Articles

The Limits of International Environmental Law: Military Necessity v. Conservation

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I. INTRODUCTION

This paper analyzes the environmental regulations imposed on the military during preparation for possible conflicts, but does not focus on the tension between military and environmental interests during conflict itself.[1] Within this context, this paper is about the conflict between the interests of the military and the interests of conservation. The focus of this study is the impact of submarine detection techniques on the marine environment, particularly on cetaceans. The question that this paper seeks to answer is, what are the rules that apply, especially when looking at this problem in an international—as opposed to a domestic—context? While this question has been largely explored in domestic legal settings, it has not been examined in an international context. The unfortunate conclusion from this analysis is that although the military can be made to comply with the goals of international environmental law, either specifically or as part of a national effort, this is not the case when dealing with considerations of conservation on the high seas. For such rules on conservation, the exceptions for the military are clearer than in any other part of international environmental law, and it is only recently that some regional initiatives have attempted to challenge the presumption that military interests will always supersede conservation ones on the high seas.

II. DETECTING SUBMARINES AND PROTECTING CETACEANS

Some five hundred years ago, Leonardo da Vinci (1452–1519) noted, "if you cause your ship to stop and place the head of a long tube in the water and the other extremity to your ear, you will hear ships at a great distance from you."[2] Despite such long-standing recognitions, the study of noise in the ocean was largely a neglected subject until the rapid success of German U-Boats in the First World War. The astounding military success of these weapons demanded quick and effective responses. The first modern scientific work with regards to acoustics was in the development of portable directional hydrophones, which were fitted to warships. These hydrophones sought to detect submarines passively by hearing the sounds that the submarines emitted, such as the sounds of machinery, propeller rotation, and the use of compressed air in

1. For a full discussion of the rules and considerations pertaining to environmental protection in times of war, *see* ALEXANDER GILLESPIE, THE CUSTOMS AND LAWS OF WAR WITH REGARDS TO CIVILIANS IN TIMES OF CONFLICT, VOLUME II (Hart, Oxford 2011).

2. GOV'T DATA PUBL'NS, ANTI-SUBMARINE WARFARE 3 (1963).

ballast tanks. This work was supplemented by the development of hydrophones that were placed in tubes and towed behind warships. However, no sooner were these developed than the Germans embarked on programs to make their submarines quieter and therefore less detectable. The Anti-Submarine Division of the British Naval Staff responded by developing a technology known as ASDIC (Anti-Submarine Division supersonICs) which actively used a transmitter-receiver to send out a highly directional sound wave through the water. The sound wave was typically heard as a "ping" when it struck a submerged object, and then was echoed back as a "beep," which was then picked up by the receiver. However, the early models had a variety of problems: (1) they could not work on boats going faster than 15 knots; (2) they responded to reflective noise from all sources; and (3) they could not gauge depth, pick up the echo of a submarine on the surface, or be used within 100 yards of a submarine. As a result, this new technology was never deployed in force and only seven ships were fitted with ASDIC by the end of the First World War.[3]

During the 1920s and 1930s, engineers in the United States developed their own underwater sound detection technology. After technical information was exchanged between Britain and the United States during the Second World War, the United States began to use the term SONAR (originally an acronym for SOund Navigation And Ranging) for their systems, as an equivalent to RADAR. By the time of the Second World War, sonar was just one of the tools that had been utilized in the fight against enemy submarines. The sonar of the Second World War eventually progressed to a maximum range of 4,000 yards. Nevertheless, sonar of this epoch was a relatively unrefined technology that was subject to multiple errors. Echoes would bounce back from many things besides enemy submarines, such as whales, schools of fish, vertical sea currents, and ships' wakes. Water conditions, in terms of turbidity and temperature, could also reduce the effectiveness of the technology, as could the inexperience of its operators. Moreover, sonar was one of the lesser tools utilized in the defeat of enemy submarines, being overshadowed by the intelligence gathered through the breaking of the enigma code and the development of high-frequency direction finding technologies that could locate radio signals and radar (for detecting submarines on the ocean's surface). These latter technologies provided the ability to find submarines within a twenty-five mile radius, which was considerably more than the sonar operative at this point. Additionally, it was truly the supplemental air power, via both long-

3. DAVID OWEN, ANTI-SUBMARINE WARFARE: AN ILLUSTRATED HISTORY 39–42 (2007); BRAYTON HARRIS, THE NAVY TIMES BOOK OF SUBMARINES: A POLITICAL, SOCIAL, AND MILITARY HISTORY 50, 58–62 (2001).

range and carrier-based aircraft, that ultimately tipped the balance against enemy submarines. Thus, in the Second World War, sonar was not the primary instrument in antisubmarine warfare.[4]

After the end of the Second World War and with the beginning of the Cold War, the context of the concerns over enemy submarines began to change for four reasons. First, the magnitude of the submarine force was rapidly expanding. For example, by the mid-1950s the Soviets had produced about 500 submarines. Second, nuclear powered submarines began to appear, which radically altered the capacity of these vessels. By the turn of the twenty-first century, 245 nuclear submarines were being utilized by Russia, now the Soviet Union. These were matched by nuclear submarines possessed by the United States, France, the United Kingdom, China, and India. Argentina and Brazil are believed to also have intentions in this area. [5] Third, in addition to nuclear-powered submarines, diesel or diesel-electric submarines became increasingly popular. The importance of these submarines is that they are often more silent than their nuclear counterparts. The majority of modern submarines are believed to be possessed by China and Russia. In addition, more than twenty developing countries currently possess over 150 diesel attack submarines. Of note, it is estimated that North Korea has twenty-five, Iran has eleven, Libya has six and Pakistan has six.[6] According to the U.S. Navy's testimony before the Supreme Court, "[m]odern diesel-electric submarines pose a significant threat to Navy vessels because they can operate almost silently, making them extremely difficult to detect and track. Potential adversaries of the United States possess at least 300 of these submarines."[7]

Finally, and most importantly, submarines with nuclear weapons came to be recognized as perhaps the ultimate weapon. The focus, tracking, and pursuit of these submarines, capable of carrying nuclear warheads, has become the first priority for most navies of significance. For the U.S. Navy, this was especially true with the "boomers," which were Soviet submarines longer than a football field and carrying twenty ballistic missiles, with each missile possessing up to ten nuclear warheads. Thus, a single submarine was able to create a firestorm greater

4. OWEN, *supra* note 3, at 53, 56–57, 71–72.

5. *Id.* at 83, 87, 105, 192.

6. JOHN PARKER, MODERN SUBMARINES: AN ILLUSTRATED REFERENCE GUIDE TO UNDERWATER VESSELS OF THE WORLD 17–19, 56–71 (2009).

7. Winter v. NRDC, 555 U.S. 7, 12–13 (2008). For commentary on this case, see Joel R. Reynolds, Taryn G. Kiekow, & Steven Zak Smith, *No Whale of a Tale: Legal Implications of Winter v. NRDC,* 36 ECOLOGY L.Q. 753 (2009); Robin Kundis Craig, *Beyond Winter v. NRDC: A Decade of Litigating the Navy's Active Sonar Around the Environmental Exemptions,* 36 B.C. ENVTL. AFF. L. REV. 353 (2009).

than the combined power of all of the bombs dropped in the Second World War. In response, one United States Poseidon submarine could destroy every large and medium sized city in the Soviet Union. As such, learning about and tracking these weapons became the single biggest priority for all navies.[8]

After the Second World War, the tracking of enemy submarines has been an increasingly difficult goal to achieve because these vessels have continually evolved to avoid detection. In particular, submarines have been designed to stay beneath the surface for long periods, not utilize radio traffic, and be generally stealthy. While the United States and the United Kingdom were believed to have led the way in this area, in decades to come, potential adversaries were believed to have followed suit.[9]

Ever ingenious methods have been devised to help detect these increasingly invisible submarines. Whilst submariners have developed excellence in trying to avoid detection through the utilization of different ocean temperatures, salinity and seascape, those seeking these craft have developed a number of methods of detection. Within the technologies that are known (remembering that it is possible that other technologies exist which are not known in the public realm), the following are particularly notable: (1) the utilization of extreme low-frequency electric fields; (2) the search for magnetic anomalies when a vessel passes through an area; and (3) thermal scarring fields, which is caused by the unwelling of deeper cooler water pushed up to the surface by submarine hydrodynamic displacement effects. The examination of disruptions to biological luminance and residue contaminants, such as the leeching of antifouling paint or the leaking of lubricants, are also utilized in the search for submarines. Despite the ingenuity of each such method, they have all been found to be limited in one respect or another, and have remained second best to the only form of energy that can penetrate water masses at great distances—noise.[10]

Physically, there is no distinction between sound and noise. Sound is a sensory perception, and complex patterns of sound waves are found in music, speech, or noise. While sounds may be desirable, noise is often considered a nuisance as it has a negative connotation that can bring with

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8. SHERRY SONTAG & CHRISTOPHER DREW WITH ANNETTE LAWRENCE DREW, BLIND MAN'S BLUFF: THE UNTOLD STORY OF AMERICAN SUBMARINE ESPIONAGE xv–xvi (1998); DONALD C. DANIEL, ANTI-SUBMARINE WARFARE AND SUPERPOWER STRATEGIC STABILITY 4–7 (1986).

9. OWEN, *supra* note 3, at 199, 201; SONTAG, *supra* note 8, at 44.

10. DANIEL, *supra* note 8, at 40–50; W. CRAIG REED, RED NOVEMBER: INSIDE THE SECRET U.S-SOVIET SUBMARINE WAR, 142–144, 271–275 (2010).

it the view that it is the wrong sound, in the wrong place, or at the wrong time.[11] This identification of displeasure may be because the word "noise" is derived from the Latin word "nausea," meaning sea sickness. The link to sea sickness may have developed because of the importance of the ear to both sea sickness and noise.[12]

The hearing of sound depends both on the sound frequency, which is measured in Hertz (Hz) and the sound pressure on the eardrum, which is measured in decibels ("dB"). The unit, A-weighted "dB(A)", is used to indicate how humans hear a particular sound. A soft whisper at one meter away is about 30 dB(A). Noise levels below 30 dB(A), although often audible, are typically recognized as "low-frequency." For a good night's sleep, sound levels should not exceed 30 dB(A).[13] Although there are some forms of low-frequency noises that may need to be lower, individual noise events exceeding 45 dB(A) should be avoided. The sound pressure level of normal speech is about 50 dB(A), but for it to be intelligible, surrounding sound levels should be less than 35 dB(A). In a busy restaurant the level is roughly equivalent to 55 dB(A), while a busy intersection can generate noise levels of 75 dB(A).[14] Densely traveled motorways may generate noise levels in the range of 75 to 80 dB(A) and heavy industries, such as shipyards, average around 94 dB (A).[15] Portable music devices plugged directly into the ear and some music festivals can both exceed 100 dB(A). A chainsaw can reach 110 dB(A).[16] "Boom cars" equipped with powerful stereo systems can hit 140 to 150 dB(A) (the equivalent to standing next to a Boeing 747 with its engines at full throttle).[17] To avoid acute damage to the inner ear, adults should never be

11. BART KOSKO, NOISE 6–12 (2006).

12. CHARLTON T. LEWIS, A LATIN DICTIONARY 1191 (1966).

13. *See generally* GEOFF LEVENTHALL, A REVIEW OF PUBLISHED RESEARCH ON LOW FREQUENCY NOISE AND ITS EFFECTS (2003) (explaining the physics and affects of low frequency noise).

14. *See* Andy Coghlan, *Dying for Some Peace and Quiet*, NEW SCIENTIST, Aug. 2007, at 6–9 (discussing link between noise pollution and physical illness).

15. *See* WORLD HEALTH ORG., GUIDELINES FOR COMMUNITY NOISE (1999) (explaining adverse health effects of noise and sleep disturbance that is caused).

16. *See* Vlasta Mercier & Beat Hohmann, *Is Electronically Amplified Music Too Loud?: What Do Young People Think?*, NOISE AND HEALTH, July–Sept. 2002, at 48 (noting high sound level exposure from electronic devices); *see also* Vlasta Mercier & Beat Hohmann, *Sound Exposure of the Audience at a Music Festival*, NOISE AND HEALTH, Apr.–June 2003, at 51 (noting high sound level exposure from concerts and music festivals).

