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Trying to end the war on the world: the campaign to proscribe military ecocide

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ABSTRACT

Military ecocide, the destruction of the natural environment in the course of fighting or preparing for war, has a long history and remains a regular feature of contemporary conflicts. Efforts to prohibit this in international law were initiated after the US' notorious defoliation campaign in the Vietnam War in the 1960s and have advanced since then. Legal ambiguities and the defence of military necessity have limited the application of this body of law but the proscription of ecocide has, nonetheless, progressed and looks set to develop further. Normative change driven by scientists, environmentalists and legal experts has raised awareness of and stigmatised such practices to the extent that recourse to the worst excesses of ecocide now appears to have lessened and some recompense for past crimes has been made. Military activities, though, still inflict a heavy cost on the environment.

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1. Introduction

This article provides an historical overview of the progression of international legal efforts to prohibit military ecocide, the deliberate or inadvertent destruction of the natural environment in the course of fighting or preparing for war. Ecocide is a term that has also come to be applied in reference to the criminal and industrial destruction of the environment – such as in illegal deforestation or dumping of toxic waste at sea – but this review will confine itself to militarily induced degradation. There is a long history of military-induced environmental degradation and it is a facet of warfare that has, in general, worsened over time with the advent of more devastating and poisonous forms of weaponry. In stark illustration of how both the politics of international security and industrialisation have traditionally been played out, such devastation has often been justified on the grounds of military necessity in ways that could not so readily be done if the casualties were human, where a large body of international law offers some restraint. The perennial problem of the natural environment being valued only instrumentally – for its human utility – rather than intrinsically, has been apparent in the recourse to military strategies such as scorching the earth, altering freshwater supplies or chemical deforestation throughout history.

However, many and an increasing number of people do value the environment for its own sake, as evidenced

by the rise of ecocentric domestic policy since the 1960s. In particular, many people have come to be convinced of the need for ecocentric restraints on human behaviour through scientific evidence. Despite the popular imagery of mystic, tree-hugging hippies, it should not be forgotten that the green movement in the 1960s was kick-started by the emergence of ground-breaking, rational and convincing scientific evidence. In particular, U.S. marine biologist Rachel Carson's *magnum opus Silent Spring* proved that the widespread use of organochlorine pesticides in the fight against disease-carrying and crop-consuming insects, following their discovery in the 1940s, was also polluting streams and killing wildlife (Carson, 1962). As a consequence of this, these activities, though serving human interests, began to be constrained in the U.S. and then elsewhere. Whilst military ecocide continues to feature in military campaigns, the legal and normative prohibition of such practices has advanced, in roughly the same timescale as the advance of ecologism, again largely due to the efforts of scientists and campaigners in highlighting the issue to a horrified public.

2. The history of militarily induced environmental damage

The wilful destruction of nature in the course of war can occur both as an offensive or defensive strategy.

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2.1. Offensive ecocide

The ‘scorched earth’ destruction of the crops and livestock of an enemy is a strategy that has been deployed in wars since ancient times. It is a method that has formed part of many international conquests, such as in the Roman sacking of Carthage, and also in the course of domestic counter-insurgency campaigns, such as in the Norman’s ‘Harrying of the North’ after annexing England in the eleventh century. In the modern era, similar methods were still being employed by U.S. in the Philippines from 1898 to 1902 to undermine nationalist resistance, much of which was from jungle-based guerrilla units, after having seized the islands from the Spanish. Domestic alarm at how an intervention, initially sold to the American public as liberating the Filipinos from Spanish tyranny, had become a typically brutal colonisation prompted criticism from prominent quarters, with the likes of former President Grover Cleveland, business tycoon Andrew Carnegie and literary great Mark Twain expressing outrage at Roosevelt’s war as part of the American Anti-Imperialist League established in 1898. Twain articulated his horror in the form of a mock prayer, calling on God to ‘help us to turn them out roofless with little children to wander unfriended the wastes of their desolated lands in hunger and thirst’ (Twain, 2016).

With the advent of synthetic organochlorine pesticides, offensive ecocide was able to move beyond the razing of food sources to include the tactical destruction of tree cover utilised by insurgent guerrilla forces. The British were the first to undertake a strategy of ‘industrialised chemical defoliation’ in wartime in the early 1950s during the ‘Malayan Emergency’. The acidic herbicide formulations 2,4,5-T and 2,4-D (later combined in *Agent Orange* used by the U.S. in Vietnam) were used to clear lines of communication and wipe out food crops in the struggle against communist insurgents. With Imperial Chemical Industries (ICI) providing the technical advice, British and Malayan troops in 1952 despatched fire engines spraying mixtures of these herbicides along a number of key roads. The strategy was not successful and after seven months, it proved more effective, both economically and practically, to remove vegetation by hand and the spraying was stopped. The following year, though, saw the use of herbicides as an aid to fighting the guerrillas restarted with the more traditional goal of destroying food crops grown by the communist forces in jungle clearings (Connor & Thomas, 1984). The environmental costs of this British ecocide are unclear. Since this episode predated *Silent Spring* and the environmental era, the sorts of scientific studies which later highlighted the environmental and health damage resulting from similar spraying operations 10 years later in Vietnam, never took place.

