Environmental Assessment
on
Effects of Issuing Marine Mammal Scientific Research Permit No. 14534-02

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Lead Agency:	USDOC National Oceanic and Atmospheric Administration National Marine Fisheries Service, Office of Protected Resources
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Location:	Coastal waters of California, especially within the U.S. Navy's Southern California Range Complex, and primarily near San Clemente Island

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue Scientific Research Permit No. 14534-02, 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 amend and replace Permit No. 14534-01 and authorize takes by harassment of a variety of marine mammal stocks and species, including endangered sperm whales, humpback whales, sei whales, fin whales, and blue whales.

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1.0 PURPOSE OF AND NEED FOR ACTION

Proposed Action: NMFS proposes to issue an amendment to Permit No. 14534-01 in response to an application from the permit holder, the NOAA Office of Science and Technology, Silver Spring, MD, [Responsible Party: Ned Cyr, Director]. The application was submitted 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 exempt the holder from statutory 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 permit holder's research is to determine how human sounds, including active sonar signals, affect marine mammals. The project includes studies of sound production, diving and other behavior, and responses to sound of marine mammals, including endangered species. The results will be integrated with related studies and contribute to conservation management for sound producers and regulatory agencies by identifying characteristics of target species that are critical for passive monitoring, detection, and/or density estimation and by demonstrating how specific sounds, including simulated military sonar, may evoke behavioral responses in marine mammals.

The current permit authorizes harassment of 27 species of marine mammals, including five pinniped stocks, 15 toothed/beaked whale stocks, and seven baleen whale stocks. Six of these species are listed as threatened or endangered under the ESA. The marine mammals that are the focus of the proposed permit amendment are included in the current permit. The permit holder is requesting additional harassment takes of some species to accommodate changes in research protocols.

Purpose and Need: The primary purpose of a permit is to provide an exemption from the take prohibitions under the MMPA and ESA to allow "takes" by harassment (including level A and level B harassment as defined under the MMPA) of marine mammals, including endangered species, for bona fide scientific research. The need for issuance of such permits is related to NMFS's mandates under the MMPA and ESA. Specifically, 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. The MMPA and ESA prohibit takes of marine mammals and threatened and endangered species, respectively, with only a few very specific exceptions, including for scientific research and enhancement purposes.

The applicant's need for the amendment relates to their desire to modify their research protocols in a manner that would result in additional harassment of marine mammals. As noted in their amendment request (on file with NMFS), the proposed modifications are based on their experience and observations during the initial field work, in which they encountered non-target species in mixed aggregations with their focal species. The researchers propose revisions to their protocols to account for the larger than predicted numbers and more frequent occurrences of humpback whales (*Megaptera novaengliae*), minke whales (*Balaenoptera acutorostrata*), and killer whales (*Orcinus orca*) during their study. These are species for which the current permit already authorizes some level of take by harassment.

Scope of Environmental Assessment: This EA focuses on evaluating whether permitting additional harassment of marine mammals, as proposed in the amendment request, would change the manner in which the action may affect the environment compared to the effects documented and analyzed in an Environmental Assessment prepared for issuance of the original permit.

The *Final Environmental Assessment on the Effects of Scientific Research Activities Associated with Behavioral Response Studies of Pacific Marine Mammals Using Controlled Sound Exposure* (NMFS 2010) considered the effects of permit issuance (File No. 14534) on a variety of marine mammals, and on physical and biological features of the action area. The proposed action alternative was issuance of the permit with the terms and conditions that are standard to permits issued by NMFS for harassment of marine mammals, including endangered species.

The 2010 EA summarized the status of the affected species, including seasonal occurrence, population abundance and density, annual productivity, and functional hearing capability as it relates to the sounds associated with the study. The 2010 EA then evaluated the effects of the research activities themselves, including effects of attaching scientific instruments and the potential for stress, pain and suffering associated with exposure to the experimental sounds.

The 2010 EA also considered the effects on stocks of the harassment that could result from the research activities. In addition, NMFS considered the effects of the harassment on threatened and endangered marine mammal species, as listed under the ESA, during consultation under section 7 of the ESA. The results of that consultation were summarized in a Biological Opinion, the conclusions of which were incorporated into the final EA.