17. Ron Chepisuik, Decibel Hell, 113 ENVIRONMENTAL HEALTH PERSPECTIVES A34, A35, A37 (2005) (listing decibel levels of sounds).

exposed to more than 140 dB(A) of noise, even for very short periods. For children, the maximum noise level is 120 dB(A).[18]

Noise behaves differently in the ocean. Although the ocean is relatively opaque to light, it is relatively transparent to sound. Depending on the conditions of depth, temperature, salinity, and surface and bottom conditions, sound can travel four times faster in water than in air. Thus, depending on the variability of conditions, sound velocity can reach speeds of up to 1,600 meters per second in seawater, as compared to 350 meters per second in air. Moreover, transmission loss in water is much lower, and as a result, noises can be heard at great distances. It is expected that as the oceans' acidity changes in some areas due to climate change, existing noise absorption of sound below 1 kiloHertz ("kHz") could be decreased by up to forty percent.[19]

Integrated Underwater Surveillance Systems are comprised of fixed, mobile and deployable acoustic arrays that provide tactical information to anti-Submarine forces. The utilization of noise, either passively (just listening) or actively (propagating and waiting for a reply), is the core of most Integrated Underwater Surveillance Systems, In the United States, passive utilization is primarily found in the chains of sonar arrays which were, from the 1950s, mounted on the seabed to keep constant alert for passing submarines. These trip wire systems are modern day equivalents of the hydrophone arrays carried on ships used in the First World War. The differences are found in the scope and effectiveness of the modern systems. In ideal situations, noise signatures of submarines now can be picked up as far as 600 miles away. In terms of scope, these systems, which were originally placed down the East and West coasts of the United States, evolved into the Sound Surveillance System, which was deployed further out into international waters and at natural choke points, like the Greenland-Iceland-UK gap. By 1981, these systems also operated in the waters of the United Kingdom, Canada, Norway, Iceland, Denmark, and Italy, as well as off the shores of Turkey, Japan, the Aleutian island chain, Hawaii, Puerto Rico, Bermuda, Barbados, the Azores, Gibraltar, Panama, the Philippines, and Guam.

Military sonar can be conveniently categorized as mid-frequency or low-frequency. Mid-Frequency Active Sonar ("MFAS") has been used by Navies all over the world since the Second World War. Over 300 ships in the U.S. Navy alone are equipped with MFAS. MFAS employs frequencies of one to ten kHz and typically can detect objects one to ten nautical miles away. According to testimony from the U.S. Navy, MFAS

18. *See* WORLD HEALTH ORG., GUIDELINES FOR COMMUNITY NOISE (1999).

19. C. Brahic, *Hearing the Carbon Jolt Loud and Clear,* NEW SCIENTIST, Sept. 2008, at 10.

is "mission-critical" and "essential to national security," because it is the only proven method of identifying submerged diesel-electric submarines operating on battery power.[20] Low Frequency Active Sonar ("LFAS") uses sound frequencies of less than 1 kHz. This lower frequency suffers less attenuation in seawater and therefore can detect objects up to 100 nautical miles away. LFAS is currently operational on two ships in the U.S. Navy and one ship in the British Navy. A variation on LFAS is LFAS Surveillance Towed Array Sensor System ("SURTASS-LFAS"), which "sends out intense sonar pulses at low frequencies that travel hundreds of miles in order to timely detect increasingly quiet enemy submarines."[21] SURTASS utilizes a vertical line array of up to eighteen source projectors suspended below a vessel. The sonar beam is omni-directional (i.e. a full 360 degrees), at a nominal depth of 122 meters (400 feet). A complete sequence of transmissions is known as a 'ping' and lasts from six to one hundred seconds. The time between pings is usually between six to fifteen minutes. The source level of an individual projector is approximately 215 dB(A).[22] although they are believed to have "an effective sound level" of 230 to 240 dB. This would equate to about 180 dB(A) level one kilometer from the source, 173 dB(A) two kilometers away, 165 dB(A) forty nautical miles away, 150 dB(A) one hundred miles away, and 140 dB(A) up to four hundred miles from the source vessel.[23]

III. THE IMPACTS OF MILITARY SONAR UPON OCEANIC SPECIES

During the early years after the Second World War, experimentation with different levels of sonar produced unexpected results. For example, in the arctic, the sonar pings were found to be so similar to the mating call of the area's ring-necked seals that upon hearing the pings, the seals would start calling back to the submarine.

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20. *Winter,* 555 U.S. 7, at 14, 18.

21. NRDC v. Evans, *279 F. Supp. 2d 1129, 1137 (N.D. Cal. 2003)*. For commentary on the Evans case, see Carolyn M. Chopko Mongeon, *NRDC v. Evans: Northern District of California Delivers "Sound" Judgment in Protection of Marine Wildlife,* 15 VILL. ENVTL. L. J. 394 (2004).

22. CHIEF OF NAVAL OPERATIONS, DEP'T OF THE NAVY, FINAL COMPREHENSIVE REPORT FOR THE OPERATION OF THE SURVEILLANCE TOWED ARRAY SENSOR SYSTEM LOW FREQUENCY ACTIVE SONAR UNDER THE NATIONAL MARINE FISHERIES SERVICE REGULATIONS 1–2 (2007) [hereinafter SURTASS LFA REPORT] (In particular, see sections 3.1 and 4.11).

23. *See generally,* Jon M. Van Dyke, *Active Sonar & Shipments of Radioactive Materials,* 14 COLO. J. INT'L ENVTL L. & POL'Y 1, 1–8 (2003).

These calls would quickly multiply, with walruses joining in as well. In the early trials, the din went on for hours with seals answering the vessel and other seals, and walruses answering one another. Unsurprisingly, this wavelength and sound structure was abandoned, and new practices were adopted that did not promote courtship with the local mammals.[24]

The vast majority of the impacts of different anthropogenic noises upon the animal kingdom are not as benign as the above example would suggest. Since the 1950s, there have been many scientific studies on the effect of noise pollution on animals. This work began and continues largely in regard to endangered terrestrial species and birds.[25] The first study of the impact of ocean noise on marine biodiversity was conducted in 1971.[26] In the four decades since, scientists have conducted a large collection of ad hoc studies of the impacts on marine biodiversity. This is particularly so with regards to studies from the impacts of noise generated from seismic exploration, commercial shipping and military sonar.

The impact of military sonar upon cetaceans is the source of a large amount of scholarship, because, unlike the other two sources, noise pollution from military sonar has a strong linkage to whale strandings. However, this is not an easy thesis to prove, as whale strandings have been recorded throughout thousands of years of history. Many of these strandings may be attributed to natural and environmental factors, such as rough weather, weakness due to old age or infection, difficulty giving birth, hunting too close to shore, and navigation errors.[27] Against this background of natural incidents, it is difficult to determine whether noise pollution, and that caused by military sonar in particular, has increased the rate of strandings. However, the evidence showing the link between whale strandings and military sonar has been developing since the early 1990s.[28] Although the evidence in this area is far from conclusive, with regards to mid-frequency sonar, even the U.S. Navy agrees that in certain circumstances, mid-frequency (but *not* low-frequency)[29] sonar can be directly linked to the strandings of marine mammals.

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24. SONTAG, *supra* note 8, at 236.

25. Adam Anthony et al., *Noise Stress in Laboratory Rodents* 31 J. ACOUSTICAL SOC'Y AM. 1430, 1437 (1959); Carl Hopkins, *How Noise Effects Wildlife,* 29 BIOSCIENCE 547 (1979) (reviewing JOHN L. FLETCHER & R. G. BUSNEL, EFFECTS OF NOISE ON WILDLIFE (1978).

26. *See* Roger Payne & Douglas Webb, *Orientation by Means of Long Range Acoustic Signaling in Baleen Whales,* 188 ANN. N.Y. ACAD. OF SCI. 110, 110 (1971).

27. FRAN HODGKINS, SOLVING THE MYSTERY OF WHALE STRANDINGS 7–16 (2007).

28. M. P. Simmonds et al., *Whales and the Military,* 351 NATURE 448, 448 (1991).

29. SURTASS REPORT, *supra* note 22, at 48–49; CHIEF OF NAVAL OPERATIONS, DEP'T. OF THE NAVY, FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR

The Navy has conducted extensive research on this issue, including testing the effects of certain active sonar systems on some marine species. Research concerning active sonar's potential effects has demonstrated that, under certain circumstances and conditions, use of active sonar has an effect upon particular marine species. [30]

This is especially so with the relatively unknown, deep diving, beaked whales in certain geographical locations.[31] This concession is consistent with the occurrence of beached whales during mid-frequency sonar training exercises in the Canary Islands (2004, 2002, 1989, 1986, 1985);[32] Madeira (2000); Spain (2006); the U.S. Virgin Islands (1999, 1998); Greece (1996);[33] and around Britain and Ireland (2008).[34] Of this collection, one of the best-documented incidents occurred in the Bahamas in 2000, when sixteen beaked whales were stranded along fifteen miles of shoreline during a U.S. Navy exercise. Following this stranding in 2000, the National Oceanic and Atmospheric Administration and the National Marine Fisheries Service issued a joint interim report. This report concluded that the U.S. Navy's use of tactical mid-range frequency sonar, was in this instance, the "most plausible source of this acoustic or impulse trauma."[35] Further strandings that overlapped with military exercises using mid-frequency sonar off Hawaii in 2004 and North Carolina in 2005 were considered by the Navy to be "a plausible,

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SURVEILLANCE TOWED ARRAY SENSOR SYSTEM LOW FREQUENCY SONAR ES-10–ES-15 (2007) [hereinafter SURTASS LFA SUPPLEMENTAL REPORT].

30. SURTASS LFA SUPPLEMENTAL REPORT, *supra* note 29, at ES-18–*ES*-19.

31. T. M. Cox Hildebrand et al., *Understanding the Impacts of Anthropogenic Sound on Beaked Whales,* 7 J. CETACEAN RES. & MGMT. 177, 177–187 (2006); S. A. Rommel et al., *Elements of Beaked Whale Anatomy and Diving Physiology and Some Hypothetical Causes of Sonar-Related Stranding*, 7 J. CETACEAN RES. & MGMT. 189, 189–209 (2006); Colin D. MacLeod et al., *A Review of Beaked Whale Behavior and Ecology in Relation to Assessing and Mitigating Impacts of Anthropogenic Noise,* 7 J. CETACEAN RES. & MGMT. 211, 211–221 (2006); R. Edwards, *Sonar Kills Whales*, NEW SCIENTIST, Oct. 2003, at 10.

32. Angela D'Amico et al., *Beaked Whale Strandings and Naval Exercises,* 35 AQUATIC MAMMALS 452, 456, 458, 462; Simmonds, *supra* note 28, at 448; Vidal Martín et al., *Mass Strandings of Beaked Whales in the Canary Islands,* 42 EUR. CETACEAN SOC'Y NEWSL. 33, 33 (2004).

33. D'Amico, supra note 33; A. Frantzis, *Does Acoustic Testing Strand Whales?*, 392 NATURE 29, 29 (1998).

34. Sarah J. Dolman, et al., *A Note on the Unprecedented Strandings of 56 Deep Diving Whales Along the UK and Irish Coast,* 3 MARINE BIODIVERSITY RECS. 1, 1–8 (2010).