The application of herbicides was far more widespread in the Vietnam War, with an estimated 80 million litres of 2,4,5-T (2,4,5-trichlorophenoxyacetic acid), 2,4-D (2,4-dichlorophenoxyacetic acid), picloram and cacodylate blended in a variety of mixtures – including the notorious *Agent Orange* – and sprayed on jungle foliage from military aircraft between 1962 and 1971 in the most infamous ever systematic military assault on the environment. American scientists have estimated that 10% of Vietnam’s inland forests, 36% of her mangrove forests and 3% of cultivated land were affected by the programme codenamed ‘Operation Ranch Hand’ (NAS, 1974, pp. 5, 6). This scale of ecological damage indirectly affected the health of millions of Vietnamese by reducing the quality of their nutritional intake and creating internally displaced persons susceptible to disease. More clearly deadly were the cases of direct poisoning by herbicides. In particular dioxin, which arises as a by-product in the manufacture of 2,4,5-T, is one of the most toxic chemicals known, an estimated 170 kg of which was sprayed over Vietnam and the neighbouring countries of Laos and Cambodia (NAS, 1974, pp. vii–9). Dioxin is severely toxic in several dimensions. It is teratogenic (causes birth defects), hepatotoxic, mutagenic, carcinogenic, a skin irritant and known to increase cholesterol levels in blood. Many studies have linked instances of such symptoms amongst South Vietnamese residents and their offspring with the sprayings between 1962 and 1971 (Franklin, 2003). As is in the nature of toxicology, and particularly carcinogenicity and teratogenicity, proving causal factors is difficult but myriad cases have documented spontaneous abortions and infant deformities. The evidence, though, is completely unambiguous with regard to liver damage due to dioxin exposure. A study led by Do Thuc Trinh found that ‘chronic hepatitis was more than ten times as prevalent among those subjects who had been directly exposed to military herbicides (more than a decade previously) than amongst those who had not’ (Westing, 1984, p. 166).

Despite some initial uncertainties in the scientific data relating to dioxin exposure, the US’s defoliation campaign in Vietnam, Cambodia and Laos was quickly and roundly condemned by the American scientific community and many international statesmen. The American Association for the Advancement of Science in 1969 set up a Herbicide Assessment Commission to investigate the effects of Operation Ranch Hand made up of four leading domestic scientists, of whom the most prominent voice to emerge was Arthur Westing. Westing’s background was as a Botanist and Forest Ecologist but the fact that he had also served in the U.S. military, seeing action as an artillery officer in the Korean War, equipped him with insights into both sides of the military-environment equation. Westing became the best known academic critic of the

U.S. defoliation campaign in Vietnam which he described as causing ‘widespread, long-lasting and severe disruptions of perennial croplands, and of farmlands – that is to say of millions of hectares or the natural resource base essential to an agrarian society’ (Westing, 1989, p. 337). Westing’s writings also advocated the need to criminalise and prosecute such acts, notably highlighted in the 1974 article, ‘Proscription of Ecocide’:

... what is urgently required at this time is the establishment of the concept that widespread and serious ecological debilitation – so called ecocide – cannot be condoned. (Westing, 1974, p. 26)

Westing here utilised the term ‘ecocide’ probably first employed by fellow U.S. scientist Arthur Galston in 1970. Galston was a biologist central to the discovery of the defoliant qualities of 2,4,5-T who became alarmed at how his work had come to be put into practice and wrote critically about how Operation Ranch Hand was destroying Vietnamese river ecosystems (Cook, Heseltine, & Galston 1970). Continued pressure by the Herbicide Assessment Commission, including a petition signed by 5000 scientists (of whom 17 were holders of Nobel prizes), led to the termination of the campaign in 1971, fuelled in particular by public horror at evidence of appalling birth defects occurring in the South Vietnamese population (Hay, 1982, p. 151).

Criticism of U.S. ecocide, though, did not end with the termination of Operation Ranch Hand. In particular, high-profile international political expression was given to the crime of military ecocide when Swedish Prime Minister Olaf Palme, after meeting Westing for a briefing on the subject, used this term to denounce the Vietnam defoliation programme, indirectly at the 1972 United Nations Conference on the Human Environment (UNCHE) at Stockholm. Palme did not explicitly cite the U.S. in condemning environmental warfare at UNCHE, but then did so overtly in several speeches in the following months (Hay, 1982, p. 165). The U.S. administration managed to use the threat of pulling out of UNCHE to avert any direct reference to Operation Ranch Hand in the official principles and paperwork that came out of the conference, but Palme’s continued criticism prompted Nixon to suspend full diplomatic relations with Stockholm for several months, an extraordinary situation for two Western democracies to find themselves in.

