

MARINE MAMMAL COMMISSION
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27 July 2007

Mr. P. Michael Payne
Permits, Conservation and Education Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3225

Dear Mr. Payne:

On 6 April 2007 the National Marine Fisheries Service published a *Federal Register* notice announcing the availability for public review of a draft Programmatic Environmental Impact Statement (DPEIS) for Seismic Surveys in the Beaufort and Chukchi Seas, Alaska. The document was prepared in cooperation with the Minerals Management Service. The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the *Federal Register* notice and the DPEIS and offers the following comments and recommendations.

RECOMMENDATIONS

The Marine Mammal Commission recommends that the National Marine Fisheries Service revise the DPEIS to—

- (1) provide consistent and thorough descriptions of the alternatives and the zones that will be implemented under the alternatives, including approximate sizes of the zones, the effectiveness of monitoring activities to detect animals within those zones, and whether and how 120-dB zones will be used to deal with moving animals; (2) better justify the use of 12 animals as a threshold for 120- and 160-dB zones and describe the number of animals that may be taken through the course of each season and year as a more informative basis for determining potential population impacts; and (3) describe how the 120-, 160-, 180-, and 190-dB zones will be implemented under poor sighting or flying conditions;
- analyze each alternative with regard to the Marine Mammal Protection Act requirements for incidental take authorizations (i.e., small numbers, negligible population impact, and no unmitigable adverse impacts on subsistence harvests) to ensure that those requirements are satisfied;
- analyze the potential impacts of the proposed actions on each marine mammal species commonly found in the action area for each of the alternatives being evaluated, including not only the analytical conclusions but also the rationale for them;
- identify the species likely to be subject to cumulative impacts from human activities and climate change, assess the nature and degree of such impacts, and indicate how, if at all, the proposed action is expected to add to those impacts, including direct effects (e.g.,

- disturbance by noise) as well as ecological effects (e.g., mediated by ecologically related species); and
- analyze the potential effects, including cumulative effects, of the proposed seismic surveys on all Alaska Native subsistence harvests.

The Marine Mammal Commission also recommends that—

- the National Marine Fisheries Service identify key whale habitats in the Chukchi and Beaufort Seas planning areas and that the Minerals Management Service modify the existing Alaska Outer Continental Shelf (OCS) geological and geophysical exploration stipulations to require that all vessels use speeds of 10 knots or less when in those key habitat areas, when whales are seen within one mile of a vessel, or when vessels are underway in conditions that limit visibility to less than one mile;
- the Minerals Management Service work with the oil and gas industry to explore, develop, and implement, to the maximum extent possible, ways of obtaining essential information without the need for large-scale seismic surveys;
- the Minerals Management Service develop and implement a new strategy for collecting geophysical information that involves the sharing of data and thus eliminates the redundancy from multiple seismic surveys being conducted over the same area to suit the needs of different companies;
- the National Marine Fisheries Service and the Minerals Management Service develop their proposed temporal/spatial/operational restrictions and publish them in the *Federal Register* to allow for public review and comment; and
- alternative 8 be modified to include a 120-dB zone and then be selected as the preferred alternative in the final programmatic environmental impact statement.

RATIONALE

Exclusion and Safety Zones

Descriptions of the alternatives in various parts of the DPEIS are inconsistent, which has confused us and will undoubtedly lead to confusion and misunderstanding among other readers, including both the public and the decision-makers. The inconsistencies are particularly apparent with regard to “exclusion” and “safety” zones, which are significant elements of alternatives 3 through 9. On pages II-1 and II-2, the DPEIS describes alternatives 3, 4, 5, and 7 as all including either 120- or 160-dB safety zones, or both, for protection of *marine mammals*. In the same section the DPEIS then describes alternative 8 as including a 160-dB zone for bowhead and gray whales only, making—or at least implying—a clear distinction between marine mammals generally and bowhead and gray whales specifically. Later in this section (page II-5), the DPEIS states that alternative 3 would include “a required 120-dB safety zone for *marine mammals* [emphasis added] during all seismic survey operations in both planning areas,” again indicating that alternative 3 would be applied to all marine mammals. However, the DPEIS then states (page II-6) that the intent of alternative 5 is the same as alternatives 3 and 4 (presumably all marine mammals) but proceeds to describe the 120-dB zone as pertaining

