January 30, 2006

Naval Facilities Engineering Command, Atlantic
Attn: Code EV21KJ (Keith Jenkins)
6506 Hampton Blvd.
Norfolk, VA 23508-1278

Re: Comments on Draft Overseas Environmental Impact Statement/Environmental Impact Statement for the Undersea Warfare Training Range

VIA FAX & MAIL: (757) 322-4894

Dear Mr. Jenkins:

The North Carolina Chapter of the Sierra Club (hereinafter, "Sierra Club") has many concerns about the potential effects of the Undersea Warfare Training Range (USWTR) the Navy is proposing to construct off the shore of North Carolina, and is presenting comments in response to the Navy's draft environmental impact statement (EIS), dated October, 2005.

The Sierra Club supports the work the Navy does and the need for military readiness - North Carolina is very supportive of the military. However, the Sierra Club does not support the construction of the sonar range. Adequate analyses have not been conducted to fully evaluate the effects of the sonar range, and the risks - to marine life and to the local economy - have not been weighed sufficiently.

Purpose and Need
The Sierra Club requests that the Navy reconsider the need for building the USWTR in the Atlantic Ocean. NATO allies, such as the British, the Italians and Scandinavian countries regularly conduct training exercises in shallow water areas of the Mediterranean Sea and the Baltic Sea, and their fleets contain ultra-quiet diesel submarines. The US could obtain great real-world experience conducting training sessions with these countries, benefiting from their combined expertise. We request that the Navy compare the cost of building the proposed USWTR with conducting training in the Mediterranean/Baltic in the EIS.

Action Area
The action area, in which effects of the sonar range have been analyzed, has not been correctly delineated. Under 50 CFR § 402.02, the action area is defined as "all areas to be affected directly or indirectly by the Federal action, and not merely the immediate area involved in the action." The action area should not be limited to the USWTR. Sound will carry off the sonar range, as evidenced by page 4.3-37, which states, "the resulting bathymetry map covers a much larger region (150 by 110 km [93 by 68 mi]) than the range area; therefore, acoustic energy propagating off the test area can be accounted for." The action area should extend out as far as animals can detect sound from the USWTR, or as far as the sound may mask their communications. Beluga whales (*Delphinapterus leucas*) exhibit strong avoidance reactions in response to the icebreaking ships, even though they were 35-50 km away (United Nations Environmental Programme, 2005). It is reasonable to assume that cetaceans occurring in Onslow Bay have hearing this sensitive, and that masking could occur from as great a distance as this, since sound is their primary method of communicating and perceiving the underwater environment.

The traffic lane(s) where most vessels will be traveling to and from the USWTR should also be considered part of the action area. The EIS should adjust the boundary of the action area to include

areas where sound carries off the sonar range and where most vessel traffic will occur and incorporate this into the analysis of effects.

Environmental Baseline/Cumulative Effects
The EIS has a cursory discussion in section 4.8.2 about effects of ship strikes, ocean debris, commercial fishing, and bioaccumulation of toxins, climate change, and other activities, including Navy activities. The final EIS should discuss these baseline environmental stressors for each federally-listed species that may occur in the vicinity of the USWTR, and how they affect the recovery of each species when combined with the added stress of sonar use at the USWTR. The final EIS should also factor in baseline levels of anthropogenically caused ocean noise and how it affects communication, feeding and navigation; the locations of major shipping lanes and how these affect migratory routes; and the effects of oil and gas exploration in other areas of species' ranges, all in combination with the use of the proposed USWTR.

Moore (2004) describes the reproductive status of the North Atlantic right whale (*Eubalaena glacialis*) and provides a good example of how environmental stressors may currently affect some cetacean populations: "Over recent decades, researchers have observed several disturbing trends. Mature females are having a declining number of calves. About 25 percent of mature females have never been sighted with calves. The age at which females have their first calf appears to be increasing. Intervals between pregnancies have increased. Overall, the species' calving rate is about one-third what it should be, which is all the more distressing in an already small population subjected to other stresses."

