affecting energetic status.

Those studies, which have objectives similar to those in the proposed permit for this EA, used aerial, vessel, and ground surveys, animal capture, sampling of various tissues, attachment of scientific instruments, and application of tags and other marks. The protocols for those methods were the same as, or analogous to those in the proposed permit analyzed in this EA.

2005 Environmental Assessment on the Effects of NMFS Permitted Scientific Research Activities on Threatened and Endangered Steller Sea Lions.
As with the 2002 EA, NMFS prepared an EA in 2005 in response to applications for permits to conduct research on threatened and endangered Steller sea lions (NMFS 2005). The proposed action was to issue permits as requested by the applicants, and with a number of mitigation

measures intended to minimize the potential for adverse impacts. The types of research activities evaluated in the 2005 EA included the same types of studies, objectives, and protocols evaluated in the 2002 EA. Unlike the 2002 EA, the proposed action did not limit the duration of permits to two years; rather, permits were to be valid for five years, which is the maximum duration allowed by regulation. In May 2005, the Assistant Administrator for Fisheries signed a FONSI, which concluded that issuance of the permits as described in the proposed action would not significantly affect the human environment.

Subsequent to completion of the 2005 EA, NMFS initiated an EIS for research on Steller sea lions and northern fur seals throughout their ranges in the United States. The intent of preparing an EIS was to evaluate the impacts of funding and permitting the research programs for these two species under a variety of alternatives. After initiation of the EIS, the U.S. District Court of the District of Columbia found that NMFS had violated the Administrative Procedure Act by failing to prepare an EIS for the permits issued under the 2005 EA. Those permits were vacated and NMFS was ordered to complete an EIS prior to reissuing them. The EIS was completed in 2007, and new permits were issued without further litigation.

The magnitude and scope of the Steller sea lion and northern fur seal research program evaluated in the EIS is greater than that of the proposed action in this EA. It included research activities that could occur year-round, throughout the species' range in the U.S., and under nine separate permits. The proposed action for this EA does not encompass the entire range of a species, and includes a single permit holder. Although there are currently 10 active permits that, in combination, authorize research year-round, throughout the species' ranges in the U.S., these target species are not listed under the ESA and their populations are robust. Thus, the cumulative impact concerns that resulted in elevation of the 2005 EA to an EIS are not considered similar to this proposed action. These other permits for the target species are summarized in Appendix A. The proposed permit for this EA does not represent a substantial change in the scope or size of the overall amount of research permitted for the three subject species, because it effectively replaces one of the 10 permits that are currently active, albeit with some additional activities. However, the total scope of research permitted for these three species warrants an evaluation of the potential for cumulative impacts. Accordingly, a cumulative impact analysis is included in section 4.7 of this EA.

## *1.3 SCOPING SUMMARY*

The purpose of scoping is to identify the issues to be addressed and the significant issues related to the proposed action, as well as identify and eliminate from detailed study the issues that are not significant or that have been covered by prior environmental review. An additional purpose of the scoping process is to identify the concerns of the affected public and Federal agencies, states, and Indian tribes. CEQ regulations implementing the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 et seq.) do not require that a draft EA be made available for public comment as part of the scoping process. However, a draft EA was made available upon request for review and comment during the requisite public comment period for the permit application. No one requested a copy of the draft EA and no comments were received on it. NMFS received comments on the application that informed the structure of the action alternatives.

The MMPA and its implementing regulations governing issuance of special exception permits for scientific research (50 C.F.R. §216.33) require that, upon receipt of a valid and complete application for a new permit, and the preparation of any NEPA documentation that has been determined initially to be required, NMFS publish a notice of receipt in the *Federal Register*. The notice summarizes the purpose of the requested permit and invites interested parties to submit written comments concerning the application. The application was made available for public review and comment for 30 days and provided to the Marine Mammal Commission. NMFS only received comments from the Marine Mammal Commission.

The Marine Mammal Commission stated[5] that while they are in favor of continuing research that has been "crucial for understanding the status and trends of [these three pinniped stocks] and the risk factors to which they are exposed" they note that "the research process could and should be improved" and it is "incumbent upon researchers to assess the possible unintended affects of their research where potentially significant effects might reasonably be expected …" The Marine Mammal Commission recommended approval of a permit upon resolution of the following outstanding issues related to the request:

- Verification of review and approval of the protocols by an Institutional Animal Care and Use Committee as required under the Animal Welfare Act
- Identification of the mechanism by which the taking of Steller sea lions incidental to the proposed research would be authorized
- Receipt of a science- or data-based justification from the applicant for why efforts to assess the impacts of such high levels of disturbance are not necessary or consideration by NMFS of how the disturbance might reasonably be evaluated over time to address these uncertainties
- Receipt of science- or data-based evidence from the applicant that branding without anesthesia provides significant advantages that outweigh the benefits of anesthesia or development by NMFS of a method of collecting the essential information as the research progresses
- Receipt of science- or data-based evidence from the applicant that no elephant seal mother-pup bonds are disrupted during research or development by NMFS, in conjunction with the applicant, of a method to collect appropriate data to address this uncertainty

With regard to the first issue, as noted in Section 1.4 of this EA, compliance with the Animal Welfare Act is the responsibility of the researchers. It is not an approval necessary for NMFS issuance of the permit, but is necessary for implementation of the research authorized. Section 4.3 of this EA addresses compliance with this requirement.

On the second issue, regarding takes of Steller sea lions, the applicant amended their request subsequent to receipt of this comment from the Marine Mammal Commission, and asked for inclusion of permission to harass Steller sea lions incidental to the proposed research. The amended application is reflected in a modified alternative that is described in Chapter 2 and evaluated in Chapter 4 of this EA.

---

5 The Marine Mammal Commission submitted written comments on the application in a letter dated October, 24, 2008. The letter is a part of the administrative record for this permit file.

Regarding the issues related to uncertainties about effects of the research, Chapter 4 of this EA discusses how impacts of the research are evaluated, including how the analysis deals with unknown or uncertain effects.

The Marine Mammal Commission also recommended the permit be conditioned to require that:

- Activities be suspended, pending review and authorization to proceed, if five California sea lions, five harbor seals, or two northern elephant seals are accidentally injured or killed in a given year
- Researchers monitor effects of activities that are focused on or result in disturbance of mother-pup pairs to determine whether there are lasting or significant effects on the mother or the pup
- The research is coordinated and data is shared with that of other permit holders who might be conducting research on the same species in the same areas to avoid unnecessary duplication of research and disturbance of animals.

The Marine Mammal Commission routinely recommends permit conditions related to limits on mortality, monitoring of effects of research, and coordination among permit holders. NMFS finds these types of mitigation and monitoring measures reasonable and practicable. Permits that would be issued under the action alternatives described in Chapter 2 include conditions responsive to these recommendations.

Subsequent to the close of the comment period on the original application the applicant submitted an amended application with a request to include takes of marine mammals from two species not included in the original application: threatened Eastern Distinct Population Segment Steller sea lions (*Eumetopias jubatus*) and endangered Southern Resident killer whales (*Orcinus orca*). The applicant requested permission to harass these two non-target species incidental to the research directed at the target species.

The amended application was made available for public review and comment for 30 days and provided to the Marine Mammal Commission. A revised draft EA was not made available during the comment period. The original draft sufficiently addressed the potential impacts to non target species. The Marine Mammal Commission submitted a letter reiterating their comments on the original application and further recommending that the permit be denied unless the applicant demonstrates that their research has been reviewed and approved by an Institutional Animal Care and Use Committee.

Comments received on the original and amended application will be considered in NMFS final decision on a permit. This final EA includes an action alternative that incorporates the changes requested to the original application (Alternative 2).

This EA will not evaluate impacts of the proposed action on the social or economic environment. Analyses in previous EAs prepared for issuance of permits for research on pinnipeds, using similar research methods, demonstrated that issuance of research permits does not tend to have a significant impact on the social or economic environment. Those previous analyses indicate that the effects of permit issuance are related to the conduct of the research they authorize, and that

those effects tend to be limited to components of the biological and physical environment. Specifically, there are effects of research on the animals that are the subject of the research, on non-target animals exposed to the presence or actions of the researchers, and, in some cases, on certain types of substrate (the physical environment) in the immediate vicinity of the research. Those previous analyses indicate that the effects on animals can be direct (caused by the action and occur at the same time and place as the action) and indirect (caused by the action, but are later in time or farther removed in distance), while effects on the physical environment are direct. Thus, issues within the scope of this EA include direct and indirect effects of the research activities on target and non-target animals, and direct effects on specific components of the physical environment.

## *1.4 APPLICABLE LAWS AND NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS*

This section summarizes federal, state, and local permits, licenses, approvals, and consultation requirements necessary to implement the proposed action, as well as who is responsible for obtaining them. This includes federal, state, or local permits and approvals that are the responsibility of the applicant to obtain.

### *1.4.1 National Environmental Policy Act*

The National Environmental Policy Act (NEPA) was enacted in 1969 and is applicable to all "major" federal actions significantly affecting the quality of the human environment. A major federal action is an activity that is fully or partially funded, regulated, conducted, or approved by a federal agency. NMFS issuance of permits for research represents approval and regulation of activities. While NEPA does not dictate substantive requirements for permits, licenses, etc., it requires consideration of environmental issues in federal agency planning and decision making. The procedural provisions outlining federal agency responsibilities under NEPA are provided in the Council on Environmental Quality's implementing regulations (40 CFR Parts 1500-1508).

NMFS procedures for complying with NEPA and the implementing regulations issued by the Council on Environmental Quality were established in NOAA Administrative Order (NAO) 216-6. This EA is prepared in accordance with NEPA, its implementing regulations, and NAO 216-6. As previously described, an important factor in the prior litigation was the status of the target species (which are listed as threatened and endangered under the ESA and depleted under the MMPA) and the scope of the research activities being permitted. Those factors do not apply to this proposed action, and NMFS has determined that an EA, not an EIS, is therefore the appropriate initial level of NEPA analysis for this proposed action.

### *1.4.2 Marine Mammal Protection Act*

The MMPA prohibits takes of all marine mammals in the U.S. (including territorial seas) with a few exceptions. Permits for *bona fide*[6] scientific research on marine mammals, or to enhance the survival or recovery of a species or stock, issued pursuant to section 104 of the MMPA are one

6 The MMPA defines bona fide research as "scientific research on marine mammals, the results of which – (A) likely would be accepted for publication in a refereed scientific journal; (B) are likely to contribute to the basic knowledge of marine mammal biology or ecology; or (C) are likely to identify, evaluate, or resolve conservation problems."

such exception. These permits must specify the number and species of animals that can be taken, and designate the manner (method, dates, locations, etc.) in which the takes may occur. NMFS has sole jurisdiction for issuance of such permits for all species of cetacean, and for all pinnipeds except walrus[7].

NMFS may issue a permit pursuant to section 104 of the MMPA to an applicant who submits with their application information indicating that the taking is required to further a bona fide scientific purpose. An applicant must demonstrate to NMFS that the taking will be consistent with the purposes of the MMPA and applicable regulations. If lethal taking of a marine mammal is requested, the applicant must demonstrate that a non-lethal method of conducting research is not feasible. NMFS must find that the manner of taking is "humane"[8] as defined in the MMPA. In the case of proposed lethal taking of a marine mammal from a stock listed as "depleted" NMFS must also determine that the results of the research will directly benefit the species or stock, or otherwise fulfill a critically important research need.

NMFS has promulgated regulations to implement the permit provisions of the MMPA (50 CFR Part 216) and has produced application instructions approved by the Office of Management and Budget that prescribe the procedures (including the form and manner) necessary to apply for permits. All applicants must comply with these regulations and application instructions in addition to the provisions of the MMPA.

Section 101(a)(5) of the MMPA provides for the authorization of the incidental, but not intentional, taking by harassment of small numbers of marine mammals for specified activities (other than commercial fishing) within a specified geographic region provided the taking will have a negligible impact on the subject species and will not have an unmitigable adverse impact on the availability of such species for taking for subsistence uses and provided the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. When conduct of research under an MMPA section 104 research permit would result in the incidental but not intentional harassment of marine mammals that are not the subject of the permit, the research permit holder may need to secure an incidental harassment authorization (IHA) pursuant to section 101(a)(5)(D) of the MMPA. These IHAs are subject to such conditions as NMFS deems necessary and appropriate and are valid for periods of not more than one year. Thus the permit holder would need to apply for and secure one IHA for each year the permit is valid. The permit holder could instead apply for authorization under Section 101(a)(5)(A) that would result in regulations setting forth permissible methods of taking for up to five years pursuant to annual letters of authorization. Regulations at 50 CFR 216.104 specify the procedures for submission and processing of requests for both types of authorizations.

### *1.4.3 Endangered Species Act*

Section 9 of the ESA, as amended, and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption such as by a permit. Permits to take ESA-listed species for scientific purposes, or for the

7 The U.S. Fish and Wildlife Service has jurisdiction for walrus, polar bears, sea otters, and manatees.
8 The MMPA defines humane in the context of the taking of a marine mammal, as "that method of taking which involves the least possible degree of pain and suffering practicable to the mammal involved."

purpose of enhancing the propagation or survival of the species, may be granted pursuant to Section 10(a)(1)(A) of the ESA.

NMFS has promulgated regulations to implement the permit provisions of the ESA (50 CFR Part 222) and has produced OMB-approved application instructions that prescribe the procedures necessary to apply for permits. All applicants must comply with these regulations and application instructions in addition to the provisions of the ESA.

Section 10(d) of the ESA stipulates that, for NMFS to issue permits under section 10(a)(1)(A) of the ESA, the Agency must find that the permit: was applied for in good faith; if granted and exercised will not operate to the disadvantage of the species; and will be consistent with the purposes and policy set forth in Section 2 of the ESA.

Section 7 of the Endangered Species Act (ESA; 16 U.S.C. 1531 *et seq*.) requires consultation with the appropriate federal agency (either NMFS or the U.S. Fish and Wildlife Service) for federal actions that "may affect" a listed species or adversely modify critical habitat. NMFS issuance of a permit affecting ESA-listed species or designated critical habitat, directly or indirectly, is a federal action subject to these Section 7 consultation requirements. Section 7 requires federal agencies to use their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of endangered and threatened species. NMFS is further required to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of habitat for such species. Regulations specify the procedural requirements for these consultations (50 Part CFR 402).

In those cases where the consulting federal agency concludes that an action and the resultant incidental take of listed species will not violate section 7(a)(2) of the ESA, and in the case of marine mammals, where the taking is authorized pursuant to section 101(a)(5) of the MMPA, the consulting federal agency will provide, with the biological opinion, a statement concerning the incidental take (i.e., an "incidental take statement") that specifies the amount of take and those measures necessary or appropriate to minimize such take.

#### *1.4.4 Animal Welfare Act*

The Animal Welfare Act (AWA: 7 U.S.C. 2131 – 2156) sets forth standards and certification requirements for the humane handling, care, treatment, and transportation of mammals. Enforcement of these requirements for non-federal facilities is under jurisdiction of the U.S. Department of Agriculture's Animal and Plant Health Inspection Service. Each research facility is required to establish an Institutional Animal Care and Use Committee (IACUC) which reviews study areas and animal facilities for compliance with the AWA standards. The IACUC also reviews research protocols and provides written approvals for those that comply with AWA requirements. For federal research facilities, the head of the federal agency is responsible for ensuring compliance with the AWA requirements. It is the responsibility of the researcher to seek and secure IACUC reviews and approvals for their research.

### *1.4.5 Magnuson-Stevens Fishery Conservation and Management Act*

Under the MSFCMA Congress defined Essential Fish Habitat (EFH) as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” (16 U.S.C. 1802(10)). The EFH provisions of the MSFCMA offer resource managers means to accomplish the goal of giving heightened consideration to fish habitat in resource management. NMFS Office of Protected Resources is required to consult with NMFS Office of Habitat Conservation for any action it authorizes (e.g., research permits), funds, or undertakes, or proposes to authorize, fund, or undertake that may adversely affect EFH. This includes renewals, reviews or substantial revisions of actions.

# CHAPTER 2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter describes the range of potential actions (alternatives) determined reasonable with respect to achieving the purpose and need, as well as alternatives eliminated from detailed study. This chapter also summarizes the expected outputs and any related mitigation associated with each alternative. Note that expected outcomes of an alternative are not the same as potential impacts. Outcomes relate to how the alternatives would achieve the defined purpose and need. NMFS evaluation of the potential environmental impacts of the alternatives is contained in Chapter 4.

As discussed in the Chapter 1, the proposed action is to issue a permit for research on marine mammals in the wild that would exempt the permit holder from the MMPA's and ESA's prohibition against "takes" of marine mammals and listed species during conduct of authorized research. Reasonable alternatives that do not involve issuance of such a permit must avoid takes to be consistent with applicable laws. Reasonable alternatives to the proposed permit could include permits that require methods different from those proposed by the applicant, including methods or mitigation measures that could be expensive or logistically difficult to implement, but are not technically infeasible or not able to be implemented.

In addition to a reasonable range of alternatives, an action agency is required to evaluate a No Action alternative. The No Action alternative serves as the baseline against which the potential impacts of the proposed action and other alternatives are evaluated. The Proposed Permit alternative represents the research proposed in the submitted application for a permit, with standard permit terms and conditions specified by NMFS. A third alternative, Permit with Special Avoidance Measures, includes the research activities proposed by the applicant, the same standard terms and conditions as the Proposed Permit alternative, and includes additional restrictions on the timing, location, and conduct of research to avoid animals listed as threatened or endangered under the ESA.

## *2.1 ALTERNATIVE 1 – NO ACTION*

Under the No Action Alternative, no permit would be issued for the activities proposed by the applicant. Research on the three target species of pinnipeds would continue under other permits issued by NMFS pursuant to the MMPA. However, research activities specifically related to the marine mammal stock assessment work conducted by NMML (the applicant) for NMFS management needs would not be permitted. As these other permits are issued for the same overarching purpose as the proposed permit, presumably information gained from research under these permits would continue to contribute to NMFS's understanding of the basic knowledge of marine mammal biology or ecology, and to identifying, evaluating, or resolving conservation problems for the species. Monitoring of fisheries that interact with these marine mammal populations would also continue. NMFS would continue to implement existing management measures for conservation of these species, including maintaining the general prohibitions of the MMPA. There would also still be research related to species conservation that does not require MMPA permits or result in "taking" of marine mammals, including investigations of climate change and oceanographic factors that may affect abundance, distribution, and population trends.

## *2.2 ALTERNATIVE 2 – PROPOSED PERMIT*

Under the Proposed Permit alternative, a permit would be issued for activities as proposed by the applicant, with the permit terms and conditions standard to such permits as issued by NMFS. These include conditions required by the MMPA, ESA, and NMFS regulations for research permits, and special conditions common to permits for research on pinnipeds. The special conditions related to research on pinnipeds are intended to mitigate (avoid or minimize) potential adverse effects on animals due to the specific research methods. The permit conditions that are part of the proposed permit alternative, including these mitigation measures, are listed in Appendix B. The permit would be valid for five years from the date of issuance.

Under this alternative, the permit would exempt the permit holder from the MMPA's take prohibitions and allow takes of California sea lions, harbor seals, northern elephant seals, Steller sea lions, and Southern Resident killer whales. The number of individual animals that may be taken by species, and the manner (research method) in which they may be taken, would correspond to that requested by the applicant. See Appendix C for a table outlining the numbers of animals, research activities, etc. as proposed by the applicant. The specific research methods are described in Section IV.C (Methods) of the application (NMFS permit application file no. 13430).