only to bowhead whales. Similarly, on page II-7, the DPEIS states that alternative 7 is a combination of alternatives 3, 4, 5, and 6, but then goes on to describe limitations that are inconsistent with both alternatives 3 and 4, particularly with regard to marine mammal specificity. At this point, we found it impossible to understand how all of the various zones will be implemented under the different alternatives. Because (1) the alternatives are the heart of the DPEIS, and (2) they are defined largely in terms of the various zones, we question whether the impact statement, as written, can achieve its intended purpose—that being to sharply define the related environmental issues and mechanisms to address them and thereby to promote informed decision-making on the proposed action.

More description of the zones themselves would be helpful. In particular, the DPEIS does not describe in sufficient detail the sizes of the zones or the effectiveness of the various proposed monitoring efforts to detect animals within those zones. Such information is necessary to evaluate whether the proposed alternatives would provide effective mitigation of the potential impacts of seismic operations. Although we understand that the zone sizes will be determined by mathematical modeling of sound propagation for specific seismic sound sources and suites of environmental conditions, and that they will therefore vary in size, it would be useful for the DPEIS to provide feasible ranges and their potential variance as a function of relevant parameters. The DPEIS also should include an analysis of the probability of detecting an animal, or, conversely, not detecting an animal, within each type of zone over the period of seismic operations. This analysis could be combined with an understanding of the density and distribution of animals to determine the likelihood (under each alternative) that an undetected animal would enter a zone and be exposed to unmitigated risks.

It also would be useful to explain in more detail how the 120-dB zone would be implemented. The 160-, 180-, and 190-dB zones all are described as zones that would be centered around the seismic sound source or sources; these zones would be monitored and seismic operations would be halted or perhaps redirected to another area if marine mammals of a given species and/or number were observed within the zone. The 120-dB zone, however, is described as being centered around a sighting of marine mammals. For bowhead whales, the DPEIS specifically indicates that a sighting of a group of four cow/calf pairs would trigger the designation of a 120-dB zone. However, it is not clear how a presumably fixed 120-dB zone would work. We can understand the utility of a zone for animals that remain in a particular area, such as for feeding. As long as the animals remain in the center of the zone, then sounds produced by seismic surveys conducted outside of the zone will have attenuated to 120 dB or lower levels before reaching the animals, and received sounds at those levels presumably will not cause an alteration in animal behavior. However, it is not clear how the 120-dB zone could be applied effectively for moving animals, which would not remain in the center of the zone and therefore could be exposed to sounds at 120 dB or higher levels produced by seismic operations outside the zone. Bowhead whales are known to avoid areas where seismic sound pulses are 120 dB or louder, so it is likely that whales would avoid areas of the zone that are closest to seismic operations even though those operations are outside the zone, thereby limiting the value of the intended mitigation. To ensure that the behavior of groups of bowhead whale cow/calf pairs is not altered substantially by seismic operations, the 120-dB safety zone should be modified to provide a buffer zone large enough to allow whales to move freely during the period between successive monitoring surveys without risk of exposure to sounds at

levels higher than 120 dB from seismic operations. The required size of such a buffer zone should be estimated based on the predicted frequency of surveys (given realistic weather conditions) and the probability of sighting the same group of whales in subsequent surveys.