No compensation has ever been forthcoming for any of the Vietnamese, Cambodian or Laotian victims of birth deformities, liver damage or other ailments attributable to Operation Ranch Hand. The Cambodian Government attempted to claim compensation for damage done in Kompong Cham province but the case dissolved when that regime was overthrown in 1970. The only victims compensated for illnesses attributable to ‘Operation Ranch

Hand’, are soldiers who fought on the side responsible. War veterans from the U.S., Australia and New Zealand, who have suffered subsequent skin and liver disorders or birth defects in their offspring, won a long battle for compensation in 1979, when a U.S. Federal Judge ruled that they could sue the companies responsible for manufacturing Agent Orange. Over 45,000 people have since claimed a share of the \$180 million in damages from Dow and six other chemical firms. Dow agreed to the settlement in the face of public pressure and mounting legal costs, but have always denied that the various illnesses incurred by the veterans were directly related to Agent Orange and other herbicide mixtures sprayed in Vietnam.

Despite the controversy of Operation Ranch Hand, U.S. ecocide in Vietnam also served to inspire other governments and armed groups engaged in conflicts in woodland or arid terrain susceptible to tactical manipulation. Mimicking the tactics used in Vietnam, the Indonesian Government in the late 1960s conducted what has been asserted to be the biggest deforestation in history to quell insurgencies in Borneo and West Kalimantan (Peluso & Vandergeest, 2011). Similarly, the 1980s civil war in El Salvador saw the government bomb agricultural lands and forests in seeking to deny guerrilla forces a base and sustenance. Partly as a consequence of this, El Salvador today is virtually deforested. In a different form of domestic ecocide, Saddam added to his long list of environmental and human crimes deliberate desertification in diverting the courses of the rivers Tigris and Euphrates in order to drain marshland areas that were home to the Shia ‘Marsh Arabs’, after they had initiated an uprising against his rule after the Gulf War in 1991. This act of ecological ethnic cleansing drained around 90% of the region’s marshes and also depleted its population from 250,000 to around 40,000 (Weinstein, 2005, p. 715). Saddam’s ‘hydro-terrorism’ doubtless served as an inspiration to ISIS who, in 2015, dammed sections of the Euphrates in order to dehydrate opponents in the Syrian Civil War.

2.2. Defensive ecocide

The ‘backs to the wall’ tactic of destroying your own resources to prevent an invading enemy making use of them is also a well-established military strategy. Perhaps most famously, Russian forces in 1812 retreated from the invading French army whilst destroying their own arable lands in an ultimately successful strategy that paved the way for Napoleon’s disastrous ‘retreat from Moscow’, which sowed the seeds of his downfall. The Russian strategy was learned from British military leader Wellington who two years earlier, in alliance with Portuguese guerrilla forces, had resisted a French invasion in the Peninsular War in a similar manner. French military power was build

on its arable supremacy, allowing her to feed the biggest army in Europe, and this had come to be realised by those on the receiving end of her autarky.

Whilst, by the twentieth century, industrial rather than arable might had become the main determinant of military power, scorching the earth could still serve its purpose. During the Second World War, the British took responsibility for rendering uninhabitable the islands of Norway's Svalbard archipelago (Spitsbergen) in order to limit German interest in its coalfields (despite Norwegian opposition). Consequently, the German presence on the Arctic islands was limited to the manning of some weather stations. In a different and more dramatic form of defensive ecocide, the Yellow River was deliberately flooded in 1938 by the Chiang Kai-shek government in resisting the Japanese invasion of Manchuria. In doing so, the Chinese succeeded in slowing down the invaders by creating a bigger barrier and destroying potential food supplies but achieved this at the cost of the lives of hundreds of thousands of their own citizens and the homes of millions more. More recently, defensive ecocide, more spiteful than strategic, featured in the Gulf War when Saddam's forces set fire to several oil wells whilst retreating from Kuwait in 1991, some of which continued to burn for several months. Oil was also deliberately leaked into the Persian Gulf by the Iraqi troops.

3. Collateral damage: indirect military environmental degradation

Environmental degradation due to war can also occur more indirectly as a result of the general destruction of battle. The aforementioned 1938 Manchurian war was, in fact, a multi-faceted environmental (and human) horror show. The Japanese used chemical and biological weaponry in a brutal invasion and then, once their defeat in the Second World War became apparent, abandoned much of the remaining munitions across north-eastern China to prevent them falling into allied hands. Shells containing chemicals such as mustard gas and phosgene were dumped in fields, lakes and streams prompting a slow-burning public health disaster in which thousands of Chinese people have subsequently died or been disabled in the decades that have since passed.