In summary, the permit would allow surveys (aerial, vessel, and ground) of pinnipeds on rookeries and haul outs, capture of individual animals in water and on land for collection of various tissue samples, attachment of scientific instruments for collection of data on habitat use and foraging, and application of marks (flipper tags, brands, etc.) to allow identification of individual animals for subsequent re-captures or surveys. The permit would also allow playback experiments involving broadcasts of recorded killer whale vocalizations from an underwater speaker deployed at a depth of approximately 5 m, from a small boat anchored 100 m from a sea lion haulout site. The frequency range of the signal would be 10 – 22 kHz, centered at 22 kHz, with a maximum source level at 148 dB (reference pressure 1 μPa at 1m).

The permit would allow harassment of Steller sea lions and Southern Resident killer whales incidental to these research activities directed at the target California sea lions, harbor seals, and northern elephant seals. In addition to the surveys, captures, and incidental harassment, the permit would authorize mortality of a limited number of animals from the three target species incidental to any of the permitted activities.

The playback experiments are an activity that was not evaluated in the previous EAs for pinniped research permits. They would involve deployment of an underwater speaker in the water column at approximately 100 m offshore from sea lion haulout sites at various locations in the Pacific Northwest including Shilshole Bay, Everett, Ballard Locks, Neah Bay and East Bodelteh Island in Washington, and at Bonneville Dam, Astoria, Rogue River, and the lower Columbia River near Astoria in Oregon. Playback experiments could affect a variety of animals in the water column, and the depth and distance from the source at which animals could be exposed depends on the source characteristics and the sound propagation characteristics at a given site. Details on which animals could be exposed to the playbacks are presented in Chapter 3, including discussion of the hearing abilities of various taxonomic groups that may be present in the action area.

Aerial and vessel surveys have a potential to affect animals on land and at or very near the water's surface. Capture activities (including tissue sampling, marking, and attachment of instruments) are likely to affect animals on land or nearshore, but not in the water column.

The field research could occur year-round, throughout the action area. Some activities would be seasonal, such as those associated with capture of animals of a specific age class, whereas others would be episodic, as described in the application. The application does not provide a schedule for the specific times and locations of the various activities, and it is assumed this would be determined by the specific research objectives and limited by availability of resources necessary to accomplish the research.

This permit would not contain special conditions limiting the conduct of research to times, areas, or means that would avoid non-target marine mammal species (those not listed in the application) or species listed as threatened or endangered under the ESA that may be present in the action area. As a result, this alternative may require that the applicant secure additional authorization under section 101(a)(5) of the MMPA for harassment of marine mammals incidental to conduct of the research. Also, NMFS would need to initiate interagency consultations pursuant to section 7 of the ESA for those threatened and endangered species that may be adversely affected by issuance of the permit and conduct of the authorized research. Consultation for ESA-listed marine mammals, sea turtles, and Pacific salmon would be with the NMFS Endangered Species Division. Consultation for ESA-listed birds and terrestrial mammals would be with the U.S. Fish and Wildlife Service. Section 4.3 describes the status of ESA consultations and additional MMPA authorizations for this alternative.

Section 1.1.2 above summarizes the need for specific types of research activities (e.g., surveys, capture, tissue sampling) related to addressing various research areas proposed by the applicant. Additional information on how individual samples, scientific instruments, etc. relate to the eight research areas proposed by the applicant can be found in Section IV.B.3 (Hypothesis/ Objectives/ Justification) of the application (NMFS permit application file no. 13430). With respect to the purpose and need of the proposed action, the research projects proposed by the applicant are broadly related to collecting information that could be used for stock assessments of the species that are the subject of the research.

### *2.3 ALTERNATIVE 3 – PERMIT WITH SPECIAL AVOIDANCE MEASURES*

Under the Permit with Special Measures alternative, a permit would be issued for activities as proposed by the applicant. The permit would contain the same standard and special permit terms and conditions as the Proposed Permit in alternative 2. The permit would contain additional special conditions that limit the conduct of research to times, areas, or means that would avoid exposure of non-target (those not listed in the application) marine mammal species and species listed as threatened or endangered under the ESA to the presence or actions of researchers. The incorporation of these "special avoidance measures" would eliminate the potential for the permitted research to adversely affect species not covered by the permit but for which "take" is prohibited under the MMPA or ESA. This permit would not require section 7 consultations, nor would it require the researchers to get an Incidental Harassment Authorization.

As with the Proposed Permit alternative, this permit would exempt the permit holder from the MMPA's take prohibitions and allow takes of California sea lions, harbor seals, and northern elephant seals. The number of individual pinnipeds that may be taken, and the manner (research method) in which they may be taken, would be the same as in the Proposed Permit alternative, i.e., the same as in the application, with the following limitations related to avoiding non-target marine mammals, threatened species, and endangered species.

- To avoid takes of cetaceans other than Southern Resident killer whales by level B harassment, the permit would require researchers to keep vessels at least 100 m away, and not conduct aerial surveys below 1000 feet when these animals are present.
- To avoid effects on sea otters, the permit would require researchers to keep vessels at least 100 m away from otters, and not conduct aerial surveys below 1000 feet when otters are present.
- To avoid takes of sea otters, small cetaceans, baleen whales, and non-ESA listed killer whales during playbacks, the permit would require researchers to turn off the source if any of these animals are sighted within 100 m of the source, and keep turned off for 30 minutes after any of these animals are sighted within 1 mile of the source. To ensure detection of these non-target animals, the permit would require researchers to visually survey a 1-mile radius from the source 30 minutes prior to initiation of playbacks, and not conduct playbacks if sea state or other conditions limit visibility within 1-mile of the source. [Note that the 1-mile survey radius is based on reasonable sightability distances and is likely overly protective given the low power of the source. Nevertheless, because the permit would not authorize takes of any non-target marine mammal species, this distance is appropriately conservative.]
- To avoid takes of ESA-listed birds, the permit would require researchers to remain at least 100 m away from individual birds or their nests at all times, and avoid beaches where these birds are known to nest during nesting season (appx. March through September).

As the research projects that would be authorized under this alternative are the same as those for the Proposed Permit alternative, this alternative is also broadly related to the overarching need for collecting information that could be used for stock assessments of the species that are the subject of the research and for "sound" management of these species. The avoidance measures could limit the researchers' ability to conduct some activities at specific locations or certain times of year. Without details about when and where each research activity needs to occur relative to a given study objective, it is not possible to predict what effect the avoidance measures would have on the permit holder's ability to achieve the objectives outlined in their application.

## *2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY*

The alternatives considered in detail are within the purpose and need for the action. NMFS did not evaluate alternatives that are not able to be implemented as part of the MMPA or ESA permit process. Issuance of permits is in response to receipt of an application, so the decision to be made is whether or not the proposed activities are consistent with applicable statutory and regulatory issuance criteria. Thus, NMFS typically only evaluates two alternatives in EAs for

issuance of research permits under the MMPA: the no action alternative and the proposed permit alternative. The proposed permit alternative typically corresponds to the activities proposed in the permit application. This usually represents bookends on the spectrum of possibilities that would not violate the MMPA's or ESA's prohibitions on takes and would be consistent with the purpose and policy of the MMPA and ESA. NMFS considered an additional action alternative (Alternative 3) to evaluate the impacts of restricting the research to times, locations, and methods that would avoid impacts on non-target marine mammals and species listed under the ESA for which no MMPA or ESA permit is being sought by the applicant.

NMFS did not evaluate alternatives in which a permit is issued to the applicant for species or methods other than those requested, or to someone other than the applicant. While the need for research on marine mammals in general is related to the purpose and policy of the MMPA, the proposed action of issuing a permit must be in response to a request from an applicant. NMFS cannot issue research permits in the absence of such applications. The MMPA requires that NMFS only issue permits to applicants who have demonstrated, in their application, that the proposed taking of marine mammals is necessary to further a bona fide scientific purpose and that the proposed methods are humane. NMFS regulations further require that permit applicants demonstrate their qualifications and resources are appropriate or adequate for conduct of the proposed research. Finally, the MMPA and NMFS regulations require that permit applications be made available to the public, and that NMFS decision to issue a permit include consideration of the comments received on the permit application. Thus, alternatives in which permits are issued for species or activities other than those justified in the specific application under consideration, or to persons who did not submit an application, would be inconsistent with the requirements of the MMPA.

NMFS did not evaluate alternatives that varied in the type of general permit conditions, other than those for avoidance of non-target species (i.e., other marine mammals, threatened or endangered, etc. for which the permit would not authorize take). The action alternatives include permit conditions required by statute and regulation, in addition to conditions specific to mitigation for the proposed research. Issuance of permits that do not include the required conditions would be inconsistent with the MMPA and ESA. Permits that do not include special conditions for mitigation of the impacts of the specific research methods would have greater potential for adverse impacts on the marine mammals that are the subject of the research. Whereas the ultimate purpose of issuing research permits is to promote conservation of marine mammals, permits that allow greater adverse impacts than are necessary to achieve the objective are not consistent with the MMPA and ESA.

NMFS did not evaluate alternatives that would make the permit valid for less than the maximum allowable time of five years. Some of the research in the proposed permit alternative is part of a long-term monitoring of species by NMFS that is likely to continue for the foreseeable future. This monitoring requires a permit to be exempt from the MMPA and ESA take prohibitions. As such, limiting the permit to less than the maximum allowable time would likely result in the need for issuance of more permits (more frequently) over time, with no appreciable change in the potential impacts on the environment.

NMFS did not evaluate alternatives that reduced the number of marine mammals that could be taken, restricted the age classes or life-history stages that could be affected, or eliminated specific research methods proposed by the applicant. Such alternatives may have reduced impacts relative to the proposed permit, but the applicant asserts these are the numbers, age classes, methods etc., most suitable for their stated hypotheses and objectives.

# CHAPTER 3 AFFECTED ENVIRONMENT

This chapter presents baseline information necessary for consideration of the alternatives, and describes the resources that would be affected by the alternatives. The effects of the alternatives on the environment are discussed in Chapter 4.

The applicant has proposed to conduct research within coastal waters and on pinniped rookeries and haul outs of Washington and Oregon. As it has been established in prior NEPA analyses that issuance of permits for research on pinnipeds does not tend to have indirect effects on the physical environment, the geographic extent of the action area for the proposed action is not expected to extend farther removed in distance than the actual sites of the field research activities, including ingress and egress routes used by the researchers. Thus, the geographic extent of the action area for this EA is the same as that proposed for research by the applicant, i.e., coastal waters and pinniped rookeries and haul outs of Washington and Oregon. This includes the airspace over these areas in the case of aerial surveys.

While some of the research activities in the action alternatives may be limited to specific times of year that coincide with the researcher's need to sample animals of a given age class, the research as proposed may occur at any time of year for five years from the date of permit issuance. Thus, consideration of what resources are within the action area and that may be affected by the research addressed all action alternatives and assumes the research will occur year-round.

The permit applicant did not specify routes of ingress or egress for the activities that would occur on land (on pinniped rookeries and haul outs). For the purpose of this analysis, it is assumed they could access some sites directly, by beaching or docking small boats, whereas other sites could be accessed indirectly, via overland routes. In the case of overland routes, it is assumed researchers could beach or dock small boats somewhere in the vicinity of the field site and walk to the field site, or they could approach overland using some combination of motorized vehicle and walking. This analysis assumes researchers are not using helicopters or other aircraft to access field sites, although fixed-wing aircraft would be used for some surveys.

## *3.1 SOCIAL AND ECONOMIC ENVIRONMENT*

An EA must include a discussion of a proposed action's economic and social effects when these effects are related to effects on the natural or physical environment. It was determined during initial scoping (see Section 1.3) that issuance of research permits does not typically affect the social or economic environment, and that analysis of potential impacts to these resources is therefore not within the scope of this document. However, for this action there is one component of the natural environment that is also a component of the social environment, and which may be affected by the action.

Gray whales are known to occur within the action area and are considered a cultural resource for the Makah Indian Tribe in Washington. Members of this tribe are allowed to hunt gray whales, for subsistence purposes, between April 1 and October 31 of each calendar year in those open waters of the Pacific Ocean which are outside the Tatoosh-Bonilla Line, and within the adjudicated usual and accustomed grounds of the Makah Tribe. These waters are along the northwest Washington coast and include the entrance of the Strait of Juan de Fuca. A permit condition requiring researchers to avoid activities in the hunting grounds during the annual

period of the subsistence harvest would avoid potential impacts on subsistence uses, as discussed in the mitigation Section 4.5.

As gray whales are a component of the natural (biological) environment that are also considered a component of the social environment because of subsistence hunting by the Makah Tribe, gray whales are discussed in the section on biological environment rather than here. Please refer to section 3.3 for relevant information about gray whales in the action area.

## *3.2 PHYSICAL ENVIRONMENT*

The action area includes waters and lands along the coasts of Washington and Oregon inhabited or used by the pinniped species that are the subject of the proposed research. There are a number of places within the action area that could be considered unique or ecologically critical, including coastal wetlands, a National Marine Sanctuary, several National Wildlife Refuges, State Parks, essential fish habitat designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and ESA designated critical habitat.

The character of the Washington and Oregon coasts varies from south to north. In some regions, mountains rise precipitously from the ocean's edge, and in others, extensive coastal dunes drift up against forested hills. Forests along the coast are dominated by shore pine, Sitka spruce, and Douglas fir. The predominant land use is intensive forestry, and coastal areas are also dominated by small communities. Tourism, hunting, and sport fishing are also common activities throughout the region. As development pressures along the coast have increased, the demand for residential and commercial waterfront properties has grown. As a result, wetland habitats in many areas are exposed to increasing encroachment, pollution, and reduced water quality.

Wetlands are transitional lands between terrestrial and deepwater habitats where the water table is usually at or near the land surface or the land is covered by shallow water. The steep slopes of mountains extending to the Pacific Ocean along much of the coast leave little room for wetland formation in the action area. Most wetlands in the action area are in the shallow, low-gradient reaches near the mouths of coastal rivers and in their deltas. The ecological and economic benefits of wetlands are generally disproportionately greater than their geographic extent.

Flood attenuation, erosion and storm-damage reduction, water quality maintenance, and water supply are among the beneficial functions of wetlands. Coastal and inland wetlands also provide stopover, feeding, and breeding habitat for migratory waterfowl and shorebirds, as well as important habitat for native fish and wildlife. In addition, many of the commercially harvested fish and shellfish in the area depend on wetlands for food and spawning or nursery habitat.

The proposed research activities are not expected to affect the extent or quality of wetlands or other ecologically critical physical features of the action area. Some research activities could have direct localized effects on substrate, the impacts of which are discussed in Chapter 4. The following discussion of ecologically critical or otherwise unique areas within the action area is provided primarily for purposes of illustrating the diversity of biological resources connected with these physical environmental features and which could be affected by the proposed research.

### *3.2.1 Sanctuaries, Parks, and Refuges*

The action area includes a National Park, a National Marine Sanctuary, several National Wildlife Refuges, and numerous State Parks. National Parks are reserves of land protected from most human development and pollution, while allowing controlled human activities including camping, fishing and other recreational activities. They are ecologically important to the wildlife within them, serving as areas of relatively undeveloped habitat. The primary objective of a National Marine Sanctuary is to protect its natural and cultural features while allowing people to use and enjoy the ocean in a sustainable way. Sanctuary waters are the aquatic equivalent of National Parks, providing a relatively undisturbed [by human development] habitat for species, protecting historically significant shipwrecks and artifacts, and supporting recreational and commercial activities including sport fishing, tourism, and commercial fishing. Wildlife Refuges were established for the restoration, preservation, and protection of wildlife and wildlands habitat, including endangered and threatened species of birds and mammals and their habitats. Thus, they are unique because of these biological resources (wildlife) within them and ecologically important because of the biological and physical characteristics that make them suitable places for the wildlife. State Parks have been established for a variety of reasons that may vary by Park, but usually include conservation of natural, aesthetic, cultural, and historic resources, while providing opportunities for outdoor recreation including sport-fishing and hunting, and camping. Because the type and amount of human activity allowed in a State Park is controlled, these areas are often ecologically important to the wildlife within them, serving as areas of relatively low human disturbance.

Olympic Coast National Park. The Olympic Coast National Park in Washington borders the Olympic Coast Marine Sanctuary, and its 73-mile long wilderness coast is one of only a few designated coastal wilderness areas in the contiguous 48 states. The National Park includes beaches, rain forest valleys, mountain peaks and a variety of plants and animals. Some animals like raccoons, beaver, and mink live mostly in the lowland areas of the Park, while others, like deer, cougars and bears range from the valleys to mountain meadows. Park waters are home to runs of Pacific salmon. Whales, dolphins, sea lions, seals, and sea otters feed in the Pacific Ocean just offshore. Over 300 species of birds live in the area at least part of the year and the forests provide habitat for spotted owls, marbled murrelets, a variety of amphibians, ground squirrels, red foxes, coyotes, wolverine, bears, etc.

Regulations governing activities within National Parks, including federal regulations for National Parks in general (36 CFR Part 7), restrict or prohibit certain activities. Landing of watercraft along the coastal strip islands and reefs is prohibited from the north bank of the Hoh River to the boundary with the Makah Indian Reservation. Activities prohibited except by a permit from the Park Superintendent include specimen collection (taking plant, fish, wildlife, rocks or minerals), audio disturbances, and aircraft operation. In those areas where motorized vessel activity is permitted, vessels may not create a wake or exceed 5 mph within 100 yards from shoreline in undeveloped areas. Obtaining applicable permits is the responsibility of the researcher.

Olympic Coast National Marine Sanctuary. The Olympic Coast National Marine Sanctuary covers an area of approximately 3,300 square miles and represents one of North America's most productive marine ecosystems and spectacular undeveloped shorelines. There are twenty nine

species of marine mammals and dozens of seabird species that spend parts of their lives within the Sanctuary's boundary including gray whales, albatross, and sea otters. This Marine Sanctuary supports habitats and unique communities of organisms, including one of the most diverse seaweed communities in the world. The NOAA Office of National Marine Sanctuaries implements a permit system to regulate and oversee potentially harmful activities in the Sanctuary. Activities within the Sanctuary that require permits include, but are not limited to overflights (lower than 2000 feet) and certain types of research. Such permits are the responsibility of the researcher.

San Juan Islands National Wildlife Refuge. The San Juan Islands National Wildlife Refuge (NWR) in Washington is a group of 83 islands in the San Juan archipelago, totaling 454 acres in northern Puget Sound, Washington. Islands are categorized into four major habitat types: reefs, rocks, grassy islands, and forested islands. Most smaller islands are nesting and loafing sites for glaucous-winged gulls, cormorants, pigeon guillemots, tufted puffins, rhinoceros auklets, black oystercatchers, and a variety of shorebirds. Harbor seals haul out to rest or to have their pups on the smaller rocks and reefs, as well as on the rocky beaches of the larger islands. Bald eagles build their nests high in the large trees of forested islands and catch fish in the surrounding waters. This area was set aside to protect colonies of nesting seabirds. These islands have also been designated by Congress as a wilderness area where seabirds, eagles, and marine mammals will have an undisturbed place to live and raise their young. Wildlife observation, study, and photography are allowed on Matia and Turn islands. All other refuge islands may be viewed from boats, but are closed to public access to help maintain the natural character of the islands. The Refuge requires that visitors stay at least 200 yards offshore to avoid flushing adult birds off nests. There is a cove on Matia Island with a boat dock, a 5-acre campground, and the trailhead to a 1-mile walk through the Wilderness. There are other small coves with limited anchorage on Matia, but these other coves have no access to the island.

