KILLING AND CLEANING IN COMBAT: A PROPOSAL TO EXTEND THE FOREIGN CLAIMS ACT TO COMPENSATE FOR LONG-TERM ENVIRONMENTAL DAMAGE

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INTRODUCTION

Like it or not, warfare has been a constant throughout human history. As technology has progressed, so too has the destruction wrought by warfare on the environment. With the introduction of nuclear weapons at the end of World War II, the possibility of near-permanent environmental damage became real, and the need to contain mankind's methods of warfare became evident. Following World War II, the threat of mutually assured destruction prevented any global environmental catastrophes; however, true international concern over the impact of war on the environment did not begin

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1 See generally JARED M. DIAMOND, GUNS, GERMS & STEEL (1999) (recounting the development of civilization and warfare).
2 See infra Part I (recounting a brief history of warfare's destructiveness).
5 See generally Owen Matthews, Russian Nukes Redux; Looking to Recapture Lost Glory, Moscow is Building a New Nuclear Warhead Designed to Evade U.S. Defenses, NEWSWEEK, Feb. 13, 2006, at 10 (inferring that the threat of mutually assured destruction prevented nuclear warfare and that the U.S. building of nuclear missile defenses upsets that balance of power).
until the Vietnam War. Vietnam brought the issue to light because it corresponded with the rise of the environmental movement in the United States. Vietnam also foreshadowed the possibility of greater environmental disasters if countries continued to modify or destroy the environment as a method of warfare. In the aftermath of the Vietnam War, the international community recognized the need for environmentally conscious treaties and negotiated numerous agreements with the specific intent of protecting the environment.

Since the Vietnam War, the environment has been a major issue of contention in the United States in almost every conflict. While the United States Military is constantly attempting to adapt to ever-changing societal environmental norms, criticism still abounds. Today, environmental groups level three primary criticisms against the United States Military: (1) the use of depleted uranium in its weapons; (2) the failure rate of cluster bombs and its associated lethality, and; (3) the environmental impact of the destruction of some of its targets.

This Note discusses the environmental problems faced in modern warfare and the international attempts to limit the destruction of the environment, and proposes a domestic solution through the Foreign Claims Act. Part I of this Note lays out the historical background behind environmental law in warfare with a special focus on the Vietnam War, which triggered the first international attempts to limit warfare's effect on the environment. Part II discusses the international treaties in effect since the Vietnam War that limit environmental destruction, including the Environmental Modification Treaty, Additional Protocols I and II to the Geneva Convention, and other weapons-specific treaties. Part III then

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discusses the Foreign Claims Act, how it operates, and its current limitations. Finally, Part IV proposes a modification to expand the Foreign Claims Act to allow the military to compensate victims of long-term environmental damage and incorporate environmental costs into its decisionmaking. Part IV then applies this proposed modification to the three largest environmental criticisms leveled against the United States Military and articulates the potential long-term beneficial effects.

I. HISTORY OF ENVIRONMENTAL WARFARE

History is replete with familiar examples of environmental damage during warfare. One of the earliest and most familiar examples of environmental warfare was the Romans salting the fields of Carthage during the Third Punic War in 146 B.C. Likewise in 1346 A.D., the Tartars implemented the first large-scale use of biological warfare by catapulting plague-infested bodies into the city of Kaffa. During Napoleon's advance on Moscow, Russian citizens burned their own homes and the surrounding forests to prevent the French army from obtaining supplies. Sherman's March to Atlanta during the American Civil War burned over four million hectares, and the impact on the flora in Georgia is still visible today.

World War II arguably saw the gravest damage to the environment as countries fought by every available means. The Chinese destroyed their own Huayuankow Dam, flooded hundreds of thousands of hectares, and killed hundreds of thousands of their own citizens in an effort to stop the Japanese onslaught. The Allied firebombing of Germany and Japan left entire cities flattened and hundreds of thousands dead. Even today,
the threat of unexploded ordnance exists throughout central Europe and Japan from the round-the-clock Allied bombing of Axis cities and military targets. Finally, the United States' use of the atomic bomb in the Japanese cities of Hiroshima and Nagasaki ended the Second World War but began a whole host of new environmental issues with the subsequent arms race and above-ground nuclear testing.

Vietnam saw both the pinnacle of military ingenuity in environmental warfare and the beginning of domestic and international backlash from the destruction of the environment. In order to combat Vietcong guerilla tactics, the United States developed a number of tactics to reduce enemy cover in the thick forests and slow down enemy troop movements. These strategies decimated over ten percent of the total Vietnamese jungles and left lasting effects that are still visible today.

The United States' first and best known tactic was the dropping of herbicides over South Vietnam in an effort to destroy the enemy's cover for troop movement. This deforestation involved the now-infamous "Agent Orange" as well as two other defoliates, Agents Blue and White. In addition to the well-documented health hazards of Agent Orange, the deforestation led to widespread soil erosion in the hilly areas of South Vietnam and significant loss of animal habitats as the new flora could not support the same animal life.


19 See Dycus, supra note 15, at 754-55.


21 See Westing, supra note 7 at 24.

22 Id. at 69-70 (discussing the damage and after-effects on indigenous flora); see also Anthony Faiola, Vietnam's Toxic Legacy, WASH. POST, Nov. 13, 2006, available at http://www.msnbc.msn.com/id/15692010/?GT1=8717 (discussing the effect dioxins from Agent Orange are having on children thirty years after the war).

23 See Westing, supra note 7, at 24 (stating the United States dropped over seventy-two million liters of herbicides across South Vietnam, including Agents Orange and White that interrupt "the normal metabolism of poisoned plants" and Agent Blue that prevents a plant from retaining moisture due to its desiccating compounds).

24 See Faiola, supra note 22.

25 Westing, supra note 7, at 32 (discussing how animals are affected both by their loss of habitat and by direct poisoning from the agents).
The American military used another environmentally destructive technique that involved heavy tractors with attached blades ("Rome ploughs") to mow down vegetation alongside roads in an effort to prevent ambushes. All told, some [325,000 hectares] were cleared by the Rome ploughs in South Vietnam, that is, 2 per cent [sic] of its entire land area. The ecological consequences of clearing such a vast area included a loss of habitat for local animals, flooding due to less absorbent soil, erosion of soil and nutrients, and even a change in the surrounding microclimate.

Arguably, the United States Military's most secretive and controversial method of environmental warfare was seeding clouds to lengthen the rainy season. The military conducted these operations during the dry seasons from 1967 until 1972. The operations were intended to increase the rainfall and make the primitive, unpaved roads of North Vietnam unusable, thereby slowing the enemy and its supply train. A secondary desired effect of modifying the rainfall was to tie up North Vietnamese resources fixing flooded roads. The results of the secret project were indeterminate; the Air Force believes it increased the rain by up to 30 percent in some areas. However, due to a lack of available ground stations to measure the rainfall and other accurate data recording methods, the Air Force admits the "results were certainly limited and unverifiable."

In the midst of the politically divisive Vietnam War, the environmental movement began to take hold in the United States as an issue that united the whole country. On January 1, 1970, President Nixon signed into law the National Environmental Policy Act ("NEPA"), one of the first of many national environmental laws. Congress and the President followed soon after with the creation of the Environmental Protection Agency, the Clean Air Act Amendments, and the Clean Water Act

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26 See id. at 46-49.
27 Id. at 47.
28 Id. at 48.
29 Secret Hearings, supra note 20, at 101.
30 Id. at 102.
31 Id.
32 Id. at 115.
33 Id. at 115, 120.
36 See Lazarus, supra note 34, at 1002.
37 Clean Air Act Amendments of 1970, Pub. L. No. 91-604, 84 Stat. 1676 (codified as
Amendments. The momentum of the national legislation spilled over into the international arena and the United States soon found itself negotiating numerous international treaties regarding the environment.