Under 50 CFR § 402.02, a biological assessment should include anticipated acts that have undergone early Section 7 (Endangered Species Act) consultation. As such, the EIS should evaluate the Surveillance Towed Array Sensor System Low Frequency Active sonar (SURTASS LFA) as part of the environmental baseline, since it has already progressed to the stage of draft supplemental EIS. If the SURTASS LFA is to be used in the western North Atlantic, the possibility exists that some endangered whale populations could be affected by both the SURTASS LFA and the USWTR sonar. The EIS should discuss what the outcome would be if a federally-listed whale population, or an individual whale, is exposed to both types of sonar, and how their prey species will be affected.

The EIS states that there is potential for future use of the USWTR for mine warfare training, and for extended echo-ranging systems. The effects of these interrelated actions should be discussed. There does not appear to be any mention of maintenance of the site, the potential for expansion, or the potential for increased use of the USWTR; this information should be included in the EIS as well.

What is the life span of the USWTR? What will be the effects of *long-term* sonar exposure to aquatic populations, especially resident ones? There does not appear to be any discussion of this in the EIS. Over the life span of the sonar range, the potential loss, or even the harassment of 29 beaked whales a year may significantly affect population numbers over time, and this should be analyzed. Loss of one vital population may affect the recovery or survivorship of a species.

The EIS must fully consider the long term, localized impacts of physical disturbance and discarded debris and toxins that will accumulate at the USWTR, and how they will effect marine organisms and the aquatic food chain; this information is missing from the EIS. Section 4.1 states there would be no significant concentration of lead in the marine ecosystem at the USWTR. The Sierra Club questions this and requests that the addition of lead to the marine ecosystem be considered more carefully. What will be the total amount of lead deposited in the USWTR each year? What if lead from multiple sources (sonobuoy batteries, torpedo ballast weights, torpedo flex hoses, etc.), tends to accumulate in certain areas of the USWTR?

Page 4.1-6 states that hydrogen cyanide will be discharged in torpedo fuel exhaust. With up to six torpedoes used a day, there is potential for 960 torpedoes to be used at the USWTR a year.

Although the hydrogen cyanide will diffuse, the cumulative, long-term effects of this are not in the EIS; it is important that they be included. What will be the total discharge per torpedo? What will happen to fish that happen to be near the path of torpedoes? Could sea turtles or other organisms be affected? Hydrogen cyanide will also be vented from MK 50 torpedo buoyancy bags (p. 4.1-10). What will be the total discharge of hydrogen cyanide each year?

The EIS has a very limited discussion of the impacts to hard bottom. The EIS assumes that unburied cable in the USWTR will be colonized and provide habitat for marine life (p. 4.2-5). Is it possible that unburied cable could scrape back and forth on the seabed as a result of currents, disturbing or destroying hard bottom habitat? If this were to occur, demersal organisms would no longer inhabit these areas. Discussion should include how alteration of live bottom habitat will affect fish populations, including those that support birds, sea turtles, and marine mammals.
The Sierra Club is concerned that the EIS underestimates the effects the sonar range will have on hard bottom habitat, as a result of using outdated survey information and the fact that not all of Onslow Bay has been surveyed for the presence of hard bottom habitat. The EIS also fails to acknowledge the presence and importance of deep-sea corals in the vicinity of the USWTR, which support a variety of fish and invertebrates.

Sperm whales frequently spend time at the ocean floor, and have been entangled in trans-Atlantic cable. It is possible that sperm whales may become entangles with cables laid in the USWTR; this information should be included in the EIS.

Sound
No mention is made in the EIS about the levels of sound that will be generated from burying cable in the development of the USWTR, and what those effects might have on marine life. Please include this information.

