ENVIRONMENTAL ASSESSMENT

Issuance of an Incidental Harassment Authorization to Ocean Renewable Power Company Maine, LLC (ORPC) to Take Marine Mammals by Harassment Incidental to Pile Driving in Cobscook Bay, Maine

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LOCATION:	Cobscook Bay, Maine
ABSTRACT:	The National Marine Fisheries Service (NMFS) proposes to issue an Incidental Harassment Authorization to Ocean Renewable Power Company Maine, LLC (ORPC) for the taking, by Level B harassment, of small numbers of marine mammals, incidental to pile driving in Cobscook Bay, Maine.

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LIST OF ACRONYMS, ABBREVIATIONS, AND INITIALISMS

BiOp	Biological Opinion
CFR	Code of Federal Regulations
CEQ	President's Council on Environmental Quality
DOE	U.S. Department of Energy
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
ft	feet
IHA	Incidental Harassment Authorization
km	kilometer
m	meter
mi	mile
MMPA	Marine Mammal Protection Act
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
NAO	NOAA Administrative Order
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
OMB	Office of Management Budget
ORPC	Ocean Renewable Power Company Maine, LLC
PSO	Protected Species Observer
USACE	United States Army Corps of Engineers, San Francisco District
U.S.C.	United States Code

1. CHAPTER 1 – PURPOSE AND NEED FOR ACTION

1.1 DESCRIPTION OF PROPOSED ACTION

The National Marine Fisheries Service (NMFS) has received an application from Ocean Renewable Power Company Maine, LLC (ORPC) for an Incidental Harassment Authorization (IHA) to take marine mammals, by harassment, incidental to pile driving in Cobscook Bay, Maine. ORPC's construction activities, which have the potential to behaviorally disturb marine mammals, warrant an incidental take authorization from NMFS under section 101(a)(5)(D) of the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1631 *et seq*.).

The proposed action considered in this Environmental Assessment (EA) is NMFS' issuance of a 1-year IHA under section 101(a)(5)(D) of the MMPA, for the taking, by Level B harassment only, of small numbers of marine mammals incidental to pile driving in Cobscook Bay, Maine.

This EA, titled "*Issuance of an Incidental Harassment Authorization to Ocean Renewable Power Company Maine, LLC (ORPC) to Take Marine Mammals by Harassment Incidental to Pile Driving in Cobscook Bay, Maine*" (hereinafter, EA), addresses the impacts on the human environment that would result from issuance of this IHA for MMPA Level B takes of marine mammals during pile driving, taking into account the mitigation measures required in the IHA.

1.1.1 INCORPORATION OF FERC AND DOE'S ENVIRONMENTAL ASSESSMENT BY REFERENCE

After conducting an independent review of the information and analyses for sufficiency and adequacy, NMFS incorporates by reference the Federal Energy Regulatory Commission (FERC) and the U.S. Department of Energy's (DOE) EA (FERC and DOE, 2012). In summary, FERC and DOE's analysis concluded that the proposed long-term Cobscook Bay tidal energy project, with FERC and DOE or other federal or state-required conservation measures (e.g., pilot license requirements), is not expected to significantly affect the quality of the human environment. While FERC and DOE's EA addresses the larger Cobscook Bay tidal energy project, the scope of this EA is specifically limited to analyzing the impacts of issuing an IHA for pile driving activities.

1.1.2 MMPA PURPOSE AND NEED

The MMPA and Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et seq*.) 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 incidental take of marine mammals in section 101(a)(5)(D) of the MMPA and 7(a)(4) of the ESA.

Section 101(a)(5)(D) of the MMPA directs the Secretary of Commerce to authorize, upon request, the incidental, but not intentional, taking of small numbers of marine mammals, by United States citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and a notice of a proposed authorization is provided to the public for review. Section 101(a)(5)(D) of the MMPA also establishes a 45-day time limit for NMFS' review of an application for an IHA followed by a 30-day public notice and comment period on any proposed authorizations for the incidental

harassment of small numbers of marine mammals. Within 45 days of the close of the public comment period, NMFS must either issue or deny the IHA.

Purpose: The primary purpose of NMFS issuing an IHA to ORPC is to provide an exemption from the take prohibitions contained in the MMPA for the take of marine mammals incidental to ORPC's pile driving.

Need: As noted above, the MMPA establishes a general moratorium or prohibition on the take of marine mammals, including take by behavioral harassment. The MMPA establishes a process by which individuals engaged in specified activities within a specified geographic area may request an IHA. Specifically, NMFS shall grant the IHA if it finds that the taking will have a negligible impact on the species or stock(s), and will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant). The IHA must, where applicable, set forth the permissible methods of taking, other means of effecting the least practicable adverse impact on the species or stock and its habitat, and requirements pertaining to the mitigation, monitoring, and reporting of such takings.