We also question the selection of 12 animals as the threshold number for triggering protective action. The DPEIS bases this number on the idea that the potential biological removal (PBR) level for the western Arctic bowhead whale stock was 95 in 2005, that the subsistence harvest may account for up to 82 animals annually, and that fishing-related mortality accounts for one additional animal. Accordingly, the DPEIS suggests 12 (or 95 minus 82 minus 1) as an appropriate threshold. However, this calculation mixes disparate types of taking (serious injury and mortality versus hearing injury and disturbance from a seismic survey) and does not account for the possibility of combined or cumulative takes on a seasonal, annual, or decadal scale. To ignore that possibility is to ignore the potential for an accumulation of adverse effects. If, for example, the average aggregation of animals contains fewer than 12 individuals, then over the course of the open-water season, a large number of animals—perhaps a majority of the population—could be taken one or more times without triggering any mitigation because the animals occur in relatively small groups.

We also are uncertain how an “aggregation” will be defined. If several whales were within a few tens of meters of one another, then they would surely comprise an aggregation. If they were more widely spaced throughout the 120-dB zone, would they still comprise an aggregation? If an aggregation were partly in and partly out of a zone, would it trigger a response? We also question why corrections are not made for availability and sightability of whales within 160-dB zones, as they are for whales within 120-dB zones.

Finally, the utility of the zones will depend on the conditions under which they are implemented. Cloud cover, fog, and other adverse weather conditions will inevitably limit efforts to conduct surveys, particularly by aircraft. Such conditions also pose risks to human safety. If conditions are such that neither marine mammal surveys nor seismic surveys can be conducted safely, then presumably the proposed activities will be delayed. However, if conditions are such that monitoring surveys (e.g., aerial surveys) or observations from seismic vessels are not possible, but seismic surveys can otherwise proceed, will the seismic surveys be postponed until monitoring surveys and observations are possible and safe? Because this is a highly plausible scenario and gets to the issue of the actual level of protection associated with the seismic surveys, we believe that the DPEIS should be specific on this point.

For the above reasons, the Marine Mammal Commission recommends that the National Marine Fisheries Service revise the DPEIS to—

- provide consistent, thorough descriptions of the alternatives and the zones that will be implemented under the alternatives, including approximate sizes of the zones, the effectiveness of monitoring activities to detect animals within those zones, and whether and how 120-dB zones will be used to deal with moving animals;

- better justify the use of 12 animals as a threshold for 120- and 160-dB zones and describe the number of animals that may be taken throughout the course of each season and year as a more informative basis for determining potential population impacts; and
- describe how the 120-, 160-, 180-, and 190-dB zones will be implemented under poor sighting or flying conditions.

Marine Mammal Protection Act Standards

The DPEIS acknowledges that the proposed action may have serious impacts on bowhead whales. For example, the DPEIS states that “NMFS and MMS believe that seismic surveys during the open-water period have the potential to cause large numbers of bowheads to avoid using areas for resting and feeding for long periods of time (days to weeks) while active surveying is occurring” (page III-129). The Commission agrees with this evaluation. The document goes on to state that “although the potential for significant impacts, as defined under the NEPA significance criteria (Section III.E), exists considering the higher level of activity, especially concurrent surveys, and the potential for repeated exposures during critical behaviors, required mitigation and monitoring measures would be implemented to reduce the potential for significant effects to occur” (pages II-19 and III-131). Again, the Commission concurs with the conclusions that the potential for significant impacts is real and that mitigation and monitoring are needed to reduce that potential. However, the legal requirements under the Marine Mammal Protection Act for issuing the incidental take authorizations are that takings are small in number, that they have no more than a negligible impact on the population, and that they do not have an unmitigable adverse impact on subsistence uses. Therefore, for the purpose of issuing incidental take authorizations, it is not sufficient for mitigation and monitoring to just reduce the potential for significant impacts; rather, those impacts must be reduced to the extent that they meet the Act’s requirements. To ensure that is the case, the Marine Mammal Commission recommends that the DPEIS be revised to analyze each alternative with regard to the Marine Mammal Protection Act requirements for incidental take authorizations to ensure that those requirements are satisfied.

