

**Finding of No Significant Impact for the Issuance of an  
Incidental Harassment Authorization to Shell Offshore Inc. and Shell Gulf of  
Mexico Inc. to Take Marine Mammals by Harassment Incidental to Conducting an  
Open-water Marine Survey Program in the Chukchi Sea, Alaska  
National Marine Fisheries Service**

Background

The National Marine Fisheries Service (NMFS) received an application from Shell Offshore Inc. and Shell Gulf of Mexico Inc., collectively Shell, for an incidental harassment authorization (IHA) pursuant to NMFS' responsibility to authorize the take of small numbers of marine mammals incidental to an otherwise lawful activity other than commercial fishing, provided that NMFS determines that the action will have a negligible impact on the affected species or stocks of marine mammals, will not have an unmitigable adverse impact on the availability of those species or stocks of marine mammals for taking for subsistence uses, and that the permissible methods of taking and requirements pertaining to the mitigation, monitoring, and reporting of such takes are set forth. NMFS has satisfied those requirements for this authorization for the take of small numbers of 12 species of marine mammals, by Level B Harassment only, incidental to the open-water marine survey program in the Chukchi Sea, Alaska, during the 2009/2010 Arctic open-water season.

In accordance with the National Environmental Policy Act (NEPA) and its implementing regulations and agency NEPA procedures, NMFS completed an *Environmental Assessment on the Issuance of an Incidental Harassment Authorization to Shell to Take Marine Mammals by Harassment Incidental to Conducting an Open-water Marine Survey Program in the Chukchi Sea, Alaska, During 2009-2010*. This FONSI has been prepared to evaluate the significance of the impacts of NMFS' proposed action and is specific to Alternative 2 in the Environmental Assessment (EA), which was identified in an August 2009 Final EA (the EA) as the preferred alternative. Alternative 2 is entitled "Issuance of an IHA with Required Mitigation, Monitoring, and Reporting Measures." Based on NMFS' review of Shell's proposed action and the measures contained in Alternative 2, NMFS has determined that no significant impacts to the human environment would occur from implementing the Preferred Alternative.

Significance Review

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

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

Response: Shell's activity and NMFS' action (i.e., issuing an IHA to Shell) would not cause substantial damage to the ocean and coastal habitats. Relatively short-term exposure (approximately 50 consecutive days of airgun operations, not including weather delays) to low-intensity seismic sounds is unlikely to have significant impacts on marine life, although some deleterious effects may occur within the small high-intensity sound impact areas near the source vessel. To date, fish mortalities associated with normal operations are thought to be slight. Behavioral changes in fish associated with sound exposures are expected to be minor (e.g., temporary abandonment of the ensonified area). Because only a small portion (less than 0.2 percent of the Chukchi Sea) of the available foraging habitat would be subjected to sound pulses at a given time, fish would be expected to return to the area of disturbance within 15 to 30 min (McCauley *et al.*, 2000) to several days (Engas *et al.*, 1996). Therefore, impacts, if they were to occur, would add an incremental degree of adverse impacts to fish resources, but these impacts would not be significant.

EFH for five species of Pacific salmon (pink [humpback], chum [dog], sockeye [red], chinook [king], and coho [silver]) occurring in Alaska has been identified in the action area. The issuance of an IHA for Shell's Chukchi Sea shallow hazard and site clearance surveys in 2009 is not anticipated to have any adverse effects on EFH.

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

Response: The action will not have a substantial impact on biodiversity or ecosystem function within the affected area. The impacts of the seismic survey on marine mammals are specifically related to the acoustic activities, and these are expected to be temporary in nature and not result in a substantial impact to marine mammals or to their role in the ecosystem. In accordance with the Preferred Alternative, NMFS will authorize the take, by Level B Harassment (temporary behavioral disturbance and displacement) only, of 12 species of marine mammals. Neither injury nor mortality is anticipated and will not be authorized. Moreover, the Level B Harassment of marine mammals is not expected to affect biodiversity or ecosystem function.

The potential for the Shell activity to affect other ecosystem features and biodiversity components, including fish, invertebrates, seabirds, and physical features, is fully analyzed in NMFS' 2009 EA. NMFS' evaluation indicates that any direct, indirect, or cumulative effects of the action would not result in a substantial impact on biodiversity or ecosystem function. In particular, the potential for effects to these resources are considered here with regard to the potential effects on diversity or functions that may serve as essential components of marine mammal habitat. Shell's data acquisition

activities in distinct areas in the Chukchi Sea would impact less than 0.2 percent of available food resources, which would have little, if any, effect on a marine mammal's ability to forage successfully. Therefore, there will not be a substantial impact on marine biodiversity or on the normal function of the nearshore or offshore Chukchi Sea ecosystems.