ORPC has submitted a complete application demonstrating potential eligibility for issuance of an IHA. NMFS now has a corresponding duty to determine whether and how it can fashion an IHA authorizing take by harassment incidental to the activities described in the application. The need for this action is, therefore, established and framed by the MMPA and NMFS' responsibilities under section 101(a)(5)(D) of that Act, its implementing regulations, and other applicable requirements which will influence its decision making, such as section 7 of the Endangered Species Act (ESA), which is discussed in more detail below this section.

The foregoing purpose and need guide NMFS in developing alternatives for consideration, including alternative means of mitigating potential adverse effects.

1.2 NEPA REQUIREMENTS AND SCOPE OF NEPA ANALYSIS

This EA focuses primarily on the environmental effects of authorizing MMPA Level B incidental takes of marine mammals during pile driving in Cobscook Bay. The MMPA and its implementing regulations governing issuance of an IHA require that upon receipt of a valid and complete application for an IHA, NMFS must publish a notice of proposed IHA in the *Federal Register* within 45 days. The notice issued for ORPC's action summarized the purpose of the requested IHA, included a statement that NMFS would prepare an EA for the proposed action, and invited interested parties to submit written comments concerning the application and NMFS' preliminary analyses and findings including those relevant for consideration in the EA.

NOAA Administrative Order 216-6 (NAO 216-6) established agency procedures for complying with the National Environmental Policy Act (NEPA) and the implementing regulations issued by the President's Council on Environmental Quality (CEQ). Consistent with the intent of NEPA and the clear direction in NAO 216-6 to involve the public in NEPA decision-making, NMFS requested comments on the potential environmental impacts described in ORPC's application and the proposed IHA. Comments received on the proposed IHA were considered during preparation of this EA.

NMFS has prepared this EA to assist in determining whether the direct, indirect, and cumulative impacts related to its issuance of the authorization for incidental take under the MMPA of four marine mammal species are likely to result in significant impacts to the human environment, or

whether the analysis contained herein, including documents referenced and incorporated by reference and public comments received on the proposed IHA, supports the issuance of a Finding of No Significant Impact. Given the limited scope of the decision for which NMFS is responsible (i.e. whether or not to issue the authorization including prescribed means of take, mitigation measures, and monitoring requirements) and that this EA is intended to inform, the scope of analysis is limited to evaluating and disclosing the impacts to living marine resources and their habitat likely to be affected by issuance of an IHA authorizing the take of marine mammals incidental to ORPC's pile driving activities. As described more fully below, the EA identifies all marine mammals and species protected under the ESA that are likely to occur within the action area.

The analysis focuses on the impacts to certain marine mammal species that could potentially result from issuance of the IHA for the take of marine mammals incidental to the proposed pile driving in Cobscook Bay; impacts that would result from the alternatives presented; and the consideration of potential cumulative environmental impacts. Impacts to other marine species and habitat located in the action area were considered unlikely, and thus received less detailed evaluation.

1.2.1 NEPA Scoping Summary

The purpose of scoping is to identify the issues to be addressed and any potentially significant environmental issues related to the proposed action, as well as identify and eliminate from detailed study the environmental issues that are not significant or that have been covered by review in prior NEPA analyses. An additional purpose of the scoping process is to identify the concerns of the affected public and federal agencies, states, and Indian tribes.

Under 50 CFR 216.104(b) of NMFS' implementing regulations for the MMPA, NMFS must, after deeming the application adequate and complete, publish in the *Federal Register* a notice of proposed IHA or receipt of a request for the implementation or re-implementation of regulations governing the incidental taking. Information gathered during the associated comment period is considered by NMFS in ensuring adequacy of preliminary determinations and proposed mitigation measures for IHAs. A notice of proposed IHA was published in the *Federal Register* on January 19, 2012 (77 FR 2701) and was made available for public review and comment for 30 days. Comments received on the proposed IHA were used to develop the scope of this EA.

1.2.2 PUBLIC INVOLVEMENT

During the public comment period for the notice of proposed IHA, NMFS received comments from the Marine Mammal Commission and one individual. NMFS developed responses to the specific comments regarding issuance of an IHA under the MMPA and will provide those responses in the *Federal Register* notice announcing final determination on the proposed IHA. NMFS does not repeat those responses here. NMFS notes, however, that it fully considered all comments, particularly those related to mitigation and monitoring. Based on those comments, NMFS re-evaluated the mitigation and monitoring proposed for incorporation in the IHA. NMFS determined, based on the best available data, that the proposed measures are presently the most feasible and effective measures capable of implementation by ORPC during pile driving activities.

