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

NOV - 2 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 on the Effects of Issuing Marine Mammal Scientific Research Permit No. 15483

LOCATION: Coastal waters off Central Oregon

SUMMARY: The action is issuance of a permit under the Marine Mammal Protection Act and Endangered Species Act to Bruce Mate, Ph.D., Oregon State University, Hatfield Marine Science Center, Newport, Oregon for a study testing the effectiveness of an acoustic deterrent device on gray whales. The research involves exposing marine mammals to a sound and documenting their responses. These activities will result in short-term adverse impacts on specified numbers of target and non-target marine mammals over the duration of the permit, which will be valid for five years from issuance. No other component of the environment is expected to be affected by the permitted research.

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.

Although NOAA is not soliciting comments on this completed EA/FONSI we will consider any comments submitted that would assist us in preparing future NEPA documents. Please submit written comments to the responsible official named above.

Sincerely,

for Paul N. Doremus, Ph.D.
NOAA NEPA Coordinator

Enclosure

Environmental Assessment
on
Effects of Issuing Marine Mammal Scientific Research Permit No. 15483

October 2010

Lead Agency:	USDOC National Oceanic and Atmospheric Administration 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 National Marine Fisheries Service 1315 East West Highway Silver Spring, MD 20910 (301) 713-2289
Location:	Coastal waters off central Oregon

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue Scientific Research Permit No. 15483, pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 *et seq*.), and the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et seq*.). The permit would be valid for five years from the date of issuance. The permit would exempt the holder from takes of marine mammals by level B harassment, including attempts to harass, under the MMPA, and by harassment, including attempts to harass, under the ESA. The purpose of the research is to test the effectiveness of an acoustic deterrent on gray whales. The permit applicant requests take allowance for gray whales as well as pinnipeds and other cetaceans in the action area.

Contents

1.0 PURPOSE OF AND NEED FOR ACTION

Proposed Action: In response to an application from Bruce Mate, Ph.D., Oregon State University, Hatfield Marine Science Center, Newport, Oregon, NMFS proposes to issue Scientific Research Permit No. 15483, pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 *et seq*.), and the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et seq*.) for "takes"[1] of marine mammals, including those listed as threatened or endangered.

Purpose of and Need for Action: The MMPA and ESA prohibit "takes" of marine mammals and of threatened and endangered species, respectively, with only a few specific exceptions. The applicable exceptions in this case are an exemption for *bona fide* scientific research under Section 104 of the MMPA and for scientific purposes related to species recovery under Section 10(a)(1)(A) of the ESA.

The purpose of the permit is to provide the applicant with an exemption from the take prohibitions under the MMPA and ESA for harassment (including level B harassment as defined under the MMPA[2]) of marine mammals, including those listed as threatened or endangered, during conduct of research that is consistent with the MMPA and ESA issuance criteria.

The need for issuance of the permit is related to the purposes and policies of the MMPA and ESA. NMFS has a responsibility to implement both the MMPA and the ESA to protect, conserve, and recover marine mammals and threatened and endangered species under its jurisdiction. Facilitating research about species' basic biology and ecology or that identifies, evaluates, or resolves specific conservation problems informs NMFS management of protected species.

Scope of Environmental Assessment: This EA focuses primarily on effects on Steller sea lions (*Eumetopias jubatus*) of the Eastern Distinct Population Segment (DPS) and killer whales (*Orcinus orca*) of the Southern Resident DPS, listed as threatened and endangered under the ESA, respectively.

The National Oceanic and Atmospheric Administration (NOAA) has, in NOAA Administrative Order 216-6 (NAO 216-6; 1999), listed issuance of permits for research on marine mammals and threatened and endangered species as categories 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). A possible exception to the use of these categorical exclusions is when the action may

[1] Under the MMPA, "take" is defined as to "harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect." The ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

[2] "Harass" is defined under the MMPA as "Any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing a disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but does not have the potential to injure a marine mammal or marine mammal stock in the wild (Level B harassment)."

adversely affect species listed as threatened or endangered under the ESA (NAO 216-6 Section 5.05c).

The target species of the applicant's research is gray whales (*Eschrictius robustus*) of the Eastern North Pacific Stock, which are not listed as threatened or endangered under the ESA. Except for the Steller sea lions and Southern Resident killer whales, the other marine mammals that are the subject of the permit application are also not listed under the ESA. There is no evidence from prior analyses[3] of the effects of permit issuance, or from monitoring reports submitted by permit holders[4], that issuance of research permits for take of marine mammals listed under the ESA results in adverse effects on stocks or species. Nevertheless, NMFS has prepared this EA, with a more detailed analysis of the potential for adverse impacts on threatened or endangered species resulting from takes of a specified number of individual Steller sea lions and Southern Resident killer whales, to assist in making the decision about permit issuance under the MMPA and ESA.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

Alternative 1 - No Action: Under the No Action alternative, no permit would be issued and the applicant would not receive an exemption from the MMPA and ESA prohibitions against take.

Alternative 2 - Proposed Permit: Under the Proposed Permit alternative, a permit would be issued to exempt the applicant from MMPA and ESA take prohibitions during conduct of research that is consistent with the purposes and policies of the MMPA and ESA and applicable permit issuance criteria.

The objective of the applicant's research is to test the effectiveness of an acoustic deterrent on gray whales by measuring their responses to the underwater sounds produced by the device. The permit would contain terms and conditions standard to such permits as issued by NMFS (see Appendix A).

The following is a summary of the applicant's request to take marine mammals, including those listed as threatened or endangered under the ESA.

Methods: The research protocols are described in detail in the application on file for this action and are briefly summarized here. The experimental protocol consists of deploying a sound source in the water and observing the reactions of gray whales traveling past the source during their annual migration between summer calving and winter feeding grounds.