As noted in the Finding of No Significant Impact signed on June 29, 2010, and based on the analyses in the 2010 EA (and associated Biological Opinion), issuance of the permit would result in minor short-term adverse effects on a specified number of animals targeted by the research, as well as non-target animals in the immediate vicinity of the research[1], but would not affect other aspects of the human environment. NMFS further concluded that, given the mitigation measures required by the permit, the adverse effects on marine mammals that are the subject of the permit are likely to result only in transitory and recoverable changes in behavior and physiological parameters of the affected animals, including those listed as threatened or endangered, but are not expected to result in measurable effects on populations, stocks, or species.

The 2010 EA considered the effects of other human activities affecting marine mammals in the action area, including entrapment and entanglement in fishing gear, vessel interactions, habitat degradation, anthropogenic noise, and other permits issued by NMFS for research on the same species and stocks. NMFS concluded that issuance of the permit would not result in individually or cumulatively significant impacts.

The 2010 EA demonstrated that issuance of a permit for harassment of marine mammals would not affect any component of the environment other than the marine mammals themselves. The proposed permit amendment involves harassment of the same species of marine mammals, in the

[1] Note that the permit authorizes harassment of both marine mammals that are targeted by the research as well as those that may only be affected incidental to it. As such, all marine mammals that may be harassed are considered "target" animals for the permit regardless of whether they are focal/target animals of the research.

same location, at the same times of year, with the same temporal frequency, and by the same research methods as the proposed action in the 2010 EA. This EA only evaluates the effects of permit amendment issuance on marine mammals.

More specifically, this EA evaluates whether permitting additional takes of marine mammals by harassment would result in more than transitory and recoverable changes in behavior and physiological parameters of the affected animals, and if so, whether those changes would impact the affected marine mammals' populations, stocks, or species.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

Alternative 1 - No Action: Under the No Action alternative, no permit amendment would be issued for the activities proposed by the applicant. The current permit (No. 14534-01) would remain valid and in effect, allowing takes of marine mammals, including ESA-listed species, by harassment during research involving suction-cup tagging (i.e., temporary attachment of scientific instruments including digital archival recording tags), photo-identification, behavioral observations, and exposure to controlled levels of natural and anthropogenic underwater sounds.

Target species and stocks: Permit No. 14534-01, issued on July 2, 2010, exempts harassment of the following species and stocks of marine mammals during conduct of bona fide scientific research:

Species	Stock (ESA listing status)
Dolphin, bottlenose	California/ Oregon/ Washington Offshore Stock
Dolphin, common, long-beaked	California Stock
Dolphin, common, short-beaked	California/ Oregon/ Washington Stock
Dolphin, northern right whale	California/Oregon/ Washington Stock
Dolphin, Pacific white-sided	California/Oregon/ Washington - Northern and Southern Stocks
Dolphin, Risso's	California/Oregon/ Washington Stock
Dolphin, striped	California/Oregon/ Washington Stock
Porpoise, Dall's	California/Oregon/ Washington Stock
Sea lion, California	US Stock
Seal, Guadalupe fur	Mexico - Southern California (Threatened)
Seal, harbor	California Stock
Seal, northern elephant	California Breeding Stock
Seal, Northern fur	San Miguel Islands Stock
Whale, Baird's beaked	California/Oregon/ Washington Stock
Whale, blue	Eastern North Pacific Stock (Endangered)
Whale, Bryde's	Eastern Tropical Pacific Stock
Whale, Cuvier's beaked	California/Oregon/Washington Stock
Whale, fin	California/Oregon/ Washington Stock (Endangered)
Whale, gray	Eastern North Pacific
Whale, humpback	Eastern North Pacific Stock (Endangered)
Whale, killer	Eastern North Pacific Offshore Stock
Whale, Mesoplodon beaked	California/Oregon/ Washington Stocks
Whale, minke	California/Oregon/ Washington stock
Whale, pilot, short-finned	California/Oregon/ Washington stock

Species	Stock (ESA listing status)
Whale, pygmy sperm	California/Oregon/ Washington stock
Whale, sei	Eastern North Pacific Stock (Endangered)
Whale, sperm	California/Oregon/ Washington stock (Endangered)

Duration and frequency: Permit No. 14534-01 authorizes harassment of marine mammals for a period of five years, beginning on the date of issuance and ending upon permit expiration on July 31, 2015. Harassment of marine mammals resulting from the research may occur over the course of five field seasons that run from late spring through early fall annually. The first field season (called SOCAL-10) was conducted in August and September 2010.

