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Naval Facilities Engineering Command Atlantic
ATTENTION: Code EV22LL (USWTR OEIS/EIS PM)
6506 Hampton Boulevard
Norfolk, VA 23508-1278

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

Dear Sir or Madam:

On behalf of the Karen Beasley Sea Turtle Rescue and Rehabilitation Center, the Duke University Environmental Law and Policy Clinic submits these comments on the above-referenced Draft Environmental Impact Statement (DEIS).^{1,2} We are mindful of the important role the Navy plays in protecting the country and safeguarding our national interests. We also value the security a stable and healthy environment provides, and encourage the Navy to execute its training goals in a way that protects our valuable natural resources – on which our national security ultimately depends. As the federal courts have ruled, NEPA places environmental concerns on equal footing with other valid national interests, including military interests.³

¹ We note that this document technically should be referred to as a Supplemental DEIS, as it follows the Navy's publication of the initial DEIS for the USWTR in the fall of 2005. Although the Navy's preferred alternative has changed from that initial DEIS and the current version contains additional analysis, the initial DEIS contains information relevant to the evaluation of environmental impacts. In particular, because the current DEIS focuses on marine mammals, especially whales, it is important for the Navy to consider comments submitted on the earlier DEIS that address other marine species and habitat. To that end, we attach comments submitted by the Southern Environmental Law Center on that earlier DEIS, dated January 30, 2006 and which describe in detail the environment of the Onslow Bight off the North Carolina coast, for your review and consideration and for ease of reference. We also ask that the Navy consider the comments submitted on the original DEIS for the USTWR and include them in the administrative record for this revised DEIS.

² We also adopt by reference the comments of the Southern Environmental Law Center, which detail the DEIS' limitations with regard to marine mammals and marine habitat.

³ See, e.g., *Washington County v. U.S. Dep't of the Navy*, 357 F.Supp.2d 861 (E.D.N.C. 2005), *aff'd*, *Nat'l Audubon Soc'y v. Dep't of the Navy*, 422 F.3d 174 (4th Cir. 2005).

I. OVERVIEW

Pursuant to the National Environmental Policy Act, an EIS is required whenever a major federal action may have significant environmental impacts. The EIS must satisfy a number of statutory and regulatory requirements. Among these are requirements that the action agency take a “hard look” at all reasonably foreseeable significant adverse impacts of the proposed action, 40 C.F.R. § 15022.22; consider the cumulative, indirect and secondary impacts of the proposed action, including reasonably foreseeable expansions in the scope of the proposed action, 40 C.F.R. § 1502.16; and include reasonable mitigation measures to avoid or minimize the environmental impacts of the proposed action, 40 C.F.R. § 1502.1, .14(f), .16(h).

As articulated by the Supreme Court in *Department of Transportation v. Public Citizen*, the EIS requirement of NEPA has two distinct, yet related, purposes.⁴ First, it ensures that a government agency possesses and considers complete information concerning the environmental impacts of potential agency action.⁵ Second, it provides this information to the public at large for the purpose of enabling citizens to participate in the decision-making and implementation processes.⁶

With these purposes in mind, courts have articulated a “hard look” standard for determining whether an EIS meets the objectives and requirements of NEPA.⁷ Unfortunately, the Navy has failed to take a “hard look” at the impacts of the proposed USWTR on sea turtles. Each section repeats, without explanation or analysis, that the action (or portion thereof considered for that section) is unlikely to have any effect, significant or otherwise, on the marine environment or the natural resources supported by that environment. This assessment is based on incomplete or nonexistent data and thus cannot be supported. Moreover, the Navy’s assertion of no or insignificant impacts taints its later analysis of cumulative impacts and truncates a thorough and reasonable review of appropriate mitigation measures, especially with regard to sea turtles.

A primary concern is that relatively little study has been done to assess the relative distribution and abundance of turtles in any of the alternative locations the Navy has identified for the USWTR. The few studies that have been done indicate that the sea islands, barrier islands and beaches of Southeast Georgia and Northeast Florida – i.e., the near shore areas that would be affected by the Navy’s preferred alternative for the USWTR – are incredibly important for sea turtles. In fact, the Recovery Plan for Loggerhead Sea Turtles states that ***91% of loggerheads in US Waters nest on Florida***

⁴ 541 U.S. 752, 767 (2004).

⁵ *Id.*

⁶ *Id.*

⁷ See *Sierra Club v. U.S. Corps of Eng’rs*, 295 F.3d 1209 (11th Cir. 2002) (“[The court’s] duty is to ensure that the agency took a ‘hard look’ at the environmental consequences of the proposed action.”); *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332 (1989) (“The sweeping policy goals announced in § 101 of NEPA are thus realized through a set of ‘action-forcing’ procedures that require that agencies take a “hard look” at environmental consequences,’(citation omitted), and that provide for broad dissemination of relevant environmental information.”).

beaches.⁸ According to SEAMAP researchers, who have conducted surveys and studies along the Southeast Atlantic Coast for the past 20 years, loggerhead populations are highest along the Northeast Florida coast.⁹ Similarly, *Sargassum* rafts that are critical to hatchling and juvenile sea turtles of all species have been documented to pass through the geographic area of the proposed location for the USWTR.¹⁰

Aside from a general lack of relevant data regarding sea turtles, the Navy also has failed to follow a specific CEQ regulation governing the preparation of an EIS: 40 C.F.R. § 1502.22 describes the duty of an agency preparing an EIS in an area for which information is incomplete or unknown. Usually, this regulation requires that such information be obtained.¹¹ However, if the information “cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known,” the agency must include a disclaimer that the information could not be obtained, as well as an analysis of the impacts based on scientifically accepted theoretical approaches.¹²

In the absence of solid data and analysis, it would be inadvisable for the Navy to proceed as currently contemplated: action in the absence of an accurate understanding of the area could lead to devastating impairment of rich and unique habitats and the species – some rare or endangered – that depend on them. There is a clear need for more thorough observation, investigation and analysis before proceeding with potentially destructive actions like the USWTR. We encourage the Navy to take this project off the fast track and take more time to complete ongoing monitoring studies and confer with scientific experts on sea turtles and marine mammals.