Other Arctic Marine Mammals

The DPEIS focuses largely on bowhead whales as this species is common in the action area, is listed as endangered under the Endangered Species Act, and is important to the subsistence culture of Alaska Natives. However, a number of other marine mammals occur in the action area, and the DPEIS is not clear with regard to the likely impacts on those species and the utility of the various alternatives to mitigate those impacts. Although section III.E of the document describes criteria and methods for evaluating potential adverse effects and their significance, later sections of the document frequently fail to clearly address those criteria. We were not able to find clear statements about the nature of likely effects (i.e., adverse or not) and their potential significance for some species of marine birds, the four species of seals, killer whales, minke whales, or harbor porpoises. For example, the discussions of impacts on seals in sections II.B.3.d and III.F.4.d(1) do not say that adverse effects are likely to occur despite the fact that the DPEIS states that “direct and adverse impacts affecting some prey species (i.e., some teleost fishes) may last for days to weeks

(e.g., displacement from foraging staging or spawning habitat areas) or longer (i.e., auditory and/or vestibular harm that lasts months or even years). If seismic surveys cause pinniped prey to become less accessible...then pinniped distributions and feeding rates are likely to be affected. Newly weaned phocid pups may be particularly vulnerable to reduced feeding rates....” (page III-155).

Beluga whale populations provide an important example of the need for more in-depth coverage of other marine mammals. The beluga whale is the most common cetacean in the Beaufort and Chukchi Seas. They range throughout the area during the open-water season when seismic operations will be conducted. They are among the most vocal of cetaceans, use highly developed echolocation, and are known to respond to anthropogenic sounds. They also are an important subsistence resource for Alaska Natives at Point Lay and Wainwright and also are hunted, albeit less frequently, at Point Hope, Barrow, and Kaktovik. In spite of these facts, the DPEIS provides only a minimal description of beluga whales in the area and a cursory and inadequate analysis of likely impacts of the proposed alternatives. For example, the DPEIS states that “[o]verall, little research has been done to study the effects of seismic activity, and related vessel and air traffic, on the behavior of toothed whales other than the sperm whale” (page III-157), but it then goes on to say that “[n]o studies have shown that toothed whales in the proposed action area have reacted behaviorally to seismic sound below the 160 dB received sound level” (page III-163). Taken at face value, these statements imply that appropriate scientific studies have not been conducted to determine whether beluga whales, for example, do or do not react behaviorally to received sound levels below 160 dB. If this is the case, then the default assumption should not be that there is no effect. A thorough analysis of potential impacts of the proposed action should include a description of the distribution, abundance, and movements of beluga whales in the action area; their acoustical abilities; and their vulnerability to anthropogenic sounds and other aspects of the proposed action. Based on that information, the analysis also should evaluate whether the proposed action will take only small numbers of beluga whales, will have no more than a negligible impact on their population(s), and will not have an unmitigable adverse impact on subsistence users. If such conclusions cannot be made, then the DPEIS should be revised to include mitigation measures that will ensure that any permitted activities meet these Marine Mammal Protection Act standards. Similar analyses should be provided for all other marine mammal species commonly found in the action area.

To address those concerns, the Marine Mammal Commission recommends that the DPEIS be revised to analyze the potential impacts of the proposed actions on each species of marine mammal commonly found in the action area for each of the alternatives being evaluated, including not only the analytical conclusions but also the rationale for them. This information could be summarized in a table that would be useful for comparing the likely impacts of the various alternatives being considered.