The EIS uses the temporary threshold shift (TTS), or temporary hearing loss, from experiments with two species of marine mammal to determine the level of exposure at which permanent hearing loss (permanent threshold shift, PTS) occurs. As the Ocean Studies Board of the National Academy of Science (2005) states, "the relationship between the TTS limit and the PTS limit has been determined for laboratory animals; the appropriateness of extrapolating such a relationship to marine mammals is untested." This is also mentioned in the EIS on page 4.3-15, "…it is now acknowledged that susceptibility to PTS cannot be reliably predicted from TTS measurements." Such uncertainty should merit extra caution.

The sound exposure threshold used for behavioral disturbance in this EIS is 190 dB re 1 uPa^2-s received EL, and is described in the EIS as "a conservative approach" for predicting the disruption of natural behavioral patterns (level B harassment), as stated on page 4.3-29. The Sierra Club disputes this, and requests that a lower level be considered. The experiments on which this conclusion was based do not replicate real-life conditions. Were the animals in the studies rewarded for being exposed to intense sounds? The Ocean Studies Board (2005) states that a study done by Finneran and Schlundt (2004) used rewards for animals submitted to loud sounds, which would significantly alter their behavior; this study is used in section 4.3.4 of the EIS. Did the animals used in the studies have normal hearing? How many years of noise experiments had the animals been used for – is it possible that they had become habituated? We hope the Navy and NMFS will also note several other items from the Ocean Studies Board (2005):

- 180 dB re 1 uPa is "considered by regulators to be a threshold of risk for injury" (p. 34).
- "…Context specificity of behavioral reactions to sound raises questions about the ecological validity of extrapolating data from captive animals to the wild. The behavioral responses of marine mammals to acoustic stimuli vary widely, depending on the species, the context, the properties of the stimuli, and prior exposure of the animals (Wartzok et al., 2004)".
- The timing and spatial extent of mass strandings associated with naval maneuvers "suggests a possible risk of stranding for whales exposed to noise as low as 160 dB re 1 uPa."

Appendix B (section B.5) of the EIS includes discussion of how sound can diffract, scatter, and reverberate, and there is mention that sound pressure may be increased due to sound reflection, such as near the ocean floor. But there appears to be little discussion of how far sound will carry off the sonar test area, or how cylindrical spreading or reflection can cause sound to carry further off the test range. In addition, there does not appear to be any mention of how sound reflecting off the ocean surface or ocean floor may potentially deliver a higher dose of sound pressure, or a repeated dose. These effects should be analyzed for worst-case scenarios. Is enough known about the bathymetry of the USWTR and surrounding area that the Navy can say there is no possibility that the sonar will be carried far off the USWTR in natural oceanic sound "channels"?

The National Marine Fisheries Service (NMFS) has been analyzing applying new criteria to determine what constitutes a ''take'' of a marine mammal under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) as a result of exposure to anthropogenic noise. How will changes to the regulations, if any, be applied to the sonar range?

Behavior/Level B Harassment

Page 4.3-6 states that "For military readiness activities, Level B harassment is now defined as 'any act that disturbs or is likely to disturb a marine mammal or marine mammal stock by causing disruptions of natural behavioral patterns…to a point where such behaviors are abandoned or significantly altered.'" The assumption made in the EIS that Level B harassment will not result in long term harm to marine mammals is completely inappropriate, even if it cannot be readily observed due to the fact that the organisms in question live underwater (section 4.3.1).

Behavioral changes caused by sonar, even short-term changes, have not been adequately addressed. Level B harassment may have substantial consequences: a short-term disruption to migration, whether a pause or a change in course, can cause a female to miss an opportunity to breed. This is especially important for the large, endangered whales, which reproduce very slowly. Interruptions in feeding can reduce the fitness of animals, especially if occurring multiple times for an individual, which is especially important for animals that tend to inhabit the action area for long periods of time. Disruptions to feeding in preferred areas could affect not only individuals, but also whole populations, if they involve females that are already in poor condition and have long intervals between calvings. The USWTR may be used 160 days a year, creating disruptions nearly half the year, potentially detrimental to populations over time. Disturbance could also separate female cetaceans from their infants, leaving them susceptible to predation. It is not sound science to assume that behavioral shifts are of no long-term consequence, when there may be losses in time, energy, and opportunity. Repeated exposure to sonar could also lead to chronic, long-term stress, which can cause suppressed immune system function, cardiovascular disease and other health problems.