Dungeness National Wildlife Refuge. The Dungeness NWR in Washington, on the south side of the Strait of Juan de Fuca, is one of the world's longest natural sand spits. The wildlife refuge designation includes surrounding waters. Portions of the refuge are closed to provide sanctuary for wildlife during critical feeding, resting, and nesting times. In 1990, Graveyard Spit within the NWR was designated as a Research Natural Area (RNA) due to its unique vegetation. Natural processes are allowed to predominate without human intervention in RNAs. Activities on RNAs are limited to research, study, observation, monitoring, and educational activities that are non-destructive, non-manipulative, and maintain unmodified conditions. (source: http://www.fws.gov/refuges/profiles/index.cfm?id=13539)

Flattery Rocks, Copalis, and Quillayute Needles National Wildlife Refuges: This assembly of 870 islands, rocks and reefs extending for more than 100 miles along Washington's Pacific coast from Cape Flattery to Copalis Beach provide habitat for 70% of Washington's nesting seabirds, and are home to among the largest seabird colonies in the continental United States. The extensive breeding seabird population includes fork-tailed storm-petrels, Leach's storm-petrels, double-breasted cormorants, Brandt's cormorants, pelagic cormorants, black oystercatchers, glaucous-winged gulls, western gulls, common murres, pigeon guillemots, ancient murrelets, Cassin's auklets, rhinocerous auklets, and tufted puffins. The refuges hold more than half of the west coast's breeding population of fork-tailed storm petrels in the contiguous United States.

These islands are closed to the public to protect seabird nesting sites, wildlife and other natural, cultural, and other resources consistent with the conservation purposes of the refuges. The refuges are within the boundary of Olympic Coast National Marine Sanctuary and Olympia National Park. Sea lions, harbor seals, sea otters, and whales may also be seen on or around the islands.

State Parks. There are dozens of state parks along the coasts of Washington and Oregon. Some state parks contain extensive infrastructure, including camp grounds and maintained trails, to provide the public with recreational and educational experiences. The land use and access rules vary by park, but most prohibit picking, cutting, removing, or mutilating plant life and natural resources, except where permits are issued. Most parks contain informational and educational signage, including signs warning of designated areas where public access is prohibited. For example, where beaches within state parks have been designated as nesting sites for Western Snowy Plover, or as wildlife habitat areas, signs warn beach pedestrians to stay on the wet sand, or on established trails.

### *3.2.2 Essential Fish Habitat*

Essential Fish Habitat (EFH) has been designated for Pacific salmon, five "Coastal Pelagic Species" (northern anchovy, Pacific sardine, Pacific (chub) mackerel, jack mackerel, and market squid) and several dozen species of groundfish managed by the Pacific Coast Fishery Management Council. EFH is established because of unique characteristics or features that are critical or essential to the fish species for which it has been designated.

In estuaries and marine areas, salmon EFH extends from the shoreline to the 200-mile limit of the Exclusive Economic Zone (EEZ) and beyond. In freshwater, salmon EFH includes all the lakes, streams, ponds, rivers, wetlands, and other bodies of water that have been historically accessible to salmon. The description of salmon EFH also includes areas above artificial barriers, except for certain barriers and dams that fish cannot pass.

The definition of EFH for coastal pelagic species (CPS) is based on the temperature range where they are found, and on the geographic area where they occur at any life stage. This range varies widely according to ocean temperatures. The east-west boundary of CPS EFH includes all marine and estuary waters from the coasts of California, Oregon, and Washington to the limits of the EEZ (the 200-mile limit) and above the thermocline where sea surface temperatures range between 10° and 26° centigrade. The southern boundary is the U.S./Mexico maritime boundary. The northern boundary is more changeable and is defined as the position of the 10° C isotherm, which varies seasonally and annually. In years with cold winter sea surface temperatures, the 10° C isotherm during February is around 43° N latitude offshore, and slightly further south along the coast. In August, this northern boundary moves up to Canada or Alaska.

The Council has identified groundfish EFH as all waters from the high tide line (and parts of estuaries) to 3,500 meters (1,914 fathoms) in depth.

The EFH regulations (50 CFR §600.810) define an adverse effect as "any impact which reduces quality and/or quantity of EFH...[and] may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site-specific or habitat

wide impacts, including individual, cumulative, or synergistic consequences of actions." Activities that have been shown to affect EFH include disturbance or destruction of habitat from stationary fishing gear, dredging and filling, agricultural and urban runoff, direct discharge, and the introduction of exotic species. The proposed action does not involve nor would it result in any of these types of activities. EFH is not likely to be affected by the proposed action and is therefore not considered further in this EA.

### *3.2.3 Designated Critical Habitat*

The action area for the proposed action includes critical habitat, as designated pursuant to the ESA, for several threatened and endangered species. Critical habitat represents an ecologically unique or critical geographic area in that is was designated because it contains features necessary or critical for the survival or recovery of the listed species for which it has been designated.

Critical habitat has been designated for a number of Evolutionarily Significant Units[9] of threatened and endangered Pacific salmon and anadramous trout in Washington and Oregon and includes freshwater and estuarine areas, with primary constituent elements (PCEs) or habitat areas identified for spawning, rearing, and migration, as well as areas that are unoccupied but essential for conservation, areas unoccupied but may be essential for conservation, and areas occupied but lacking PCEs. (50 CFR Part 226.212)

Critical habitat has been designated for Steller sea lions in California, Oregon, Washington and Alaska. In Oregon, all major Steller sea lion rookeries, and associated air and aquatic zones that extend 3,000 feet (0.9 km) seaward and upward, respectively, are designated critical habitat. (50 CFR Part 226.202)

Critical habitat designated for the endangered Distinct Population Segment of Southern Resident Killer Whales (*Orcinus orca*) includes three specific marine areas of Puget Sound, Washington, within the following counties: Clallam, Jefferson, King, Kitsap, Island, Mason, Pierce, San Juan, Skagit, Snohomish, Thurston, and Whatcom. Critical habitat includes all waters relative to a contiguous shoreline delimited by the line at a depth of 20 feet (6.1 m) relative to extreme high water in specified areas … (71 FR 69054-69070; November 29, 2006).

Critical habitat has been designated for the threatened marbled murrelet (*Brachyramphus marmoratus*) in California, Oregon, and Washington. Primary constituent elements are: individual trees with potential nest platforms and forest lands of at least one half site-potential tree height regardless of contiguity within 0.8 kilometers (0.5 miles) of individual trees with potential nesting platforms and that are used or potentially used by the marbled murrelet for nesting or roosting. (50 CFR Part 17.95)

Critical habitat has been designated for threatened western snowy plover (*Charadrius alexandrinus nivosus*) in California, Oregon and Washington. (50 CFR Part 17.95) Primary constituent elements are: (1) sparsely vegetated areas above daily high tides (e.g., sandy

---

9 An ESU, or evolutionarily significant unit, is a Pacific salmon population or group of populations that is substantially reproductively isolated from other conspecific populations and that represents an important component of the evolutionary legacy of the species. The ESU policy (56 FR 58612) for Pacific salmon defines the criteria for identifying a Pacific salmon population as a distinct population segment (DPS), which can be listed under the ESA.

beaches, dune systems immediately inland of an active beach face, salt flats, seasonally exposed gravel bars, dredge spoil sites, artificial salt ponds and adjoining levees) that are relatively undisturbed by the presence of humans, pets, vehicles or human-attracted predators; (2) sparsely vegetated sandy beach, mud flats, gravel bars or artificial salt ponds subject to daily tidal inundation but not currently under water, that support small invertebrates such as crabs, worms, flies, beetles, sand hoppers, clams, and ostracods; and, (3) surf or tide-cast organic debris such as seaweed or driftwood located on open substrates such as those mentioned above (essential to support small invertebrates for food, and to provide shelter from predators and weather for reproduction).

## *3.3 BIOLOGICAL ENVIRONMENT*

In addition to the species that are the subject of the permit (target species), a wide variety of non-target aquatic species could be found within the action area, including other marine mammals, sea turtles, invertebrates, teleost and elasmobranch fish (including species commercially and recreational exploited), sea birds, and shore birds. Terrestrial species that may be in or near the action area include bears, wolves, foxes, coyotes, beavers, river otters, martens, fishers, raccoons, and skunks. Because merely being present within the action area does not necessarily mean an organism will be affected by the proposed action, the following discussion focuses not only on the distribution and abundance of various species with respect to the timing of the action, but also on whether and by what means the proposed research activities may affect the non-target species.

With the exception of the playback experiments and deployment of a beach seine to capture seals, the research is not conducted in the water column. Only those species in the water column likely to be capable of detecting (based on hearing ability) the playback sounds could be affected by the playbacks. The mesh size of the nets used for beach seine captures is sufficiently large to exclude fish that may be present in the nearshore waters. For the rest of the research activities, organisms that do not spend time at the surface of the water, or on the adjacent shores, are not expected to be exposed to the research activities. Species or taxonomic groups not expected to be exposed to the research activities are not described further.

### *3.3.1 Target Marine Mammal Species*

Three species of pinnipeds are the focus of the proposed research. The population status and other biological and ecological characteristics of these “target species” that are relevant to the potential for the proposed action to affect them are summarized below. Because they are target species, and the research would occur year round, Pacific harbor seals, California sea lions, and northern elephant seals of all ages and reproductive stages would be exposed to all of the proposed research activities. Unlike the non-target species, which would be indirectly affected by the presence and actions of researchers during capture and sampling activities, these three target species would be directly affected by the capture and sampling.

<u>Pacific harbor seal.</u> In the Pacific, harbor seals (*Phoca vitulina*) inhabit coastal and estuarine waters off Baja California, north along the western coasts of the continental U.S., British Columbia, and Southeast Alaska, west through the Gulf of Alaska and Aleutian Islands, and in

the Bering Sea north to Cape Newenham and the Pribilof Islands. NMFS has designated two stocks within the action area: the Oregon/Washington Coast Stock and the Washington Inland Waters Stock. The most recent population abundance estimates, trends, and reproductive and mortality rates for these stocks are available at http://www.nmfs.noaa.gov/pr/sars/species.htm. Neither stock is listed as depleted under the MMPA, or listed under the ESA. The minimum population estimate for the Oregon/Washingon Coast Stock is 22, 380 seals, and both the Washington and Oregon portions of this stock have reached carrying capacity and are no longer increasing. The Washington Inland Stock is thought to be stable, with a minimum population estimate of 12, 844 seals.

Harbor seals haul out and breed on rocks, reefs, and beaches in the action area, and feed in marine, estuarine, and occasionally fresh waters. Harbor seals generally are non-migratory, with local movements associated with such factors as tides, weather, season, food availability, and reproduction. Breeding season is from May through September, varying by region. Pups are precocial, and able to swim almost immediately after birth. The lactation period averages four weeks, during which time pups are attended more or less continuously by their mothers. Adults mate within a few days after pups are weaned, and females give birth the following year, usually to a single pup. Mother-pup pair bonds are based on scent and vocal recognition. Mothers are typically solicitous, and may defend their pups aggressively.

Harbor seals, like other phocid or true seals, rely primarily on blubber rather than pelage for insulation. They tend to have substantially thicker blubber layers than otariid, or eared, seals, and that blubber layer is generally thicker in winter than summer. They must consume enough food during summer and fall to both satisfy daily maintenance requirements and allow accumulation of sufficient blubber for insulation in winter. For adult females, these blubber reserves must also be sufficient to support lactation.

During lactation, females mobilize lipids from their blubber stores to produce very high fat milk. The high fat content of harbor seal milk promotes rapid growth of blubber in pups, which the pups in turn rely on for insulation and as energy reserves following an abrupt weaning and transition to nutritional independence.

The diet of harbor seals varies regionally and seasonally. In the Pacific, they feed on a variety of invertebrates and benthic and pelagic fish, including salmon. In the water, harbor seals of all ages are susceptible to predation by sharks, killer whales, and occasionally Steller sea lions. On land, bears and canids (e.g., coyotes) have been known to prey on harbor seals, and eagles may prey on pups.

Harbor seals tend to haul out at low tide, especially in areas where large intertidal rocks or outcroppings are only exposed during low tides. While hauled out, they may be resting, nursing pups, giving birth, or breeding. They tend to prefer relatively isolated, and therefore undisturbed, haul out locations. Hauling out may also be a means of predator avoidance. Seals also tend to haul out more when offshore wave height is especially high, perhaps to shelter from the effects. Human disturbance, especially by boat approaches, often causes seals to re-enter the water despite tide level, wave height, or the behavior (resting, nursing, etc.) they were engaged in at the time of the disturbance.

California sea lion. California sea lions (*Zalophus californianus*) range from southern Mexico to southwestern Canada, and include three subspecies: *Z. californianus wollebaeki* (on the Galapagos Islands), *Z. californianus japonicus* (in Japan, but now thought to be extinct), and *Z. californianus californianus* (found from southern Mexico to southwestern Canada. The "U.S. Stock" begins at the U.S./Mexico border and extends northward into Canada. The minimum population size of the U.S. stock is 141,842 sea lions. The most recent population abundance estimates, trends, and reproductive and mortality rates for this stock is available at http://www.nmfs.noaa.gov/pr/sars/species.htm.

In the U.S., California sea lions breed on islands located in southern California, and rookeries in the U.S. are widely separated from the major rookeries of western Baja California, Mexico. Peak pupping occurs during May and June. Adult males leave the rookeries and migrate north during fall and winter, traveling as far as Puget Sound and British Columbia. The males return to the rookeries in March through May. Females and immature animals likely remain near their natal rookeries year-round. Sea lions haul out on rocks, reefs, and beaches in the action area, and feed in marine, estuarine, and occasionally fresh waters.

Sea lions feed at relatively shallow depths (less than 100 m) on a wide variety of finfish and invertebrates including northern anchovy, rockfish, mackerel, and market squid. At sea, California sea lions fall prey to killer whales and sharks, including great white sharks. They are also susceptible to entanglement and drowning in monofilament gill nets.

Northern elephant seal. There is only one stock of northern elephant seals (*Mirounga angustirostris*) in the U.S.: the California Breeding Stock. Although northern elephant seals breed and give birth in California and Baja California (Mexico), the California breeding population is demographically isolated from the Baja California population. The most recent population abundance estimates, trends, and reproductive and mortality rates for this stock is available at http://www.nmfs.noaa.gov/pr/sars/species.htm. The minimum population size for northern elephant seals is 74,913 seals. Based on trends in pup counts, northern elephant seal colonies were continuing to grow in California through 2005, but appear to be stable or slowly decreasing in Mexico.

Northern elephant seals breed and give birth from December to March, primarily on offshore islands in California. Adult males and females make long migrations between breeding seasons. Males migrate north to feed at sea near the eastern Aleutian Islands and in the Gulf of Alaska, while females typically remain south of 45$^{o}$N. Adults return to land between March and August to molt, with males returning later than females. Adults return to their feeding areas again between their spring/summer molting and their winter breeding seasons.

Elephant seals are found along the coasts of Oregon, Washington, and British Columbia during non-breeding season. They haul out on beaches in the action area to rest between foraging trips and to molt. Molting in elephant seals is catastrophic: the upper layer of skin, along with hair, is shed in large patches over a period of a couple of weeks. Animals remain on land for the duration of the molt, and do not feed during this time.

Between breeding seasons, animals remain at sea feeding for weeks to months at a time without returning to land. Northern elephant seals are deep divers (routinely diving to depths of 300 to 400 m) and feed primarily on mesopelagic cephalopods, as well as fish and occasionally small sharks. Great white sharks and killer whales have been known to occasionally prey on elephant seals, and shark predation may be a significant cause of juvenile seal mortality.

### *3.3.2 Non-target Aquatic Species*

Pacific salmon, anadromous trout, leatherback sea turtles, northern sea otters, Steller sea lions, and a variety of cetacean species are present in the action area at various times of year and could be exposed to the research activities in or over water. Of those non-target aquatic species that could be exposed, several are listed as threatened or endangered species under the ESA. Some of these ESA-listed species have designated critical habitat within the action area. Critical habitat is discussed in section 3.2.3 above.

NMFS publishes annual stock assessment reports for the marine mammals under its jurisdiction. Except for sea otters, details on the distribution, abundance, productivity and annual human-caused mortality for the marine mammal species listed below can be found in the U.S. Pacific Marine Mammal Stock Assessment reports, and the Alaska Marine Mammal Stock Assessment Reports, which are available on the NMFS website. The most current information on the status of the sea otter is available from the U.S. Fish and Wildlife Service, which has jurisdiction for this species. Relevant information from these reports about abundance and distribution in the action area is summarized below for each species.

<u>Pacific salmon and anadramous trout</u>. There are four species of threatened and endangered Pacific salmon and anadromous trout in the action area: Coho salmon (*Oncorhynchus kisutch*), Chinook salmon (*O. tshawytscha*), chum salmon (*O. keta*), and steelhead trout (*O. mykiss*). Some salmon populations or groups of populations that are substantially reproductively isolated from other conspecific populations and that represent an important component of the evolutionary legacy of the species have designated as Evolutionarily Significant Units (ESUs).

All four species are anadromous, meaning they migrate from a marine environment into freshwater streams and rivers of their birth to mate (spawn). Coho, Chinook and chum salmon are semelparous, meaning they spawn once and die. Trout return to spawn more than once and are called iteroparous. The offspring spend varying amounts of time in freshwater before migrating to the marine environment to feed and continue maturing before returning to freshwater to spawn. The exception is *O. mykiss*: some offspring remain in freshwater all their lives, and are called rainbow trout, in distinction from those that migrate to the ocean and are called steelhead. The timing of spawning varies by species, and in some cases, by river system. The amount of time hatchling and juvenile fish spend in freshwater versus marine environments also varies by species. Spawning habitat also varies by species.

Spawning habitat – streams and rivers – for these fish is within the action area. While some species may spawn only once per year, others have spawning “runs” (the migration from the ocean to the streams and rivers of their birth) in spring, summer, fall, and winter. As such, both adults and offspring could be present during the research, which would occur year-round, and

could be exposed to playbacks and vessel activity. They could also be exposed to the beach seine capture activity.

Leatherback sea turtle. Leatherback sea turtles (*Dermochelys coriacea*) are listed as endangered. They are commonly known as pelagic animals, but they also forage in coastal waters. In the action area, leatherback sea turtles may be found just outside the surf line, including in waters less than 10 meters deep. Leatherback sea turtles are not likely to be found on the beaches in the action area (because they do not nest in the Pacific Northwest), but could be in the water and exposed to surveys and vessel activity. The frequency of the playback sounds is likely above the hearing range of sea turtles.

