



MARINE MAMMAL COMMISSION

12 July 2013

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 (MMC), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the application from TGS-NOPEC Geophysical Company ASA (TGS), seeking an incidental harassment authorization (IHA) under section 101(a)(5)(D) of the Marine Mammal Protection Act (MMPA). TGS is seeking authorization to take small numbers of marine mammals by harassment incidental to a 2-dimensional (2D) seismic survey program in the Alaskan Chukchi Sea during the 2013 Arctic open-water season. The MMC also has reviewed the National Marine Fisheries Service's (NMFS) 12 June 2013 notice (78 Fed. Reg. 35508) 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—

- encourage the development of conflict avoidance agreements that reflect the interests of all potentially affected communities and co-management organizations and account for potential adverse impacts on all marine mammal species taken for subsistence;
- provide stronger assurance that the actual numbers of takes would be negligible by revising the estimated numbers of takes to (1) incorporate some measure of uncertainty in that estimate (e.g., upper and lower confidence limits) or (2) use maximum estimated densities;
- require TGS to revise its take estimates such that adjustment factors do not reduce the estimated densities for waters north of 72° N latitude without additional scientific basis for those adjustments;
- only authorize an in-season adjustment in the size of the exclusion and/or disturbance zones if the size(s) of the estimated zones are determined to be too small;
- specify reduced vessel speeds to 9 knots or less when weather conditions or darkness reduce visibility;
- require TGS to monitor the seismic survey area for marine mammals for 30 minutes before the proposed activities begin, during the proposed activities, and for 30 minutes after the proposed activities have ceased;
- encourage TGS to deploy additional protected species observers to 1) increase the probability of detecting marine mammals in or approaching the exclusion and disturbance zones and 2) assist in the collection of data on activities, behavior, and movements of marine mammals around the source; and

- allow sufficient time between the close of the comment period and the issuance of an incidental harassment authorization for NMFS to analyze, consider, and respond fully to comments received and incorporate recommended changes, as appropriate—the applicable statutory provision, section 101(a)(5)(D)(iii), anticipates that up to 45 days might be required.

RATIONALE

TGS plans to conduct a 2D seismic survey in U.S. and international waters of the Chukchi Sea off Alaska from 15 July–31 October 2013. TGS plans to conduct its survey along approximately 9,600 km of tracklines (within an area of 260,522 km²). The seismic source vessel would use a 3,280-in³ airgun array and tow an 8,100-m long hydrophone streamer. One additional vessel would be used to search for marine mammals and for ice and other navigational hazards.

NMFS has preliminarily determined that the proposed activities could result in a temporary modification in the behavior of small numbers of up to nine species of marine mammals, but that the total taking would have a negligible impact on the affected species or stocks. NMFS does not anticipate any take of marine mammals by death or serious injury. NMFS also believes that the potential for temporary or permanent hearing impairment from TGS's activities would be at the least practicable level because of the proposed mitigation and monitoring measures. Those measures include—

- (1) conducting in-situ sound source and sound propagation measurements for the full airgun array and the single airgun used during power-down procedures;
- (2) adjusting, as necessary, the exclusion zones (i.e., based on Level A harassment thresholds of 180 and 190 dB re 1 μ Pa for cetaceans and pinnipeds, respectively) and the disturbance zones (i.e., based on Level B harassment threshold of 160 dB re 1 μ Pa for all marine mammals) for the full airgun array and the single airgun;
- (3) using trained and experienced, NMFS-approved protected species observers stationed on the survey vessel and also on the support vessel to monitor the exclusion and disturbance zones for at least 30 minutes before and during airgun operations that occur during daylight hours;
- (4) using ramp-up, delay, power-down, and shut-down procedures;
- (5) restricting ramp-up from a full shutdown at night or in periods of poor visibility (e.g., fog, heavy snow or rain) if the entire exclusion zone has not been visible for at least 30 minutes;
- (6) firing a single airgun approximately once per minute for not longer than three hours during turns or brief transits to avoid implementation of ramp-up procedures;
- (7) preventing interactions with marine mammals by (a) avoiding concentrations or groups of two or more whales when operating vessels, (b) reducing vessel speed to less than 5 knots when one or more whales are within 274 m, (c) steering around whales, (d) avoiding vessel operations that separate members of a group or cause whales to make multiple changes in direction, and (e) checking the waters immediately adjacent to a vessel for whales before engaging the propellers;
- (8) reducing vessel speed when weather conditions or darkness diminish visibility;
- (9) using passive acoustic monitoring to supplement visual monitoring;
- (10) making all visual and acoustic monitoring data available on the website for the Ocean Biogeographic Information System-Spatial Ecological Analysis of Megavertebrate Populations (OBIS-SEAMAP) to facilitate analyses of impacts and the efficacy of mitigation measures;

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

Those measures were listed in the draft incidental harassment authorization included at the end of the *Federal Register* notice and are assumed to be those that would be required by the final authorization.