During the survey operations, only a small fraction of the available habitat would be ensonified at any given time (i.e., the 160-dB radius extends only 1,400 m [0.87 mi]). Disturbance to fish species would be short-term (i.e., most likely only hours to days), and fish would return to their pre-disturbance behavior once the seismic activity in a specific area ceases. Thus, the proposed survey would have little, if any, impact on the ability of marine mammals to feed in the area where airgun operations are conducted.

Little or no mortality to fish and/or invertebrates is anticipated. The Chukchi Sea open-water marine survey program is predicted to have minor physical effects on the various life stages of fish and invertebrates. Though these effects do not require authorization under an IHA, the effects on these features were considered with respect to consideration of effects to marine mammals and their habitats, and NMFS finds that these effects from the survey itself on fish and invertebrates are not anticipated to have a substantial effect on biodiversity and/or ecosystem function within the survey area.

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

Response: Shell's survey activities or the issuance of an IHA associated with the survey are not expected to have a substantial adverse impact on public health or safety. The constant monitoring for marine mammals and other marine life during operations effectively eliminates the possibility of any humans being inadvertently exposed to levels of sound that might have adverse effects. As described in question 5 below, mitigation measures imposed by the IHA will ensure that the geophysical activity will not interfere with any fall 2009 subsistence bowhead whale hunt in the Chukchi Sea or any spring subsistence hunts in 2010 in the Chukchi Sea.

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

Response: The site clearance and shallow hazards surveys may result in some Level B Harassment (in the form of short-term and localized changes in behavior and short-term displacement from habitat) of small numbers, relative to the population sizes, of 12 species of marine mammals (no more than 0.3 percent of any species). No injury or mortality is anticipated, and none will be authorized. Behavioral effects may include temporary and short-term displacement of marine mammals from within certain ensonified zones by acoustic equipment used for surveys (which is not expected to exceed the time of ensonification for an area), generally within 1,400 m (0.87 mi) from the operating source vessel. The mitigation measures required for the activity are designed to minimize the exposure of marine mammals to sound and to minimize

conduct of the activity in the vicinity of habitats that might be used by certain cryptic marine mammals (i.e., those that are more difficult to detect).

The following mitigation measures will be contained in the IHA: speed or course alteration when a marine mammal appears likely to enter the safety zone; power-down procedures when marine mammals are about to enter the safety zone; shutdown procedures when marine mammals are detected in the safety zone while the airgun array is at full volume or during a power-down; and ramp-up procedures. Taking these mitigation measures into account, effects on marine mammals from the selected alternative are expected to be limited to avoidance of the area around the seismic operation and short-term behavioral changes, falling within the Marine Mammal Protection Act (MMPA) definition of “Level B harassment”. Because these mitigation measures will be included in the IHA to Shell, no marine mammal injury or mortality is anticipated. Numbers of individuals of all species taken are expected to be small (relative to species abundance; less than 0.3 percent of any species or stock), and the take is anticipated to have a negligible impact on the affected species or stock.

This action may adversely affect, but will not jeopardize the continued existence of species listed under the Endangered Species Act (ESA). The ESA-listed species that might be affected by this action are the bowhead, humpback, and fin whales.

For bowhead whales, adverse effects will be limited to short-term behavioral disturbances that may constitute Level B harassment. No injury or mortality is expected due to this species avoiding active seismic operations by 20 km (12.4 mi) or more and other marine mammals likely taking similar actions to avoid the proximity of seismic vessels and the resultant noise. The Arctic Regional Biological Opinion (ARBO) issued by NMFS on July 17, 2008, for this action supports this determination. Impacts to marine mammals, if any, are expected to be limited to short-term behavioral harassment. This action has been determined to be consistent with determinations made under section 101(a)(5)(D) of the MMPA as the taking of marine mammals by seismic survey activities in the Arctic Ocean will have a negligible impact on affected species or stocks and be at the lowest level practicable through implementation of mitigation and monitoring measures. Migrating bowhead whales are not expected in the survey area between August and September. Moreover, a 160-dB vessel monitoring zone for bowhead and gray whales will be established and monitored. Whenever an aggregation of bowhead or gray whales (12 or more whales) are observed during the monitoring program within the 160-dB safety zone around the airgun activity (1,400 m [0.87 mi] for Shell’s survey), the operation will not commence or will shutdown, until marine mammal observers confirm they are no longer present within the 160-dB radius. Additional mitigation measures based on the Plan of Cooperation (POC)<sup>1</sup> will be required via the IHA to avoid conflicts