Northern sea otter. The northern sea otter (*Enhydra lutris kenyoni*) historically ranged throughout the Aleutian Islands, originally as far north as the Pribilof Islands and in the eastern Pacific Ocean from the Alaskan Peninsula south along the coast to Oregon. The U.S. Fish and Wildlife Service has designated five stocks of sea otter. The Washington stock ranges from Neah Bay south to Destruction Island, and the range of the stock is defined as within the borders of the state. The northern sea otter is not a federally listed endangered species, but is listed by the State of Washington as "State endangered" under Revised Code of Washington 77.12.020 and Washington Administrative Code (WAC) 232.12.014 due to small population size, restricted distribution, and vulnerability. The Washington Department of Fish and Wildlife finalized a sea otter recovery plan in 2004.

Sea otters breed and give birth year-round, but the peak is usually in spring and early summer. Sea otters are almost exclusively aquatic: they mate, sleep, groom, hunt, give birth, rest and play at sea. However, in areas where there are few predators, sea otters may rest on land. Sea otters are year-round inhabitants of the action area and they could be exposed to the aerial surveys and vessel-based activities. They could also be exposed to the proposed playback sounds, which are within the frequency range audible by sea otters.

Steller sea lion. The Eastern Distinct Population Segment (DPS) of Steller sea lion (*Eumetopias jubatus*) is listed as threatened under the ESA. The range of this DPS extends from California, north through Oregon and Washington, into British Columbia and southeast Alaska. It is separated from the Western DPS, which ranges from the Gulf of Alaska, along the Aleutian Islands and into Russia, at 144$^{o}$ West longitude (Cape Suckling, Alaska). A detailed description of the status, including threats to the population, biology and ecology of this species, can be found in the Steller Sea Lion and Northern Fur Seal Research PEIS (NMFS 2007). Critical habitat has been designated for Steller sea lions and some occurs within the action area.

Steller sea lions are year-round inhabitants of the action area, and may be found on land (rookeries and haulouts) and in the water. Steller sea lions breed in spring and pups are dependent (remain with their mothers) for up to a year or more. As such, adults, juveniles, and pups could be exposed to the surveys and to presence of researchers during capture and sampling of target animals. They could also be exposed to the proposed playback sounds, which are within the frequency range audible by Steller sea lions.

Humpback whale. Humpback whales (*Megaptera novaeangliae*) are listed as endangered under the ESA and are known to occur in waters of the action area. (Note that no critical habitat has been designated for this species.) Eastern North Pacific Stock found in waters off California, Washington, and Oregon. Humpback whales could be exposed to the aerial surveys and vessel-based activities. They could also be exposed to the proposed playback sounds, which are within the frequency range audible by humpback whales.

Fin whale. Fin whales (*Balaenoptera physalus*) are listed as endangered under the ESA and are known to occur in waters of the action area. Fin whale aggregations can be found year-round in southern/central California and in the Gulf of California. They can be found in Oregon in summer, and in the Shelikof Strait/Gulf of Alaska area in summer/autumn. Acoustic signals from fin whale are detected year-round off northern California, Oregon and Washington, with a concentration of vocal activity between September and February. Individuals of the California/Oregon/Washington Stock could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action. They could also be exposed to the proposed playback sounds, which are within the frequency range audible by fin whales.

Blue whale. Blue whales (*Balaenoptera musculus*) are listed as endangered under the ESA, and are known to occur in waters of the action area. They have been sighted off California, Oregon, and Washington during aerial and shipboard surveys. The U.S. West Coast is one of their most important feeding areas in summer and fall. Individuals of the Eastern North Pacific Stock could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action. They could also be exposed to the proposed playback sounds, which are within the frequency range audible by blue whales.

Minke whale. Minke whales (*Balaenoptera acutorostrata*) in the Pacific are usually seen over continental shelves. While animals in populations in the extreme north are believed to be migratory, animals of the California/Oregon/Washington Stock appear to establish home ranges in waters of Washington and Central California. Minke whales could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action. They could also be exposed to the proposed playback sounds, which are within the frequency range audible by minke whales.

Gray whale. Gray whales (*Eschrichtius robustus*) of the Eastern North Pacific Stock are not listed as endangered. However, they are considered a cultural resource for the Makah Indian Tribe in Washington. Whaling by members of the Tribe is permitted between April 1 and October 31 of each calendar year in those open waters of the Pacific Ocean outside the Tatoosh-Bonilla Line, and within the adjudicated usual and accustomed grounds of the Makah Tribe. Gray whales could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action. They could also be exposed to the proposed playback sounds, which are within the frequency range audible by gray whales.

Sperm whale. Sperm whales (*Physeter macrocephalus*) are listed as endangered under the ESA, and are known to occur in waters of the action area. They are widely distributed across the entire North Pacific and into the southern Bering Sea in summer but the majority are thought to be south of 40$^{o}$N in winter. Individuals of the California/Oregon/Washington Stock have been seen

in waters off Washington and Oregon in every season except winter (Dec.-Feb.). Sperm whales could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action. They could also be exposed to the proposed playback sounds, which are within the frequency range audible by sperm whales.

Killer whale. Killer whales (*Orcinus orca*) are the most widely distributed cetacean species, and can be found in all parts of the ocean and in most seas from the Arctic to the Antarctic. In the action area, killer whales are often sighted in the intercoastal waterways of Washington State and along the coasts of Washington, Oregon, and California. Killer whales of the Southern Resident DPS are listed as endangered. Critical habitat has been designated for this DPS and occurs within the action area. Killer whales breed and give birth year round. Calves are dependent for up to two years. As year-round inhabitants of the action area, killer whales of all ages could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action. They could also be exposed to the proposed playback sounds, which are within the frequency range audible to killer whales.

Bottlenose dolphin. Bottlenose dolphins (*Tursiops truncatus*) of the California-Oregon-Washington Offshore Stock have been documented in offshore waters as far north as about 41$^{o}$N, and they may range into Oregon and Washington waters during warm water periods. Bottlenose dolphins may be present in the action area and could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action. They could also be exposed to the proposed playback sounds, which are within the frequency range audible to dolphins.

Striped dolphin. Striped dolphins (*Stenella coeruleoalba*) are distributed world-wide in tropical and warm-temperate pelagic waters. Individuals of the California-Oregon-Washington Stock could be present in the action area. No sightings have been reported for Oregon and Washington waters, but striped dolphins have stranded in both states. In the rare event striped dolphins are present in the action area, they could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action. They could also be exposed to the proposed playback sounds, which are within the frequency range audible to dolphins.

Short-beaked common dolphin. Short-beaked common dolphins (*Delphinus delphis*) are the most abundant cetacean offshore of California, being widely distributed between the coast and at least 300 nmi from shore. The distribution of short-beaked common dolphins is highly variable, apparently in response to oceanographic changes on both seasonal and interannual time scales. They are primarily reported south of Pt. Conception, California, but have been commonly sighted as far north as 42$^{o}$N and strandings of common dolphins (*Delphinus* sp.: animals could not be identified to species level) have been reported in Oregon and Washington. Individuals of the California-Oregon-Washington Stock could be present in the action area. In the rare event short-beaked common dolphins are present in the action area, they could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action. They could also be exposed to the proposed playback sounds, which are within the frequency range audible to dolphins.

Pacific white-sided dolphin. Pacific white-sided dolphins (*Lagenorhynchus obliquidens*) are endemic to temperate waters of the North Pacific Ocean, and are common both on the high seas and along the continental margins. Off the U.S. west coast, Pacific whitesided dolphins have been seen primarily in shelf and slope waters. There may be seasonal north-south movements, with animals found primarily off California during the colder water months and shifting northward into Oregon and Washington as water temperatures increase in late spring and summer. Individuals of the California/Oregon/Washington, Northern and Southern Stocks could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action. They could also be exposed to the proposed playback sounds, which are within the frequency range audible to dolphins.

Risso's dolphin. Risso's dolphins (*Grampus griseus*) are distributed world-wide in tropical and warm-temperate waters. Off the U.S. West coast, they are commonly seen on the shelf in the Southern California Bight and in slope and offshore waters of California, Oregon and Washington. The distribution of Risso's dolphins throughout this region is highly variable, apparently in response to oceanographic changes on both seasonal and interannual time scales. Animals tend to be found off California during the colder water months are thought to shift northward into Oregon and Washington as water temperatures increase in late spring and summer. Individuals of the California/Oregon/Washington Stock could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action. They could also be exposed to the proposed playback sounds, which are within the frequency range audible to dolphins.

Northern right-whale dolphin. Northern right-whale dolphins (*Lissodelphis borealis*) are endemic to temperate waters of the North Pacific Ocean. Off the U.S. west coast, they have been seen primarily in shelf and slope waters. The distribution of northern right-whale dolphins throughout this region is highly variable, apparently in response to oceanographic changes on both seasonal and interannual time scales. Animals are found primarily off California during the colder water months and shifting northward into Oregon and Washington as water temperatures increase in late spring and summer. In individuals of the California/Oregon/Washington Stock could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action. They could also be exposed to the proposed playback sounds, which are within the frequency range audible to dolphins.

Dall's porpoise. Dall's porpoise (*Phocoenoides dalli*) are endemic to temperate waters of the North Pacific Ocean. Individuals of the California/Oregon/Washington Stock are commonly seen in shelf, slope and offshore waters of the U.S. west coast. The distribution of Dall's porpoise throughout this region is highly variable between years and appears to be affected by oceanographic conditions. Dall's porpoise could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action. They could also be exposed to the proposed playback sounds, which are within the frequency range audible to porpoise.

Harbor porpoise. Harbor porpoise (*Phocoena phocoena*) are found in coastal and inland waters from Point Barrow, along the Alaskan coast, and down the west coast of North America to Point Conception, California. Individuals of the Washington Inland Waters Stock, Oregon/Washington Coast Stock, and Northern California/Southern Oregon Stock are present in

the action area. Aerial survey data from coastal Oregon and Washington, collected during all seasons, suggest that harbor porpoise distribution varies by depth. Harbor porpoise could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action. They could also be exposed to the proposed playback sounds, which are within the frequency range audible to porpoise.

### *3.3.3 Non-target Seabirds and Shorebirds*

The beaches and dunes of the Pacific Northwest coast are important nesting and resting habitat for a wide variety of seabirds, including the federally threatened marbled murrelet, endangered brown pelican, and endangered short-tailed albatross. In addition to these ESA-listed species, the action area includes nesting bald eagles, glaucous-winged gulls, cormorants, pigeon guillemots, tufted puffins, rhinoceros auklets, black oystercatchers, and a variety of shorebirds. A number of National Wildlife Refuges (see section 3.2.1 above) were established along the coast, in part to protect important habitat for birds.

Nesting season on U.S. Pacific coast beaches occurs March through September. This is a sensitive period during which birds that are disturbed may fail to find a mate, establish a nesting site, incubate eggs, or successfully raise young. Given that the research proposed by the applicant may occur at any time of year, year-round, anywhere within the action area, it is likely some seabirds would be exposed to the surveys, to the presence of researchers during capture and sampling of target species, and to researchers accessing or leaving field sites.

<u>Marbled murrelet.</u> Marbled murrelets (*Brachyramphus marmoratus*) inhabit the pacific coast of North America from the Bering Sea to central California. They are listed as threatened and have designated critical habitat within the action area. Marbled murrelets are commonly found nesting within 30 miles of the ocean, and foraging at sea within three miles of the coastline. They are usually found inland during the summer breeding season, but make daily trips to the ocean to feed. When not nesting, the birds live at sea, spending their days feeding close to shore and then moving several kilometers offshore at night. Because they nest inland, nesting birds are not likely to be exposed to the research activities. However, birds at sea, especially those foraging near shore, could be exposed to the aerial surveys associated with the research for the proposed action.

<u>Brown pelican.</u> On the Pacific Coast, brown pelicans (*Pelecanus occidentalis*) can be found from British Columbia to south-central Chile and the Galapagos Islands. They are listed as endangered, but there is no critical habitat designated for this species. Brown pelicans nest in large colonies on the ground, in bushes, or in the tops of trees. Peak egg-laying usually occurs in March through May. They fly over the ocean at heights of 60 to 70 feet, plunging into the water to catch fish. Brown pelicans could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action.

<u>Short-tailed albatross.</u> Short-tailed albatrosses (*Diomedea albatrus*) forage widely across the temperate and subarctic North Pacific. There are only two active breeding colonies remaining, both in Japan. After breeding, short-tailed albatrosses move to feeding areas in the North Pacific, including waters of the action area. Short-tailed albatross are listed as endangered, but there is no critical habitat designated for this species. Because they do not nest in the U.S.,

nesting birds would not be exposed to the research. Brown pelicans could be exposed to the aerial surveys and vessel activities associated with the research for the proposed action.

Snowy plover. The Pacific coast population of the snowy plover (*Charadrius alexandrinus*) is defined as those individuals that nest adjacent to tidal waters of the Pacific Ocean, and includes all nesting birds on the mainland coast, peninsulas, offshore islands, adjacent bays, estuaries, and coastal rivers. The breeding range of this population extends from Damon Point, Washington, to Bahia Magdelena, Baja California, Mexico. In the U.S., they breed from March through September, primarily above the high-tide line on coastal beaches, as well as on sand spits, dune-backed beaches, sparsely-vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. This species is listed as threatened, but no critical habitat has been designated. Nesting snowy plover are particularly vulnerable to disturbance from human activities, including walking and vehicle use, and human disturbance is a key factor in the ongoing decline in breeding sites and populations. The snowy plover could be exposed to the surveys and to presence of researchers during capture and sampling of target animals.

#### *3.3.4 Non-target Terrestrial Species*

Research on pinniped rookeries and haul outs does not typically affect forest-dwelling species. However, the applicant has not provided detailed information on routes of ingress and egress to the pinniped research sites, and it is assumed researchers may occasionally access sites via overland routes that would take them through the forest. Terrestrial mammal species in or near the action area include black bears, canids (e.g., wolves, coyotes, and foxes), beavers, mustelids (e.g., river otters, martens, and fishers), skunks, raccoons, and other small mammals (e.g., shrews, moles, rabbits, squirrels, chipmunks, and mice). The forested areas are inhabited by a diversity of birds, including the federally threatened northern spotted owl. Most of these animals are associated with forest cover and are likely to rarely be found on exposed nearshore areas used by pinnipeds for haulouts and rookeries. However, they may be disturbed by researchers using overland approaches to access these sites, or disturbed by research activities near forest habitat.

Research may occur at any time of year, and animals of any age, including dependent young, could be exposed to the researcher's activities. However, overland routes are not expected to be a frequent access method used by the researchers, such that any exposure of non-target terrestrial species to the presence of researchers would be expected to be limited. For this reason, the potential to disturb these terrestrial species is considered minor, and description of the species that may be present, and their biological characteristics, is provided in Appendix D.

#### *3.3.5 Hearing abilities of target and non-target aquatic species*

The upper limit of effective hearing in seals is approximately 60 kHz, although some species of seals can apparently detect very high frequency sounds (up to 180 kHz) underwater (Richardson *et al*., 1995). Their sensitivity to frequencies at or below 100 Hz is better than in toothed whales or sea lions, but their frequency discrimination and ability to process click sequences are less precise than that of toothed whales. Sea lions have hearing sensitivity similar to seals at moderate frequencies, but their upper limit is lower – 36-40 kHz (Richardson *et al*., 1995).

No audiograms are available for sea otters. However, measures of hearing in air for two North American river otters indicate a functional hearing range of 0.45 to 35 kHz in air (Wartzok and

Ketten 1999). In addition, sea otter vocalizations are similar in frequency to those of pinnipeds and terrestrial carnivores. It is reasonable to assume that sea otters may be able to detect the playback sounds as well as the pinniped species could.

Indirect indications are that baleen whales are most sensitive to low-frequency sounds. However, there is evidence that gray whales can detect higher frequency killer whales sounds whose received levels are about equal to the broadband noise level and humpback whales reacted to sonar signals at 3.1-3.6 kHz (Richardson *et al*., 1995).

Toothed whales are most sensitive to sounds above 10 kHz. Masking of sound signals by background noise has only been studied in bottlenose dolphins, beluga, and killer whales. Results of these studies indicate that some toothed whales can detect sounds weaker than the total background noise in the masking band.

Seabirds that forage for food at sea by plunging or diving beneath the surface could be exposed to underwater sound. Little is known about hearing in seabirds nor about underwater hearing in any bird species. Dooling (1978) summarizes studies of in-air hearing in birds and notes that behavioral measurements of absolute auditory sensitivity in a wide variety of birds show a region of maximum sensitivity between 1 and 5 kHz. There is no overlap between the absolute auditory sensitivity of birds (maximum sensitivity between 1 and 5 kHz) and the proposed killer whale vocalization transmissions, so it is not likely that seabirds diving near the source might hear the transmissions. Even if some diving birds were able to hear the signal, it is unlikely to have an impact because: 1) there is no evidence seabirds use underwater sound; 2) seabirds spend a small fraction of time submerged; and 3) seabirds could rapidly fly away from the area and disperse to other areas if disturbed.

Audiograms have been determined for over 50 fish and three shark species (Fay, 1988). The majority of acoustic data have been collected on bony fish, while virtually nothing is known of hearing in jawless fish (Popper and Fay, 1993). Myrberg (1980) states that the most important region of sound detection in most fishes rests between about 40 and 1000 Hz. Sharks generally do not detect sounds above 1 kHz and, in most cases, best sensitivity is to signals below 300 Hz (Popper and Fay, 1977). Fish that have specializations to enhance their hearing sensitivity have been referred to as hearing specialists, whereas those that do not possess such capabilities are termed generalsits. The former tend to have greater sensitivity and a wider hearing bandwidth (up to 3 kHz) than the latter. Some research suggests that fish such as alewives, herring, and cod are able to detect intense high frequency sounds. For example, Astrup and Møhl (1993) provide evidence that cod (*Gadus morhua)* detect short 38 kHz pulses at 194 dB re 1 μPa. Both alewives (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) form tighter schools and moved away from playback of sounds from 110-140 kHz at levels above 160 dB re 1 μPa (alewives; Dunning *et al*., 1992) to 180 dB re 1 μPa (herring; Nestler *et al*., 1992). These observed responses occurred at intense (high) received levels, which in the proposed research would only occur over a very small range close to the sound source. In addition, the sound transmissions in the proposed research are lower in frequency than those that elicited responses. Thus, the proposed research may not elicit any response from any fish species.

Sea turtles have well-developed ears, but their auditory sensitivity is poor. Several studies suggest that they can hear sounds below 1 kHz, but no evidence suggests that they can hear higher frequencies. There are no audiogram data available for leatherbacks. Because they are morphologically distinct, approximating hearing thresholds from data available for the other (hard shell) species is probably inappropriate. It is unlikely the sound transmissions in the proposed research would elicit responses from leatherback sea turtles.

# CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

This chapter represents the scientific and analytic basis for comparison of the direct, indirect, and cumulative effects of the alternatives. Regulations for implementing the provisions of NEPA require consideration of both the context and intensity of a proposed action (40 CFR Parts 1500-1508). Context means that the significance of an action must be analyzed with respect to the affected region, affected interests or resources, and society as a whole, and includes both short- and long-term effects. Intensity refers to the severity of an impact and should take into account both beneficial and adverse effects, as well as cumulative effects. Appendix F ("Effects of Research Activities on Individual Sea Lions") in the 2005 EA (NMFS 2005) provides a detailed analysis of the effects of the proposed types of research activities on pinnipeds, and that appendix is incorporated by reference to this EA as background for the following summary of effects analyses for the target species in this proposed action.