35. NAT'L MARINE FISHERIES SERVICE, U.S. DEP'T OF COMMERCE, JOINT INTERIM REPORT BAHAMAS MARINE MAMMAL STRANDING EVENT OF 15–16 MARCH 2000 ii (2001); Jeff Hecht, *Navy Accepts Blame For Whale Deaths,* NEW SCIENTIST, Jan. 2002, at 12, 15; James Hrynyshyn, *Going Round the Bend,* NEW SCIENTIST, Dec. 2001, at 17.

if not likely, contributing factor in what may have been a confluence of events"[36] (in the case of Hawaii) or a possible, but inconclusive, overlap (in the case of North Carolina).[37]

The whales that appear most vulnerable to military sonar are beaked whales. Beaked whales include twenty-one species of toothed whales, which are members of the family *Ziphiidae* and notable for their elongated snouts. Beaked whales are one of the least known groups of sea mammals. Several species have yet to be formally described or named; other species are known only from remains and have never been sighted alive. Only three to four of the twenty species are reasonably well-known. What is known is that beaked whales are the world's most extreme divers. They can dive for up to one hour and reach depths of nearly 1,900 meters. To avoid getting decompression sickness—the potentially fatal build-up of nitrogen bubbles in body tissues—they must surface slowly. Research suggests that their complex dive patterns and communication could be changed in response to sonar signals, either by surfacing more quickly than usual, disrupting a series of near-surface dives between deep dives, or triggering an extended fleeing response. In some unusual circumstances, such as certain confluences of particular bathymetric conditions or deep near-shore canyons, with shorelines limiting escape routes, modifications of behavior may lead to strandings or death.[38] Evidence suggests that the most serious effect of this process is the evolution of gas bubbles in their tissues, driven by behaviorally altered dive profiles (such as extended surface intervals). It has been predicted that the tissues of beaked whales are supersaturated with nitrogen gas on ascent due to the characteristics of their deep-diving behavior. The lesions observed in beaked whales that strand after interacting with sonar are consistent with, but not diagnostic of, decompression sickness. This is similar to what is commonly known as

36. BRANDON L. SOUTHALL ET AL., U.S. DEP'T OF COMMERCE, HAWAIIAN MELON-HEADED WHALE (*PEPONACEPHALA ELECTRA*) MASS STRANDING EVENT OF JULY 3–4, 2004, 2 (2006).

37. ALETA A. HOHN ET AL., U.S. DEP'T OF COMMERCE, REPORT ON MARINE MAMMAL UNUSUAL MORTALITY EVENT UMESE0501SP: MULTISPECIES MASS STRANDING OF PILOT WHALES (GLOBICEPHALA MACRORHYNCHUS), MINKE WHALE (BALAENOPTERA ACUTOROSTRATA), AND DWARF SPERM WHALES (KOGIA SIMA) IN NORTH CAROLINA ON 15–16 JANUARY 2005, 2–3 (2006).

38. J. Hildebrand et al., *Understanding the Impacts of Anthropogenic Sound on Beaked Whales,* 7 J. CETACEAN RES. & MGMT. 177–187 (2006); S.A. Rommel et al., *Elements of Beaked Whale Anatomy and Diving Physiology and Some Hypothetical Causes of Sonar-related Stranding*, 7(3) J. CETACEAN RES. & MGMT. 189–209 (2006); Colin D. MacLeod & Angela D'Amico, *A Review of Beaked Whale Behavior and Ecology in Relation to Assessing and Mitigating Impacts of Anthropogenic Noise*, J. CETACEAN RES. & MGMT. 211–221 (2006).

"the bends" in humans, and these injuries are known as "gas and fat embolic syndrome."[39]

To help build certainty in this area, a number of scholars have attempted to establish databases that show an overlap between military exercises using mid-frequency (*not* low-frequency) sonar and mass strandings of cetaceans. From such databases, a correlation was shown along the Japanese coast near Yokosuka, one of the primary bases for United States naval activity in the western Pacific, with ten mass strandings reported since the early 1950s and sixty-four beaked whales stranded individually. By comparison, only two other possible mass strandings of beaked whales are known to have occurred over the rest of the entire Pacific coast of Japan.[40] Similarly, a correlation appears evident with the historic strandings of beaked whales and naval operations in both the Mediterranean and the Caribbean from the early 1990s. However, in other parts of the world, such as with southern California between 1982 and 2007, there was no such overlap.[41] This last example, supplemented by the omission of "a single documented sonar-related injury to any marine mammal" of any cetacean deaths during 40 years of training exercises off Southern California was influential in the U.S. Supreme Court's decision to downgrade the risks of this technology.[42]

Although methodologies for the assessment of the environmental burdens and their impact are difficult in all fields, noise pollution is an especially challenging area. These difficulties are due to the multiple pathways that noise pollution can take, its cumulative impact, its failure

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39. *See* A. Fernández et al., *Gas and Fat Embolic Syndrome: Involving a Mass Stranding of Beaked Whales Exposed to Anthropogenic Sonar Signals,* 42 VETERINARY PATHOLOGY 446, 446–457 (2005); P. D. Jepson et al., *Gas Bubble Lesions in Stranded Cetaceans,* 425 NATURE 575, 575 (2003); Four major research priorities, needed to address information gaps on the impacts of sound on beaked whales have been identified as: (1) controlled exposure experiments to assess beaked whale responses to known sound stimuli; (2) investigation of physiology, anatomy, pathobiology and behavior of beaked whales; (3) assessment of baseline diving behavior and physiology of beaked whales; and (4) a retrospective review of beaked whale strandings.

40. R. Brownell, T. Yamada, J. G. Mead, & A. L. Helden, *Mass Stranding of Cuvier's Beaked Whales in Japan: U.S. Naval Acoustic Link?* (2004), (unpublished paper SC/56/E37 presented to the IWC Scientific Committee), (on file with the Office of the Journal of Cetacean Research and Management and reported out of the IWC Scientific Committee).

41. Ronald Filadelfo et al., *Correlating Military Sonar Use with Beaked Whale Mass Strandings: What Do the Historical Data Show?,* 35 AQUATIC MAMMALS 435, 435; Michela Podesta et al., *A Review of Cuvier's Beaked Whale Strandings in the Mediterranean Sea,* 7 J. CETACEAN RES. MGMT. 251, 251–261 (2006).

42. *Winter*, 555 U.S. at 14.

to leave a residue, and the vast differences between and within species' responses to noise.[43] Thus, it often becomes difficult, as has been pointed out in the courts of the United States, to find exactly where a level of noise is "biologically significant" to a species.[44] That is, when exactly does noise induce long-term abandonment of an area important for feeding, breeding, or rearing the young, leading to a reduction in fecundity, carrying capacity, or both? Such impacts may not become immediately apparent and could be modified by habituation, sensitization, hearing loss, physiological damage, and stress. It may be that such "indirect" stresses more seriously affect many marine species over the long term, as their efficiencies in foraging, navigation, or communication may be compromised. This may be especially so if the populations are already endangered and anthropogenic noise affects long-term reproductive success.[45] Accordingly, as the 2005 Report of the U.S. National Research Council explained, when trying to ascertain the biologically significant impacts upon marine mammals from ocean noise, "there was a consensus that we are a decade away or more from having the data and understanding of the transfer functions needed to turn such a conceptual model into a functional, implementable tool."[46]

The multitude of scientific gaps in this area have been noted by the International Council for the Exploration of the Sea[47] and the 1994,[48]

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43. COMM. ON POTENTIAL IMPACTS OF AMBIENT NOISE IN THE OCEAN ON MARINE MAMMALS, NAT'L RESEARCH COUNCIL, OCEAN NOISE AND MARINE MAMMALS 6–7 (2003) [hereinafter NRC 2003]; INT'L COUNCIL FOR THE EXPLORATION OF THE SEA ADVISORY COMM. ON ECOSYSTEMS, INT'L COUNCIL FOR THE EXPLORATION OF THE SEA, REPORT OF THE AD-HOC GROUP ON THE IMPACTS OF SONAR ON CETACEANS AND FISH 2, 3, 13–15, 39. (2nd ed. 2005) [hereinafter ICES REPORT].

44. NRDC v. Evans, 279 F. Supp. 2d 1129, at 1155*; see also*, NRDC v. United States Dep't of the Navy, 2002 WL 32095131, at *12.

45. STATE HEALTH AGENCY OF BADEN-WÜRTTEMBERG, WORLD HEALTH ORG., EXPERTS CONSULTATION ON METHODS OF QUANTIFYING BURDEN OF DISEASE RELATED TO ENVIRONMENTAL NOISE (2007); DAVID KAY, ANNETTE PRÜSS & CARLOS CORVALÁN,. WORLD HEALTH ORG., METHODOLOGY FOR ASSESSMENT OF THE ENVIRONMENTAL BURDEN OF DISEASE (2000); ICES Report, *supra* note 44, at 13, 15–17, 36–37; COMM. ON CHARACTERIZING BIOLOGICALLY SIGNIFICANT MARINE MAMMAL BEHAVIOR, NAT'L RESEARCH COUNCIL, MARINE MAMMAL POPULATIONS AND OCEAN NOISE: DETERMINING WHEN NOISE CAUSES BIOLOGICALLY SIGNIFICANT EFFECTS 3 (2005) [hereinafter NRC 2005]; NRC 2003, *supra* note 44, at 4–6; COMM. TO REVIEW RESULTS OF ATOC'S MARINE MAMMAL RESEARCH PROGRAM, NAT'L RESEARCH COUNCIL, MARINE MAMMALS AND LOW-FREQUENCY SOUND: PROGRESS SINCE 1994 3 (2000) [hereinafter NRC 2000].

46. ICES REPORT, *supra* note 44, at 2, 10–13, 15–17, 36–38; NRC 2005, *supra* note 46, at 4, 34; NRC 2000, *supra* note 46, at 3, 59; NRC 2003, *supra* note 44, at 4–6.

47. M. L. TASKER ET AL., THE MARINE STRATEGY FRAMEWORK DIRECTIVE: TASK GROUP 11, UNDERWATER NOISE AND OTHER FORMS OF ENERGY 33–35, 36 (2010); ICES REPORT, *supra* note 44, at 12–23, 47–49.

2000,[49] 2003,[50] and 2005[51] reports of the National Research Council. Similar calls highlighting the scientific gaps in this area have been made by the specialist cetacean organizations that operate within international law, namely the International Whaling Commission,[52] the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area[53] and the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas.[54] In addition, a number of scientific studies[55] along with the European Parliament,[56] the United States,[57] and the United Nations General Assembly[58] have called for collaborative international scientific investigations into the topic of anthropogenic noise pollution in the oceans. Following through, in 2010, the Secretariat of the Convention on Biological Diversity was

48. COMM. ON LOW-FREQUENCY SOUND AND MARINE MAMMALS OCEAN STUDIES BD., NAT'L RESEARCH COUNCIL, LOW-FREQUENCY SOUND AND MARINE MAMMALS: CURRENT KNOWLEDGE AND RESEARCH NEEDS (1994).

49. NRC 2000, *supra* note 46.

50. NRC 2003, supra *note* 44.

51. NAT'L RES. COUNCIL, MARINE MAMMAL POPULATIONS AND OCEAN NOISE: DETERMINING WHEN NOISE CAUSES BIOLOGICALLY SIGNIFICANT EFFECTS (2005).

52. *See generally* INT'L WHALING COMM'N, REPORT OF THE SCIENTIFIC COMMITTEE OF THE IWC, IWC/61/Section 12.4, *available at* http://swfsc.noaa.gov/uploadedFiles/Divisions/PRD/Programs/Photogrammetry/SC%20Report%20%20A-C.pdf?n=9220.

53. *See* AGREEMENT ON THE CONSERVATION OF CETACEANS OF THE BLACK SEA, MEDITERRANEAN SEA, AND CONTIGUOUS ATLANTIC AREA, ASSESSMENT AND IMPACT ASSESSMENT OF MAN-MADE NOISE, ACCOBAMS Res. 2.16 (2004) [hereinafter ACCOBAMS Res. 2.16].

54. *See* 4th Meeting of the Parties to ASCOBANS, Esbjerg, Den., Aug. 19–22, 2003, *Effects of Noise and of Vessels*, Res. 5, § 3.

55. *See generally*, INT'L WHALING COMM'N, REPORT OF THE SCIENTIFIC COMMITTEE § 12.2.5. (2004); NRC 2000, *supra* note 46, at 4, 7; NRC 2003, *supra* note 44, at 7, 11; Note also ACCOBAMS Res. 2.16, *supra* note 54.

56. Resolution on the Environmental Effects of High-Intensity Active Naval Sonars, EUR. PARL. DOC. (B6-0089) 5 (2004).

57. *See* International Union for the Conservation of Nature and Natural Resources, World Conservation Congress, Bangkok, Thail., Nov. 17–25, 2004, Resolutions and Recommendations 3.068 (2005); The Statement, attached to the end of the resolution. *See also* U.S. MARINE MAMMAL COMM'N, MARINE MAMMALS AND NOISE: A SOUND APPROACH TO RESEARCH AND MANAGEMENT, iii–iv (2007); U.S. COMM'N ON OCEAN POLICY, OCEAN BLUEPRINT FOR THE 21ST CENTURY 315–316 (2004).