II. ANALYSIS OF IMPACTS TO SEA TURTLES

The Navy’s analysis of the potential impacts to sea turtles is lacking in several important respects and does not meet the “hard look” standard imposed by NEPA. These omissions also undermine the Navy’s assertion that its activities will not result in a taking of sea turtles listed as threatened or endangered pursuant to the Endangered Species Act.

⁸ NAT’L OCEANIC AND ATMOSPHERIC ADMIN.: NAT’L MARINE FISHERIES SERV., *LOGGERHEAD RECOVERY PLAN 1* (1993) [hereinafter “RECOVERY PLAN”].

⁹ Eaton et al., *In-Water Sea Turtle Monitoring and Research in Florida: Review and Recommendations* 177, NOAA Technical memorandum NMFS-OPR 38 (Jun. 2008).

¹⁰ After leaving the beach, hatchlings apparently swim directly offshore and eventually become associated with *Sargassum* and/or debris in pelagic drift lines that result from current convergences. The evidence suggests that when post-hatchlings become a part of the *Sargassum* raft community they remain there as juveniles, riding current gyres for several years and growing to 40 to 50 cm SCL. NAT’L OCEANIC AND ATMOSPHERIC ADMIN.: NAT’L MARINE FISHERIES SERV., *LOGGERHEAD SEA TURTLE FIVE-YEAR REVIEW* 2–3 (Aug. 2007).

¹¹ *See, e.g., Nat’l Audubon Soc’y v. U.S. Dep’t of the Navy*, 422 F.3d 174 (4th Cir. 2005). NEPA imposes an affirmative obligation to seek out information concerning the environmental consequences of proposed federal actions. *Id.*

¹² 40 C.F.R. § 1502.22(b).

A. Affected Environment

Scientists have identified significant nesting groups of sea turtles along the coasts of Florida, Georgia, South Carolina, and North Carolina.¹³ The Atlantic coast of the southeast United States has the most diverse and abundant sea turtle population in the United States. Three endangered species, the leatherback, Kemp's ridley, and hawksbill, and two threatened species, the loggerhead and green, occur regularly along the Atlantic coast from Florida to Virginia.

Scientists also have determined that after leaving the beach, hatchlings swim directly offshore and become associated with *Sargassum* (and/or debris) in pelagic drift lines along the convergence of currents. The evidence suggests that when post-hatchlings become a part of the *Sargassum* raft community they remain there as juveniles, riding current gyres for several years and growing to 40 to 50 cm SCL.¹⁴ The importance of these *Sargassum* rafts to protect sea turtles at this vulnerable stage of development cannot be overstated.

The Jacksonville OPAREA hosts all five species of sea turtles year round. The area is important for juvenile sea turtles that use its many lagoons, estuaries, bays, and offshore reefs for foraging and resting habitats.¹⁵ Area beaches provide important nesting habitats, and the warm waters provide an important overwintering habitat for many species.¹⁶ Even so, the draft recovery plan for the loggerhead, released for review in May 2008, indicates that populations along the Atlantic coast from the Florida-Georgia border to Virginia have sustained a long-term decline.¹⁷ The regional nesting trend of loggerhead turtles also shows a significant decline of 1.6% annually.¹⁸

The Onslow Bay OPAREA hosts all five species of sea turtles for much of the year. The inshore and estuarine waters of North Carolina are a very important developmental habitat for juvenile loggerhead, green, and Kemp's ridley turtles.¹⁹ The North Carolina coast also provides important nesting habitat for many species, particularly along the Cape Lookout National Seashore and Onslow Beach.²⁰

B. Hearing

The Navy asserts that sea turtles have limited hearing abilities and thus will not experience adverse effects from the use of sonar in the USWTR.²¹ This assertion is

¹³ LOGGERHEAD SEA TURTLE FIVE-YEAR REVIEW, *supra* note 10, at 2.

¹⁴ *Id.* at 2-3.

¹⁵ DEIS p. 3.2-34.

¹⁶ *Id.*

¹⁷ NAT'L OCEANIC AND ATMOSPHERIC ADMIN.: NAT'L MARINE FISHERIES SERV., LOGGERHEAD TURTLE DRAFT RECOVERY PLAN (2008) [hereinafter "DRAFT RECOVERY PLAN"].

¹⁸ *Id.*

¹⁹ DEIS p. 3.2-41.

²⁰ DEIS p. 3.2-49.

²¹ DEIS p. 3.3-12.

unsupported by the best available science. There is very limited research on sea turtle hearing, and there remains substantial uncertainty about the impact of sound on sea turtles, especially whether and to what degree high-intensity, mid-frequency sonar will affect them. As discussed above, NEPA obligates the Navy to acknowledge this uncertainty and explain the implications and risks of proceeding in the absence of such critical scientific data.

The uncertainty about the impact of sound on sea turtles exists for several reasons. First, the studies that have been conducted to test sea turtle hearing have employed low intensity noise to avoid possible injuries to the ear.²² Mid-frequency sonar, however, can emit continuous sound at 235 decibels. Although available studies indicate that turtles show a decrease in response at higher *frequencies*, (i.e., above 1,000 Hz), it is uncertain whether testing at higher *intensities* would elicit significant responses at mid-frequency levels.