II. INTERNATIONAL PRINCIPLES OF WAR AND INTERNATIONAL TREATIES ON THE ENVIRONMENT

A. The Development of the International Law of War

Before discussing the current state of international environmental law, it is necessary to discuss how international law came about. The first attempts at developing a law of war involved bilateral treaties or the unilateral adoption of a code of warfare by a country. Individual nations quickly discovered that these treaties were ineffective and recognized the need for truly international laws of war to regulate all countries and all wars. The first major attempt to develop truly international law began in 1864 with the convening of the first Geneva Diplomatic Conference. This conference led to the adoption of the First Geneva Convention on the Amelioration of the Condition of the Wounded in Armies in the Field. Only four years later, the St. Petersburg Declaration renounced the "employment of arms which uselessly aggravate the sufferings of disabled men, or render their death inevitable," as well as certain types of exploding bullets.

Eventually, two separate lines of treaty law developed from these first attempts: "Hague Law" and "Geneva Law." Hague Law developed its name from the two peace conferences at the Hague in 1899 and 1907 that focused on limiting the means and methods of warfare similar to the

amended at 42 U.S.C. §§ 7401-7671q (2000)).
40 Id.
41 Id.
44 Roberts, supra note 39, at 113.
St. Petersburg Declarations. The most important of these treaties was the Convention Regarding Laws and Customs of War on Land (Hague IV), which regulated the means and methods of land warfare. Following World War II, the world saw the need to further regulate the wartime treatment of civilians, wounded and captured soldiers, and types of warfare that are particularly damaging to surrounding civilian populations. This realization lead to four separate agreements collectively known as the Geneva Convention of 1949. Geneva law compliments Hague law by defining who or what is a legitimate target of the means and methods of warfare allowed by Hague law.

B. International Customary Law of War

Four customary principles of the law of war developed from the early Hague Law and apply today: necessity, proportionality, discrimination, and humanity. In order for a principle to become customary international law, there must be “evidence of a general practice accepted as law” and it must reflect “the general principles of law recognized by civilized nations.” The underlying ideal behind these customary principles of the law of war is that the means of engaging in warfare are not unlimited.

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46 Convention Respecting the Laws and Customs of War on Land (Hague IV), Oct. 18, 1907, 36 Stat. 2277.
48 See supra note 47.
49 Schmitt, supra note 6, at 65-66.
52 See Schmitt, supra note 6, at 52.
The first customary principle that actors must always satisfy is the principle of military necessity. It requires an aggressor to determine whether it will gain an articulable military advantage from attacking a target; if not, the aggressor may not attack. The intent of this principle is to prevent long wars of arbitrary civilian attrition in an effort to win a war. This principle is perhaps best summarized in United States v. List, one of the many post-World War II trials held at Nuremberg:

[Military necessity] does not permit the killing of innocent inhabitants for purposes of revenge or the satisfaction of a lust to kill. The destruction of property to be lawful must be imperatively demanded by the necessities of war. Destruction as an end in itself is a violation of international law. There must be some reasonable connection between the destruction of property and the overcoming of the enemy forces.

The conviction of the German commanders in List illustrates that the principle of necessity requires the aggressor to demonstrate a nexus between the military advantage sought and the target selected.

The second customary principle that actors must satisfy contemporaneously with necessity is proportionality. Proportionality can be thought of best as a sliding scale of the military advantage gained versus the humanitarian consequences. At some point on the scale, the damage to the surrounding civilian population will outweigh the military advantage gained, and the attack is deemed illegal under the principle of proportionality. The difficulty in determining this exact point, where an attack becomes illegal, is exacerbated by the differing values of human life in the international forum. Compounding this cultural difference is the fact that values within a single society evolve over time. For example, prior

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53 See Protocol I, supra note 8, at art. 52.
54 See generally id.
56 Id.
57 See Hourcle, supra note 9, at 668.
58 See Richards & Schmitt, supra note 50, at 1082.
59 See infra notes 145-51 and accompanying text (discussing the differing values of human life when paying claims under the Foreign Claims Act).
60 See Richards & Schmitt, supra note 50, at 1083.
to the Vietnam War, destruction of the environment was not considered a major factor in the United States' proportionality analysis, but with the rise of the environmental movement, the world community now evaluates the environmental impact of different targets hit and the weapons used.\textsuperscript{61}

The third customary principle, discrimination, requires the means of warfare to discriminate between legitimate military targets (as defined by necessity and proportionality) and illegitimate civilian targets.\textsuperscript{62} A recent example of attacks that likely violate the principle of discrimination were Hezbollah's rocket attacks against cities in northern Israel.\textsuperscript{63} The rockets were not guided and clearly did not discriminate between legitimate military targets and illegitimate schools and hospitals. In addition to indiscriminate attacks, the world community has banned several weapons that it recognizes as incapable of discrimination, including unmarked land-mines, booby traps,\textsuperscript{64} and biological and chemical weapons.\textsuperscript{65}

The final principle of the customary law of war, humanity, protects against inhumane means and methods of warfare.\textsuperscript{66} At the heart of the principle of humanity is the ideal that there are certain "things that civilized people just don't do."\textsuperscript{67} This principle complements the other three principles of discrimination, necessity and proportionality. In some

\textsuperscript{61} See generally Part IV.B (discussing the criticisms raised against the United States for the use of depleted uranium munitions, cluster bombs, and the effect of missed targets). For an ongoing discussion of the efforts to improve or ban cluster munitions, see HRW Documents on Cluster Bombs, HUMAN RIGHTS WATCH, available at http://www.hrw.org/doc?t=arms_clusterbombs.

\textsuperscript{62} Hourcle, supra note 9, at 665-66.


\textsuperscript{65} Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, Apr. 10, 1972, 26.1 U.S.T. 583, 1015 U.N.T.S. 163 (reaffirming the world's commitment to banning chemical and biological weapons and reducing national stockpiles); Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, June 17, 1925, 26 U.S.T. 571, 94 L.N.T.S. 65 [hereinafter 1925 Protocol Against Chemical and Biological Weapons].

\textsuperscript{66} See Schmitt, supra note 6, at 61.

\textsuperscript{67} Id. at 62.
instances, illegal acts can violate all four principles, such as destroying food supplies to induce starvation and poisoning water supplies.\textsuperscript{68} Other attacks, such as the use of incendiary devices to burn the enemy alive, are illegal solely under the principle of humanity because of the vicious effect on the enemy.\textsuperscript{69}

The customary principles of the law of war can be used to protect the environment as well as civilians. Attacks such as poisoning a town’s drinking water source or laying undocumented mine fields clearly have an effect on both the environment and the civilian population. The customary principles of the law of war can thus be used to protect the environment as a byproduct of protecting the civilian population.\textsuperscript{70}

While the customary principles of warfare set about a framework for protecting the environment, the primary criticism of these principles and international law in general are their overall lack of an enforcement mechanism.\textsuperscript{71} The United States clearly recognizes the customary principles of warfare.\textsuperscript{72} Mere recognition of an international principle is not adequate; a foreign government wishing to bring a claim needs an international forum to hear the claim. The charter of the United Nations created the International Court of Justice ("ICJ") to hear these international disputes,\textsuperscript{73} but the ICJ only has jurisdiction only if both parties to the dispute consent to the Court’s jurisdiction.\textsuperscript{74} In practice, the United States has never consented to the jurisdiction of the ICJ, which leaves complaining nations without a remedy.\textsuperscript{75}

\begin{footnotes}
\item[68] See id. at 61.
\item[69] See Conventional Weapons Prohibition, supra note 64, Protocol III. The United States is not a party to this protocol, but is party to Protocols I and II.
\item[73] ICJ Statute, supra note 51, art. 34.2; International Court of Justice, Rules of Court, art. 1 (1978), available at http://www.icj-cij.org/documents/index.php?pl=4&p2=3&p3=0 [hereinafter Rules of Court].
\item[74] Rules of Court, supra note 73, art. 38(5) (directing that a claim cannot be brought against a nation under the ICJ unless the nation submits to the ICJ’s authority).
\end{footnotes}
In 2002, the United Nations created a second international court, the International Criminal Court ("ICC"), to prosecute individuals instead of states for "[t]he crime of genocide; [c]rimes against humanity; [w]ar crimes; [and] [t]he crime of aggression." Environmental damage can be characterized as either war crimes or crimes against humanity, so the ICC could be used for environmental protection. Unfortunately, the United States is not a party to the treaty establishing the ICC, which leaves the Court lacking jurisdiction, and the claimant without a remedy.