Page 4.3-33 states, "There is no established scientific correlation between mid-frequency sonar use and long-term abandonment or significant alteration of behavior patterns in marine mammals." We request that the Navy verify and report what happened to the beaked whale population in the Bahamas where mid-range sonar was being used and where a mass stranding occurred. The beaked whales were a well-studied population and supposedly abandoned the area after sonar was used there (Cetacean Society International, 2002; Calvert and Buck, 2005). Analysis is needed in the EIS about what the effects would be to whale populations if they are driven from the area as a result of sonar use.

Page 4.3-45 states that humpback whales did not abandon Hawaiian breeding grounds in response to acoustic sources, although they did exhibit short-term behavioral responses. It is possible that the biological urge to mate and remain at the breeding grounds overrode the disturbance and possible harm caused by the sounds. The Navy should use more caution in interpreting the studies on which conclusions are based in the EIS.

Low levels of received sound have the potential to disrupt a large portion of a population, if the sound reduces hearing sensitivity enough to mask normal stimuli. The EIS should discuss, for

studies used to predict the behavior of cetaceans exposed to sonar, the ability (or statistical power) of each study to detect subtle changes in behavior, such as reduced prey capture per unit effort, or reduced time spent feeding – critical life functions. The amount of uncertainty in the EIS analyses should be stated explicitly.

What are the effects of sonar on infant whales, which are likely to be migrating in the vicinity of the USWTR with their mothers in the spring? Infant whales may be more sensitive to noise than adults. If little is known about their sensitivity, this should be stated, and a more conservative approach should be used in the analysis.

The EIS makes a black and white assumption that behavioral responses will be of no consequence or risk to individuals. The Sierra Club suggests that a range of possible responses should be evaluated instead. This would help address the fact that responses can be situation-specific, species-specific and even specific to individuals. Since behavior cannot be easily predicted, likely responses should be expressed as a range of possibilities, i.e., 20% of sperm whales will startle upon exposure to sonar (cessation of activity), 20% will abandon the area, 20% will do nothing, 40% will permanently abandon the area, etc. Individual responses should be incorporated into risk to populations and then risk to species. The probability of death and probability of extinction should be discussed.

"The status of any population is the consequence of the accumulation of many effects; resulting in marginal changes in survival and reproduction over time…the end result is often so far removed in time from the proximate causal events that they cannot simply be traced post hoc" (Ocean Studies Board, 2005). Due to the difficulty in measuring the impacts of sound on critical life functions through behavior, more caution should be used. Is the temporary threshold shift really an appropriate method for determining harassment? Temporary threshold shifts should not be considered as Level B harassment unless it can be proven that they does not lead to permanent hearing loss later on, and do not result in any long-term reduction in fitness.

Strandings

The use of mid-range sonar has been associated with mass strandings on over 12 occasions, including off Washington State, the Canary Islands, Madeira, the U.S. Virgin Islands, Greece, the Bahamas, and most recently, off North Carolina. Theriault (2005) suggests that the strandings in Greece, the Bahamas, and the Canary Islands could only have been caused by sonar. The Navy acknowledged that the use of its sonar was likely the cause of the mass stranding of beaked whales in the Bahamas, and is treating beaked whales somewhat more cautiously than other species as a result in the EIS. Researchers are theorizing that sonar may cause whales to surface too quickly, or not remain at the surface long enough to recover from deep dives, essentially causing the bends; this has been theorized as the cause of the beaked whale stranding.

