



# MARINE MAMMAL COMMISSION

21 September 2012

Mr. P. Michael Payne, Chief  
Permits and Conservation Division  
Office of Protected Resources  
National Marine Fisheries Service  
1315 East-West Highway  
Silver Spring, Maryland 20910-3226

Dear Mr. Payne:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the application from ION Geophysical (ION), seeking an incidental harassment authorization under section 101(a)(5)(D) of the Marine Mammal Protection Act. The authorization would be to take small numbers of marine mammals by harassment incidental to a seismic survey in the Alaskan Beaufort and Chukchi Seas between October and December 2012. The Commission also has reviewed the National Marine Fisheries Service's 17 August 2012 notice (77 Fed. Reg. 49922) announcing receipt of the application and proposing to issue the authorization, subject to certain conditions.

## RECOMMENDATIONS

The Marine Mammal Commission recommends that the National Marine Fisheries Service—

- continue to include proposed incidental harassment authorization language, including the total number of estimated takes by Level A and Level B harassment, at the end of *Federal Register* notices but ensure that the language is consistent with that referenced in the main body of the corresponding notice;
- propose to issue regulations under section 101(a)(5)(A) of the Marine Mammal Protection Act and a letter of authorization, rather than an incidental harassment authorization, for any proposed activities expected to cause a permanent threshold shift;
- require ION to (1) consult with the Service's National Marine Mammal Laboratory and other researchers and revise its expected density estimates for gray whales and bearded seals to reflect new information from passive acoustic recordings, and (2) include, as appropriate, an estimate of takes by Level A harassment for those species;
- require ION to recalculate expected densities for bowhead whales based on (1) the corrected decrease in abundance of bowhead whales reported by Miller et al. (2002) for early and late October (i.e., 78 percent) and (2) any additional information from more recent surveys, including acoustical surveys, conducted by the Service's National Marine Mammal Laboratory and other researchers to assess the distribution and relative abundance of bowhead whales in the survey area from October through December;
- provide stronger assurance that the actual number of takes would be negligible by (1) estimating the expected number of takes plus some measure of uncertainty in that estimate, (2) using maximum estimated densities of the marine mammals in the survey area to estimate



- takes, or (3) using some comparable approach that accounts for uncertainty and provides a high level of assurance that the actual taking would, in fact, be negligible;
- require ION to (1) revise the estimated number of Level A harassment takes to include all marine mammals that may be exposed to source levels greater than or equal to 180 and 190 dB re 1  $\mu$ Pa (for cetaceans and pinnipeds, respectively), (2) account for all sources of uncertainty in its estimation approach, including animals that may be present but not observed, (3) provide a scientific basis for any conclusions about the animals' responses to the airguns, and (4) base its negligible impact determination on the revised estimated number of Level A harassment takes;
  - require ION to (1) record, analyze, and report (within five days of collecting the data) the results of measurements of vessel sounds, including the icebreaking vessel and (2) adjust the size of the 120-dB re 1  $\mu$ Pa harassment zone and revise the estimated number of animals expected to be taken by Level B harassment for all icebreaking activities, as necessary;
  - require ION to use passive and active acoustic monitoring, whenever practicable, to supplement visual monitoring during the implementation of its mitigation measures for all activities that generate sound;
  - specify reduced vessel speeds of 9 knots or less when in transit and 5 knots or less when weather conditions or darkness reduce visibility; and
  - require ION to establish and monitor adequately both a 160- and a 120-dB re 1  $\mu$ Pa disturbance zone around all sound sources and to not initiate or continue an activity if (1) an aggregation of bowhead whales or gray whales (12 or more whales of any age/sex class that appear to be engaged in a non-migratory, significant biological behavior (e.g., feeding, socializing)) is observed within the 160-dB re 1  $\mu$ Pa zone, or (2) a female-calf pair is observed within the 120-dB re 1  $\mu$ Pa zone.