## *4.1 EFFECTS OF ALTERNATIVE 1: No Action*

Not issuing the permit, i.e., permit denial, would obviate the potential adverse direct and indirect effects of the proposed research on the target and non-target species and any potentially adverse direct effects on the physical environment. Permit denial would also eliminate any indirect beneficial effects on conservation of the target species that might derive from the results of the research. This alternative only involves denial of the single permit in question. There are several other research permits in effect for the target species that will presumably yield information relevant to the need for conservation of the target species, but these may not meet the objectives of NMML's (the applicant) marine mammal stock assessment activities. The populations would likely continue along the same growth trends as currently observed, however, there would be a gap in the population census data sets for these stocks in the action area if the proposed surveys are not conducted.

## *4.2 EFFECTS OF ALTERNATIVE 2: Proposed permit*

Issuance of the permit for research as proposed by the applicant, and with the standard permit conditions described in Appendix B, would result in adverse direct and indirect effects on target and non-target species, and adverse direct effects on the physical environment. Of the non-target species that may be in the action area, only those likely to be exposed to and affected by the research activities or presence of the researchers are discussed here. Permit issuance would be expected to yield information (results from the research) that would result in some indirect beneficial effects on conservation of the target species.

The aerial surveys would have no measurable effect on the physical environment. Vessel surveys, and use of vessels to access study sites, are not expected to impact the physical environment, with the exception of potential localized disturbance of sediments in areas where boats are beached. Animal capture is not expected to affect the physical environment, with the exception of localized disturbance of sediments associated with beach seine captures. Activities with captured animals – including collection of tissue samples, attachment of scientific instruments, and application of tags or other marks – is not expected to have any effect on the physical environment. The playbacks of killer whale vocalizations in the water column are not expected to result in any changes in the physical environment. Researcher ingress and egress to

some field sites may have localized effects on the physical environment including trampling of vegetation and other disturbance of plants. The nature and extent of the disturbance would depend on whether the researchers were on foot or driving motorized vehicles, the frequency of the activity, and the existing conditions (percent plant cover, extent of soil erosion, etc.). It is assumed researchers would use established trails where such trails exist, and would otherwise minimize disturbance of vegetation.

Most of the effects of the research activities would be on the biological environment, and more specifically on the target and non-target animals exposed to the research activities and presence of the researchers. Target animals are expected to be affected more than non-target animals because the research is directed at them, and in many cases involves capture and handling. Non-target animals would likely be affected by the disturbance associated with human presence and activities, including surveys and ingress or egress to field sites, but would not be affected by the tissue sampling of, instrument attachment to, or application of tags or other marks to target animals. The playback activity could disturb target and non-target aquatic animals within a short distance of the sound source, but is not expected to affect animals on land.

#### *4.2.1 Effects on Target Marine Mammal Species*

Only those marine mammals targeted by the permit, which includes a specified number of individuals for capture, sampling, etc., and a specified number of individuals incidentally disturbed by the capture, sampling, etc., would be affected by the research. As required by the MMPA, the permit would specify the number of marine mammals that could be affected by the various research activities. The number of marine mammals specified in the proposed permit represents a small percentage of the overall population for the species. The target species are not listed as depleted under the MMPA, or as threatened or endangered under the ESA.

Direct adverse effects of the permitted research on marine mammals that are the target of the research permit would include effects related to disruption of feeding, breeding, pupping, resting, sheltering, and other behaviors, as well as injuries and a small number of mortalities (the number of mortalities per species that would be allowed would be approximately 3-5 per year). The disruption of behaviors or behavioral patterns would occur at the time of the research activity, and could last for hours or days following the activity. Injuries, including those directly resulting from collection of intrusive or invasive samples (e.g., blood samples, biopsies) or other tissue trauma (e.g. the burns associated with application of hot-brands) would occur at the time of the research, although the effects would extend for days to weeks or months, depending on the time required for healing. Disturbance associated with the permitted research would result in varying degrees of stress, and associated physiological responses to stress. The effects of the physiological response to stress could last for hours to days following the disturbance. Animals that are captured and restrained for sampling are expected to experience greater stress responses than those merely disturbed by aerial surveys. Animals exposed to the killer whale vocalization playbacks may be temporarily displaced from a foraging area if they respond to the sounds with avoidance. The sound transmissions are not expected to result in injury because the source level is below the threshold determined capable of causing injury.

The permit would not authorize intentional lethal take of any animals, but some research-related mortality is unavoidable. Some animals are expected to die as a result of the capture and

sampling activities. Some deaths may occur at the time of capture and handling, usually from adverse reactions to sedatives or other drugs, or from injuries sustained while attempting to evade capture. Some research-related mortality may occur days or weeks following the actual research activity, such as from starvation of an abandoned pup or death from infection following intrusive sampling. The permit would specify a limit on the number of research related mortalities and require researchers to cease activities if this limit is reached. The number of allowable mortalities would not be more than a few animals per species per year, which is not expected to adversely affect the population or the species.

Many of the adverse effects on individual animals are expected to be short-term, lasting hours to days following a research activity. However, some effects may be long-term or permanent. For example, studies of the effects of human disturbance on harbor seal haul-out behavior indicate that haul-out numbers infrequently (Suryan and Harvey, 1999) or never (Allen et al., 1984) recover fully following a disturbance. A study with Steller sea lions in Alaska suggests this is also the case for other pinniped species (Kucey and Trites, 2006). Repeated disturbances can cause animals to abandon a preferred haul out or rookery location, for a season, or permanently. If there are suitable alternative sites available, the effect of this site abandonment may be negligible. If animals are forced to use less favorable sites, including those where there is more intraspecific competition for resources, or less protection from predation or other risks, there could be substantial adverse impacts on that portion of the population, including reduced reproductive success. Also, animals that are forced into the water, or flee into the water as a result of disturbance, may experience increased predation risks, increased maintenance requirements (less rest, forced to be more active), and pups could experience reduced or delayed growth if nursing is substantially disrupted. Disturbance of rookeries can result in permanent abandonment of dependent pups. Abandoned pups, especially those abandoned early in lactation, may die of starvation or exposure.

The long-term effects of stress in marine mammals are not well-documented and are difficult to study in free-ranging animals. However, studies on captive animals, and information about the effects of stress on humans, suggest that chronic stress can be debilitating and lead to reduced disease resistance, reproductive failure, and mortality.

The permit would require researchers to follow mitigation measures, as outlined in Tables 1 and 2 of Appendix B, which are intended to reduce or avoid the potential for the types of adverse impacts described here. For example, a permit condition requiring researchers to cease efforts to capture or sample an animal that shows signs of life-threatening stress responses minimizes the likelihood that animals will die as a result of research. There are standard permit conditions specific to mitigating potential for infection, injury, and mortality. There are conditions requiring monitoring of the effects of research and effectiveness of mitigation measures. There are also conditions requiring researchers to report annually on the effects of their research. NMFS would use those monitoring reports to evaluate the assumptions and predictions about effects of research in this EA. Finally, there are permit conditions allowing NMFS to modify, suspend, or revoke a permit if information in monitoring reports or elsewhere indicates the research is having significant adverse impacts on marine mammal species or stocks.

There is not a permit condition stipulating the frequency or duration of disturbance events. NMFS allows researchers to use their discretion in decisions about whether to limit frequency or duration of disturbance events because the factors that influence the nature and magnitude of adverse impacts are not always predictable. Depending on the species affected, the number of animals present, the time of year, and the age and sex composition of the group, there can be a trade off between the risks associated with effects from frequent but short disturbances versus effects from fewer longer duration disturbances. The applicant has been conducting research on these species in the action area for years and would presumably use past experience to inform decisions about frequency and duration of field activities.

#### *4.2.2 Effects on Non-target Aquatic Species*

Direct adverse effects of the permitted research on non-target aquatic species that are within the action area would include disruption of feeding, breeding, pupping, resting, sheltering, and other behaviors at the time of the research activities. Some displacement may result from the disturbance, including in response to the playbacks of killer whale vocalizations. The duration of the behavioral disruptions and displacements are expected to vary by species and type of disturbance.

Fish, including ESA-listed Pacific salmon and anadromous trout, would not be affected by the aerial surveys or research activities on land because they would not be exposed. Some fish are likely to be exposed to the playback sounds, but are unlikely to be affected because the sounds are below the frequency and energy level associated with observed reactions of fish to underwater sounds. Fish of various species would be exposed to the beach seine capture activities, but are unlikely to be captured because of the large mesh-size of the nets. The vessel operations, including vessel surveys of haul outs, are not expected to have a measurable effect on fish.

Leatherback sea turtles that may be in waters of the action area would not be affected by the aerial surveys or research activities on land. Some turtles may be exposed to the playback sounds, but are unlikely to be affected because the sounds are below the predicted hearing ability of these animals. Turtles are not likely to be exposed to the beach seine capture activities, but if any were entangled in the nets the measures researchers would take to ensure pinnipeds do not drown would also preclude drowning of turtles. Incidental capture of turtles would require an exemption from the ESA via an incidental take statement resulting from inter-agency consultation. The vessel operations, including vessel surveys of haul outs, are not expected to have a measurable effect on turtles.

Marine mammals other than the target pinniped species – including sea otters and various small and large cetaceans – may be disturbed by the aerial and vessel surveys and the playback experiments. These disturbances may result in disruption of behaviors and behavioral patterns at the time of the research activity, and the effects could last for hours or days following the activity. The duration and severity of the effect would depend on the behavior disrupted, the time taken to return to pre-disturbance activity (or whether the activity was abandoned), and the condition of the animals affected. For example, a disturbance may cause a group of animals to cease feeding for several hours, but the effect is short term because the disturbance was an isolated event and the animals are able to compensate by returning to feeding later that day.

However, if the disturbance is repeated, and the frequency is such that animals cannot recover between disturbances (i.e., cannot compensate for the lost feeding time), and the series of disturbance events lasts for weeks or longer, animals may fail to grow, succumb to disease, or starve. Non-target marine mammals are not expected to be affected by the land-based research activities.

#### *4.2.3 Effects on Non-target Seabirds and Shorebirds*

As with aquatic species, direct adverse effects of the permitted research on seabirds and shorebirds would include disruption of feeding, breeding, nesting, resting, sheltering, and other behaviors at the time of the research activities. Some displacement may result from the disturbance. The duration of the behavioral disruptions and displacements are expected to vary by species, time of year, and type of disturbance.

Birds at sea and on shore may be disturbed by the aerial surveys. Birds on shore (including nesting birds), or feeding or resting in waters nearshore may be disturbed by vessel operations, including vessel surveys, and by the presence and actions of researchers on shore. Birds are not expected to be affected by the playback activities for the reasons discussed in section 3.3.5 above. Birds would not be directly affected by the capture, tissue sampling and other activities performed on the target pinnipeds, but the presence and actions of the researchers during these activities could result in disturbance of birds on shore.

Birds that are frequently disturbed by human activities may have reduced opportunities to forage and rest, which could have negative impacts on their health and survival. Human disturbance of nesting birds can result in a decline in nesting activity, nest abandonment, and poor reproductive success. While birds that nest on beaches are highly adapted to the shifting sands and sparsely vegetated environment, loss of beach habitat caused by development, recreational activities, increased predator pressures, and invasive plants has left birds in some areas with few alternative nesting sites.

#### *4.2.4 Effects on Non-target Terrestrial Species*

Terrestrial species would not be affected by activities in the water, including the playbacks. They may be disturbed by aerial surveys nearshore, and by researchers traveling overland to and from field sites. The disturbances may result in disruption of feeding, breeding, resting, sheltering, and other behaviors at the time of the research activities, including passage of researchers. Some displacement may result from the disturbance. As with other target and non-target species, the duration of the behavioral disruptions and displacements are expected to vary by species, time of year, and type of disturbance.

It is assumed that most research activities would be confined to the nearshore environment, and that most field sites would be accessed from water, or, in the case of overland routes, that researchers would use established trails where such trails exist. This would minimize the occurrence of researcher presence in the forested areas where most of the non-target terrestrial species are likely to be found. In addition, it is assumed researchers would conduct their activities during daylight hours (because ability to see target animals is essential to the various research activities) and would not be traveling through terrestrial habitats at night. As such, terrestrial animals would not be disturbed at night. For those species that forage at night, the

proposed research would not likely affect feeding. Similarly, for those species that rest primarily at night, research activities are not likely to affect resting. Conversely, the research is more likely to disturb behaviors of those species that are most active during the day.

## *4.3 EFFECTS OF ALTERNATIVE 3: Permit with Special Avoidance Measures*

Issuance of the permit for research as proposed by the applicant, with the same standard permit conditions as for Alternative 2, and with additional permit conditions (avoidance measures) outlined in Section 2.3, would result in the same types of adverse direct and indirect effects on target and non-target species, and adverse direct effects on the physical environment. Compared to Alternative 2 (the Proposed Permit alternative), there would be no effects on non-target ESA-listed species or on non-target marine mammal species because of the special avoidance measures. Of the other non-target species that may be in the action area, only those likely to be exposed to and affected by the research activities or presence of the researchers are discussed here. Permit issuance under this alternative is expected to yield similar information (results from the research) that would result in some indirect beneficial effects on conservation of the target species similar to that under Alternative 2.

The effects of alternative 3 on the physical environment would be the same as those discussed for alternative 2. While the special avoidance measures that would be required in a permit issued under alternative 3 would restrict the timing of certain activities, it would not eliminate any types of research activities or their associated potential for localized effects on sediment or vegetation.

### *4.3.1 Effects on Target Marine Mammal Species*

Alternative 3 would have the same types of effects on the three target marine mammal species as those discussed in alternative 2. However, because some of the special avoidance measures would restrict the timing of some activities, and thus reduce the frequency with which they may occur, alternative 3 would result in less disturbance of target animals during certain times of year. Alternative 3 would also result in less impact to some non-target species, because the special avoidance measures would require researchers to move or stay away from them. The number of animals that would be captured and sampled, tagged, etc., would be the same under this alternative as under alternative 2. As such, the number of target animals adversely affected, and the nature of the effects, would be the same.

### *4.3.2 Effects on Non-target Aquatic Species*

Alternative 3 would not affect ESA-listed aquatic species or non-target marine mammals because of the special avoidance measures that would be required under the permit (see Section 2.3). The research would result in disturbance of other non-target aquatic species, but the effects would be less than under alternative 2 because the measures that would avoid interactions with or exposures of ESA-listed species and non-target marine mammals would reduce the frequency of occurrence of some activities and restrict the timing of others, thereby reducing or eliminating disturbance of other non-target animals in the vicinity.

### *4.3.3 Effects on Non-target Seabirds and Shorebirds*

Alternative 3 would not affect ESA-listed species because of the special avoidance measures that would be required under the permit. As with non-target aquatic species, the research would result in disturbance of non-listed birds but the effects would be less than under alternative 2.

The special avoidance measures that would eliminate disturbance of or other effects on ESA-listed species would reduce the potential for the research to affect non-ESA species because they would reduce frequency of some activities and eliminate exposure to other activities for animals in vicinity of those protected by avoidance measures.

#### *4.3.4 Effects on Non-target Terrestrial Species*

Alternative 3 would not affect ESA-listed terrestrial species because of the special avoidance measures that would be required under the permit. As with other non-target species, the research would result in disturbance of non-listed animals, but the effects would be less than under alternative 2. The special avoidance measures that would eliminate disturbance of or other effects on ESA-listed species would reduce the potential for the research to affect non-ESA species because they would reduce frequency of some activities and eliminate exposure to other activities for animals in vicinity of those protected by avoidance measures.

## *4.3 SUMMARY OF COMPLIANCE WITH APPLICABLE LAWS, NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS*

As summarized below, issuance of a permit under either action alternative is consistent with the applicable permit requirements of the MMPA and NMFS regulations for permit conditions and restrictions. Details of compliance with the MMPA, ESA, AWA, and MSA are provided below.

### *4.3.1 Marine Mammal Protection Act*

In compliance with the requirements of the MMPA, the permit application was made available for public review and comment, and provided to the Marine Mammal Commission. Comments received on the application will be considered by the Office Director in making a determination about permit issuance.

Under either action alternative, a permit would contain standard terms and conditions stipulated in the MMPA and NMFS's regulations. As required by the MMPA, the permit would specify: (1) the effective date of the permit; (2) the number and kinds (species and stock) of marine mammals that may be taken; (3) the location and manner in which they may be taken; and (4) other terms and conditions deemed appropriate. Other terms and conditions deemed appropriate relate to minimizing potential adverse impacts of specific activities (e.g. capture, sampling, etc.), coordination among permit holders to reduce unnecessary duplication and harassment, monitoring of impacts of research, and reporting to ensure permit compliance.

Based on the information in the application about the conduct of the research, information about species' distribution, and information about marine mammal hearing abilities, the surveys and the playbacks authorized in the permit may result in harassment of sea otters and cetaceans. With the exception of Southern Resident killer whales, these species were not part of the application submitted for the permit, and thus takes would not be authorized under either action alternative.

Under alternative 2, the permit would not contain conditions requiring avoidance of sea otters or non-target cetacean species. The applicant would need an exemption from the MMPA's take prohibitions as allowed under section 104 or section 101(a)(5) for harassment of sea otters or cetaceans (other than Southern Resident killer whales) incidental to the permitted activities.

Under alternative 3, the permit would condition the conduct of the research to avoid the potential for these takes and the associated requirement for additional permits or authorizations under the MMPA.

The applicant has not applied for or secured permission under the MMPA for such takes. Securing additional permits or authorizations is not necessary to NMFS issuance of this permit, but may be necessary for implementation of some research protocols by the applicant. The process for securing additional MMPA permits and authorizations would take between four and 15 months depending on the type of application submitted.

#### *4.3.2 Endangered Species Act*

This section summarizes consultations as required under section 7 and permits required under section 10 of the ESA. No consultations or permits are required for issuance of a permit under alternative 3, which would condition the permit to avoid the potential for takes of threatened and endangered species in the action area. Based on information about the conduct of the research, distribution and abundance of ESA-listed species, and hearing abilities of animals in the action area, NMFS determined that issuance of a permit under alternative 2 may affect various threatened and endangered species under the jurisdiction of the U.S. Fish and Wildlife Service and NMFS. As a result, formal consultation with NMFS Endangered Species Division was initiated at the draft EA stage, subsequent to the requisite public comment period on the application.

Formal consultation with NMFS Endangered Species Division was initiated for alternative 2, which includes permission to harass threatened Steller sea lions and endangered Southern Resident killer whales. The initiation request identified the following species as likely to be adversely affected by issuance of the permit based on preliminary information about abundance, distribution, and hearing abilities:

- Eastern Distinct Population Segment of Steller sea lion (*Eumetopias jubatus*) – threatened
- Humpback whale *(Megaptera novaeangliae*) – endangered
- Sperm whales (*Physeter macrocephalus*) – endangered
- Fin whale (*Balaenoptera physalus*) – endangered
- Blue whale (*B. musculus*) – endangered
- Southern Resident Distinct Population Segment of Killer whales (*Orcinus orca*) – endangered

In its Biological Opinion, NMFS concluded that issuance of the proposed permit is not likely to affect humpback, sperm, fin, or blue whales or to jeopardize the continued existence of any species or destroy or adversely modify the critical habitat of listed species under NMFS jurisdiction. The Biological Opinion contained conservation recommendations, which are discretionary agency actions to minimize or avoid adverse effects of a proposed action on listed species or critical habitat to help implement recovery plans or to develop information for conservation.