Elsewhere during World War Two, 'total war' bombings were of such a scale and nature that environmental catastrophes were, of course, inevitable. However, in spite of the revival of limited and just war principles since then, 'collateral ecocide' has still been apparent in the supposedly more strategic strikes of recent conflicts. In 2006, for example, between 20 and 30,000 tonnes of oil polluted a large stretch of the Eastern Mediterranean Sea and coastline after Israel bombed the Jiyeh Power Station

during the Lebanon War (CoE, 2011). Similarly, in the 1999 Kosovan War, NATO included amongst its strategic bombing targets several chemical plants and fossil fuel facilities which would inevitably pollute waterways and cause other forms of environmental damage. The campaign led to the significant pollution of the Danube and also released toxic and carcinogenic chemicals into the ground and air. Most notorious was the targeting of the major Serbian petrochemical and fertiliser plants at Pancevo. NATO acknowledged the environmental consequences of the strikes but asserted that military necessity justified some collateral fallout since the plants were a key source of the Serb regime's power. Longer lasting forms of environmental and human damage from the Kosovan War bombings and other recent campaigns such as in Iraq have come from contamination resulting from the U.S. and U.K. use of the radioactive and highly persistent chemical 'depleted uranium' to coat munitions shells. Greenhouse gasses, CFCs, mercury, sulphur dioxide and nitrous oxide emissions are also now part of the common collateral damage of contemporary bombing campaigns (Sanders, 2009, pp. 71, 72).

Battlefield destruction can also render arable land and other natural resources useless to humanity and other life forms. In addition to the pollution and defoliation, millions of craters today mark the agricultural belts of Vietnam and Laos as a consequence of a combination of deliberate and collateral military actions by the U.S. in the 1960s. Many French and Belgian World War One battlefields remain barren today nearly a century on. Resource depletion through over-utilisation is another typical consequence of war. The appropriation of food and fuel by invading troops is the most predictable form of this phenomenon, but too much strain can also be put on the home resources of the invading forces. Environmental degradation can also occur more indirectly as a result of sudden influxes of refugees fleeing war. For example, 38 sq km of forest in Kivu Province of Congo DR were lost within three weeks of the arrival of Rwandan refugees fleeing genocide in the mid-1990s (UNEP, 2002). As well as being worsened deliberately, deforestation can be accelerated as a consequence of countries trying literally to rebuild their country after a conflict. Many Iraqi city trees were felled for fuel in the aftermath of the US-led invasion of 2003 and it is also known that Afghan water supplies and vegetation were seriously damaged and depleted following the onset of war in 2001 (CoE, 2011; Sheehan, 2003). Animals, of course, are frequent casualties of war. Gorilla numbers in the Democratic Republic of Congo are known to have fallen as a consequence of that country's persistent civil conflict, both through direct killings and more indirectly as a result of the destruction of their habitat through deforestation (Kalpers, 2001). Collateral

514-512 BC	Scythians defending against invading Persians (Darius)
146 BC	3 rd Punic Wars: Romans on Carthage, to subjugate after military defeat
52 BC	Galic Wars: Gauls (Vercingetorix) defending against invading Romans
1069-70	'Harrying of the North': Normans (William) against English uprising
1414	'Hunger Wars': Teutonic Knights (Germanic crusaders) invading Poland-Lithuania
1565	Great Siege of Malta: Crusaders resisting Turkish invasion
1581	2 nd Desmond Rebellion: English settlers suppressing Irish rebellion in Munster
1644	30 Years War: Swedes (Torstensson) in invading Denmark
1679	Mughal-Maratha Wars: Marathas of India (Shivaji) against Mughal Empire
1708-09	Great Northern War: Russians defending against invading Swedes (Charles XII)
1810	Peninsular War: British and Portuguese in defending against French invasion
1812	'Retreat from Moscow': Russians defending against French invasion
1812-13	South American War of Independence: Argentine patriots defending against Spanish / Royalists
1817-18	Sri Lankan Great Rebellion- British colonial suppression of uprising
1864	'March to the Sea': US Unionists (Sherman) against Confederates in the Civil War.
1867-69	US (Sherman) extermination of the Buffalo to subjugate native Americans
1898-1902	US-Philippine War: US colonial suppression of uprising
1900	2 nd Boer War: British against Boers in power struggle over South Africa
1922	Greco-Turk War: Greeks in Western Anatolia in retreat
1938	Manchurian War: Chinese flooding in defending against Japanese invasion
1938	Manchurian War: Japanese dumping of chemical weapons
1941	World War Two: Soviets in defending against German invasion
1941	World War Two: British in Spitsbergen to render useless to German invasion
1944-5	World War Two: Germans in retreat from Soviets in Northern Norway and Finland
1952	'Malayan Emergency': British and Malayan government suppressing leftist insurgency
1962-69	Vietnam War: US intervention against leftist insurgency
1967	Indonesia government suppression of insurgencies in Borneo and West Kalimantan
1980-90	Salvadoran Civil War: government suppression of leftist insurgency
1981-2	Guatemalan Civil War: government suppression of leftist insurgency
1990	Gulf War: Iraq (Saddam) in retreat from Kuwait
1991	Iraqi government (Saddam) suppression of uprising by 'Marsh Arabs'
1999	East Timorese secession from Indonesia: pro-government militia in retreat
1999	Kosovan War: pollution from NATO bombing of Serbia
1999-2009	Chechen Wars- pollution from Russian bombing
2003-08	Darfur Crisis: Sudanese government and Janjaweed militia against Darfurians
2006	Lebanon War: pollution from Israeli bombing
2006-09	Sri Lankan Civil War: government suppression of Tamil insurgency
2011	Libyan Civil War: Government (Gadafi) suppression of rebels in Benghazi.
2014-15	Syrian Civil War: Insurgents (ISIS) river diversion against government and slashed earth v Kurds.