The sound source consists of a transmitter, projector and battery to be moored directly west of Yaquina Head, Oregon, at the 50 m isobar (~44.676^{o} N, 124.140^{o} W). The depth of the sound projector would be 20 m below the sea surface. The sound has peak efficiency in the 1-3 kHz

[3] Since 2005, NMFS has prepared over 100 EAs for issuance of permits under the MMPA and ESA. In every case, the EA supported a finding of no significant impact regardless of the nature of the permitted take or the status of the species that were the subject of the permit. These EAs were accompanied by Biological Opinions prepared pursuant to interagency consultation under section 7 of the ESA and further document that such permits are not likely to adversely affect listed species. A listing of recently completed EAs is provided in Attachment 1.

[4] All NMFS permits for research on marine mammals require submission of annual reports, which include information on responses of animals to the permitted takes.

(1,000-3,000 Hz) range and a maximum source level of 170 dB re: 1 μPa at 1 m. The signal consists of a pulse up to 1 sec in duration with a pulse rate of 3 pulses/minute. The acoustic device would operate during daylight hours only. There would be no sound production at night.

Operational protocol of the device includes control phases of no sound and phases of active sound emission on a 2 day rotation. On day 1 of this rotation, the sound source would be on from 8:00 am until 2:10 pm, with the first 10 minutes being the ramp-up procedure. The source would then be turned off. On day 2 of the rotation, the sound source would be on from 10:00 am until 4:10 pm, with the first 10 minutes being the ramp-up procedure. Thus, during an 8-h day, there would be 6 h of experimental period and 2 h of control period, with the latter alternating between afternoon and morning in the 2-d rotation.

The sound source would be actively transmitting for 6.2 h/d during the 105 days of the proposed field study (January 1 – April 15, 2011). The device would also be actively transmitting upon deployment in December 2010, resulting in an additional 31 days maximum (depending on deployment date). This would result in a maximum total of 843.2 h of sound transmission during the experiment.

It is the intent of the experiment to elicit a change in the behavior of the target species, gray whales. Measures that avoid or reduce their exposure to the research in general would be contradictory to the goal of the experiment. It is necessary for researchers to expose marine mammals to the sound source to determine its effectiveness at altering their behavior.

The researcher is not attempting to injure any marine mammals, or to disturb marine mammals other than gray whales. Some disturbance of these non-target animals is unavoidable. However, the sound source operates with a "ramp-up" procedure at the beginning of each experimental period to ensure that no animals are exposed to the full source level without prior opportunity to move away from the source. The initial source level of the device is 120 dB, which then increases by 5 dB every minute. The maximum source level of 170 dB is reached 10 minutes after the unit is turned on.

The maximum source level is not associated with potential for injury, thus the ramp-up measure is a precaution against disturbance of non-target animals. If animals choose to remain in the ensonified zone during or after ramp up, exposure to the source is not likely to result in injury.

Concurrent with the operation of the acoustic device, shore-based observers would track gray whales with theodolites and monitor behavioral responses of gray whales via binoculars. Location, route and speed of travel, and behavioral characteristics of tracked individuals or groups of whales would be recorded, including the number of blows per surfacing sequence, dive duration, and surface displays (fluking, spy-hopping, breaching). This land-based research activity would not result in takes of marine mammals and is therefore not part of the proposed permit.

Duration: The researchers intend to conduct the experiment in a single field season in 2011, but are asking for a five-year permit in the event that financial, logistical, or environmental complications arise and they are unable to accomplish their sample size goal in that one year.

The permit would thus be valid for five years from date of issuance, which is the maximum duration of an MMPA permit.

Target species or stocks: The applicant's research is directed at gray whales. However, as the research involves introducing sound into the water that may affect marine species other than gray whales, the permit would exempt takes of all marine mammals potentially disturbed by the sound. This is consistent with the MMPA definition of level B harassment in which actions with a potential to disturb a marine mammal in the wild by causing disruption of behavioral patterns including migration, breathing, nursing, breeding, feeding, or sheltering are considered a take. The inclusion of "potential to" in this definition means that the take occurs regardless of whether there is a disruption in the behavioral patterns of marine mammals exposed to the action.

The sound propagating from the source may temporarily disrupt some marine mammals' behavior. Therefore, the permit would exempt take of the following marine mammals known or likely to be present in the action area:

Line	Species	MMPA Stock/ ESA Listing Unit/	Lifestage	Sex	Maximum No. Animals per year	Maximum No. Takes per Animal per Year	Procedures
1	Whale, gray	Eastern North Pacific	All	Male and Female	2260	2	Acoustic, active playback/broadcast; Observations, behavioral
2	Whale, killer	Eastern North Pacific Southern Resident Stock (Endangered)	All	Male and Female	14	1	Incidental harassment by broadcast from underwater source
3	Whale, killer	West Coast Transient Stock	All	Male and Female	14	1	Incidental harassment by broadcast from underwater source
4	Porpoise, harbor	Northern California - Southern Oregon Stock	All	Male and Female	364	1	Incidental harassment by broadcast from underwater source
5	Sea lion, California	US Stock	All	Male and Female	8	1	Incidental disturbance by broadcast from underwater source
6	Sea lion, Steller	Eastern US (Threatened)	All	Male and Female	4	1	Incidental disturbance by broadcast from underwater source
7	Seal, harbor	Oregon & Washington Coastal Waters Stocks	All	Male and Female	508	1	Incidental disturbance by broadcast from underwater source
8	Seal, northern elephant	California Breeding Stock	All	Male and Female	4	1	Incidental disturbance by broadcast from underwater source

3.0 AFFECTED ENVIRONMENT

Location

The research does not involve vessels in the water, and all observations would take place from shore-based stations that do not involve approaches to marine mammals. The action area is in the water column, and effectively defined by the sound propagation of the source device. The sound source will be moored directly west of Yaquina Head, Oregon, at the 50 m isobar (~44.676^{o} N, 124.140^{o} W). The depth of the sound projector will be 20 m below the sea surface. Sound propagation modeling for the proposed mooring site suggested a range of approximately 750 m from a 170 dB sound source, where levels of 120 dB are most likely to be observed throughout the water column. This is the source level for which gray and bowhead whales have been shown to exhibit avoidance responses (Tyack 2009a). Sounds below the 120 dB level are not expected to be detectable by or otherwise affect animals. The action area is therefore a zone of sound propagation centered on the source and expanding outward by approximately 750 m.