Second, the available studies have primarily tested *unsubmerged* turtles. However, turtles spend 90% of their time underwater, and water conduction,²³ in combination with bone conduction, may be an important source of hearing.²⁴ Bartol and Musick explain:

If the turtle uses bone conduction to process sound, sound flows through the bones and soft tissue to stimulate the inner ear. The tympanum would act as a release mechanism rather than a sound receptor. However, if the turtle uses water conduction to process sound, the tympanum and subtympanal fat could act as low-impedance channels for underwater sound, resulting in columellar displacement to stimulate the inner ear. Recent imaging data strongly suggest that the fats adjacent to the tympanal plates in at least three turtle species are highly specialized for underwater sound conduction. Bartol and Musick 2003 p. 92.

Because the morphology of a turtle's ear is likely highly specialized for underwater hearing, it is uncertain whether tests conducted on unsubmerged turtles represent the full hearing capabilities of turtles in their underwater habitat. The studies cited by the Navy (except Ketten and Bartol 2002) did not test submerged or partially submerged turtles, and the Navy should therefore recognize the uncertainty and limitations associated with these studies.

²² See, e.g., Soyara M. Bartol et al, *Auditory Evoked Potentials of the Loggerhead Sea Turtle* (Caretta Caretta), 1999 COPEIA 836 (No. 3) [hereinafter "*Auditory Potentials*"]; M. L. Lenhardt, *Seismic and Very Low Frequency Sound Induced Behaviors in Captive Loggerhead Marine Turtles* (Caretta Caretta), Proceedings, Fourteenth Annual Symposium on Sea Turtle Biology and Conservation; Sam H. Ridgeway et al, *Hearing in the Giant Sea Turtle, Chelonia Mydas*, 64 PROCS. NAT'L ACAD. SCI. 884 (1969).

²³ It is noteworthy in this regard that sound carries farther – and faster – through water than through air.

²⁴ *Auditory Potentials*, *supra* note 22.

The Ketten and Bartol study was the first study to record brainstem responses to underwater sound on partially submerged turtles.²⁵ Because minimal research has been conducted on submerged or partially submerged turtles, additional research is necessary to say with certainty that submerged turtles cannot hear mid-frequency sounds. The studies on which the Navy pins its analysis are of limited value, a fact the Navy must acknowledge in its analysis.

Finally, there may be substantial variability in auditory perception among different age groups and species of turtles. Bartol and Musick explained the significance of these differences and the need for more research to account for the differences among different species and life history stages:

It is believed that physiological and behavioral adaptations may have evolved for sea turtles based on their selection of aquatic niches with each ontogenetic stage . . . [but] [d]ifferences in functional morphology and behavioral hearing capabilities among species and life history stages have not been documented for sea turtles in the literature. In fact, only juvenile loggerhead and green sea turtles have undergone any auditory investigations. . . . ***[B]ehavioral responses by multiple life history stages of sea turtles to sound stimuli, in the form of behavioral audiograms, need to be pursued in future research studies.*** Bartol and Musick 2003 pp. 94-95 (emphasis added).

The Navy fails to recognize any of this uncertainty, instead entirely dismissing the possible effects of high-intensity mid-frequency sonar on sea turtles of all species and life history stages. Consequently, its assessment of no impact fails to meet NEPA's "hard look" standard.

C. Underwater Cables

The Navy does not address the possibility that the underwater cable and transducer network will create an electromagnetic field on the ocean floor. It also fails to consider the possibility of electromagnetic fields created by electrical or magnetic hardware used on the range, such as the Mk 30 ASW target simulator.

The draft recovery plan for loggerhead turtles notes that renewable energy projects "connected via benthic cables to the shore" might harm sea turtles, but the DSEIS fails to consider that the USWTR underwater cables may pose a threat.²⁶ Research shows that juvenile and adult sea turtles have a magnetic map that helps them navigate and move toward specific destinations by allowing them to assess their position

²⁵ DARLENE R. KETTEN & SORAYA M. BARTOL, FUNCTIONAL MEASURES OF SEA TURTLES (2002).

²⁶ DRAFT RECOVERY PLAN, *supra* note 17.

relative to specific geographic goals.²⁷ Hatchlings also use the Earth's magnetic field as an orientation cue.²⁸ The Navy must consider the potential disruption to the geomagnetic navigation systems of sea turtles and other species from the operation of these underwater cables. NEPA's "hard look" standard requires no less.

D. Entanglement/ingestion of debris

Recovery plans for all five species of sea turtles cite ingestion of plastics as a significant threat. Sea turtles ingest a variety of debris items, including plastic bags, raw plastic pellets, plastic and styrofoam pieces, tar balls, balloons, and plastic sheets.²⁹ Effects of debris ingestion may include direct obstruction of the gut, absorption of toxic byproducts, and reduced absorption of nutrients in the gut wall. *Id.* Post-hatchling turtles, specifically, are not able to adjust their food intake to counter nutrient dilution from debris ingestion. *Id.* Even at low levels of ingestion, plastics may interfere with energy metabolism and gut function. *Id.* Sub-lethal effects have an unknown but potentially large effect of the demography of sea turtles. *Id.* Juvenile sea turtles are particularly vulnerable because of indiscriminate feeding practices. *Id.*

Ingestion of plastics poses a particular threat in epipelagic (open surface waters) convergence lines. *Id.* These areas are an important habitat of neonate and juvenile loggerheads, and convergence at these areas sweeps together neonate sea turtles with the substrates they forage among. *Id.* The neonate loggerheads ingest this debris at a high frequency and incur mortality from its effects. *Id.* One study showed that *of 83-post hatching loggerheads stranded in east Florida, 83.1% had ingested plastics.* *Id.*

Ingestion may also pose a particular threat in pelagic *Sargassum* habitats. Large quantities of *Sargassum* can accumulate on the continental shelf off the southeastern United States, providing food and protection and forming an important habitat for hatchling and juvenile sea turtles.³⁰ If parachutes or other debris land in or among the sargassum, they are less likely to sink to the bottom. They therefore may pose a significant threat to hatchlings by accumulating (and possibly disintegrating into smaller pieces) in the sargassum where hatchlings and juveniles forage for food.

