

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

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# Executive Summary

Generally, the military can be made to comply with environmental problems of an international significance.

In some instances, where they are main culprits in the causation of the problem, such as with the testing of nuclear weapons in the atmosphere, they can be the subject of particular treaties.

In other instances, obligations can be placed upon them to control their pollutants, as all other sectors with a country may be obliged to comply to meet agreed international obligations, which are divided nationally (and not by sector).

This is not the case when dealing with considerations of conservation. In the treaties of conservation, exceptions from compliance from international obligations are very clear, although it is rare these are attached directly to the military.

The situation is different with regards to conservation concerns upon the high seas, where the exceptions for the military are clearer than any other part of international environmental law. In this area, clearly, the interests of the military trump those of conservation.

It is only recently that a regional governance body has issued collective Guidelines (not laws, directives or recommendations) in this area. There has been no comparable effort at the International Whaling Commission, which would be the natural, and best, organisation to attempt such work.

Until the international side of this work is fully explored, the likelihood of conservation success in the short term will best be achieved through domestic and or regional initiatives.

Although such Guidelines are caveated by a large number of rules which retain the ability of the Parties to avoid them if deemed necessary, they are a clear, if tentative, step away from the absolute immunity of the military in this area.

## 1. Introduction

This paper is not about the rules imposed upon the military and environmental protection in times of war, but the military and environmental protection in times before war, when they are preparing for possible conflict in the future.<sup>1</sup> Within this context, this paper is about the conflict between the interests of the military and the interests of conservation. The basis of this study is the particular problem of the techniques related to submarine detection and their impact upon the marine environment, and cetaceans in particular. The question that this paper seeks to ask, are what are the rules that apply, especially when looking at this problem in an international – as opposed to a domestic – context? The reason this question is asked is that whilst these questions have been largely explored in domestic legal settings, they have not been examined in an international context. The unfortunate conclusion that it reached from this analysis is that whilst 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 upon the high seas. In this last instance, the exceptions for the military are clearer than any other part of international environmental law, and it is only recently that some regional initiatives have attempted to, tentatively, challenge the presumption that military interests will always trump conservation ones, on the high seas.

## 2. 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’.<sup>2</sup> 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. Aside a raft of other proposals, 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 by passive means via hearing the sounds that the submarines emitted, such as the sounds of machinery, propeller rotation and the use of compressed air in 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 programmes to make their submarines quieter and thus less detectable. The answer to these developments, as provided by the Anti-Submarine Division of the British Naval Staff, working with a technology known as *ASDIC*, was the utilisation of noise in an active sense, whereby a transmitter-receiver sent out a highly directional sound wave through the water. If the sound wave, typically heard as a ‘ping’ struck a submerged object it was reflected or echoed back as a ‘beep’ and was picked up by the receiver. However, the early models could not work on boats going faster than 15 knots, it obtained reflective noise from all sources, it could not pick up the echo of a submarine on the surface, and it could not gauge

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<sup>1</sup> For a full discussion of the rules and considerations pertaining to environmental protection in times of war, see Gillespie, A. (2011). *A History of the Laws and Customs of War*. (Hart, Oxford). Volume II. Chapter 4.

<sup>222</sup> As cited in Government Data Publications (1963) *Anti-Submarine Warfare*. (Government Data Publications, Washington). 3.

depth and it was of no use when within 100 yards of the submarine. Finally, this new technology was never deployed in force, with only seven ships being fitted with ASDIC by the end of the First World War.<sup>3</sup>

During the 1920s and 1930s American engineers developed their own underwater sound detection technology. After technical information was exchanged between the two countries during the Second World War, Americans began to use the term *SONAR* (originally an acronym for Sound Navigation And Ranging) for their systems, coined as the equivalent of *RADAR*. By the time of the Second World War, sonar was just one of the tools that had been utilised in the fight against enemy submarines. The sonar of the Second World War eventually progressed to a maximum range of up to 4,000 yards. Nevertheless, sonar of this epoch was a relatively unrefined technology which 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 ship's 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 utilised in the defeat of enemy submarines, being overshadowed by the intelligence gathered through the breaking of the enigma code, the development of high-frequency direction finding technologies that could locate radio signals and radar (for detecting submarines on the ocean surface). These latter technologies provided the ability to find submarines within a 25 mile radius, which was considerably more than the sonar operative at this point. The supplemental air power, via both long range and carrier based aircraft, ultimately tipped the balance against enemy submarines. Thus, in the Second World War, sonar was not the primary instrument in anti-submarine warfare.<sup>4</sup>

After the end of the Second World War and with the beginning of the Cold War, the context of concerns over enemy submarines began to change for four reasons, which were different to the Second World War. First, the magnitude of this force was rapidly expanding. Thus, the Soviets had produced about 500 submarines by the mid 1950s. Second, nuclear powered submarines began to appear, and radically alter the capacity of these vessels. In time, some 245 nuclear submarines were made and utilised by Russia, nee the Soviet Union, by the turn of the 21<sup>st</sup> century. 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. 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. According to the United States navy in testimony accepted by the Supreme Court, 'at least 300 modern diesel-electric submarines [are] possessed by potential adversaries of the United States, which can operate 'almost silently' or 'quieter than the surrounding environment'.<sup>5</sup>

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3 Owen, D. (2007). *Anti-Submarine Warfare*. (Barnsley, Seaforth Publishing). 39-42. Harris, B (1997) *The Navy Times Book of Submarines. A Political, Social and Military History* (NYC, Berkley) 50, 58-62.

4 Owen, D. (2007). *Anti-Submarine Warfare*. (Barnsley, Seaforth Publishing). 53, 56-57, 71-72, 83, 87, 105, 192.

5 Winter, Secretary of the Navy et al, v Natural Resource Defence Council et al. 555 U.S. 7 (2008). 3, 15, 16 and 17. For commentary on this case, see Reynolds, J. (2009). 'No Whale of a Tale: Legal Implications of Winter v. NRDC'. 36 *Ecology*

The majority of the modern quiet submarines are believed to be possessed by China and Russia. In addition, more than 20 developing countries currently possess over 150 diesel attack submarines. Of note, it is estimated that North Korea has 25, Iran has 11, Libya has 6 and Pakistan has 6.<sup>6</sup> Finally, submarines with nuclear weapons came to be recognised as perhaps the ultimate weapon. The focus, tracking and pursuit of knowledge of these submarines capable or carrying nuclear warheads has become the priority for most navies of significance. In the American case, this was especially so with the ‘boomers’, which were Soviet submarines that were longer than a football field and each carried up to 20 ballistic missiles, with each missile possessing up to ten nuclear warheads each. Thus, a single submarine was possible to create a firestorm greater than the combined power of all of the bombs dropped in the Second World War. Conversely, one American 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.<sup>7</sup>

Post 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 were designed to stay beneath the surface for long periods, not utilise radio traffic and have been continually redesigned to become increasingly quiet. Whilst the United States and the United Kingdom were believed to have lead the way in this area, in decades to come, potential adversaries were believed to have followed suit. Supplemental methods to avoid sonar involved learning to utilise different natural features beneath the ocean surface, including, temperatures, salinity and seascape.<sup>8</sup>

Against increasingly invisible submarines, ever ingenious methods have been devised to help detect them. 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. These are the utilisation of extreme low-frequency electric fields, the search for magnetic anomalies when a vessel passes through an area; and 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 biological luminance (caused by the disruption of biological life as a submarine passes through) and residue contaminants (such as the leeching of anti-fouling paint, the leaking of lubricants etc) are also all utilised 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 always remained second-best to the only form of energy that can penetrate water masses at great distances - noise.<sup>9</sup>

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Law Quarterly 753. Craig, R. (2009) ‘Beyond Winter v. NRDC: A Decade of Litigating the Navy’s Active Sonar Around the Environmental Exemptions’. 36 BC Environmental Affairs Law Review. 353.

6 Parker, B. (2009). *Modern Submarines: An Illustrated Reference Guide to Underwater Vessels of the World*. (Praeger, NYC).

7 Sontag, S. (1998). *Blind Man’s Bluff: The Untold Story of American Submarine Espionage*. (Harper, NYC). xv-xvi.

Daniel, D. (1986) *Anti-Submarine Warfare and Superpower Strategic Stability*. (Chicago, University of Illinois Press). 4-7

8 Owen, D. (2007). *Anti-Submarine Warfare*. (Barnsley, Seaforth Publishing). 199, 201. Sontag, S. (1998). *Blind Man’s Bluff: The Untold Story of American Submarine Espionage*. (Harper, NYC). 44.

99 Daniel, D. (1986) *Anti-Submarine Warfare and Superpower Strategic Stability*. (Chicago, University of Illinois Press). 40-50. Reed, C. (2010). *Red November: Inside the Secret U.S Soviet Submarine War*. (Morrow, NYC). 142-144, 271-275.

Physically, there is no distinction between sound and noise. Sound is a sensory perception and complex patterns of sound waves are commonly identified as sources such as music, speech, or noise. While sounds may be desired, noise usually is not and is often considered a nuisance as it is the wrong sound, in the wrong place, at the wrong time. 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.

