

Comments of Dr. Bruce Mate:

I understand and appreciate the Navy's mission to defend us. I am grateful for a society in which even the most important missions require a certain amount of inspection and comment by the general public, to assure it has broad-scale support and the least impact on other aspects of life and nature as needed. Thank you for preparing such a large document, and providing details that have never before been shared with the public or the scientific community about your future needs and your historic operations in the NWT waters offshore.

I have been studying marine mammals along the Oregon coast since 1968, finishing a PhD from University of Oregon describing the migration habits of sea lions. I completed an NIH post-doctoral fellowship in Biochemistry in 1974. I have been at Oregon State University in a faculty position since then, focusing my research exclusively on the study of marine mammals, which has included 30 years of continuous ONR research funding on whale topics, which included the distinction of ONR Marine Mammal Investigator of the Year Award in 2001. I have been at the OSU Hatfield Marine Science Center since 1975, where I am Director of the OSU Marine Mammal Institute, a multi-disciplinary group studying marine mammal ecology. My comments at the Newport hearing were made as a private citizen, but those I offer here are in response to elected officials asking me to respond as a professional scientist with a marine mammal specialty. The comments fall into three broad areas: Notification Process, EIS Assessment of Risk, and Mitigation.

Notification:

I do not personally believe that the Navy would be disingenuous in its communications efforts, but many skeptical parties will feel that there was not a genuine effort applied to raising public awareness of the comment process or receiving broad-scale stakeholder input on this issue. The only copy of the DEIS placed in Oregon was in the Lincoln City Public Library, which is a small coastal community with no port, no developed commercial fishing interests, nor where the only public hearing in Oregon was held. I believe a copy should have been available in the Newport public library since it is the County seat, the center of most of Oregon's commercial fishing enterprises, and the site of the Hatfield Marine Science Center, which was the location of the only hearing in Oregon for public testimony. Although the Federal Register notice and a few small local ads in the small local Newport paper may suffice under the letter of the law, not providing news releases with the relevant information to the Oregonian (Portland), the Statesman Journal (Salem and State capital) and the Eugene Register Guard, kept this information from reaching over 80+% of Oregon's newspaper-reading public. Further, none of the Portland or Eugene television stations that I contacted were aware of this meeting, nor were any of the federal agency heads of laboratories at the Hatfield Marine Science Center, which included the EPA, USFWS (responsible for offshore island management), NOAA, or the National Marine Fisheries Service. Despite my long association with ONR, I was neither asked for input (local knowledge) during the development of this DEIS, nor did a copy come to my office for review. Overall, Navy notification in my opinion was far too little and to engage the number of interested parties who would have otherwise participated.

DEIS Assessment of Risk (errors in content, omissions and interpretation):

In the Marine Mammal chapter, table 3.9-1, there are several errors of fact, many of which are readily available in print, some of which are matters of widespread public knowledge, and some of which might be considered more limited in public awareness, but known to those of us doing research in this region and field. For instance, although it is true that most blue whales and humpback whales are on their southern breeding grounds from November through April, they are also found in the NWTR region at that time. During the last 30 years, gray whales have also been a steady source of tourism-based industry here from May to October feeding near shore along the Oregon Coast, as are Dall porpoises, killer whales, and (during some years) striped dolphins. It is fair to say that most observers would not recognize the difference between transient, offshore, or resident killer whales, but as recently as the week before the hearing we had sightings of 24 members of the L pod (resident) orcas from Puget Sound, and later members of K and J pod. These are ESA-listed species.