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<sup>1</sup> A POC or information that identifies what measures have been taken and/or will be taken to minimize adverse effects on the availability of marine mammals for subsistence purposes is required to be submitted by an applicant pursuant to 50 CFR 216.104(a)(12). The POC specifies measures the applicant would take to minimize adverse effects on marine mammals where proposed activities may affect the availability of a species or stock of marine mammals for Arctic subsistence uses or near a traditional subsistence hunting area.

between industry activities and the fall bowhead migration through the Chukchi Sea. The distribution of humpback and fin whales is considered extralimital in the Chukchi Sea, thereby causing NMFS to conclude that the probability of any humpback and fin whales being exposed would be small. Even if humpback and fin whales are found to be within the project area, any effects would be limited to behavioral harassment.

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

Response: This action will not have a significant social or economic impact to commercial fishing or other activities that might be affected by offshore seismic and site clearance and shallow hazards surveys for oil and gas deposits. Since some behavioral harassment of marine mammals is anticipated, the impacts to subsistence needs and culture were fully analyzed in the supporting EA. Marine mammals are legally hunted in Alaskan waters by coastal Alaska Natives. The species hunted include: bowhead and beluga whales; ringed, spotted, ribbon, and bearded seals; walruses; and polar bears. (Note that walrus and polar bear are under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS).) The importance of each of the various species varies among the communities and is based largely on availability. Bowhead and beluga whale hunting is the key activity in the subsistence economies in and around the Chukchi Sea. The whale harvests have a great influence on social relations by strengthening the sense of Inupiat culture and heritage in addition to reinforcing family and community ties. Harvesting of beluga whales generally occurs between April and July, and therefore is not expected in the area during the time of Shell's proposed surveys. Ringed seals are available year-round; however, the seismic survey will not occur during the primary period when these seals are typically harvested (i.e., October through June). Thus, there is no reason to expect a conflict between seismic surveys and a subsistence harvest activity. Finally, the project area is not a primary hunting ground for bearded seals, so no conflict between the survey and a subsistence harvest activity would arise.

Shell signed the 2009 Conflict Avoidance Agreement (CAA) with the AEW and the affected villages' Whaling Captains' Association. The CAA provides additional assurance that Shell's activities would not result in an unmitigable adverse impact on the availability of those species or stocks of marine mammals for taking for subsistence uses. The CAA terms that will be incorporated into the IHA as mitigation measures include a prohibition on conducting surveys within 96.6 km (60 mi) of the Chukchi Sea coast, a dispute resolution process, and provisions for emergency assistance to whalers at sea. Consequently, Shell's activity is unlikely to conflict with the native hunters. Implementation of the IHA measures ensures that there will not be significant social or economic impacts on the coastal inhabitants of the Chukchi Sea. While the CAA only seeks to resolve conflicts regarding the subsistence use of bowhead whales, NMFS has determined (based on the above stated reasons and NMFS' record) that Shell's activities will not have an unmitigable adverse impact on the subsistence uses of the other species hunted by Alaska Natives.

Moreover, Shell's activities will occur more than 113 km (70 mi) from the Chukchi Sea coast. Subsistence hunters typically do not travel this far from shore to hunt marine mammals. In addition, because Shell's survey activities will occur during the late summer and fall (after many of the Chukchi Sea communities have harvested sizeable portions of their marine mammal quota), NMFS does not believe that Shell's activities are likely to reduce the availability of the affected species to a level insufficient for a typical annual harvest. NMFS does not expect subsistence users to be directly displaced by the surveys because subsistence users typically do not travel this far offshore to harvest marine mammals. Because of the distance offshore and the lack of hunting in these areas, there is no expectation that any physical barriers would exist between marine mammals and subsistence users. Therefore, NMFS has determined (based on the above stated reasons) that Shell's activities will not have an unmitigable adverse impact on the subsistence uses of the other species hunted by Alaska Natives. The scheduling and location of the proposed shallow hazard and site clearance survey is expected to result in minimal, if any, conflict between Shell and subsistence users. As a result of these measures and the mitigation measures that will be implemented to reduce the potential for natural and physical effects, no significant social and economic impacts are expected.