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 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) for continuous background noise. 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 and not masked, surrounding sound levels should be less than 35 dB(A). In a busy restaurant the level is roughly equivalent to 55 dB(A), while 75 dB(A) is approximately the noise levels that can be heard at a very busy intersection. Densely traveled motorways may generate noise levels in the range of 75 to 80 dB(A), heavy industries (such as ship yards) average around 94 dB (A). Portable music devices which plug directly into the ear, and some music festivals, can both exceed 100 dB(A). A chainsaw can reach 110 dB(A). '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). To avoid acute damage to the inner ear, adults should never be exposed to more than 140 dB(A) of noise, even for very short periods. For children, the level is 120 dB(A).<sup>10</sup>

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 reaches speeds of up to 1,600 metres per second in seawater as compared with 350 meters per second in air. Moreover, transmission loss in water is much lower. Thus, noises can be heard at great distances. It is expected that as the oceans change in terms of acidity (due to climatic change) in some areas, existing noise absorption of sound below 1 kHz, could be decreased by up to 40%.<sup>11</sup>

The utilisation of noise, in either passive (just listening) or active (propagating and waiting for a reply) methods is the core of most Integrated Underwater Surveillance Systems. In the

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10 Coghlan, A. (2007). 'Dying for Some Peace and Quiet'. *New Scientist*, Aug. 25. At 6-9. Chepisiuk, R. (2005). 'Decibel Hell.' 113 *Environmental Health Perspectives*. A35, A37. World Health Organization (2004). *Guidelines for Community Noise*. (WHO, Geneva). 8. Leventhall, G. (2004). *A Review of Published Research on Low Frequency Noise and its Effects*. (Department of Environment, Food, and Rural Affairs, London). Alberti, P. (2003). *Pathophysiology of the Ear*. (WHO, Geneva). 63, 66. Mercier, V. (2002). 'Is Electronically Amplified Music Too Loud?'. *Noise and Health*. April 16, 48.

11 Brahic, C. (2008). 'Hearing the Carbon Jolt Loud and Clear'. *New Scientist*. Sep 27. 10.

case of the United States, passive utilisation 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 difference is found in the scope and effectiveness of the modern systems. In ideal situations, noise signatures of submarines can now 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, evolving into the Sound Surveillance System which was deployed further out into international waters and natural choke points, like the Greenland-Iceland-UK gap. By 1981 these systems also operated in UK waters, off Turkey and Japan and the Aleutian island chain, off Hawaii and Puerto Rico, off Bermuda and Barbados, Canada, Norway, Iceland, the Azores, Italy, Denmark, Gibraltar, Panama, the Philippines and Guam.

Military sonar can be conveniently categorised into mid and 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 United States 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 United States Navy, MFAS is ‘mission-critical’ as this is the only proven method of identifying submerged diesel-electric submarines operating on battery power. As such, MFAS is ‘essential to national security’.<sup>12</sup> Low Frequency Active Sonar (LFAS) uses sound frequencies of less than 1 kHz. This lower frequency suffers less attenuation in seawater and hence allow the detection of objects up to 100 nautical miles away. LFAS is currently operational on two ships in the United States Navy and one ship in the British Navy. A variation on LFAS working from a vessel is LFAS Surveillance Towed Array Sensor System (SURTASS). SURTASS-LFA, ‘sends out intense sonar pulses at low frequencies that travel hundreds of miles in order to timely detect increasingly quiet enemy submarines’.<sup>13</sup> SURTASS-LFA utilises a vertical line array of up to 18 source projectors suspended below a vessel. The sonar beam is omni-directional (i.e. a full 360 degrees), at a nominal depth of 122 metres (400 feet). A complete sequence of transmissions is known as a ‘ping’ and lasts from 6 to 100 seconds. The time between pings is usually between 6 to 15 minutes. The source level of an individual projector is approximately 215 dB(A), 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 kilometre from the source, at 173 dB(A) two kilometres from the source, about 165 dB(A) 40 nautical miles from the source, around 150 dB(A) up to 100 miles from the source and some 140 dB(A) up to 400 miles from the source vessel.<sup>14</sup>

### 3. The Impacts of Military Sonar upon Oceanic Species

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12 Winter, Secretary of the Navy et al, v Natural Resource Defence Council et al. 555 U.S. 7 (2008). 3, 15, 16 and 17.

13 This quote is from the case of *NRDC v Evans*. No. C-02-3805-EDL. 316 F.3d 904 (9th Cir. 2003). For commentary on the Evans case, see Mongeon, C. (2004). ‘NRDC v Evans: Northern District of California Delivers ‘Sound’ Judgement in Protection of Marine Wildlife’. 15 Villanova Environmental Law Journal. 394.

14 Department of the Navy, Chief of Naval Operations (2007). Final Comprehensive Report for the Operation of the Surveillance Towed Array Sensor System Low Frequency Active Sonar Under the National Marine Fisheries Service Regulations. (Washington). 1-2. Van Dyke, J. (2003) ‘Active Sonar’. 14 Colorado Journal of International Environmental Law and Policy. 1-8.

It has been known for hundreds, if not thousands, of years by hunters from all over the world that animals exhibit unusual behaviour when confronted with different noise. For example, 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 areas ring-necked seals, that upon hearing the pings, the seals would start calling back to the submarine. These calls would quickly multiply, with walruses joining in as well. In the early trials, the din went on for hours, seals answering the vessel and other seals, walruses answering one another. Unsurprisingly, this wavelength and sound structure was abandoned, and new ones adopted that did not promote courtship with the local mammals.<sup>15</sup>

The vast majority of the impacts of different anthropogenic noises upon the animal kingdom are not so benign as the above example would suggest. The scientific study of noise pollution upon non-human animals has been preceeding since the 1950s. This work began (and has continued) with regards to endangered terrestrial species, and birds in particular.<sup>16</sup> The first study of the impact of ocean noise on marine biodiversity was conducted in 1971.<sup>17</sup> In the four decades since this point, a large collection of ad-hoc studies of the impacts of 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 impacts of military sonar upon cetaceans are the source of a particularly large amount of scholarship, as unlike the other two sources, in some settings, 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 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.<sup>18</sup> Against this background of natural incidents, is the large question, of whether noise pollution, and that caused by military sonar in particular, is increasing the rate of strandings. The evidence that supports this thesis began to be assembled in the early 1990s.<sup>19</sup> Although the evidence in this area is far from conclusive, with regards to mid frequency sonar, even the United States Navy agrees that in certain circumstances, mid frequency (but *not* low frequency)<sup>20</sup> sonar can be directly linked to the strandings of marine mammals.<sup>21</sup> This is especially so with the relatively unknown, deep diving, beaked whales in certain geographical locations.<sup>22</sup> This concession is consistent with mass strandings and mortality events

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<sup>15</sup> Sontag, S. (1998). *Blind Man's Bluff: The Untold Story of American Submarine Espionage*. (Harper, NYC). 305=306.

<sup>16</sup> Anthony, A. (1959). 'Noise Stress in Laboratory Rodents'. 31 *Journal of the Acoustic Society of America* 11, 1437.

Hopkins,C. (1979). 'Effects of Noise on Wildlife'. 29 *Bioscience* 547.

<sup>17</sup> See Payne, R. (1971). 'Orientation by Means of Long Range Acoustic Signaling in Baleen Whales'. 188 *Annual New York Academy of Sciences* 110-141.

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<sup>19</sup> Simmonds, M et al (1991) 'Whales and the Military'. 337 *Nature* 448.

<sup>20</sup> Department of the Navy, Chief of Naval Operations (2007). *Final Comprehensive Report for the Operation of the Surveillance Towed Array Sensor System Low Frequency Active Sonar Under the National Marine Fisheries Service Regulations*. (Washington). 48-49. Department of the Navy, Chief of Naval Operations (2007). *Final Supplemental Environmental Impact Statement for Surveillance Towed Array Sensor System Low Frequency Sonar* (Washington). 10-14.

<sup>21</sup> Department of the Navy, Chief of Naval Operations (2007). *Final Supplemental Environmental Impact Statement for Surveillance Towed Array Sensor System Low Frequency Sonar* (Washington). 18-19.

<sup>22</sup> Hildebrand, J., et al (2005/06). 'Understanding the Impacts of Anthropogenic Sound on Beaked Whales'. 7(3) *Journal Cetacean Research and Management*. 177-187. Rommel, S.A., et al. (2005/06). 'Elements of Beaked Whale Anatomy and

coincident with mid-frequency sonar training exercises in the Canary Islands (2004, 2002, 1989, 1986, 1985);<sup>23</sup> Madeira (2000); Spain (2006); the U.S. Virgin Islands (1999, 1998); Greece (1996)<sup>24</sup> and around Britain and Ireland (2008).<sup>25</sup> Of this collection, one of the best documented incidents occurred in the Bahamas in the year 2000 when 16 beaked whales stranded along 15 miles of shoreline during a 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 their Navy's use of tactical mid-range frequency sonar, in this instance, was, 'the most plausible source of this acoustic or impulse trauma'.<sup>26</sup> Further strandings which 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, if not likely, contributing factor in what may have been a confluence of events'<sup>27</sup> (in the case of Hawaii) or a possible – but inconclusive – overlap (in the case of North Carolina).<sup>28</sup>

The whales which appear most vulnerable to military sonar are beaked whales. Beaked whales are 21 species of toothed whales, members of the family Ziphiidae that are 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; others are known only from remains and have never been sighted alive. Only 3 to 4 of the 20-odd species are reasonably well-known. What is known is that beaked whales are the world's most extreme divers. They can dive for long periods, being submerged for up to one hour, reaching depths of nearly 1,900 metres. 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 (which can cease during sonar exercises) 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, which may have to do with certain confluences of particular bathymetric conditions such as deep near-shore canyons, with shorelines limiting escape routes, such modifications of behaviour may lead to strandings or death whilst trying to flee a location. Evidence suggests that the most serious effect of this process is the evolution of gas bubbles in their tissues, driven by behaviourally altered dive profiles (such as extended

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Diving Physiology and Some Hypothetical Causes of Sonar-Related Stranding'. 7 (3) *Journal of Cetacean Research and Management*. 189-209. MacLeod, C. Et al. (2005/06). 'A Review of Beaked Whale Behaviour and Ecology in Relation to Assessing and Mitigating Impacts of Anthropogenic Noise'. *Journal of Cetacean Research and Management*. 7(3): 211-221. Edwards, R. (2003). 'Sonar Kills Whales.' *New Scientist*. Oct 11. pp.10.