Cumulative Impacts Analysis

As indicated in section III.C, the wildlife and environment of the Chukchi and Beaufort Seas likely have been affected and will continue to be affected by an array of past, ongoing, and planned human activities, including those leading to and those promoted by climate change. Relevant data

are sparse for many species and regions. Nonetheless, the DPEIS attempts to determine whether the proposed action will add significantly to those cumulative effects and repeatedly claims that the proposed seismic surveys are “not expected to add significantly to cumulative impacts.” The basis for that conclusion is not always clear; nor is it clear which species or resources are considered in the analyses—particularly the analysis for “other marine mammals” (III.H.4). Potential cumulative effects are described in some detail for bowhead whales and polar bears but are not considered sufficiently for some species (e.g., gray and beluga whales) or at all for others. Ribbon and spotted seals are never mentioned in the cumulative impacts analysis other than by reference to “ice-dependent pinnipeds” being “particularly vulnerable to...climate change,” and it is not clear whether any or all of the analyses and conclusions are deemed relevant to those species.

Significant cumulative impacts are most likely to result from a combination of seismic operations and other activities occurring within important habitats of specific species. Such habitats include areas used for reproduction, rearing of young, feeding, or migration. For essentially all species analyzed, seismic surveys have the potential to cause injury, behavioral modification, and displacement, with the range at which effects occur varying by species. In its report entitled “Cumulative Environmental Effects of Oil and Gas Activities on Alaska’s North Slope,” the National Research Council indicated “[i]f two or more types of disturbance occur at the same time or in the same general area, the effects could be greater than those observed from single sources. The greatest diversion [of bowhead whales from their migratory path] would occur if two or more seismic vessels operated simultaneously with one just offshore of the other.” Such displacement may be temporary, but repeated displacement from important habitats could lead to secondary adverse effects on population distribution and, eventually, population status. This concern seems to be largely overlooked or downplayed in the DPEIS cumulative impacts analysis despite the fact that seismic surveys will likely be conducted in this region for many years to come.

For those reasons, the Marine Mammal Commission recommends that the DPEIS be revised to identify all marine mammal species that may be subject to cumulative impacts from human activities and climate change, assess the nature and degree of such impacts, and indicate how, if at all, the proposed action is expected to add to those impacts, including through direct effects (e.g., disturbance by noise) as well as ecological effects (e.g., mediated by ecologically related species). The Commission understands that quantitative analysis of cumulative impacts is a difficult task, but at a minimum the DPEIS should provide a more thorough qualitative analysis of cumulative impacts, including a discussion of the types of considerations mentioned above. Development of quantitative approaches to cumulative impact analysis will require substantial effort on the part of the Services, and the Commission is interested in providing whatever assistance it can to foster that development.

Subsistence Use

Displacement as a result of human activities, including seismic surveys, also could affect the availability of wildlife and fish to subsistence hunters and fishermen. Here, too, much of the DPEIS analysis focuses on bowhead whales. For this species, the analysis indicates that “[d]evelopment already has caused increased regulation of subsistence hunting, reduced access to hunting and fishing

areas, altered habitat, and intensified competition from non-subsistence hunters for fish and wildlife,” implying that the cumulative effects of development already have adversely affected subsistence harvests. The analysis also indicates that, in the future, “[i]f increased noise affected whales and caused them to deflect from their normal migration route, they could be displaced from traditional hunting areas, and the traditional bowhead whale harvest could be adversely affected... but required protective mitigation is expected to reduce these noise disturbance impacts.” It is not clear what “required protective mitigation” is intended here or how that mitigation might be expected to reduce the likelihood of bowhead whales being displaced from their normal migratory routes when it is well known that bowhead whales are, in fact, displaced at least temporarily by vessel and seismic noise. Presumably, the protective measures suggested in some of the alternatives are considered as “required protective mitigation.” If so, the cumulative impact analysis should discuss the likely impacts under each alternative. The analysis also should consider in greater depth and detail the potential for synergism between the effects of climate change and any displacement caused by human activities. For example, sea ice retreat may allow bowhead whales to travel farther offshore in response to disturbance, thereby making them less easily available to subsistence hunters.