Figure 1. Timeline of some major incidences of environmental damage in war.

killings of wildlife can also occur in the context of military preparation. Peacetime NATO naval exercises off the south coast of Spain, for instance, are known to have killed at least 15 beached whales in 2002 (CoE, 2011)(Figure 1).

4. The militarisation of the environment

As the case of the whale fatalities in the NATO exercise case illustrates, it is not just actual war which can prompt environmental damage but the whole phenomenon of defence and military preparation. The scale and nature of the cold war defence greatly intensified the traditional ecological side effects associated with this. The rise of nuclear weapons testing, mass military exercises and the global proliferation of military bases came with significant costs, many of which are continuing to be counted. The Soviet testing of nuclear weapons and dumping of the waste from this was particularly extensive in its peripheral regions such as the northern reaches of Siberia. At least 130 tests were carried out in the Soviet Arctic between 1955 and 1970, prompting landslides as well as depositing radioactive material in the soil, water, ice and air (Glasby

& Voytekhovskiy, 2010, p. 20). Environmental damage was also inflicted on parts of the Soviet empire during the cold war. For example, Soviet military camps occupied nearly 2% of Estonia and left behind significant pollution in that country on their withdrawal in 1994. No compensation for water and soil pollution by oil, cadmium, lead, uranium and general waste was ever paid in a clean-up that the Estonian Government claimed cost them \$4 billion (Auer, 2004, pp. 119–121).

U.S. militarism at home and particularly in its overseas outposts has also carried significant environmental costs. Again in the Philippines, realpolitik and imperial neglect saw the Subic Bay naval base become the scene of a notorious ecological disaster which included the wilful pollution of side-stepping sewage treatment and allowing human waste to be dumped directly into the sea. The Philippine Government claimed compensation for such pollution but the Americans never paid and abandoned the base in 1991 whilst pointing to the 1947 Military Bases Agreement between the two countries absolving them of any legal responsibility. In domestic politics, American military exceptionalism is also apparent with the Pentagon

exempted from being reported on by the Environmental Protection Agency and, hence, never having been held accountable for known instances of pollution by solvents, fuels and munitions near military bases well above state limits (Schettler, 1995).

In a different facet of ecocide, the military securitisation of the environment can sometimes take the form of a kind of 'nationalisation of nature' with wild badlands forcibly tamed. Tropical woodlands have regularly featured in security politics as both the arenas and symbols of resistance. Much of the resistance to the Japanese invasions in South-East Asia during the Second World War was jungle-based and this also came to be the stage for resisting European colonial rule after 1945. Hence, as well as carrying out deforestation for tactical reasons, many governments consciously came to construct their woodland as 'jungle' so as to invoke notions of lawlessness, danger and insecurity that required the assertion of sovereign control through enforced land purchases, coerced population movements and the establishment of permanent military bases (Peluso & Vandegeest, 2011). This was very much the case with the aforementioned governmental deforestations in Indonesian and El Salvadoran.

In a more general sense, it should always be remembered that there is a significant ecological side effect to the sheer existence of the military-industrial complex. A study in the 1990s found that the military accounted for

around a quarter of the world's jet fuel, 9% of its iron and steel consumption and employed 20% of its scientists (Ostling, 1992, p. 8). Given that, two decades on, global military expenditure has significantly increased, it must be assumed that this ecological footprint is now even greater.