Methods: The research protocols that may result in harassment of marine mammals are described in detail in the application on file for this permit and are briefly summarized here. Some animals are temporarily "tagged" with scientific instruments attached via suction cups. These tags measure and record received sound levels during playback experiments and record animal behaviors such as acceleration and body orientation. Animals are also photographed for later identification and to document behaviors. Tagged and untagged subjects may be exposed to received sound levels up to 180 dB re: 1μPa. Animals are monitored visually and through passive acoustic monitoring (e.g., via an underwater hydrophone array), as well as through data from the tags, for responses to the sounds. Behavior is measured before, during, and after carefully controlled exposures of sound in conventional playback experiments. Sloughed skin samples may be collected from the detached suction cup used to attach tags to cetaceans and exported for analysis.

The primary species of concern are beaked whales, but the responses of other marine mammal species are also monitored. The target animals are purposely exposed to anthropogenic underwater sounds, photo-identified, tagged, and their behavioral responses observed. The permit authorizes harassment of target animals from the close approach necessary for tagging, photo-identification, and behavioral observations, as well as incidental harassment of non-target animals that might be in the vicinity of the target animal. The permit also authorizes harassment of target and non-target animals due to exposure to the controlled sound playback experiments.

Visual and passive acoustic monitoring and other safeguards are implemented to minimize harassment of marine mammals. There are clear sound source shutdown criteria to limit exposure to Level B harassment levels and ensure no marine mammals are injured.

If the permit amendment is not issued, researchers would not have an exemption for the additional harassment that may result from proposed modifications to their protocols. The researchers are expected to limit their activities to the levels of harassment authorized by their current permit. While this may not prevent achieving the study objectives, it could limit their samples sizes within a given field season and possibly delay obtaining sufficient data to validate their hypotheses before the permit expires.

Alternative 2 - Proposed Permit: Under the Proposed Action alternative, a new permit (No. 14534-02) that amends and replaces the current permit would be issued for activities as proposed by the applicant, with the permit terms and conditions standard to such permits as issued by NMFS.

The amended permit would retain all of the take authority, and terms and conditions of the current permit, while adding new takes for harassment associated with proposed modifications to the applicant's research.

Target species and stocks: The amendment does not change the species or stocks of marine mammals that may be harassed. The affected species and stocks of marine mammals are the same as listed in the No Action alternative.

The amendment does increase the numbers of individuals within three species/stocks that may be taken annually by adding harassment associated with the same tagging, playback, and observational activities as the species that are focal animals under the current permit.

Species/Stock	Annual takes under Permit No. 14534-01	Annual takes under proposed Permit No. 14534-02
minke whale (California/Oregon/Washington Stock)	2	174
killer whale (Eastern North Pacific Offshore Stock)	14	918
humpback whale (Eastern North Pacific Stock)	2	174

Duration and frequency: The amendment would not affect the expiration date of the permit and would therefore not extend the duration of the temporal scope of the action. The permit amendment would expire on July 31, 2015.

The applicant has not proposed a change in the time of year or duration of their field seasons, and the amendment would not change when or how often the harassment of marine mammals would occur.

Methods: The research protocols are the same as for the proposed action. The difference is that the three species listed above, which are currently only taken incidental to activities directed at target species, would become focal species and be subject to tagging and intentional exposure to sound playbacks with associated observations. In addition to allowing researchers to collect data from these three species in particular, it also allows them to achieve greater sample sizes of other target species overall by allowing harassment of these animals when they occur in mixed groups with or in the vicinity of other target species.

3.0 AFFECTED ENVIRONMENT

Location

The study would be conducted in the U.S. Navy's Southern California (SOCAL) Range Complex, and primarily near the vicinity of San Clemente Island. The SOCAL Range Complex encompasses 120,000 square nautical miles (nm^2) of ocean between Dana Point and San Diego, California, and extends southwest from southern California in an approximately 700 by 200 nm

rectangle with the seaward corners at 33°30' N. lat.; 127°10' W. long.; 28°30' N. lat.; and 116°00 W. long.. The harassment of marine mammals would occur at the time and in the place where the study is conducted. Thus, the action area for the proposed permit is the same as the research study area.

The permitted takes of marine mammals do not affect other components of the environment. Thus, the action area is effectively limited to the locations where the research occurs, or, more specifically, to where the marine mammals are at the time they are approached for tagging, observations, or sound exposures.