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

Response: There is a lack of agreement within the scientific and stakeholder communities about the potential effects of noise on marine mammals, including in this instance, bowhead whales. This was demonstrated by the National Research Council (NRC, 2005) report and by the lack of consensus among participants in the Marine Mammal Commission's Advisory Committee on Acoustic Impacts on Marine Mammals (MMC, 2006). Over the past several years, comments and concerns from industry, environmental organizations, and Native Alaskan groups have focused mainly on: (1) questions and concerns related to NMFS' compliance with the NEPA and the MMPA; and (2) criticism of the mitigation and monitoring measures proposed by NMFS and MMS. Similar concerns were expressed in response to the release of the proposed Shell IHA in 2009. In reviewing these concerns (which are more specifically addressed and will be publicly available in NMFS' final IHA determination), NMFS believes that its actions are in full compliance with the MMPA and the ESA. As noted elsewhere in this FONSI, NMFS is requiring, as proposed by Shell, a detailed mitigation and monitoring program designed to gather additional data and reduce impacts on affected marine mammal stocks to the lowest level practicable. In addition, the oil industry will jointly implement for the fourth year, a research program to gather additional data on the status of Arctic Ocean marine mammal populations.

In 2006, industry concerns focused on the practicability of implementing some of the mitigation measures and the transfer of these mitigation measures to other areas of the world where oil and gas exploration occurs. These concerns were addressed in the 2006 final IHA *Federal Register* notices, indicating that all IHAs are reviewed independently based upon the marine mammal species affected, the level of impact, and mitigation and monitoring measures required to reduce those impacts to the lowest level practicable and

whether the activity would have an unmitigable adverse impact on subsistence uses of marine mammals. Specific to the Shell application, a notice of receipt and request for 30-day public comment on the application and proposed authorization was published in the *Federal Register* on June 1, 2009 (74 FR 26217). During the comment period, NMFS received six comment letters from the following groups and organizations: the Marine Mammal Commission (Commission); Ocean Conservancy and Oceana; the Alaska Eskimo Whaling Commission (AEWC); the Inupiat Community of the Arctic Slope; North Slope Borough (NSB) Office of the Mayor and NSB Department of Wildlife Management; and Alaska Wilderness League, Center for Biological Diversity, Defenders of Wildlife, Earthjustice, Natural Resources Defense Council, Northern Alaska Environmental Center, Pacific Environment, Sierra Club, The Wilderness Society, and World Wildlife Fund, which also included an attached letter from David E. Bain, Ph.D. Inupiat concerns on the potential impact on their traditional lifestyle have been addressed through the mitigation and monitoring measures in the IHA. As a result of the implementation of the required measures in the IHA, the industry will avoid significant sociocultural impacts. Little additional information that would augment or contradict the scientific basis for NMFS' determinations has been provided through public comment on the IHA, and NMFS continues to make its determinations under the MMPA based on the best available science. As a result, while NMFS believes that offshore oil and gas exploration and development in U.S. waters is of concern to certain members of the public, the activity proposed by Shell in the offshore waters of the Chukchi Sea in the Arctic Ocean in 2009 is not highly controversial.

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

Response: No substantial impacts to park land, prime farmlands, wetlands, or wild and scenic rivers are anticipated as a result of Shell conducting shallow hazard and site clearance surveys as none of these unique areas are found in the action area. Similarly, as described in the response to question 1 above, no substantial impacts to EFH are expected. Bowhead whales are an important cultural resource to the Native Alaskan communities in the Arctic. Based on mitigation measures described in the EA, no substantial impacts to this cultural resource are expected.

Where data are available and sufficient, NMFS has attempted to identify other areas where aggregations of bowheads are known to occur and where feeding aggregations repeatedly have been observed. Where analyses identified areas where effects to bowheads potentially could be significant, NMFS has identified monitoring and mitigation measures to reduce the potential for such impacts to non-significant levels. For the Chukchi Sea, such mitigation includes prohibiting the generation of seismic sounds when an aggregation of 12 or more bowhead or gray whales are sighted within a 160 dB isopleth from an acoustic source.