5. History of international treaties and laws to address military ecocide

A body of international law proscribing military ecocide has steadily advanced since the 1970s; but in a predictable illustration of traditional national security trumping environmental concerns, there is little precedent for enforcing this legislation. Explicit references to the 'environment' were not made in the war laws of the Geneva or Hague Conventions prior to the 1970s, despite their extensive evolution since the nineteenth century (Figure 2). The second Hague Convention of 1907 though does declare illegal military methods which 'destroy or seize the enemy's property, unless such destruction or seizure be imperatively demanded by the necessities of war'. In more general terms, the centuries old tradition of Just War, upon which the Geneva and Hague Conventions are built, can be seen as helping safeguard the environment since the notion of 'limited war', which proscribes the escalation of conflicts beyond their specific purposes and acts of pure retribution and spite, logically must also apply to the destruction of

C3 rd – C13 th :	Evolution of Just War principles within Christianity and Islam proscribe excessive military damage
1868:	Declaration of St Petersburg by European powers outlawing explosive bullets includes agreed principle that only military targets should be considered legitimate.
1899:	First Hague Convention on Laws of War- article IV (ii) outlaws use of poison gas by great powers (except US)
1907:	Second Hague Convention- article 23(g) outlaws wanton destruction
1925:	Geneva Protocol to Hague Convention outlaws chemical weapons
1948:	Nuremberg War Trials establish scorched earth tactics without clear military purpose are illegal.
1969:	General Assembly Resolution 2603 states that all military applications of chemicals (including defoliants) is contrary to the 1925 Geneva Protocol.
1976:	Convention on the Prohibition of Military or any Hostile Use of Environmental Modification Techniques (ENMOD)
1977:	Geneva Conventions on War Protocol I Articles 35 and 55 outlaw widespread, long-term and severe military damage to the environment
1981:	UN General Assembly Resolution 36/150 condemns Israeli canal plan because of its implications for Jordan in the context of their dispute.
1990:	Cairo Declaration on Human Rights in Islam Resolution Article 3b outlaws military destruction of crops or livestock
1991:	UN Security Council Resolutions 687 and 692 prosecute Iraq government for environmental destruction in invasion of Kuwait.
1992:	UN General Assembly Resolution 47/37 states that military ecocide is contrary to International Law
1992:	UN Conference on Environment & Development- Rio Declaration Principle 24 affirms that the environment should be respected in warfare.
1993:	Chemical Weapons Convention outlaws use and possession of chemical weapons
1995:	Organization of African Union Conference of Ministers of Health Resolution 14(5) outlaws destruction of crops in war.
1999:	International Criminal Court Statute 8(2) b (iv) lists excessive damage to the environment as a war crime

Figure 2. Timeline of international law and military ecocide.

nature beyond military necessity. International arms control law can similarly be suggested to proscribe ecocide, in principle at least. The 1925 Geneva Protocol on Chemical Weapons (and its effective contemporary successor the 1993 Chemical Weapons Convention), whilst driven by humanitarian rather than environmental concerns, by outlawing the military use of toxins, inherently makes wilful pollution illegitimate.

That the wanton destruction of buildings and land is contrary to international law was confirmed at the Nuremberg war trials at the close of the Second World War. German General Lothar Rendulic was prosecuted by the International Military Tribunal for his command of scorched earth raids in Finnmark, Norway when in retreat from the Russian army. Rendulic was actually acquitted, as the Tribunal accepted that he genuinely believed the destruction to be militarily justified, but a precedent that such acts could amount to an international crime was, nonetheless, established. (Boas & Schabas, 2003, p. 293) Another German General, Alfred Jodl, was convicted and hanged for several war crimes amongst which was culpability for scorched earth in Finnmark for which no military justification could be found. The UN War Crimes Commission at Nuremberg also confirmed that German plundering of Polish forestry constituted a war crime (case 7150). Military ecocide was more acute in the War in the East but national interest and an early manifestation of cold war realpolitik ultimately trumped humanitarian concerns when it came to prosecuting Japanese war crimes. The Tokyo War Crimes Trials did not properly address the Japanese deployment and dumping of chemical and biological weapons in Manchuria, largely due to the US's desire to keep such knowledge to themselves and out of the hands of the Soviet Union.

Japan's actions in Manchuria were clearly counter to the Geneva Protocol and Hague Convention, but the will to implement these instruments was not apparent, as it had not been a few years earlier when appeasement saw Mussolini's chemical assault on Abyssinia overlooked by the League of Nations in 1935. The effective death knell of the Geneva Protocol came when it became apparent that the huge advances in chemical synthesis in the 1940s and 1950s had rendered it redundant by the time an attempt came to prosecute the U.S. for Operation Ranch Hand on the basis of a 1969 General Assembly request. In response to this, U.S. Secretary of State Rogers stated that 'the 1925 Geneva Protocol does *not* cover chemical herbicides', on the grounds that the chemicals used were not known in 1925 and that their intention was to kill plants not humans.