In general, it is difficult for even a professional like myself to verify the risk model which was the basis for this DEIS without having a much better understanding of where and when each of the proposed activities will occur. For instance if, as the executive summary notes, the primary risk of PTS for sonar exposure is harbor seals (a near shore species), then it would seem a whole complex of marine mammals that are also typically near shore would also be at risk, including harbor porpoises, orcas, sea lions, and gray whales. Spanning from near shore to 250 miles offshore and such a variety of activities, it is impossible at the present time to characterize the possible impacts. Further, the public is left trying to infer where activities like detonation of dummy mines might occur from the reference to divers working 10m off of the bottom. Are we to conclude that much of the debris will be cleaned up or left? This becomes an issue possibly for bottom-feeding species like near shore gray whales, while lines left in the water may be an entanglement issue for any of the cetaceans.

Oregon has a narrow continental shelf and a steep slope, so we have deep water species fairly close to shore including beaked whales, false killer whales, pygmy sperm whales, and sperm whales. These are all deep divers and as such may encounter higher levels of sound in the Sofar Channel (a deeper area of acoustic ducting as a result of temperature and pressure), which tends to capture sound and have very little attenuation (rather than the spherical spreading losses more typical in shallower waters). In the summary table on exposure risks there certainly must be other sources of permanent threshold shift (PTS) than just a 50% rupture of the tympanic membrane. If so, why are they not a possibility for underwater detonations, and why is lung injury only an issue for harbor seals? Why is PTS the only level A exposure to sonar? What about other tissue injuries? Recently, some scientists have speculated that the injuries to beaked whales, (that have rightly or wrongly been ascribed to military sonar in other parts of the world) may be due to the animals' panicked response, which sends them to the surface so quickly that they develop fat and air emboli associated with the bends. While most people are familiar with this circumstance as an affliction of divers' breathing compressed air at depths, recent bone evidence shows signs of cumulative bends exposure in sperm whales, suggesting this is a latent issue for them under natural circumstances. Recent ONR-funded dive data suggest that some of the beaked whales are doing bounce-decompression by coming to the surface for a breath and descending to an intermediate depth to decompress (perhaps several times) before another long dive. If some species pursuing this strategy are panicked, accelerate their ascent to the surface,

and are reluctant to dive again, then the impact of operations in their vicinity may be somewhat immediate and such evidence in deep water will not likely come ashore to be evaluated as part of the immediate, cumulative, or long-term impacts of offshore operations. As a result, I will add comments in the mitigation section on additional ways in which this might be evaluated as a part of future operations. Because of the long dive times for many deep-diving species, it will be prudent to add additional search time to evaluate their presence before operations begin in deep or slope waters (probably 70% of the Op area).

The Cumulative Effects chapter concluded that there would be no cumulative effects related to fish, yet the DEIS never addressed how such sonar activity impacts would be detected. With the present limitations of not knowing where and when sonar and other activities might be practiced in the area, it is difficult to address the possibility of displacement or avoidance behaviors. The Navy said at the Newport public meeting that NMFS is collaborating with them. Surely this is merely reference the Section 7 consultation requirement in accordance with the ESA and the MMPA concerning the NMFS responsibilities to identify potential for impacts to marine mammals resulting from the proposed NWTRC activities. The way this was portrayed was in my opinion misleading. It is NOT an endorsement or collaboration as much as it is a required consultation with the pertinent regulatory authority. It would be useful to include the NMFS recommendations in the DEIS. If the NMFS recommendations have not been offered yet, then this DEIS is less useful for public review and perhaps prematurely offered to the public.

In general the DEIS Option 2 doubles the level of activities which the Navy has been undertaking since WWII. It also adds several activities, which have not previously been identified in this region. In that regard, it would be especially useful to provide additional information about whether particular activities pose new or different sorts of risk. For instance, does electronic combat training emit sound, magnetic waves or other potentially discernible emissions for fish, birds, mammals or invertebrates? The development of new technologies such as the portable undersea tracking range emits a 190-194dB source and may operate for five hours per day for 30 days, during the summer from June to August. This is a time when many species are in the OPAREA, so it would be useful to know whether these are consecutive days or spread out through the summer months.

