MARINE MAMMAL COMMISSION
4340 EAST-WEST HIGHWAY, ROOM 905
BETHESDA, MD 20814

18 January 2006

Mr. Keith Jenkins
Department of the Navy
Naval Facilities Engineering Command–Atlantic
6506 Hampton Boulevard
Norfolk VA 23508-1278

Dear Mr. Jenkins:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the Draft Overseas Environmental Impact Statement/Environmental Impact Statement: Undersea Warfare Training Range, dated October 2005 (the DEIS), and offers the following comments and recommendations.

The proposed action "is to instrument a 1,713-square-kilometer (km^2) (500-square-nautical-mile [NM^2] area of ocean [off the U.S. East Coast] with undersea cables and sensor nodes, creating an undersea warfare training range (USWTR), and to use the area for anti-submarine warfare (ASW) training." The purpose of the proposed action is to enable the Navy to more effectively carry out ASW training "in a shallow water environment (encompassing 37 to 274 meters [m], or 120 to 900 feet [ft], in depth) at a suitable location for Atlantic Fleet units." The training would typically involve up to three ships, two aircraft, and a variety of support vessels for each exercise. The instrumented area would be connected to shore by a single trunk cable.

The DEIS identifies and provides assessments of the relative merits of three possible alternative sites, plus a "no-action" alternative. The alternative sites are Site A – offshore of southeastern North Carolina (Cherry Point Operating Area [OPAREA]); Site B – offshore of northeastern Virginia (VACAPES OPAREA); and Site C – offshore of northeastern Florida (Jacksonville/Charleston OPAREA). The preferred alternate is the site offshore North Carolina (the Cherry Point OPAREA). The DEIS concludes that installation of the instrumentation and subsequent training and related operations at any of the alternative sites would have negligible impacts on marine mammals (c.f., the second bulleted point on page 4.3-55).

The Commission appreciates the practical value of establishing an instrumented training range in an area readily accessible to Atlantic Fleet ships and aircraft. Although not identified as one of the criteria for selecting the Cherry Point OPAREA as the preferred alternative, the Commission believes that construction, training exercises, and related support activities in that area would have less potential for affecting marine mammals, particularly endangered right and humpback whales, than they would at sites B and C. The Commission also concurs that installation of the USWTR at any of the alternative sites is unlikely to have biologically significant effects on any marine mammal species or stock, with the possible exception of the highly endangered northwest Atlantic right whale stock. As

noted below, however, the conclusion that training operations and support activities would have negligible impacts on marine mammals at any of the possible alternative sites is based on sparse data about the presence of marine mammals in the area and potential impacts to them as well as a series of assumptions, many of which are questionable at best. Also, the DEIS fails to consider all possible impacts and to provide key background information needed to fully understand the scope of the proposed action and its possible impacts on marine mammals. For these reasons, the Marine Mammal Commission recommends that the Navy prepare and circulate a supplemental environmental impact statement that fills in the information gaps and shortcomings described below before proceeding to a final EIS.

Missing Information

The DEIS indicates in the first paragraph on page S-8 that the no-action alternative "would not prevent the Navy from maintaining ASW readiness…"; however, it "represents existing conditions at the USWTR locations and is used as the baseline alternative against which the magnitude of impact of constructing and operating a shallow water ASW range is evaluated." These statements suggest that ASW training, of the nature and scale that would be conducted under the proposed action, is currently being conducted in one or more of the offshore OPAREAs. Elsewhere (e.g., the bottom of page 6-1), the DEIS seems to indicate that use of onboard marine mammal observers, training observers in marine mammal species identification and behavior, and many, if not most or all, of the other planned marine mammal mitigation and monitoring measures described in section 6 of the DEIS have been and are being employed in the ongoing ASW training.