The DEIS concludes without support that there will be no significant impact from debris ingestion because the parachutes are too large for turtles to ingest.³¹ However, the Mk 39 Expendable Mobile Acoustic Torpedo Target employs a parachute that is only 38 cm (15 inches) in diameter, and the sonobuoy employs a parachute that is only 20 to 30

²⁷ Kenneth J. Lohmann et al, *Geomagnetic Map Used in Sea-turtle Navigation*, 428 NATURE 909 (2004).

²⁸ Kenneth J. Lohmann et al., *Regional Magnetic Fields as Navigational Markers for Sea Turtles*, 294 SCIENCE 364 (2001); Kenneth J. Lohmann & Catherine Lohmann, *Orientation Mechanisms of Hatchling Loggerheads*, in LOGGERHEAD SEA TURTLES 44 (A. Bolten & B. Witherington eds., 2003).

²⁹ DRAFT RECOVERY PLAN, *supra* note 17.

³⁰ DEIS p. 3.2-23.

³¹ DEIS p. 4.2-31.

cm (8 to 12 in) in diameter.³² Moreover, the parachutes may disintegrate into even smaller pieces when exposed to the ocean environment.

Pieces of plastic larger than this size have been removed from sea turtle guts and intestines. In 2008, researchers at the University of Queensland in Australia removed several plastic bags, the largest of which was 30cm in length, from the gut of a sub-adult sea turtle stranded near the University's marine research station at Moreton Bay, Australia.³³ A NOAA technical report confirms that turtles will ingest items as large as entire plastic bags and bottles.³⁴ The 30cm sheet of plastic and the plastic grocery bags referenced by NOAA are larger in size than a sonobuoy parachute and comparable (if not larger) in size to an Mk 39 parachute. Accordingly, the Navy's assertion that the parachutes are too large to pose a threat is incorrect, and the Navy must correct its analysis to properly evaluate this threat. It must also consider potential mitigation techniques to decrease the impacts on sea turtles.

E. Entanglement and Target Strike

The Navy suggests that the threats of target strike and entanglement are minimal because the low density of sea turtles in the affected area makes it improbable that sea turtles will encounter targets or come across parachutes, control wires, and other debris that might cause entanglement.³⁵ However, this assessment is unsupported by the evidence.³⁶ The DEIS includes no data on the density of sea turtles at the proposed sites, and, contrary to the Navy's assessment of "low density," the available data suggests that there are significant numbers of sea turtles within the geographic range of the current preferred alternative. In fact, as noted above, the Recovery Plan for Loggerhead Sea Turtles states that *91% of loggerheads in US Waters nest on Florida beaches*, with the most significant numbers occurring on the Northeast Florida coast.³⁷ Moreover, available data may underestimate the number of sea turtles in the proposed areas. As noted above at footnote 9, relatively few studies of sea turtle abundance have been conducted in this area. An additional consideration, as noted in the available literature, is that turtles spend most of their time underwater; thus, observational data accounts only for a small percentage of sea turtles that are actually present in the area.

³² DEIS pp. 2-11, 2-13.

³³ Newsletter. Centre for Marine Studies, Mar.–Apr. 2008.

³⁴ Barbara A. Schroeder, *Proceedings of the Eighth Annual Conference on Sea Turtle Biology and Conservation*, NOAA Technical Memorandum NMFS-SEFC-214 (1988).

³⁵ DEIS pp. 4.2-23; 4.2-31 to -32.

³⁶ In fact, this conclusion is contradicted by the Navy's statement elsewhere in the DEIS that loggerhead nesting occurs along almost the entire coastline adjacent to the Jacksonville OPAREA and that several locations in this area are high-density nesting beaches. DEIS p. 3.2-37.

³⁷ RECOVERY PLAN, *supra* note 8, at 1.

F. Cumulative impacts from vessels, noise, and pollution

The Turtle Expert Working Group (TEWG) has noted a 40% decline in loggerhead nests since 1998.³⁸ Although they have not – and perhaps cannot – determine the cause for this decline, they have expressed concern about this dramatic dip in recorded nests, and have recommended the immediate initiation of population studies in the Atlantic to aid their understanding of the significance.³⁹

In light of this trend, it is especially important that the cumulative effects of vessel traffic and noise be considered in accordance with NEPA requirements. Propeller and collision injuries from boats and ships are common in sea turtles. From 1997 to 2005, 14.9% of all stranded loggerheads were documented as having sustained some type of propeller or collision injuries. Moreover, continuous and intense boat traffic may cause the abandonment of previously used foraging or resting areas.⁴⁰ Navy vessels will contribute to the cumulative impact of vessel strikes and traffic.

The USWTR will also contribute to the cumulative effects of noise pollution. Noise pollution is shown to have behavioral effects on loggerheads and other species, including the alteration of migration routes and the avoidance of foraging areas.⁴¹ The species recovery plans emphasize this threat but note that no estimates on the extent of the threat are available.⁴²

III. LEGAL STANDARDS FOR “HARD LOOK” AND SCIENTIFIC UNCERTAINTY

A. NEPA’s “Hard Look” Requirement

As noted above, the “hard look” requirement ensures that an agency, with input from the citizenry, obtain and consider all relevant information related to environmental impacts. The hope is that once armed with such knowledge the government will be able to make an environmentally sound decision. While NEPA does not require a specific result, it does impose procedural requirements.⁴³ If an agency does not follow the procedures mandated by the NEPA legislation, the CEQ procedures, or its own NEPA-related procedures, it is likely that it has not taken the requisite “hard-look.”