The simultaneous rise of environmentalism and the Vietnam War, however, did prove twin catalysts for the emergence of international law specifically dealing with military ecocide. In the spirit of detente, the Americans and

Soviets actually cooperated in formulating a draft for what would become the 1976 Convention on the Prohibition of Military or any Hostile Use of Environmental Modification Techniques (ENMOD Convention). Moscow, able to capitalise on the controversy that had emanated from Operation Ranch Hand, initiated the idea of an 'ecocide convention' and Washington, having terminated the strategy in 1971 and then the whole war in 1975, had no strategic need to risk the reputational loss of allowing the Soviets to claim the moral high ground. ENMOD was adopted by Resolution 31/72 of the United Nations General Assembly in 1976 and opened for signature the following year.

Simultaneous to the negotiation of ENMOD a Protocol to the Geneva War Conventions (1977) dealing with ecocide was also agreed. Protocol I additional to the Geneva Conventions, added in 1977, includes two Articles dealing directly with the dangers that modern warfare poses for the environment.

Article 35 – Basic rules

3. It is prohibited to employ 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 55 – Protection of the natural environment

1. Care shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage. This protection includes a prohibition of the use of methods or means of warfare which are intended or may be expected to cause such damage to the natural environment and thereby to prejudice the health or survival of the population.

2. Attacks against the natural environment by way of reprisals are prohibited.

By 2016, Protocol I had been ratified by some 174 states but notable amongst the non-parties were the U.S., India, Israel, Iran, Pakistan, Turkey and Libya. Parties to the ENMOD Convention similarly undertake not to use environmental manipulation that would have 'widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party' (Article I). Far less universal than Protocol I, ENMOD had, by 2016, 77 parties (though this does include the United States).

Taken together, parties to the twin ecocide instruments are prohibited from attacking, destroying, removing or rendering useless objects indispensable to the survival of the civilian population, such as foodstuffs, agricultural areas and drinking water supplies. Protocol I is the more ecological of the twin instruments since its aim is to protect the environment from war, whilst ENMOD is really humanitarian as it seeks to prohibit the use of the environment (land, sea, atmosphere or space) as a weapon in war. ENMOD is limited by the stipulation that such manipulation of the environment must be 'widespread, long-lasting

or severe' ('WLS') to be deemed illegal but, nevertheless, has the advantage of being worded in such a way that gives it the potential to outlaw war-making methods not yet devised (Roberts & Guelff, 2000, pp. 407–418). Hence the sort of defence used by the U.S. against prosecution for Operation Ranch Hand under the Geneva Protocol would not stand up in the event of a country being prosecuted under ENMOD (although this could not happen to the U.S. as the Convention does not permit retrospective jurisdiction). Indeed, it was international concern that the U.S. strategy in Vietnam could evolve to include tactics such as deliberate flooding and the manipulation of the weather that did much to inspire ENMOD.

Moving on to the early 1990s, the oil and ordnance pollution that marked the Gulf War along with the general multilateral optimism that permeated international relations in the aftermath of the cold war reinvigorated international efforts to prevent ecocide. Hence, in 1991, the Security Council held Iraq liable for ecocide in their Kuwaiti invasion through the adoption of Resolution 687, confirming that they were:

liable under international law for any direct loss, damage, including environmental damage and the depletion of natural resources, or injury to foreign Governments, nationals and corporations, as a result of Iraq's unlawful invasion and occupation of Kuwait. (S/RES/687 (1991) 8 April)

On the basis of this, the Kuwaiti Government filed claims against Iraq for damages to its natural resources and related public health concerns. The UN Compensation Commission (UNCC) was subsequently established by Security Council Resolution 692 in May 1991 to adjudicate the amount of damages and its Governing Council then approved, in December 1996, an award of \$610 million to Kuwait. Hence, the Saddam government became the first and, to date, only international entity to be charged for military ecocide.

As a corollary of this Iraqi prosecution, the UN General Assembly in November 1992 adopted a resolution on 'the protection of the environment in time of conflict', which stated that the 'destruction of the environment not justified by military necessity and carried out wantonly, is clearly contrary to international law' (A/RES/47/37). In further developments, in 1992 and 1993, the UN Secretary General submitted two reports on the protection of the environment which paved the way for a General Assembly resolution (A/RES/49/50) mandating the International Committee of the Red Cross (ICRC) to encourage the inclusion of their guidelines on the protection of the environment during conflict in military manuals. Consequently, many countries have adapted ICRC-drafted principles into the rules of engagement they provide for their armed forces.