23 Simmonds, M et al (1991) 'Whales and the Military'. 337 *Nature* 448. Martin, V et al (2004) 'Mass Strandings of Beaked Whales in the Canary Islands'. In 42 *European Cetacean Society Newsletter* 33.

24 Frantzis, A (1998) 'Does Acoustic Testing Strand Whales?' 392 *Nature* 29.

25 Dolman, S. (2010) 'A Note on the Unprecedented Strandings of 56 Deep Diving Whales Along the UK and Irish Coast'. *Marine Biodiversity Records*. 1-8.

26 National Oceanic and Atmospheric Administration (NOAA) and the National Marine Fisheries Service (2001). Joint Interim Report Bahamas Marine Mammal Stranding Event of 15-16 March 2000 (NOAA, Washington). ii. Hecht, J. (2001). 'Navy Accepts Blame For Whale Deaths.' *New Scientist*. Jan 12. pp.15. Hrynshyn, J. (2001). 'Going Round the Bend.' *New Scientist*. Dec pp.15. pp.17.

27 Southall, B. (2006). NOAA Technical Memorandum NMFS-OPR-31, Mass Stranding Event of of July 3-4, 2004. NOAA Technical Memorandum NMFS-OPR-31 April 2006. NOAA, Maryland. At 3.

28 Hohn, A. et al. (2006). Report on Marine Mammal Unusual Mortality Event UMSE0501Sp: 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. NOAA TECHNICAL MEMORANDUM NMFS-SEFSC-537 (NOAA, Maryland). At 2 to 3.

surface intervals) or directly from esonification. 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 behaviour. 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 ‘the bends’ in humans, and these injuries, are known as ‘gas and fat embolic syndrome’.<sup>29</sup>

To help build certainty in this area, a number of scholars have attempted to establish databases which show an overlap between military exercises using mid-frequency (*not* low-frequency) sonar and mass strandings of cetaceans. From such databases, a correlation has been proposed of mass beaked whale strandings 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, with an additional 64 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.<sup>30</sup> 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 overlap.<sup>31</sup> 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 Supreme Court of the United States, in downgrading the risks of this technology.<sup>32</sup>

Although methodologies for the assessment of the environmental burdens and their impact are difficult in all fields, this area is especially difficult with noise pollution. These difficulties are due to the multiple pathways that noise pollution can take, its cumulative impact, its failure to leave a residue and vast differences between and within species, to the way noise is responded to.<sup>33</sup> Thus, it often become difficult, as has been pointed out in the Courts of the United States, to find exactly where a level of noise is ‘biologically significant’

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29 Hildebrand, J., et al (2005/06). ‘Understanding the Impacts of Anthropogenic Sound on Beaked Whales’. 7(3) *Journal of Cetacean Research and Management*. 177-187. Rommel, S.A., et al. (2005/06). ‘Elements of Beaked Whale Anatomy and Diving Physiology and Some Hypothetical Causes of Sonar-Related Stranding’. 7 (3) *Journal of Cetacean Research and Management*. 189-209. MacLeod, C. Et al. (2005/06). ‘A Review of Beaked Whale Behaviour and Ecology in Relation to Assessing and Mitigating Impacts of Anthropogenic Noise’. *Journal of Cetacean Research and Management*. 7(3): 211-221. 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 behaviour of beaked whales; (3) assessment of baseline diving behaviour and physiology of beaked whales; and (4) a retrospective review of beaked whale strandings.

30 Brownell, R., Yamada, T., Mead, J.G. and Helden, A.L. 2004. Mass stranding of Cuvier's beaked whales in Japan: U.S. Naval acoustic link?. *Journal of Cetacean Research and Management*, 7: 1-10.

31 Filadelfo, R. et al. ‘Correlating Military Sonar Use with Beaked Whale Mass Strandings: What Do the Historical Data Show?’ 35(4) *Aquatic Mammals*. 435. Podesta, M., et al. (2005/06). ‘A Review of Cuvier’s Beaked Whale Strandings in the Mediterranean Sea’. 7(3) *Journal of Cetacean Research and Management*. 251-261.

32 SC, pages 1, 9 and 12.

33 See Fernandez, A. et al. (2005). ‘Gas and Fat Embolic Syndrome: Involving a Mass Stranding of Beaked Whales Exposed to Anthropogenic Sonar Signals’. *Veterinary Pathology*. 42 (4) 446-457. Jepson, P. (2003). ‘Gas Bubble Lesions in Stranded Cetaceans’. *Nature*. (425). 575-576. National Research Council. (2003). Potential Impacts. *Supra* note 13. At 6-7. ICES Advisory Committee on Ecosystems (2005). *Supra* note 13. At 2, 3, 13-15, 39.

to a species.<sup>34</sup> 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, sensitisation, hearing loss, physiological damage and stress. It may be that such 'indirect' stresses are the more serious pollution on 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.<sup>35</sup> Accordingly, as the 2005 National Research Council of the United States report on this topic explained, when trying to ascertain what were biologically significant impacts upon marine mammals from ocean noise, 'there was a consensus that we are a decade away or more away from having the data and understanding of the transfer functions needed to turn such a conceptual model into a functional, implementable tool'.<sup>36</sup>

The multitude of scientific gaps in this area have been noted by the International Council for the Exploration of the Sea<sup>37</sup> and the 1994,<sup>38</sup> 2000,<sup>39</sup> 2003<sup>40</sup> and 2005<sup>41</sup> reports of National Research Council. Similar calls highlighting the scientific gaps in this area have been made by the specialist cetacean organisations that operate within international law, namely, the International Whaling Commission,<sup>42</sup> the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area<sup>43</sup> and the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas.<sup>44</sup> All of these bodies,<sup>45</sup> in addition to the European Parliament,<sup>46</sup> the United States,<sup>47</sup> and the United Nations General

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34 NRDC v Evans. No. C-02-3805-EDL. 316 F.3d 904 (9th Cir. 2003). Note also, NRDC v. Navy, No CV-01-07781. (C.D. Cal. Sept 19, 2002). At 12

35 State Health Agency of Baden- Wurttemberg. (2007). Experts Consultation on Methods of Quantifying Burden of Disease Related to Environmental Noise. World Health Organisation (2000). Methodology for Assessment of the Environmental Burden of Disease. ICES Advisory Committee on Ecosystems (2005). Supra note 13. At 15-17, 36-37. National Research Council. (2005). Supra note 27. At 3. National Research Council. (2003). Potential Impacts. Supra note 13. 4-6. National Research Council. (2000). Supra note 27, at 3.

36 ICES Advisory Committee on Ecosystems (2005). Report of the Ad-hoc Group on the Impacts of Sonar on Cetaceans and Fish (AGISC). ICES CM 2005/ACE:06 (2nd Edn). , at 2, 10-13, 15-17, 36-38, National Research Council. (2005), at 3, 4. National Research Council. (2000), at 3,59; National Research Council. (2003), at 4-6.

37 Tasker, M., et al (2010). The Marine Strategy Framework Directive: Task Group 11, Underwater Noise and Other Forms of Energy. (ICES, Paris), pp.33-36. ICES Advisory Committee on Ecosystems (2005). Report of the Ad-hoc Group on the Impacts of Sonar on Cetaceans and Fish (AGISC). ICES CM 2005/ACE:06 (2nd Edn), pp.12-23,47-49.

38 National Research Council(1994). Low-Frequency Sound and Marine Mammals: Current Knowledge and Research Needs. (National Research Council, Washington).

39 National Research Council (2000). Marine Mammals and Low-Frequency Sound: Progress Since 1994. (National Research Council, Washington).

40 National Research Council. (2003). Potential Impacts of Ambient Noise in the Ocean on Marine Mammals (National Academies Press, Washington)

41 National Research Council (2005). Marine Mammal Populations and Ocean Noise: Determining When Noise Causes Biologically Significant Effects. (National Academies Press, Washington).

42 Report of the Scientific Committee of the IWC. IWC/62/Rep 1.Section 12.2.5.

43 See Resolution 2.16 (2004). 'Assessment And Impact Assessment Of Man-Made Noise'.

44 See Section 3 of Resolution No. 5. 'Effects of Noise and of Vessels. Proceedings of the Fourth Meeting of the Parties to the ASCOBANs Convention. (Esbjerg, 2003).