The general requirements for preparation of an EIS can be found in 42 U.S.C. § 4332(C), which requires a statement on “any adverse effects which cannot be avoided should the proposal be implemented.”⁴⁴ In the current DEIS, the Navy repeatedly fails to

³⁸ LOGGERHEAD SEA TURTLE FIVE-YEAR REVIEW, *supra* note 10, at 11.

³⁹ Memorandum from James Lecky, Ph.D., Director, Office of Protected Species, to Nancy Thompson, Ph.D., Science and Research Director (Dec. 4, 2007).

⁴⁰ Schroeder, *supra* note 34.

⁴¹ *Id.*

⁴² *Id.*

⁴³ Lands Council v. Powell, 395 F.3d 1019, 1026–27 (9th Cir. 2005).

⁴⁴ 42 U.S.C. § 4332(C)(ii) (2006).

follow this rule: it claims there will be no adverse effects but fails to provide any factual or scientific basis for such a conclusion. Specifically, this problem is evidenced in the Navy's findings of no significant impacts to sea turtles from exercise torpedoes (direct impacts and entanglement with control wires), flex hoses, sensing devices, targets, and Navy vessels. The DEIS merely concludes that there would be no significant impacts because the probabilities of any of these events occurring is low. What is not disclosed, however, is any estimation of impact probabilities or the description of any methodology (scientific or otherwise) used to arrive at such a conclusion.

The lack of scientific analysis is not surprising; without sea turtle density data, it is unclear how any concrete conclusions about the probabilities of these events occurring could be determined. Such analysis is necessary, however, for the public and agency officials to make an informed decision. With three threatened and two endangered species of sea turtles generally occupying all proposed sites for the USWTR, any potential impacts to sea turtles must be considered with the upmost scrutiny. It is not enough to assume that there will be no impacts. Without rigorous scientific analysis, neither the government nor public can make an informed decision, undermining the entire purpose of NEPA's EIS requirement.

In addition, there is at least one potential impact that the Navy does not even consider in the DEIS – the effect of electromagnetic fields on sea turtle navigation. The DEIS only addresses the chance of sea turtle entanglement with undersea cable and the potential impacts to sea turtles during cable installation.⁴⁵ As noted above, sea turtles use the Earth's magnetic field as an aid to navigation. The impact of electromagnetic fields (created by the transfer of signals from the off-shore range to the on-shore control center) must be considered. This is especially relevant to proposed USWTR sites offshore of sea turtle nesting areas. Some studies suggest that part of juvenile sea turtle growth is a permanent "calibration" to the Earth's magnetic field.⁴⁶ Early exposure to man-made electromagnetic fields may prevent juvenile turtles from properly tuning into the Earth's field, preventing them from being able to navigate the ocean throughout the rest of their lives.

Finally, while the Navy might be technically accurate in its statement that the USTWR will not overlap with designated critical habitat for the right whale and nesting grounds for sea turtles, this statement belies the fundamental point that the impacts and effects of activities that will take place within the USTWR cannot be contained within the USWTR's geospatial boundaries. Sound carries, and sonar in particular has been shown to travel many miles underwater.

⁴⁵ DEIS pp. 4.2-20 to -21.

⁴⁶ See generally Kenneth Lohmann & Catherine Lohmann, *Orientation and Open-Sea Navigation in Sea Turtles*, 199 J. EXPERIMENTAL BIOLOGY 73 (1996) (discussing magnetic orientation in juvenile sea turtles).

B. Uncertain or Unavailable Information

The CEQ regulations address an agency's duty regarding incomplete or unavailable information.⁴⁷ When confronted with a lack of information of this sort, the preparer of an EIS has two options. First, if the information is essential to a reasoned choice among alternatives and overall cost of obtaining it is not "exorbitant," the agency "shall include the information in the environmental impact statement."⁴⁸ Otherwise, the agency must add the following to the EIS:

- (1) a statement that such information is incomplete or unavailable; (2) a statement of the relevance of the incomplete or unavailable information . . . ; (3) a summary of existing credible scientific evidence which is relevant . . . ; (4) the agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community.⁴⁹

Implicit in the second option is that the overall cost of obtaining the missing information *is* "exorbitant." Thus, aside from merely mentioning that the information is incomplete or unavailable, the agency must also make some statement as to the "exorbitant" cost being avoided.

In addition, scientific uncertainty has been discussed in a recent case by the Court of Appeals for the Ninth Circuit, *The Lands Council v. McNair*.⁵⁰ In this case, the court recognizes that it would be unreasonable to require an agency to identify and address every possible uncertainty in its scientific research.⁵¹ What an agency must do, however, is "acknowledge and respond to comments by outside parties that raise significant scientific uncertainties and reasonably support that such uncertainties exist."⁵² Therefore, even if the Navy was unaware of any scientific uncertainties during the preparation of the DEIS, once those uncertainties are disclosed and substantiated in public comment the Navy has a duty to address them.

Turtle Hearing

As noted above, the DEIS does not properly consider the acoustic effects of sonar on sea turtles. The DEIS admits that "[s]ea turtle hearing sensitivity, in air and underwater, is not well studied."⁵³ However, the DEIS fails to discuss why the Navy is unable to conduct its own studies as to the range of hearing in sea turtles. Considering that the Navy's expenditures for scientific studies are but a fraction of its budget for the

⁴⁷ 40 C.F.R. § 1502.22.