Beaked whales, such as the ones that stranded in the Bahamas, do not appear to be the only cetaceans to be prone to injury associated with rapid decompression. Stranded Risso's dolphins (*Grampus griseus*), common dolphins (*Delphinus delphis*) and one harbor porpoise (*Phocoena phocoena*) have been found with gas bubbles in their blood vessels and gas-filled cavities in internal organs (Jepson et al., 2003). These are symptoms consistent with decompression sickness. Sperm whale (*Physeter macrocephalus*) bones have also been found to show signs of decompression sickness (Woods Hole Oceanographic Institute, 2004). This information should be factored into the EIS.

The following species were all involved in mass stranding associated with seismic or naval activities: pygmy sperm whales (*Kogia breviceps*), Canary Islands, 1988 and North Carolina, 2005; minke whales (*Balaenoptera acutorostrata*), Bahamas, 2000 and North Carolina, 2005; humpback whales (*Megaptera novaeangliae*), Brazil, 2002; melon-headed whales (*Peponocephala electra*) Hawaiian Islands, 2004; and pilot whales (*Globicephala* sp.), North Carolina, 2005 (strandings summarized by Jansy, et al., 2005). These species may all be prone to injury or death as a result of exposure to sudden loud noises, such as sonar.

Although there are significant knowledge gaps, the circumstantial evidence provides enough impetus that the risks to marine mammals from high-power acoustic sources must be assessed and managed (Theriault, 2005). Emerging technologies such as computer-based decision aids for environmental risk management and cutting-edge methods for detecting marine mammals should be considered to minimize risks from sonar.

Not all whales that are affected are likely to strand or wash up on shore. Many whales may sink and never be seen. Sonar-related injuries to whales occur far from shore, before strandings occur, and as a result, many more whales may be dying than are found on shore.

The mass stranding in North Carolina occurred in January 2005. It involved 37 whales of three different species: a minke whale (infant), pilot whales, and pygmy sperm whales. The Navy has not assumed responsibility for this stranding, nor mentioned it in the EIS, although sonar was being used some distance away about the time it occurred. Results of this event were not released last year, despite a Freedom of Information Act request. The initial studies have finally been released, but the results will not be complete until later in 2006. The Sierra Club requests that the Navy and NMFS will wait for the complete findings before making any final decisions about the fate of this project.

Right whales

Regarding ship strike conservation measures for right whales: the Navy is to be commended for recommending that their vessels reduce speeds in areas where right whale strikes are likely to occur, and for reporting any strikes that do occur. However, we hope more will be done. Having observers on board ships is not enough to avoid all whales, especially not in darkness or inclement weather.

The Sierra Club questions how right whales have been excluded from the analysis for the Site A USWTR.

Section 3.2 of the EIS states that right whales are "expected to occur" seasonally in the shallower portions of the Site C USWTR, which is 50 NM off shore. Site A is 3 NM closer to shore than Site C (47 NM) but right whales are "expected to occur only rarely in the vicinity" of Site A. The specific rational for this is not detailed. As a result of this determination, right whales are excluded from acoustic modeling, discussions of harassment, etc. for the preferred alternative. It is true that right whales are usually observed near shore, but not enough is known about mid-Atlantic movements of right whales to conclusively state that they will never be in the Site A USWTR and will never be subjected to sonar and its related effects.

The Sierra Club requests that the Navy consider the following information in the EIS:

- 40% of cow calf pairs are unaccounted for in summer (Cetacean Society International, 2005). As a result, migration routes through the mid-Atlantic cannot be predicted for many whales.
- "The whereabouts of much of the population during winter remains unknown" (NMFS, 2005).
- "Survey data for the mid-Atlantic is virtually absent" (Russell, 2001).
- Records have existed for many years of right whales sighted between 20 and 50 miles off shore of North Carolina (CETAP, 1982). Other records exist for right whales further off North Carolina, greater than 200 miles (CETAP, 1982; Scientific Alert Network, Smithsonian Institution).
- Within the last year, right whales have been sighted 60 nautical miles east and 70 nautical miles south of Cape Lookout (NOAA Northeast Fisheries Science Center, 2006).
- "Limited surveys recently conducted along the mid-Atlantic suggest some mother-calf pairs use the area from Cape Fear North Carolina to South Carolina as a wintering/calving area" (NMFS, 2005). This area is very near the Site A USWTR.
- "Many of the whales disappear for long periods of time before appearing at the traditional feeding, breeding or calving grounds. Some visit all locations with breaks between, some visit only one location… Scientists suspect there are some off-shore areas that might be where these