Availability of marine mammals for subsistence

NMFS indicated that TGS has signed a conflict avoidance agreement with the Alaska whaling communities outlining measures that it would implement to minimize impacts on bowhead whale hunts. TGS also has prepared a plan of cooperation to address potential impacts on subsistence hunting activities. Based on the project design, the timing and location of the proposed activities, and the proposed mitigation measures, NMFS has preliminarily determined that the proposed taking would not have an unmitigable adverse impact on the availability of marine mammals for subsistence use by Alaska Natives.

The MMC commends TGS for entering into a conflict avoidance agreement in support of its 2013 activities in the Chukchi Sea, but believes that such agreements should cover all communities that take marine mammals for subsistence in the affected area and include all species of marine mammals taken for subsistence that might be affected by seismic activities. Therefore, the MMC recommends that NMFS encourage the development of conflict avoidance agreements that reflect the interests of all potentially affected communities and co-management organizations and account for potential adverse impacts on all marine mammal species taken for subsistence.

Estimation of takes

The MMC has commented on several occasions that NMFS should estimate the numbers of animals to be taken based on density estimates that incorporate some measure of uncertainty to provide assurance that the total potential taking has no more than a negligible impact on the affected stocks. In this case, TGS's estimated numbers of takes do not reflect the significant uncertainty associated with the "best available" density estimates for marine mammals in the Chukchi Sea, and do not reflect the lack of density estimates for the proposed seismic survey area, especially those areas north of 72°. In addition, those estimates do not reflect the considerable uncertainty caused by changing climatic conditions in the Arctic.

TGS's density estimates for the proposed seismic survey area were based on two types of sources: (1) independent marine mammal surveys conducted in the U.S. Chukchi Sea (reported in IHA applications prepared by LGL 2011 and Shell 2011) and (2) sightings of marine mammals observed when the airguns were not firing during previous seismic surveys in the U.S. Chukchi Sea (reported in 90-day reports prepared by Bles et al. 2010 and Hartin et al. 2011). TGS used only the average density estimates reported in those sources, despite the limited nature of the marine mammal surveys cited in the IHA applications and acknowledgement within the 90-day reports that marine mammals sighted by observers provide only a minimum estimate of the number of animals that might have been present. TGS did not include reference to maximum density estimates or uncertainty in those estimates (e.g., upper confidence limits or standard errors), even though they

were available for at least three of the sources. NMFS's use of average densities to estimate the expected numbers of takes, without consideration of the uncertainty in those density estimates, is not appropriate when evaluating whether a proposed action will have a negligible impact on one or more species of marine mammals as it does not address the possibility that the actual takes will exceed the expected takes.

The applicability of the referenced density estimates to the proposed seismic survey area is another source of considerable uncertainty. A significant portion of the proposed seismic survey (71 percent) would be conducted in waters north of 72° N latitude—where no systematic marine mammal surveys have been conducted and for which no reliable density estimates are available. A geophysical survey was conducted in 2011 by the University of Alaska Geophysics Institute in U.S. waters north of 72° N latitude which overlapped a large portion of the proposed seismic survey area. However, no independent marine mammal surveys were conducted in conjunction with that survey and no density estimates were derived from off-effort observations (Cameron et al. 2012).

The estimated numbers of takes also do not reflect uncertainty due to increasing inter-annual variability in environmental conditions in the Arctic. For example, Weingartner et al. 2013 documented significant fluctuations in ice cover and sea surface temperature in the U.S. Chukchi Sea oil and gas lease sale areas during recent open-water seasons (2008–2010). That variability may explain, at least in part, the inter-annual differences in densities of ringed, spotted, and bearded seals reported for the same areas and years (Aerts et al. 2013). Inter-annual variability in environmental conditions could challenge basic assumptions regarding marine mammal movements and abundance in the leasing area as well as throughout the Chukchi Sea.

For these reasons, the MMC recommends that NMFS provide stronger assurance that the actual numbers of takes would be negligible by estimating the expected numbers of takes by (1) incorporating some measure of uncertainty in that estimate (e.g., the upper confidence limit or mean plus standard error) or (2) using maximum estimated densities.

Given the inherent uncertainties, NMFS should require a conservative approach to the estimation of takes—that is, one that is less likely to underestimate the numbers of takes that could occur as a result of the proposed survey. Instead, TGS and NMFS have proposed to reduce the estimated densities for those portions of the seismic survey that would occur north of 72° N latitude by applying adjustment factors ranging from 0 to 1, based on the assumption that marine mammals would occur in lower numbers in the deeper waters of the Chukchi Sea. Although that assumption may be valid for certain species, no explanation is provided for how TGS derived the values for the proposed adjustment factors. TGS did state that NMFS approved a similar 0.1 adjustment factor to take estimates for ION's 2012 IHA for an in-ice seismic survey in the Beaufort Sea. However, contrary to the assertion of TGS, that adjustment was made to account for expected avoidance of the sound source by marine mammals, not for lesser numbers of animals expected within the survey. Regardless, the MMC was critical in that case of NMFS's support for the use of adjustment factors that have no scientific basis or support and is again concerned that NMFS is proposing this seemingly arbitrary approach to the estimation of takes in the face of uncertainty. It is also unclear from the information provided in the *Federal Register* notice whether TGS applied additional adjustment factors to the density estimates. Therefore, the MMC recommends that NMFS require TGS to revise its take estimates such that they do not apply adjustment factors that reduce the

estimated densities for waters north of 72° N latitude without additional scientific basis for those adjustments.