## RATIONALE

ION has proposed to conduct a seismic reflection/refraction survey in the Alaskan Beaufort and northeastern Chukchi Seas between October and December 2012 when sea ice is forming. The survey would consist of 7,175 km of transect lines in water less than 20 to 3,500 m deep over the continental shelf. ION would use one main source vessel and one icebreaking vessel. The source vessel would tow a 28-airgun array at 8.5 m in depth. The array would have a total discharge volume of 4,450 in<sup>3</sup> and an estimated source level of 232 dB re 1  $\mu$ Pa (rms). ION also would tow a hydrophone streamer up to 9 km in length to collect the seismic data. In addition, it would use an icebreaker travelling up to 1.0 km ahead of the source vessel to break and clear ice; the source level of the icebreaker in first year ice is unknown but expected to be less than 200 dB re 1  $\mu$ Pa (rms). Both vessels would use 30 to 200 kHz echo sounders continuously to measure water depth while underway. Source levels for the echo sounders typically range from 188 to 200 dB re 1  $\mu$ Pa at 1 m.

The Service preliminarily has determined that the proposed activities could result in Level A harassment of small numbers of up to three marine mammal species or stocks and Level B



harassment of small numbers of those same three plus six other marine mammal species or stocks. However, the Service believes that the total taking would have a negligible impact on each of the affected species or stocks. The Service does not anticipate any taking of marine mammals by death or serious injury, and also believes that the potential impacts on the species/stocks and their habitat would be the least practicable because of the proposed mitigation and monitoring measures. Those measures include—

- (1) conducting in-situ sound propagation measurements for the airgun array and mitigation airgun at the beginning of the survey at representative depths (weather permitting) and adjusting the respective Level A and Level B harassment zones, as necessary;
- (2) recording ambient sounds and sounds generated by the vessels (including icebreaking activities) once every hour for approximately 54 seconds;
- (3) using three trained, Service-approved, and vessel-based observers on the seismic source vessel to monitor the exclusion and disturbance zones (i.e., Level A and Level B harassment zones, respectively) during daylight hours throughout the entire survey;
- (4) using three trained, Service-approved, and vessel-based observers on the icebreaker to provide advance notice of marine mammals to the observers on the source vessel;
- (5) using ramp-up, power-down, and shut-down procedures;
- (6) prohibiting ramp-up procedures from a cold start if the entire exclusion zone is not visible;
- (7) prohibiting the practice of continuous firing of only one airgun (i.e., the “mitigation gun”) during extended maintenance (greater than one hour), long transits, and for long periods of time during darkness or other periods of poor visibility;
- (8) monitoring pinnipeds hauled out on ice within the exclusion zone and implementing power-down procedures if an animal enters the water within that zone;
- (9) altering the vessels’ speed and/or direction, if feasible, when a marine mammal in the water is detected outside the exclusion zone but is likely to enter that zone;
- (10) operating vessels in ways that avoid groups of whales and conducting activities at the maximum distance possible from those groups;
- (11) operating transiting vessels at speeds necessary to limit physical contact with whales;
- (12) avoiding potential interactions within 1.6 km of a bowhead whale by (a) reducing vessel speed to five knots or less within 274 m of the whale, (b) steering around it if possible, (c) operating the vessel in a way that does not separate members of a whale group and avoids causing a whale to make multiple changes in direction, and (d) checking the water immediately adjacent to the vessel to ensure that no whales would be injured if the propellers were engaged;
- (13) reducing vessel speed when weather conditions diminish visibility;
- (14) limiting aircraft overflights to an altitude of no less than 305 m when within 0.5 km of a group of whales;
- (15) restricting aircraft from hovering or circling above or within 0.5 km of a group of whales;
- (16) collaborating with other industry operators to deploy and retrieve acoustic recorders in the Alaskan Beaufort Sea to characterize seismic sounds and marine mammal vocalizations during fall and winter 2012/2013;



- (17) reporting injured and dead marine mammals to the Service and the local stranding network using the Service's phased approach and suspending activities, if appropriate; and
- (18) submitting field and technical reports and a final comprehensive report to the Service.