whales congregate. If the areas were closer to shore they would have probably been noticed by now" (Smrcina, 2000).

North Atlantic Right whale population is critically imperiled; any margin of error of what the effects of the sonar range could significantly affect the survival of the species.

- "There have been few studies of the effects of anthropogenic noise on right whales specifically. In general, the impact of noise from shipping or industrial activities on the communication, behavior and distribution of right whales remains unknown (NMFS, 2005)."
- In a 2001 study published in Nature, researchers from the Woods Hole Oceanographic Institution showed that preventing the deaths of just two female right whales a year could allow the North Atlantic right whale population to increase to more than a replacement level, significantly improving the species' odds of survival.

Even though right whales may not be common in the USWTR area, they do occur there periodically, and as the sonar range is used over time, the likelihood of exposing right whales to sonar increases. The same is true for other whale species. This is not considered in the EIS; it should be. Analyzing the effects for the span of just a single year is completely unjustified.

The North Atlantic right whale population is so small that the species is literally on the brink of extinction. Any more pressure on the species could easily extirpate it. The way in which the EIS has been constructed, claiming that there will be no adverse effects to right whales from any aspect of the sonar range, appears to be slanted in order to avoid Section 7 consultation under the Endangered Species Act, and a discussion with NMFS whether the sonar range could jeopardize the species' survival.

Gulf Stream

Studies have shown that features generated by the Gulf Stream, such as eddies or rings, upwellings, and the frontal edge of the Gulf Stream itself tend to attract marine life. There is even speculation that some right whales may use the currents of the Gulf Stream during their northward migration (CETAP, 1982; Winn, 1984). There is a brief mention of the attraction of the Gulf Stream in the EIS, but this apparently has not been factored into the density calculations for marine mammals. We request that this be done; it is especially important for USWTR Site A, the majority of which is within the standard deviation for the Gulf Stream axis, as shown on Figure 3.1-4.

If the Gulf Stream flows through the USWTR the majority of the time when training exercises are planned, how will the Navy address this? Thorough discussion is needed regarding how training exercises will be fit in around the presence of the Gulf Stream, including the frontal edge and associated features, such as upwelling and eddies.

Fish

The Sierra Club does not agree with the statement on page 4.3-77 of the EIS, "significant effects to fish are not anticipated from the installation and operation of the proposed USWTR." Over 800 species of fishes from 109 families worldwide are known to be vocal, and use sound to overcome the problem of living in a dark or visually opaque medium (Rountree, 2002). Many fish species could be disturbed as a result of sonar use. The fish's lateral line system contains diverse receptors that are highly sensitive to various conditions in the water, including sound. Disrupting forage fish such as Atlantic menhaden (*Brevoortia tyrannus*) and striped mullet (*Mugil cephalus*) may have substantial impacts on the ecosystem off southeastern North Carolina. Forage fish such as menhaden are an important food source for sport fish. How will activities at the USWTR affect such forage fish?

Mann et al. (2005) found that Pacific herring (*Clupea pallasii*) had hearing thresholds at lower frequencies (100–5000Hz), which could be relevant to herring found in the USWTR area. Herring are important both as forage fish and commercially. More studies regarding finfish and shellfish, such as this, need to be incorporated into the EIS; very little is cited supporting the Navy's conclusion that there will be minimal effects to fish.