The following conservation recommendations were made, which are intended to reduce harassment related to authorized activities and to provide information for future consultations involving issuance of marine mammal permits that may affect endangered whales:

- Cumulative impact analysis. The NMFS Permits Division should work with the Marine Mammal Commission, the International Whaling Commission, and the marine mammal research community to identify a research program with sufficient scope and depth to determine cumulative impacts of existing levels of research on marine mammals, including sub-lethal and behavioral impacts.
- Estimation of actual levels of "take." NMFS Permits Division should continue to review annual and final reports submitted by marine mammal research permit holders, and data and results that can be obtained from permit holders. This data should be used to estimate the amount of harassment that occurs given the level of research effort, and how the harassment affects the life history of individual animals. The results of this study should be provided to NMFS Endangered Species Division for use in future consultations.
- Assessment of permit conditions. NMFS Permits Division should periodically assess the effectiveness of its permit conditions, including those for notification and coordination of research.
- Data sharing. NMFS Permits Division should encourage investigators to coordinate their efforts by sharing research vessels and the data they collect as a way of reducing duplication of effort and the level of harassment that threatened and endangered species experience as a result of field investigations.

With the exception of the data sharing recommendation, these conservation recommendations pertain to future permits and consultations and do not specify considerations or measures that should be part of the decision on this permit. Under either action alternative, a permit would require that researchers coordinate to the maximum extent practicable, with the intent of minimizing duplication and harassment. This is a standard condition for permits for research on marine mammals. The other conservation recommendations will be taken under advisement for future permit and consultation considerations.

As required under section 10(d), a permit for takes of endangered Southern Resident killer whales and threatened Steller sea lions as described in Alternative 2 would not be issued unless NMFS finds that the permit was applied for in good faith, if granted and exercised would not operate to the disadvantage of endangered species, and will be consistent with the purposes and policy set forth in section 2 of the ESA. These findings, to be made by the Director of NMFS Office of Protected Resources, will be based on available information including the analysis in this EA, the Biological Opinion, and other pertinent information. As required by the ESA, these findings would be published in the *Federal Register*.

#### *4.3.3 Animal Welfare Act*

Under either action alternative, the researchers must comply with the humane handling, care, and treatment provisions of the AWA. The applicant does not have an established Animal Care and Use Committee (ACUC) to evaluate compliance of the research protocols for consistency with these provisions of the AWA. However, NMFS has established an "ACUC Task Force" to evaluate how to ensure that its Science Centers are in compliance with the AWA. The Task

Force has developed a draft policy for the establishment of ACUCs to cover Science Center activities. Once a final policy is adopted by NMFS, research and grant proposals from the Science Centers will be reviewed by ACUCs for compliance with AWA.

#### *4.3.4 Magnuson-Stevens Fishery Conservation and Management Act*

No adverse effects on essential fish habitat are expected under either action alternative, thus no consultation was warranted.

## *4.4 COMPARISON OF ALTERNATIVES*

Alternatives 2 and 3 have the same potential for adverse direct and indirect effects on target species and indirect beneficial effects on target species. Both alternatives meet the research objectives established by the applicant and have greater potential to meet the purpose and need for the proposed action (permit issuance) than does the no action alternative.

The no action alternative would have no adverse effects on the environment. Both action alternatives have the same potential for adverse direct effects on the physical environment. The type of effects on non-target species would be the same under either action alternative, but the intensity of the effects and the number of species affected would be less under alternative 3 because the special avoidance measures would reduce the frequency of some actions and restrict the timing of others. Alternative 3 would have no effect on ESA-listed species or non-target marine mammals because of these special avoidance measures, whereas alternative 2 would result in direct and indirect effects on these groups of non-target species.

## *4.5 MITIGATION MEASURES*

There are no additional mitigation measures beyond those conditions that would be required by permit. The conditions that would be required if a permit were issued under either Alternative 2 or 3 are outlined in Appendix B. The additional permit conditions applicable to Alternative 3 are outlined in Section 2.3 above. All of these conditions are intended to minimize unavoidable adverse effects of the various research activities and, in the case of Alternative 3's special avoidance measures, avoid the potential for adverse effects on certain non-target animals.

The permit conditions also require regular reports on the effectiveness of the research at achieving the applicant's stated objectives (and thus at achieving the purpose and need of the federal action) and on the effectiveness of the mitigation measures required by the permit. By statute, regulation, and permit conditions, NMFS has authority to modify the permit or suspend the research if information suggests it is having a greater than anticipated adverse impact on target species or the environment.

To avoid interference with gray whale subsistence activities of the Makah Indian Tribe in waters along the northwest Washington coast, including the entrance of the Strait of Juan de Fuca, the permit would require researchers to avoid conducting research in that area between April 1 and October 31.

## *4.6 UNAVOIDABLE ADVERSE EFFECTS*

Because the research involves disturbance, capture, and intrusive sampling of wild animals, a certain amount of adverse effects on individual target animals exposed to the research is

unavoidable. While a permit would contain mitigation measures to minimize the extent of the adverse effects, it is not possible to avoid some stress, injury, and limited mortality of target animals. Under alternative 3, the special avoidance measures would eliminate adverse effects on ESA-listed animals and marine mammal species that are not the target of the research, but disturbance of other non-target animals would unavoidably result from the surveys, playbacks, and presence and actions of the researchers. No serious injury or mortality of non-target species is expected.

## *4.7 CUMULATIVE EFFECTS*

Cumulative effects are defined as those that result from incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (federal or nonfederal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time.

Research would result in disturbance of non-target species under either action alternative. The non-target species are also exposed to disturbance from other human activities in the action area including vessel traffic, fishing, and recreation/tourism (hiking, camping, etc.). In the case of some ESA-listed birds, the current levels of human disturbance are identified as factors contributing to the species' decline or failure to recover. Under alternative 3, the research would not result in additional disturbance of non-target ESA-listed animals or non-target marine mammal species. Research under either action alternative would result in additional disturbance of other non-target animals in the action area. Whether this frequency of disturbance, by itself or in combination with disturbance from other human activities, would result in cumulative adverse effects depends on how long the effects of each disturbance last, whether the animals have sufficient time between disturbance events to resume or compensate for disrupted activities, and whether the effects of repeated disturbance are additive, synergistic or accumulate in some other way.

### *4.7.1 Research permits and other MMPA authorizations*

Under either action alternative, animals in the action area would be disturbed by surveys and other research activities up to twice a month for nine months (in fall, winter, and spring) and weekly for three months (in summer) or once a month for six months and three times a month for six months. Whether this frequency of disturbance, by itself or in combination with disturbance from other permitted research, would result in cumulative adverse effects depends on how long the effects of each disturbance last, whether the animals have sufficient time between disturbance events to resume or compensate for disrupted activities, and whether the effects of repeated disturbance are additive, synergistic or accumulate in some other way.

As summarized in Appendix A, there are nine active permits that, in combination, allow research year-round on the three target species – harbor seals, California sea lions, and northern elephant seals – throughout the species' ranges in the U.S. The effects of many individual research activities (e.g., a survey, a field trip to capture animals) are short-term, lasting hours to days following the research event. There is not enough information about the exact location and timing of the research under the various permits to specifically identify the extent of overlap in time and space of all of the permitted research, or to identify the frequency with which any given local population may be disturbed.

Although it is not possible to describe the extent of overlap under these research permits, NMFS permits for research on marine mammals require that researchers coordinate their activities with those of other permit holders to avoid unnecessary disturbance of animals). Permitted researchers are also required to notify the appropriate NMFS Regional Office at least two weeks in advance of any planned field work so that the Regional Office can facilitate this coordination and take other steps appropriate to minimize disturbance from multiple permits. Refer to Table 1 in Appendix B for the applicable permit conditions.

#### *4.7.2 Other human activities*

Within the action area the target marine mammal species are adversely affected by human activities including commercial and recreational fishing (via entrapment and entanglement in fishing gear), tourism and recreation (via harassment from human approach and presence), and habitat degradation (via displacement from haul out sites as a result of human presence). Of these, disturbance that results in displacement of groups of animals or abandonment of behaviors such as feeding or breeding by groups of animals are more likely to have cumulative effects on the species than entanglement of a few animals in fishing gear.

#### *4.7.3 Summary of cumulative effects*

It is likely that issuance of the proposed permit would have some cumulative adverse effects on the target animals due to the frequency of the disturbances associated with research activities. These adverse effects would likely be additive to those resulting from disturbance under other permits, and to disturbances related to other human activities in the action area. Some animals may be acclimated to a certain level of human activity and may be able to tolerate disturbance associated with these activities with little adverse impacts on population or species vital rates. However, even animals acclimated to a certain level of disturbance may be adversely affected by additive effects that exceed their tolerance threshold.

The stocks and populations of the three species of pinniped that are the target of the proposed research are considered “healthy” and are not listed as depleted under the MMPA or threatened or endangered under the ESA. The most recent stock assessment reports for the affected stocks and species indicate they are stable or increasing. It is assumed the current level of human activity is not having a significant adverse affect on the species’ or stocks’ abilities to maintain current abundance levels and population growth rates and that the incremental contribution of this proposed action would not result in cumulatively significant impacts when considered in concert with past, present, and reasonably foreseeable future activities.

## CHAPTER 5 LIST OF PREPARERS

Permits Division, Office of Protected Resources, National Marine Fisheries Service, Silver Spring, MD

## LITERATURE CITED

Allen, S.G., D.G. Ainley, G.W. Page and C.A. Ribic. 1984. The effect of disturbance on harbor seal haul-out patterns at Bolinas Lagoon, California. Fishery Bulletin 82(3):493-500.

Astrup, J. and B. Møhl. 1993. Detection of intense ultrasound by the cod Gadus morhua. J. Exp. Biol., 182:71-80.

Dunning, D.J., Q.E. Ross, P. Geoghegan, J.J. Reichle, J.K. Menezes and J.K. Watson. 1992. Alewives avoid high-frequency sound. North American Journal of Fisheries Management, 12:407-416.

Fay, R.R. 1988. Hearing in vertebrates: a psychophysics handbook. Hill-Fay Associates, Winneka, IL. 621 p.

Kucey, L., and A.W. Trites. 2006. A review of the potential effects of disturbance on sea lions: assessing response and recovery. In A.W. Trites, S. Atkinson, D.P. DeMaster, L.W. Fritz, T.S. Gelatt, L.D. Rea and K. Wynne (eds), Sea Lions of the World. Alaska Sea Grant College Program, University of Alaska, Fairbanks. pp. 581-589.

Myrberg, A.A., Jr. 1980. Fish bio-acoustics: its relevance to the 'not so silent world. Env. Biol~ Fish., 5:297-304.

NMFS. 2002. Environmental Assessment on the Effects of NMFS Permitted Scientific Research Activities on Threatened and Endangered Steller Sea Lions.

NMFS. 2005. Environmental Assessment on the Effects of NMFS Permitted Scientific Research Activities on Threatened and Endangered Steller Sea Lions.

NMFS. 2007. Steller Sea Lion and Northern Fur Seal Research Final Programmatic Environmental Impact Statement.

Nestler, J.M., G.R. Ploskey, J. Pickens, J. Menezes, and C. Schilt. 1992. Responses of blueback herring to high-frequency sound and implications for reducing entrainment at hydropower dams. North American Journal of Fisheries Management, 12:667-683.

Popper, A.N. and R.R. Fay. 1993. Sound detection and processing by fish: Critical review and major research questions. Brain Behav. Evol. 41:14-38.

Richardson, W.J., C.R. Greene Jr., C.I. Malme, D.H. Thompson. 1995. Marine Mammals and Noise. Academic Press, New York.

Suryan, R.M. and J.T. Harvey. 1999. Variability in reactions of Pacific harbor seals, *Phoca vitulina richardsi*, to disturbance. Fishery Bulletin 97:332-339.

Wartzok, D. and D.R. Ketten. 1999. Marine mammal sensory systems. In J.E. Reynolds and S.A. Rommel, eds., Biology of Marine Mammals. Smithsonian Institution Press, Washington.

## APPENDIX A: ACTIVE RESEARCH PERMITS AFFECTING THE TARGET SPECIES

There are 9 active permits authorizing research on the same species of marine mammals as are the target species for the proposed action in this EA. These permits are held by:

- Alejandro Acevado-Gutiérrez, Ph.D., Biology Department, Western Washington University, Bellingham, Washington (Permit No. 1070-1783)
- Daniel Costa, Ph.D., Long Marine Laboratory, University of California, Santa Cruz, California (Permit No. 87-1743)
- James Harvey, Ph.D., Moss Landing Marine Laboratories, Moss Landing, California (Permit No. 555-1870)
- The NMFS National Marine Mammal Laboratory (NMML), Seattle, Washington (Permit Nos. 782-1702 (expired on September 30, 2009) to be replaced by this permit no. 13430) and 782-1812)
- Point Reyes Bird Observatory (PRBO), Petaluma, California (Permit No. 373-1868)
- Brent S. Stewart, Ph.D., J.D., Hubbs-Sea World Research Institute, San Diego, California (Permit No. 486-1790)
- The United States Air Force (USAF), Environmental Management Office, Vandenberg Air Force Base, California (Permit No. 859-1680) [replaced by 14197 on June 25, 2009]

The following tables summarize the species affected by each permit, and the types of activities authorized, by species. Table 1 lists all active permits for the three target species and indicates where research activities are authorized. Tables 2-4 summarize the type of research activities permitted, by species.

**Table 1: Locations of research on target species.** This table lists active permits, in order of pending expiration dates, that authorize takes of the marine mammal species that are the target species in the proposed action. The locations of the research are designated as CA = California; OR = Oregon; and WA = Washington.

| Permit No. and Holder | Expiration Date | California sea lions | Harbor seals | Northern elephant seals |
|---|---|---|---|---|
| *782-1702; NMML | 09/30/2009 | OR, WA | OR, WA | OR, WA |
| 14197; USAF | 06/30/2014 | CA | CA | CA |
| 87-1743; Costa | 09/30/2010 | | | CA |
| 486-1790; Stewart | 10/01/2010 | CA | CA | CA |
| 1070-1783; Acevado | 03/31/2011 | | WA | |
| 782-1812; NMML | 04/30/2011 | CA, OR, WA | CA, OR, WA | CA, OR, WA |
| 87-1851; Costa | 01/31/2012 | CA | CA | CA |
| 555-1870; Harvey | 04/15/2012 | | CA, WA, OR | |
| 373-1868; PRBO | 04/15/2012 | CA | CA | CA |

*The permit that is the subject of this EA is effectively a replacement for this permit that expired subsequent to preparation of the draft EA.

**Table 2: Types of research activities under active permits affecting California sea lions.** A check mark in a given column indicates that activity is authorized by the permit in the corresponding row. The sex and age classes of animals affected varies by permit, as does the time of year and frequency of activity.

| Permit No. | Aerial survey | Vessel survey | Ground survey‡ | Capture | Tissue sampling | Attach instruments | Tags or marks | Mortality |
|---|---|---|---|---|---|---|---|---|
| 1070-1783 | | | | | | | | |
| 87-1743 | | | | | | | | |
| 87-1851 | | | √ | √ | √ | √ | √ | √ |
| 555-1870 | | | √ | | | | | |
| 782-1702 | √ | √ | √ | √ | √ | √ | √ | √ |
| 782-1812 | | | √ | √ | √ | √ | √ | √ |
| 373-1868 | | | √ | | | | | |
| 486-1790 | | | √ | √ | √ | √ | √ | √ |
| 14197 | | | | √ | √ | √ | √ | √ |

‡Includes scat collection and disturbance from other ground-based activities.

**Table 3: Types of research activities under active permits affecting Pacific harbor seals.** A check mark in a given column indicates that activity is authorized by the permit in the corresponding row. The sex and age classes of animals affected varies by permit, as does the time of year and frequency of activity.

| Permit No. | Aerial survey | Vessel survey | Ground survey‡ | Capture | Tissue sampling | Attach instruments | Tags or marks | Mortality |
|---|---|---|---|---|---|---|---|---|
| 1070-1783 | √ | √ | √ | | | | | |
| 87-1743 | | | | | | | | |
| 87-1851 | | | √ | | | | | |
| 555-1870* | | | √ | √ | √ | √ | √ | √ |
| 782-1702 | √ | √ | √ | √ | √ | √ | √ | √ |
| 782-1812 | | | √ | √ | √ | √ | √ | √ |
| 373-1868 | | | | √ | √ | √ | √ | √ |
| 486-1790 | | | √ | √ | √ | √ | √ | √ |
| 14197 | | | | √ | √ | √ | √ | √ |

‡Includes scat collection and disturbance from other ground-based activities.
*This permit also authorizes underwater playbacks of recorded male harbor seal vocalizations to wild harbor seals.

**Table 4: Types of research activities under active permits affecting northern elephant seals.** A check mark in a given column indicates that activity is authorized by the permit in the corresponding row. The sex and age classes of animals affected varies by permit, as does the time of year and frequency of activity.

| Permit No. | Aerial survey | Vessel survey | Ground survey‡ | Capture | Tissue sampling | Attach instruments | Tags or marks | Mortality |
|---|---|---|---|---|---|---|---|---|
| 1070-1783 | | | | | | | | |
| 87-1743 | | | | √ | √ | √ | √ | √ |
| 87-1851 | | | √ | | | | | |
| 555-1870 | | | | | | | | |
| 782-1702 | √ | √ | √ | √ | √ | √ | √ | √ |
| 782-1812 | | | √ | √ | √ | √ | √ | √ |
| 373-1868 | | | | √ | √ | | √ | |
| 486-1790 | | | √ | √ | √ | √ | √ | √ |
| 14197 | | | | √ | √ | √ | √ | √ |

‡Includes scat collection and disturbance from other ground-based activities.

## APPENDIX B: PERMIT CONDITIONS

The following two tables outline the conditions that are included in permits for research on marine mammals issued by NMFS under the Marine Mammal Protection Act (MMPA). Some conditions derive from the permit requirements of the MMPA and others from NMFS regulations for permits. The language of the conditions may vary slightly in actual permits, but still address the underlying statutory or regulatory requirements. The purpose or reason for each condition is briefly explained.