Mitigation:

Pre-exercise surveys should be conducted for longer than the proposed 30 minutes prior to the commencement of an explosive event so that longer-diving whales will have a high probability of being detected visually at the surface. A reliance purely on passive acoustic monitoring is inadequate because not all species are vocal. Further, in many baleen whales only the males are vocal, the behavioral and seasonal context remain unclear. The use of 3 trained visual observers is laudable but of no value at night and very limited value in daylight when winds get above 15-20 kts for small cetaceans or above 20 kts for large cetaceans.

With sonar levels of 235dB, the Navy is operating at levels that are millions of times higher at their source than what NMFS allows the sound exposure level to reach for animals. For instance, oil and gas seismic activities are not supposed to expose whales to levels >160dB, at which half the population is expected to change behavior. Such behavioral changes under the MMPA are considered "takes", an unfortunate term, which inappropriately suggests mortality to poorly,

informed readers. Simplistically, the sound exposure levels for animals are related to the power level of the source and their distance from the source. The DEIS could do a much better job of informing readers what level of sound (and distances) might result in specific types of behavioral responses (including cessation of feeding), TTS, and more permanent injuries for specific activities. In this context it would be useful to know from the Navy's vast modeling experience what the sound exposure levels (as suggested mitigation criteria) would be at 1000 yards, where the suggested solution is to reduce power by 6dB, or by 10dB when animals are detected within 500 yards. These are legitimate questions to evaluate whether significant physiological effects are likely. The document should be able to, within general terms, provide figures, tables or text, which relates the way sound energy drops off with distance in a typical NW environmental setting by season and depth category. While there are certainly variations in sound velocity and losses depending upon salinity, temperature and pressure, some attempt should be made at providing a general evaluation for the public that resembles typical situations.

In one circumstance, a mitigation suggestion was that helicopters would be required to observe or survey the vicinity of a training event for 10 minutes before the first deployment of active (dipping) sonar in the water. This seems inadequate in areas where deep diving species occur, many of which spend over 30 minutes underwater on a single breath. I could not find any mention of the amplitude of this type of sonar, but the DEIS says the Navy will cease pinging if a marine mammal is within 200 yards. If a shutdown takes place, how soon afterwards will sound be resumed? Elsewhere it was suggested that experiments would resume within 30 minutes if no whales were detected. This may not be long enough for deep divers to flee the area.

The DEIS indicates that no mitigation actions are necessary if dolphins or porpoises exhibit bow wave riding behavior, however if the sonar systems are not in use it should not be turned on under such circumstances. With regard to underwater detonations, the 700-yard radius exclusion zone for mine warfare and countermeasures should be related in terms of the likely sound exposure level at that distance to consider its adequacy. I was unable to identify information regarding the source levels for these charges.

Because there is still considerable concern and debate about the effects of military sonar, it would be prudent that surveys prior to such activities are of long enough duration, large enough in scale of area, and varied in type to assure whales are not in the possibly affected area(s) (dependent upon source levels for specific activities). Further, because animals in distress may spend more time at the surface, a post-activity monitoring effort would be advisable. I do not see any attempt to monitor cumulative (long-term) impacts, and suggest that a thorough post-mortem examination of beach-cast mammals would be appropriate throughout the year with or without Naval activities. At the present time, the Oregon Marine Mammal Stranding Network has modest funding from the NMFS Prescott Grant Program, which limits how fast and complete a response can be mounted for reported strandings. Because the evidence of emboli can be lost in a fairly short period of time to the general deterioration of specimens, a fast response time is critical and an enhanced effort to identify possible sound-related trauma injuries is important. This would include examining the inner ear for damaged hair cells in the cochlea and ruptured tympanic membrane. This type of specialty examination will require additional time and effort, but should be an enhancement of the present protocols. These results should then be combined with the knowledge of when and where naval activities have taken place. If this notification of activities

cannot be provided ahead of time or in real-time, it should certainly be made available soon thereafter so that any appropriate correlations can be determined after the fact. While correlation is not the same as cause and effect, it is the means by which scientists develop and test hypotheses about probable associations. In many respects this DEIS is the first appreciation the public and scientific community has had about the extent of naval activities which has been going on offshore. In that regard, it would be important for the Navy to be forthcoming about its historic operations in this region as well so that a retrospective examination of individual and mass stranding events can be conducted.