C. Additional Protocol I of the Geneva Convention

In 1974, the International Committee of the Red Cross ("ICRC") convened the Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts. The ICRC convened this conference because the nature and scale of warfare was changing and the laws of war needed to be updated in response. This conference met four times between 1974 and 1977 and developed two additional protocols to the Geneva Convention. Protocol I is a mixture of Hague and Geneva law and attempts to regulate international armed conflict. Protocol II attempts to regulate human rights during non-international conflict or civil war.

Additional Protocol I of the Geneva Convention is the first formal attempt to specifically prevent damage to the environment during war-time. It accomplishes this through three articles: 35(3), 55, and 56. Article 55 follows traditional Hague and Geneva law because it prohibits "widespread, long-term and severe damage" to the environment because it "thereby . . . prejudice[s] the health or survival of the population."

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77 See supra notes 62-70 and accompanying text (discussing how violations of discrimination and humanity laws can be used to characterize environmental crimes as violating the customary principles of war).
78 See Rome Statute, supra note 76. A full list of countries that have ratified the ICC can be found at the United Nations website, http://untreaty.un.org/English/bible/englishinternettreaty/partI/chapterXVIII/treaty11.asp. The United States is not on the list.
79 See Schmitt, supra note 6, at 68-69.
80 Id.
81 Id. at 69.
82 See Protocol II, supra note 8.
83 See Protocol I, supra note 8, arts. 35(3), 55, 56.
84 Id. at art. 55.
Article 55 focuses on protecting the environment because of its effect on the surrounding population. Article 35(3), on the other hand, prohibits the "methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment." Article 35(3) is unique because it protects the environment in its own right, regardless of its effect on the surrounding population. Finally, article 56 protects the environment by prohibiting attacks on "[w]orks or installations containing dangerous forces, namely dams, dykes and nuclear electrical generating stations" to prevent releasing the forces and "consequent severe losses among the civilian population." The environmental implications of attacks on these targets are clear and would likely lead to violations of articles 35(3) and 55 as well because it would intentionally cause "widespread, long-term and severe damage" to the natural environment.

Although Additional Protocol I provides protection to the environment during wartime, it does not clearly define the level of protection, and the application of the treaty to the United States seems doubtful. The terms "widespread, long-term and severe" are never defined in the treaty, so the time frame and scale of damage necessary to violate the treaty are open to debate. Despite the definition problems, the United States signed Additional Protocol I in 1978, but the Senate never ratified it, so the United States is not party to the agreement. Even though the United States did not ratify the treaty, the United States armed forces have cited Additional Protocol I as customary law of war. Although this recognition appears to strengthen environmental protection, the military clearly de-

85 Id. art. 35(3).
86 Id. art. 56.
87 Id. arts. 35(3), 55.
88 Id.
91 UNITED STATES ARMY, OPERATIONAL LAW HANDBOOK 11 (2002) ("Furthermore, the U.S. considers many of the provisions of the Protocols to be applicable as customary international law.") [hereinafter OPERATIONAL LAW HANDBOOK (2002)].
lineates that the United States takes exception to articles 35(3), 55, and 56.92 Ultimately, an attempt to protect the environment through the enforcement against the United States of Additional Protocol I appears doubtful at best.

D. Environmental Modification Treaty

The only treaty to which the United States is a party that directly pertains to the environment in wartime is the Environmental Modification Treaty ("ENMOD").93 The need for a treaty preventing the use of the environment as a weapon was first proposed by the United States Senate in the early 1970s.94 This proposal was in response to top secret hearings where the military admitted to using cloud seeding as an environmental weapon against the North Vietnamese.95 The Soviet Union quickly agreed to the need to limit this method of warfare, and after two years of negotiation the United Nations General Assembly adopted the resolution in 1976.96

Unfortunately, the ENMOD treaty by its terms does not directly provide significant environmental protection in wartime.97 It specifically bans the use or modification of the environment as a weapon rather than explicitly prohibiting environmental damage.98 Article I provides "(1) Each State Party to this Convention undertakes not to engage in military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party."99 The key terms "widespread," "long-lasting" and "severe" are further defined in the Understanding related to Article I: "(a) 'widespread': encompassing an area on the scale of several hundred square kilometers; (b) 'long-lasting': lasting for a period of months, or approximately a season; (c) 'severe': involving serious or significant disruption or harm to human life, natural and economic resources or other

92 Id.
93 Although the Hague Law principles of proportionality and necessity deal indirectly with the environment, see supra notes 53-61, ENMOD is the only treaty ratified by the United States that specifically mentions the environment.
94 See Secret Hearings, supra note 20, at 15.
95 Id. at 21.
96 Id. at 2-5.
97 See generally ENMOD Treaty, supra note 8.
98 See generally id.
99 Id. at 336.
Examples of prohibited environmental modification techniques include, but are not limited to, "earthquakes; tsunamis; an upset in the ecological balance of a region; changes in weather patterns . . . changes in climate patterns; changes in ocean currents; changes in the state of the ozone layer; and changes in the state of the ionosphere."\(^{101}\)

One key change from Additional Protocol I, which was negotiated contemporaneously with the ENMOD treaty, was the use of "or" rather than "and" in the description of "widespread, long-lasting, or severe."\(^{102}\) This change shows the lower threshold needed to prove an environmental modification violation of international law compared to an environmental damage violation under Protocol I.

From the outset, the ENMOD treaty received sharp criticism from major environmental groups in the United States.\(^{103}\) Environmental groups believed the treaty was "illusory," with the primary substantive criticisms as follows:

> [A] sound Convention would prohibit all hostile environmental modification techniques and activities, and such a prohibition ought to apply with respect to any and all uses, and the prohibition should not apply merely to use against a party to the Convention. We also think that the Convention ought to contain a verifiable prohibition on the development and testing of environmental modification techniques for hostile purposes.\(^{104}\)

An additional concern was that the enforcement was left to the Security Council and subject to the "crippling limitation" of a veto.\(^{105}\) Hence, any permanent member of the Security Council could still use environmental modification weapons and there would be no recourse if they chose to use their veto. A final concern was that the treaty does not even prohibit the

\(^{100}\) Secret Hearings, supra note 20, at 11-12.

\(^{101}\) Id. at 12.

\(^{102}\) ENMOD, supra note 8, art. I; Protocol I, supra note 8, art. 55.

\(^{103}\) See Secret Hearings, supra note 20, at 36-46 (statement of Leonard C. Meeker, Director of International Projects Center For Law and Social Policy, Washington, D.C., presenting on behalf of the Natural Resources Defense Council, the Sierra Club, the Environmental Policy Center, the Wilderness Society and the Federation of American Scientists).