58. *See* G.A. Res. 65/37A, ¶ 186, U.N. Doc. A/RES/65/37A (Dec. 7, 2010); For the earlier recognition of the same point, see G.A. Res. 64/71, ¶ 162, U.N. Doc A/RES/64/71 (Dec. 4, 2009); G.A. Res. 63/111, ¶ 141, U.N. Doc A/RES/63/111 (Dec. 5, 2008); G.A. Res. 62/215, ¶ 120, U.N. Doc A/RES/62/215 (Dec. 22, 2007); G.A. Res. 61/222, ¶ 107, U.N. Doc; A/RES/61/222 (Dec. 20, 2006); and G.A. Res. 60/30, ¶ 84, U.N. Doc A/RES/60/30 (Nov. 29, 2005).

instructed to compile and synthesize available scientific information on anthropogenic underwater noise and its impacts on marine and coastal biodiversity and habitats, for consideration at a future meeting prior to the eleventh meeting of the Conference of the Parties.[59]

IV. THE MILITARY AND CONSERVATION IN A DOMESTIC CONTEXT

Not surprisingly, against these growing concerns, a number of conservation groups have attempted to force the naval exercises utilizing sonar to be either abandoned or modified. All of the legal work on this topic has, to date, been conducted within domestic settings, and that of the United States in particular.

The domestic laws at issue over this topic in the United States are the Endangered Species Act,[60] the Marine Mammals Protection Act,[61] the

59. Tenth Meeting of Parties to the Convention on Biological Diversity, Nagoya, Japan, Oct. 18–20, 2010, *Decision X/13, New and Emerging Issues,* ¶ 2(b); *see also id. at Decision X/29, Marine and Coastal Biodiversity*, ¶ 12.

60. The Endangered Species Act of the United States was enacted in 1973 in order to, "provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, [and] . . . to provide a program for the conservation of such endangered species and threatened species." *16 U.S.C. § 1531(b) (2011)*. This Act requires each federal agency to "insure that any action authorized, funded, or carried out by [federal] agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary [of the Interior or of Commerce] . . . to be critical." *16 U.S.C. § 1536(a)(2) (2011)*. To satisfy this mandate, an agency must inquire of the Fish and Wildlife Service whether any threatened or endangered species may be present in the area of proposed action. If the answer is in the affirmative, they must prepare a biological assessment, normally as part of environmental impact assessment, to see if the species is "likely to be effected." If the answer is positive, the agency must consult with the Fish and Wildlife Service, and the latter must produce a "biological opinion." If this shows the actions will jeopardize the species or destroy or adversely modify critical habitat, then the action may not go forward unless an alternative that avoids such destruction of adverse modification is found. For a good discussion of this Act in this setting, see STEPHEN DYCUS, NATIONAL DEFENSE AND THE ENVIRONMENT 30–35 (1996). For this Act when in conflict with the military in court, see *Sierra Club v. Glickman*, 156 F.3d 606 (5th Cir. 1998).

61. 16 U.S.C. § 1361 (1988). This Act is aimed primarily at the prevention of commercial whaling, as well as fishing that incidentally kills or injures ocean mammals. However, the act makes any hunting, capture, killing, harassment, or trade of a marine mammal unlawful without a permit from the Secretary of Commerce. Thus, the Act applies to national defense activities that might threaten cetaceans. The Navy had experience with this Act during the 1980s because of their taking and utilization of dolphins for military purposes. *See* Citizens to End Animal Suffering and Exploitation v. The New England Aquarium, 836 F. Supp. 45 (D. Mass. 1993).

Coastal Zone Management Act,[62] and the National Environment Policy Act.[63] While all of these laws have a strong conservation focus, they also have exemptions built into them allowing for necessary military objectives to trump conservation concerns. These exceptions were either built in originally at the time of drafting, or subsequently. However, before these subsequent amendments, which gave giving greater leeway to military needs, there was clearly a different trend in the decade between the end of the Cold War in 1991 and the attacks on the United States in 2001. This trend began, following some high profile noncompliance by the military, with environmental statutes.[64] Following the high profile noncompliance the then Secretary of Defense, Dick Cheney, issued a memorandum to the Secretaries of the Army, Navy, and Air Force declaring that:

> The Department of Defense will be the Federal Leader in agency compliance and protection. We must demonstrate commitment with accountability for responding to the Nations environmental agenda . . . defense and the environment is not an either/or proposition. To choose between them is impossible in this real world of serious defense threats and genuine environmental concerns.[65]

Following through, the Department of Defense and the associated wings of the military began to integrate environmental considerations into their work to a much greater extent. For example, in 1996, the Department of Defense issued a directive announcing its policy to "display environmental security leadership within DoD activities worldwide . . . [by] ensuring that environmental factors are integrated into DoD decision making processes . . . [and] protecting, preserving, and, when required, restoring and enhancing the quality of the environment."[66] The high tide of these efforts, which were reflected in

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62. 16 U.S.C. §§ 1451–1464 (1988). The Coastal Zone Management Act requires planning for activities that affect the nation's coastal waters and adjacent shore-lands. Each coastal state is encouraged through federal financial assistance to develop a management program approved by the Secretary of Commerce. And federal agency activity affecting the coastal zone of a state with an approved program must be "consistent with" that program "to the maximum extent practicable."

63. The National Environmental Policy Act, *42 USCA § 4321.*

64. United States v. Dee, 912 F.2d 741 (4th Cir. 1990).

65. Julie J. Yap, *Just Keep Swimming: Guiding Environmental Stewardship Out of the Riptide of National Security*, 73 FORDHAM Law L. REV. 1289, 1291 (quoting Dick Cheney's address to the Defense and Environmental Initiative Forum, September 3rd, 1990). Note also Nancy Bethurem, *Environmental Destruction in the Name of National Security,* 8 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 109, 115.

66. DEP'T OF DEF. Directive No. 4715 (Feb. 24, 1996). This Directive was cancelled in 2005, and replaced with a new one which omitted all of the language quoted above, and commits the government only to compliance with "applicable laws and DoD

numerous countries, was found in early 2001, when the Military Environmental Responsibility Act was introduced to the House of Representatives.[67] This revolutionary piece of legislation sought to make all of the military departments comply with all Federal and State laws designed to protect the environment or the health and safety of the public to the same extent as all other entities subject to those laws.[68]

Although the environmental progress between 1991 and 2001 was slow, at least it was slow progress, opposed to the regression post September 11, 2001, when environmental laws within the United States were quickly restricted.[69] This occurred because Congress granted a series of new exemptions or widening of rights within the existing laws because the military argued that it was unable to train correctly because its training areas (which have been expanded greatly since the middle of the twentieth century)[70] were being increasingly encroached upon,[71] thus causing it to lose its military edge. Following an overt push back authorizing the Secretary of Defense "to address training constraints caused by limitation on the use of military lands, marine areas and airspace that are available in the United States and overseas for training of the Armed Forces,"[72] the Readiness and Range Preservation Initiative emerged as a tool to counter what was perceived as environmental laws that were preventing the military from being fully prepared.[73] Although

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policies." DEP'T OF DEF. Directive No. 4715, *Environmental Safety and Occupational Health* § 4.6 (Mar. 9, 2005).

67. For similar approaches to this question in Europe, *see* RACHEL WOODWARD, MILITARY GEOGRAPHIES 85–90, (2004).

68. *See* Military Environmental Responsibility Act, H.R. 2154, 107th Congress (2001).

69. F.R. DURANT, THE GREENING OF THE U.S. MILITARY 155–175, (2007); Richard Lazarus, *A Different Kind of Republican Movement in Environmental Law,* 87 MINN. L. REV. 999 (2003).

70. SUSAN S. LANIER-GRAHAM, THE ECOLOGY OF WAR 88 (1993).

71. The Department of Defense uses the term "encroachment" to describe "the cumulative result of any and all outside influences that inhibit normal military training and testing." The eight encroachment issues of concern are urban growth around military installations and training ranges, radio frequency interference, air pollution, noise pollution, airspace interference, unexploded munitions, and endangered species habitat and protected marine reserves. Urban sprawl is recognized as the foremost concern in this area. *See* Ryan Santicola, *Encroachment: Where National Security, Land Use, and the Environment Collide*,10 ALB. L. ENVTL. OUTLOOK J. 329; *see also*, United States Army Legal Servs. Agency, *USALSA Report: Environmental Law Division Notes: Encroachment: Putting the Squeeze on the Department of Defense,* ARMY LAWYER, Dec. 2001, at 33.

72. National Defense Authorization Act, Pub. L. No. 107–314, § 366, 116 Stat. 2458, 2522 (2002).

73. National Defense Authorization Act, Pub. L. No. 108–136, § 319, 117 Stat.

remaining committed to "environmental stewardship," a number of exemptions were subsequently created for the laws pertaining to endangered species,[74] coastal zone management[75] and marine

1392, 1434 (2004). For commentary, see Marcilynn Burke, *Green Peace? Preserving Our National Treasures While Providing for Our National Security*, 32 WM. & MARY ENVTL. L. & POL'Y REV., 803, 804–806 (2008) and Stephen Dycus, *Osama's Submarine: National Security and Environmental Protection After 9/11*, 30 WM. & MARY ENVTL. L. & POL'Y REV., 1, 2–3 (2005).

74. The ESA already contained a broad exemption for national security reasons. Specifically, "[n]otwithstanding any other provision of this Act, the Committee shall grant an exemption for any agency action if the Secretary of Defense finds that such exemption is necessary for reasons of national security." This exemption is not subject to the discretion of the Committee, but is dependent only upon certification by the Secretary of Defense. The military has traditionally viewed the exemption as an extraordinary remedy, to be invoked as a measure of last resort in wartime. It has never been used, and during recent decades it appeared that this was likely to remain the practice. However, National Defense Authorization Act for Fiscal Year 2004, Pub. L. No. 108–136, §318, 117 Stat. 1433 (2003), took this further, with limiting the designation of critical habitat under the Endangered Species Act—if a military site was already in accordance with the 1960 (and subsequently updated) Sykes Act. This Act has consistently tried to promote effectual planning, development, maintenance, and coordination of wildlife, fish, and game conservation and rehabilitation in military reservations. However, this Act has always been clear that this had to be "consistent with the use of military installations to ensure the preparedness of the Armed Forces." For a useful background to this push, *see* Major David N. Diner, *The Army and the Endangered Species Act: Who's Endangering Whom?*, 143 MIL. L. REV. 161, 200–233 (1994).

75. Federal lands (of which the military has a strong stake) were specifically excluded from the Act's definition of coastal zone. Nevertheless, considerable uncertainty existed over the extent of the military obligations in this area. *See* Friends of the Earth v. United States Navy, 841 F.2d 927 (9th Cir. 1988); Richard Lee Kuersteiner et al., *Protecting our Coastal Interests: A Policy Proposal for Coordinating Coastal Zone Management, National Defense, and the Federal Supremacy Doctrine*, 8 B.C. ENVTL. AFF. L. REV 705 (1979). As was further explained in the Supreme Court, the President, pursuant to 16 U.S.C. § 1456(c)(1)(B) (2011), granted the Navy an exemption from the CZMA. Section 1456(c)(1)(B) permitted such exemptions if the activity in question is "in the paramount interest of the United States." The President determined that continuation of the exercises as limited by the Navy was "essential to national security." Thus, the President concluded that compliance with the District Court's injunction in this area would "undermine the Navy's ability to conduct realistic training exercises that are necessary to ensure the combat effectiveness of . . . strike groups." *Winter v. NRDC,* 555 U.S. 7, 17 (2008). In 2008, the Secretary of Commerce requested further, that the that the President exempt the Navy from section 307(c)(a)(a) of the CZMA, certifying that mediation under § 1456(h) was not likely to result in compliance with 1456(c)(1)(a). President Bush determined that, "compliance would undermine the Navy's ability to conduct realistic training exercises that are necessary to ensure the combat effectiveness of carrier and expeditionary strike groups. This exemption will enable the Navy to train effectively and to certify carrier and expeditionary strike groups for deployment of worldwide operational and combat activities, which are essential to national security." Marcilynn A. Burke, *Green Peace? Protecting our National Treasures While Providing*

mammals.[76] Moreover, the courts have consistently taken a hard line in limiting the application of the National Environmental Policy Act when conservation priorities have conflicted with military priorities. In particular, the underlying theme that the National Environmental Policy Act ("NEPA") "is a procedural statute . . . [that] does not force an agency to reach substantive, environment-friendly outcomes" is never far from the surface.[77] Courts have also been clear that they will not "flyspeck" an agency's environmental analysis, looking for any deficiency, no matter how minor,[78] and therefore, transgressions must be substantive for them to get involved.[79] Finally, and most substantively, when dealing with certain issues of high military importance, the courts will not demand that the military reveal its secrets in order to show compliance with the requirements of environmental impact assessments. In such instances, "ultimately, whether or not the navy has complied with the NEPA to the fullest extent possible is beyond judicial scrutiny."[80]

The cumulative results of the existing practices, and all of the changes noted above, is that it is very rare for any American court to absolutely prohibit the military from carrying out those activities that the military (or more specifically, the President and Congress) considers to

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for Our National Security, 32 WM. & MARY ENVTL. L. & POL'Y REV. 803, 831 (2007–2008).