45 ICES Advisory Committee on Ecosystems (2005), p. 47. Report of the Scientific Committee of the International Whaling Commission (2004), Section 12.2.5. National Research Council (2000) at 4, 7. National Research Council. (2003). Potential Impacts, at 7 and 11. For ACCOMBAMs, see Resolution 2.16 (2004). 'Assessment And Impact Assessment Of Man-Made Noise'.

46 European Parliament Resolution on the Environmental Effects of High-Intensity Active Naval Sonars. (2004). B6-0089/2004., Paragraph 5.

Assembly<sup>48</sup> have all called for collaborative international scientific investigations into the topic of anthropogenic noise pollution of the oceans. Following through, in 2010 the Secretariat of the Convention on Biological Diversity was instructed to compile and synthesise 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.<sup>49</sup>

### 3. The Military and Conservation in a Domestic Context

Unsurprisingly, against these growing concerns, a number of conservation groups have attempted to force the naval exercises utilising 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,<sup>50</sup> the Marine Mammals Protection Act,<sup>51</sup> the Coastal Zone Management Act<sup>52</sup> and the National Environment Policy Act.<sup>53</sup> However, although all of these laws have a strong conservation focus, all of these pieces of legislation also have exemptions allowing for necessary military objectives to trump conservation concerns, built into them. These

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47 See the United States statement from the IUCN. Third Conservation Congress (2004, Thailand). RESWCC3.068. Resolution on 'Undersea Noise Pollution'. Congress reference: CGR3.RES053.Rev.1. The Statement, attached to the end of the resolution. See also their Marine Mammal Commission (2007). *Marine Mammals and Noise: A Sound Approach to Research and Management: A Report to Congress from the Marine Mammal Commission*. (MMC, Washington), pp.iii-iv. United States Commission on Ocean Policy (2005). *Ocean Blueprint for the 21st Century*. (National Technical Information Service, Washington), pp.315-16.

48 See paragraph 186 of the 2010 Oceans Resolution: A/RES/65/37. For the earlier recognition of the same point, see paragraph 162 of the 2009 A/RES/64/71; paragraph 141 of the 2008 A/RES/63/111; paragraph 120 of the 2007 A/RES/62/215; paragraph 107 of the 2006 A/RES/61/222 and, paragraph 84 of the 2005 A/RES/60/30.

49 Decision X/13 (2010). *New and Emerging Issues*, paragraph 2(b). Note also Decision X/29 (2010) on *Marine and Coastal Biodiversity*, paragraph 12.

50 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). 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'.. § 1536(a)(2). 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 jeopardise the species or destroy or adversely modify critical habitat, then the action may not go forward unless an alternative that avoids such jeopardy, destruction of adverse modification is found. For a good discussion of this Act in this setting, see Dycus, S. (1996). *National Defence and the Environment*. (Hanover, University of New England Press). 30-35. For this Act when in conflict with the military in court, see *Sierra Club v. Dan Glickman*. 156 F.3d 606; 1998 U.S. App. LEXIS 23988.

51 16 U.S.C. ss 1361 (1988 & Supp. V 1993). 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 defence activities that might threaten cetaceans. The Navy, which had experience of this Act during the 1980s due to their taking and utilisation 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).

52 16 U.S.C. ss 1451-1464 (1988 § Sipp. V 1993). 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 programme 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'.

53 The National Environment Policy Act.

exceptions were either built in originally at their time of drafting, or subsequently. However, before these subsequent amendments giving greater leeway to military needs, there was a clear 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 non-compliance by the military with environmental statutes.<sup>54</sup> Following this, the then Secretary of Defence, Dick Cheney, issued a memorandum to the Secretaries of the Army, Navy and Air Force, declaring that,

The Department of Defence will be the Federal Leader in agency compliance and protection. We must demonstrate commitment with accountability for responding to the Nations environmental agenda... defence and the environment is not an either/or proposition. To choose between them is impossible in this real world of serious defence threats and genuine environmental concerns'.<sup>55</sup>

Following through, the Department of Defence and the associated wings of the military, began to integrate environmental considerations into their work, to a much greater extent than previously. For example, in 1996, the Department of Defence 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'.<sup>56</sup> The high tide of these efforts, which were reflected in numerous countries, was found in early 2001, when the Military Environmental Responsibility Act was introduced to the House of Representatives.<sup>57</sup> 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. This would have entailed a complete waiver of sovereign immunity given in all of the existing environmental laws to the benefit of the military.<sup>58</sup>

Although the environmental progress over this decade was slow, it was a slow progress in a direction which was the exact opposite of what happened, post September 11, 2001, when environmental laws within the United States were quickly restricted.<sup>59</sup> This occurred because the military requested, and Congress granted a series of new exemptions, or widening of existing rights, within the existing laws- as the military argued that it was losing its military edge, due to being unable to train correctly, because its training areas (which have been

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<sup>54</sup> United States v. Dee. 912 F.2d 741 (4th Cir. 1990)

<sup>55</sup> Cheney, address to the Defence and Environmental Initiative Forum, September 3rd, 1990. Quoted in Yap, J. (2004). 'Just Keep Swimming: Guiding Environmental Stewardship Out of the Riptide of National Security'. 73 Fordham Law Review. 1289. Note also Bethurem, N. (2002). 'Environmental Destruction in the Name of National Security'. 8 Hastings W. Nw Journal of Environmental Law and Policy. 109, 115.

<sup>56</sup> DoD. Directive Number 4715 Environmental Security (1996, February 24). 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 policies'. DoD Directive Number 4715. 1E. Environmental Safety and Occupational Health (2005, March 9). Section 4.6.

<sup>57</sup> For the similar approaches to this question in Europe, see Woodward, R. (2004). Military Geographies. (Blackwell, London). 85-90.

<sup>58</sup> See the Military Environmental Responsibility Act, H.R. 2154, 107 Congress (2001).

<sup>59</sup> Durant, R. (2007). The Greening of the U.S. Military. (Washington, Georgetown University Press). 155-175. Lazarus, R. (2003) 'A Different Kind of Republican Movement in Environmental Law'. 87 Minnesota Law Review. 999.

expanded greatly since the middle of the 20<sup>th</sup> century)<sup>60</sup> were being increasingly encroached upon.<sup>61</sup> Following an overt push-back authorising the Secretary of Defence, ‘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’,<sup>62</sup> the Readiness and Range Preservation Initiative emerged, as a tool to counter what was perceived as environmental laws that were preventing the military being fully prepared.<sup>63</sup> Although remaining committed to ‘environmental stewardship’, a number of exemptions were subsequently created with the laws pertaining to endangered species,<sup>64</sup> coastal zone management<sup>65</sup> and marine mammals.<sup>66</sup> Moreover, with regards to the Nation Environmental

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60 Lanier-Graham, S (1993) *The Ecology of War* (Walker, NYC) 88.

61 The Department of Defence 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 recognised as the foremost concern in this area. See Santicola, R. (2006). ‘Encroachment: Where National Security, Land Use, and the Environment Collide’. *Army Law Review*. 1. Also, USALSA Report: Environmental Law Division Notes: Encroachment: Putting the Squeeze on the Department of Defence. 2001 *Army Lawyer*. 33.

62 National Defence Authorisation Act for Fiscal Year 2003, Pub. L No. 107-314, ss. 366, 116 Stat. 2458, 2522 (2002).

63 National Defence Authorisation Act for Fiscal year 2004, Pub. L No. 108-136, ss 319, 117 Stat. 1392, 1434 (2004). For commentary, Burke, M. (2008) ‘Green Peace ? Preserving Our National Treasures While Providing for Our National Security’. 32 *William and Mary Environmental Law and Policy Review*. 803, 804-806. Dycus, S. (2005). ‘Osama’s Submarine: National Security and Environmental Protection After 9/11’. 30 *William and Mary Environmental Law and Policy Review*. 1, 2-3.

64 The ESA already contained a broad exemption for national security reasons. Specifically, ‘Notwithstanding 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 on 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, section 318 of 117 STAT. 1434 Public Law 108-136—NOV. 24, 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 Diner, N. (1998). ‘The Army and the Endangered Species Act: Who is Endangering Whom ?’ 143 *Military Law Review*. 200-233.

65 Note, 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). Kuersteiner, R. (1980). ‘Protecting Our Coastal Interests: A Policy Proposal for Coordinating Coastal Zone Management, National Defence and Federal Supremacy Doctrine’. 8 *Boston College Environmental Affairs Law Review*. 705. As was further explained in the Supreme Court, the President, pursuant to 16 U.S.C. §1456(c)(1)(B), 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, Secretary of the Navy et al, v Natural Resource Defence Council et al*. 555 U.S. 7 (2008). 9. Note, 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 ss1456(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 world wide operational and combat activities, which are essential to national security’. Press release from the White House, Jan 15, 2008. Reprinted in Burke, M. (2008). ‘Green Peace ? Protecting Our National Treasures While Providing for Our National Security’. *William and Mary Environmental Law and Policy Review*. 804, 831.