The Commission commends the Service for its inclusion of the draft incidental harassment authorization at the end of the *Federal Register* notice, as it clarifies the Service's proposed authorization. However, some of the measures outlined in that section differ from those described in the main body of the *Federal Register* notice. The Service has clarified subsequently that the above measures are correct and would be required by the final authorization. Additionally, the total number of estimated takes by Level B harassment (i.e., from the seismic survey and refueling) was not specified. The Marine Mammal Commission recommends that, in the future, the National Marine Fisheries Service continue to include proposed incidental harassment authorization language, including the total number of estimated takes by Level A and Level B harassment, at the end of *Federal Register* notices but ensure that the language is consistent with that referenced in the main body of the corresponding notice.

#### **Availability of marine mammals for subsistence**

ION has signed a conflict avoidance agreement with the Alaska Eskimo Whaling Commission and the Whaling Captains' Associations of 11 North Slope communities. It also has developed a plan of cooperation identifying the measures it would implement to minimize the survey's adverse impacts on the availability of marine mammals for subsistence. Such measures include scheduling the seismic survey to occur after the open-water season to avoid (1) periods of greater abundance of marine mammals and (2) interference with the fall bowhead whale hunts in Kaktovik, Cross Island, and Barrow. ION would begin the survey in deeper waters in the northeast and proceed west across the Beaufort Sea to the Chukchi Sea to avoid, as much as possible, any remaining whales and associated subsistence activities. ION also would conclude its seismic survey before the formation of shore-fast ice to avoid disturbance of ringed seals that may be establishing ice lairs for breeding. In addition, ION would maintain contact with an emergency communications center in Deadhorse at all times during the survey and report to the center at least every six hours and when plans or weather conditions change. Based on the timing and location of the proposed activities and the proposed mitigation, monitoring, and reporting measures, the Service preliminarily has determined that the proposed taking would not have an unmitigable adverse impact on the availability of marine mammals for subsistence use by Alaska Natives.

#### **Authorization of incidental takes by Level A harassment**

The National Marine Fisheries Service is proposing to authorize the incidental taking of three species of marine mammals by Level A harassment using the authority of section 101(a)(5)(D) of the Marine Mammal Protection Act (i.e., under an incidental harassment authorization). Level A harassment is defined in statute and regulation as "any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild" (section 3(18) of the Marine Mammal Protection Act and at 50 C.F.R. § 216.3). The Service has stated, and the



Commission agrees, that the proposed activities have the potential to injure marine mammals in part because of the limited effectiveness of mitigation and monitoring measures for protecting and observing animals in ice conditions, inclement weather, and during low or no daylight hours, all of which reduce the effectiveness of visual monitoring. As a result, observers are less likely to detect a marine mammal in the proposed exclusion zone during the survey and any marine mammal in the exclusion zone is more likely to experience an injurious effect, such as a permanent reduction in hearing sensitivity (i.e., a permanent threshold shift).

The Service informed the Commission that this is the first time that the Service has proposed to authorize taking by Level A harassment under the authority of section 101(a)(5)(D) of the Act, rather than through regulations issued in accordance with section 101(a)(5)(A). Doing so would set an inappropriate precedent that is inconsistent with the intent of the Act and the Service's implementing regulations. Regulations implementing the incidental harassment authorization provisions of the Act at 50 C.F.R. § 216.107 state that authorizations may be issued for activities that may result in only the incidental harassment of a small number of marine mammals, "except for activities that have the potential to result in serious injury or mortality, which must be authorized under § 216.105."

Any permanent hearing loss could compromise the survival of the affected animal because marine mammals rely heavily on hearing for feeding, navigation, communication, detecting and avoiding predators, and other vital life functions (National Research Council 2003). Therefore, all permanent hearing loss should be considered a serious injury. And again, activities with the potential to result in serious injury require authorization by regulation in accordance with 50 C.F.R. § 216.105.

Therefore, to ensure compliance with the Act and the Service's own regulations, the Marine Mammal Commission recommends that the National Marine Fisheries Service propose to issue regulations under section 101(a)(5)(A) of the Marine Mammal Protection Act and a letter of authorization, rather than an incidental harassment authorization, for any proposed activities expected to cause a permanent threshold shift.