If trained observers are being used to sight, identify, and record the presence and behavior of marine mammals in areas where they could be affected by the operations, and if any of the operations have been conducted in or near the three referenced OPAREAs, it should be possible to compare the actual sighting data with the data used to estimate the seasonal presence and densities of marine mammals in and near the three prospective USWTR sites to evaluate the reliability of the latter. Also, it should be possible to determine (1) the nature and frequency of situations in which different species and numbers of marine mammals were sighted in or approaching the calculated zones of influence, (2) what, if any, indications there were that different species were avoiding, moving away from, being attracted to, or otherwise altering their behavior in response to the vessels, sonar transmissions, etc., and (3) the frequency and circumstances under which operations had to be suspended or modified to avoid potential harm to marine mammals. We understand that the National Oceanic and Atmospheric Administration/National Marine Fisheries Service has conducted marine mammal surveys throughout these areas. Furthermore, many of these data have been transmitted to the SEAMAP/OBIS database to facilitate public access [http://www.iobis.org.] Data products based upon NOAA/Fisheries surveys are therefore available for incorporation in this DEIS. The supplemental EIS should access these data and compare NOAA/NMFS data with those of Navy observers.

It is not possible to judge the merits of the impact assessments without knowing the baseline against which the alternatives are evaluated. As an example, it appears that no consideration is given in the DEIS to the nature, magnitude, or possible impacts of vessel-

related engine, propeller, and hull sounds because they are considered to be comparable to sounds produced by ships and support vessels that have been conducting ASW training exercises in one or more of the East Coast OPAREAs (the no-action baseline conditions). Also, there is no indication as to whether any or all of the training in other areas would be terminated if the proposed USWTR is established. Therefore, the supplemental environmental impact statement should indicate (1) the nature, locations, frequency, and scale of ASW training exercises now being carried out under the no-action alternative; (2) measures that have been and are being taken to assess and minimize or mitigate the effects of the activities on marine mammals; and (3) whether any or all training exercises currently being conducted in other OPAREAs would be terminated if the USWTR is established as proposed.

The Commission calls your attention to the 2005 National Research Council (NRC) report entitled *Marine Mammal Populations and Ocean Noise: Determining When Noise Causes Biologically Significant Effects*. Among other things, that report concludes that any activity that adversely affects the growth, survival, or reproduction of a marine mammal can be viewed as potentially having a biologically significant population-level effect. The report notes that available information is generally insufficient to predict how various species and different age groups of marine mammals are likely to be affected by particular types and levels of anthropogenic sound. Further, the report states that, with few exceptions, available information is insufficient to determine whether a particular activity is or is not having population-level effects. The NRC report contains eight recommendations aimed at resolving the dilemma. Recommendation 2 calls for the further development of a conceptual model to allow sensitivity analysis that can be used to focus, stimulate, and direct research on cause/effect relationships necessary to ascertain population-level effects. Recommendation 3 calls for the development of a centralized database of marine mammal sightings and their responses to anthropogenic sound and specifies that the database should include

- Published peer-reviewed papers in the scientific literature;
- Government technical reports;
- Data submitted to NOAA Fisheries and the U.S. Fish and Wildlife Service in permit applications;
- Data submitted by industry to the Minerals Management Service for regulating offshore hydrocarbon exploration and production; and
- **All relevant data accumulated by all federal agencies in the course of their research and operational activities, including monitoring** [emphasis added].

Further, Recommendation 3 states that

> To facilitate the integration of data from the various sources, federal agencies need to develop standardized data-reporting formats. Survey data should include locations where marine mammals were detected and the track lines when personnel were monitoring for marine mammals, regardless of whether any were sighted. All data entered into such an integrated database must be

> coded as to quality, and peer-reviewed data and interpretations should be rated highest.

Toward this end, the Marine Mammal Commission recommends that, if it has not already done so, the Navy consult with NOAA/National Marine Fisheries Service to agree on standard formats for recording and reporting marine mammal sighting and related data to be collected in the course of ASW training exercises. On a related matter, the Commission notes that much of the information used in the assessment of the possible impacts of the proposed action on marine mammals is derived from Department of the Navy publications, at least some of which may not be publicly available and may not have been subject to external peer review. The Marine Mammal Commission recommends that

1) The Navy use the NRC 2005 report to address relevant uncertainties;
2) The Navy include all relevant Navy publications and the data therein in the recommended centralized database;
3) The Navy include peer-reviewed literature and data from the SEAMAP/OBIS and LMRIS databases; and
4) The final environmental impact statement provide annotations of the referenced Navy publications and identify those that are not publicly available and that have not been subject to external peer review.