76. In 2003, Congress, through the National Defense Authorization Act for Fiscal Year 2004, Pub. L. No. 108–136, §319, 117 Stat. 1434 (2003*)* amendments to the MMPA (section 319 of the 2004 Act, dealing with "exemptions of actions necessary for national defense" gave the Navy greater leeway to use LFAS if necessary for national defense. This was done by narrowing the definition of "harassment" in the MMPA for "military readiness activities" to cover (1) acts that actually injure or have a significant potential to injure marine mammals – mere potential is not enough and (2) acts that actually disturb or are likely to disturb to such a degree that behavioral patterns are abandoned or significantly altered . . . earlier requirements of advance publicity in local newspapers, opportunity for public comment, eliminated . . . finally the amendment allows the Secretary of Defense to exempt any action or category of actions from compliance with the MMPA for up to two years if they determine that it is "necessary for national defense" —this brings the Act into line with most other similar acts. For a discussion of this, *see* Stephen Dycus, *Osama's Submarine: National Security and Environmental Protection After 9/11*, 30 WM. & MARY ENVTL. AFF. L. & POL'Y REV. 1, 35–37 (2005–2006).

77. Nat'l Audubon Soc'y v. Navy, 422 F.3d 174, 184 (4th Cir. 2005).

78. *Id.* at 186.

79. Australians for Animals v. Evans, 301 F. Supp. 2d 1114, 1120 (N.D. Cal., 2004).

80. Weinberger v. Catholic Action of Hawaii, 45 U.S. 139, 146 (1981). For an overview of this area, see Randall Abate, *NEPA, National Security and Ocean Noise: The Past, Present and Future of Regulating the Impact of Navy Sonar on Marine Mammals,* 13 J. INT'L WILDLIFE L. & POL'Y 326, 349–355 (2010).

be necessary. These issues are, ultimately, not open to judicial inquiry.[81] In this regard, the Supreme Court has acknowledged that with regards to military matters: "[J]udges are not given the task of running the Army . . . . Orderly government requires that the judiciary be as scrupulous not to interfere with legitimate Army matters as the Army must be scrupulous not to interfere in judicial matters."[82]

Accordingly, when dealing with environmental matters, if some act is deemed "essential" for military purposes, courts will usually permit the activity to proceed, even if it is in breach of various environmental statutes.[83] This was most evident in the Supreme Court case *Winter v. NDRC*, where although it was agreed that "military interests do not always trump other considerations,"[84] if the interests are essential. In *Winter* MFA sonar was deemed "mission-critical [and] essential to

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81. United States v. 243.22 Acres of Land in Babylon, NY, 129 F.2d 678, 683 (2d Cir. 1942); Gilligan v. Morgan, 413 U.S. 1, 10 (1973); Schlesinger v. Ballard, 419 U.S. 498, 510 (1975).

82. Orloff v.Willoughby, 345 U.S. 83, 93–94 (1953).

83. *See* Barcelo v. Brown, 478 F. Supp. 646 (D.P.R. 1979). In this case, the defendants (the United States Navy) was charged with violating 17 different environmental laws during their military exercises on Vieques Island, Puerto Rico. Although many of these were not upheld, a number were. Accordingly, the court ordered the United States Navy to promptly comply with the technical requirements of three federal environmental and historic preservation statutes that it had violated. However, the Court refused to place a permanent injunction on the continued use of the island for military purposes, allowing the exercises to continue on the proviso that the Navy comply with the identified areas. The United States District Court for Puerto Rico held, "under the present circumstances the continued use of Vieques by Defendant Navy for naval training activities is essential to the defense of the Nation and that the enjoining of said activities is not an appropriate relief for the correction of the cited statutory violations." This was very similar to the earlier 1977 case of *Aluli v. Brown,* 437 F. Supp. 602, (D. Haw. 1977), where the District Court for the District of Hawaii, refused to order the navy to stop conducting bombing activities on an uninhabited Hawaiian island, although they were ordered to comply with the environmental and cultural laws and regulations that they had avoided. After prolonged legal debate, the Navy finally stopped utilizing the island in 2003. For a contemporary example of this, see *Nat'l Audobon Soc'y v. Gordon*, 422 F.3d 174 (4th Cir. 2005). In this case, the Navy had to comply with the NEPA, so they could not start building a new airfield, but they could still proceed with certain specific steps prefatory to possible construction. In addition, the Court was clear they would not second guess the navy in matters of military readiness, and as such, would not grant broad injunctions in this case. *See* Barcelo v. Brown, 478 F. Supp. at 694.

84. Winter v. NRDC, 555 U.S. 7, 9 (2008). For commentary on this case, *see* Joel Reynolds, *Submarines, Sonar and the Death of Whales: Enforcing the Delicate Balance of Environmental Compliance and National Security in Military Training,* 32 WM. & MARY ENVTL. L & POL'Y REV. 759 (2008); Benjamin Narodick, *Winter v. National Resources Defense Council: Going Into the Belly of the Whale*, 15 B.U. J. SCI. & TECH. L. 332 (2009); Alicia Schaffner, *National Security v. Whales: the Navy and Natural Defense Counsel Battle Their Way to the Supreme Court,* 1 SEA GRANT L. & POL'Y J. 82 (2008).

national security,"[85] and therefore the Court concluded that the environmental injury was "outweighed by the public interest and the Navy's interest in effective, realistic training of its sailors."[86] However, although matters deemed essential to the military may trump environmental considerations, the latter are rarely completely discarded. Rather, the courts typically try to find a balance between the interests of the military and the interests of environmental protection (as expressed by statutory obligations), whereby, in the language of *NDRC v. Evans*, "both can be safeguarded." Thus, in the case of *Evans*, "the public interest in both military preparedness and protection of marine life can be reconciled through a carefully tailored injunction that allows the Navy to meet its needs for peacetime training and testing, while also providing reasonable safeguards for marine mammals and other sea animals."[87]

The exact balance in such safeguarding will be influenced by considerations, such as the degree of the endangerment of the species at hand (with critically endangered species given higher standards),[88] the base standard is one whereby mitigation measures are imposed on the proposed military activity.[89] The question is, what are the appropriate mitigation measures to be imposed? The most common mitigation measure to be adopted is a "least-harm" rule, whereby military exercises may be continued, provided they attempt to do the least possible harm. The foremost method to achieve this is by ensuring that the testing site is the best possible location in terms of minimal environmental impact. The test for this is usually via an evaluation of alternative sites.

The examination of alternatives is a key consideration with impact assessments in general. In the cases pertaining to sonar, the adoption of alternative sites where there would be the least impact, has become standard. This practice first arose in the 1994 case of *NRDC v. the United States Department of the Navy*, which turned on the Navy's failure to examine meaningfully the possibility of alternative sites for the planned ship-shock trial, which would have resulted in taking fewer marine mammals and other animals. This was juxtaposed against evidence that suggested the planned site was a "uniquely populous nature of the Southern California Bight."[90] Similar considerations, whereby the importance of looking at all suitable alternative sites—and choosing the one which would result in the least impact on cetaceans—available to

85. Winter, 555 U.S. at 18, 25, 26.

86. *Id.* at 8.

87. NRDC v. Evans, 364 F.Supp.2d 1083, 1090 (N. D. Cal. 2003).

88. NRDC v. Evans, 316 F.3d 904, 907 (9th Cir. 2003).

89. NRDC v. Navy, 857 F. Supp. 734, 742 (C.D. Cal. 1994).

90. *Id.* at 740, 741.

test the new technologies, were reiterated in the cases of *NDRC v. United States Navy*[91] and *NRDC v. Evans*.[92]

In *Evans*, after reviewing the Navy's SURTASS LFAS Program, the Northern District of California imposed an injunction that permitted the Navy to train and test LFAS in a wide range of oceanic conditions as needed, "while restricting it from operating in certain sensitive areas when marine mammals are particularly abundant there."[93] Particular areas, identified as "Offshore Biologically Important Areas," were later added to this list.[94] Following this case, the Navy and the Natural Resources Defense Council ("NRDC") settled their lawsuit over global deployment of LFAS by the Navy agreeing to limit ongoing training missions to a region of the West Pacific, which is of great strategic importance to the Navy, yet relatively free of cetacean populations. In 2008, as attempts were made for a further roll-out of this technology, the Navy and NRDC agreed to a settlement in which both training and operational use of LFAS would continue to be limited to defined areas of the Pacific Ocean (although there were broad exemptions to these limits when Naval commanders deemed LFAS necessary in the search for potentially hostile submarines).[95]

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91. *See generally,* NRDC v. Navy, No CV-01-07781 (C.D. Cal. Sept 19, 2002); *Richard Heisler, A Whale of a Tale: NDRC v. U.S. Navy and the Attempt to Exempt the Exclusive Economic Zone from the National Environmental Policy Act,* 10 *SW. J. L. & TRADE AM.*, 125 (2008).

92. NRDC v. Evans, 316 F.3d 904 (9th Cir. 2003).

93. *Id.* at 1090. In particular, the injunction extended the coastal buffer zone beyond the existing twelve miles to include more of the continental shelf. The injunction also required the Navy to avoid certain areas of the deep ocean during seasons when data on marine mammals and other endangered species such as sea turtles shows that they are migrating, breeding, feeding, or otherwise clustering there.

94. CHIEF OF NAVAL OPERATIONS, DEP'T OF THE NAVY, FINAL COMPREHENSIVE REPORT FOR THE OPERATION OF THE SURVEILLANCE TOWED ARRAY SENSOR SYSTEM LOW FREQUENCY ACTIVE (SURTASS LFA) SONAR ONBOARD THE R/V CORY CHOUEST AND USNS IMPECCABLE (T-AGOS 23) UNDER THE NATIONAL MARINE FISHERIES SERVICE REGULATIONS 50 CFR 216 SUBPART Q 10–11, 15–17 (2007), *available at* http://www.nmfs.noaa.gov/pr/pdfs/permits/surtass_lfa_final_report.pdf. [hereinafter SURTASS LFA REPORT ONBOARD CHOUEST]. Outside the coastal areas, the areas identified were the 200 meter isobath of the North American Eastern Coast, year round; the Costa Rico Dome, year round; and the Atlantic Convergence Zone, October through March. It was also agreed that LFAS would not be deployed in the Arctic or the Antarctic. The court in late 2003 and again in 2005 added a further nine areas off Japan, the Philippines and China where the Navy was not to operate.

95. *See* Press Release, Natural Resources Defense Council, Agreement Limits Navy's Use of Low-Frequency Active Sonar (Aug. 18, 2008), available at http://www.nrdc.org/media/2008/080812.asp.