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

Response: More information is needed about the potential effects of disturbance from single vessel and multiple seismic vessels operating concurrently to the health of bowhead whale females and young calves and to the next year's reproductive potential of adult females. There is a current lack of scientific data about the effects of sound on the hearing of mysticete whales, particularly very young calves. In the past, appropriate and practicable mitigation measures have been required which were aimed at gathering additional data on these species while also reducing the potential for adverse effects on bowhead whales, especially cow/calf pairs. In the EA, NMFS again reviewed this information and determined that, because no other companies would be conducting a seismic survey in the Chukchi Sea in 2009, impacts to bowhead whales, especially cow/calf pairs, are likely to be reduced appreciably in comparison to previous years when multiple surveys have been conducted in a single season. A determination has been made that it is impracticable for Shell to monitor a 120-dB zone during its activities because the safety zone is too large to be monitored from the vessel and would need to be monitored by aerial surveys. It is not practical to use airplanes due to lack of adequate landing facilities and the prevalence of fog and other inclement weather in that area, thereby resulting in safety concerns. However, NMFS will require Shell to monitor a 160-dB safety zone for the presence of aggregations of bowhead and gray whales from the source vessel during the shallow hazard and site clearance surveys in 2009.

NMFS has reviewed the 90-day marine mammal monitoring and mitigation reports submitted for the 2008 open-water seismic and site clearance and shallow hazards surveys conducted by Shell, BP Exploration (Alaska) Inc. (BP), PGS Onshore Inc., and ConocoPhillips Alaska Inc. (Aerts *et al.*, 2008; Hauser *et al.*, 2008; Brueggeman, 2009; Ireland *et al.*, 2009). Based on the results of these studies collectively, NMFS concludes that the previous monitoring and mitigation measures prescribed in these marine mammal take authorizations were effective. In addition, actual take of marine mammals by Level B harassment was generally lower than expected due to the implementation of monitoring and mitigation measures. No Level A harassment (injuries included) or mortality was observed or suspected as a result of the operations. Therefore, effects on the human environment are not likely to be highly uncertain or involve unique or unknown risks.

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

Response: Within the U.S. Arctic Ocean there are other Federal actions, such as oil-and-gas exploration and production (BP's Northstar facility) and MMS Lease Sales in the U.S. Chukchi and Beaufort Seas. However, these activities are temporally dispersed and use appropriate mitigation designed to reduce impacts on marine life to the lowest level practicable. Finally, this area is not known for heavy ship traffic. Shell's activities will only occur for approximately 50 days, take only small numbers of each species by behavioral disturbance, and are not expected to result in injury or mortality. While it is possible that some animals may experience multiple behavioral disturbance incidents due



to the planned conduct of other actions in the larger Arctic Ocean, the potential for multiple, cumulative impacts to marine mammals is considered remote due to the distance between actions, the short term nature of anticipated behavioral effects, and the separation in time of disturbance from past activities. In addition, since mitigation and monitoring measures are in place or would be required for all actions that require MMPA take authorization, each action's effects would be managed to ensure the least practicable adverse impact to marine mammal species or stocks. Since fish and their habitats would be expected to be impacted only very close to an acoustic source, Shell's actions would not be expected to incrementally contribute to cumulatively significant impacts to fish or fish stocks or to their availability for harvest or as prey.

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

Response: The action will have some potential to adversely affect native cultural resources along the Arctic Coast. However, as described in question 5 above, implementation of mitigation measures in the IHA issued to Shell and under the signed CAA between Shell and the native whaling communities ensures that there will not be significant social or economic impacts on the coastal inhabitants of the Chukchi Sea or an unmitigable adverse impact of the subsistence uses of marine mammals by these residents. The proposed action is not likely, directly or indirectly, to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, as none are known to exist in the action area.

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

Response: The primary concern regarding the introduction or spread of a non-indigenous species from the proposed seismic survey is through ballast water exchange. Shell is responsible for ensuring that their ships are in compliance with all international and U.S. national ballast water requirements to prevent the spread of a non-indigenous species.