⁴⁸ 40 C.F.R. § 1502.22(a).

⁴⁹ 40 C.F.R. § 1502.22(b).

⁵⁰ 537 F.3d 981 (9th Cir. 2008).

⁵¹ *Id.* at 1001.

⁵² *Id.*

⁵³ DEIS p. 3.3-12.

USWTR alone, it appears the Navy can well afford to hire scientists to conduct these studies and improve the understanding of sonar-related impacts.

Most of the studies cited by the Navy in the DEIS only tested hearing sensitivity to sounds waves propagated through the air. The primary concern for the purpose of the USWTR, however, is the impact of underwater sound waves on sea turtles. While it might be assumed that the ranges might be somewhat similar, hearing sensitivity to air propagated sound waves is not a direct substitute for underwater waves. This is especially relevant considering that the physiology of sea turtles is much more sensitive to sound propagated through water than through air.⁵⁴ Moreover, at least one inventor believes that depending on the depth, the air bubble in the middle ear of a sea turtle will resonate at frequencies between 900 Hz and 25 kHz.⁵⁵ It is unclear what effect high energy sound waves matched to the resonance frequency of the middle ear might have on a sea turtle. Even if a sea turtle isn't able to perceive the wave as sound, the high energy resonance might have other physiological effects.

In addition to the lack of underwater data, the Navy admits that no data has ever been collected for leatherback turtles. As before, the Navy fails to explain why such data cannot be obtained. The fact that these turtles have been recording producing sounds up to 1,200 Hz above water⁵⁶ suggests that their out-of-water hearing sensitivity might be higher than that of the other species tested. For these reasons, the data related to hearing ranges of turtles is impermissibly incomplete and does not meet the requirements set forth in 40 C.F.R. § 1502.22.

Lack of Density Data

In addition to the lack of scientific analysis regarding the probability of impacts between sea turtles and training objects, there is also a complete lack of data regarding sea turtle density – i.e., population distribution and abundance at the alternative locations under consideration. It is only possible to know the chance of encounters between animals and objects if the amount of each is a known quantity. The only mention of sea turtle populations in the entire DEIS is in the section explaining whether a specific species of sea turtle has been sighted in one of the proposed areas.⁵⁷ Furthermore, there is no statement of the cost of obtaining data, no assertion that the cost of obtaining density data is too high – nor is there an admission that sea turtle density data is lacking. In fact, this information is publicly available, and there are several groups that will freely provide it.⁵⁸

As mentioned above, density data is crucial for the probability analysis of any impacts between sea turtles and physical training implements. Aside from probability

⁵⁴ LUTZ ET AL., THE BIOLOGY OF SEA TURTLES 92 (1997).

⁵⁵ U.S. Patent No. 6,388,949, col. 8 ll. 24–49 (filed Aug. 29, 2000).

⁵⁶ DEIS p. 3.3-12.

⁵⁷ See DEIS 3.2.5 (describing the occurrence).

⁵⁸ For instance, kemp's ridley, loggerhead, and leatherback turtle density information is available from the Turtle Expert Working Group. <http://www.sefsc.noaa.gov/seaturtleleatherback.jsp>

calculations, density data would also be of general use in making an ultimate site decision. Even if the impacts are otherwise minimal, putting the USWTR in an area with the lower density sea turtle population will most likely result in a lower overall impact to the sea turtle population. Because this data is lacking, the DEIS does not comply with 40 C.F.R. § 1502.22.

Lack of South Carolina Coast Brumation Data

Regarding sea turtle brumation⁵⁹ data, the DEIS states “[t]here have been no studies on sea turtle brumation off South Carolina.”⁶⁰ It does conclude, however, that “based on winter water temperatures, they are more likely to brumate off the coast of Georgia or Florida.”⁶¹ This section of the DEIS fails to meet the requirements of 40 C.F.R. § 1502.22 on all counts. First, it gives no explanation for why the data cannot be obtained (referencing neither cost nor impossibility). Second, even if obtaining the data ultimately proves too costly, the Navy’s evaluation of the impacts off the South Carolina coast does not follow from the sparse information that was provided. The DEIS states only that it is “less likely” that turtles will brumate off the South Carolina coast. The next sentence, however, asserts that sea turtles are not expected to brumate in this area.⁶² The fact that turtles may be “less likely” to bromate off the South Carolina coast, however, does not mean that no brumation will occur in the South Carolina region.

When considering the impacts of the undersea cable installation, whether sea turtles brumate in a given region is especially important. The depths that sea turtles dig into the ocean floor during brumation is not discussed in the DEIS, nor was any sort of depth mentioned in the sparse literature referenced. Even if the buried undersea cable would be at such a depth that it would not pose any harm to bromating turtles, the plan for the USWTR also describes a number of unburied undersea cables. If sea turtles brumate in any of the proposed USWTR sites, there is a chance that they could become entangled in these unburied cables and asphyxiate. In order to make an informed decision on the siting and construction of the USWTR, it is necessary to have brumation data for any region in which it may occur.

Climate Change

Another area of uncertainty – which also has the potential for significant cumulative impacts – is the impact of climate change. In addition to the general impact that warming ocean waters will have on species distribution and habitat, scientists have estimated that the warming of the oceans due to global climate change will change the pH levels of oceanwater and result in noisier oceans; low frequency sounds travel farther in

⁵⁹ Brumation is sea turtle response to cold conditions somewhat similar to mammalian hibernation. It is the process in which sea turtles “burrow” into the ocean floor and enter a lower than usual energy state.

⁶⁰ DEIS 4.2-21.

⁶¹ *Id.*

⁶² *Id.*

more acidic water.⁶³ Hester estimates that sound could be enhanced as much as 20% within the next 50 years. Yet the Navy has not acknowledged this change that has the potential to exacerbate the impacts of sound in the marine environment – a violation of NEPA’s requirement.