\(^{104}\) Id. at 39.

\(^{105}\) Id.
defoliation and weather modification tactics from the Vietnam War because they do not qualify as widespread, long-lasting, or severe.\textsuperscript{106}

Much of the criticism was addressed in the Senate Resolution discussing the ratification of the treaty. First, the chairman made it clear that after seven years of negotiation, this is the best compromise that can be made between environmental protection and the military.\textsuperscript{107} If the treaty were inclusive of all hostile environmental modification techniques, many necessary military functions could bring about litigation. Examples include an artillery bombardment that triggers a landslide or an avalanche,\textsuperscript{108} dispelling fog to enable aerial resupply,\textsuperscript{109} and defoliating around a base to provide for defensive lines-of-fire and observation.\textsuperscript{110} Additionally, the United States did not want to ban all research on environmental modification techniques because there were several promising programs that had great potential for peaceful purposes.\textsuperscript{111} Finally, defoliation is arguably covered if it has widespread effects, as the foliage is part of the environment.\textsuperscript{112}

E. Other International Treaties Limiting Warfare

The United States is party to several other international treaties banning the use of specific weapons during wartime. Chemical and biological weapons were banned in 1925,\textsuperscript{113} but the United States reserved a right to respond in kind with chemical weapons.\textsuperscript{114} The other major treaty signed by the United States was a prohibition against certain weapons that are excessively injurious against civilians.\textsuperscript{115} The United States Senate ratified Protocols I and II of this treaty, which prohibit fragmentation weapons that cannot be detected by X-rays and limits the indiscriminate use of land-mines that do not self-destruct.\textsuperscript{116} The United States did not

\textsuperscript{106} Id. at 38.
\textsuperscript{107} Id. at 44.
\textsuperscript{108} Id. at 32.
\textsuperscript{109} Id. at 31.
\textsuperscript{110} UNITED STATES ARMY, OPERATIONAL LAW HANDBOOK 194.
\textsuperscript{111} See Secret Hearings, supra note 20, at 31 (describing programs that included "precipitation enhancement" in dry areas and a program "trying to reduce the wind speed in the eye of hurricanes").
\textsuperscript{112} See id. at 44.
\textsuperscript{113} See generally 1925 Protocol Against Chemical and Biological Weapons, supra note 65.
\textsuperscript{114} OPERATIONAL LAW HANDBOOK, supra note 91, at 15.
\textsuperscript{115} See generally Conventional Weapons Prohibition, supra note 64.
\textsuperscript{116} OPERATIONAL LAW HANDBOOK, supra note 110, at 16.
ratify Protocols III and IV, which prohibit the use of incendiary weapons and blinding lasers, respectively.117

F. The Limitations of International Law in Protecting the Environment During Wartime

Ultimately, if a country is looking for environmental protection during wartime, international law has many shortcomings.118 The customary law of war provides a framework for arguing whether individual actions or weapons violate the principle of necessity, proportionality, humanity, or discrimination, but there is no international court with jurisdiction to hear these claims against the United States.119 The Environmental Modification Treaty merely prevents the use of the environment as a means of war and does not accomplish the stated goal of protecting the environment during wartime.120 Finally, Additional Protocol I to the Geneva Convention provides a limited means of protecting against “long-term, widespread, and severe” damage, but the United States is not a party to the treaty and expresses direct reservations about the indefiniteness of these very terms.121

Although these limitations of international law create difficulties for a country to make a claim against the United States, should the United States itself be concerned about environmental damage during wartime? In the aftermath of the Iraq War, the United States faced a massive rebuilding process in part because of the environmental damage inflicted during the war.122 As of the end of February 2007, the Department of Defense had disbursed over $10.6 billion to the Iraq Reconstruction and Redevelopment Fund.123 Additionally, the United Nations raised over

117 Id.
118 See supra Parts II.A-II.D.
119 See supra Part II.B.
120 See supra Part II.D.
121 See OPERATIONAL LAW HANDBOOK, supra note 91, at 11.
$1.2 billion from numerous countries including the United States to help reconstruct Iraq.\textsuperscript{124} The Iraqi government and supporting organizations are using the funds for a wide range of environmentally-related projects including rebuilding of the electric grid and health, water and sewage programs.\textsuperscript{125} While none of these projects are explicitly tied to wartime environmental damage,\textsuperscript{126} minimizing the environmental damage is intuitively in the economic interest of the United States so as to minimize the burden on United States taxpayers.

In addition to the $11.8 billion spent by the United States and various nations in the reconstruction of Iraq, some commentators argue that the wartime damage to the electric power grid contributes to the $400 billion cost of security in Iraq.\textsuperscript{127}

In the most recent survey . . . Iraqis were asked which of 10 different problems ‘requiring a political or governmental solution’ was most important to them. The first choice, by a margin of about 10 percent, was ‘inadequate electricity.’ ‘National security’ came in fifth; the ‘presence of multinational forces’ was seventh; and ‘terrorists’ was eighth.

A popular if not universal idea is that a more robust electrical system would be a weapon against the insurgency . . . .\textsuperscript{128}

Fixing the electrical power system will not cure all of Iraq’s security problems, but the survey demonstrates that it could go a long way to helping build confidence in the fledgling government and improve security.\textsuperscript{129}

If the United States did want to create national legislation to protect the environment of hostile countries during wartime, the Foreign Claims Act provides a foundational model. The Foreign Claims Act provides

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\item \textsuperscript{124} U.N. DEV. GROUP, IRAQ TRUST FUND GROSS DONOR COMMITMENTS AND DEPOSITS, available at http://www.irffi.org/WBSITE/EXTERNAL/IRFFI/0,,contentMDK:20316791-pagePK:64168627-piPK:64167475-theSitePK:491458,00.html (stating that the United States contribution is $5 million of the total $1.26 billion).
\item \textsuperscript{125} IRAQ RECONSTRUCTION REPORT, supra note 123, at 3.
\item \textsuperscript{126} See id.
\item \textsuperscript{129} See id.
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compensation for accidental damage to non-hostile foreign citizens paid by the United States Military. This Act forces the military to internalize these accidental costs and recognize the price of its peaceful mistakes. Extending this principle to environmental damage, the United States Military could better measure the total cost of striking a target and the true price of weapons' damage, including the environmental impact.

III. NATIONAL LEGISLATION PROTECTING FOREIGN CLAIMANTS—THE FOREIGN CLAIMS ACT

Congress established the Foreign Claims Act in 1942 “for the purpose of promoting and maintaining friendly relations by the prompt settlement of meritorious claims” for property loss or personal injury of foreign nationals. Only non-combat incidences of the United States Armed Forces fall within the scope of this Act. If the United States is engaged in conflict within a country, the claimant must be “friendly to the United States” and the action must not “result directly or indirectly from an act of the armed forces of the United States in combat.” There is an exception to the combat exclusion if an aircraft has an accident or malfunction en route to or returning from a combat mission. Additionally, the Secretary of Defense can waive the entire non-combat exclusion of payments as was done after the 1983 invasion of Granada.

The Foreign Claims Act is quite expansive and covers damages by civilian employees of the Department of Defense in addition to the military. The Act is limited to actions under the Department of Defense as evidenced by the Comptroller General’s refusal to expand the Foreign

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131 See infra Part IV.B.1 (discussing the after-effects of bombing Pancevo industrial complex).
132 See infra Parts IV.B.2, IV.B.3 (discussing the effects of cluster munitions and depleted uranium).
133 Foreign Claims Act, ch. 645, 55 Stat. 880 (1942) (current version at 10 U.S.C. § 2734(a) (West Supp. 2007)).
135 Id. § 2734(b)(3).
136 Id.
Claims Act to injuries created by the United States Agency for International Development during times of war. Additionally, Congress placed several limitations on the Foreign Claims Act, including a requirement that no payments are made unless “the amount tendered is accepted by the claimant in full satisfaction.” Other requirements include a two-year statute of limitations on all claims, and the military’s maximum discretionary award is $100,000.