Status of Target Species

Gray whales: Gray whales of the Eastern North Pacific Stock are not listed as, or proposed to be listed as, depleted under the MMPA, or threatened or endangered under the Endangered Species Act (ESA).

The minimum population estimate for the Eastern North Pacific Stock of gray whales is 17,752 whales. Most of the Eastern North Pacific Stock of gray whales spends the summer feeding in the northern and western Bering and Chukchi Seas. However, gray whales have been reported feeding in the summer in waters near Kodiak Island, Southeast Alaska, British Columbia, Washington, Oregon, and California. Each fall, the whales migrate south along the coast of North America from Alaska to Baja California, in Mexico, most of them starting in November or December. The northbound migration generally begins in mid-February and continues through May, with cows and newborn calves migrating northward primarily between March and June along the U.S. West Coast.

The EA prepared for issuance of a permit to test the effectiveness of a low-power high-frequency sonar system as a tool for reliably detecting marine mammals contains a summary of information on the status and biology of gray whales, including the auditory capabilities of gray whales and other marine mammals (NMFS 2003). Gray whales migrating past central California were the subject species for that permit. That EA reviews information on how sounds may affect gray whales and other marine mammals, including what levels may cause disturbance, masking, temporary threshold shift, permanent threshold shift and injury. That information and analysis suggests that gray whales are likely capable of hearing the sounds produced by the deterrent and are not likely to be injured by it.

Status of ESA-listed species

Steller sea lion (*Eumetopias jubatus*): The Eastern DPS of Steller sea lion 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 of Steller sea lion, which ranges from the Gulf of Alaska, along the Aleutian Islands and into Russia, at 144^{o} West longitude (Cape Suckling, Alaska). The Western DPS Steller sea lions

would not be affected. A detailed description of the status, including threats to the population, biology and ecology of Steller sea lions, 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, however none occurs within the action area. The minimum population abundance estimate for Eastern DPS Steller sea lions is 44,404.

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 dependent pups remain with their mothers for up to a year or more. As such, adults, juveniles, and young of the year could be exposed to the proposed playback sounds, which are within the frequency range audible by Steller sea lions.

Received sound levels <150 dB re 1 μPa are unlikely to induce avoidance behavior in these animals (Southall et al. 2007). The proposed sound signal attenuates to <150 dB re 1 μPa at a distance less than 50 m from the source. Calculations on the number of pinnipeds expected to occur within 50 m of the sound source yield estimates of less than one for all of the species for which published density estimates are available, including Steller sea lions. Therefore no biologically significant effects are anticipated from the proposed study on Steller sea lions.

Killer whale (*Orcinus orca*): Killer whales 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. Killer whales of the Southern Resident DPS are listed as endangered. Killer whales are often sighted along the coast of Oregon, and may belong to the listed DPS or to the non-ESA listed population. Critical habitat has been designated for this DPS but is not within the action area.

The abundance estimate for this stock of killer whales is a direct count of individually identifiable animals. It is thought that the entire population is censused every year. This estimate therefore serves as both a best estimate of abundance and a minimum estimate of abundance. Thus, the minimum population estimate for the Southern Resident stock of killer whales is 85 animals as of a 2008 count.

Killer whales breed and give birth year round. Calves are dependent for up to two years. Killer whales of all ages could be exposed to the sound, which is within the frequency range audible to killer whales.

Relatively little is known about the winter movements and range of the Southern Resident DPS. Southern Residents have not been observed associating with other resident whales, and genetic data suggest that Southern Residents rarely, if ever, interbreed with other killer whale populations. Most sightings of the Southern Resident DPS of killer whales have occurred in the summer in inland waters of Washington and southern British Columbia. However, pods belonging to this DPS have also been sighted in coastal waters off southern Vancouver Island and Washington.

Level B Harassment (behavioral disturbance) of killer whales may occur if the animals are exposed to received levels of more than 140 dB re 1 μPa. The proposed sound signal attenuates to 140 dB re 1 μPa at less than 50 m from the source. The occurrence of either Southern

Resident or non-ESA listed Transient killer whales off Yaquina Head is very low, especially during the time of the proposed study. The number of killer whales actually occurring within a 50 m radius of the sound source and the likelihood of them exhibiting an avoidance response is extremely low, approaching zero.

Status of Other Affected Marine Mammals

The permit application summarizes the status of the other marine mammals in the project area that may be affected by the action and for which takes are requested. With the exception of Steller sea lions and the Southern Resident DPS of killer whales, none of the other affected marine mammals belong to stocks listed as depleted under the MMPA. These other marine mammals are from robust populations that are either stable or increasing in size. The minimum population estimates from the most recent Stock Assessment Reports are provided for reference. More information about each stock may be found in the respective Stock Assessment Reports, which are available online at http://www.nmfs.noaa.gov/pr/sars/species.htm.

Species	Stock	MMPA status	Minimum Population Estimate
Killer whales	West Coast Transient Stock	Not depleted	314
Harbor porpoise	Northern California - Southern Oregon Stock	Not depleted	28,833
California sea lion	US Stock	Not depleted	141,842
Harbor seal	Oregon & Washington Coastal Stock	Not depleted	22,380
Northern elephant seal	California Breeding Stock	Not depleted	74,913

Several other marine mammal species may be found in waters offshore of Oregon, but they are either primarily deep water species not likely to be found within the near shore action area, are only present seasonally and not expected at the time of the project, or have only been sighted on rare occasions and considered unlikely to be encountered. Table 1 of the application lists these other species, which include several baleen whales, beaked whales, sperm whales, and sea otters. No take allowance was requested for these other species and they are not considered further.