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

Response: This action will not set a precedent for future actions with significant effects or represent a decision in principle. To ensure compliance with statutory and regulatory standards, NMFS' actions under section 101(a)(5)(D) of the MMPA must be considered individually and be based on the best available information, which is continuously evolving. Moreover, each action for which an incidental take authorization is sought must be considered in light of the specific circumstances surrounding the action, and mitigation and monitoring may vary depending on those circumstances. In addition, the EA, evaluated the potential effects of seismic survey activities that could occur in the 2009 open-water (ice-free) season. Regarding bowhead whales, there is extensive history

and regulatory and procedural structure to evaluate the effects of seismic survey noise on bowhead whales and other marine mammal species. For these reasons, NMFS does not believe that issuance of an IHA to Shell to conduct site clearance and shallow hazards surveys in the Chukchi Sea, Alaska, in 2009 is precedent setting.

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

Response: NMFS does not expect this action to violate any Federal law or requirements imposed for the protection of the environment, as responsibilities under Section 7 of the ESA have been fulfilled (see response to question 4 above) and the action itself would result in issuance of an IHA in compliance with all standards required in the MMPA. MMS completed Section 7 responsibilities with the USFWS for the species under its jurisdiction. As the authorizing agency, MMS must comply with any required measures or conditions resulting from either the NMFS or USFWS Biological Opinions and Incidental Take Statements.

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

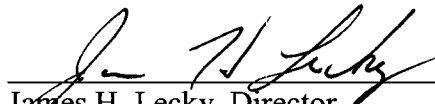
Response: There are other seismic survey activities around the world that may impact marine mammals, but most are dispersed both geographically and temporally (Gulf of Mexico, North Sea, West Africa), are relatively short-term in nature, and most either currently use, or will likely use in the future, standard mitigation and monitoring measures to minimize impacts to marine life. This action will not target any marine species, but may affect certain non-target species, such as cetaceans and pinnipeds in the area, particularly bowhead and gray whales. Shell's open-water marine survey program will only use low-intensity seismic sources (40 in<sup>3</sup> array and other types of acoustic equipment) for a short period of time (approximately 50 days). This will create small ensonified areas compared to surveys that use larger arrays. Two other surveys will occur in the Arctic Ocean in 2009: BP's Canadian Beaufort Sea survey and the joint NOAA, U.S. Geological Survey, and Canadian seismic survey in international waters more than 200 miles north of Barrow. Because of the small size of the safety radii of the exclusion zone for Shell's survey, biological observers should be able to detect marine mammals and implement necessary mitigation measures to reduce the impacts to bowhead whales and other marine mammal species. Additionally, there will be no overlap of the ensonified areas between these surveys since they are dispersed geographically. In order to avoid, and if not possible, minimize, adverse effects, NMFS is requiring Shell to implement mitigation measures, such as monitoring exclusion zones to prevent injury; ramp-up; and power-down and shutdown procedures when marine mammals are observed just outside or inside the safety zones. These mitigation measures further reduce the potential for cumulative adverse effects. The survey would also not be expected to have a substantial cumulative effect on any fish or invertebrate species. Although some loss of fish and other marine life might occur as a result of being in close proximity to the airguns, this loss is not expected to be significant. Due to the relatively large habitat area for marine mammals (and other marine species) in the Arctic Ocean

and the small area of the Chukchi Sea that is of interest for conducting this site clearance survey in 2009 (exposing approximately 900 km<sup>2</sup> (347.5 mi<sup>2</sup>) of water to sounds of 160 dB (rms) or greater), the relatively short time that seismic operations will be in the area (approximately August to end of October), the dispersed nature of marine mammals (particularly pinnipeds), the relatively low density of all marine mammal species in this part of the Arctic, avoidance behavior by some species (e.g., bowheads and belugas) to the activity area, and the implementation of mitigation measures, NMFS does not anticipate that the proposed action will result in cumulative adverse effects that could have a substantial effect on marine mammals or other marine species.

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## DETERMINATION

In view of the information presented in this document and the analyses contained in the supporting *Environmental Assessment on the Issuance of an Incidental Harassment Authorization to Shell to Take Marine Mammals by Harassment Incidental to Conducting an Open-water Marine Survey Program in the Chukchi Sea, Alaska, During 2009-2010*, prepared by NMFS, it is hereby determined that the issuance of an to Shell for the take, by Level B harassment only, of 12 species of marine mammals incidental to conducting an open-water marine survey program in the Chukchi Sea, Alaska, in accordance with Alternative 2 in NMFS' 2009 EA will not significantly impact the quality of the human environment, as described above and supported by NMFS' EA. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environmental Impact Statement for this action is not necessary.

  
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James H. Lecky, Director  
Office of Protected Resources  
National Marine Fisheries Service

AUG 14 2009

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Date