Perhaps the most interesting aspect of the Foreign Claims Act is that it is completely discretionary and not subject to judicial review. Additionally, if a claim exceeds the $100,000 maximum allowed under the Foreign Claims Act, the service secretary can pay up to $100,000 and forward a request for the remainder to the Secretary of Treasury for payment subject to his or her certification. In theory, this interplay of statutes allows the appropriate service secretary and the Treasury Secretary to pay a foreign claimant any amount of money at their joint discretion without being subject to judicial review.

In practice, the Foreign Claims Act creates a host of challenging legal, gender, and ethnic issues. The primary legal issue is determining whether damages can be assessed under the Foreign Claims Act in the country where the accident occurred. If the United States has a Status of Forces Agreement with the country, such as countries in the North American Treaty Organization (“NATO”), the international agreement applies instead of the Foreign Claims Act. If no international agreement is in place, the military must apply local tort law and custom in determining the appropriate value of damages.

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141 Id. § 2734(b).
142 Id. § 2734(d).
143 See 10 U.S.C. § 2734 (West. Supp. 2007); Aaskov v. Aldridge, 695 F. Supp. 595, 599 (D.C. Cir. 1988) (holding that the Secretary of the Air Force has the discretion to decide whether not to settle a claim and cannot be ordered by a court to make a settlement).
145 See Vanessa Blum, After the War, A Time to Pay: How JAG Lawyers Settle Foreign Claims Over Noncombat Damage, LEGAL TIMES, April 1, 2003, at 1.
146 See, e.g., Aaskov, 695 F. Supp. at 596 (holding that a Danish citizen does not have a claim under the Federal Claims Act, but rather under NATO Status of Forces Agreement and the International Claims Act, 10 U.S.C. §§ 2734a, 2734b (2000)).
147 R. Peter Masterton, Managing a Claims Office, 2005 ARMY LAW. 29, 48 (2005); see also Blum, supra note 145, at 16.
Applying local law raises numerous difficult issues. For example, in Somalia, a “man’s life was valued at 100 camels and a woman’s life at [only] 50 [sic] camels.”\textsuperscript{148} The military determined camels cost approximately $100 during stable economic times and placed a maximum $10,000 payout for death claims in Somalia.\textsuperscript{149} Likewise, in Afghanistan, the military used a valuation for a person’s life similar to that used in United States tort law, accounting for a person’s age, future earnings, and dependents. Applying this formula leads to payments of less than $15,000 for the wrongful death of an Afghan.\textsuperscript{150} Larger racial and ethical issues begin to emerge in the application of the Foreign Claims Act when one compares the meager payments for the loss of life in Somalia and Afghanistan with the payment of $1,000,000 to an Australian woman for brain damage incurred when hit by a golf ball.\textsuperscript{151}

IV. PROPOSAL TO EXTEND NATIONAL LEGISLATION TO PROTECT THE ENVIRONMENT

A. Extending the Foreign Claims Act

Although the Foreign Claims Act is far from perfect,\textsuperscript{152} it does provide an otherwise unavailable means for foreign claimants to seek redress for accidental military harms, and for military commanders to track non-combat damages. Unfortunately, the Foreign Claims Act does not presently provide a means to compensate for the environmental externalities of warfare previously identified.\textsuperscript{153} The Secretary of Defense can simply waive the non-combat requirement,\textsuperscript{154} but creating a series of one-time exceptions would not force the military to internalize the future costs of environmental damage into its planning.

If the United States Congress would require the military to plan for environmental damage before the war, rather than paying for it after

\textsuperscript{148} Blum, supra note 145, at 18.

\textsuperscript{149} Id.

\textsuperscript{150} Id.

\textsuperscript{151} Id.


\textsuperscript{153} See supra Part II.F.

\textsuperscript{154} See Hockstader, supra note 137, at A23.
the war, the Foreign Claims Act provides an excellent model for the military. The legislation could be easily expanded by complementing the exception to the exclusion for aircraft accidents or malfunctions with an exception for environmental damage. Congress should restrict this to environmental damage lasting more than one year and having a direct impact on human health. This proposed modification would limit compensation to only the most extreme cases where environmental damage cannot be corrected within a year, while not creating unrealistic liability for every crater on the battlefield. Additionally, payments for environmental damage would still be at the Department of Defense’s discretion to account for scenarios where the United States does not have unquestioned air superiority or the ability to select targets and account for the environment.

Moreover, expanding the Foreign Claims Act to compensate for long-term environmental damage would help to achieve the ultimate stated goal of the Foreign Claims Act: “[t]o promote and to maintain friendly relations” with other countries. Other countries level three primary environmental criticisms against the United States: the destruction of environmentally sensitive targets, the high dud rate of cluster bombs, and the use of depleted uranium. Changing the Foreign Claims Act would address these concerns and provide further benefits.

B. Environmental Criticisms

1. Selection of Targets: The Bombing of Pancevo

From March 24, 1999, through June 8, 1999, NATO forces hit the Pancevo Industrial Complex in Serbia with missiles and bombs. These strikes released numerous toxic chemicals into the environment, including 2,100 tons of Ethylene Dichloride ("EDC"), eight tons of metallic mercury,

155 See IRAQ RECONSTRUCTION REPORT, supra note 123, at 3.
157 See generally infra Part IV.B.1 (arguing that the one-year minimum allows adequate time to perform an environmental assessment and begin a cleanup operation).
158 See generally Faiola, supra note 22 (discussing how paying for the cleanup of just the three largest "hot-spots" in Vietnam would cost over $60 million and ultimately it would likely be cost prohibitive to clean the entire country).
159 10 U.S.C. § 2734(a) (West. Supp. 2007); Faiola, supra note 22.
160 See Haavisto, supra note 10, at 573-83.
161 Uli Schmetzer, Serbs allege NATO raids caused toxic catastrophe: Bombed refineries, plants spewed stew of poisons, they say, CHIC. TRIB., July 8, 1999, at N1.
460 tons of vinyl chloride monomer ("VCM"), 80,000 tons of oil and oil products and 250 tons of liquid ammonia.\textsuperscript{162} The EDC, mercury, VCM, and oil products threatened terrestrial and aquatic life, the health of the food chain, and plant life in direct contact with the chemicals.\textsuperscript{163} The Pancevo site managers "released [the ammonia] into the open canal from the fertiliser [sic] plant . . . fearful [that] a direct air strike on stored ammonia could kill large numbers of people."\textsuperscript{164} Recording stations in Pancevo reported concentrations of VCM "10,600 times more than safe industrial levels,"\textsuperscript{165} and the mayor reported seeing black clouds of toxins in the sky and white clouds of mixed poisons floating through the streets.\textsuperscript{166}

Despite being spared from the worst of the environmental effects because the predominately westerly winds carried the toxins away from the city, the citizens of Pancevo still suffered devastating effects.\textsuperscript{167} At least one doctor reportedly advised all of his pregnant patients to have abortions because of the potential effects of the toxins.\textsuperscript{168} Fish in the neighboring Danube river appeared "sluggish and sickly, with protruding bones and bulging eyes."\textsuperscript{169} Local residents regularly complained of "respiratory difficulties, burning eyes, choking sensations and upset stomachs."\textsuperscript{170}

Luckily for the citizens of Pancevo and the former Yugoslavia as a whole, the United Nations Environment Programme ("UNEP") moved in quickly after the war in an effort to identify environmental damage, clean up "hot spots," and provide clean drinking water to affected areas.\textsuperscript{171} In total, the cleanup efforts by UNEP in the Balkans cost over $12.5 million and took four years to complete.\textsuperscript{172} UNEP is not allocated this money through general United Nations funds but rather must raise this money

\textsuperscript{163} Id. at 34-35.
\textsuperscript{164} Id. at 35.
\textsuperscript{165} William Booth, A Ghost City of Mixed Poisons; NATO Bombs Left Site of Petrochemical Complex a Toxic Slough, WASH. POST, July 21, 1999, at A15.
\textsuperscript{166} Id.
\textsuperscript{167} Id.
\textsuperscript{168} See Schmetzer, supra note 161.
\textsuperscript{169} Id.
\textsuperscript{170} Id.
through a mixture of governmental and private donors. Noticeably absent from the list of governmental donors are NATO's two largest members, the United States and the United Kingdom.