Non-Target Marine Animals

In addition to the marine mammal stocks and species that are the subject of the permit, an assortment of sea birds, sea turtles, fish and invertebrates may be found in the action area. The permit would only authorize takes of marine mammals. The takes of marine mammals by harassment would not affect any non-target marine animals and they are not considered further.

Biodiversity and Ecosystem Function

The proposed action is directed at marine mammals and does not interfere with benthic productivity, predator-prey interactions or other biodiversity or ecosystem functions. Marine mammals will not be removed from the ecosystem or displaced from habitat, nor will the

permitted research affect their diet or foraging patterns. Further, the proposed action does not involve activities known or likely to result in the introduction or spread of nonindigenous species, such as ballast water exchange or movement of vessels among water bodies. Thus, effects on biodiversity and ecosystem function will not be considered further.

Ocean and Coastal Habitats
The proposed action is directed at marine mammals and does not affect habitat. It does not involve alteration of substrate, movement of water or air masses, or other interactions with physical features of ocean and coastal habitat. Thus, effects on habitat will not be considered further.

Unique Areas
There are no historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas within the action area, which is limited to coastal and open waters in which no such areas occur. The exception is essential fish habitat (EFH) designated for various species of groundfish, which includes hard and soft bottom substrates. The proposed action is directed at marine mammals and does not alter or affect unique areas, including any components of EFH. Thus, effects on such unique areas will not be considered further.

Historic Places, Scientific, Cultural, and Historical Resources
There are no districts, sites, highways or structures listed in or eligible for listing in the National Register of Historic Places in the action area. The proposed action represents non-consumptive use of marine mammals and does not preclude their availability for other scientific, cultural, or historic uses, including subsistence harvest by Alaskan Natives. Thus, effects on such resources will not be considered further.

Social and Economic Resources
The proposed action does not affect distribution of environmental burdens, access to natural or depletable resources or other social or economic concerns. It does not affect traffic and transportation patterns, risk of exposure to hazardous materials or wastes, risk of contracting disease, risk of damages from natural disasters, food safety, or other aspects of public health and safety. Thus, effects on such resources will not be considered further.

4.0 ENVIRONMENTAL CONSEQUENCES

Effects of the No Action Alternative
There are no direct or indirect effects on the environment of not issuing the permit. The takes of marine mammals, including those listed as threatened or endangered, resulting from the applicant's research would not be exempted. It is unlikely the applicant would conduct the research in the absence of a permit, because to do so would risk sanctions and enforcement actions.

Effects of the Proposed Permit Alternative
Effects would occur at the time when the applicant's research results in takes of marine mammals, including those listed as threatened or endangered.

No animals would be approached by researchers, nor would there be any physical contact with research equipment. Animals would be taken by harassment due to exposure to the sound propagating from the acoustic deterrent source. Only minimal short-term behavioral disturbance to marine mammals is expected from the active sound transmissions in the proposed study.

Based on past sound playback studies involving migrating gray whales (Malme *et al*. 1983, 1984, Tyack 2009b), researchers expect 50% of the migrating gray whales in this study to exhibit an avoidance response to received sound levels $\geq$120 dB re 1 µPa at 1 m. Specifically, they expect half of the gray whales whose trajectory would take them within 750 m of the sound source during the experimental phases (active sound transmission) of the study to adjust their trajectory to maintain a distance of 750 m or greater from the source. This change in trajectory would have minimal significance to an animal that is migrating over 7,200 km in one direction (estimated from the satellite-monitored track of a gray whale tagged by the applicant's program in 2005). For instance, the travel distance of a gray whale migrating within 750 m of the sound source may increase by a maximum of 855 m, which is the difference between a travel path around half the circumference of a 750 m radius circle and a path straight through the center of the same circle. This represents 0.01% of the total distance of a 7,200 km migration from feeding to breeding area, and is highly unlikely to be of any biological significance to the animals.

There may also be changes in gray whale respiration rate and speed of travel with exposure to the sound source proposed for this study, but as with changes in trajectory, these will likely be of very short duration, and have little to no biologically significant effect on the whales.

For the other marine mammals, including threatened Steller sea lions and endangered killer whales, which are not known to undertake migrations on the scale of gray whales, responses to the sound source are likely to include

- minor changes in swim direction or speed of travel to avoid closer proximity or longer exposure to the sound, if they find the sound disturbing
- no changes in behavior but minor physiological changes (such as associated with short-term stress responses) if they are disturbed but choose to remain in the ensonified zone
- no changes in behavior and no physiological changes

There is a potential for auditory masking for killer whales' vocalizations in close proximity to the sound source. However, given the transient nature of the signals (three 1-s pulses per minute), the low source level, and the small zone of influence, the level of masking that may occur is not expected to have biological significance for the killer whales.

The permitted take numbers are conservative in that they assume that 100% of animals exposed are affected, which may not be the case. While each animal that comes within the ensonified zone is being counted as a "take" under the MMPA's definition of level B harassment, not all animals are expected to react or be adversely affected by the activity.

The application describes the likely effects of exposure to the sound, including previously reported responses of animals to similar experiments. The effects of the harassment take are related to the responses of the animals and the impacts such responses have on survival and

reproduction. The most obvious or easily observed responses are behavioral, although there may be physiological responses as well. Physiological responses, such as increased heart rate or elevated levels of stress hormones, are not visible and are not detectable without causing further impacts on the animal.