#### **Estimation of incidental takes**

Observers generally cannot detect all animals that enter exclusion and disturbance zones and, in this case, their task will be more difficult when ice is present and sighting conditions are poor. For that reason, ION estimated that some animals would be exposed to sounds that are greater than the Level A and Level B harassment thresholds. However, ION's estimates of the number of animals that could be exposed are confounded by considerable uncertainty; they are based on limited or outdated stock assessment survey data and questionable assumptions regarding the behavior of, or potential injury to, animals exposed to sound pressures and energies from the proposed survey.

The Service acknowledged some uncertainty in the data and assumptions used to estimate potential takes, but considers the approach used by ION to be the best available at this time. The Commission disagrees, and believes that the Service should take a more critical look at ION's



analysis. The Commission further believes that, in view of the considerable uncertainty, the Service should require a more conservative approach—that is, one that is less likely to underestimate the number of takes that would occur as a result of the proposed survey.

*Species expected to occur in the survey area.* The Service anticipates that only two cetacean species (bowhead and beluga whales) and one pinniped species (ringed seals) would be present in the Beaufort Sea late in the survey or where extensive ice cover is present. Based on that assumption, it proposes to authorize taking by Level A harassment for those three species only. However, data from passive acoustic recorders deployed during winter in that area indicate that other marine mammal species are likely to be present during the survey and, therefore, they could be exposed to received sound levels greater than or equal to 180 or 190 dB re 1  $\mu$ Pa (rms).

Stafford et al. (2007) reported that gray whale vocalizations were recorded every month from October 2003 through May 2004 off Point Barrow in the Beaufort Sea. Although the presence of gray whales in the Beaufort Sea during past winters is not well described, evidence suggests that gray whales are expanding their range into the Arctic and may remain there to feed in the fall months during the survey. That expectation is certainly consistent with the warming trend in the Arctic, as described by Wang and Overland (2009). In fact, ION notes that gray whales may be present during the winter but then assigns only a minimal density estimate for this species (0.0001 whales/km<sup>2</sup>), the same density estimate assigned to other cetaceans not expected to be present during the survey.

In addition, 2009 and 2010 acoustic data from the Service's Bowhead Whale Feeding Ecology Study (Shelden and Mocklin 2012) provide evidence that bearded seals also will be present. That study recorded bearded seal vocalizations off Point Barrow, and found fairly consistent numbers of vocalizations per hour from August through December. ION acknowledged that bearded seals may be present, but, for this species, used density estimates (0.0004 seals/km<sup>2</sup>) only slightly greater than for species not expected to be present. It also did not request authorization for takes by Level A harassment for this species. To account for the presence and possible exposure of gray whales and bearded seals in the project area, the Marine Mammal Commission recommends that the National Marine Fisheries Service require ION to (1) consult with the Service's National Marine Mammal Laboratory and other researchers and revise its expected density estimates for gray whales and bearded seals to reflect new information from passive acoustic recordings, and (2) include, as appropriate, an estimate of takes by Level A harassment for those species.

*Expected densities of bowhead whales.* ION also appears to have underestimated the density of bowhead whales that would be present in the survey area. It first calculated average and maximum "reference" density estimates for bowhead whales in October based on multiple years of surveys. It then calculated expected densities for the eastern Beaufort survey area by reducing the average reference densities by 90 percent. It based that reduction on Miller et al. (2002), which it cited as indicating a 90 percent decrease in bowhead abundance in that area from early to late October. However, Miller et al. (2002) actually reported an overall bowhead abundance of 0.55 bowheads/100 km in early October and 0.12 bowheads/100 km in late October—that is, a reduction of 78 percent, not 90 percent. If the data in Miller et al. (2002) are considered the best available, then ION has not



used those data appropriately and, for that reason, has likely underestimated the number of bowhead whales that may remain in the eastern Beaufort in October. In addition, the density of bowhead whales in October may well be increasing each year if ice formation is occurring later in the fall. ION should be able to test for such an increase using the multi-year survey data collected in October. The error and uncertainty in ION's approach invalidate its estimate of Level A harassment takes for bowheads. To ensure that expected densities and take estimates reflect the best available data on bowhead whales during the survey period, the Marine Mammal Commission recommends that the National Marine Fisheries Service require ION to recalculate expected densities for bowhead whales based on (1) the corrected decrease in abundance of bowhead whales reported by Miller et al. (2002) for early and late October (i.e., 78 percent) and (2) any additional information from more recent surveys, including acoustic surveys, conducted by the Service's National Marine Mammal Laboratory and other researchers to assess the distribution and relative abundance of bowhead whales in the survey area from October through December.