IV. MITIGATION

Pursuant to the CEQ regulations, an agency’s EIS must include appropriate and reasonable mitigation measures and discuss means to mitigate adverse environmental impacts. The mitigation measures must be developed to a “reasonable degree” and include supporting analytic data.⁶⁴ This discussion is needed for the agency and the public to fully evaluate the severity of a project’s adverse impacts, and make informed decisions about the trade-offs and risks. Without this discussion, NEPA’s objectives of informed decision-making are undermined.

In the most current DEIS for the USWTR, the Navy repeats the shortcomings of the earlier DEIS and offers no substantive measures to offset the acoustic impacts, lower the potential for vessel strikes, or minimize harm from debris. The few mitigation measures that are considered focus exclusively on marine mammals; there is no discussion of measures to mitigate harm to sea turtles, despite their status as federally protected species. Moreover, the brief section on mitigation makes no mention of measures proposed by scientists and environmental organizations in their comments on the earlier DEIS. The Navy has had two years to update its analysis and investigate these proposed measures, yet the new DEIS contains no response, no explanation for the exclusion of these measures that would lessen the impacts of the Navy’s training activities on marine life. The Navy must address those measures, adopt those it can, and explain why others cannot be pursued.

The primary mitigation measure the Navy proposes is to place trained observers as look-outs on its ships when conducting sonar training exercises. While the Navy has offered much more detail about the training of the observers in this new DEIS, this measure alone is insufficient to detect all marine mammal species and is entirely deficient as a means of identifying and avoiding sea turtles, which spend approximately 90% of their lives underwater – a fact the Navy seems to disregard.⁶⁵ Moreover, the Navy has not satisfactorily addressed how it intends to mitigate for the inherent limitations of posted observers at night and during periods of inclement weather.

⁶³ Keith C. Hester et al., *Unanticipated Consequences of Ocean Acidification: A Noisier Ocean at Lower pH*, 35 GEOPHYSICAL RES. LETTERS L19601 (2008).

⁶⁴ Nat’l Parks & Conservation Ass’n v. Babbitt, 241 F.3d 722, 733–34 (9th Cir. 2001).

⁶⁵ The Navy must better explain why it cannot use independent observers or scientists to aid in the detection and avoidance of marine mammals and sea turtles. NMFS has posted observers on commercial shipping vessels to further its program to protect endangered and threatened sea turtles, a process that has improved that agency’s understanding of the impacts of the fishing industry on other marine life and aided in its development of reasonable and effective regulatory measures to further the goals of the Endangered Species Act. This reasonable measure should be seriously considered to improve the integrity of the Navy’s mitigation plans.

We encourage the Navy to correct this deficiency and include additional measures to protect sea turtles and other marine life from the negative impacts of its sonar training activities. Perhaps the most critical need is for additional research and study into population densities and trends in the waters of the mid-Atlantic. There are large data gaps in the available science on sea turtle distribution, including the waters off the northeast coast of Florida where the Navy proposes to locate the USTWR.⁶⁶ Additionally, researchers with NOAA have identified inshore and estuarine habitats in this same area as another aspect in need of additional population study: “Strandings indicate this is important area for [green turtles, loggerheads and Kemp’s ridleys].”⁶⁷

Considering the number of sightings in these waters, documented strandings, and the nesting activity along the beaches of SE Georgia and NE Florida, it is reasonable to assume that there are substantial and important populations of sea turtles swimming and feeding in these waters. A thorough study of population abundance and distribution is needed for an informed discussion of the impacts associated with the proposed USWTR. Without a better understanding of these potential impacts, the Navy cannot design a reasonable set of mitigation measures to offset those impacts and offer adequate protection to the valuable – and legally protected – marine resources found in each of the proposed alternative locations.

Without detail or explanation, the Navy merely states that it will consult with USFWS and that current existing conservation measures would “minimize or eliminate the potential for adverse impact.”⁶⁸ The DEIS includes no analysis of the sufficiency or relative success of these measures, which merely include marking known nesting areas and avoiding disturbance of these areas.⁶⁹ The lack of mitigation and sound analysis of impacts is particularly troubling given recent estimates of a decline in loggerhead nesting along the Southeast Atlantic coast, including Florida.

To correct the deficiencies in the Navy’s analysis and to better protect sea turtles, we recommend consideration and inclusion of the following mitigation measures:

- Develop thorough and accurate information on the presence, abundance and distribution of sea turtles.
- Inform the National Marine Fisheries Service (NMFS) Stranding Coordinators within 24 hours of the start of each event to increase the potential of detecting sonar-related strandings.

⁶⁶ Eaton et al., *In-Water Sea Turtle Monitoring and Research in Florida: Review and Recommendations*, NOAA Technical memorandum NMFS-OPR 38 (June 2008), at 204–05.

⁶⁷ *Id.*

⁶⁸ DEIS 4.6-3.

⁶⁹ DEIS 6-20.