Status of Affected Species

Non-ESA listed marine mammals: Twenty-one of the 27 stocks of marine mammals that are the subject of the permit amendment are not listed as threatened or endangered under the ESA, or as depleted under the MMPA, or proposed for any such listings. Descriptions of these stocks, including the most current information on distribution, abundance, productivity, and human-caused mortality, are available in NMFS Stock Assessment reports. These reports are available at http://www.nmfs.noaa.gov/pr/sars/species.htm#.

ESA-listed marine mammals: Descriptions of the six ESA-listed marine mammals that are the subject of the permit amendment, including the most current estimates of abundance, productivity, and human-caused mortality for these species, are available in NMFS Stock Assessment reports, which are available at http://www.nmfs.noaa.gov/pr/sars/species.htm#.

There have been no changes in the listing status of these six species, nor are any changes proposed. The factors affecting the status of these species are the same as described in the 2010 EA.

The amendment would only increase the numbers of individuals harassed for one of these six ESA-listed species: humpback whales. Humpback whales are increasing in abundance throughout much of their range, including in the North Pacific.

Non-target species

In addition to the marine mammal species that are the target of the proposed permit, the action area is home to sea otters, a variety of sea birds, and numerous fish species. The harassment of marine mammals that may result from the proposed permit would not affect sea birds, fish, or other non-target animals. Thus, effects on species that are not the subject of the permit will not be considered further.

Biodiversity and Ecosystem Function

The proposed action 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 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 within the action area, which is limited to coastal and open waters in which no such areas occur. Section 3.2 of the 2010 EA, which is hereby incorporated by reference, describes the Marine Protected Areas, essential fish habitat (EFH), and ESA designated critical habitat that occur in or near the action area. Santa Barbara Island, which is part of the Channel Islands National Marine Sanctuary, is located within the boundaries of the SOCAL Range Complex. EFH has been designated for many of the fish species within the action area. Details of the designations and descriptions of the habitats are available in the Pacific Fishery Management Plans. While critical habitat has been designated for some of the species that may occur in the action area, the habitat designations are all well outside the bounds of the action area.

The proposed action does not alter or affect any components of such protected areas, including EFH or elements of any critical habitat. 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
The effects of the No Action Alternative, in which NMFS does not issue the permit amendment, are the same as the effects of issuing the original permit. The original permit includes harassment takes of the same pinnipeds, toothed and baleen whales, by the same methods proposed for the permit amendment, in the same locations, at the same times of year, and with the same frequency. The effects of issuing the original permit were discussed and evaluated in

the 2010 EA, which is hereby incorporated by reference. Based on that EA, NMFS issued a Finding of No Significant Impact and concluded that permit issuance would not significantly impact the quality of the human environment and that preparation of an Environmental Impact Statement was not necessary.

While there may be adverse effects on individual marine mammals harassed by the research, the harassment is not likely to result in adverse effects on the stocks or populations. The number of marine mammals affected represents a small portion of the individual stocks and populations and the effects are expected to be minor and short-term.

The effects of harassment on individual marine mammals are dependent on the responses of the animals to exposure to the research activity and are constrained by the species' behavioral repertoires and physiology. Physiology and basic behavioral responses are not influenced by a species' listing status under the MMPA. An endangered humpback whale is not likely to respond differently to harassment than a non-endangered minke whale simply because it belongs to a collective designated by a federal agency as "endangered" under a federal statute.

In general, there is the potential for an ESA-listed species to be affected differentially by a human activity compared to an analogous non-ESA listed species, if, for example, the effects on the individual resulted in decreased fitness, reproductive success, or survival, <u>and</u> the number of individuals thusly affected relative to the size of the species was sufficiently large to cause a reduction in the overall reproductive capacity of the species that in turn affects the predicted probability of extinction or recovery.

However, for this action, there is no information to suggest that harassment from tagging, observations, or controlled exposure experiments under the proposed permit amendment would affect individual animals of any species in this way, regardless of their ESA-listing status. At most, the harassment would result in temporary changes in behaviors that are not life-threatening and that are entirely recoverable within minutes to days of completion of the surveys.

An animal's responses may be species-specific, and influenced by factors such as age, sex, reproductive status, season, and the behavioral pattern in which they were engaged at the time of exposure. These factors were considered in the analysis of effects in the 2010 EA. The annual report submitted by the permit holder at the conclusion of the 2010 field season confirmed that the responses of animals to the research were as predicted in that analysis.