**Table 1. General Marine Mammal Research Permit Terms and Conditions.** All permits for research on marine mammals specify that the activities authorized by the permit must occur by the means, in the areas, and for the purposes set forth in the permit application, and as limited by the following Terms and Conditions specified in the permit, including all attachments and appendices. These conditions originate from the permit requirements of the MMPA and NMFS regulations for permits.

| Condition | Origin | Purpose |
|---|---|---|
| | *Duration of permit* | |
| Personnel listed in this permit (hereinafter "Researchers") may conduct activities authorized by this permit through [a specified expiration date that varies by permit]. This permit expires on the date indicated and is non-renewable | MMPA section 104(b)(2)(C) and regulations at 50 CFR Part 216.36 | Statute and regulations require that permits specify duration of permitted activity. |
| Researchers must suspend all permitted activities in the event serious injury or mortality of protected species reaches that specified in the permit. | MMPA section 104(b)(2)(D) and regulations at 50 CFR Part 216.36 | Statute and regulations require that permits specify "any other terms and conditions which [NMFS] deems appropriate." NMFS requires this condition to ensure research does not exceed levels of serious injury and mortality determined acceptable for a given species. |
| If authorized take is exceeded, Researchers must cease all permitted activities and notify the Permits Division as soon as possible, but no later than within two business days. The Permit Holder must also submit a written incident report as described in the reporting section of this permit. Research may resume with written permission from NMFS. | MMPA section 104(b)(2)(D) and regulations at 50 CFR Part 216.36 | Statute and regulations require that permits specify "any other terms and conditions which [NMFS] deems appropriate." NMFS requires this condition to ensure real-time adaptive management of adverse effects of research. |

| Condition | Origin | Purpose |
|---|---|---|
| *Number and Kind(s) of Protected Species, Location(s) and Manner of Taking* | | |
| The tables in this permit outline the number of protected species, by species and stock, authorized to be taken, and the locations, manner, and time period in which they may be taken. | MMPA section 104(b)(2)(A)-(B) and regulations at 50 CFR Part 216.36 | Statute and regulations require that permits specify the number and kind of animals authorized to be taken, and the location and manner in which they may be taken. |
| Researchers must comply with the following conditions related to the manner of taking [a list of taxanomic or activity specific conditions that varies by permit] | MMPA section 104(b)(2)(D) and regulations at 50 CFR Part 216.36 | Statute and regulations require that permits specify "any other terms and conditions which [NMFS] deems appropriate." NMFS requires these conditions to minimize adverse effects of research activities including capture, sampling, and disturbance. (See Table 2 below for conditions common to pinniped research permits.) |
| Researchers working under this permit may collect visual images (*i.e.*, any form of still photographs and motion pictures) as needed to document the permitted activities, provided the collection of such images does not result in takes of protected species. | 50 CFR Part 216.41(c)(vii) | Regulations require that any activity conducted incidental to the authorized scientific research activity (i.e., educational and commercial photography) must not involve any taking of marine mammals beyond what is necessary to conduct the research. |
| The Permit Holder may use visual images collected under this permit in printed materials (including commercial or scientific publications) and presentations provided the images are accompanied by a statement indicating that the activity depicted was conducted pursuant to a NMFS Permit. This statement must accompany the images in all subsequent uses or sales. | MMPA section 104(b)(2)(D) and regulations at 50 CFR Part 216.36 | Statute and regulations require that permits specify "any other terms and conditions which [NMFS] deems appropriate." NMFS requires this condition to ensure visual images of permitted research acknowledge the appropriate permit authority for the activity. |

| Condition | Origin | Purpose |
|---|---|---|
| Upon written request from the Permit Holder, approval for photography, filming, or audio recording activities not essential to achieving the objectives of the permitted activities, including allowing personnel not essential to the research (*e.g.* a documentary film crew) to be present, may be granted by the Chief, Permits Division. | MMPA section 104(b)(2)(D) and regulations at 50 CFR Part 216.36 | Statute and regulations require that permits specify "any other terms and conditions which [NMFS] deems appropriate." This condition allows researchers to record or document their research for educational or other purposes. |
| Where such non-essential photography, filming, or recording activities are authorized they must not influence the conduct of permitted activities in any way or result in takes of protected species. | 50 CFR Part 216.41(c)(vii) | Regulations require that any activity conducted incidental to the authorized scientific research activity (i.e., educational and commercial photography) must not involve any taking of marine mammals beyond what is necessary to conduct the research. |
| Personnel authorized to accompany the Researchers during permitted activities for the purpose of non-essential photography, filming, or recording activities are not allowed to participate in the permitted activities. | 50 CFR Part 216.35(g) | Regulations require that individuals conducting activities under the permit possess qualifications commensurate with their duties and responsibilities. This condition therefore limits photographers, audiographers, and film crew to conduct of photography, filming and other recording activities. |
| The Permit Holder and Researchers cannot require or accept compensation in return for allowing non-essential personnel to accompany Researchers to conduct non-essential photography, filming, or recording activities. | 50 CFR Part 216.35(i) | Regulations state that permit holders may not require any direct or indirect compensation from another person in return for requesting authorization for such person to conduct [activities] authorized under the subject permit. |
| *Qualifications, Responsibilities, and Designation of Personnel* | | |
| The following Researchers may participate in the conduct of the permitted activities in accordance with their qualifications and the limitations specified herein: [a list of names of the Principal Investigator, Co-investigators, and Research Assistants] | MMPA section 104(b)(2)(D) and regulations at 50 CFR Part 216.36 | Statute and regulations require that permits specify "any other terms and conditions which [NMFS] deems appropriate." This condition identifies those individuals NMFS has determined qualified to participate in permitted research, and the degree of qualification (PI, CI, RA) relative to the research activities. |

| Condition | Origin | Purpose |
|---|---|---|
| Individuals conducting permitted activities must possess qualifications commensurate with their roles and responsibilities | 50 CFR Part 216.35(g) | Regulations require that individuals conducting activities under the permit possess qualifications commensurate with their duties and responsibilities. |
| The Permit Holder is ultimately responsible for all activities of any individual who is operating under the authority of this permit. Where the Permit Holder is an institution/facility, the Responsible Party is the person at the institution/facility who is responsible for the supervision of the Principal Investigator. | 50 CFR Part 216.35(f) | Regulations state that the permit holder is responsible for all activities of any individual who is operating under the authority of the permit. |
| The Principal Investigator (PI) is the individual primarily responsible for the taking, import, export and any related activities conducted under the permit. The PI must be on site during any activities conducted under this permit unless a Co-Investigator named in this permit is present to act in place of the PI. | 50 CFR Part 216.3 and Part 216.41(c)(iii) | Regulations define Principal Investigator as the individual primarily responsible for the taking, import, export and any related activities conducted under a permit issued for scientific research. Regulations regarding permit restrictions also require that research activities be conducted under the direct supervision of the principal investigator or a co-investigator identified in the permit. |
| Co-Investigators (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. | 50 CFR Part 216.41(c)(iii) and Part 216.35(g) | This condition defines the role and responsibility of co-investigators and derives from the regulatory restrictions for permits. |
| Research Assistants (RAs) are individuals who 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. | 50 CFR Part 216.41(c)(iii) and Part 216.35(g) | This condition defines the role and responsibility of research assistants and derives from the regulatory restrictions for permits. |

| Condition | Origin | Purpose |
|---|---|---|
| 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 any vessels or aircraft essential to conduct of the activity); individuals included as backup for those personnel essential to the conduct of the permitted activity; and individuals included for training purposes. | 50 CFR Part 216.41(c)(iv) | Regulations regarding permit restrictions state that personnel involved in permitted research be reasonable in number and limited to individuals who perform a function directly supportive of and necessary to the permitted activity [i.e., "essential" personnel]; and support personnel included for the purpose of training or as backup for "essential" personnel. |
| Persons who require state or federal licenses to conduct activities authorized under the permit (*e.g.*, veterinarians, pilots) must be duly licensed when undertaking such activities. | 50 CFR Part 216.35(h) | Regulations state that persons who require state or federal licenses to conduct activities authorized under the permit must be duly licensed when undertaking such activities. |
| Permitted activities may be conducted aboard vessels or aircraft, or in cooperation with individuals or organizations, engaged in commercial activities, provided the commercial activities are not conducted simultaneously with the permitted activities. | MMPA section 104(b)(2)(D) and regulations at 50 CFR Part 216.36 | Statute and regulations require that permits specify "any other terms and conditions which [NMFS] deems appropriate." This condition allows researchers to use platforms of opportunity for conduct of their research but prohibits use of research permits for commercial activities. |
| The Permit Holder may request authorization from the Permits Division to add personnel to this permit as indicated below. The Permit Holder cannot require or receive any direct or indirect compensation in return for requesting authorization for such person to act as a PI, CI, or RA under the permit. | 50 CFR Part 216.35(i) | Regulations state that permit holders may not require any direct or indirect compensation from another person in return for requesting authorization for such person to conduct [activities] authorized under the subject permit. |
| *Possession of Permit* | | |
| This permit cannot be transferred or assigned to any other person. | 50 CFR Part 216.35(i) | Regulations state that special exception permits are not transferable or assignable to any other person. |

| Condition | Origin | Purpose |
|---|---|---|
| The Permit Holder and all other persons operating under the authority of this permit must possess a copy of this permit: when engaged in a permitted activity; when a protected species is in transit incidental to a permitted activity; and during any other time when any protected species taken or imported under such permit is in the possession of such persons. | MMPA section 104(f) and regulations at 50 CFR Part 216.35(j) | This condition is paraphrased from statutory and regulatory text regarding possession of the permit. |
| A duplicate copy of this permit must be attached to the container, package, enclosure, or other means of containment in which a protected species or protected species part is placed for purposes of storage, transit, supervision or care. | MMPA section 104(f) and regulations at 50 CFR Part 216.35(j) | This condition is paraphrased from statutory and regulatory text regarding possession of the permit. |
| *Reports* | | |
| The Permit Holder must submit annual, final, and incident reports, and any papers or publications resulting from the research authorized herein to the Chief, Permits Division, | MMPA section 104(c)(1) and regulations at 50 CFR Part 216.38 | The statute requires any person authorized to take a marine mammal for scientific research to furnish to [NMFS] a report on all activities carried out pursuant to that authority. Regulations require all permit holders to submit annual, final, and special reports in accordance with the requirements established in the permit, and any reporting format established by the Office Director. |
| Written incident reports related to serious injury and mortality events or to exceeding authorized takes, must be submitted to the Chief, Permits Division within two weeks of the incident. The incident report must include a complete description of the events and identification of steps that will be taken to reduce the potential for additional research-related mortality or exceedence of authorized take. | | The purpose of incident (special) reports is to monitor effects of research and effectiveness of permit conditions for mitigation of adverse effects. |

| Condition | Origin | Purpose |
|---|---|---|
| An annual report must be submitted to the Chief, Permits Division by [a specified date that varies by permit but which is usually 90 days following the anniversary of permit issuance] for each year the permit is valid. The annual report describing activities conducted during the previous permit year must follow the format in [an Appendix with specific questions and format requirements]. | | The purpose of annual and final reports is to monitor permit compliance and effects of research on marine mammals. Annual and final reports also demonstrate the permit holder's progress toward achieving stated objectives of their study. |
| A final report must be submitted to the Chief, Permits Division within 180 days after expiration of the permit, or, if the research concludes prior to permit expiration, within 180 days of completion of the research. | | |
| Research results must be published or otherwise made available to the scientific community in a reasonable period of time. | 50 CFR Part 216.41(c)(ii) | Regulations require that research results be published or otherwise made available to the scientific community in a reasonable period of time. Note that the statutory definition of bona fide research includes "results of which likely would be accepted for publication in a refereed scientific journal." |
| *Notification and Coordination* | | |
| The Permit Holder must provide written notification of planned field work to the appropriate Assistant Regional Administrators for Protected Resources. Such notification must be made at least two weeks prior to initiation of any 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 (for example: PI, CI, veterinarian, boat driver, safety diver, animal restrainer, Research Assistant "in training") of participants. | MMPA section 104(b)(2)(D) and regulations at 50 CFR Part 216.36 | Statute and regulations require that permits specify "any other terms and conditions which [NMFS] deems appropriate." NMFS requires this condition to facilitate NMFS Regional Offices' coordination and monitoring of permitted activities in each specific geographic area. |

| Condition | Origin | Purpose |
|---|---|---|
| To the maximum extent practical, the Permit Holder must coordinate permitted activities with activities of 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. The appropriate Regional Office may be contacted for information about coordinating with other Permit Holders. | MMPA section 104(b)(2)(D) and regulations at 50 CFR Part 216.36 | Statute and regulations require that permits specify "any other terms and conditions which [NMFS] deems appropriate." NMFS requires this condition to promote coordination among permitted researchers to minimize unnecessary overlap of research in time and space and the resulting disturbance of animals. |
| *Observers and Inspections* | | |
| NMFS may review activities conducted pursuant to this permit. At the request of NMFS, the Permit Holder must cooperate with any such review by: allowing any employee of NOAA or any other person designated by the Director, NMFS Office of Protected Resources to observe permitted activities; and providing any documents or other information relating to the permitted activities. | MMPA section 104(b)(2)(D) and regulations at 50 CFR Part 216.36 | Statute and regulations require that permits specify "any other terms and conditions which [NMFS] deems appropriate." NMFS requires this condition to facilitate monitoring of research for compliance with the terms and conditions of the permit. Note also that this condition is consistent with, and paraphrased from, regulatory requirements for the General Authorization (50 CFR Part 216.45(d)(7)) |
| *Modification, Suspension, and Revocation* | | |
| All 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. | 50 CFR Part 216.40 | This condition is taken directly from the regulations. |
| The Director, NMFS Office of Protected Resources may modify, suspend, or revoke this permit in whole or in part: (1) In order to make the permit consistent with any change made after the date of permit issuance with respect to any applicable regulation prescribed under section 103 of the MMPA and section 4 of the ESA; (2) In any case in which a violation of the terms and conditions of the permit is found; (3) In response to a written request from the Permit Holder; (4) If NMFS determines that the | MMPA section 104(e) and Regulations at 50 CFR Part 216.39 and 50 CFR Part 216.36 and ESA section 10(d) | Parts 1 and 2 of this condition are taken directly from the corresponding section of the statute. Part 3 derives from the regulatory requirements for permit amendments. Part 4 derives from the statutory and regulatory requirement that permits specify "any other terms and conditions which [NMFS] deems appropriate." This condition allows NMFS to take appropriate action should it discover an applicant has falsified information in their application or other permit related information (e.g., permit reports). Part |

| Condition | Origin | Purpose |
|---|---|---|
| application or other information pertaining to the permitted activities (including, but not limited to, reports pursuant to [other sections] of this permit and information provided to NOAA personnel pursuant to [other sections] of this permit) includes false information; and (5) 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. | | 5 implements part of the ESA section 10(d) requirements. |
| Issuance of this permit does not guarantee or imply that NMFS will issue or approve subsequent permits or amendments for the same or similar activities requested by the Permit Holder, including those of a continuing nature. | MMPA section 104(b)(2)(D) and regulations at 50 CFR Part 216.36 | Statute and regulations require that permits specify "any other terms and conditions which [NMFS] deems appropriate." This condition clarifies that each application for a permit, including permit amendments, must satisfy the applicable statutory and regulatory issuance requirements, independent of previous permits. |
| *Penalties and Permit Sanctions* | | |
| Any person who violates any provision of this 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. | MMPA section 105 and regulations at 50 CFR Part 216.40(a) | This condition is paraphrased from the statute and regulations. |

| Condition | Origin | Purpose |
|---|---|---|
| NMFS shall be the sole arbiter of whether a given activity is within the scope and bounds of the authorization granted in this permit. The Permit Holder must contact the Permits Division for verification before conducting the 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. | MMPA section 104(b)(2)(D) and regulations at 50 CFR Part 216.36 | Statute and regulations require that permits specify "any other terms and conditions which [NMFS] deems appropriate." This condition clarifies that permits are not subject to interpretation by the permit holder and that NMFS's has exclusive authority regarding interpretation of the permit. |
| *Acceptance of Permit* | | |
| In signing this 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 this permit does not relieve the Permit Holder of the responsibility to obtain any other permits, or comply with any other Federal, State, local, or international laws or regulations. | 50 CFR Part 216.33(e)(3)(i) and (ii) | This condition is paraphrased from the regulations regarding permit issuance. This condition also clarifies that the authority conferred by the permit to take marine mammals in exception to the MMPA's prohibitions does not confer to the permit holder authority under any other laws. |

**Table 2. Special Conditions for Pinniped Research Permits.** In addition to the general permit conditions listed in Table 1 above, permits for activities with pinnipeds in the wild contain the following special conditions related to the manner of taking, which are intended to mitigate the potential adverse impacts of research on marine mammals that are the target of or may be incidentally harassed during the research. These mitigation measures are based on information and recommendations for proper care and handling of wildlife developed by The American Society of Mammalogists (see the American Society of Mammalogists' Animal Care and Use Guidelines) and the U.S. Geological Survey (see Chapter 6: Guidelines for the Proper Care and Use of Wildlife in Field Research *in* Field Manual of Wildlife Diseases, USGS Biological Resources Division Information and Technology Report 1999-001). The authority for requiring these special conditions is provided in section 104(b)(2)(D) of the MMPA, which states that permits issued pursuant to section 104 shall specify "any other terms and conditions which [NMFS] deems appropriate." NMFS has deemed these conditions appropriate measures to minimize the adverse effects associated with various research activities.

| Condition | Purpose |
|---|---|
| Except where disturbance during pupping season is expressly authorized, Researchers must not conduct any rookery activities until after the peak of pupping season. | This condition limits disturbance of a critical life history stage during a time when pups are particularly vulnerable to injury, abandonment, and mortality if the rookery is disturbed. |
| When working on rookeries, Researchers must, to the maximum extent practical, ensure pups do not gather in places or a manner that could lead to their suffocation, crushing, drowning, fluid aspiration, or other serious injury or mortality. | Permit reports indicate that pinniped pups, including those not handled by researchers, have died by suffocation, crushing, drowning, etc. during rookery disturbance. This condition requires adequate monitoring of pups to prevent this type of mortality. |
| Researchers must minimize the time lactating females are removed or otherwise separated from their dependent offspring as a result of research activities. | This condition minimizes the impacts of separating mother-pup pairs, including loss of suckling time (and provisioning of pups). |
| Researchers must take reasonable steps to identify pups of lactating females before attempting to immobilize a lactating female. | This condition minimizes the likelihood of causing pup injury or abandonment, and allows researchers to humanely provide for dependent pups in the even the lactating female dies during the research. |

| Condition | Purpose |
|---|---|
| If a lactating female dies as a result of the permitted activities and her dependent pup can be identified, Researchers must immediately contact the NMFS Regional Stranding Network Coordinator (SNC) and proceed as directed. If the pup cannot be identified or the SNC determines the pup is not a candidate for rehabilitation, the pup is to be counted as a permit-related mortality. | This condition allows orphaned pups to be humanely provided for in the even the mother dies during research. |
| If a pregnant female dies as a result of the permitted activities, both the female and the unborn pup shall be counted as permit-related mortalities. | This condition, in conjunction with the condition that limits research-related mortality, limits adverse impacts of research on marine mammal populations. |
| Researchers must capture and handle pinnipeds in groups small enough that handling and restraint time for each animal is minimized and all animals can be adequately monitored for signs of adverse reactions that could lead to serious injury or mortality. | Annual reports indicate pinnipeds have died (by suffocation and adverse reactions to anesthesia) while being restrained with insufficient monitoring. This condition reduces stress of handling and risk of mortality for individual animals. |
| Researchers must immediately cease attempts to approach, capture, restrain, sample, mark, or otherwise handle pinnipeds if the procedure does not appear to be working or there are indications such acts may be life-threatening or otherwise endanger the health or welfare of the animal. To the extent that it would not further endanger the health or welfare of the animal, Researchers may monitor or treat (e.g., administer reversal agents or attempt resuscitation) the animal as determined appropriate by the PI, CI, or attending veterinarian. | This condition reduces the likelihood of mortality for animals that are unduly stressed by the research. |
| Researchers must use aseptic techniques for collection of external tissue samples (e.g., swabs) or puncture procedures (e.g., venipuncture, flipper tagging) and use sterile techniques for surgical procedures and collection of internal tissue samples (e.g., blubber and muscle biopsy) | This condition minimizes likelihood of introducing novel disease causing pathogens, cross-contamination among animals, and risk of mortality or other adverse effects from infection post-sampling. |
| Researchers must use sterile disposable instruments (e.g., needles, biopsy punches) to the maximum extent practicable. | This condition minimizes likelihood of introducing novel disease causing pathogens, cross-contamination among animals, and risk of mortality or other adverse effects from infection post-sampling. |

| Condition | Purpose |
|---|---|
| Researchers must limit the amount of blood collected to actual needs for sample analysis and not exceed three attempts (needle insertions) per site per animal, and not more than 1.0 ml blood per kg body mass per capture event. | This limitation on blood sampling is consistent with current veterinary guidelines for safe removal of blood from live animals. |
| When capturing or detaining animals in traps, pens, carriers, etc., Researchers must adequately monitor the animals to prevent injury, mortality, dehydration, and thermal stress. | Annual reports indicate pinnipeds have died when left unattended in traps, carriers, etc. This condition reduces the likelihood of this by requiring appropriate monitoring. |
| Sedated and anesthetized animals should be monitored closely and not be released until they recover normal locomotor capabilities. When sedated/anesthetized animals are too large or dangerous to be held until fully recovered from sedation/anesthesia, they should be placed in secure sites where they will not be subject to physical harm or extremes of temperature, and can be monitored from a safe distance. | This condition reduces the risk of post-capture mortality by injury from con-specifics, accidental drowning, and other hazards present on and around rookeries and haul-outs. This condition also allows for researchers to respond should the animal fail to recover from sedation/anesthesia. |
| Researchers must take appropriate actions (e.g., disinfection procedures) for minimizing the introduction of new disease agents, vectors capable of efficiently transmitting indigenous dormant diseases or those not currently being effectively transmitted, and species that can serve as amplification hosts for transmitting indigenous diseases to other species. | This condition is self-explanatory. |
| To the maximum extent practical without causing further disturbance of marine mammals, Researchers shall monitor study sites following any disturbance (e.g., surveys or sampling activities) to determine if any marine mammals have been killed or injured or pups abandoned. Any observed serious injury to or death of a marine mammal is to be reported as indicated in [a previous condition]. Any observed abandonment of a dependent marine mammal pup is to be reported to the NMFS Regional Stranding Network Coordinator. | This condition requires researchers to collect much needed information on the effects of research on these animals. |