*Accounting for uncertainties in making a negligible impact finding.* Take estimates are required in applications for incidental harassment authorizations to provide a basis for ensuring that the proposed activity will not have more than a negligible impact on the affected species or stocks. Take estimates are often, if not generally, associated with a considerable amount of uncertainty. If, for any given species or stock, the uncertainty in the take estimate is relatively symmetrical, then a negligible impact determination serves the purpose of the Marine Mammal Protection Act about one-half of the time if it is based on the average, or "expected" density and does not account for that uncertainty. That is, if the estimated take is an unbiased indicator of the actual take and the error around that expected value is symmetrical, then the actual number of takes will be greater than expected about half the time and less than expected about half the time. That means if the Service made its negligible determination based on the expected number of takes, but did not account for the associated uncertainty, then its assurance of a negligible impact would be sufficient for the purpose of the Act about 50 percent of the time.

For that reason, the Commission does not consider it appropriate for the Service to make a negligible impact finding based solely on the average or expected number of takes. That approach does not address the possibility that the actual takes will exceed the expected takes. To address that uncertainty, the Service should be seeking the information needed to complete the following statement: "Given the estimated number of takes and the uncertainty around that estimate, there is a 95 percent chance that the actual number of takes will be equal to or less than X, and the Service considers that taking to be negligible because ...."

Although ION estimated maximum and average densities, it used only the average densities to estimate expected takes. The Service appears to have done the same. That is, neither appear to have given due consideration to the error around ION's take estimates. If the expected number of takes was 1,000 plus or minus a standard error of 5 takes, the Service might consider the combination of expected number and possible error to be negligible. But if the expected number of takes was 1,000 plus or minus a standard error of 500, then the Service should reconsider whether it can provide the required assurance that the actual number of takes would be negligible. In addition,



such assurance also should account for those cases where the behavior of the potentially affected animals (e.g., beluga whales forming large social groups for foraging) could increase the chance of encountering and taking considerably more animals than one might expect on the basis of average densities.

In other incidental harassment authorizations (e.g., the U.S. Geological Survey's proposed geophysical survey in the central Gulf of Alaska; 76 Fed. Reg. 18187), the Service used maximum densities to estimate the number of takes in a way that accounted for uncertainties—uncertainties not unlike those in ION's application. The Commission does not understand why the Service did not use the same or a similar standard in this case. To address this concern, the Marine Mammal Commission recommends that the National Marine Fisheries Service provide stronger assurance that the actual number of takes would be negligible by (1) estimating the expected number of takes plus some measure of uncertainty in that estimate, (2) using maximum estimated densities of the marine mammals in the survey area to estimate takes, or (3) using some comparable approach that accounts for uncertainty and provides a high level of assurance that the actual taking would, in fact, be negligible.

*Assumptions regarding avoidance of the seismic source:* ION's approach to estimating takes by Level A harassment assumed that a significant portion of animals would avoid the sound source and therefore avoid exposure to received levels greater than or equal to 180 dB re 1  $\mu$ Pa. This assumption is not supported by best available scientific data or by current methods used to estimate takes, but instead appears to be an attempt by ION to reduce estimated takes by Level A harassment to the lowest levels possible.

Although observations of marine mammals around seismic sources suggests some level of avoidance, the degree of avoidance by individual animals is highly variable and may depend on a number of factors, including (1) an animal's prior experience with the sound source, (2) the consequences of previous encounter(s), (3) its auditory sensitivity, (4) its biological and social status, and (5) its behavioral state and activity at the time of the survey (Gordon et al. 2004). Without additional information on the responses of the potentially affected species/stocks to expected received levels in areas and at times proposed by ION, assumptions regarding avoidance of the sound source and resulting numbers of animals exposed to received levels constituting Level A harassment would be arbitrary and unsupported.