In addition, the DPEIS should consider cumulative effects on other important subsistence species such as ringed seals, bearded seals, walrus, and beluga whales. These species exhibit different life history strategies and habitat-use patterns and may be more or less vulnerable to disturbance than are bowheads. For that reason, we believe it inappropriate to assume that the analyses and conclusions concerning impacts on subsistence use of bowhead whales can be extrapolated to other marine mammal species. The Marine Mammal Commission therefore recommends that the DPEIS be revised to analyze the potential effects, including cumulative effects, of the proposed seismic surveys on Alaska Native subsistence harvests of all marine mammals taken in the action area.

Modification and Implementation of Existing G&G Exploration Stipulations

Pages II-2 through II-5 of the DPEIS describe existing Alaska OCS geological and geophysical exploration stipulations and guidelines as well as the “proposed mitigation and monitoring requirements specific to marine mammals” and “additional proposed mitigation measures.” These stipulations and proposed requirements provide a number of important protections for marine mammals, and the likely impacts of the various alternatives depend critically on these protections being in place. The Marine Mammal Commission concurs with the addition of these stipulations and guidelines to the alternatives as described in the DPEIS.

However, the Commission also believes that further caution is needed with regard to vessel speeds. On pages II-2-3, the DPEIS describes existing Alaska OCS geological and geophysical exploration stipulations regarding ship/boat speeds. It states that “vessels should reduce speed when within 300 yards of whales” and “[s]mall boats should not be operated at such a speed to make collisions with whales likely.” These stipulations are not sufficiently specific or cautious and provide little assurance that operators will act to avoid accidental collisions with whales. According to the best information available, it appears that most collisions involve whales that are not seen prior to being struck or are seen too late to take evasive actions. In addition, collisions are not limited to

small boats and therefore speed restrictions should be applied to all vessels. Furthermore, available information suggests that the probability of serious or lethal injuries to whales increases sharply at vessel speeds of between about 10 and 14 knots. Given this information and the currently limited feasibility of detecting whales from moving vessels, we believe that all vessels should use speeds that are unlikely to cause serious or lethal injuries to whales. This is particularly true of vessels traveling through areas where whales are likely to be present, such as known feeding grounds and migratory corridors. For these reasons, the Marine Mammal Commission recommends that the National Marine Fisheries Service identify key whale habitats in the Chukchi and Beaufort Seas planning areas and that the Minerals Management Service modify existing Alaska OCS geological and geophysical exploration stipulations to require, with exceptions if needed to ensure human safety, that all vessels use speeds of 10 knots or less when in those key habitat areas, when whales are seen within one mile of a vessel, or when vessels are underway in conditions that limit visibility to less than one mile.

Minimizing Seismic Survey Activity

The DPEIS provides a useful summary of seismic surveys conducted in the Chukchi and Beaufort Seas during 1970–2004, and the distribution of those surveys is shown graphically in Figures III.C-1, 2, and 3. The report states (page I-4) that “[p]rior to the 2006 open water season, more than 100,000 line-miles of 2D and 3D seismic surveys have been collected in the Beaufort Sea Planning Area and approximately 80,000 line-miles of 2D seismic surveys in the Chukchi Sea Planning Area.” The figures show that the nearshore portion of the Beaufort Sea planning area and nearly the entire Chukchi Sea planning area have been surveyed at least once.

The Commission recognizes that seismic surveys can be conducted for several reasons and that, as technology and market forces change, opportunities arise to collect more and better data. However, the DPEIS makes it clear that the proposed action—allowing up to six open-water seismic surveys in the Beaufort Sea and six in the Chukchi Sea each year—will have a considerable impact on the environment. Effects can reasonably be expected at multiple trophic levels, possibly leading to changes in the behavior and status of several marine mammal species. As both the short-term and long-term effects of seismic surveys and related activities are potentially significant, particularly when coupled with the primary and secondary effects of climate change in this region, the permitted amount of seismic survey activity must be limited to levels consistent with requirements of the Marine Mammal Protection Act. To ensure that seismic survey activity and its impacts are the least practicable, the permitted activity should not exceed what is absolutely essential to the industry.

