NOAA's National Marine Fisheries Service
Endangered Species Act Section 7 Consultation

Biological Opinion

Agencies: Division of Ocean Sciences at the National Science Foundation and the Permits, Conservation, and Education Division of the Office of Protected Resources, NOAA's National Marine Fisheries Service

Activities Considered: Seismic survey by the Lamont-Doherty Earth Observatory in the northeast Pacific Ocean off Vanvouver Island and Issuance of an Incidental Harassment Authorization pursuant to Section 101(a)(5)(D) of the Marine Mammal Protection Act (MMPA)

Consultation Conducted by: Endangered Species Division of the Office of Protected Resources, NOAA's National Marine Fisheries Service

Approved by: _____

Date: AUG 18 2009

Section 7(a)(2) of the Endangered Species Act (ESA)(16 U.S.C. 1531 *et seq.*) requires that each federal agency shall ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species. When the action of a federal agency "may affect" a listed species or critical habitat that has been designated for them, that agency is required to consult with either the NOAA's National Marine Fisheries Service (NMFS) or the U.S. Fish and Wildlife Service, depending upon the listed resources that may be affected. The National Science Foundation (NSF) proposes to fund the Lamont-Doherty Earth Observatory (L-DEO) to conduct a seismic survey in the northeast Pacific Ocean off Vancouver Island from August to October of 2009.

This document represents the NMFS' biological opinion (Opinion) of the effects of the proposed actions on endangered and threatened species and designated critical habitat and has been prepared in accordance with Section 7 of the ESA. This Opinion is based on information provided in the IHA application, draft IHA, environmental assessment, monitoring reports from similar activities, published and unpublished scientific information on endangered and threatened species and their surrogates, scientific and commercial information such as reports from government agencies and the peer-reviewed literature, Opinions on similar activities, and other sources of information. Combined, the foregoing documents represent the best scientific and commercial data available with respect to the effects of issuing the IHA on affected species.

areas are expected to experience temporary startle, alarm, and/or displacement responses. Individuals exhibiting these behavioral responses are also expected to undergo temporary, low-level stress responses. However, we do not expect any individual to die as a result of exposure, or experience other sub-lethal consequences. Only rough population sizes are known for salmon and without a good understanding of the number of individuals exposed, proportions of populations exposed cannot be calculated. As no fish is expected to be capable of hearing signals produced by the SBP system, no direct effects are expected from this system on the fitness of any fish's fitness. No indirect effects from the proposed actions are known that will influence fish. Overall, no individual fish is expected to undergo a fitness reduction, and thus, no listed fish species is expected to be jeopardized.

Conclusion

After reviewing the current status of blue, fin, sei, humpback, and sperm whales, leatherback sea turtles, and listed salmonids; the *Environmental baseline* for the action area; the anticipated effects of the proposed activities; and the *Cumulative effects*, it is the NMFS' Opinion that the actions (NSF's funding of and the Permits Division's issuance of an IHA for seismic surveys off Newport, Oregon) are not likely to jeopardize the continued existence of these species. Similarly, it is the NMFS' Opinion that the issuance of an IHA by the NMFS' Permits Division for harassment that would occur incidental to the proposed action is not likely to jeopardize the continued existence of these species. No critical habitat has been designated within the action area and thus the proposed action would have no effect on critical habitat.

Incidental take statement

Section 9 of the ESA and federal regulation pursuant to Section 4(d) of the ESA prohibit the "take" of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the NMFS as an act which actually kills or injures wildlife, which may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of Sections 7(b)(4) and 7(o)(2), taking that is incidental and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are nondiscretionary, and must be undertaken by the NSF and the Permits Division so that they become binding conditions for L-DEO for the exemption in Section 7(o)(2) to apply. Section 7(b)(4) of the ESA requires that when a proposed agency action is found to be consistent with Section 7(a)(2) of the ESA and the proposed action may incidentally take individuals of listed species, the NMFS will issue a statement that specifies the impact of any incidental taking of endangered or threatened species. To minimize such impacts, reasonable and prudent measures and term and conditions to implement the measures, must be provided. Only incidental take resulting from the agency actions and any specified reasonable and prudent measures and terms and conditions identified in the incidental take statement are exempt from the taking prohibition of Section 9(a), pursuant to Section 7(o) of the ESA.