ION's calculation of ringed seal takes is indicative of its apparent attempt to reduce expected takes to the lowest level possible. It first estimated that 277 ringed seals could be exposed to sound greater than or equal to 190 dB re 1  $\mu$ Pa based on studies indicating that 75 percent of pinnipeds would avoid the seismic source. But it then used an alternative method based on the number of seal sightings and resulting powerdowns during a previous survey. That method resulted in an estimated take of 38 ringed seals. ION did not justify its use of the second estimate and the Commission questions whether it was appropriate given that the second estimate does not appear to be corrected for seals that were not seen during the previous survey. That is, it appears that ION assumed that the number of powerdowns during the previous survey is a reliable indicator of the number of seals



actually exposed. If that is the case and the estimated take of 38 seals for the proposed survey did not account for seals not seen, then the estimated take was undoubtedly biased low. If the estimate was biased low, then the Service needs to explain how that estimate provided a reliable basis for a negligible impact determination.

Further, ION stated that only 10 percent of those animals “initially exposed” to received levels above 180 and 190 dB re 1  $\mu$ Pa (for cetaceans and pinnipeds, respectively) would not vacate the area and, therefore, only that small portion of animals would be subject to a permanent threshold shift. The Commission believes and the Service has confirmed that this claim was not supported by any scientific data. However, the Service accepted it as the basis for further reducing the number of animals subject to a permanent threshold shift (i.e., Level A harassment).

Using those questionable methods, ION reduced the estimated number of Level A harassment takes by 99 and 99.6 percent for cetaceans and pinnipeds, respectively. Based on ION’s application and the information in the *Federal Register* notice, the Commission believes those reductions were arbitrary and inconsistent with the best available scientific methods. Therefore, the Marine Mammal Commission recommends that the National Marine Fisheries Service require ION to (1) revise the estimated number of Level A harassment takes to include all marine mammals that may be exposed to received levels greater than or equal to 180 and 190 dB re 1  $\mu$ Pa (for cetaceans and pinnipeds, respectively), (2) account for all sources of uncertainty in its estimation approach, including animals that may be present but not observed, (3) provide a scientific basis for any conclusions about the animals’ responses to the airguns, and (4) base its negligible impact determination on the revised estimated number of Level A harassment takes.

#### **In-situ sound measurements for vessel sounds**

ION has proposed to measure vessel sound levels (including the icebreaking vessel) on a routine basis throughout the survey using the streamer hydrophones. ION estimated that icebreaking sounds may be greater than or equal to 120 dB re 1  $\mu$ Pa out to a maximum distance of 21.6 km. That distance is less than that at which sounds from the airguns would be greater than or equal to 160 dB re 1  $\mu$ Pa. Therefore, no additional takes were calculated for icebreaking activities during the seismic survey (although takes were calculated for refueling activities). In addition, sound levels were not available for the icebreaking vessel proposed for use in this survey. Instead, ION based its sound measurements on surveys conducted nearly 30 years ago on different vessels (Zykov et al. 2011). The Commission does not consider it reasonable to assume the vessel sounds would be comparable. For that reason, the Marine Mammal Commission recommends that the National Marine Fisheries Service require ION to (1) record, analyze, and report (within five days of collecting the data) the results of measurements of vessel sounds, including the icebreaking vessel and (2) adjust the size of the 120-dB re 1  $\mu$ Pa harassment zone and revise the estimated number of animals expected to be taken by Level B harassment for all icebreaking activities, as necessary.