66 In 2003, Congress, through the national Defence Authorisation Act for Fiscal year 2004. 117 STAT. 1434 PUBLIC LAW 108-136—NOV. 24, 2003, amendments to the MMPA (section 319 of the 2004 Act, dealing with ‘exemptions of actions necessary for national defence’ gave the Navy greater leeway to use LFAS if necessary for national defence. 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 behavioural patterns are abandoned or significantly altered... earlier

Policy Act, the Courts have consistently taken a hard line in limiting the application of this law when priorities of conservation have come head to head with priorities of the military. In particular, the underlying theme that, ‘NEPA is a procedural statute; it does not force an agency to reach substantive, environment-friendly outcomes’ is never far from the surface.<sup>67</sup> The Courts have also been clear that they will not ‘flyspeck’ an agency’s environmental analysis, looking for any deficiency, no matter how minor,<sup>68</sup> and therefore, transgressions must be substantive for them to get involved.<sup>69</sup> Finally, as most substantively, when dealing with certain issues of high military importance, the Courts will not demand the military reveal its secret military secrets 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’.<sup>70</sup>

The cumulative results of the existing practices and all of these changes noted above is that it is very rare for any American court to absolutely prohibit the military from carrying out the activities the military (or more specifically, the President and Congress) considers to be necessary. These issues are, ultimately, not open to judicial inquiry.<sup>71</sup> The Supreme Court has acknowledged on numerous occasions that, in military matters,

Judges 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’.<sup>72</sup>

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 in breach of various environmental statutes.<sup>73</sup> This was most evident in the Supreme Court in the case of

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requirements of advance publicity in local newspapers, opportunity for public comment, eliminated... finally the amendment allows the Secretary of Defence 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 defence’ – this brings the Act into line with most other similar acts. For a discussion of this, see Dycus, S. (2005). ‘Osama’s Submarine: National Security and Environmental Protection After 9/11’. 30 William and Mary Environmental Law and Policy Review. 1, 35-37.

67 National Audubon Society v Navy... Page 12.

68 National Audubon Society v Navy... page 14.

69 Australians for Animals et al, v. Donald Evans, in 2004 before the District Court for the Northern District of California. No. C-04-0086. 2004 U.S. Dist. LEXIS 753.

70 Weinberger, Secretary of Defence v. Catholic Action of Hawaii. 45 U.S. 139; 102 S. Ct. 197; 70 L.Ed. 2d 298; 1981 U.S. LEXIS 45. The quote is on page 11. For an overview of this area, see Abate, R. (2010). ‘NEPA, National Security and Ocean Noise: The Past, Present and Future of Regulating the Impact of Navy Sonar on Marine Mammals’. 13 Journal of International Wildlife Law and Policy. 326, 349-355.

71 United States v. 243.22 Acres of Land, 129 F.2d 678, 683 (2d Cir., 1942). Gilligan v. Morgan, 413 U.S. 1, 10, 93 S. Ct. 2440, 2446, 37 L. Ed. 2d 407. Schlesinger v. Ballard, 419 U.S. 498, 510, 95 S. Ct. 572, 578, 42 L. Ed. 2d 610 (1975).

72 Orloff v. Willoughby, 345 U.S. 83, 93-94, 73 S. Ct. 534, 540, 97 L. Ed. 842 (1953).

73 See Barcelo v. Brown. 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, 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 he had avoided. After prolonged legal debate, the Navy finally stopped utilising the island in 2003. For the original decisions, see Aluli v. Brown. 437 F. Supp. 602; 1977 U.S. Dist. LEXIS 13986; 10 ERC (BNA) 1765; 7 ELR 20780. For a contemporary example of this,

Winter v NDRC, where although it was agreed that ‘military interests do not always trump other considerations’,<sup>74</sup> if the interests are essential, or in this case, a certain technology (MFA sonar) was deemed (by the Navy) ‘mission-critical [and] essential to national security’,<sup>75</sup> 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’.<sup>76</sup> 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’.<sup>77</sup>

Whilst the exact balance in such safeguarding will be influenced by considerations such as exactly how endangered the species at hand is (with critically endangered species being existant of higher standards)<sup>78</sup> the base standard is one whereby mitigation measures are imposed on the proposed military activity.<sup>79</sup> 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 this is achieved is by ensuring that the testing site is the best possible location (in terms of minimal environmental impact). The test of this is usually via the evaluation of alternative sites.

Whilst the examination of alternatives is key consideration with impact assessments in general, in the cases pertaining to sonar, the adoption of alternative sites where there would be least impact, has become standard. This practice first arose in the 1994 case of the NRDC v. the United States Department of the Navy, that turned on the failure of the Navy to meaningfully examine the possibility of alternative sites for the planned ship-shock trial, that would result in the taking of fewer marine mammals and other animals. This was juxtaposed against evidence which suggested that the planned site was a ‘uniquely populous nature of the

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see National Audubon Society v. Gordon. 422 F.3d 174; 2005 US. App. LEXIS 19277; 61 ERC (BNA) 1161; 35 ELR 20183. 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, Governor of Puerto Rico, et al., v. Brown et al. 478 F. Supp. 646, at 693; 1979 U.S. Dist. LEXIS 9774; 13 ERC (BNA) 2105

<sup>74</sup> Winter, Secretary of the Navy et al, v Natural Resource Defence Council et al. 555 U.S. 7 (2008). 16. For commentary on this case, see Reynolds, J (2008) ‘Submarines, Sonar and the Death of Whales: Enforcing the Delicate Balance of Environmental Compliance and National Security in Military Training’. 32 William and Mary Environmental Law and Policy Review. 759. Narodick, B. (2009). ‘Winter v. National Resources Defence Council: Going Into the Belly of the Whale’. 15 B. U Journal of Science and Technology Law. 332. Schaffner, A. (2008) ‘National Security v. Whales’. 1(2) Sea Grant Law and Policy Journal. 82.

<sup>75</sup> Winter, Secretary of the Navy et al, v Natural Resource Defence Council et al. 555 U.S. 7 (2008). 3, 15, 16 and 17.

<sup>76</sup> Winter, Secretary of the Navy et al, v Natural Resource Defence Council et al. 555 U.S. 7 (2008). 13.

<sup>77</sup> Pages 70 to 72.

<sup>78</sup> NRDC v Evans. No. C-02-3805-EDL. 316 F.3d 904 (9th Cir. 2003).

<sup>79</sup> Natural Resources Defence Council, et al., v. United States Department of the Navy. 857 F. Supp. 734, see especially pages 742; 1994 U.S. Dist. LEXIS 9674; 39 ERC (BNA) 1369.

Southern California Bight'.<sup>80</sup> The 2002 case of *Center for Biological Diversity v. National Science Foundation*, held before the District Court for the Northern District of California,<sup>81</sup> also turned, in part, on the failure of defendant scientists identifying suitable alternative sites for their extremely high energy acoustic bursts (as high as 263 dB(A) into the biologically rich Gulf of California. Very similar conclusions, whereby the importance of looking at all suitable alternative sites (and choosing the one which would result in least impact on cetaceans) available to test the new technologies, was reiterated in the cases of *NRDC v United States Navy*,<sup>82</sup> and *NRDC v Evans*.<sup>83</sup>

In the *Evans* example, the injunction applied by the Northern District of California's review of the Navy's SURTASS LFA Programme, permitted the Navy to train and test LFA sonar 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'.<sup>84</sup> Particular areas identified as 'Offshore Biologically Important Areas' were later added to this list.<sup>85</sup> Following this case, the Navy and the NRDC settled their lawsuit in this area on the global deployment of LFAS by the Navy agreeing to limit ongoing training missions to a region of the West Pacific which is relatively free of cetacean populations and of is of great strategic importance to the Navy. 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 (though somewhat expanded) areas of the Pacific Ocean (although there were broad exemptions to these limits when Naval commanders deem it necessary in search of potentially hostile submarines).

Once the question of alternative sites has been dealt with, additional mitigation methods tend to come into play. For example, in *NRDC v Evans*,<sup>86</sup> when dealing with mitigation measures for the testing of LFA SURTASS, in addition to the rule of seeking out alternative sites where there will be less environmental impacts the court laid down (and the Navy helped subsequently refine) two additional measures were added. These were measures to be adopted, 'whenever feasible'. Specifically, in seeking to minimise the exposure of marine mammals (and sea turtles) to SURTASS to levels below 180 dB(A), they mandated a two kilometre safety zone, whereby if one of these animals (to be actively monitored via visual

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80 *Natural Resources Defence Council, et al., v. United States Department of the Navy*. 857 F. Supp. 734, see especially pages 740 and 741; 1994 U.S. Dist. LEXIS 9674; 39 ERC (BNA) 1369. This was decided by the District Court for the Central District of California.

81 No. C 02-5065 JL. 2002 U.S. Dist. LEXIS 22315; 55 ERC (BNA) 1873. October 30, 2002.

82 *NRDC v. Navy*, No CV-01-07781. (C.D. Cal. Sept 19, 2002). Heisler, R. (2004) 'A Whale of a Tale: *NRDC v. U.S. Navy* and the Attempt to Exempt the Exclusive Economic Zone from the National Environmental Policy Act'. 10 *Southwestern Journal of Law and Trade in the Americas*. 125.

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

84 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. See pages 70 to 72.

85 Outside the coastal areas, the areas identified were the 200 meter isobath of the North American Eastern Coast, year round; the Costa Rica Dome, year round; and the Atlantic Convergence Zone, October through March. It was also agreed that LFA would not be deployed in the Arctic or the Antarctic. The court in late 2003 and again in 2005, added a further 9 areas, off Japan, the Philippines, China] were not to operate. Department of the Navy, Chief of Naval Operations (2007). *Final Comprehensive Report for the Operation of the Surveillance Towed Array Sensor System Low Frequency Active Sonar Under the National Marine Fisheries Service Regulations*. (Washington). See pages 15 to 17.