The DPEIS dismisses alternative 1 (the “no-action” alternative, which would not approve any further seismic surveys) because “[i]ndustry would have to rely on other measures to obtain needed geophysical information, such as using new data-processing technology to reanalyze existing geophysical exploration seismic data and/or using survey techniques other than seismic” (page II-5), and “it does not provide the means for oil and gas industry to obtain the information it needs to evaluate the location, extent, and properties of hydrocarbon resources in the Chukchi and Beaufort seas” (page II-11). The Commission agrees that a complete cessation of seismic surveying in the area is not realistic. However, based on the likelihood of serious adverse effects on marine mammals and

their ecosystems, the Marine Mammal Commission recommends that the Minerals Management Service work with the oil and gas industry to explore, develop, and implement, to the maximum extent possible, ways of obtaining essential information without the need for large-scale seismic surveys. For example, more and better use should be made of existing data, novel methods for analyzing those data should be developed and applied, and non-seismic means of acquiring new data should be employed wherever and whenever feasible. In other words, an active effort should be made to minimize the extent and intensity of future seismic surveys in the region.

Although it is not discussed in the DPEIS, the Commission is aware that data from seismic surveys are generally considered proprietary by the oil and gas industry. Because data are not shared, a given area may be surveyed repeatedly to provide the same information to different companies. Clearly, from the perspective of wishing to reduce environmental impacts, this practice is misguided and unacceptable. The Commission does not believe that the perceived need to maintain proprietary information should be allowed to outweigh concern for the adverse environmental effects of redundant seismic surveys. The Marine Mammal Commission therefore recommends that the Minerals Management Service develop and implement a new strategy for collecting geophysical information that involves the sharing of data and thus eliminates the redundancy from multiple seismic surveys being conducted over the same area to suit the needs of different companies.

Selecting an Alternative

The DPEIS presents nine alternatives for managing seismic surveys in the Beaufort and Chukchi Seas during the open-water season. Alternative 1, the no-action alternative (no seismic survey permits would be issued), is required in the DPEIS although it is not consistently considered in the subsequent analysis. Alternative 2 (permitting seismic surveys with only Alaska OCS geological and geophysical exploration stipulations and guidelines to provide protection) and alternative 9 (limiting seismic survey permits to one in each planning area annually) are included in the DPEIS but are not evaluated in detail. Alternatives 3 through 8 are evaluated, include Alaska OCS exploration stipulations and guidelines, and present various combinations of exclusion zones, safety zones, and temporal/spatial/operational restrictions to mitigate impacts on marine mammals.

Judging the likely effectiveness of alternatives 3 through 8 is difficult for several reasons. First, as noted above, the DPEIS does not clearly describe the 120-dB and 160-dB safety zones, including their likely extent and the efficacy of monitoring methods for detecting marine mammals within them, particularly under poor environmental conditions. Second, the impacts analysis of alternatives frequently includes statements such as “[a]lternatives 3 through 8 are essentially the same with varying levels of protection for marine mammals depending on the size of the safety or exclusion zone” (page III-161). These sorts of statements seem contrary to the purpose of having multiple alternatives, which is to sharply define the issues, including the consequences of varying types and levels of protection. What is needed is a clear and complete description of the alternatives based on the varying types and levels of protection they provide. Third, as discussed above, the DPEIS does not provide and support clear conclusions regarding the likely utility of each alternative for providing the necessary protection. A presentation of the benefits of each alternative in a format that facilitates comparison (for instance, a table) would contribute to informed decision-making.