## APPENDIX C: TABLE OF TAKES AS REQUESTED BY APPLICANT

The following table outlines the annual takes of marine mammals requested by the applicant, as grouped by species, age class, and type of research activities proposed. This table is from the application (file no. 13430) submitted to NMFS by the applicant for research on pinniped haulouts in coastal Washington and Oregon, and adjacent waters, between 2008 and 2013. Note that the "expected take" column represents the maximum number of animals that would be taken per year by the research activities indicated in the corresponding "take action" column. The "number of takes per individual" represents the maximum number of times per year that an individual animal would be taken by the research activities indicated in the corresponding "take action" column. The "take action" column represents the specific research activity or suite of activities that would be performed on the animals in the corresponding "species," "life stage," "sex," etc. columns.

| Species | Life Stage | Sex | Number of Animals per Year | Number of takes per individual | Take action | Location | Dates/Time Period |
|---|---|---|---|---|---|---|---|
| Harbor seal | All | All | 30,000 | 30 | Incidental harassment during aerial, ground and boat surveys | WA, OR haulouts | Jan to Dec |
| California sea lion | Adult, subadult, juvenile | Male | 8,000 | 30 | Incidental harassment during aerial, ground and boat surveys | WA, OR haulouts | Jan to Dec |
| Northern elephant seal | All | All | 100 | 30 | Incidental harassment during aerial, ground and boat surveys | WA, OR haulouts | Jan to Dec |
| Harbor seal | All | All | 20,000 | 30 | Incidental harassment during captures, scat collections, and dead pup surveys | WA, OR haulouts | Jan to Dec |
| California sea lion | Adult, subadult, juvenile | Male | 8,000 | 30 | Incidental harassment during captures and scat collections | WA, OR haulouts | Jan to Dec |
| Northern elephant seal | All | All | 100 | 30 | Incidental harassment during captures and scat collections | WA, OR haulouts | Jan to Dec |
| Harbor seal | All except pups < 20 kg and near term females | All | 160 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, hot brand, no anesthetic | WA, OR haulouts | Jan to Dec |

| Species | Life Stage | Sex | Number of Animals per Year | Number of takes per individual | Take action | Location | Dates/Time Period |
|---|---|---|---|---|---|---|---|
| Harbor seal | All except pups < 20 kg and near term females | All | 20 | 2 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, hot brand, no anesthetic. If recaptured, may be resampled | WA, OR haulouts | Jan to Dec |
| Harbor seal | All except pups < 20 kg and near term females | All | 20 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, hot brand, no anesthetic; valium | WA, OR haulouts | Jan to Dec |
| Harbor seal | All except pups < 20 kg and near term females | All | 50 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, pelage dye or patch | WA, OR haulouts | Jan to Dec |
| Harbor seal | Pups > 20 kg | All | 25 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, nasal, rectal, conjunctival and urogenital swabs; Genetic tissue sample; mark - tag rear flipper, hot brand, no anesthetic | WA, OR haulouts | Jan to Dec |
| Harbor seal | Pups | All | 50 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; blood, nasal, rectal, conjunctival and urogenital swabs; genetic tissue sample; mark - tag rear flipper, | WA, OR haulouts | Jan to Dec |
| Harbor seal | Adult, subadult except near term females | All | 60 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, pelage dye or patch. | WA, OR haulouts | Jan to Dec |
| Harbor seal | Adult, subadult except near term females | All | 7 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, pelage dye or patch, valium | WA, OR haulouts | Jan to Dec |

| Species | Life Stage | Sex | Number of Animals per Year | Number of takes per individual | Take action | Location | Dates/Time Period |
|---|---|---|---|---|---|---|---|
| Harbor seal | Adult, subadult except near term females | All | 8 | 2 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark – tag or retag rear flipper as necessary, pelage dye or patch. If recaptured, may be resampled | WA, OR haulouts | Jan to Dec |
| Harbor seal | Adult, subadult, except near term females | All | 11 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, pelage dye or patch, Hot brand, no anesthetic. | WA, OR haulouts | Jan to Dec |
| Harbor seal | Adult, subadult, except near term females | All | 2 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, pelage dye or patch, Hot brand, no anesthetic, valium. | WA, OR haulouts | Jan to Dec |
| Harbor seal | Adult, subadult, except near term females | All | 2 | 2 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag or retag rear flipper as necessary, pelage dye or patch, Hot brand, no anesthetic. If recaptured, may be resampled | WA, OR haulouts | Jan to Dec |
| Harbor seal | All except pups < 20 kg and near term females | All | 75 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, hot brand, no anesthetic; VHF or acoustic tag. | WA, OR haulouts | Jan to Dec |
| Harbor seal | All except pups < 20 kg and near term females | All | 40 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, VHF or acoustic tag | WA, OR haulouts | Jan to Dec |

| Species | Life Stage | Sex | Number of Animals per Year | Number of takes per individual | Take action | Location | Dates/Time Period |
|---|---|---|---|---|---|---|---|
| Harbor seal | All except pups < 20 kg and near term females | All | 35 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber, whiskers, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, VHF or acoustic tag | WA, OR haulouts | Jan to Dec |
| Harbor seal | Adult, subadult > 30 kg except near term females | All | 40 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, pelage dye or patch; instrument - satellite, TDR, VHF or acoustic tag -alone or in combination. No more than 3 instruments on an individual animal. | WA, OR haulouts | Jan to Dec |
| Harbor seal | Adult, subadult > 30 kg except near term females | All | 5 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, pelage dye or patch; instrument - satellite, TDR, VHF or acoustic tag -alone or in combination. No more than 3 instruments on an individual animal; valium. | WA, OR haulouts | Jan to Dec |
| Harbor seal | Adult, subadult > 30 kg except near term females | All | 5 | 2 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag or retag rear flipper, pelage dye or patch; instrument - satellite, TDR, VHF or acoustic tag -alone or in combination. No more than 3 instruments on an individual animal. If recaptured, may be resampled | WA, OR haulouts | Jan to Dec |

| Species | Life Stage | Sex | Number of Animals per Year | Number of takes per individual | Take action | Location | Dates/Time Period |
|---|---|---|---|---|---|---|---|
| Harbor seal | Adult, subadult, > 30 kg except near term females | All | 6 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, pelage dye or patch, Hot brand, no anesthetic; instrument - satellite, TDR, acoustic or VHF- alone or in combination. No more than 3 instruments on an individual animal. | WA, OR haulouts | Jan to Dec |
| Harbor seal | Adult, subadult, > 30 kg except near term females | All | 2 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, pelage dye or patch, Hot brand, no anesthetic; instrument - satellite, TDR, acoustic or VHF- alone or in combination. No more than 3 instruments on an individual animal; valium. | WA, OR haulouts | Jan to Dec |
| Harbor seal | Adult, subadult, > 30 kg except near term females | All | 2 | 2 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag or retag rear flipper, pelage dye or patch, Hot brand, no anesthetic; instrument - satellite, TDR, acoustic or VHF- alone or in combination. No more than 3 instruments on an individual animal. If recaptured, may be resampled | WA, OR haulouts | Jan to Dec |
| Harbor seal | Adult, subadult > 60 kg except near term females | All | 14 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, pelage dye or patch; instrument - satellite, TDR, VHF, or stomach sensor tags alone or in combination. No more than 3 instruments on an individual animal; valium , atropine. If STT, then gas anesthesia | WA, OR haulouts | Jan to Dec |

| Species | Life Stage | Sex | Number of Animals per Year | Number of takes per individual | Take action | Location | Dates/Time Period |
|---|---|---|---|---|---|---|---|
| Harbor seal | Adult, subadult > 60 kg except near term females | All | 2 | 2 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, pelage dye or patch; instrument - satellite, TDR, VHF, or stomach sensor tags alone or in combination. No more than 3 instruments on an individual animal; valium, atropine. If STT, then gas anesthesia | WA, OR haulouts | Jan to Dec |
| Harbor seal | Adult, subadult > 60 kg Except near term females | All | 4 | 2 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, pelage dye or patch, Hot brand, no anesthetic; instrument - satellite, TDR, VHF, or stomach sensor tags alone or in combination. No more than 3 instruments on an individual animal; valium, atropine. If STT, then gas anesthesia. If recaptured, may be resampled | WA, OR haulouts | Jan to Dec |
| Harbor seal | Pups | All | 75 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper genetics sample | WA, OR haulouts | Jan to Dec |
| Harbor seal | Pups > 20 kg | All | 15 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs; mark - tag rear flipper, hot brand, no anesthetic | WA, OR haulouts | Jan to Dec |
| Harbor seal | Adult | Female lactating | 15 | 1 | Capture - hoop net; physical restraint; morphometrics - measure, weigh, sex; sample – blood, blubber biopsy, whisker, fur, nasal, rectal, conjunctival and urogenital swabs, oxytocin given IM and milk expressed; mark - tag rear flipper, pelage dye or patch. | WA, OR haulouts | Jan to Dec |

| Species | Life Stage | Sex | Number of Animals per Year | Number of takes per individual | Take action | Location | Dates/Time Period |
|---|---|---|---|---|---|---|---|
| California sea lion | Adult, sub-adult | Male | 300 | 1 | Capture, restrain, measure, weigh, patch, flipper tag, hot brand | WA, OR haulouts | Jan to Dec |
| California sea lion | Adult, sub-adult | Male | 50 | 1 | Capture, restrain, measure, weigh, patch, flipper tag, hot brand, external instrument- satellite, TDR, acoustic or VHF- alone or in combination. No more than 3 instruments on an individual animal. | WA, OR haulouts | Jan to Dec |
| California sea lion | Adult, sub-adult | Male | 50 | 1 | Capture, restrain, measure, weigh, patch, flipper tag, hot brand, draw blood | WA, OR haulouts | Jan to Dec |
| California sea lion | Adult, sub-adult | Male | 150 | 2 | Recapture, restrain, measure, weigh | WA, OR haulouts | Jan to Dec |
| California sea lion | Adult, sub-adult | Male | 50 | 2 | Recapture, restrain, measure, weigh, external instrument- satellite, TDR, acoustic or VHF- alone or in combination. No more than 3 instruments on an individual animal. | WA, OR haulouts | Jan to Dec |
| Harbor seal | all | all | | | Import and export tissue and blood to/from | Canada | Jan to Dec |
| California sea lion | Adult, sub-adult | Male | 4000 | 10 | Playback of killer whale vocalization, video film | WA, OR haulouts | Jan to Dec |
| Northern elephant seal | All | All | 50 | 1 | Capture, physical restraint, measure, tag, bleach, blood | WA, OR haulouts | Jan to Dec |
| Harbor seal | All | All | 5 | 1 | Unintentional mortality | WA, OR haulouts | Jan to Dec |
| California sea lion | Adult, subadult, juvenile | Male | 5 | 1 | Unintentional mortality | WA, OR haulouts | Jan to Dec |
| Northern elephant seal | All | All | 2 | 1 | Unintentional mortality | WA, OR haulouts | Jan to Dec |
| Steller sea lion, Eastern DPS | All | All | 250 | 20 | Incidental harassment during research directed at pinnipeds | Waters adjacent to WA & OR haulouts | Jan to Dec |

| Species | Life Stage | Sex | Number of Animals per Year | Number of takes per individual | Take action | Location | Dates/Time Period |
|---|---|---|---|---|---|---|---|
| Southern Resident killer whale | All | All | 100 | 2 | Incidental harassment during research directed at pinnipeds | Waters adjacent to WA & OR haulouts | Jan to Dec |

## APPENDIX D: DESCRIPTION OF NON-TARGET TERRESTRIAL SPECIES IN ACTION AREA

As noted in Section 3.3.4, a variety of non-target forest-dwelling mammals and birds may be found in or near the action area for the proposed permit. The following is a brief description of the distribution, life-history, and other characteristics of such species and an indication of whether and by what means these non-target species may be affected by the proposed action if researchers use overland routes to access the pinniped rookeries and haulouts.

Northern spotted owl. The threatened northern spotted owl (*Strix occidentalis*) inhabits mature coniferous forests (aka "old growth forests") from northern California to British Columbia. Their dependence on dense old growth forests is probably related to a need for large trees for nesting and roosting sites, and variables associated with abundance and availability of appropriate prey. The primary prey of spotted owls are flying squirrels and woodrats. They also eat other small mammals, including bats, as well as other owls. Individual spotted owls may not breed every year, and some do not breed for up to five or six years. Eggs are laid from March through mid-May and incubated for about a month. Young owls leave the nest about a month after hatching, often before their flight feathers are fully developed. They perch on nearby branches, and those that fall to the ground will climb up nearby trees to perch. Most nest sites are used for more than 1 year and are typically 60 - 100 feet high. Most owlets can fly short distances by about 40 days post-hatching. The survival rate for young spotted owls is low, but adult survival is high, and spotted owls may live to be upwards of 17 years old. Spotted owls would not likely be exposed to the research on pinniped rookeries and haulouts, but owls of any age could be disturbed by humans traveling overland to access these sites, and by aerial surveys.

Black bear. The American black bears (*Ursus americanus*) is the most common and widely distributed bear species in North America. In Washington and Oregon, they live in a diverse array of forested habitats, from coastal rainforests to the dry woodlands of the Cascades' eastern slopes. In general, black bears are strongly associated with forest cover, but they do occasionally use relatively open country, such as clearcuts and the fringes of other open habitat. Bears may be active at any time, day or night, but most often during morning and evening twilight. Bears mate in early summer, but development of the fertilized egg is delayed until November. After a two or three month pregnancy, altricial cubs (usually two per litter) are born in midwinter. Cubs emerge from the den in mid-May and stay with their mother for one year. Black bears actively throughout the summer and early fall in preparation for winter. Most bears spend the winter in dens, and do not come out to forage until spring. Bears, including mothers with dependent cubs, would not likely be exposed to the research on pinniped rookeries and haulouts, but could be disturbed by humans traveling overland to access these sites.

Canids. There are a number of canid species (members of the family Canidae) in or near the action area including the endangered gray wolf (*Canis lupus*), the coyote (*C. latrans*), the gray fox (*Urocyon cinereoargenteus*), and the red fox (*Vulpes vulpes*). The gray wolf, also known as the timber wolf, is the largest wild member of the Canidae family (which also includes domestic dogs, *C. lupus familiaris*). Throughout their range, gray wolves inhabit temperate forests, deserts, mountains, tundra, grasslands, and even urban areas. Mating occurs between January and April, and litters of pups (usually one per pack) are born about two months after mating.

The pups are altricial and stay in the den for about two months following birth. Pups are usually weaned after about 10 weeks, and remain with their pack for several years, until reaching sexual maturity. While wolves feed primarily on medium to large sized ungulates (e.g., goats, sheep, deer and moose), they have also been known to eat seals and feed on beached whales. The western gray wolf (Northern Rocky Mountain Population) was removed from the federal endangered species list on March 28, 2008 (73 FR 10514). However, in response to a complaint filed by a coalition of environmental groups, the U.S. Federal District Court in Missoula, Montana, issued a preliminary injunction on July 18, 2008, that immediately reinstated the Endangered Species Act protections. The gray wolf is also listed as endangered by the State of Oregon.

Coyotes are found throughout North and Central America, and usually flourish in areas where wolves have been exterminated. Mating occurs in January through late March, and pups are born about two months later. The growth rate of coyotes is faster than that of wolves: pups are fully weaned in about a month and reach sexual maturity within about 12 months of birth. Coyotes primarily eat small mammals, such as voles, ground squirrels, and mice. They will also eat large insects, birds, lizards, and deer, and will feed on carrion. They are active both day and night in the wild, but tend to adopt a more nocturnal lifestyle near civilization.

Foxes are smaller than coyotes and wolves. Foxes range throughout the northern hemisphere from the Arctic circle to Central America. Unlike wolves and coyotes, foxes are usually not pack animals. These typically solitary animals feed on smaller prey (birds, rodents, etc.) as well as insects, fruit, and berries. Breeding occurs February through April, and pups are born about six to seven weeks later. Pups are fully weaned by eight to 10 weeks, and remain with their mother until the autumn. They reach sexual maturity in about 10 months.

Other mammals. There is a wide variety of arboreal mammals, including raccoons and smaller mammals such as squirrels and chipmunks, that live in, nest in, or are otherwise associated with (for feeding and protection) the trees and bushes of the action area. There is also a variety of small mammals associated with freshwater and coastal marine habitats within the action area, including rivers, lakes, and estuaries. River otters and some mustelids feed on aquatic organisms such as amphibians, fish, turtles, crabs, and other invertebrates. The primary prey of fishers includes rabbits, squirrels and other smaller mammals. The breeding seasons and habits for these assorted mammals vary by species. Some, like the river otter, reproduce annually, typically in the spring, and others, like squirrels, have multiple mating seasons within a year. The period of dependence, and time to sexual maturity, also varies by species.

Note that, after a decades-long absence from Washington, 18 fishers (*Martes pennanti*) were released into the forests of Olympic National Park in early 2008. Restoring fishers to Washington and Olympic National Park is a cooperative effort between the Washington Department of Fish and Wildlife, the National Park Service and many other partners.