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

and sonar sources) is located, within one kilometre (the safety zone) of the sonar source, transmissions are to be suspended. *Secondly*, coastal waters within 22 kilometres of the shore are not exposed to SURTASS LFA sonar signals at levels above 180 dB(A).<sup>87</sup>

Similar – but different- additional mitigation measures were accepted by the Supreme Court when dealing with MFA sonar. These measures, as originally propagated by the District Court were, the imposition of a 12-mile ‘exclusion zone’ from the coastline; utilising lookouts to conduct additional monitoring for marine mammals; restricting the use of “helicopter-dipping” sonar; and limiting the use of MFA sonar in geographic ‘choke points’. Where the Supreme Court differed to the District court on additional mitigation measures for MFA sonar, where over the 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 during significant surface ducting conditions’.<sup>88</sup> In respect of these two additional measures, the Supreme Court, in deferring to the opinion of the Navy, ordered that they did not need to be complied with as they were overtly restrictive as they were likely to affect effective and 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]’.<sup>89</sup>

#### 4. 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, there was an initial presumption that certain laws, like their NEPA, had a global application, outside of the borders of America.<sup>90</sup> This was especially so when dealing with Trust territories where there was exclusive control,<sup>91</sup> - but not when there were unique foreign policy considerations, which trumped the possible application of domestic environmental laws.<sup>92</sup> Similarly, as the

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87 NRDC v Evans. No. C-02-3805-EDL. 316 F.3d 904 (9th Cir. 2003). 71-74. Also, Department of the Navy, Chief of Naval Operations (2007). Final Comprehensive Report for the Operation of the Surveillance Towed Array Sensor System Low Frequency Active Sonar Under the National Marine Fisheries Service Regulations. (Washington). 8-12.

88 Conditions, as reiterated by the Supreme Court, Winter, Secretary of the Navy et al, v Natural Resource Defence Council et al. 555 U.S. 7 (2008), at page 7.

89 Winter, Secretary of the Navy et al, v Natural Resource Defence Council et al. 555 U.S. 7 (2008). 15. 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. 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’. At page 19.

90 The Court of Appeals for the District of Columbia Circuit Specifically, § 102(2)(F) of NEPA requires all federal agencies to recognize the worldwide and long-range character of environmental problems – but such recognition must be consistent with the foreign policy of the United States. For a discussion of this, see NRDC v. NRC, 647 F.2d at 1366.

91 See People of Enewetak v. Laird, 353 F. Supp. 811, 818 (D. Haw. 1973). Also, People of Saipan by Guerrero v. United States Dep’t of Interior, 356 F. Supp. 645, 650 (D. Haw. 1973).

92 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

Courts have held, neither does the NEPA apply to such bilateral contexts with friendly countries, such as those which may hold American military bases (because foreign policy interests outweigh the benefits of preparing an environmental impact statements).<sup>93</sup>

As a way to move past the ambiguities in this area, in 1979, President Carter issued Executive Order No 12,114 which pertained to ‘Environmental Effects Abroad of Major Federal Actions’.<sup>94</sup> The purpose of this order was to enable responsible officials of Federal agencies having ultimate responsibility for authorizing and approving, actions having ‘significant effects on the environment outside of the geographical borders of the United States’<sup>95</sup> to be informed of pertinent environmental considerations and to ‘take such considerations into account’, with other pertinent considerations of national policy. Although independent from other legislation, it was seen furthering ‘the purpose of the National Environmental Policy Act and the Marine Protection Research and Sanctuaries Act ... consistent with the foreign policy and national security policy of the United States’.<sup>96</sup> By its order, this exempted a number of instances,<sup>97</sup> 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 require no consideration of the environmental effects (as such countries are assumed to have worked out, and reconciled with the visitors, such questions for themselves).<sup>98</sup>

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 participating with the United States and not otherwise involved in the action).<sup>99</sup> Environmental impact statements, when dealing with the global commons outside the jurisdiction of any nation (e.g., the oceans or Antarctica), were also required – although in some of these cases, such as with Antarctica, the American courts have not needed Executive Order No 12,114 as they have held that the NEPA does apply to Federal actions in this area, because Antarctica was not subject to foreign sovereignty, but instead a global commons over

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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. *NRDC v. Nuclear Regulator Commission* 647 F.2d 1345 (D.C. Cir. 1981).

<sup>93</sup> *NEPA Coalition of Japan, v Aspin* 837 F. Supp. at 467. (D.D.C. 1993). Note also the Stone decision, of which 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 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’. *Stone*, 748 F. Supp. at 760.

<sup>94</sup> The provisions of Executive Order 12114 of Jan. 4, 1979, appear at 44 FR 1957, 3 CFR, 1979 Comp., p. 356.

<sup>95</sup> Section 2.1.

<sup>96</sup> Section 1.1.

<sup>97</sup> Section 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.

<sup>98</sup> Dycus, S. (1996). *National Defence and the Environment*. (Hanover, University of New England Press). 26-27. Fair, K. (1998). ‘Environmental Compliance in Contingency Operations: In Search of a Standard’. 157 *Military Law Review*. 112.

<sup>99</sup> Section 2.4.

which the United States had ‘some real measure of legislative control’.<sup>100</sup> On the same logic, it is possible – but uncertain<sup>101</sup> – whether the same situation exists for the high seas – although the United States has a much lesser 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. This fact, that the United States is a Party to a specific treaty which provides particular obligations is a defining consideration with regards to environmental responsibilities of an international significance.

### A. The Military and Pollution of International Significance

Although there may be a particular treaty dealing with an environmental problem of international significance, the way that the military is drawn into the agreed obligations, depends on the treaty at hand, and whether the treaties deal with pollution or conservation.

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

The foremost example where international law has come to favour conservation (and security) concerns over efforts of the military in terms of preparation, is with the testing of nuclear weapons 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 have been carried out in the atmosphere. Cumulatively, the nuclear tests already undertaken have left an ongoing worldwide legacy and in both environmental and human terms. It has been suggested that atmospheric nuclear testing may have had a direct link in the killing of up to 65 million people worldwide. Many of these deaths were in the late 1950s and early 1960s, when certain cancers, like breast cancer, took hold in women who were adolescent in this period. The United States Department of Health and Human Services suggested that at least 11,000 Americans alone had died from cancers caused from the radioactivity released from the 390 nuclear bombs exploded in the atmosphere between 1951 and 1963. The number of non-lethal cancers from these tests in the United States alone has been put at more than 200,000. The Soviet atomic bomb testing projects may have directly cost the lives of between 50,000 to 100,000 non-military personnel. Problems have also been contended by the service personnel of all countries who were forced to witness some of the blasts. However, the differences in the way nuclear test veterans and civilians from the United States, France, the United Kingdom and the Commonwealth experienced them suggest the extent of impact from watching such tests, despite their often being exposed to dangerous levels of radiation, are the

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100 *Environmental Defence Fund v. Massey*. 986 F.2d. 528 (D.C. Cir 1993). The quote is from 534.

101 This question was hinted at in *NRDC v. Navy*, No CV-01-07781. (C.D. Cal. Sept 19, 2002).

subject of scientific uncertainty due to difficulties in trying to disentangle background rates of cancer and other possible sources of cause.<sup>102</sup>

Aside the instability that nuclear testing was causing in the Cold War, the Superpowers were also aware of the environmental damage that was being created by their atmospheric testing of nuclear weapons. Following through, the first formal proposals for a limited test ban treaty were advanced by the Soviet Union in 1955 and the United States and the United Kingdom in 1959. The General Assembly of the United Nations added their voice for an international agreement that would stop the testing of nuclear weapons.<sup>103</sup> The following year, the Security Council noted that the ongoing failure of meetings between the world superpowers ‘may lead to an increase of international tensions likely to endanger peace and security’. They were particularly aware ‘of the mounting danger of the continuation of the arms race’. In particular, they requested ‘negotiations on measures to prevent surprise attack, including technical measures’. They also requested all governments to act for the discontinuance of all nuclear weapons tests.<sup>104</sup> However, this appeal was against rising international tensions, and soon after the General Assembly solemnly appealed directly to the Soviets ‘to refrain from carrying out its intention to explode in the atmosphere a 50 megaton bomb’.<sup>105</sup> The Soviets declined the request and carried out the largest nuclear test, ever, 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 themselves to supporting in early 1963. However, a comprehensive treaty proved elusive due to difficulties over ensuring compliance as a result of a lack of established verification procedures such as seismic mechanisms or on-site inspections.<sup>106</sup> 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’.<sup>107</sup> The Parties were also, ‘desiring to put an