1.3 APPLICABLE LAWS AND NECESSARY FEDERAL PERMITS

This section summarizes federal, state, and local permits, licenses, approvals, and consultation requirements necessary to implement the proposed action.

1.3.1 THE NATIONAL ENVIRONMENTAL POLICY ACT

NEPA's EIS requirement is applicable to all "major" federal actions with the potential to significantly affect the quality of the human environment. Major federal actions include activities that are fully or partially funded, regulated, conducted, or approved by a federal agency. NMFS' issuance of an IHA for incidental harassment of marine mammals represents approval and regulation of takes of marine mammals incidental to the applicant's activities and is a federal action for which environmental review is required. While NEPA does not dictate a substantive outcome for an IHA, it requires consideration of environmental issues in federal agency planning and decision making, and requires an analysis of alternatives and direct, indirect, and cumulative environmental effects of the NMFS proposed action to authorize MMPA Level B incidental take. As noted, NMFS has prepared this EA to assist in determining whether an EIS is necessary for the action.

1.3.2 THE ENDANGERED SPECIES ACT

Section 7 of the ESA requires consultation with the appropriate federal agency (either NMFS or the U.S. Fish and Wildlife Service) for federal actions that "may affect" a listed species or critical habitat. NMFS' issuance of an IHA affecting ESA-listed species or designated critical habitat, directly or indirectly, is a federal action subject to these section 7 consultation requirements. Accordingly, NMFS is required to ensure that its action is not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of critical habitat for such species. Regulations specify the requirements for these consultations (50 CFR § 402).

NMFS has determined that issuance of the IHA would not affect listed marine mammals. Therefore, section 7 consultation is not required.

1.3.3 THE MARINE MAMMAL PROTECTION ACT

Section 101(a)(5)(D) of the MMPA directs the Secretary of Commerce to authorize, upon request, the incidental, but not intentional, taking by harassment of small numbers of marine mammals of a species or population stock, for periods of not more than one year, by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specific geographic region if certain findings are made and a *Federal Register* notice of a proposed authorization is provided to the public for review.

Section 101(a)(5)(D) of the MMPA established an expedited process by which U.S. citizens can apply for an authorization to incidentally take small numbers of marine mammals by harassment. Except with respect to certain activities not pertinent here, the MMPA defines "harassment" 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 disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering ["Level B harassment"].

Section 101(a)(5)(D) of the MMPA establishes a 45-day time limit for NMFS' review of an application followed by a 30-day public notice and comment period on any proposed authorizations for the incidental harassment of small numbers of marine mammals. Not later than 45 days after the close of the public comment period, if the Secretary of Commerce makes the findings set forth in section 101(a)(5)(D)(i) of the MMPA, the Secretary of Commerce shall issue the authorization with appropriate conditions to meet the requirements of section 101(a)(5)(D)(ii) of the MMPA.

NMFS has promulgated regulations to implement the permit provisions of the MMPA (50 CFR Part 216) and has produced Office of Management and Budget (OMB)-approved application instructions (OMB Number 0648-0151) that prescribe the procedures necessary to apply for permits. All applicants must comply with these regulations and application instructions in addition to the provisions of the MMPA. Applications for an IHA must be submitted according to regulations at 50 CFR § 216.104.

1.3.4 Magnuson-Stevens Fishery Conservation and Management Act

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

A total of 14 finfish and one shellfish species have designated EFH within the proposed project area. NMFS Northeast Region's EFH recommendations are detailed in FERC and DOE's EA (FERC and DOE, 2012). NMFS issuance of the IHA would not result in adverse effects to EFH.

2. CHAPTER 2 – ALTERNATIVES INCLUDING THE PROPOSED ACTION

The NEPA implementing regulations (40 CFR § 1502.14) and NAO 216-6 provide guidance on the consideration of alternatives to a federal proposed action and require rigorous exploration and objective evaluation of all reasonable alternatives. Each alternative must be feasible and reasonable in accordance with the implementing regulations (40 CFR §§ 1500-1508). This chapter describes the range of potential actions (alternatives) determined reasonable with respect to achieving the stated purpose and need, as well as alternatives eliminated from detailed study and also summarizes the expected outputs and any related mitigation for each alternative.

This EA evaluates the alternatives to ensure that they would fulfill the purpose and need, namely: (1) the issuance of an IHA for the take of marine mammals by Level B behavioral harassment, incidental to ORPC's pile driving activities in Cobscook Bay; and (2) compliance with the MMPA which sets forth specific standards (i.e., no unmitigable adverse impact and negligible impact) that must be met in order for NMFS to issue an IHA.