UNEP focused the majority of its donor funds on cleaning up Pancevo, the most heavily affected area. Although the effort did lead to significant environmental improvements and identification of future projects, it lacked sufficient funds to remove all identified environmental toxins from Pancevo's environment. This was due to a combination of wartime damage and preexisting environmental problems from inadequate waste treatment and environmental monitoring. One major environmental project remaining is dredging a heavily polluted waste water canal filled with toxic levels of both mercury and mineral oils. Ultimately, UNEP turned the remaining cleanup efforts over to the Serbian Government with safe drinking water, rehabilitated waste water treatment facilities, and a plan for future environmental cleanup.

Applying the proposed modifications to the Foreign Claims Act, the Pancevo attack clearly created environmental damage lasting more than one year with a direct impact on human health. If the United States truly desired "[t]o promote and to maintain friendly relations" with other countries, it is certainly counterintuitive to lead NATO air strikes on Pancevo and to refuse to contribute with other NATO countries in the later environmental cleanup. By maintaining its refusal to fund environmental cleanup efforts, the United States is, in effect, taxing other environmentally minded countries without taking this into consideration during its target selection.

173 See UNEP SERBIA CLEAN-UP, supra note 171, at 10.
174 See id. at 10.
175 Id. at 32.
176 See id. at 32-37.
177 See id.
178 Id. at 36-37 (discussing that the pollution resulted from both preexisting sources and from the Kosovo conflict).
179 See id. at 33, 50.
180 See id. at 32-37 (discussing the cleanup and the existence of toxic substances five years after the attack).
182 See generally Nato Leadership Splits Revealed, BBC NEWS ONLINE, Mar. 9, 2000, http://news.bbc.co.uk/d/hi/europe/671420.stm (stating that the NATO air strikes were lead by General Mike Short, United States Air Force, and that General Wesley Clark, United States Army, was the Supreme Allied Commander).
183 See UNEP SERBIA CLEAN-UP, supra note 171, at 10.
184 See generally Press Release, U.N. Env't Programme, Toxic Sites in Iraq to be Made
The proposed legislation could potentially create beneficial effects both preemptively and retroactively in the Pancevo example. The Department of Defense does not have an unlimited budget, so the military must weigh the estimated cost of the cleanup if the site were bombed against other options: doing nothing, destroying the roads accessing the facility, capturing the facility, or another alternative. If the military chose not to bomb the facility because of the estimated environmental costs, the United States benefits by averting the negative publicity of Pancevo. Alternatively, if the United States decides the ultimate gains in bombing Pancevo outweigh the potential costs, the military will have a ready report justifying its decisionmaking, and the United States will not receive the negative publicity of letting other countries pay for its environmental decisions.

2. Use of Cluster Bombs

The United States Military employs several types of combined effect munitions ("CEM") depending on the range of the target. The three primary weapons for dispensing CEMs are the Tomahawk Land-Attack Missile for long-range attacks launched from ships or submarines, the Joint Standoff Weapon for medium-range attacks, and the Cluster Bomb Unit ("CBU-87") for direct attacks. Each CEM is filled with 150 to 200 "soda-can sized bomblet submunitions" known as cluster bombs.


186 See Booth, supra note 165, at A15 ("The complex was built in consultation with engineers from the United States and Europe, and Mikovic said NATO airstrike planners should have known what was in the storage tanks.").

187 See generally Schmetzer, supra note 161.


190 Id. at 92.
191 Id. at 90, 141.
192 Id. at 90.
193 Id.
These bomblet submunitions are further filled with hundreds of pieces of shrapnel that can cause injury at up to 150 meters.\textsuperscript{194} The entire CEM has an effective range of approximately 200 to 400 meters,\textsuperscript{195} and is effective against a wide range of targets including enemy radar, personnel, and tanks.\textsuperscript{196}

The primary danger and criticism of the cluster bomb is that it has a 5 to 7 percent dud rate,\textsuperscript{197} which leaves 10 to 14 unexploded bomblets with each use.\textsuperscript{198} When this seemingly small failure rate is multiplied by the 1,100 CBU-87s used during Operation Allied Force in Kosovo\textsuperscript{199} and the 1,210 CBU-87s used in Afghanistan,\textsuperscript{200} the magnitude of the problem becomes apparent, with an estimated 11,000 unexploded ordnance in Kosovo and 12,000 in Afghanistan.\textsuperscript{201}

One factor amplifying the danger of the unexploded ordnance is that the CBU-87 is not a precision-guided weapon. A CBU-87 can strike over a kilometer away from its intended target.\textsuperscript{202} Additionally, the submunitions have a tendency to burrow into the ground when they land on soft soil.\textsuperscript{203} This causes the submunitions to become invisible to the naked

\textsuperscript{196} \textit{AFTER-ACTION REPORT}, supra note 189, at 90.
\textsuperscript{197} \textit{See} Federation of American Scientists, \textit{supra} note 195 (noting that the manufactured claimed dud rate is 5 percent); \textit{HUMAN RIGHTS WATCH, CLUSTER BOMBS IN AFGHANISTAN} 1 (2001) [hereinafter CLUSTER BOMBS IN AFGHANISTAN], available at http://www.hrw.org/background/arms/cluster-bck1031.pdf (reporting that the United Nations Mine Action Coordination Center found that the actual dud rate in Yugoslavia was 7 percent for the CBU-87).
\textsuperscript{198} \textit{See} \textit{AFTER-ACTION REPORT, supra} note 189, at 90 (basing this number off the calculation of 202 submunitions within each CBU-87 multiplied by 5\% and 7\% respectively).
\textsuperscript{199} \textit{CLUSTER BOMBS IN AFGHANISTAN, supra} note 197, at 4 (accounting only for the number of cluster bombs dropped by the United States, and not the 665 cluster bombs dropped by other nations with even higher dud rates).
\textsuperscript{200} Thomas M. McDonnell, \textit{Cluster Bombs Over Kosovo: A Violation of International Law?}, 44 Ariz. L. Rev. 31, 54 (2002) (noting that these numbers are only as of January 2002).
\textsuperscript{201} These numbers are based on multiplying the number of CBU-87s dropped by the number of bomblets in each CBU by the dud rate of the CBUs.
\textsuperscript{203} \textit{See} \textit{CLUSTER BOMBS IN AFGHANISTAN, supra} note 197, at 5 (noting that the U.N. Mine Action Coordination Center found some cluster bombs buried as deep as fifty centimeters).
eye, thereby creating thousands of virtual land mines that are unmarked with an unknown location because of the inaccuracy of the weapon. These virtual land mines are even more sensitive than actual land mines and can be set off by a variety of factors including temperature variations, extreme cold or heat, slight vibrations, or the use of a radio nearby. The military confirms the danger of the unexploded ordnance in Brigadier General John Craddock's statement, "'[In terms of unexploded ordnance, a cluster bomb submunition] is probably the biggest danger in that it is so fragile . . . . I don't know that the residents are aware of how dangerous it is to even walk by that. [Walking by] could set it off.'"  