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102 Reuters ‘France to Compensate for Victims of Nuclear Testing’ *New Zealand Herald* (Mar 25 2009) A3; AP ‘UK Comes Clean on Radiation’ *NZ Herald* (Aug 4 2008) A3; O’Rourke, S ‘Vets Want Tests on Their Children Too’ *New Zealand Herald* (May 15 2007) A7; Anon ‘European Union: Atmospheric Testing’ *New Scientist* (Feb 8 2003) 13; Anon ‘Nuclear Tests Cancer Toll’ *New Scientist* (Mar 9 2002) 7; Edwards, R ‘New Twist To Veteran’s Tale’ *New Scientist* (Nov 23 2002) 14–15; Edwards, R ‘New Twist To Veteran’s Tale’ *New Scientist* (Nov 23 2002) 14–15; Hecht, J ‘Fatal Fallout’ *New Scientist* (Sept 12 1998) 13; Ortmeyer, P ‘Worse Than We Knew’ *Bulletin of Atomic Scientists* (Nov 1997) 46–50; Gonzalez, A ‘A Radiological Legacy: Radioactive Residues of the Cold War Period’ 40(4) *IAEA Bulletin* (1998) 2–6; Robbins, A et al (1991) *Radioactive Heaven and Earth: The Health and Environmental Effects of Nuclear Weapons Testing In, On and Above the Earth* (London, Zed); Kiernan, V ‘US Takes A Closer Look At Nuclear Test Veterans’ *New Scientist* (July 3 1993) 8; Cross, M ‘Most US Atom Veterans Unharmed’ *New Scientist* (June 13 1985) 8; Torrey, L ‘Nuclear Bomb Fall-Out Victims Should Be Compensated’ *New Scientist* (Mar 20 1980) 901; Edwards, R ‘Radiation Payout’ *New Scientist* (May 22 1999) 12; Anon ‘Radiation Damages’ *New Scientist* (Nov 30 1996) 12; Larin, V ‘Mayak’s Walking Wounded’ *Bulletin of Atomic Scientists* (Sept 1999) 20–25; Edwards, R ‘The Day the Sky Caught Fire’ *New Scientist* (May 13 1995) 14–15; Klochko, M ‘Victims of Stalin’s A-Bomb’ *New Scientist* (June 23 1983) 854–57.

103 UNGA Resolution (1959) 1402 (XIV) Suspension of Nuclear and Thermonuclear Tests.

104 S/RES/ 135 (1960, May 27).

105 UNGA Resolution (1961) 1632 (XVI) Continuation of Suspension of Nuclear Tests.

106 US–USSR Exchange of Views on a Nuclear Test Ban, 2 *ILM* (1963) 198–207; Verification and Response in Disarmament Treaties, 2 *ILM* (1963) 320–331; US Report On Nuclear Test Ban Treaty Safeguards, 3 *ILM* (1964) 664–665. Also, United States Takes Note of Soviet Nuclear Tests, 4 *ILM* (1965) 393.

107 Both of these sentences in quotes are from the Preamble of the Atmospheric Test Ban Treaty.

end to the contamination of man's environment by radioactive substances'.<sup>108</sup> Accordingly, they agreed to:

[P]rohibit, 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, including outer space; or under water, including territorial waters or high seas.<sup>109</sup>

It was also prohibited to carry out any nuclear test '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'.<sup>110</sup> The 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'.<sup>111</sup> The Atmospheric Test Ban Treaty was signed by the United States, the Soviet Union and the United Kingdom. It was not signed by the other superpowers of France and China. France came to stop the atmospheric testing of its nuclear weapons in 1974 following cases brought against it by Australia<sup>112</sup> and New Zealand<sup>113</sup> at the International Court of Justice.<sup>114</sup>

The above example of the atmospheric testing is somewhat unique, as only the military was responsible for this problem. This is very unlike most other areas of pollution of international significance, where the military is only one contributor with many others. This type of situation can be seen with the creation of toxic waste, climate change, ozone depleting chemicals and some persistent organic pollutants. In these situations, the obligation upon the military to control their polluting activities are contained within the general obligations for Parties to control all of the sources of pollution under their control. Nevertheless, exceptions to allow non-compliance by the military exist in at least two cases.

The military is reknown for its environmental footprint in terms of the pollution it causes, in terms of the both the chemicals it uses and the impacts it leaves behind. However, unlike with the atmospheric testing of nuclear weapons, in the cases of other types of pollution, 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 where militaries have created substantive pollution but have no responsibilities through international law is with their creation of toxic waste and damage done to their former (or contemporary) bases. Whilst in some instances, the damage was done by

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108 Preamble of the Atmospheric Test Ban Treaty.

109 Art I (1)(a).

110 Art 1 (1)(b).

111 Art 1 (1)(b). Note, this is the last sentence from this section.

112 Nuclear Tests Case (Australia v France), ICJ, 20 December 1974, General List No 58.

113 Nuclear Tests Case (New Zealand v France), ICJ, 20 December 1974, General List No 59.

114 For the follow through on this case, see Request for an Examination of the Situation in Accordance With Paragraph 63 of the 1974 Nuclear Tests Case, 22 September 1995, General List No 97.

deliberate violations of existing laws,<sup>115</sup> more often than not, the damage was done in accordance with the national exceptions which were created to laws such as those in the United States, covering toxic substances,<sup>116</sup> clean air<sup>117</sup> and clean water.<sup>118</sup> Globally within the estimated tens of million acres of territory in the possession of all of the militaries of the world, there are tens of thousands of these sites worldwide containing, inter alia, buried waste, poisoned ecosystems and/or damaged landscapes.<sup>119</sup> The only exception to this area is where some 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.<sup>120</sup>

With a problem like climatic change, the contribution of the military can only be guessed at. Estimates suggest that in some countries, such as the United States, the military was responsible at the end of the twentieth century for 76,267 gigatonnes of carbon dioxide (equivalent) emissions per year.<sup>121</sup> Some scholars have suggested that may equate to about one third of the nations total energy consumption each year.<sup>122</sup> This percentage may be possible due to the sheer scale of military hardware in existence, coupled with the fact that considerations such as energy efficiency tend to play a very distant second to considerations such as military efficiency. However, any attempts at numbers in this area are pure conjecture, and it unlikely they will ever be known. The primary reason for this is that most nations do not report specifically on greenhouse gas emissions from their military, but rather, they are reported within their aggregated national totals (or divided within subsectors, such as military aviation forming part of the overall contributions on aviation emissions in general) does not help. Although this is creating a number of anomalies in the attempts to create a robust greenhouse accounting regime, it is unlikely to change in the near term future.<sup>123</sup> In exactly the same manner, as reductions in greenhouse gases are called for by country – not by 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 non-military sector, as reductions targetted at 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, and it is upto a Party on how it manages its collective

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115 See *United States of America v. Dee, Lentz and Gepp*. 912 F.2d 741; 1990 U.S. App. LEXIS 15568; 31 ERC (BNA) 1953; 21 ELR 20051.

116 The Toxic Substances Control Act, 15 USC. § 2621.

117 The Clean Air Act, § 7418 (b)

118 The Clean Water Act, 33 USC. ss. 1323, section 313.

119 Sanders, B. (2009). *The Green Zone: The Environmental Costs of Militarism*. (AK Press, Oakland). 36-37, 47. Lanier-Graham, S (1993) *The Ecology of War* (Walker, NYC) 81, 85. Thomas, W. (1995). *Scorched Earth*. (New Society Publishers, Philadelphia). 16-32.

120 Krupnick, C. (2001). *Decommissioned Russian Nuclear Submarines and International Cooperation*. (California UP, California).

121 Secretariat (2002). *Report of the Individual Review of the Greenhouse Gas Inventory of the United States Submitted in the Year 2000*. (UNFCCC, Bonn; FCCC/WEB/IRI(1)2000/USA 11 July 2002). Paragraph 68.

122 Sanders, B. (2009). *The Green Zone: The Environmental Costs of Militarism*. (AK Press, Oakland). 39. Woodward, R. (2004) *Military Geographies*. (Blackwell, London). 73-76.

123 FCCC Secretariat (2000). *Preliminary Options for Methodologies to Apply Adjustments Under Article 5.2 of the Kyoto Protocol*. (FCCC, Bonn, Working paper No. 3 (a).

reductions is more pronounced in other regimes, such as the Montreal Protocol..... As it was, few of the Parties which signed the Montreal Protocol had any fully informed idea of how important ozone depleting substances (ODS) were to the military. It was only after they did national audits, from which they could make their promised reductions, that they discovered the presence of ODS in many weapon systems. That is, ODS were actually required in standards, specifications, and codes governing operations ranging from design, engineering, manufacture, and purchasing to operations and maintenance activities. Their use for aerosols, electronics, solvents and refrigeration (particularly for specialist areas, such as with submarines and ships) were particularly notable. Moreover, in the 1980s, once the less damaging, but still impacting, halons were created as an alternative to CFCs, halons quickly became the preferred fire-fighting agents on board aircraft and ships, in armoured combat vehicles, and for ground/shore facility fire protection.