Once the question of alternative sites has been dealt with, additional mitigation methods tend to come into play. For example, in *NRDC v. Evans*,[96] when dealing with mitigation measures for testing SURTASS-LFAS, in addition to the rule of seeking out alternative sites that would lessen environmental impacts, two additional measures were added. These measures were to be adopted "whenever feasible." Specifically, in seeking to minimize the exposure of marine mammals (and sea turtles) to SURTASS levels below 180 dB(A), they mandated a two kilometer safety zone, whereby if one of these animals (to be actively monitored via visual and sonar sources) is located, within one kilometer (the safety zone) of the sonar source, transmissions are to be suspended. Secondly, coastal waters within 22 kilometers of the shore should not be exposed to SURTASS-LFAS signals at levels above 180 dB(A).[97]

Similar additional mitigation measures were accepted by the Supreme Court when dealing with MFA sonar. These measures, originally promulgated by the District Court, included: (1) the imposition of a 12-mile "exclusion zone" from the coastline; (2) utilizing lookouts to conduct additional monitoring for marine mammals; (3) restricting the use of "helicopter-dipping" sonar; and (4) limiting the use of MFA sonar in geographic "choke points." The Supreme Court differed from the District Court over two additional measures of "shutting down MFA sonar when a marine mammal is spotted within 2,200 yards of a vessel," and "powering down MFA sonar by 6 dB(A) during significant surface ducting conditions."[98] With respect to these two additional measures, the Supreme Court, in deferring to the opinion of the Navy, ordered that the Navy need not comply with the additional measures as they were overly restrictive and were likely to affect necessary Navy operations. Specifically, each additional shutdown could result in the loss of several days' worth of training. This could cause operational commanders to "lose awareness of the tactical situation through the constant stopping and starting of MFA [sonar]."[99]

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96. NRDC v Evans. No. C-02-3805-EDL. 316 F.3d 904 (9th Cir. 2003).

97. *Id.* at 1130; *see* SURTASS LFA REPORT ONBOARD CHOUEST, *supra* note 96 at 8–12.

98. Winter v. NRDC, 555 U.S. 7, 18 (2008).

99. *Id.* at 28. The Supreme Court also disagreed with the sixth condition, that the Navy power down MFA sonar by 6 dB during significant surface ducting conditions. Surface ducting is a phenomenon in which relatively little sound energy penetrates beyond a narrow layer near the surface of the water. When surface ducting occurs, active sonar becomes more useful near the surface but less useful at greater depths. The Supreme Court held that restrictions in this area placed upon the navy understated the burden this would impose on the Navy's ability to conduct realistic training exercises.

V. THE MILITARY AND THE ENVIRONMENT IN AN INTERNATIONAL CONTEXT

The question that arises following the consideration of the military and conservation in the domestic context is, how would such matters be considered in an international context? As it stands, it is assumed that military forces will carry some of their domestic laws with them when they leave their national territory. Thus, in the case of the United States, lawmakers initially presumed that certain laws, like their NEPA, had a global application outside of the borders of America.[100] This was especially so when dealing with Trust territories where the United States had exclusive control,[101] but when the United States. had unique foreign policy considerations those considerations trumped the possible application of domestic environmental laws.[102] Similarly, as the courts have held, NEPA does not apply to bilateral contexts with friendly countries, such as those countries which may hold American military bases (because foreign policy interests outweigh the benefits of preparing environmental impact statements).[103]

Indeed, "given that surface ducting is both rare and unpredictable, it is especially important for the Navy to be able to train under these conditions when they occur."

100. The National Environmental Policy Act of 1969, 42 U.S.C.S § 4332 (2011) (requires all federal agencies to recognize the worldwide and long-range character of environmental problems); *see* NRDC v. Nuclear Regulatory Comm'n, 647 F.2d 1345, 1366 (D.C. Cir. 1981) (a discussion of how this recognition must be consistent with the foreign policy of the United States).

101. *See* People of Enewetak v. Laird, 353 F. Supp. 811, 818 (D. Haw. 1973); *see also* People of Saipan by Guerrero v. United States Dep't of Interior, 356 F. Supp. 645, 650 (D. Haw. 1973).

102. For example, in *NRDC v. NRC*, the Court of Appeals for the District of Columbia Circuit held that NEPA did not apply to the Nuclear Regulatory Commission's approval of the export of a nuclear reactor and complementary nuclear materials to the Philippines. The Court of Appeals for the District of Columbia Circuit found NEPA inapplicable because of the unique foreign policy interests arising in the nuclear energy and nonproliferation contexts, the potential cultural and legal problems inherent in engaging in an analysis of environmental effects in another country, and the United States' limited oversight of the project once the export permit was issued. 647 F.2d 1345 (D.C. Cir. 1981).

103. *See, e.g.,* NEPA Coal. of Japan v. Aspin, 837 F. Supp. 466, 467 (D.C. Cir. 1993); *see also* Greenpeace USA v. Stone, 748 F. Supp. 749, 760 (D. Haw. 1990) In *Stone* the court found that NEPA's EIS requirement did not apply to certain portions of the United States Army's transport of obsolete chemical munitions from the Federal Republic of Germany to Johnston Atoll, a United States trust territory in the Pacific, so that they could be destroyed. NEPA did not apply because the disposal policy for the munitions was the result of a cooperative agreement between the United States and the FRG and "an extraterritorial application of NEPA to the Army's action in the FRG with

As a way to move past the ambiguities in this area, in 1979 President Carter issued Executive Order No. 12,114 which pertained to the "Environmental Effects Abroad of Major Federal Actions."[104] The purpose of this order was to enable those responsible officials from Federal agencies, who have ultimate responsibility to authorize and approve actions that have "significant effects on the environment outside of the geographical borders of the United States,"[105] to be informed of pertinent environmental considerations and to "take such considerations into account,"[106] as well as other pertinent considerations of national policy. Although independent from other legislation, the Executive Order was seen as furthering "the purpose of the National Environmental Policy Act and the Marine Protection Research and Sanctuaries Act . . . [by keeping them] consistent with the foreign policy and national security policy of the United States."[107] This Order exempted a number of instances,[108] including many of the United States national security activities abroad, from the depth of scrutiny applied to domestic actions. Similarly, most environmental impacts within a "participating" nation escape review entirely. Thus, a joint military exercise within a NATO country would not require the United States to consider its environmental effects (as such countries are assumed to have worked out, and reconciled with the visitors, such questions for themselves).[109]

Despite these limits, procedures were established in a number of other areas, such as for bilateral or multilateral environmental studies or reviews (when impacting the environment of a foreign nation not

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the approval and cooperation of the FRG would result in a lack of respect for the FRG's sovereignty, authority and control over actions taken within its borders."

104. Exec. Order No. 12,114, 44 Fed. Reg. 1,957 (Jan. 4, 1979).

105. *Id.* § 2-1.

106. Exec. Order No. 12, 114 § *1-1*.

107. *Id.* § 1-1.

108. *Id.* § 2-5. Exemptions from the order include, actions not having a significant effect on the environment outside the United States as determined by the agency; actions taken by the President; actions taken by or pursuant to the direction of the President or Cabinet officer when the national security or interest is involved or when the action occurs in the course of an armed conflict; intelligence activities and arms transfers; export licenses or permits or export approvals, and actions relating to nuclear activities except actions providing to a foreign nation a nuclear production or utilization facility as defined in the Atomic Energy Act of 1954, or a nuclear waste management facility; votes and other actions in international conferences and organizations; or disaster and emergency relief action.

109. STEPHEN DYCUS, NATIONAL DEFENSE AND THE ENVIRONMENT 26–28 (1996); Karen V. Fair, *Environmental Compliance in Contingency Operations: In Search of a Standard?*, 157 MIL. L. REV. 112, 120 (1998) (discussing the "participating nation" exception).

participating with the United States and not otherwise involved in the action).[110] Environmental impact statements, when dealing with the global commons outside the jurisdiction of any nation (e.g., the oceans or Antarctica), were also required. However, in some of these cases, such as with Antarctica, the American courts have not needed Executive Order No. 12,114 because they have held that the NEPA does apply to Federal actions in Antarctica because it was not subject to foreign sovereignty. Rather, it was part of a global commons over which the United States had "some real measure of legislative control."[111] By the same logic, it is possible—but uncertain[112]—that the same situation exists for the high seas, although the United States has a much lesser degree of control in this context, unlike the regulatory regime of the Antarctic Treaty System, of which the United States is a consultative party with full standing. The fact that the United States is a party to a specific treaty, which imposes particular obligations, is a defining consideration with regard to environmental responsibilities of an international significance.

A. The Military and Pollution of International Significance

Where international treaties responding to environmental problems exist, the obligations of the military depend on the treaty and whether it deals with pollution or conservation.

When dealing with international treaties that aim to control pollution, the degree of military involvement is largely dictated by the degree of environmental damage directly caused by the military. That is, if the damage is clearly excessive relative to the advantages gained by the military action, then the activity may be prohibited.

The foremost example where international law has come to favor conservation concerns over military preparation involves nuclear weapons testing in the atmosphere. The first nuclear weapons test was conducted in Alamogordo, New Mexico, on July 16, 1945 as part of the Manhattan Project. By 2010, a further 2,402 nuclear tests had been recorded. Five-hundred and forty-one of these tests have occurred in the atmosphere. Cumulatively, the nuclear tests have left a worldwide legacy in both environmental and human terms. It has been suggested that

110. Exec. Order No. 12, 114 § E.2.4.

111. Envt'l. Def. Fund v. Massey, 986 F.2d. 528, 534 (D.C. Cir. 1993).

112. *See generally* NRDC v. United States Dep't. of the Navy, No. CV-01-07781, 2002 U.S. Dist. LEXIS 26360, at 1 (C.D. Cal. Sept. 17, 2002).

atmospheric nuclear testing may have had a direct link to the deaths of up to 65 million people worldwide. [113]

The United States Department of Health and Human Services suggested that at least 11,000 Americans alone have died from cancers caused by the radioactivity released from the 390 nuclear bombs exploded in the atmosphere between 1951 and 1963.[114] Service personnel of all countries who were forced to witness some of the blasts have met with serious health problems. However, the differences in the way nuclear test veterans and civilians from the United States,[115] France, the United Kingdom, and the Commonwealth (especially Australia and New Zealand)[116] experienced blasts suggest that the extent of the impact from watching such tests, despite their frequent exposure to dangerous levels of radiation, is scientifically uncertain because of difficulties in trying to disentangle background rates of cancer and other possible sources of cause.[117]

Aside from the instability that nuclear testing caused during the Cold War, the world superpowers were also aware of the environmental damage that was being created by their atmospheric testing. The first formal proposals for a limited test ban treaty were advanced by the Soviet Union in 1955, followed by the United States and the United Kingdom in 1959. The General Assembly of the United Nations also advocated for an international agreement that would stop the testing of nuclear weapons.[118] The following year, the Security Council noted that the ongoing failure of meetings between the world superpowers "may

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113. *See* ALEXANDER GILLESPIE, 3 A HISTORY OF THE LAWS OF WAR: THE CUSTOMS AND LAWS OF WAR WITH REGARDS TO ARMS CONTROL 123 (2011).

114. *Id.* at 122.

115. *See generally* PHILLIP FRADKIN, FALLOUT: AN AMERICAN NUCLEAR TRAGEDY, (2004); F. Lincoln Grahlfs, VOICES FROM GROUND ZERO: RECOLLECTIONS AND FEELINGS OF NUCLEAR TEST VETERANS (1996). *Also,* Vincent Kiernan, *US Takes A Closer Look At Nuclear Test Veterans*, NEW SCIENTIST, July 1993, at 8; Rob Edwards, *Radiation Payout*, NEW SCIENTIST, May 1999, at 12; Anonymous, *Radiation Damages*, NEW SCIENTIST, Nov. 1996, at 12.

116. *See generally* RODGER CROSS, BEYOND BELIEF: THE BRITISH BOMB TESTS (2006). *See also*

France to Compensate for Victims of Nuclear Testing, N.Z. HERALD, Mar. 25, 2009, at A3, *available at* http://uk.reuters.com/article/2009/03/24/us-france-nuclear-idUKTRE52N4W720090324; *UK Comes Clean on Radiation, N.Z. HERALD,* Aug. 4 2008, at A3.

117. A. ROBBINGS ET AL., RADIOACTIVE HEAVEN AND EARTH: THE HEALTH AND ENVIRONMENTAL EFFECTS OF NUCLEAR WEAPONS TESTING IN, ON AND ABOVE THE EARTH 72–82 (1991).