A summary table (3-9-13) suggests that various species may or may not be affected by the variety of proposed activities. There are only three "levels" in the table: MA (may affect), NE (no effect), and NA (inadequate information to determine). With so many ESA-listed species (threatened or endangered due to their depletion) and uncertainty, it would seem prudent for the Navy to provide more detail of their modeling effort. At the present time it is hard to agree that no significant impact or significant harm to marine mammals would occur for the three proposed actions (even at existing levels of operations). The Federal Register notice says, "The decision to be made by the Navy is to determine which of the alternatives analyzed in the EIS/OEIS best meet the operational needs of the Navy, given that all reasonably foreseeable environmental impacts have been considered." If the Navy's present assessment is that none of the alternatives provides evidence of adverse impact, it seems obvious that more than doubling the current activity will be approved. As a result, the weight of that assessment is critically important to affirming their decision. In that regard, improvements in their analyses are important. Owing to the overwhelming response of the participants at the Newport hearing and their consensus regarding the perceived inadequate notification, additional public outreach events and opportunities for public input are essential. I recommend that the period for written input be extended by 45 days, that the Navy make its DEIS more widely known, and that they widely advertise their return to Oregon for at least one additional hearing to be held at least two weeks before the close of the new written input deadline.

MITIGATION

In general, the Navy should train, practice, and develop tools and protocols which may have adverse effects on marine mammals in areas where the likely effects are lowest with regard to ESA-listed species.

The Navy should conduct more observations of the areas around exercise area before beginning the exercise to assure that it is clear of animals. The observers should record their data in a consistent and organized manner so that the information is usable to better estimate how many of which species of marine mammals are in the NWT. These data should be made available to scientists and the public at least annually and a summary report should be prepared for the public at least every 5 years. The purpose of this is to expand knowledge about what occurs in the NWT.

The Navy should make historic records of their activities available to scientists requesting them so that they can evaluate correlations of these activities with unusual stranding events (numbers or unusual species).

The Navy should make records of their operations available to scientists requesting them in close to real time (annually) to evaluate the possible effects of the activities proposed in the DEIS. These data should detail the specific locations, date, times, nature of the activity, levels of sounds created

The Navy should provide effort to evaluate the possible impact of their operations. This could be done with "post-exercise" surveys of activity areas to assess whether or not they find animals that may have been effected (such as unusually long surface times), evaluating animals found dead in the region, and facilitating stranding work-ups to

identify animals possibly directly effected (damaged hearing apparatus) or lag-effected animals (such as ematiated stranded animals with signs of impairment showing up after operations).

The Navy should provide funds to improve the regional stranding networks' capabilities to evaluate marine mammal strandings, especially cetaceans to determine whether or not NWT activities have caused some of the strandings (examinations of anatomical and physiological parameters associated with hearing). If there is good reason to believe that there are adverse effects, that the numbers of animals effected are higher than predicted, or that effected species are of great concern (ESA-listed or considered rare), then the Navy should try to reduce the effects of their activities.

The duration of the proposed period of activities under this DEIS was not apparent to me. I suggest the requested activities be authorized for a period of ten years and that there then be a public meeting for a reasonably detailed summary of NWTR activities and an evaluation of their possible effects, looking at all available data sources before an extension of the activities is authorized for another ten years. This evaluation ought to involve regional scientists and provide at least one meeting for the public (held within a major metropolitan community onshore of the NWT area). The meeting should be well publicized in advance and held in a suitably large enough facility to accommodate the likely number of interested persons. It should include presentations and have sufficient time for Navy-public Q & A plus discussion time, as well as the normal public "hearing" format for public comment