Despite this importance, 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 in the time frame given were not possible. Accordingly, rather than create overt difficulty on the military, it was agreed that armed forces could collect and recycle their existing ODS (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'.<sup>124</sup> Although this 'essential uses' exception exists, the important point to note is that to date, is that the Parties (as in, each use must be agreed by the Parties collectively, not by the individual Party) have only rarely utilised it for military exceptions, although this has been done.<sup>125</sup> Whether this situation will change in the future, and the utilisation of this exception for military purposes becomes more widespread, as some ODS appear (especially some halon types for certain types of fire-fighting, and some HCFC for cleaning oxygen systems), irreplaceable, is a matter of debate.<sup>126</sup>

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 which were of direct interest to the military, such as technical pentabromodiphenyl ethers (TBE). These chemicals are a class of additive flame retardants used since the 1960s in thermoplastics to suppress or delay combustion. Within military application, they are widely valued for their flame retardant properties, for both safety clothing and electronics. However, they are also a persistent, multi-generational, organic pollutant. Accordingly, the international community agreed to prohibit the further production and use of this chemical, and/or its import or export.<sup>127</sup> However, this prohibition, like all others under this Convention, can be

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124 See articles 2(a)(4); 2(b)(3); 2(c)(e); 2(d)(2); 2(e)(3) and 2(g). Covering CFCs, halons, other fully halogenated CFCs, carbon tetrachloride, trichloroethane (Methyl chloroform) and hydrobromofluorocarbons.

125 Decision X/6/ Essential Use Nominations for Controlled Substances for 1999 & 2000. Report of the 10th MOP of the Montreal Protocol. 19-20. Decision XIII/8. Essential Use Nominations for Non-Article 5 Parties For Controlled Substances for the Year 2002 and Beyond. Report of the 13th MOP.

126 UNEP (2010). Assessment Report of the Technology and Economic Assessment Panel. (UNEP, Nairobi). Section 1.8

127 See SC-4/18 (2009). Listing of Tetrabromodiphenyl Ether and Pentabromodiphenyl ether ... Annex A. (2009).

exempted by individual Parties for exceptional (and limited) reasons.<sup>128</sup> However, to date, no national governments have sought an exemption to the prohibition of TBE either for the exceptional needs of the military.

## B. The Military and Conservation of International Significance

Exceptions for the military, to take (or kill) endangered species are rarely spelt out within international wildlife law. Rather, they are assumed within some of the broader exceptions that exist within 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 areas beyond the limits of national jurisdiction' this obligation is tempered by the general caveats that they are expected, 'in accordance with its particular conditions and capabilities' and 'as appropriate' to develop national strategies, plans or programmes for the conservation of biological diversity.<sup>129</sup> 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 trump other considerations. This type of exception, is common within many types of wildlife agreement. 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.

This type of exception reappeared in other wildlife treaties such as the Conventions on Wetlands, Migratory Species and European Wildlife and Natural Habitats. In the case of the Ramsar Convention on wetlands and waterfowl, the ability to take actions required by 'urgent national interest' was clearly spelt out in Article 4. Similarly, under the CMS, 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'.<sup>130</sup> The Convention on the Conservation of European Wildlife and Natural Habitats reiterated this type of exception for Contracting Parties. Thus, under Article 9, if 'there [wa]s 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. Under such wide exceptions,

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<sup>128</sup> See articles 3(6) and 4 of the Convention.

<sup>129</sup> Article 6 of the CBD.

<sup>130</sup> CMS. Article III (5)(d).

military activities have been permitted by the Parties to some of these conventions, such as with the United States and the 1916 Migratory Birds Treaty.<sup>131</sup>

Although the examples noted above did not spell out that the military may be the beneficiary of these exceptions, in the case of the oceans, it was different. In this area, international law, with regards to controls pertaining to pollution (of which noise from sonar may be considered) from warships (or similar) is very clear: namely, there is no international law in this area. Thus, within the multitude of treaties pertaining to matters of the oceans and oil pollution (in terms of liability<sup>132</sup> and outside intervention to stop),<sup>133</sup> other forms of marine pollution (including, but not limited to oil pollution),<sup>134</sup> the dumping of waste into the ocean,<sup>135</sup> and even salvage,<sup>136</sup> -all explicitly do not apply to military vessels. However, it is expected in all instances, that flag States will attempt to adhere to the spirit of the various regimes. The overall situation was best summed up by Article 236 of the United Nations Convention on the Law of the Sea. 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 aircraft 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 aircraft owned or operated by it, that such vessels or aircraft act in a manner consistent, so far as is reasonable and practicable, with this Convention.<sup>137</sup>

In this area, the situation is doubly bleak, because the conservation of marine mammals, as directed through the UNCLOS to be undertaken by ‘appropriate international organisations’ – and universally recognised as the International Whaling Commission, although able to, and aware of the problem of noise in general, has never passed a specific resolution on this topic,

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131 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 Defence, for the (incidental) killing of migratory birds located on, or near, a firing range on an island in the Marianas. *Centre for Biological Diversity v. Pirie* 191 F. Supp. 2d 161; 2002 U.S. Dist. LEXIS 4112. 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 Defence Authorisation Act, which substantially amended their domestic implementation of the Migratory Birds Treaty. In particular, the new law directed the Secretary of the Interior, with the concurrence of the Secretary of Defence, 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 Defence Authorisation Act for Fiscal Year 2003*, Pub. L. No. 107-314, ss 315, 16 Stat. 2458, 2509 (2002).

132 See the 1969 and 1992 International Convention on Civil Liability for Oil Pollution Damage. Article XI in both conventions.

133 1969 International Convention Related to Intervention on the High Seas in Cases of Oil Pollution Damage UKTS 77 (1971). Article 1(2).

134 See the 1973 International Convention for the Prevention of Pollution from Ships, articles 3 and 11(2).

135 The 1973 International Convention for the Prevention of Pollution from Ships, articles 3, 7 and 11(2). Note, the 1996 Protocol to this regime, which substantially reorientated the original 1972 Convention, did not contain the original exception, although Article 8(2) did allow exceptions for dumping in emergencies.

136 Article 4 of the 1989 International Convention on Salvage.

137 Note also article 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 UNCLOS].

nor more pertinently, on military generated noise.<sup>138</sup> Accordingly, aside the general and specific exceptions granted to the military in the area of conservation concerns with the international law of the sea, the standards to which they are expected to act in a manner consistent with at 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 (and only) example of this is found with the regional Agreement of the Convention on Migratory Species, the Agreement on the Conservation of Cetaceans in the Black Sea Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS). This is a particularly interesting example, as a large number of the members of ACCOBAMS, within the European Community, has actively avoided obligations in this area. Thus, whilst the European Community created strong obligations relating to the assessment and management of (large scale) environmental noise, they added,

This Directive shall not apply to noise that is caused by the exposed person himself, noise from domestic activities, noise created by neighbours, noise at work places or noise inside means of transport or due to military activities in military areas.<sup>139</sup>

Despite this Directive, and although being fully cognisant of Article 236 of the UNCLOS, (and aware of the overall possibility to exclude themselves from the overall Convention on Migratory Species obligations, due to ‘extraordinary circumstances’)<sup>140</sup> still issued recommended Guidelines for all Parties to combat underwater noise.<sup>141</sup> With particular regard to military sonar, the Guidelines have recommended principles that largely follow what has already been agreed in the domestic setting of the United States (even though the United States is not a Party to ACCOBAMS). Namely, the avoidance of key habitat areas (although the Courts were much clearer on this area of where was restricted, - but the Guidelines highlighted the importance of avoiding areas of beaked whales) and using the lowest practicable power levels. Where the ACCOBAMS Guidelines differed was in the specification of the details of the monitoring requirements (so as to ensure that cetaceans are not in the area); and not utilising high power sources at night (because detection is difficult). They were also more prescriptive in terms of ramp up times (a slow build-up to maximum noise emissions) and power-down requirements (when a specimen was found in the zone), of which the American Supreme Court specifically excluded (for some types of sonar training).

## 5. 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

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138 The Parties to the ICRC 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’.

<sup>139</sup> Directive 2002/49/EC, Relating to the Assessment and Management of Environmental Noise. (June 25, 2002). Article 2.

<sup>140</sup> CMS. Article III (5)(d).

<sup>141</sup> Resolution 4.17 (2010). Guidelines to Address the Impact of Anthropogenic Noise on Cetaceas in the ACCOBAMS Area.

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? This question was asked, as to date, these issues have only been examined in a domestic context – and only one domestic – that of the United States. Thus, a technology that will have international implications is only being examined by one country, with regards to their own domestic laws. Due to this shortfall, the question arises, how are the considerations of the military and conservation reconciled in times of peace, from an international perspective?

Generally, the answer is that the military can be made to comply with environmental problems of an international significance. 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, as all other sectors with a country may be obliged to comply to meet agreed international obligations. This is the case with climate change, ozone depletion and some persistent organic pollutants. However, in some instances, the ability for the military to be granted exceptions exists, although to date, these are rarely used. Rather, the militaries have learnt to adapt and comply with the same national standards as all other sectors.

However, this is not the case when dealing with considerations of conservation. In the treaties of conservation, exceptions from compliance from international obligations are very clear, although it is rare these are attached directly to the military (although the military has learnt to avail themselves of them). The situation is different with regards to conservation concerns upon the high seas. In this last instance, the exceptions for the military are clearer than any other part of international environmental law, with clear rules being agreed since the Second World War, that the military cannot be 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 considerations.

The conclusion this represents for the case study at hand is that whilst some success may be obtained in 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 exclude their application to the military, and the only international body which could provide assistance in this, has failed to contribute any guidance or comment. The only exception to this trend is with one regional agreement, 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 are caveated by a large number of rules which retain the ability of the Parties to avoid them if deemed necessary, they are a clear, if tentative, step away from the absolute immunity of the military in this area. However, how far the trumping of the militaries interests, over those of conservation, when dealing with the high seas has been mitigated, is a matter of debate.