Red drum (*Sciaenops ocellatus*) and croaker (*Micropogonias undulatus*), both of which are named for the sounds they make, and sea trout (*Cynoscion* spp.) are all very important commercially and recreationally, and the USWTR area may be in the middle of their wintering grounds. Some of these fish may use the area for their spawning grounds as well. The drums in particular may be extremely sensitive to sound since they create drumming sounds to communicate with one another.

Many Atlantic sharks are in decline due to overfishing and fishing bycatch; all sharks are highly sensitive to sound. Sandbar sharks (*Carcharhinus plumbeus*), which used to be economically important, migrate through Onslow Bight on their way to mate and give birth in estuarine areas. This species, which has become uncommon, inhabits this area during warmer months. Sand tiger sharks (*Carcharias taurus*) are even more rare and use the wrecks off the North Carolina coast for mating and pupping.

Cownose rays (*Rhinoptera bonasus*) migrate through Onslow Bight on their way to pup in Chesapeake Bay and other large estuaries. They too are highly sensitive to noise pollution, and play a role in the ecosystem as a means for energy transfer, consuming crabs, snails, and small clams. Clearnose skates (*Raja eglanteria*) use the Onslow Bight hard bottoms as anchor sites for their eggs. Skates are growing more important in the fishing industry, and like the rays, are important components of a complex ecosystem.

The EIS should thoroughly evaluate the effects of sonar on fish populations off North Carolina, including fish larvae. Monitoring is proposed for cetaceans in the EIS. How will other ecosystem components, such as fish and invertebrates, be monitored? Will the Navy be conducting research to determine the impacts of sonar on fish?

Seabirds and Sea Turtles

Many pelagic seabirds overwinter in the Onslow Bight area, including thick-billed murres (*Uria lomvia*), razorbills (*Alca torda*), and possibly tens of thousands of northern gannets (*Morus bassanus*). These birds subsist on the same fishes that dolphins and other marine predators eat. It is important that the EIS analyze the potential effects to seabird prey from the use of sonar and from the loss of hard bottom habitat.

Endangered sea turtles may occur in the USWTR as inhabitants or as migrants. They are likely to be affected by activities on the USWTR; regular disruptions from ship traffic could affect seasonal movements or feeding, or result in ship strikes, and sonar impacts could reduce prey availability or affect the turtles themselves.

The loggerhead sea turtle (*Caretta caretta*) is the most sighted sea turtle in the operation area around the Site A USWTR. The northern subpopulation of loggerheads occurs from North Carolina through Northeast Florida. It is considered as a separate recovery unit by NMFS in the draft revised recovery plan (200_). Gene flow between the four subpopulations found along the western Atlantic is considered to be very low. "If nesting females are extirpated from one of these regions, regional dispersal will not be sufficient to replenish the depleted nesting subpopulation" (NMFS, 200_). This information is not discussed in the EIS, but should be, as should an analysis of what the effects to this population could do to the species as a whole. Some of the main threats to loggerhead recovery, as well as the recovery of other sea turtles, include degradation of foraging habitat, marine pollution and debris (ingestion as well as entanglement), and watercraft strikes (NMFS, 1991). These threats should be included in the EIS and addressed in a discussion about cumulative effects.

The Sierra Club disputes the conclusions of the EIS that there will be no adverse effects to sea turtles. Adult sea turtles may occur over the continental shelf, and juveniles occur in *Sargassum* rafts, as stated in the EIS. Ship strikes are likely to sea turtles in these areas over time, despite having watchers on deck. *Sargassum* is frequently associated with the Gulf Stream, which commonly flows through the proposed Site A USWTR. It will not be possible for all vessels to

avoid every patch of *Sargassum,* and all sea turtles, while conducting exercises. Over the life span of the USWTR, entanglements with parachutes and the ingestion of pieces of debris from training activities are bound to happen.