NMFS' proposed action (preferred) alternative represents the activities proposed by the applicant for the IHA, along with required monitoring and mitigation measures that would minimize potential adverse environmental impacts.

2.1 PROJECT OBJECTIVES

The fundamental objective of the project is to install foundational piles to support an underwater tidal turbine unit. This is the first phase of ultimately generating and delivering electricity to an onshore location and connecting to the Bangor Hydro Electric Company power grid. The long-term project would be carried out in two separate phases over an expected 8-year pilot license term.

2.2 ALTERNATIVE 1 – NO ACTION ALTERNATIVE

Under the No Action Alternative, NMFS would not issue an IHA to ORPC for the taking, by Level B harassment, of small numbers of marine mammals, incidental to pile driving activities. The MMPA prohibits all takings of marine mammals unless authorized by a permit or exemption under the MMPA. The consequences of not authorizing incidental take are (1) the entity conducting the activity may be in violation of the MMPA if take occurs, (2) mitigation and monitoring measures cannot be required by NMFS, (3) mitigation measures may or may not be performed voluntarily by the applicant, and (4) the applicant may choose not to conduct the activity. By undertaking measures to further protect marine mammals from incidental take through the authorization program, the impacts of these activities on the marine environment can potentially be lessened. While NMFS does not authorize the pile driving itself, NMFS does authorize the incidental harassment of marine mammals incidental to this activity and prescribes the methods of taking and other means of effecting the least practicable adverse impact on the species and stocks and their habitats. If an IHA was not issued, ORPC could decide either to cancel pile driving or to continue the proposed activity. If the latter decision was made, ORPC could independently implement mitigation measures; however, they would be proceeding without authorization from NMFS pursuant to the MMPA. If ORPC did not implement mitigation measures during survey activities, increased takes of marine mammals by harassment (and potentially by injury or mortality) could occur if the activities were conducted when marine mammals were present. Although the No Action Alternative would not meet the purpose and need to allow incidental takings of marine mammals under certain conditions, CEQ regulations

require consideration and analysis of a No Action Alternative for the purposes of presenting a comparative analysis to the action alternatives.

2.3 ALTERNATIVE 2 – PROPOSED ACTION (PREFERRED)

The Proposed Action is the Preferred Alternative. Under this alternative, NMFS would issue an IHA to ORPC allowing the take, by Level B harassment, of four marine mammal species in Cobscook Bay, incidental to pile driving with the mitigation, monitoring, and reporting conditions contained within ORPC's IHA application and NMFS' proposed IHA *Federal Register* notice. Accordingly, the Proposed Action would satisfy the purpose and need of the NMFS MMPA action – issuance of an IHA, along with required mitigation and monitoring measures – and would enable ORPC to comply with the statutory and regulatory requirements of the MMPA.

2.3.1 PILE DRIVING OPERATIONS

NMFS' proposed IHA *Federal Register* notice (77 FR 2701, January 19, 2012) describes the pile driving protocols in detail and this EA briefly summarizes them here. Installation of 11 steel pipe piles would take place in about 26 m (85 ft) of water at mean lower low tide. The piles would be installed over a period of 7-12 days beginning in March, 2012.

2.3.2 MITIGATION AND MONITORING MEASURES

The NMFS' proposed IHA *Federal Register* notice (77 FR 2701, January 19, 2012) describes the required mitigation and monitoring measures in detail and this EA briefly summarizes them here. To reduce the potential for disturbance from acoustic stimuli associated with the activities, ORPC has proposed to implement the following mitigation and monitoring measures for marine mammals: (1) use of a sound attenuation device; (2) establishment of an exclusion zone; (3) pile driving shut down and delay procedures; (4) soft-start procedures; (5) visual monitoring; and (6) hydroacoustic monitoring.

Sound Attenuation Device: When using a diesel impact hammer to "proof" piles, ORPC would use wooden sound absorption cushions and/or a bubble curtain to reduce hydroacoustic sound levels and avoid the potential for marine mammal injury. A bubble curtain is expected to reduce sound levels by at least 5 dB.

Exclusion Zones: NMFS has determined that for acoustic effects, using acoustic thresholds in combination with corresponding exclusion zones is an effective way to consistently apply measures to avoid or minimize the impacts of an action. During all in-water impact pile driving, ORPC would establish a preliminary marine mammal exclusion zone around each pile to avoid exposure to sounds at or above 180 dB. The preliminary exclusion zone would have a radius of 152 m (500 ft). This encompasses the initial estimate of the 180 dB isopleth, where injury could occur, plus a 52-m (171-ft) buffer zone. The buffer zone would be established to account for the initial lack of in-water acoustic measurements. Once hydroacoustic monitoring is conducted, the exclusion zone may be adjusted upward accordingly to ensure that marine mammals are not exposed to Level A harassment sound pressure levels.