Finally, with regard to missing information, the Commission notes that the DEIS does not provide the most up-to-date information concerning beaked whales and does not consider the possibility that cetaceans, particularly right and humpback whales, may become entangled in the cables suspending sonobuoys used in the ASW exercises. With regard to beaked whales, the Commission encloses two recent reports: *Abundance and density of beaked and bottlenose whales (family Ziphiidae)* (Barlow et al., in press) and *Understanding the impacts of anthropogenic sound on beaked whales* (Cox et al., in press). With regard to entanglement, the Commission notes on page 4.2-2 of the DEIS that "[i]t is estimated that 132 XBTs and 7,884 sonobuoys per year would be used during training exercises." Elsewhere it is noted that the sonobuoys are suspended between 90 to 400 feet from the surface for periods up to eight hours. Given the occurrences of both right and humpback whales being entangled in fishing gear, the failure to consider the possibility of entanglement in the sonobuoys cables appears to be an oversight.

Data Sufficiency and Validity of Assumptions

The DEIS, like the Navy's environmental impact statements regarding operational use of the SURTASS LFA sonar, assumes that acoustic impacts on marine mammal hearing—one of the few parameters that can be and has been measured directly for several small cetaceans and pinnipeds—can be used as a reliable indicator or predictor of the effects of anthropogenic sound on all species and age/sex classes of marine mammals. It states at the beginning of section 4.3.3.3 on page 4.3-18 that

> A marine mammal predicted to receive a sound exposure with EL [energy flux density] of 215 dB re 1μPa^2-s or greater is assumed to experience PTS

> [permanent hearing threshold shift] and is counted as a Level A [injurious] harassment. A marine mammal predicted to receive a sound exposure with EL greater than or equal to 195 dB re 1μPa^2-s but less than 215 dB re 1μPa^2-s assumed to experience TTS [temporary hearing threshold shift] and is counted as Level B [non-injurious but biologically significant] harassment.

This implies that exposure levels with ELs less than 195 dB re 1μPa^2-s are assumed to have no biologically significant effects. These conclusions are based on a series of TTS studies using less than a dozen captive bottlenose dolphins and beluga whales cited on pages 4.3-12 and 13 of the DEIS. Although the data from these studies no doubt are the best available regarding the types and levels of sound likely to produce TTS in captive bottlenose dolphins and beluga whales, it is inappropriate to assume that (1) all species and age/sex classes of cetaceans in the wild would be affected in the same ways by the types and levels of sounds used in captive studies of small numbers of two species; (2) the sounds used in the captive-animal studies are representative of the types and levels of sounds produced by the ships, aircraft, support vessels, and various sonars used in ASW training exercises; and (3) sound levels below those that produce TTS are unlikely to have biologically significant effects.

On a related matter, the Commission notes that the last of the bulleted points in the third paragraph on page 4.3- 25 of the DEIS states that

> For pooled white whale and dolphin data at 3, 10, and 20 kHz, exposure SPLs [sound pressure levels] of 180, 190, and 199 dB re 1 μPa (ELs of 180, 190, and 199 dB re 1 μPa^2-s) corresponded with the 25, 50, and 75% altered behavior points respectively.

Then, in the second paragraph on the next page, it is stated that

> For this OEIS/EIS, the 50% point is used as the threshold at which a significant alteration of a statistically normal behavior pattern occurs. The use of the 50% point to estimate a single numeric 'all-or-nothing threshold from a psychometric function is a common and accepted psychophysical technique (e.g., Nachtigall 2000, Yost 1994).

Use of the 50% point as the threshold at which a significant alteration is assumed to occur means that half the alterations would be considered insignificant. Although the 50% point is often used as the measure of significance for a variety of dose/response studies, the NRC 2005 panel recommended that, "to be conservative in the face of small samples and ignorance of shape of distribution of baseline behavior" a "quartile level (upper or lower, as appropriate)" response should be used to determine significant alteration, The Marine Mammal Commission recommends that the supplemental EIS explain why the Navy has chosen to ignore the advice of the NRC 2005 panel with respect to using the lower quartile as the measure of significance when the underlying data are meager.