### **Mitigation and monitoring measures**

ION has proposed to conduct its survey in the fall when the number of marine mammals in the area is expected to be less than during the open-water season. However, ice coverage increases as autumn progresses and visibility worsens with more ice, diminishing hours of daylight, and no direct sunlight after mid-November. In addition, the exclusion zones for the survey are relatively large. These factors raise significant concerns about the effectiveness of the proposed mitigation and monitoring measures, particularly because they are highly dependent on visual observation. In previous letters, the Commission has questioned whether observers would be able to see marine mammals approaching, entering, or within an exclusion zone larger than a few hundred meters. If observers are unable to monitor the exclusion zone effectively, then important mitigation measures including ramp-up, power-down, and shut-down procedures are not likely to be implemented reliably. If that is the case, then Level A harassment is more likely to occur unless additional mitigation measures are implemented.

ION proposed to use night vision devices and forward-looking infrared to monitor the exclusion zones during darkness, but acknowledged that those tools have not been proven reliable in those conditions. To specifically address the shortcoming of visual observations as a mitigation strategy in poor visibility conditions, the Marine Mammal Commission recommends that the National Marine Fisheries Service require ION to use passive and active acoustic monitoring, whenever practicable, to supplement visual monitoring during the implementation of its mitigation measures for all activities that generate sound.

ION also proposed that vessels operating in the survey area would reduce their speed while in transit or in poor visibility conditions. However, the Service did not specify the appropriate vessel operating speeds in the proposed authorization. To address any ambiguity regarding safe vessel operating speeds, and for consistency with previous Commission recommendations regarding vessel operations in the Arctic, the Marine Mammal Commission recommends that the National Marine Fisheries Service specify reduced vessel speeds of 9 knots or less when in transit and 5 knots or less when weather conditions or darkness reduce visibility.

To ensure that aggregations of bowhead whales engaged in feeding or socializing are protected from disturbance, the Marine Mammal Commission recommends that the National Marine Fisheries Service require ION to establish and monitor adequately both a 160- and a 120-dB re 1  $\mu$ Pa disturbance zone around all sound sources and to not initiate or continue an activity if (1) an aggregation of bowhead whales or gray whales (12 or more whales of any age/sex class that appear to be engaged in a non-migratory, significant biological behavior (e.g., feeding, socializing)) is observed within the 160-dB re 1  $\mu$ Pa zone, or (2) a female-calf pair is observed within the 120-dB re 1  $\mu$ Pa zone. The Service has imposed similar requirements in other incidental harassment authorizations in the Arctic (e.g., 77 Fed. Reg. 40007) and the Commission believes they also should be included in this authorization, if issued.



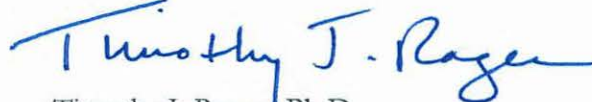
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Finally, the uncertainty regarding the efficacy of mitigation and monitoring methods still needs to be addressed, as the Commission has noted in numerous other letters for incidental harassment authorizations. Stated frankly, those measures provide some basis for protecting marine mammals, but they also are compromised by obvious shortcomings. In reviewing applications for incidental harassment authorizations, the Service is in the difficult position of having to judge whether the level of protection afforded by proposed mitigation and monitoring measures is sufficient. The scientific information available to support such a decision is simply not adequate at this time and, in the Commission's view, the Service thus will keep making decisions that involve uncertainty. However, it also has the opportunity and latitude to reduce that uncertainty by structuring authorizations in ways that use mitigation and monitoring methods to collect the needed scientific data. Taking such an approach would require the cooperation of the various action agencies, organizations, and industries involved, but also would provide a much stronger basis for making informed decisions in the future.

To improve mitigation and monitoring methods over time, the Commission would be pleased to work with the Service to identify (1) the types of seismic surveys of greatest concern, (2) the species at greatest risk and most difficult to detect and/or protect, (3) the tools that either are available now or need further development to improve mitigation and monitoring methods, and (4) the types of scientific data needed to assess and improve the efficacy of these methods.

Please contact me if you have questions regarding these recommendations.

Sincerely,



Timothy J. Ragen, Ph.D.  
Executive Director

Cc: Jon Kurland, National Marine Fisheries Service, Alaska Regional Office  
Jim Kendall, Bureau of Ocean Energy Management, Alaska Region

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