Shut Down and Delay Procedures: If a protected species observer (PSO) sees a marine mammal within or approaching the exclusion zone prior to start of impact pile driving, the

PSO would notify the on-site project lead (or other authorized individual) who would then be required to delay pile driving until the marine mammal has moved 305 m (1,000 ft) from the sound source or if the animal has not been resighted within 30 minutes. If a marine mammal is sighted within or on a path toward the 152-m (500-ft) exclusion zone during pile driving, pile driving would cease until that animal has moved 305 m (1,000 ft) and is on a path away from the exclusion zone or 30 minutes has lapsed since the last sighting.

Soft-start Procedures: ORPC would implement a "soft-start" technique at the beginning of each pile installation to allow marine mammals to leave the immediate area before sound sources reach full energy. Soft-start procedures would be conducted prior to driving each pile if hammering ceases for more than 30 minutes.

Visual Monitoring: ORPC would have at least two PSOs monitoring the Level B harassment zone for marine mammals 30 minutes before, during, and 30 minutes after all impact pile driving activities. In addition, PSOs would conduct behavioral monitoring out to 4,600 m (2.5 mi) during at least three events of vibratory pile driving to validate take estimates and evaluate behavioral impacts.

Hydroacoustic Monitoring: ORPC would conduct hydroacoustic monitoring at the initial installation of each pile driving method to ensure that the harassment isopleths are not extending past the calculated distances described in the notice of proposed IHA (77 FR 2701, January 19, 2012).

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

NMFS considered whether other alternatives could meet the purpose and need and support ORPC's proposed activity. An alternative that would allow for the issuance of an IHA with no required mitigation or monitoring was considered but eliminated from consideration, as it would not be in compliance with the MMPA and therefore would not meet the purpose and need. For that reason, this alternative is not analyzed further in this document.

NMFS also considered an alternative whereby NMFS issues the IHA for another time. However, this alternative failed to meet the statutory and regulatory requirements of the MMPA for an IHA as ORPC did not submit an application (i.e., NMFS shall issue an IHA upon request) to conduct pile driving at an alternate time. Pile driving activities are expected to begin shortly after issuance of an IHA and are determined by the most suitable dates that would satisfy the purpose and need, from a logistical perspective, for ORPC. NMFS Northeast Region recommends that in-water construction involving pile driving be conducted between November 8 and April 9 to avoid impacts to fisheries resources. However, ORPC may be able to conduct pile driving activities after April 9 if they can demonstrate that noise levels caused by the impact hammer are below NMFS' guidelines.

3. CHAPTER 3 – AFFECTED ENVIRONMENT

The summary of the physical and biological environment of the project area, as analyzed in the IHA application, notice of proposed IHA, and FERC and DOE's EA is hereby incorporated by reference (ORPC, 2011; 77 FR 2701, January 19, 2012; FERC and DOE, 2012). In addition to the marine mammal stocks and species that are the subject of the IHA, a number of sea birds, sea turtles, fish, and invertebrates may be found in the action area.

The project area is located in Cobscook Bay, in between Lubec and Eastport, Maine. Cobscook Bay is described as part of the Quoddy Region, which is located at the mouth of the Bay of Fundy and encompasses an area between Maine and New Brunswick, Canada. Cobscook Bay is a sub-basin that marks the entrance to the Bay of Fundy, which features the highest tidal range in the world. Cobscook Bay has extremely strong tidal currents and notably high tides (averaging 20 ft around Eastport), creating an extensive intertidal habitat for marine and coastal species. The Bay is considered a relatively intact marine system, as the area has not experienced much industrialization. The proposed project area is primarily used for commercial fishing, marine resource harvesting and aquaculture, recreation, and marine vessel traffic.

3.1 PHYSICAL ENVIRONMENT

3.1.1. Bathymetry and Oceanography

Pile driving activities would take place within a 1,700 ft^2 area in Cobscook Bay. Geotechnical data shows that the area is flat with up to 40 ft of marine clay and some thin layers of glacial till overlaying bedrock on the surface. Water depth at the proposed project location is about 85 ft at mean lower low water.

3.2 BIOLOGICAL ENVIRONMENT

Cobscook Bay is a habitat for numerous coastal and marine species, including birds, fish, and marine mammals, that are protected by a variety of environmental regulations. FERC and DOE's 2012 EA for the Cobscook Bay tidal energy project identifies and describes a variety of biologically important and protected species inhabiting the action area (FERC and DOE, 2012). NMFS' limited action of issuing an IHA would allow for the harassment of marine mammals incidental to pile driving and, therefore, is the focus of this section.