- Employ an alternative detection system (such as passive and active acoustic detection) to help identify the presence of sea turtles and marine mammals prior to the initiation of training activities.
- Slow ship transit speeds in the near shore and where sea turtles and/or marine mammals have been detected. Slower speeds will aid the detection of nearby marine life and lessen the risk of collision with slow-moving and deep-diving animals.
- Use biodegradable materials for parachutes and assemblage. Material that biodegrades would lessen the hazard posed to sea turtles from the ingestion of debris and entanglement in assemblage. (This measure previously was recommended in the comments of the Southern Environmental Law Center in January, 2006.)
- Avoid sea turtle nesting and hatching season when laying the transmission cables and junction box for the USTWR. Limiting the period of disturbance to a period of time when turtle activity is thought to be at its lowest would lessen the risks of harm. This measure is especially important to protect breeding females and hatchlings.
- Suspend training exercises during the peak of hatching season to avoid interference with hatchlings' navigation.
- Use aerial detection of *Sargassum* and avoid dropping sonabuoy on or near *Sargassum* rafts, which harbor small juvenile turtles while they feed and rest.
- Recover spent materials associated with sonar training exercises to reduce the amount of marine pollution. The U.S. Coast Guard has articulated a goal of eliminating the dumping of plastics into ocean waters. The Navy should support this goal. It has not explained why it cannot recover materials used in its sonar training exercises.
- Financially support and assist with studies and monitoring of in-water populations of both juvenile and adult populations of sea turtles to compliment beach-based population assessments.
- Employ principles of Adaptive Management. As continued research expands our knowledge of population densities and the behavioral and physiological responses to sonar, alterations to training protocols may need to change in order to better protect marine life.

V. CONSULTATION

The Navy has noted that because its proposed action may adversely affect endangered and threatened marine species, it must consult with NMFS to insure that its proposed action will not jeopardize⁷⁰ the continued existence of those species.⁷¹ However, the DEIS does not indicate whether such consultation has begun, nor what it will entail. As discussed above, the DEIS downplays the potential impacts of its proposed action and avoids explanation of how its action will affect the larger ecosystem; it similarly fails to articulate what mitigation measures will be employed to reduce those impacts. As a consequence, we are concerned that this consultation process will fail to offer adequate protection to these marine species and the habitat that supports them.

The consultation process imposes procedural and substantive requirements. A biological opinion (“Bi-op”) is used to guide an agency to a decision that will not jeopardize the continued existence of a species. Pursuant to the consultation guidelines, where there is uncertainty, the agency may either extend its time line to accommodate the development of scientific data that would resolve – or lessen – the uncertainty, or it may proceed to develop the Bi-op, giving the “benefit of the doubt” to the endangered species – i.e., resolving uncertainty in favor of the species at risk of adverse impact.⁷² In addition, the Navy may not proceed to invest the irreversible or irretrievable commitment of resources pending the conclusion of the consultative process.⁷³

As outlined above, there is substantial uncertainty about the impacts of the Navy’s proposed action on endangered and threatened sea turtles, as well as on the marine environment these species inhabit. This uncertainty takes many forms, from questions about the hearing ranges of sea turtles and differences in hearing levels among adults and juveniles and among different species of sea turtles, to the impacts of noise on sea turtles, to the density of the populations of sea turtles in the area where the USWTR would be located. Additional uncertainty exists with regard to the extent of hardbottom that would be affected, as well as impacts on other marine life, including other endangered species for which consultation is required.

Decisions such as the one involving the USWTR must be made despite scientific uncertainty, but those decisions cannot be made in violation of the legal mandate that no federal action jeopardize the existence of any species or designated critical habitat.⁷⁴ In the face of such uncertainty, it will be difficult for the Navy to demonstrate that the USWTR – and its use of active sonar in the Atlantic – will not result in jeopardy to sea

⁷⁰ “Jeopardy” has been defined to mean “to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers or distribution of that species.” 50 C.F.R. § 402.02.

⁷¹ See 16 U.S.C. § 1855(b)(2) (2006).

⁷² U.S. FISH & WILDLIFE SERVICE AND NATIONAL MARINE FISHERIES SERVICE, ENDANGERED SPECIES CONSULTATION HANDBOOK: PROCEDURES FOR CONDUCTING CONSULTATION AND CONFERENCE ACTIVITIES UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT (1998).

⁷³ 16 U.S.C. § 1536(d) (2006).

⁷⁴ 16 U.S.C. § 1536(a)(2) (2006).

turtles, the North Atlantic right whale and other endangered species, in addition to impacts on Marine Protected Areas and Essential Fish Habitat. Because of this uncertainty, and the magnitude of risk involved, it is imperative that the Navy and NMFS resolve all questions in favor of ample protection of the potentially affected species. There is no margin of error here, especially where sea turtle takes exceed the Potential Biological Removal (PBR), and where NMFS has issued the dramatic statement that the loss of even one right whale due to non-natural causes could result in the extinction of the species.⁷⁵ We thus request that the Navy include the Duke Environmental Law and Policy Clinic and the Karen Beasley Sea Turtle Rescue and Rehabilitation Center in any and all announcements and notices it provides concerning the initiation of consultation and drafts published for public notice and comment.

VI. CONCLUSION

In sum, the DEIS does not satisfy the Navy's legal obligations under NEPA and the Administrative Procedures Act, and, if implemented as planned, could also violate the Endangered Species Act and Marine Mammal Protection Act. We urge the Navy to withdraw the DEIS until it has the opportunity to conclude the monitoring studies of the Onslow Bight and JAXOPAREA that the Navy has commissioned. The information expected to be produced from this study would offer a more informed assessment of the species presence, distribution and abundance in these alternative locations, thereby facilitating a more informed and accurate assessment of potential environmental impacts from the Navy's proposed action. In addition, we encourage the Navy to fund studies of the impact that sonar and the accumulation of other anthropogenic sources of noise in the marine environment have on sea turtles and other marine life.

Thank you for your consideration of these comments.

Sincerely,

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Attachments

cc: Jean Beasley
North Carolinians for the Responsible Use of Sonar

⁷⁵ NMFS 2003 Stock Assessment Report, available at <http://www.nmfs.noaa.gov/pr/sars/species.htm>; NMFS 2007 Stock Assessment Report at 10, available at <http://www.nmfs.noaa.gov/pr/sars/species.htm>.

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