Another danger associated with cluster bombs is their disproportionate killing of children. Cluster bombs are bright yellow, the size of a soda can, and have a parachute on top which makes them appealing for young children to pick up. The bright yellow color of the cluster bomb is also the same color as the food packets distributed by the United States. General Myers commented on the unfortunate similarity of colors in food aid packages and cluster bombs:

[I]t is unfortunate that the cluster bombs, the unexploded ones are the same color as the food packets. We have dropped fliers that show the pictures and the proper language explaining why you want to go to one and you don't want to go to the other. We hope that helps. Another thing we're doing is with the food packets is changing the color

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204 See McDonnell, supra note 200, at 56 (discussing how cluster bomb duds act as landmines). See generally FATALLY FLAWED, supra note 202 (stating that cluster bombs can fall significantly off target).  
208 See Afghan Children at Risk From 24,000 Unexploded Bomblets, AGENCE FRANCE PRESSE, Dec. 21, 2001, available at http://www.reliefweb.int/rw/rwb.nsf/AllDocsByUNID/C83417001BC835DBC1256B29004C5CAE.  
209 CLUSTER BOMBS IN AFGHANISTAN, supra note 197, at 2.
of their design. We’re going to—I think it’s going to be blue. It obviously will take some time . . . . They were probably yellow because they were very visible and people could see them lying around. The same for the cluster bombs. Unfortunately, they get used to running to yellow.210

In addition to the tragic human consequences of cluster bombs, their effect on the environment can be equally devastating.211 "They deny access to farm and grazing land, pose a danger to livestock, impede access to shelter and water, and delay rehabilitation of essential infrastructure such as roads, bridges, and irrigation systems that are critical to a viable national economy."212 A typical strike uses five cluster effect munitions, which would result in an average of over thirty-five unexploded submunitions.213 If these unexploded munitions were located in an agricultural area or within a village, the fear of these munitions could effectively force the villagers to abandon their homes because they have no way of knowing if there are more or less than thirty-five unexploded bombs.214

The Defense Department is not ignorant of the dangers and problems cluster bombs create. During Operation Desert Storm, unexploded submunitions killed twenty-five service personnel and directly hampered the retaking of Kuwait International Airport.215 In January 2001, Secretary of Defense William Cohen issued a directive to all service Secretaries laying out the following:

Submunition weapons employment in Southwest Asia and Kosovo, and major theater war modeling, have revealed a significant unexploded ordnance (UXO) concern . . . It is the policy of the DoD to reduce overall UXO through a process of improvement in submunition system reliability—the

212 Id.
213 See McDonnell, supra note 200, at 57.
214 Id. at 57-58.
desire is to field future submunitions with a 99% or higher functioning rate.\textsuperscript{216}

The services were given until fiscal year 2005 before future procurement had to meet this standard and existing weapons could be used until expended.\textsuperscript{217}

As discussed, cluster bombs clearly create environmental damage by denying the population's use of the environment.\textsuperscript{218} This damage can last more than one year if the area is not cleared of unexploded mines, and it clearly threatens human life, which would bring it under the proposed modifications to the Foreign Claims Act. The need to properly account for and internalize the true cost of using cluster bombs is even more pressing than the Pancevo example because of their widespread use.\textsuperscript{219} Not only do these weapons affect the citizens of the countries where they are dropped, but they are responsible for the deaths of twenty-five United States Soldiers during the Persian Gulf War. Of these twenty-five casualties, seven were trained mine clearance personnel who died attempting to clear these weapons from an airfield in the middle of the day.\textsuperscript{220}

Unlike the case of target selection,\textsuperscript{221} the proposed modifications would likely have a preemptory effect against the use of cluster bombs. The United States must face the seemingly improbable decision to use cluster bombs against targets, face a widespread long-term cleanup,\textsuperscript{222} and risk the very lives of the military members it intends to protect through the use of these weapons.\textsuperscript{223} In addition to risking lives, the United States would likely face a high cost and long effort to locate and destroy the unexploded submunitions.\textsuperscript{224} Faced with these decisions, it seems much more


\textsuperscript{217} \textit{Id.}

\textsuperscript{218} \textit{See Augst, supra} note 211, at 10,670.

\textsuperscript{219} \textit{See McDonnell, supra} note 200, at 54.

\textsuperscript{220} \textit{See id.} at 56.

\textsuperscript{221} \textit{See supra} Part IV.B.1.

\textsuperscript{222} \textit{See McDonnell, supra} note 200, at 54.

\textsuperscript{223} \textit{See id.} at 56 (noting that the limited cleanup efforts of cluster bombs that the United States already attempted resulted in the death of seven specially trained unexploded ordnance soldiers).

\textsuperscript{224} \textit{See id.} at 54.
probable that the United States would take the path already chosen by Secretary Cohen and improve the reliability of cluster munitions. The savings would be immense, including American lives, foreign citizen lives, environmental damage, and public relations. Finally, enacting the legislation change would likely force the United States to select more reliable weapons and hold the manufacturer accountable for the weapons dud rate to prevent the aforementioned problems.

3. Use of Depleted Uranium

Uranium has three general usable forms: naturally occurring uranium, enriched uranium, and depleted uranium. The World Health Organization provides an excellent summary of naturally occurring uranium:

Uranium is a naturally occurring metal that consists of three radioactive isotopes: U238, U235 and U234. The concentration by weight is approximately 98.3% U238, 0.72% U235 and 0.006% U234. Uranium is ubiquitous in the environment. It occurs in all rocks and soil. A typical concentration of U238, the main isotope, in the earth’s crust is between 0.5 to 10 gram/t.

Depleted uranium is a waste product created when naturally occurring uranium is refined to extract the U-235 from the metal. This process is completed by superheating the uranium into a gas and passing it through a series of centrifuges to separate out the lighter U235. The enriched U-235 is known as “enriched uranium” and can be used in commercial or military reactors, or as fuel for nuclear weapons.
When the process is complete, the waste product is known as depleted uranium because the U-235 is depleted from .72% to .25% of the total mass and the remaining material is only "about 60% [sic] as radioactive as natural uranium."\textsuperscript{235}

In 1999, the Department of Energy estimated that the United States had 739,000 metric tons of depleted uranium and continues to produce approximately 30,000 metric tons every year.\textsuperscript{236} Depleted uranium is extremely dense, which creates a variety of commercial applications including counterweights in sailboats, aircraft, and as shielding from X-rays.\textsuperscript{237} Additionally, the United States Military and other countries use the metal for armor piercing rounds.\textsuperscript{238}

The United States Military and its allies' use of depleted uranium has been a source of controversy since the First Gulf War.\textsuperscript{239} Critics have linked the use of depleted uranium to the Gulf War Syndrome affecting over 250,000 American Gulf War veterans, to the death of 1.5 million Iraqi soldiers and civilians since the Gulf War, and to an alarming increase in "[l]eukemia, cancer, birth defects and rare diseases" in Iraq.\textsuperscript{240} Iraqi scientists identified elevated levels of U-238 in the Tigris River, in the drinking water of various cities, and in vegetables, fish and meat.\textsuperscript{241}

Independent sources confirm that depleted uranium can contaminate the environment in a number of ways.\textsuperscript{242} Dangers include immediate