Section 7(b)(4)(C) of the ESA specifies that in order to provide an incidental take statement for an endangered or threatened species of marine mammal, the taking must be authorized under

Section 101(a)(5) of the MMPA. One of the federal actions considered in this Opinion is the Permits Division's proposed authorization of the incidental taking of blue, fin, sei, humpback, and sperm whales pursuant to Section 101(a)(5)(D) of the MMPA. With this authorization, the incidental take of listed whales is exempt from the taking prohibition of Section 9(a), pursuant to Section 7(o) of the ESA.

The NMFS anticipates the incidental harassment of the blue whale (*Balaenoptera musculus*), fin whale (*Balaenoptera physalus*), sei whale (*Balaenoptera borealis*), humpback whale (*Megaptera novaeangliae*), sperm whale (*Physeter macrocephalus*), leatherback sea turtle (*Dermochelys coriacea*), Lower Columbia River Chinook salmon (*Oncorhynchus tschawytscha*), Upper Columbia River spring-run Chinook salmon (*Oncorhynchus tschawytscha*), Puget Sound Chinook salmon (*Oncorhynchus tschawytscha*), Snake River fall-run Chinook salmon (*Oncorhynchus tschawytscha*), Snake River spring/summer-run Chinook salmon (*Oncorhynchus tschawytscha*), Upper Willamette River Chinook salmon (*Oncorhynchus tschawytscha*), Columbia River chum salmon (*Oncorhynchus keta*), Hood Canal summer-run chum salmon (*Oncorhynchus keta*), Lower Columbia River coho salmon (*Oncorhynchus kisutch*), Oregon coast coho salmon (*Oncorhynchus kisutch*), Ozette Lake sockeye salmon (*Oncorhynchus nerka*), Snake River sockeye salmon (*Oncorhynchus nerka*), Lower Columbia River steelhead (*Oncorhynchus mykiss*), Middle Columbia River steelhead (*Oncorhynchus mykiss*), Puget Sound steelhead (*Oncorhynchus mykiss*), Snake River steelhead (*Oncorhynchus mykiss*), Upper Columbia River steelhead (*Oncorhynchus mykiss*), and Upper Willamette River steelhead (*Oncorhynchus mykiss*) during the proposed seismic activities.

Amount or extent of take

The NMFS anticipates the proposed seismic survey in the Pacific Ocean off Vancouver Island might result in the incidental take of listed species. The proposed action is expected to take 2 blue whales, 8 fin whales, 1 sei whale, 6 humpback whales, and 10 sperm whales by exposing individuals to received seismic sound levels greater than 160 dB re 1 μPa by harassment. These estimates are based on the best available information of whale densities in the area to be ensonified above 160 dB re 1 μPa during the proposed activities. This incidental take would result primarily from exposure to acoustic energy during seismic operations would be in the form of harassment, and is not expected to result in the death or injury of any individuals that are exposed.

We expect the proposed action will also take individual leatherback sea turtles as a result of exposure to acoustic energy during seismic studies, and we expect this take would also be in the form of harassment, with no death or injury expected for individuals exposed. Harassment of sea turtles is expected to occur at received levels above 166 dB re 1 μPa.

Further, we expect the proposed seismic survey will also take individual salmonids as a result of exposure to acoustic energy during seismic surveys.

Harassment of blue, fin, sei, humpback, and sperm whales exposed to seismic studies at levels less than 160 dB re 1 μPa, or of sea turtles at levels less than 166 dB re 1 μPa, is not expected. However, if overt adverse reactions (for example, startle responses, dive reactions, or rapid departures from the area) by listed whales or sea turtles are observed outside of the 160 dB or 166 dB re 1 μPa isopleths, respectively, while airguns are operating, incidental take may be exceeded. If such reactions by listed species are observed while airguns, MBES, or SBP are in operation, this may constitute take that is not covered in this Incidental Take Statement. The

NSF and the Permits Division must contact the Endangered Species Division to determine whether reinitiation of consultation is required because of such operations.

Any incidental take of blue whales, fin whales, sei whales, humpback whales, sperm whales, or leatherback sea turtles is restricted to the permitted action as proposed. If the actual incidental take meets or exceeds the predicted level, the NSF and Permits Division must reinitiate consultation. All anticipated takes would be "takes by harassment", as described previously, involving temporary changes in behavior.