3.2.1 MARINE MAMMALS

Marine mammals with known presence in this region of Cobscook Bay are the harbor seal (*Phoca vitulina*), grey seal (*Halichoerus grypus*), harbor porpoise (*Phocoena phocoena*), and Atlantic white-sided dolphin (*Lagenorhynchus acutus*). Other species that may possible occur in the vicinity of the proposed activity include North Atlantic right whale (*Eubalaena glacialis*), humpback whale (*Megaptera novaengliae*), fin whale (*Balaenoptera borealis*), minke whale, (*Balaenoptera acutorostrata*), and sei whale (*Balaenoptera borealis*). However these five species are not likely to occur in Cobscook Bay and are generally associated with open ocean habitats and offshore locations. Detailed species information and proposed take numbers can be found in the notice of proposed IHA and FERC and DOE's EA (76 FR 66274, October 26, 2011; FERC and DOE, 2012).

3.2.2 SEABIRDS

Nearly 300 bird species are known to inhabit Cobscook Bay during some part of the year. Common shorebirds observed near the proposed project area include sea ducks, common terns, spotted sandpipers, and bald eagles. Cobscook Bay is an important habitat for species such as Bonaparte's gulls, American black ducks, and razorbills. Most of the birds expected to occur in the proposed project area are migratory species that typically breed and forage in the summer months. Detailed information on bird species in the area and the resources they use can be found in FERC and DOE's EA (FERC and DOE, 2012).

3.2.3 MARINE TURTLES

Leatherback (*Dermochelys coriacea*) and loggerhead (*Caretta caretta*) marine turtles may occur in the general project vicinity; however, they typically inhabit offshore marine areas and rarely use nearshore areas such as those found in the proposed project area. The proposed project is not expected to impact marine turtles.

3.2.4 FISH

Examples of fish present in Cobscook Bay include winter flounder (*Pseudopleuronectes americanus*), Atlantic cod (*Gadus morhua*), pollock (*Pollachius virens*), silver hake (*Merluccius bilinearis*), Atlantic herring (*Clupea harengus*), rainbow smelt (*Osmerus mordax*), ocean pout (*Macrozoarces americanus*), rock gunnel (*Pholis gunnellus*), and little skate (*Raja erinacea*). Detailed information on fish species in the area can be found in FERC and DOE's EA (FERC and DOE, 2012).

3.2.5 INVERTEBRATES

Examples of crustaceans, mollusks, and other invertebrates present in Cobscook Bay include sea cucumbers, green sea urchins, common sea stars, purple sunstars, northern red anemones, blue mussels, and numerous sponges. A detailed account of invertebrates in the proposed project area is found in FERC and DOE's EA (FERC and DOE, 2012).

4. CHAPTER 4 –ENVIRONMENTAL CONSEQUENCES

NMFS has evaluated the potential impacts of ORPC's action in order to determine whether to authorize incidental take of marine mammals under the MMPA. Detailed information on impacts to the surrounding environment and biology can be found in FERC and DOE's EA (FERC and DOE, 2012).

NMFS' evaluation indicates that any direct or indirect effects of the action would not result in a substantial impact to living marine resources or their habitats and would not have any adverse impacts on biodiversity or ecosystem function. Effects of the proposed action are considered to be short-term, temporary in nature, and negligible, and unlikely to affect normal ecosystem function or predator/prey relationships; therefore, there would not be a substantial impact on marine life biodiversity or on the normal function of the near shore marine environment. NMFS has determined that appropriate mitigation measures would be in place to minimize impacts to marine mammals and other marine species.

ORPC proposes to conduct pile driving during daylight hours for 7-12 days. During pile driving, any displacement of fish species in the proposed action would be temporary. Many fish species (i.e., those that do not have swim bladders, have rudimentary swim bladders (such as bottom-dwelling species, including flatfish), or well-developed swim bladders that are not directly connected to the ears) tend to have relatively poor auditory sensitivity and are not likely to be affected by exposure to intense noise. Pile driving may potentially displace prey items of marine mammals, such as fish. However, prey items would return after pile driving ends and the ambient sound has returned to baseline levels.

The impacts of pile driving on marine mammals are specifically related to acoustic activities, and these are expected to be temporary in nature, negligible in intensity, and would not result in substantial impacts to marine mammals or to their role in the ecosystem. NMFS anticipates, and would authorize, the incidental Level B harassment only of small numbers of marine mammals, in the form of temporary behavioral disturbance. NMFS does not anticipate that take by injury (Level A harassment), serious injury, or mortality would occur and expects that harassment takes would be at the lowest level practicable due to the incorporation of the mitigation measures required by the proposed IHA and analyzed in this EA. Level B harassment is not expected to affect biodiversity or ecosystem function.