In this same context, Table 4.3-3 on page 4.3-39 of the DEIS provides estimates of the distances from mid-level sonar sources of different levels that received sound levels

would reach the 215 dB Level A (injury) threshold under different conditions. For example, it indicates that the 215-dB threshold level would be reached at a distance of 5.6 meters from a 230-dB source, assuming spherical spreading. Then, the last of the bullet points on the page states that

> Level A harassment ranges for all sonars correspond to distances where striking the mammals is possible. Mitigation to avoid ship strikes of mammals simultaneously eliminates the potential for Level A harassment.

From this logic, it follows that, if the hemorrhaging that was found in some of the beaked whales that stranded and died in the Bahamas in March 2000 was caused by exposure to mid-frequency sonar transmissions (Level A harassment), the animals would have had to have been within 5.6 meters of the transducers to have been affected and should have been sighted so that measures could have been taken to avoid striking them. Conversely, if the animals stranded and died because they were startled by exposure to received transmission levels below 195 dB, their deaths would be considered biologically insignificant using the previously noted 195 dB threshold criteria for Level B harassment.

For the reasons outlined above, the Marine Mammal Commission recommends that

- The calculated threshold levels for Level A and Level B harassment be reexamined and revised to more reasonably reflect the lack of data and uncertainties concerning the likely biological significance of the potential impacts of the proposed action on marine mammals in this area; and
- The final EIS clearly identify the relevant uncertainties, the possible consequences of assumptions made in assessing the biological significance of the potential impacts of the proposed action on marine mammals, and steps being taken to resolve the uncertainties and validate the assumptions.

The Commission believes that the kinds of monitoring and mitigation measures described on pages 6-5 and 6-6 would help avoid some potentially harmful effects of the proposed action on marine mammals and that the referenced long-term monitoring program has the potential to ensure that the activities do not have population-level effects. One key provision is for the Navy to commit to using the acoustics assets of the training range for monitoring marine mammal presence and responses to exercises. Therefore, the Marine Mammal Commission recommends that the supplemental EIS describe the planned long-term monitoring program in greater detail, including how it can use range assets for monitoring, and identify the criteria that would be used to decide whether the ASW operations are having population-level effects on any marine mammal species or stock.

Exposure Levels Eliciting Behavioral Responses

The DEIS uses exposure levels above 190 dB (energy flux level) as causing a behavioral response from marine mammals. This figure is based exclusively on the received levels at which captive animals changed their responses to operant conditioned behaviors. This is about as far removed as possible from the natural situation: the animals were captive,

the altered behaviors were not normal behaviors, and the animals had prior exposure to the sounds. The Commission questions the applicability of using these captive-animal results to predict how marine mammals in the wild may respond to unfamiliar sounds. Many marine mammals in the wild show behavioral responses when exposed to far lower sound levels. We also note that the 190 dB (energy flux level) differs significantly from the 180 dB sound exposure level that the Navy is using as the onset of behavioral modifications in the Surveillance Towed Array Sonar System Low Frequency Active (SURTASS-LFA) supplemental EIS currently out for review. The supplemental EIS for the USWTR should more fully describe the metrics by which the Navy characterizes these sound sources and assess data on observed marine mammal response to various sounds in the wild.

Estimates of the Species and Numbers of Marine Mammals That Could Be Affected

The first full paragraph on page 3.3-8 of the DEIS states that

> Characterization of the distribution and abundance of marine mammals was accomplished by calculating estimates of the numbers of each species that may be expected within the region (DoN, 2002a,b and 2003b). The resultant density estimates themselves were stratified by depth to further represent distributions and relative concentrations of species within the regions.

The resultant estimates, listed by season, are provided in Tables 3.3-1 to 3.3-6 on pages 3.3.11 to 3.3-16 of the DEIS. They are used as one of the input variables to estimate the numbers of various species of marine mammals that potentially would be taken annually by Level A and Level B harassment in the course of the described ASW training and related support activities at the three alternative sites. The latter estimates are provided in Tables 4.3-5, 4.3-6, and 4.3-7 on page 4.3-56, 62, and 69 of the DEIS.