Reasonable and prudent measures

The NMFS believes the reasonable and prudent measures described below are necessary and appropriate to minimize the amount of incidental take of listed whales and sea turtles resulting from the proposed action. These measures are non-discretionary and must be binding conditions of the NSF funding of the proposed seismic studies and the NMFS' authorization for the exemption in Section 7(o)(2) to apply. If the NSF or the NMFS fail to ensure compliance with these terms and conditions, the protective coverage of Section 7(o)(2) may lapse.

1. For listed sea turtle and marine mammal species these measures include the following: immediate shutdown of all seismic sources in the event a North Pacific right whale is detected; vessel-based visual monitoring by marine mammal and sea turtle observers; real-time passive acoustic monitoring by marine mammal and sea turtle observers; speed or course alteration as practicable; implementation of a marine mammal and sea turtle exclusion zone within the 180 dB re 1 μPa_{rms} isopleth for power-down and shut-down procedures; emergency shutdown procedures in the event of an injury or mortality of a listed marine mammal or sea turtle; and ramp-up procedures when starting up the array. The measures for marine mammals are required to be implemented through the terms of the IHA issued under section 101(a)(5)(D) and 50 CFR 216.107.
2. The implementation and effectiveness of mitigation measures incorporated as part of the Reasonable and Prudent Measure mentioned above and the associated Terms and Conditions must be monitored.

Terms and conditions

In order to be exempt from the prohibitions of Section 9 of the ESA, the NSF, Permits Division, and L-DEO must comply with the following terms and conditions, which implement the Reasonable and Prudent Measures described above. These terms and conditions are non-discretionary.

To implement the Reasonable and Prudent Measures, the NSF and the NMFS shall ensure that

1. L-DEO implements the mitigation, monitoring, and reporting conditions contained in the IHA and this Opinion.
2. The Chief of the Endangered Species Division is immediately informed of any changes or deletions to any portions of the monitoring plan or IHA.
3. L-DEO immediately reports all sightings and locations of injured or dead endangered and threatened species to the Permits Division and NSF.
4. The NSF and the Permits Division provide a summary of the implementation and

effectiveness of the terms of the IHA to the Chief of the Endangered Species Division. This report shall confirm the implementation of each term and summarize the effectiveness of the terms for minimizing the adverse effects of the project on listed whales and sea turtles.

Conservation recommendations

Section 7(a)(1) of the ESA directs federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

We recommend the following conservation recommendations, which would provide information for future consultations involving seismic surveys and the issuance of incidental harassment authorizations that may affect endangered large whales and endangered or threatened sea turtles

1. *Improve estimates of levels and forms of "take" and responses to seismic sounds.* The Permits Division should review reports submitted for this and other prior geophysical research surveys funded by the NSF and compile and analyze information to improve agency estimates of the number of the different species of marine mammals and sea turtles that are likely to be exposed to sounds from seismic surveys, the response of those species to this exposure, and the probable consequences of those responses on the life history of individual animals. The results should be provided to the Endangered Species Division as part of requests for consultation on future proposals to authorize incidental harassment.
2. *Effects of seismic noise on sea turtles and fish.* The NSF should promote and fund research examining the potential effects of seismic surveys on listed sea turtle and fish species.
3. *Estimate additional isopleth ranges.* The NSF provides modeling for exclusion zones (Figure 3, page 10), which have largely been based on threshold analyses of marine mammals. As better scientific data become available, modeling additional decibel levels that are biologically relevant to other ESA-listed species (e.g., sea turtles, salmonids) may improve the effects analysis and precision of take estimates.

In order for the Endangered Species Division to be kept informed of actions minimizing or avoiding adverse effects on, or benefiting ESA-listed species or their habitats, the Permits Division should notify the Endangered Species Division of any conservation recommendations they implement in their final action.

Reinitiation notice

This concludes formal consultation on the proposed seismic source survey to be funded by the NSF and conducted by the L-DEO on board the *R/V Langseth* in the Pacific Ocean off Vancouver Island, and the issuance of an incidental harassment authorization for the proposed studies pursuant to Section 101(a)(5)(D) of the Marine Mammal Protection Act (MMPA). As provided in 50 CFR §402.16, control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an

extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of authorized take is exceeded, Section 7 consultation must be reinitiated immediately.

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