\textsuperscript{235} DEPLETED URANIUM MISSION, supra note 230, at 6.
\textsuperscript{237} DEPLETED URANIUM MISSION, supra note 230, at 6.
\textsuperscript{239} See Haavisto, supra note 10, at 573-83; Thompson, supra note 233, at 10,476; Damacio A. Lopez, Director, International DU Study Team, The Case for an Immediate Ban on the Military Use of Depleted Uranium, Presented at a Meeting of the European Parliament in Brussels, Belgium (June 10, 2003) [hereinafter Lopez Presentation], available at http://www.grip.org/bdg/g1035.html.
\textsuperscript{240} Lopez Presentation, supra note 239.
\textsuperscript{241} Id.
aerial movement of the depleted uranium after the initial impact of the explosive, subsequent leakage of the uranium into the soil and transportation by plants, animals, or microbes, and migration of uranium into surface or ground water.\(^{243}\) The most dangerous exposure occurs immediately after impact when depleted uranium particles can be inhaled into the lungs.\(^{244}\) In worst case scenarios, this could lead to kidney failure within a few days.\(^{245}\) An additional acute risk of exposure can occur when children play near an impact site or handle a depleted uranium round.\(^{246}\) More widespread and long-term contamination can occur if depleted uranium reaches a water supply where it will remain indefinitely, thereby exposing the population to radiological and toxic risks.\(^{247}\)

The United States Military downplays these risks as relatively insignificant.\(^{248}\) First, the effects in Iraq are expressly denounced because the primary source of the information was Saddam Hussein’s government.\(^{249}\) Colonel James Naughton eloquently hypothesizes in a Defense Department briefing on depleted uranium that:

The Iraqis tell us terrible things happened to our people because you used it last time. Why do they want it to go away? They want it to go away because we kicked the crap out of them—okay? I mean, there’s no doubt that DU gave us a huge advantage over their tanks. They lost a lot of tanks. Their soldiers can’t be really amused at the idea of going out in basically the same tanks with some slight improvements and taking on Abrams again. That has got to be a huge morale—so wouldn’t it be great if we could convince the world to make the U.S. give up DU?\(^{250}\)

Department of Defense studies of ninety soldiers with significant exposure to depleted uranium due to friendly fire show no cases of cancer or kidney failure thirteen years after the exposure.\(^{251}\) The military also points out

\(^{243}\) TH E ROYAL SO CIETY II, supra note 242, at 21-23.
\(^{244}\) Id. at 24.
\(^{245}\) Id. at ix.
\(^{246}\) Id. at x, 24.
\(^{247}\) See Thompson, supra note 233, at 10,476.
\(^{248}\) See Naughton, supra note 238.
\(^{249}\) See id.
\(^{250}\) Id.
\(^{251}\) Id.
that depleted uranium is 40% less radioactive than naturally occurring uranium that the general population is exposed to everyday.\footnote{Id.} Lastly, studies of uranium refiners show no increased risk of cancer associated with the long-term handling of natural uranium.\footnote{DEPLETED URANIUM MISSION, \textit{supra} note 230, at 10.}

Independent sources support the military's contention that the risks from exposure are generally minimal. Although depleted uranium can corrode and pollute local water sources, the expected increased risk of cancer due to depleted uranium is one person per million or lower.\footnote{THE ROYAL SOCIETY II, \textit{supra} note 242, at x.} The increased risk for kidney failure is similarly low except for worst-case scenarios.\footnote{Id.} World Health Organization studies on the effects of depleted uranium after its use in Kosovo show no significant impact on the environment.\footnote{DEPLETED URANIUM MISSION, \textit{supra} note 230, at 26, 29 (concurring with the Royal Society Study that the danger of depleted uranium is remote).} The study points out that even if seventy-two kilograms of depleted uranium were absorbed at a site with none escaping, the average uranium content of the soil would only increase by 5\%.\footnote{Id. at 28.}

Based on the reports of the United Nations Environment Programme,\footnote{See U.N. ENV'T PROGRAMME, \textit{DEPLETED URANIUM IN KOSOVO: POST-CONFLICT ENVIRONMENTAL ASSESSMENT} 34-36 (2001), available at http://postconflict.unep.ch/publications/uranium.pdf.} the World Health Organization,\footnote{See DEPLETED URANIUM MISSION, \textit{supra} note 230, at 25-31.} and the United States' own data,\footnote{See Naughton, \textit{supra} note 238.} it does not appear that depleted uranium poses a serious environmental risk. The proposed modification to the Foreign Claims Act would minimally affect the United States Military's use of depleted uranium. The one scenario where the use of depleted uranium should be monitored is when it is used near a water source.\footnote{See DEPLETED URANIUM MISSION, \textit{supra} note 230, at 30-31, 33.} Members of the Armed Forces should be mindful not to use depleted uranium weapons near a water source, but they obviously cannot always control when and where they engage the enemy. This would likely mean that the proposed legislation would rarely affect depleted uranium use, and it would be primarily retroactive as a humanitarian effort to provide clean water to a town with radioactively polluted water.\footnote{See generally id.}
CONCLUSION

Environmental damage has been a certainty in warfare throughout history and remains an issue today. Although some environmental damage is inevitable, recent conflicts have demonstrated the ability of the United States and its allies to choose targets and strike them at will with the weapon of their choosing, thereby limiting environmental damage.

Although the United States has the ability to limit environmental damage during conflict, there is little legal framework for the United States to exercise this restraint. International law does provide a framework for identifying when environmental damage is excessive through the lens of necessity, proportionality, humanity, and distinction; however, the United States is unlikely to submit to international jurisdiction for an environmental claim for damages or a criminal claim against a member of the armed forces.

Although the United States has little incentive to submit to international jurisdiction, there is evidence from recent conflicts that the United States could benefit from more careful scrutiny of the long-term environmental consequences of its targets and ordnance. One possible means of providing this scrutiny and forcing the Department of Defense to internalize the long-term costs of environmental damage is by modifying the Foreign Claims Act. This Act already permits international claimants to recover for accidental damage caused by members of the Department of Defense as long as the claimants are friendly to the United States and the damage does not result directly or indirectly from combat operations. A proposed modification is to allow claimants to recover for environmental damage lasting more than one year and posing a significant risk to human life. This proposed modification is a balance between over-compensating for every crater on the battlefield and the current situation of under-compensating and creating extensive environmental damage on the battlefield.

Ultimately, expanding the Foreign Claims Act to compensate for long-term environmental damage would go a long way toward achieving the ultimate goal of the Foreign Claims Act: "[t]o promote and to main-

263 See generally Nato Leadership Splits Revealed, supra note 182 (demonstrating that during the bombing of Serbia, NATO had the unfettered ability to choose when and where to strike).
tain friendly relations" with other countries.\textsuperscript{264} The United States would hold manufacturers of ordnance to stricter standards and abandon its fire-and-forget mentality. As evidenced, this modification could help save the lives of its own Armed Forces.\textsuperscript{265} Additionally, commanders would select targets with the long-term environmental consequences to the surrounding population clearly in mind and would not depend on third-party countries for the cleanup. Finally, the modification would give the military commanders on the ground more flexibility to compensate and clean up affected areas, thereby improving relationships and security.\textsuperscript{266}

Ultimately, the question of expanding the Foreign Claims Act to protect the environment of foreign countries is up to the discretion of the United States Congress. It requires leadership in Congress to recognize that the United States should be a world leader in protecting the environment, and not simply pass the environmental costs of warfare along to other countries. As the largest economic and military power in the world, the United States must act as a model for the free world in protecting foreign citizens and their environments during war.

\textsuperscript{264} Foreign Claims Act, 10 U.S.C. § 2734(a) (West Supp. 2007).
\textsuperscript{265} See Herthel, \textit{supra} note 215, at 239-40.
\textsuperscript{266} See Zorpette, \textit{supra} note 128.