The Commission and others not familiar with the referenced Navy publications cannot judge the reliability of the data and the validity of the procedures used to generate the estimates. For example, it is not possible from the information in the DEIS to judge the reliability of the data used to generate the estimates of the numbers of beaked whales and other species expected to be present and potentially taken annually by Level A and Level B harassment. Also, although the likelihood of right whales being present at any time in the Cherry Point OPAREA is very small, it is not zero. The DEIS does not reference NOAA surveys or take into account marine mammal stranding records that indicate presence of animals in the vicinity that ship-based surveys regularly miss. More importantly, the DEIS does not acknowledge that the death or serious injury (e.g., miscarriage or fatal premature birth) of a single right whale would constitute a significant population-level effect. Also, there is no indication whether the marine mammal sighting and behavior data to be collected during the ASW exercises would be evaluated to confirm the validity of the estimates.

Cumulative Impacts

As indicated on page 4.8-1 of the DEIS, the Council on Environmental Quality's regulations regarding implementation of the National Environmental Policy Act require,

among other things, that environmental analyses assess the potential cumulative effects of proposed major federal actions. Cumulative effects are defined as "impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions."

In DEIS section 4.82 (page 4.81 to 4.8-6), a range of activities are described that is known or thought to be affecting marine mammals in waters off the U.S. East Coast. They include bycatch in commercial fisheries, ship strikes, entanglement in and ingestion of marine debris, coastal development, environmental contaminants, naturally occurring biotoxins, whale watching, climate change, and a number of other at-sea Navy training exercises, including other East Coast sonar training. No quantitative "take" data are provided for any of theses activities.

In section 4.8.2.9 (Conclusion) of the DEIS, there is a discussion and references to several published papers concerning the ways that stress may affect the growth, survival, and reproduction of marine mammals. Then, the concluding paragraph states

> With regard to the incremental contribution of the proposed USWTR action, impacts are expected to be primarily temporary behavioral effects…. Mitigation measures described in Chapter 6 have been designed and would be implemented for use of the proposed USTWTR in order to minimize any potential adverse effects to marine mammals…. Therefore, the incremental impacts of the proposed construction and use of the USWTR off the east coast of the US would not have any significant contribution to the cumulative effects on marine mammals when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.

Although the conclusion may well be valid, it is not justified by the information and analyses provided in this or other sections of the DEIS. To the extent possible, cumulative impacts should be assessed with respect to the potential biological removal (PBR) concept introduced in the 1994 MMPA amendments to the Marine Mammal Protection Act. Although it does not do so explicitly, the DEIS implies that the proposed action's incremental contribution to the impacts of human activities on marine mammals and their habitats can be ignored because they are small compared to the impacts of other activities. The intent of NEPA cumulative impact assessment regulations is to insure that the impacts of proposed new activities, when added to the effects of ongoing and other foreseeable activities, do not reach a point where they jeopardize the health or welfare of a species, population, or the ecosystem of which they are a part. In the case of marine mammals, any activity, which by itself or in combination with other activities causes a marine mammal population to be reduced or maintained below its optimum sustainable population (OSP) level, is viewed as having a significant adverse effect and requires remedial action. If, as seems likely, the available information is insufficient to determine whether the possible additive impacts of the proposed action would cause any species or population of marine mammal to be reduced or maintained below its OSP level, it should be so stated. In this

context, it is important to keep in mind that impacts must be considered on a stock-by-stock basis. As noted earlier, for example, the death or serious injury of a single right whale would constitute a significant impact and should be acknowledged.

For the reasons noted, the Marine Mammal Commission recommends that Navy prepare a supplemental EIS that

- Provides better justification for threshold energy flux densities for Level A and Level B harassment;
- Describes the data and procedures used to generate the density estimates and the estimates of the species and numbers of marine mammals that potentially could be taken by Level A and Level B harassment;
- Acknowledges that the death or serious injury of a single North Atlantic right whale would constitute a significant population-level effect;
- Provides detailed plans for surveying and monitoring programs over the long-term to include further development of acoustic techniques using range assets; and
- Indicates when and how the marine mammal observational data will be evaluated to confirm the validity of the estimates.

Please contact me if you have questions concerning these comments or recommendations.

Sincerely,

David Cottingham
Executive Director

Enclosures

Barlow, J., et al. In press. Abundance and density of beaked and bottlenose whales (family Ziphiidae). *Journal of Cetacean Research and Management*.

Cox, T. M., et al. In press. Understanding the impacts of anthropogenic sound on beaked whales. *Journal of Cetacean Research and Management*.