4.1 EFFECTS OF ALTERNATIVE 1 – NO ACTION ALTERNATIVE

Under the No Action Alternative, NMFS would not issue an IHA to ORPC for the proposed pile driving activities. In this case, ORPC would decide whether or not it would want to continue with pile driving. If ORPC chose not to conduct the activity, then there would be no effects to marine mammals. Conducting the activity without an MMPA authorization (i.e., an IHA) could result in a violation of federal law. If ORPC decided to conduct some or all of the activity without implementing any mitigation measures, and if activities occur when marine mammals are present in the action area, there is the potential for unauthorized harassment of marine mammals. The sounds produced by pile driving would have the potential to cause behavioral harassment of marine mammals in the action area, while some marine mammals may avoid the area altogether. Additionally, masking of natural sounds may occur. Auditory impacts (i.e., temporary and permanent threshold shifts) could also occur if no mitigation or monitoring measures are implemented. Monitoring of exclusion zones for the presence of marine mammals allows for the implementation of mitigation measures, such as shutdowns and delays when

marine mammals occur within these zones. These measures are required to prevent the onset of shifts in hearing thresholds. However, if a marine mammal occurs within these high energy ensonified zones, it is possible that hearing impairments to marine mammals could occur. Additionally, although unlikely, based on an animal's proximity to the sound source, permanent threshold shift (PTS) could also occur, but this possibility is thought to be unlikely. If ORPC were to decide to implement mitigation measures similar to those described in the proposed IHA, then the impacts would most likely be similar to those described for Alternative 2 below.

4.2 EFFECTS OF ALTERNATIVE 2 – PREFERRED ALTERNATIVE

The IHA *Federal Register* notice, incorporated by reference (77 FR 2701, January 19, 2012), describes in detail the potential effects of pile driving on marine mammals. FERC and DOE's EA also includes detailed analyses on effects to fish and other marine species (FERC and DOE, 2012).

ORPC proposed a number of monitoring and mitigation measures for marine mammals, which were included in the proposed IHA *Federal Register* notice (77 FR 2701, January 19, 2012). In analyzing the effects of the preferred alternative, NMFS has considered the following monitoring and mitigation measures as part of the preferred alternative:

(1) use of a sound attenuation device;
(2) proposed exclusion zone;
(3) pile driving shut-down and delay procedures;
(4) soft-start procedures;
(5) visual monitoring by PSOs; and
(6) hydroacoustic monitoring.

Inclusion of these monitoring and mitigation measures is anticipated to minimize and/or avoid impacts to marine resources. With the above planned monitoring and mitigation measures, any unavoidable impacts to a marine mammal encountered are expected to be limited to short-term, localized changes in behavior (such as brief masking of natural sounds) and short-term changes in animal distribution near the pile hammer. At worst, effects on marine mammals may be interpreted as falling within the MMPA definition of "Level B behavioral harassment." Under the proposed action, NMFS expects no long-term or substantial adverse effects on marine mammals, the populations to which they belong, or on their habitats.

NMFS does not anticipate that take by injury (Level A harassment), serious injury, or mortality would occur and expects that harassment takes would be at the lowest level practicable due to the incorporation of the mitigation measures proposed in the application and NMFS' notice of proposed IHA (77 FR 2701, January 19, 2012), nor is take by injury, serious injury, or mortality authorized by the proposed IHA.

4.2.1 COMPLIANCE WITH NECESSARY LAWS – NECESSARY FEDERAL PERMITS

NMFS has determined that the IHA is consistent with the applicable requirements of the MMPA, ESA, and NMFS' implementing regulations. The applicant has secured or applied for necessary permits from NMFS. The applicant is responsible for complying with all other applicable laws and regulations.

4.2.2 UNAVOIDABLE ADVERSE IMPACTS

The summary of unavoidable adverse impacts to marine mammals, fish, the populations to which they belong, and on their habitats occurring in the survey area analyzed in FERC and DOE's EA and NMFS' notice of proposed IHA are hereby incorporated by reference (FERC and DOE, 2012; 77 FR 2071, January 19, 2012).

NMFS does not expect ORPC's activities to have adverse consequences on the viability of marine mammals in the proposed project area. Further, NMFS does not expect that marine mammal populations in the area would experience reductions in reproduction, numbers, or distribution that might appreciably reduce their likelihood of surviving and recovering in the wild. Numbers of individuals of all species taken by harassment are expected to be small (relative to species or stock abundance), and pile driving activities would have a negligible impact on the affected species or stocks of marine mammals. The MMPA requirement of ensuring the proposed action has no unmitigable adverse impact to subsistence uses does not apply here because of the location of the proposed activity.