The mitigation measures incorporated into the methods are intended to minimize the potential for adverse impacts and mitigate the extent of any unavoidable adverse impacts. Researchers are required to submit annual reports in which they must provide an accounting of the numbers of marine mammals encountered and observed effects of the research. NMFS can revoke, suspend or modify the permit if there is reason to believe the research is having or has the potential to have an adverse effect on a stock or species.

For issuance of the original permit, NMFS determined that the take of marine mammals results in transitory and recoverable adverse effects on individual marine mammals targeted by the research. Those effects on individual animals, because they are temporary and not biologically

significant, do not result in adverse effects on marine mammal stocks, populations, or species. Further, authorizing such take of marine mammals does not adversely affect other aspects of the human environment, including land, air, or water resources.

Effects of the Proposed Action Alternative

The nature of the effects of the Proposed Action Alternative, in which NMFS would issue a permit amendment to allow harassment of additional marine mammals, are effectively the same as the effects of the No Action alternative. The proposed permit amendment would be valid for the same duration as the current permit, and would affect the same marine mammal species/stocks in the same location by the same research methods. Increasing the numbers of individuals harassed for three species by making them focal species intentionally targeted for tagging, playbacks, and observations does not change the manner in which the action would affect the environment.

As discussed for the No Action alternative, the 2010 EA considered the effects of harassment from close approach and playback associated with the research activities on the three species. It did not specifically consider the effects of tagging humpback whales, as this was not an activity proposed for those species. However, the 2010 EA did discuss the effects of tagging on marine mammals in general, and much of the information on marine mammal responses to tagging comes from prior studies on humpback whales. There is no information to suggest that the humpback whales, minke whales, and killer whales that would be tagged under the proposed permit amendment would react to or be affected differently than described for the No Action altenrative.

NMFS engaged in consultation on issuance of the permit, as required under section 7 of the ESA. The consultation process was concluded after close of the comment period on the application and draft EA to ensure that no relevant issues or information were overlooked. For the purpose of the consultation, the draft EA represented NMFS' assessment of the potential biological impacts. A Biological Opinion summarizing the consultation concluded that issuance of the permit is not likely to jeopardize the continued existence of the species or result in adverse modification of designated critical habitat.

The effects of permit amendment issuance on the environment would not differ from the effects of issuance of the original permit.

Cumulative Impacts

The stocks and species of marine mammals that are the subject of the permit are exposed to a variety of human activities throughout their ranges, including entanglement in fishing gear, noise from vessel traffic and military readiness exercises, and harassment from oil and gas development.

Entanglement is not believed to be a significant source of mortality for any of these species. The harassment from military readiness exercises and oil and gas development is authorized pursuant to Section 101(a)(5) of the MMPA and has been found to have a negligible impact on the stocks.

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

These stocks and populations of marine mammals are the subject of other research permits issued by NMFS, each of which was subject to analysis under NEPA and found to have no significant adverse impacts. The combined effects of the total amount of permits relative to the status of the populations were considered. Further, the take numbers in the proposed permit are conservative estimates of the potential maximum numbers of animals that may be present during a survey and they assume that 100% of animals taken are affected, which may not be the case. There are no other NMFS-issued or proposed research permits for the SOCAL Range Complex.

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

No measurable effects on population demographics are anticipated because any sub-lethal (disturbance) effects are likely 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 endangered whales.

5.0 Mitigation Measures

There are no additional mitigation measures beyond those that are part of the applicant's protocols or standard conditions that would be required by permit.

Given that the research is directed at marine mammals, mitigation measures that avoid or reduce their exposure to the research in general are not appropriate. It is necessary for researchers to closely approach the whales to attach instruments, make observations, and make photo-identification. It is necessary for researchers to expose animals to sound playbacks in a controlled experiment to collect data on how animals are affected by these sounds. However, researchers only approach as closely as necessary to achieve these ends, and limit sound exposure levels to the minimum that will result in a behavioral change. The MMPA requires the research methods to be humane, resulting in the least possible degree of pain and suffering practicable to the animal involved. The permit mitigation measures are consistent with best practices for humane research on wildlife.

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. In the first field season for this permit, no animals were injured and the behavioral responses observed were consistent with those anticipated by the 2010 EA and covered by the permit.

6.0 List of Preparers and Agencies Consulted

Prepared by: Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service, Silver Spring, MD

No other persons or agencies were consulted in the preparation of this document.