In general, the behavioral responses of marine mammals to various sounds have ranged from no detectable change in behavior to behaviors characteristic of avoidance or escape, such as sudden changes in swim speed or direction, or increased dive duration. Animals that act to escape the ensonified zone during ramp up may temporarily cease behaviors such as feeding, resting, or mating. Animals that act to avoid the ensonified zone once the signal is at full strength are likely to do so by making course corrections or altering their swim speed.

Chapter 4 of the EA prepared for issuance of a permit to test the effectiveness of a low-power high-frequency sonar system as a tool for reliably detecting marine mammals (NMFS 2003) contains a discussion of the manner in which exposure to sounds is likely to affect marine mammals, including consideration of when an adverse effect upon an individual animal equates to an adverse effect upon the entire species to which that animal belongs. That discussion and evaluation is hereby incorporated by reference. In summary, takes of marine mammals by level B harassment, as may occur under the Proposed Permit Alternative, may adversely affect individual animals but do not result in adverse effects on stocks or species, because the effects on individuals are transitory and recoverable.

The consequence of stopping certain behaviors (e.g., feeding, resting, mating) is a function of how long it lasts and whether the whale is able to recover from the lapse. For example, if a whale ceases to feed for an hour as a result of being disturbed by the research, it will not suffer a long-term adverse consequence unless the loss of that feeding time adversely impacts its energy needs and it is unable to make up for the lost feeding time.

The consequence of changing course or swim speed is a function of the energetic costs relative to the animal's energy budget. As only relatively minor changes in direction or speed are necessary to move out of the small ensonified zone, no measurable energetic costs are likely.

The action area (ensonified zone) is small, especially relative to the range of the affected species. No marine mammals, including endangered killer whales and threatened Steller sea lions, would be excluded from important habitat. The research would only occur during the winter migration of gray whales, a 4.5 month period between January and mid-April, with preliminary set up and broadcasts in December, and the source would only broadcast during daylight hours. If individual marine mammals are disturbed by the sound and act to avoid or escape the small ensonified zone, they would only have to move tens of meters. The sound is not likely to affect abundance or distribution of prey species, or access to prey.

To the extent that marine mammals exposed to the research have been previously exposed to anthropogenic sounds, including those similar to the proposed source, individual animals may be acclimated or they may be sensitized to it. It is unlikely animals in the study area are naïve to anthropogenic sound, and likely all have encountered echolocators, depth finders, engine noise,

in-water construction, etc. It is not possible to predict which type of animals is likely to be exposed to the research: sensitive, or acclimated.

Conservatively, we could assume all animals are sensitized to anthropogenic sound and predict that their responses would be "extreme" in that the animals would exhibit the maximum avoidance or escape response within their behavioral repertoire. That response is likely to be analogous to their response to a predator, which for most whales is to initiate an immediate dive and travel underwater the maximum distance away before needing to surface to breathe. Females with young calves are a probable exception, and are likely to remain at or near the surface and in close proximity to their calf, which cannot swim as quickly, dive as deeply or breath-hold as long as an adult.

However, it is unlikely animals would perceive the source sounds as a threat and respond as if to a predator. It is more likely they will either make no changes in their behavior, or make minor swim speed or direction changes to move away from the small ensonified area. Even if animals, including calves, remain in the ensonified area for the duration of the experiment, they are not likely to suffer injury, mortality, decreased survival, or decreased reproductive capacity.

Controversy

Federal agencies are required to consider "the degree to which effects on the quality of the human environment are likely to be highly controversial" when evaluating potential impacts of a proposed action. [40 CFR §1508.27] The application for the proposed permit was made available for public review and comment. NMFS received comments opposing wave energy installations in the action area and expressing concerns about the environmental impacts of operating such facilities, including cumulative impacts. There was also opposition to using acoustic deterrent devices as a mitigation measure in association with operation of such facilities.

The action being considered by NMFS is issuance of a permit to take marine mammals during bona fide scientific research. Issuance of the permit is not connected to potential future installation or operation of wave energy facilities, or to use of the acoustic deterrence device in association with such facilities. Subsequent use of the acoustic deterrence device in association with wave energy facilities is too speculative to evaluate at this time.

NMFS also received comments suggesting that an EA or EIS is required for issuance of the permit. As previously noted, issuance of such permits is among a class of actions categorically excluded from the need to prepare an EA or EIS because they do not generally have a potential for significant impacts. An EIS is not required unless NMFS finds potential for significant impacts. This EA has been prepared to provide a more detailed analysis of the potential for significant impacts and to assist in making the decision about permit issuance under the MMPA and ESA. It addresses the relevant resources and potential impacts highlighted in comments received on the application.

Cumulative Impacts

Summary of Effects from Total Number of Permits: In general, takes of marine mammals by level B harassment during permitted research have not been shown to result in long-term or permanent adverse effects on individuals regardless of the number of times the harassment

occurs. The frequency and duration of the disturbance under the proposed permit would allow adequate time for animals to recover from adverse effects such that additive or cumulative effects of the action on its own are not expected.

No measurable effects on population demographics are anticipated because any sub-lethal (disturbance) effects are expected to be short-term, with the animals recovering within hours to days, and the proposed action is not expected to result in mortality of any animals. There exists the possibility that adverse effects on a species could accrue from the cumulative effects of a large number of permitted takes by level B harassment relative to the size of the population. However, there is no evidence that current or past levels of permitted takes have resulted in such species level effects.

There are nine other permits for takes of gray whales of the Eastern North Pacific Stock related to conducting surveys, biopsy sampling, or instrument attachment. Not all permitted researchers work in the same waters as the applicant. Some work in waters of California, Washington, and Oregon, or Alaska. The total combined number of gray whales from this stock that may be taken by level A harassment (e.g., biopsy or instrument attachment) represents a relatively small number of animals from the population overall: less than 5% per year. The number of gray whales that may be harassed by vessel or aerial approaches not related to biopsy and tagging is a larger fraction of the population: effectively 100% considering some permits are for range-wide abundance surveys. However, consistent with the MMPA definition of level B harassment, this number accounts for animals that have only the *potential* to be disturbed, and which may in fact not be affected by the research at all.