4.3 CUMULATIVE EFFECTS

Cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR§1508.7). Cumulative impacts may occur when there is a relationship between a proposed action and other actions expected to occur in a similar location or during a similar time period, or when past or future actions may result in impacts that would additively or synergistically affect a resource of concern. These relationships may or may not be obvious. Actions overlapping within close proximity to the proposed action can reasonably be expected to have more potential for cumulative effects on "shared resources" than actions that may be geographically separated. Similarly, actions that coincide temporally will tend to offer a higher potential for cumulative effects.

Actions that might permanently remove a resource would be expected to have a potential to act additively or synergistically if they affected the same population, even if the effects were separated geographically or temporally. Note that the proposed action considered here would not be expected to result in the removal of individual cetaceans or pinnipeds from the population or to result in harassment levels that might cause animals to permanently abandon preferred feeding areas or other habitat locations, so concerns related to removal of viable members of the populations are not implicated by the proposed action. This cumulative effects analysis considers these potential impacts, but more appropriately focuses on those activities that may temporally or geographically overlap with the proposed activity such that repeat harassment effects warrant consideration for potential cumulative impacts to the affected four marine mammal species and their habitats.

Human activities in the region of the proposed pile driving include extensive commercial fishing, marine resource harvesting, aquaculture, and vessel traffic. As described in Richardson et al. (1995), marine mammals are likely habituated and tolerant to a certain degree of anthropogenic disturbance, including noise. ORPC's proposed action is not likely to add an increment of disturbance that would cumulatively, when combined with other actions, result in significant adverse impacts to marine mammals. In addition to the activities listed above, future environmental effects may result from ORPC's proposed Cobscook Bay tidal energy project and

the Half Moon Cove Project, a tidal barrage planned for Cobscook Bay. ORPC plans to construct and operate a 300-kilowatt hydrokinetic project at the location of the pile driving activities. The first phase of ORPC's long-term project would consist of a single turbine generator unit mounted on a bottom support frame. The second phase would consist of four additional turbine generator units. ORPC's proposed pile driving activities would not overlap with future construction or operation of the turbine units. The environmental effects of ORPC's long-term project have been analyzed in FERC and DOE's EA and are incorporated here by reference (FERC and DOE, 2012). In summary, an assortment of mitigation and monitoring measures (e.g., use of a shear plot during cable laying to reduce turbidity, measurement of sound around the turbine, fish and marine mammal monitoring, phased installation, etc.) are expected to minimize impacts to marine species and the surrounding environment. The Half Moon Cove Project would involve the construction of a dam connecting Moose Island (Eastport, Maine) to Perry, Maine. Although the effects of this proposed project are uncertain, the limited action of ORPC's pile driving activities would occur over a short period of time and would likely not overlap with the Half Moon Cove Project construction. Any future authorizations would have to undergo the same permitting process and would take ORPC's pile driving activities into consideration when addressing cumulative effects.

NMFS' proposed action of issuing an IHA for the incidental take of marine mammals by Level B harassment in Cobscook Bay is only expected to result in minimal impacts to marine species in the area. This limited action and any temporary, behavioral effects that may result from ORPC's proposed action, are not expected to contribute substantially to other cumulative impacts from activities in Cobscook Bay.

4.4 CONCLUSION

The inclusion of the mitigation and monitoring requirements in the IHA, as described in the Preferred Alternative, would ensure that ORPC's activity and the proposed mitigation measures under Alternative 2 (Preferred Alternative) are sufficient to minimize any potential adverse impacts to the human environment, particularly marine mammal species or stocks and their habitat. With the inclusion of the required mitigation and monitoring requirements, NMFS has determined that the proposed pile driving activities, and NMFS' proposed issuance of an IHA to ORPC, would result at worst in a temporary modification of behavior (Level B harassment) of some individuals of four species of marine mammals. In addition, no take by injury, serious injury, and/or mortality is anticipated, and the potential for temporary or permanent hearing impairment would be avoided through the incorporation of the mitigation and monitoring measures described earlier in this document.

5. LIST OF PREPARERS AND AGENCIES CONSULTED

Agencies Consulted
No other persons or agencies were consulted in preparation of this EA.

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6. REFERENCES

FERC and DOE. (2012). Environmental Assessment for Hydropower Project Pilot License. Cobscook Bay Tidal Energy Project – FERC Project NO. 12711-005 (DOE/EA1916).

ORPC. (2011). Marine Mammal Incidental Harassment Authorization for Pile Placement for ORPC's Cobscook Bay Tidal Energy Pilot Project. 46 pp.

Richardson, W.J., et al. (1995). Marine mammals and noise. San Diego: Academic Press. 576 pp.