118. Suspension of Nuclear and Thermonuclear Tests, G.A. Res. 1402 (XIV) ¶ 1–2, U.N. Doc. A/4290 (Nov. 21, 1959).

lead to an increase of international tensions likely to endanger peace and security."[119] It was particularly aware "of the mounting danger of the continuation of the arms race."[120] In particular, the Security Council requested "negotiations on measures to prevent surprise attack, including technical measures."[121] It also requested that all governments act to discontinue all nuclear weapons tests.[122] However, this appeal was against rising international tensions, and soon thereafter, the General Assembly solemnly appealed directly to the Soviet Union "to refrain from carrying out its intention to explode in the atmosphere a 50 megaton bomb."[123] The Soviets declined the request and carried out the largest nuclear test ever commenced on the planet. Nevertheless, this action was a stepping stone towards a comprehensive test ban treaty, which the United States, the United Kingdom, and the Soviet Union all pledged to support in early 1963. However, a comprehensive treaty proved elusive because there were difficulties over ensuring compliance due to a lack of established verification procedures, such as seismic mechanisms and on-site inspections.[124] Due to such concerns, the best the three superpowers could achieve was the 1963 Treaty Banning Nuclear Weapon Tests in the Atmosphere, Outer Space and Under Water. This Treaty was positioned as a stepping stone toward "the discontinuance of all test explosions of nuclear weapons for all time," and "the speediest possible achievement of an agreement on general and complete disarmament under strict international control."[125]

The parties to the agreement also "desir[ed] to put an end to the contamination of man's environment by radioactive substances."[126] Accordingly, they agreed to:

> [P]rohibit, to prevent, and not to carry out any nuclear weapon test explosion, or any other nuclear explosion, at any place under its jurisdiction or control . . . in the atmosphere; beyond its limits,

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119. S.C. Res. 135, U.N. Doc. S/RES/135 (May 27, 1960).

120. *Id.*

121. *Id.* at ¶ 3.

122. *Id.*

123. G.A. Res. 1632 (XVI), U.N. Doc. A/4942 (Oct. 27, 1961).

124. US–USSR Exchange Views on Nuclear Test Ban, Feb. 11, 1963, 2 I.L.M. 298, at 298–300, 198–207; Verification and Response in Disarmament Treaties, 2 Agreements, June 20, 1963, 2 I.L.M. 320, at 321–331; US Report On Nuclear Test Ban Treaty Safeguards, May 11, 1964, 3 I.L.M., at 664, 664. *See also* Question of Compliance with Nuclear Test Ban Treaty, Jan. 19, 1965, 4 I.L.M. 393.

125. Treaty Banning Nuclear Weapon Tests in the Atmosphere Preamble, in Outer Space and Under Water, Aug. 5, 1963, 480 U.N.T.S. 43 [hereinafter Treaty Banning Nuclear Tests].

126. *Id.*

> including outer space; or underwater, including territorial waters or high seas.[127]

The treaty also prohibited carrying out any nuclear tests "in any other environment if such explosion causes radioactive debris to be present outside the territorial limits of the State under whose jurisdiction or control such explosion is conducted."[128] This prohibition did not cover underground explosions, although the parties did record their intention to reach "a treaty resulting in the permanent banning of all nuclear test explosions."[129] The Atmospheric Test Ban Treaty was signed by the United States, the Soviet Union and the United Kingdom. It was not signed by other superpowers, such as France and China. France stopped the atmospheric testing of its nuclear weapons in 1974 following cases brought against it by Australia[130] and New Zealand[131] in the International Court of Justice.[132]

Atmospheric testing is somewhat unique relative to other environmental problems because only the military is responsible for it. This is very unlike most other areas of internationally significant pollution, where the military is only one contributor among many, as seen with the creation of toxic waste, climate change, ozone depletion, chemicals, and some persistent organic pollutants. In these situations, the military's obligation to control its polluting activities is contained within the general obligations for parties to control all sources of pollution. Thus, unlike the atmospheric testing of nuclear weapons, when other types of pollution are involved the military is often just one sector of society contributing to the overall problem. When these problems are not international, the responsibilities of the military become invisible as the solutions are found only in domestic contexts. However, in some instances, where the pollution is international in impact, militaries have been drawn into the necessary solutions.

The best example of militaries having no direct international legal responsibilities with regard to their pollution is with their creation of toxic waste, which damages former (or contemporary) military bases. While in some instances the damage is done through deliberate violations

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127. *Id.* art. I.

128. *Id.* § (1)(b).

129. *Id.*

130. Nuclear Tests (Austl. v Fr.), 1974 I.C.J. 253, 269 (Dec. 20).

131. Nuclear Tests (N.Z. v Fr.), 1974 I.C.J. 457, 474–75 (Dec. 20).

132. *See* Request for an Examination of the Situation in Accordance With Paragraph 63 of the Court's Judgment of 20 December 1974 in *Nuclear Tests (New Zealand v. France)*, 1995 I.C.J. 288 (Sept. 22).

of existing laws,[133] more often than not the damage is done in accordance with the national exceptions that were added to laws such as those in the United States, covering toxic substances,[134] clean air,[135] and clean water.[136] Globally, within the estimated tens of millions of acres of territory in the possession of all of the militaries of the world, tens of thousands of sites contain buried waste, poisoned ecosystems, and/or damaged landscapes.[137] The only exception is where the disposal of some wastes have created impacts that have spread beyond national boundaries, such as with the reckless disposal of some nuclear submarines. In this situation, a number of nations have come together to cooperate in cleaning up a problem caused by previous administrations, when the environmental standards were considerably lower.[138] With a problem like climatic change, the contribution of the military can only be estimated. Estimates suggest that in some countries, such as the United States, the military was responsible for 76,267 gigatons (measures in carbon dioxide equivalent) of greenhouse gases emissions per year by the end of the twentieth century.[139] Some scholars have suggested that such an amount may equate to about one third of the nation's total energy consumption each year.[140] This percentage may be accurate based onto the sheer scale of military hardware in existence, coupled with the fact that considerations of energy efficiency and the like tend to play a very distant second to considerations of military efficiency.

Any attempts to determine numbers in this area are based purely on conjecture, and are likely not precise. The primary reason for this is that most nations do not report specifically on greenhouse gas emissions from their military, but rather, military totals are reported within aggregate national totals. Although this is creating a number of anomalies in the

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133. *See* United States v. Dee, 912 F.2d 741, 745 (4th Cir. 1990).

134. Toxic Substances Control Act, 15 U.S.C. § 2621 (2011)

135. Clean Air Act, 42 U.S.C. § 7418(b) (2011).

136. Clean Water Act, 33 U.S.C. § USC. 1323 (2011).

137. B. SANDERS, THE GREEN ZONE: THE ENVIRONMENTAL COSTS OF MILITARISM 36–37 (2009); S. LANIER-GRAHAM, THE ECOLOGY OF WAR 81, 85 (1993); W. THOMAS, SCORCHED EARTH 16–32 (1995).

138. C. KRUPNICK, DECOMMISSIONED RUSSIAN NUCLEAR SUBMARINES AND INTERNATIONAL COOPERATION (2001); *A Global Nightmare*, NEW SCIENTIST, Dec 6, 1997, at 2; R. Edwards, *Russia's Toxic Shock*, NEW SCIENTIST, Dec 6, 1997, at 15.

139. U.N. Framework on Climate Change Convention, *Report of the Individual Review of the Greenhouse Gas Inventory of the United States Submitted in the Year 2000*, ¶ 68, (July 11, 2002); Anon, *Armies Brought to Book for Dirty Deeds*, NEW SCIENTIST, June 27, 1992, at 6.

140. SANDERS, *supra* note 130, at 39; R. WOODWARD, MILITARY GEOGRAPHIES 73, 76 (2004).

attempts to create a robust greenhouse accounting regime, it is unlikely to change in the near term.[141] In exactly the same manner, because reductions in greenhouse gases are called for by country—not be specific sector—it is for each country to manage its own greenhouse budget. Accordingly, they may decide to pursue reductions and efficiencies in greenhouse gases in their nonmilitary sector, as reductions targeted toward this sector do not exist in international law.

This approach, whereby the military is but one sector that has to be considered akin to all other sectors within a society, requires a country to manage its collective reductions and is found to be more pronounced in other regimes, such as the Montreal Protocol. As it was, few of the parties who signed the Montreal Protocol had a fully informed idea of how important ozone depleting substances ("ODSs") were to the military. Only after they did national audits, from which they could make their promised reductions, did they discover the presence of ODSs in many weapons systems. That is, ODSs were actually required in standards, specifications, and codes governing operations ranging from design, engineering, manufacturing, and purchasing, to operations and maintenance activities. Their use for aerosols, electronics, solvents, and refrigeration were particularly notable. Moreover, in the 1980s, once the less damaging, but still impactful halons were created as an alternative to chlorofluorocarbons ("CFCs"), they quickly became the preferred firefighting agents aboard aircrafts and ships, in armored combat vehicles, and for ground/shore facility fire protection.

Despite the importance of the contribution of the military to the damage of the ozone layer, the Montreal Protocol contained no explicit provision to exempt military consumption of ozone depleting substances. The immediate response of the military to this situation was to find alternatives and plan for the phase out of the stipulated chemicals by the agreed dates. However, in many instances, alternatives were not possible within the given time frame. Accordingly, rather than create overt difficulties for the military, it was agreed that armed forces could collect and recycle their existing ozone depleting substances (as all sectors in society could). In addition, the Protocol allowed exceptions to the elimination of ODS obligations "to the extent that the Parties decide to permit the level of production or consumption that is necessary to satisfy uses agreed by them to be essential."[142] Although this "essential uses"

141. U.N. Framework on Climate Change Convention, *Preliminary Options for Methodologies to Apply Adjustments Under Article 5.2 of the Kyoto Protocol*, § 2, (Feb. 20, 2000).

142. Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, 26 I.L.M. 1550, arts. 2(a)(4), 2(b)(3), 2(c)(e), 2(d)(2), 2(e)(3) 2(g), *available at* http://www.unep.org/ozone (covering CFCs, halons, other fully halogenated CFCs,

exception exists, the important point to note is that to date, the parties have rarely utilized it for military exceptions.[143] Whether this situation will change in the future, and the use of this exception for military purposes will become more widespread, as some ozone depleting substances appear (especially some halon types for certain types of fire fighting) irreplaceable, is a matter of debate.[144]

The other international regime of note in this area is the Stockholm Convention on Persistent Organic Pollutants. The parties to this Convention have also banned singular chemicals that were of direct interest to the military, such as technical pentabromopidhenyl ethers. These chemicals are a class of additive flame retardants used to suppress or delay combustion. Within military application, they are widely valued for their flame retardant properties, for both safety clothing and electronics. They are also a persistent, multi-generational, organic pollutant. Accordingly, the international community agreed to prohibit the further production and use of this chemical, as well as its import or export.[145] This prohibition, like all others under this Convention, can be exempted by individual parties for exceptional reasons.[146] Despite this possibility, to date, no national governments have sought an exemption to the prohibition of technical pentabromopidhenyl ethers.

B. The Military and Conservation of International Significance

Exceptions for the military to take endangered species are rarely spelled out within international wildlife law. Rather, exceptions are assumed within some of the broader exceptions that exist in most treaties. Thus, the basic principle in this area, as recorded in Article 3 of the Convention on Biological Diversity, is that although "States have . . . the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of

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carbon tetrachloride, trichloroethane (Methyl chloroform) and hydrobromofluorocarbons)).

143. 10th Meeting of the Parties to the Montreal Protocol, Cairo, Egypt, Nov. 23–24, 1998, *Decision X/6:/ Essential Use Nominations for Controlled Substances for 1999 & 2000* (Dec. 3, 1998); 13th Meeting of the Parties to the Montreal Protocol, Colombo, Sri Lanka, Oct. 16–19, 2001, *Decision XIII/8: Essential Use Nominations for Non-Article 5 Parties For Controlled Substances for the Year 2002 and Beyond* (Oct. 26, 2001).

144. U.N. Environment Programme, Assessment Report of the Technology and Economic Assessment Panel, § 1.8 (2010), *available at* http://www.unep.org/zone.