Southern Resident killer whales are the focus of numerous research permits and have been the focus of a varying intensity of research projects for decades, including prior to their listing under the ESA. Approximately 80% of the population is authorized for tissue sampling and instrument attachment and effectively 100% of the population may be harassed by vessel or aerial-based surveys and other research annually. This research spans the range of Southern Resident killer whales and may occur year-round.

Steller sea lions are also intensely studied and are the focus of numerous research permits authorizing activities year-round and throughout their range. Approximately 2% of the population is authorized for capture, which may include tissue sampling and instrument attachment. Effectively 100% of the population may be harassed multiple times annually by a combination of vessel and aerial surveys and incidental to ground-based activities such as scat collection and capture of conspecifics.

The other five stocks or species of marine mammals that may be affected by the action are also the subject of various research permits. To the extent that there are permits for takes related to population abundance and distribution surveys for each species, effectively 100% of each stock may be harassed multiple times annually by a combination of vessel and aerial surveys. Small numbers of killer whales and harbor porpoise may be taken by level A harassment associated with remote attachment of scientific instruments or collection of tissue samples. The California sea lions, harbor seals and northern elephant seals, like every other pinniped in the U.S., are also the subject of more invasive projects that include takes of 20% or more of a species by capture,

level A harassment, and limited numbers of lethal takes associated with research-related mortality.

Researchers working under NMFS permits are required to notify the appropriate NMFS Regional Office in advance of field work. The Northwest Regional Office is tasked with coordinating activities under multiple permits for the Oregon area to ensure there is not unnecessary duplication of research.

Summary of Other Actions: The stocks and populations of marine mammals that are the subject of the permit are exposed to a variety of human activities including subsistence harvest of gray whales in Washington and Steller sea lions in Alaska, entanglement in fishing gear, and anthropogenic noise from vessel traffic and coastal development. Killer whales in the action area and elsewhere are the subject of an ever-growing commercial whale-watch industry.

The levels of harvest are managed under various federal and international laws and treaties and are not believed to have had an adverse impact on the status of the species. Entanglement is not believed to be a significant source of mortality for any of these species. The harassment from coastal development that is authorized pursuant to Section 101(a)(5) of the MMPA has been found to have a negligible impact on the stocks. These projects include construction and repair of bridges and ports, as well as explosive removal of structures. Harassment from whale-watching is not regulated by permits, nor are the effects monitored.

Steller sea lions are the target of a co-managed subsistence harvest in Alaska. The average number of animals harvested and struck but lost is 11 animals/year. An unknown number of Steller sea lions from this stock are harvested by subsistence hunters in Canada. The magnitude of the Canadian subsistence harvest is believed to be small.

A gray whale harvest by the Makah Tribe in Washington has not occurred since 2000, and future harvests are subject to obtaining a waiver to the MMPA's take moratorium. Harvest quota levels are set by the International Whaling Commission.

In general, marine mammals may interact with a variety of fishing gear to become entangled, injured, or die. During this decade there have been no reported takes of Southern Resident killer whales incidental to commercial fishing operations, no reports of interactions between killer whales and longline operations, no reports of stranded animals with net marks, and no photographs of individual whales carrying fishing gear.

There are reports of serious injuries or mortalities of Eastern DPS Steller sea lions due to commercial fishing. Steller sea lions have been taken incidental to the California/Oregon thresher shark and swordfish drift gillnet, WA/OR/CA groundfish trawl, Northern Washington marine set gillnet, and Gulf of Alaska sablefish longline fisheries. These mortalities result in a mean annual mortality rate of 0.8 (CV = 0.02) Steller sea lions. No mortalities were reported by fishery observers monitoring drift gillnet and set gillnet fisheries in Washington and Oregon this decade; though, mortalities have been reported in the past. Strandings of Steller sea lions provide additional information on the level of fishery-related mortality. There were no fishery-related strandings of Steller sea lions in Washington, Oregon, or California between 2001 and

2005. The minimum estimated mortality rate incidental to commercial fisheries (both U.S. and Canadian) is 1.4 sea lions per year, based on observer data (0.8) and stranding data (0.6).

Many marine mammal populations may be experiencing increased exposure to vessels and associated sounds. Commercial shipping, whale watching, ferry operations, and recreational boating traffic have expanded in many regions in recent decades, including the northeastern Pacific. Commercial fishing boats are also a prominent part of the vessel traffic in many areas. Vessels have the potential to affect marine mammals through the physical presence and activity of the vessel, the increased underwater sound levels generated by boat engines or a combination of these factors. Vessel strikes are rare, but do occur and can result in injury.

The growth of whale watching during the past two decades has meant that killer whales in the region are experiencing increased exposure to vessel traffic and sound. Not only do greater numbers of boats accompany the whales for longer periods of the day, but there has also been a gradual lengthening of the viewing season. The mean number of vessels following groups of killer whales at any one time during the peak summer months increased from five boats in 1990 to 18-26 boats from 1996-2006, and individual whales sometimes attract much larger numbers of vessels. There was documentation of a whale-boat collision in Haro Strait in 2005 which resulted in a minor injury to a killer whale. In 2006, killer whale L98 was killed during a vessel interaction.

Steller sea lions are not the subject of the intense whale-watch efforts that affect killer whales. The in-water noise associated with vessel operations also does not likely affect Steller sea lions to the degree that it may disturb killer whales, as sea lions are not known to use sound to locate food or to communicate with conspecifics in water.

Summary: There may already be significant adverse impacts on marine mammals from the existing levels of human activities. However, the relative incremental effect of the proposed action would not be significant. The proposed takes of specified numbers of marine mammals by level B harassment during the experiment are not likely to contribute to collectively significant adverse impacts on marine mammal stocks or species, including those listed as threatened or endangered. The effects of the takes would be transitory and recoverable, associated with only minor and short-term changes in the behavior of a limited number of individual marine mammals.