Alternatives 3 and 4 would provide protection to marine mammals through either a 120-dB or 160-dB safety zone, respectively. Alternative 5 would include both types of safety zone. Although the description of safety zones is unclear, if such zones would be triggered only by sightings of groups of bowhead whales or gray whales, then those zones would not necessarily provide adequate protection for other species unless those species happened to be located near groups of bowhead whales or gray whales. None of these alternatives includes the 180-dB and 190-dB exclusion zones, and therefore the animals would not be protected from noise-related injury. For these reasons, the Commission believes Alternatives 3, 4, and 5 are inadequate for providing the required level of protection for marine mammals.

Alternative 6 would provide protection to marine mammals only by establishing 180-dB and 190-dB exclusion zones. Although this would provide some mitigation against injury caused by seismic noise, it would do nothing to mitigate disturbance that could occur outside the relatively small exclusion zones. The Commission believes this alternative also is inadequate.

Alternative 7 would provide protection to marine mammals by establishing 180-dB and 190-dB exclusion zones as well as a 120-dB safety zone for bowhead whales and a 160-dB safety zone for bowhead whales and gray whales. This alternative provides mitigation against injury caused by seismic noise as well as some mitigation against disturbance of bowhead whales and gray whales. The alternative does not protect other species from disturbance and will be difficult to implement for lack of suitable aircraft and trained observers and because weather conditions in the Beaufort and Chukchi Seas regions often reduce visibility and increase the risks to human safety associated with flying.

Alternative 8 would provide mitigation through 180-dB and 190-dB exclusion zones, a 160-dB safety zone, and temporal/spatial/operational restrictions on seismic operations. According to the DPEIS, “[d]epending on the temporal/spatial/operational restrictions imposed, alternative 8 might exceed the level of protection afforded in alternatives 3-7” (page II-20). Although this statement may be true, it fails to provide a basis for informed selection among alternatives because the temporal/spatial/operations restrictions are not specified and described. Ideally, these restrictions would preclude seismic surveys in areas that are being used by relatively large numbers of animals for important functions. If seismic surveys are not ruled out completely, they should be restricted in a manner that ensures the animals are neither injured nor displaced. To the extent that the restrictions apply to areas and times used by Alaska Natives for subsistence hunting, they also would be consistent with the Marine Mammal Protection Act requirement of no unmitigable impact on subsistence use. We note, however, that the temporal/spatial/operational restrictions should be based on the need to avoid taking of marine mammals, and “conflict avoidance agreements” should not be relied upon for that purpose. Because the nature and utility of these measures are a critical part of alternative 8, the Marine Mammal Commission recommends that the National Marine Fisheries Service and the Minerals Management Service develop their proposed temporal/spatial/operational restrictions and publish them in the *Federal Register* to allow for public review and comment. Otherwise, the public will not have an opportunity to review and comment on those measures even though they constitute a significant part of alternative 8.

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Alternative 8 could be made more effective by the addition of a 120-dB zone. Earlier we noted concerns about implementation of such a zone, but until implementation has been attempted, it will not be possible to evaluate the zone's utility. The Commission's concerns notwithstanding, the idea of a whale-centered protection zone has merit, particularly when animals have reached an area where they might remain for some period of time (e.g., feeding). Because (1) the amount of seismic survey activity in this region will increase dramatically in coming years, (2) the effects of that activity are bound to be exacerbated by climate change and other expanding human activities, and (3) the cumulative effects on arctic ecosystems are uncertain but potentially severe, the Commission believes that all available approaches to mitigation and monitoring should be used. It will then be important to monitor their effectiveness and develop a scientific basis for discriminating between those approaches that work and those that do not. For all these reasons, the Marine Mammal Commission recommends that alternative 8 be modified to include a 120-dB zone and then selected as the preferred alternative in the final programmatic EIS. Whether the concept of a 120-dB zone is practical will likely become evident after a year or two of attempted implementation.

Please contact me if you have any questions about the Commission's recommendations or rationale.

Sincerely,



Timothy J. Ragen, Ph.D.
Executive Director

cc: John Goll