145. *See* Stockholm Convention on Persistent Organic Pollutants amendment: *Listing of Tetrabromodiphenyl Ether and Pentabromodiphenyl Ether*, SC-4/18 (2009).

146. Stockholm Convention on Persistent Organic Pollutants, arts. 3(6), 4.

areas beyond the limits of national jurisdiction," this obligation is tempered by general caveats, that they are expected, "in accordance with its particular conditions and capabilities" and "as appropriate" to develop national strategies, plans, or programs for the conservation of biological diversity.[147]

The important point to note here is that the general principle and its application is clearly limited by the words "as appropriate." In practice, this means that conservation measures do not always supersede other considerations. This type of exception is common within many types of wildlife agreements. For example, Article VII of the 1916 Convention for the Protection of Migratory Birds between the United States and Great Britain (Canada) stipulated,

> Permits to kill any of the above named birds, which, under extraordinary conditions, may become seriously injurious to the . . . other interests in any particular community, may be issued by the proper authorities of the High Contracting Powers under suitable regulations prescribed therefore by them respectively, but such permits shall lapse, or may be cancelled, at any time when, in the opinion of said authorities, the particular exigency has passed, and no birds killed under this article shall be shipped, sold or offered for sale.[148]

Under this exception, national military activities have been permitted to trump regionally agreed conservation obligations.[149]

This type of exception reappeared in three other wildlife related treaties. In the first example, the Ramsar Convention on Wetlands of

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147. Convention on Biological Diversity, Dec. 29, 1993, art. 6.

148. Convention Between the United Kingdom and the United States for the Protection of Migratory Birds in Canada and the United States, Aug. 16, 1916, 2478 U.N.T.S. 33.

149. In 2002, the Congress of the United States was persuaded to alter its internal operation in terms of compliance with the 1916 Migratory Birds Treaty, of which the United States is a signatory. This followed the successful legal action against the Secretary of Defense, for the (incidental) killing of migratory birds located on, or near, a firing range on an island in *Marianas Ctr. for Biological Diversity v. Pirie*, 191 F. Supp. 2d 161, 166 (D.C. Cir. 2002). Although the United States could have dealt with this matter by correctly and fully complying with the exceptions in the Treaty, the American Congress passed and the president signed into law the Fiscal Year 2003 Defense Authorization Act, which substantially amended their domestic implantation of the Migratory Birds Treaty. In particular, the new law directed the Secretary of the Interior, with the concurrence of the Secretary of Defense, to prescribe new regulations that allow the 'incidental taking' of migratory birds during 'training and operations by the Armed Forces that relate to combat' and during the testing of military equipment and weapons. Bob Stump National Defense Authorization Act for Fiscal Year 2003, Pub. L. No. 107-314, §§315-16, 116 Stat. 2458, 2509 (2002).

International Importance provided parties with the ability to take actions required by "urgent national interest."[150] Similarly, a second example appeared in the Convention on Migratory Species, under which the parties can excuse themselves from the strong obligations to protect Appendix I listed animals if "extraordinary circumstances so require; provided that such exceptions are precise as to content and limited in space and time. Such taking should not operate to the disadvantage of the species."[151] Finally, the Convention on the Conservation of European Wildlife and Natural Habitats reiterated this type of exception in certain situations. Under Article 9, a party may avoid their regionally agreed conservation objectives if "there is no other satisfactory solution and that the exception will not be detrimental to the survival of the population concerned," and the action was "in the interests of public health . . . or other overriding public interests," then, under "strictly supervised conditions, on a selective basis and to a limited extent," protected species could be taken.[152] Although the examples noted above do not display how the military benefits from these exceptions, in the case of the oceans, it is different. In this area, international law is very clear with regards to controls pertaining to pollution (including noise from sonar) from warships—there is no international law in this area. Within the multitude of treaties covering the ocean, the exceptions for the military in meeting regional and/or international environmental goals are remarkably clear. These exceptions can be found in all matters related to the oceans and oil pollution (in terms of liability[153] and outside intervention to stop the spreading of oil pollution),[154] other forms of marine pollution,[155] the dumping of waste into the ocean,[156] and even salvage.[157] However, it is expected that on the High Seas, all flag States will attempt to adhere to the spirit of the various regimes. The overall

150. Ramsar Convention on Wetlands of International Importance, *amended*, July, 13 1994, art. 4.

151. Convention on Migratory Species, *revised*, Jan. 1, 2002, art. III (5)(d).

152. Convention on the Conservation of European Wildlife and Natural Habitats. Sept. 19, 1979, art. 9.

153. *See* International Convention on Civil Liability for Oil Pollution Damage, Nov. 29, 1969, art. XI.

154. International Convention Related to Intervention on the High Seas in Cases of Oil Pollution Damage, Nov. 11, 1969, art. 1(2).

155. *See* International Convention for the Prevention of Pollution from Ships, art. 3, 11(2) (1973).

156. *Id.* art. 3, 7, 11(2). The 1996 Protocol to this regime, which substantially re-oriented the original 1972 Convention, did not contain the original exception, although Article 8(2) did allow exceptions for dumping in emergencies.

157. International Convention on Salvage, art. 4, (1989).

situation was best summed up by Article 236 of the United Nations Convention on the Law of the Sea ("UNCLOS"). Namely, under the principle of sovereign immunity:

> The provisions of this Convention regarding the protection and preservation of the marine environment do not apply to any warship, naval auxiliary, other vessels, or aircrafts owned or operated by a state and used, for the time being, only on government non-commercial service. However, each state shall ensure, by the adoption of appropriate measures not impairing operations or operational capabilities of such vessels or aircrafts owned or operated by it, that such vessels or aircrafts act in a manner consistent, so far as is reasonable and practicable, with this Convention.[158]

The exceptions for the military from having to comply with conservation objectives are doubly reinforced in certain areas. For example, when examining the problem of military caused marine pollution which impacts upon cetaceans, the UNCLOS is clear that any conservation controls have to be undertaken by "appropriate international organizations." In this context, the universally recognized body in charge of the conservation of cetaceans is the International Whaling Commission. However, although the International Whaling Commission ("IWC") is aware of the problem of noise pollution of the oceans, it has never passed a specific resolution on this topic nor, more pertinently, on military generated noise.[159] Accordingly, aside from the general and specific exceptions granted to the military in the area of conservation concerns with the international law of the sea, standards to which they are expected to act, in a manner consistent with the international level, simply do not exist.

Although there are no international standards in this area, some standards are appearing at the regional level. The best examples of this are found within the Regional Agreement of the Convention on Migratory Species, the Agreement on the Conservation of Cetaceans in

158. U.N. Convention on the Law of the Sea, Dec. 10, 1982, 21 I.L.M. 1261, 1315, art. 237; *see also id.* at 1325, art. 298(1)(b) (disputes concerning military activities, including military activities by government vessels and aircraft engaged in non-commercial service, and disputes concerning law enforcement activities in regard to the exercise of sovereign rights or jurisdiction excluded from the jurisdiction of a court or tribunal under article 297 of the Convention).

159. The Parties to the IWCICRC could address (but not regulate) this topic under Article VI of the Convention. Specifically, "the Commission may from time to time make recommendations to any or all Contracting Governments on any matters which relate to whales or whaling and to the objectives and purposes of this Convention." INT'L WHALING COMM'N, INTERNATIONAL CONVENTION FOR THE REGULATION OF WHALING, art. VI (1946), *available at* http://iwcoffice.org/_documents/commission/convention.pdf.

the Black Sea Mediterranean Sea and Contiguous Atlantic Area ("ACCOBAMS")[160] and the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas ("ASCOBANS").[161] These are particularly interesting examples, as a large number of the members of both Agreements within the European Community have actively avoided obligations in this area. Thus, while the European Community created strong obligations relating to the assessment and management of (large-scale) environmental noise, they added the following exceptions:

> This Directive shall not apply to noise that is caused by the exposed person himself, noise from domestic activities, noise created by neighbors, noise at work places or noise inside means of transport or due to military activities in military areas.[162]

Despite such concerns, in the case of the ASCOBANS in 2003, the parties treated the call for further cooperation with military authorities in the area of noise pollution.[163] Taking one step further, the parties of ACCOBAMS, although being fully aware of Article 236 of the UNCLOS, still issued recommended Guidelines for all parties to combat underwater noise.[164] With particular regard to military sonar, the guidelines recommended principles that largely follow the United States (even though the United States is not a party to ACCOBAMS). Namely, the avoidance of military sonar activities in key habitat areas. The ACCOBAMS guidelines differed from the United States' position in the specification of the details of the monitoring requirements (so as to ensure that cetaceans are not in the area) and prohibiting the use of high-power sources at night (because detection is difficult). The guidelines were also more prescriptive in terms of ramp up times (a slow build-up to maximum noise emissions), and power down requirements (when a

160. Agreement on the Conservation of Cetaceans of the Black Seas, Mediterranean Sea and Contiguous Atlantic Area, Nov. 24, 1996, 36 I.L.M. 777.

161. Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas, (1995). U.K.T.S. No 52; Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas, April 14, 1992, *available at* http://ascobans.org/pdf/Ch_XXVII_09_Certified True CopiesAgreement.pdf.

162. European Council, Directive 2002/49: Relating to the Assessment and Management of Environmental Noise, art. 2, L/189 OFFICIAL J. OF THE EUROPEAN CMTYS. 12, 13 (2002).

163. Fourth Meeting of Parties to ASCOBANS, Esbjerg, Den., Aug. 19–22, 2003, Res. No. 5: Effects of Noise and of Vessels, at Annex 13 (Aug. 22, 2003), *available at* http://www.ascobans.org/pdf/mops/docs/MOP4FinalReport.pdf.

164. Agreement on the Conservation of Cetaceans in the Black Sea Mediterranean Sea and Contiguous Atlantic Area, Guidelines to Address the Impact of Anthropogenic Noise on Cetaceans in the ACCOBAMS Area, Resolution 4.17 (2010).

specimen was found in the zone), of which the United States Supreme Court specifically excluded for some types of sonar training.

VI. CONCLUSION

This paper was about the conflict between the interests of the military and the interests of conservation, in times of peace. The basis of this study was the particular problem of the techniques related to submarine detection and their impact upon the marine environment, and cetaceans in particular. The question at play was what are the rules that apply, especially when looking at this problem in an international—as opposed to a domestic—context? These issues have only been thoroughly examined in the domestic context of the United States. Thus, a technology that will have international implications is being examined by only one country, with regard to its own laws. Due to this shortfall, the question arises, how are the international considerations of militaries and conservation to be reconciled in times of peace?

Generally, the answer is that the military can be made to comply with laws that seek to resolve internationally significant environmental problems. In some instances, such as where they are main culprits in the causation of the problem, they can be the subject of particular treaties. This was the case with the testing of nuclear weapons in the atmosphere. In other instances, obligations can be placed upon them to control their pollutants, just as all other sectors within a country may be obligated to comply with agreed international rules. This is true with climate change, ozone depletion, and some persistent organic pollutants. Nonetheless, in some instances, the ability for the military to be granted exceptions exists, although they are rarely used. Rather, militaries have learned to adapt and comply with international standards.

However, this is not the case when dealing with issues of conservation. In the conservation treaties, exceptions from compliance of international obligations are very clear, although it is rare these attach directly to the military. The situation is different with respect to conservation concerns upon the high seas. In this last instance, the exceptions for the military are clearer than in any other part of international environmental law, specifically, the military is not expected to comply with such concerns. As such, in a manner unlike any other part of international environmental law, the military is granted a clear exception from compliance.

The conclusion this presents for the case study at hand is that while some success may be obtained by balancing the interests of conservation and the military—but only in some domestic settings—it is unlikely that

any such robust success will be found in international settings in the short term. This is especially so when all of the applicable laws in this area explicitly exempt the military and the only international body that could provide assistance has failed to contribute any guidance or comment. The only exception to this trend is two regional agreements, ACCOBAMS and ASCOBANS, where the parties have tentatively issued guidelines for each party to consider in controlling the emissions of underwater noise from their military. Although these guidelines include provisions that allow parties to circumvent the guidelines if deemed necessary, they are a clear, if tentative, step away from the absolute immunity of the military in this area. However, the extent of placing the interests of militaries over those of conservation when dealing with the high seas remains a matter of debate.