5.0 MITIGATION MEASURES

There are no additional mitigation measures beyond those that are part of the applicant's protocols or conditions that would be required by permit, as discussed in the description of the Proposed Permit Alternative. The applicant's protocols are incorporated into the permit by reference.

In summary, the permit conditions limit the level of take to level B harassment and require notification, coordination, monitoring, and reporting. Although injury and mortality are not expected due to the low power and signal strength of the device, the permit contains

precautionary measures requiring researchers to turn off the device if the behavior of animals suggests greater than level B take.

Review of monitoring reports of previous permits for the same or similar research protocols indicate that these types of mitigation measures are effective at minimizing stress, pain, injury, and mortality associated with takes.

6.0 Literature Cited

Malme, C. I., P. R. Miles, C. W. Clark, P. Tyack, and J. E. Bird. 1983. Investigations of the potential effects of underwater noise from petroleum industry activities on migrating gray whale behavior. BBN Rep. 5366. Rep. from Bolt Beranek and Newman Inc., Cambridge, MA, for U.S. Minerals Manage. Serv., Anchorage, AK. NTIS PB86-174174. Var. p. Malme, C. I., Miles, Wursig, B., Bird, J. E. and Tyack, P. 1986. Behavioral responses of gray whales to industrial noise: Feeding observations and predictive modeling. BBN Report 6265, Report from BBN Laboratories Inc., Cambridge, MA for US National Oceanic and Atmospheric Administration and US Minerals Management Service, Anchorage, AK.

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Tyack, P. L. 2009a. Human-generated sound and marine mammals. Physics Today 62:39-44.

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APPENDIX A: 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) and Endangered Species Act (ESA). 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, ESA, 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.
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	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

Condition	Origin	Purpose
	Part 216.36	conditions common to cetacean 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.
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 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.
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.

Condition	Origin	Purpose
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.
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.
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	MMPA section 104(b)(2)(D) and regulations at 50 CFR	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
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.	Part 216.36	
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 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.	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 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		

Condition	Origin	Purpose
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.
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 Cetacean Research Permits. In addition to the general permit conditions listed in Table 1 above, permits for activities with cetaceans in the wild may 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
Researchers will follow the ramp-up protocols described in the application each time the source is turned on.	This condition allows time for animals that are disturbed by the sound to leave the ensonified zone before the signal is at full strength.
Researchers will turn off the source if observers detect marine mammal behaviors indicative of level A harassment, either during or immediately after exposure to the sound, and will consult the Chief, Permits Division before resuming.	This condition limits the potential for adverse effects from greater than level B harassment by requiring researchers to abort activities that provoke extreme responses.
Researchers shall consider a marine mammal to have been taken if it enters the ensonified zone when the source is on. The ensonified zone is defined as the area from the source out to where the signal attenuates to 120 dB.	Provides guidance on when to consider an animal "taken" under the permit, for the purpose of explaining and enforcing other conditions that limit number of takes.

Attachment 1. Recent Environmental Assessments for Marine Mammal Research Permits

NMFS Permits Division has prepared EAs with Findings of No Significant Impact (FONSI) for issuance of permits to conduct research on killer whales and Steller sea lions, as well as for issuance of permits to conduct sound exposure behavioral response studies on numerous species of marine mammals. Those EAs were prepared to take a closer look at potential environmental impacts of permitted research on marine mammals listed as threatened or endangered, and not because the Permits Division determined that significant adverse environmental impacts were expected or that the a categorical exclusion was not applicable. As each EA demonstrates, and each FONSI has documented, research on marine mammals generally does not have a potential for significant adverse impacts on marine mammal populations or any other component of the environment.

Some of the most recently prepared EAs of relevance to the scope of this EA are:

- *Environmental Assessment on the Effects of Scientific Research Activities Associated with Behavioral Response Studies of Pacific Marine Mammals Using Controlled Sound Exposure* (NMFS 2010)

  The EA was prepared for issuance of scientific research permit no. 14534 and describes the effects of conducting controlled sound exposure experiments on a variety of marine mammals. The research protocols include attachment of data-logging scientific instruments to cetaceans and observing behavioral responses of marine mammals exposed to anthropogenic sounds. The research occurs in waters off California. A Finding of No Significant Impact (FONSI) was signed on June 29, 2010, based on information indicating that the controlled exposure protocols and mitigation measures in the permit ensure no mortality will occur, and the effects on animals will be associated with minor changes in behavior which are transitory and recoverable.

- *Environmental Assessment on Issuance of a Scientific Research Permit for a Behavioral Response Study on Deep Diving Odontocetes* (NMFS 2007)

  The EA was prepared for issuance of scientific research permit no. 1121-1900 and describes the effects of conducting controlled sound exposure experiments on a variety of marine mammals. The research protocols include attachment of data-logging scientific instruments to cetaceans and observing behavioral responses of marine mammals exposed to anthropogenic sounds. The research occurs in waters off Bahamas. A Finding of No Significant Impact (FONSI) was signed on August 13, 2007, based on information indicating that the controlled exposure protocols and mitigation measures in the permit ensure no mortality will occur, and the effects on animals will be associated with minor changes in behavior which are transitory and recoverable.

- *Environmental Assessment for Issuance of Permit (File No. 13430) for Research on Marine Mammals* (NMFS 2010)

  The EA was prepared for issuance of scientific research permit no. 13430 and describes the effects of various projects directed at non-ESA listed pinnipeds in Washington and Oregon, including conducting controlled sound exposure experiments directed at California sea lions and incidentally harassing threatened Steller sea lions and endangered Southern Resident DPS killer whales. A Finding of No Significant Impact (FONSI) was signed on February 16, 2010.