Mitigation and monitoring measures

Sound source verification

Accurate characterization of the sizes of the exclusion and disturbance zones is critical for implementing mitigation measures and estimating the numbers of animals taken. In the past, the MMC has recommended a rapid turnaround of the in-situ sound source verification analysis to ensure that exclusion zones are the appropriate size. However, in at least one instance, rapid turnaround has resulted in errors, as occurred with ION's measurements of source levels during its 2012 in-ice survey. In that case, the size of the exclusion zone was decreased from that modeled based on erroneous field-report results. The error was not discovered until the end of the field season, when it was determined that the in-season adjustments resulted in unauthorized Level A harassment takes of bowhead whales. Since the purpose of verification is to ensure protection of marine mammals, one way to reduce risk to marine mammals would be to allow only for expansion, but not contraction, of the exclusion and/or disturbance zones after in-situ measurements are made. Therefore, the MMC recommends that NMFS only authorize an in-season adjustment in the size of the exclusion and/or disturbance zones if the size(s) of the estimated zones are determined to be too small.

Speed alterations

TGS also proposed that vessels operating in the survey area would reduce their speed in poor visibility conditions to ensure no physical contact with or injury of whales. However, NMFS did not specify the appropriate vessel operating speeds in the proposed authorization. In other IHAs, NMFS has specified that seismic operators reduce speeds to 9 knots or less when weather conditions require, such as when visibility drops (77 Fed. Reg. 40007). To address any ambiguity regarding safe vessel operating speeds, the MMC recommends that NMFS specify reduced vessel speeds of 9 knots or less when weather conditions or darkness reduce visibility.

Monitoring after survey operations

NMFS proposed that TGS monitor for marine mammals 30 minutes before and during the proposed activities. No post-activity monitoring requirement was specified. However, post-activity monitoring is needed to ensure that marine mammals are not taken in unexpected or unauthorized ways or in unanticipated numbers. Some types of taking (e.g., taking by death or serious injury) may not be observed until after the activity has ceased. Post-activity monitoring is the best way, and in some situations may be the only reliable way, to detect certain impacts. Accordingly, the MMC recommends that NMFS require TGS to monitor the seismic survey area for marine mammals for 30 minutes before the proposed activities begin, during the proposed activities, and for 30 minutes after the proposed activities have ceased.

Enhanced monitoring to detect marine mammals and document behavioral responses

The overall objective of monitoring should be to provide reliable, statistically robust estimates of the marine mammals in the project area, data on their distribution and movement patterns, and evidence sufficient to determine if and how project activities affect their presence, distribution, and movements. An increased number of observers who monitor for marine mammals at any given time on the source vessels and other project-related vessels would increase the probability of detecting marine mammals in the area. Additional observers also would assist in the collection of data on activities, behavior, and movements of marine mammals in the exclusion and disturbance zone. Behavioral response information is critical for understanding the effects of acoustic activities on various marine mammal species. Therefore, the MMC recommends that NMFS encourage TGS to deploy additional protected species observers to 1) increase the probability of detecting marine mammals in or approaching the exclusion and disturbance zones and 2) assist in the collection of data on activities, behavior, and movements of marine mammals near the source.

Adequate time for incorporation of public comments before issuance of an authorization

The deadline for comments on the proposed incidental harassment authorization is 12 July 2013, yet the Service has indicated in the proposed incidental harassment authorization that the effective date would be 15 July. The MMC is concerned that the time between the close of the comment period and the proposed issuance date (less than 1 business day) does not provide adequate opportunity for NMFS to consider, provide adequate responses to, and incorporate any changes prompted by comments from the MMC and the public. This rushed timeframe runs counter to the intent of the MMPA, which provides for meaningful public input on proposed authorizations, and may preclude the implementation of some of our recommendations (e.g., recalculating take estimates to take uncertainty into account).

The MMC recognizes that staffing limitations, the growing number of incidental harassment authorization requests, and the complexity of some of those requests may make it difficult for NMFS to publish a proposed authorization in a timely manner. However, the MMC does not believe that NMFS should issue authorizations without full consideration of comments received. To ensure effective compliance with both the letter and the spirit of the public review process provided for under the MMPA, the MMC recommends that NMFS allow sufficient time between the close of the comment period and the issuance of an incidental harassment authorization for NMFS to analyze, consider, and respond fully to comments received and incorporate recommended changes, as appropriate. Without knowing the number and content of comments on the proposed authorization, it is difficult for the MMC to suggest a specific timeframe for the necessary review. However, we note that the applicable statutory provision, section 101(a)(5)(D)(iii), anticipates that up to 45 days might be required.

The MMC appreciates the opportunity to review this incidental harassment authorization. Please contact me if you have questions regarding these recommendations.

Sincerely,



Rebecca J. Lent, Ph.D.
Executive Director

Cc: Jon Kurland, National Marine Fisheries Service Alaska Regional Office

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