The EIS cites a hearing study conducted on one species of turtle and uses that to conclude that the effects of sonar on will be negligible on all sea turtles (p. 3.3-5). How loud was the sound that was used to test the hearing of sea turtles, compared to that of sonar? How many turtles were studied? It is inappropriate to assume, despite the fact that the hearing range of green turtles (*Chelonia mydas*) extends up to 1,000 Hz, there will be no harm caused by sonar to this species or any of the other endangered or threatened sea turtles. Studies should be conducted to fill the gaps in knowledge about these species – will this occur?

Public Use, Economy and Notification

The EIS states (p. 4.3-77) that it is unlikely that civilian divers will be present in the USWTR area. How did the Navy make this determination? How can the Navy be certain that none will be in the area when sonar is used? How would divers be affected if they were close enough to sonar emissions to exceed the "permissible exposure limit?"

Many people living in coastal North Carolina rely upon the sea for their living. The draft EIS says that the Navy will give seventy-two hours notice of exercises, but more specifics are needed: who will be notified? What format will it take? Who will be key outreach people? If fishing boats are in the USWTR during training, the EIS states the Navy could postpone its operations. Given the logistics that must be involved in training exercises, it seems that this would be unlikely to happen. A detailed notification plan must be given, due to the diverse nature of the groups using this area.

The EIS should include discussion about how training exercises will be scheduled in relationship to big fishing tournaments; if such a tournament were to be postponed or shut down, the costs that would incur to the region would be substantial. Would this be mitigated for? Discussion is also needed about the possibility of sonar causing damage to fish finders. Many fishermen who use this kind of equipment cannot afford to replace gear.

Use of the sonar range will effectively close 660 square miles of ocean to the public 160 days a year, nearly every other day, assuming that one six-hour exercise will take place a day. There is no analysis of how the local economy, which is largely based on tourism and fishing, will be affected by the USWTR. This is another large gap in the EIS. Even if there are few impacts on recreational fishing, commercial fishing or recreational diving, the public perception that a large area in Onslow Bay will be closed to public use for half the year could affect revenues for the area.

Minimization Measures

We strongly urge the Navy to consider the following:

1. Avoid or minimize using the sonar range during seasons when sensitive and endangered marine mammals are most likely to be concentrated in the operation area.
2. Use passive sonar to detect marine mammals before active sonar is used, and stop the use of active sonar if marine mammals are detected within the training range.
3. Increase the volume of active sonar gradually to give any marine mammals that may be in the area a chance to leave.
4. Use the sonar range to monitor marine mammals and collect data on sonar exposure.
5. Equip parachutes used for aircraft-launched torpedoes, sonabuoys, etc. with break-away couplings and minimal knots in lines, to reduce entanglement with marine life.
6. Develop additional precautions for avoiding marine mammals and sea turtles when they cannot be spotted visually, such as at night or in inclement weather. Include aerial spotters whenever possible.
7. If future mass strandings occur, halt sonar training until the cause can be determined.
8. Use the sonar range only in times of warfare.

The Navy needs to reconsider how vital an Undersea Warfare Training Range is in the Atlantic. The Sierra Club supports the continued use of simulators and other low impact activities to provide sonar training. We do not support the construction of the sonar range. There is a risk to marine life from the use of sonar, and this needs to be thoroughly reassessed in the EIS; too many flaws and gaps are present in this draft version. The EIS consistently underestimates what the effects will be, assuming that since little or nothing is known about potential impacts, none are likely to occur. The EIS fails to adequately analyze the range of direct and indirect effects that *may* occur as a result of the installation and operation of the USWTR, and therefore fails to meet the requirements of the National Environmental Policy Act.

More precautions must be taken before the sonar range could be considered safe for marine life. The analysis on how the local economy will be affected is insufficient, and the procedures for notifying recreational and commercial fishermen and recreational divers of when sonar training activities will occur are too underdeveloped to provide substantive comments at this time. Thank you for this opportunity to comment, and for granting an extension to the comment period.

Sincerely,

Elyse Jung
Chapter Chair
NC Sierra Club

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