

the area around the vessel with 7 X 50 Fujinon reticle binoculars or with the naked eye during the daytime. At night, NVDs will be available (ITT F500 Series Generation 3 binocular image intensifier or equivalent), and used, if necessary. Laser rangefinding binoculars (Bushnell Lytespeed 800 laser rangefinder with 4 optics or equivalent) will be available to assist with distance estimation.

The vessel-based monitoring will provide data required to estimate the numbers of marine mammals exposed to various received sound levels, to document any apparent disturbance reactions, and thus to estimate the numbers of mammals potentially taken by Level B harassment. It will also provide the information needed in order to power-down the airguns at times when mammals are present in or near the safety zone. Results from the vessel-based observations will provide (1) the basis for real-time mitigation (airgun power-down); (2) information needed to estimate the number of marine mammals potentially taken by harassment, which must be reported to NMFS; (3) data on the occurrence, distribution, and activities of marine mammals in the area where the seismic study is conducted; (4) information to compare the distance and distribution of marine mammals relative to the source vessel at times with and without seismic activity; and (5) data on the behavior and movement patterns of marine mammals seen at times with and without seismic activity.

Reporting

When a mammal sighting is made, the following information about the sighting will be recorded: (1) Species, group size, age/size/sex categories (if determinable), behavior when first sighted and after initial sighting, heading (if consistent), bearing and distance from seismic vessel, sighting cue, apparent reaction to seismic vessel (e.g., none, avoidance, approach, paralleling, etc.), and behavioral pace; and (2) time, location, heading, speed, activity of the vessel (shooting or not), sea state, visibility, cloud cover, and sun glare. The data listed under (2) will also be recorded at the start and end of each observation watch and during a watch, whenever there is a change in one or more of the variables.

All mammal observations and airgun power-downs will be recorded in a standardized format. Data will be entered into a custom database using a laptop computer when observers are off-duty. The accuracy of the data entry will be verified by computerized validity data checks as the data are entered and by subsequent manual checking of the

database. These procedures will allow initial summaries of data to be prepared during and shortly after the field program, and will facilitate transfer of the data to statistical, graphical or other programs for further processing and archiving.

A draft report will be submitted to NMFS for review within 90 days after the end of the seismic program in the Hess Deep area which is predicted to occur on or about July 28, 2003. The draft report will cover the seismic surveys in the Hess Deep area and will provide full documentation of methods, results, and interpretation pertaining to all monitoring tasks. The draft report will summarize the dates and locations of seismic operations, sound measurement data, marine mammal sightings (dates, times, locations, activities, associated seismic survey activities), and estimates of the amount and nature of potential "take" of marine mammals by harassment or in other ways. The draft report will be considered the final report unless comments and suggestions are provided by NMFS within 60 days of its receipt of the draft report.

Estimates of Take by Harassment for the Hess Deep Cruise

As described previously (see 68 FR 17909, April 14, 2003) and in the L-DEO application, animals subjected to sound levels above 160 dB may alter their behavior or distribution, and therefore might be considered to be taken by Level B harassment.

Based on summer marine mammal survey data collected by NMFS and density calculations by Ferguson and Barlow (2001), L-DEO used their average marine mammal density to compute a "best estimate" of the number of marine mammals that may be exposed to seismic sounds ≥ 160 dB re 1 μ Pa (rms). The average densities were then multiplied by the proposed survey effort (912 and 189 km for the 10-gun and 12-gun array, respectively) and twice the 160 dB safety radius from the source vessel (the 160-dB radius was 6.5 and 7.25 km for the 10-gun and 12-gun array, respectively) to estimate the "best estimate" of the numbers of animals that might be exposed to sound levels ≥ 160 dB re 1 μ Pa (rms) during the proposed seismic survey program. Separate estimates were made for the 10-gun and 12-gun arrays because the 160-dB radius was different for the two arrays (see Tables 5 and 6 in L-DEO (2003)). Based on this method, Table 7 in L-DEO (2003) provided a "best estimate" of the number of marine mammals (by species) that would be exposed to ≥ 160 dB (rms), and thus potentially taken by Level B

harassment, during the proposed survey, by both the 10-gun and 12-gun arrays. Twelve animals would be endangered species, sperm whales (11) and a single blue whale, while two stocks of dolphins would account for 96 percent of the overall estimate for potential taking by harassment.

Conclusions

Effects on Cetaceans

Strong avoidance reactions by several species of mysticetes to seismic vessels have been observed at ranges up to 6 to 8 km (3.2–4.3 nm) and occasionally as far as 20–30 km (10.8–16.2 nm) from the source vessel. Some bowhead whales avoided waters within 30 km (16.2 nm) of the seismic operation. However, reactions at such long distances appear to be atypical of other species of mysticetes, and even for bowheads may only apply during migration.

Odontocete reactions to seismic pulses, or at least those of dolphins, are expected to extend to lesser distances than are those of mysticetes. Odontocete low-frequency hearing is less sensitive than that of mysticetes, and dolphins are often seen from seismic vessels. In fact, there are documented instances of dolphins approaching active seismic vessels. However, dolphins as well as some other types of odontocetes sometimes show avoidance responses and/or other changes in behavior when near operating seismic vessels.

Taking account of the mitigation measures that are planned, effects on cetaceans are expected to be limited to avoidance of the area around the seismic operation and short-term changes in behavior, falling within the MMPA definition of "Level B harassment." In the cases of mysticetes, these reactions are expected to involve small numbers of individual cetaceans because few mysticetes occur in the areas where seismic surveys are proposed. L-DEO's "best estimate" is that 10 Bryde's whales, or 0.1 percent of the estimated Eastern Equatorial Bryde's whale population, will be exposed to sound levels ≥ 160 dB re 1 μ Pa (rms) and potentially affected, and 1 blue whale, or 0.1 percent of the endangered ETP blue whale population, would receive ≥ 160 dB. Therefore, these potential takings by Level B harassment will have a negligible impact on their populations.

Larger numbers of odontocetes may be affected by the seismic survey activities, but the population sizes of the main species are large and the numbers potentially affected are small (<0.1 percent) relative to the population sizes. The total number of odontocetes that might be exposed to ≥ 160 dB (re 1 μ Pa