- *Environmental Assessment on the Effects of the Issuance of Four National Marine Fisheries Service Scientific Research Permits and Three Permit Amendments on the Eastern North Pacific Southern Resident Killer Whale (Orcinus orca) and Other Marine Mammals in the U.S. Territorial Waters, Exclusive Economic Zones, and High Seas of the Eastern North Pacific Ocean along the Coast of the U.S. from Southeastern Alaska to Central California, and Coastal Inlets and Estuaries of These States* (NMFS 2006)

  The EA was prepared for issuance of several permits and amendments for research directed at Southern Resident killer whales, and including research on non-ESA listed killer whales and various other marine mammals. The research protocols analyzed did not include controlled exposure experiments, but the EA does discuss killer whale responses to research in general. A FONSI was signed on March 30, 2006.

NMFS also prepared an Environmental Impact Statement (EIS) on the Steller Sea Lion and Northern Fur Seal Research Program (NMFS 2007). The EIS describes the suite of research activities historically and currently permitted on Steller sea lions throughout their range in the U.S. It does not specifically evaluate the effects of controlled exposure experiments on Steller sea lions as none have been proposed or conducted to date.

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. 15483

Background

In July 2010, the National Marine Fisheries Service (NMFS) received an application for a permit (File No. 15483) from Bruce Mate, Ph.D., Oregon State University, Hatfield Marine Science Center, Newport, Oregon, to take marine mammals during conduct of research in waters off 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 (Environmental Assessment on Effects of Issuing Marine Mammal Scientific Research Permit No. 15483; 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 for takes of marine mammals as described in Alternative 2 of the EA will not cause substantial damage to ocean and coastal habitats or essential fish habitat (EFH). The "takes" of marine mammals authorized by the permit will not affect components of ocean and coastal habitat, including EFH. The takes will consist of harassment of individual marine mammals which may result in behavioral changes. However, these changes will have no impact on any component of the physical environment.

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 the permit will not affect biodiversity or ecosystem function. The takes of marine mammals authorized by the permit will not alter foraging

patterns, dietary preferences, or relative distribution or abundance of species groups within the area. The takes of marine mammals 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 the permit will not affect public health or safety. The takes of marine mammals authorized by the permit will not 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 the permit will not adversely affect endangered or threatened species, marine mammals, critical habitat, etc. The takes of a specified number of marine mammals, as authorized by the permit, will directly and indirectly result in adverse effects on a the individual marine mammals targeted by the research (gray whales), as well as non-target marine mammals 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 at the level of marine mammal populations, stocks, or species.

Issuance of the permit, and associated takes of marine mammals, will not adversely affect critical habitat because none is designated within the area.

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

There are no significant social or economic impacts interrelated with potential natural or physical impacts of the action. The takes of marine mammals authorized by the permit will result in insignificant effects on the natural and physical environment, and there are no significant social or economic impacts interrelated with these effects. The action 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, or differential access to natural or depletable resources in the action area.

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

The effects of the action are not uncertain; they are predictable based on information about marine mammal hearing, sound propagation in water, and monitoring reports from permit for similar research activities. Research involving exposing marine mammals to sound has been the subject of public controversy for previous permits. That controversy was not related to uncertainty about impacts but represented opposition to the research in general. The likely adverse effects of the techniques in the subject permit are limited to a specified number of marine mammals targeted by the research and are predicted to involve only transitory stress, but no pain or injury. Although the precise levels of a sound that will provoke a behavioral response may be uncertain, and the research seeks to provide answers to this question, there is no substantial dispute as to what resources will be affected, or the temporal and geographic scale of those effects.

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 the permit is not expected to affect unique or ecologically critical areas. Takes of marine mammals authorized by the permit will not impact unique or ecologically critical areas. The action does not involve contact with or activities that may indirectly impact physical structures or features of the environment.

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

The effects of permit issuance on the human environment are not highly uncertain and the takes of marine mammals authorized by the permit do not involve unique or unknown risks. The applicant's action 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 previous permits 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 the permit will not result in individually or cumulatively significant impacts. The EA considered the other activities affecting the resources in the area. The impacts of this action are expected to be short-term and transitory.

Issuance of the permit and subsequent takes of marine mammals, are not related to other federal actions. Results of the applicant's research may inform future management actions. However, those future actions are too speculative to evaluate at this time and would themselves be subject to consideration under NEPA.

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 the permit will not adversely affect the above mentioned places and resources. The takes of marine mammals authorized by the permit 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 action are limited to resources within the action area. Taking marine mammals by level B harassment represents non-consumptive use and will not cause loss or destruction of significant resources as none are present.

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

Issuance of the permit is not expected to result in the spread or introduction of non-indigenous species. The takes of marine mammals authorized by the permit will not result in the spread or introduction of non-indigenous species. The action does not involve handling animals in the wild, or transporting animals among locations. The action does not involve movement of vessels, or researchers and their equipment, among water bodies. There are no routes by which non-indigenous organisms can be transmitted or introduced by the research.

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?

The proposed action does not establish a precedent for future actions with significant effects nor represent a decision in principle about a future consideration. Issuance of the permit enables the applicant to take marine mammals by harassment during conduct of research 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?

Issuance of the permit will be consistent with applicable provisions of the Marine Mammal Protection Act, Endangered Species Act, and NMFS regulations. NMFS engaged in consultation under Section 7 of the ESA and obtained a Biological Opinion which concluded the action was not likely to jeopardize the continued existence of listed species. There are no other permits, licenses, consultations, etc. necessary for NMFS issuance of the permit.

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 the permit will not result in cumulative adverse effects substantially affecting target or non-target species. The takes of marine mammals authorized by the permit will result in adverse impacts on a specified number of marine mammals 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 populations, stocks, and 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. 15483, 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.

OCT 29 2010

James H. Lecky
Director, Office of Protected Resources

Date