A further legal milestone for ecocide came with the adoption of Article 8(2)(b)(iv) in the statutes of the International Criminal Court, which lists as a war crime the launching of an attack that may cause excessive damage to the natural environment. However, whilst this makes individual criminal responsibility for ecocide clearly established under an international treaty, the statute suffers from the same lack of precision as the Geneva Protocol and ENMOD in terms of determining what constitutes 'excessive damage' (Peterson, 2009). Hence, to date, no individual or government has been prosecuted specifically for military ecocide under the Hague Convention, ENMOD or through the ICC. A case was presented to the International Criminal Tribunal for Yugoslavia (ICTY) (a special ad hoc UN court set up to try crimes committed in the wars of the Yugoslav secession) by the Serbian Government against NATO bombing raids in the Kosovan War but was dismissed by the ICTY committee on the basis that it did not exceed the WLS threshold.

In some other areas of international laws that could potentially limit ecocide, military necessity is explicitly cited as an exemption. The 1993 Prevention of Major Industrial Accidents Convention, for example, does not apply to military installations. The Arctic Council, an intergovernmental organisation that has produced a range of soft and hard laws on environmental and shipping issues covering the region since the mid-1990s, has it written into its rules of procedure that military matters are off the table.

Reflecting international relations as a whole, early 1990s international solidarity against Saddam has proved to be something of a false dawn for prosecuting military ecocide and the efforts of campaigners and UN experts have since then have, instead, focussed on improving the implementation of existing legislation and developing new instruments. Through its Environmental Cooperation for Peacebuilding programme, UNEP has worked with the International Committee of the Red Cross in seeking to strengthen international laws protecting the environment during times of conflict. This work came together and was showcased in 2009 in an International Day for Preventing the Exploitation of the Environment in War and Armed Conflict on 6 November. The event emphasised the need to clarify and enforce existing laws and made some particular recommendations including the following: (1) give greater clarity to the 'widespread, long-term and severe' (WLS) threshold; *severe* should be taken to mean environmental impacts over several hundred square kilometres and *long term* should be considered to be a period of several months or over a season; (2) establish new laws to demilitarise important ecosystems, which should be determined at the outset of conflict; (3) laws should deal with civil as

well as inter-state wars; (4) environmental crimes should be referable to The Permanent Court of Arbitration and be considered for inclusion in the ICC Statutes.

At the same time, a campaign for a more comprehensive and unambiguous UN treaty on ecocide, picking up the mantle from Westing and Falk in the early 1970s, has gathered momentum over recent years, led by British lawyer Polly Higgins. The campaign, launched in 2008, seeks to end the ambiguities around military (and industrial) necessity by establishing ecocide as a crime under customary international law (like genocide and torture) and opening it up to ICC prosecution. Celebrities, politicians and the Morales government of Bolivia are amongst those who have pledged their support to this cause which has set a deadline of 2020 for the codification of a new treaty (Higgins, 2010). Higgins was also instrumental in the setting up of the 'End Ecocide in Europe' campaign in 2012 seeking to get the EU Commission to draft a directive criminalising corporate and military damage to the environment. The movement was the first to take advantage of a new EU participatory democracy scheme, the European Citizens Initiative, under which signatures can be gathered to trigger new policies to be considered for proposal by the Commission in Brussels.

6. Normative progress in curbing military ecocide

A UN Treaty on ecocide by 2020 seems like an ambition unlikely to be achieved, but the popular support and attention gathered by the campaign is probably as important as establishing a clear legal platform for prosecution. The precedent for enforcing the conventions on genocide, torture and (anthropocentric) war crimes is pretty limited, but the (fairly) unambiguous universal acknowledgement of these crimes has still made them less likely to occur than in the 'total war' era of the twentieth century. Implementing moral international laws is inherently difficult in a sovereign state system, but few could deny that overall progress has been made in advancing human rights and environmental principles over recent decades. Huge gaps and problems with implementation remain, but sovereign states have come to be restrained on the basis of humanitarian and ecological values as they have crystallised in the form of laws and in the rules of looser international regimes. The principle that military ecocide is unacceptable has, in line with this, come to be much better acknowledged. This has been reaffirmed at several high-profile intergovernmental forums, including at UNCED in 1992, where Principle 24 of the Rio Declaration unambiguously states that 'warfare is inherently destructive of sustainable development. States shall therefore respect international law providing protection

for the environment in times of armed conflict and cooperate in its further development, as necessary'.

This normative evolution of proscribing ecocide can actually be traced back to the late cold war era once detente had seen humanitarian law advanced and the backlash against Operation Ranch Hand had occurred, particularly in the context of the Arab–Israeli dispute. Long before New World Order optimism had come to inform international relations, General Assembly Resolution 36/150 in 1981 condemned Israeli plans to construct a canal linking the Mediterranean to the Dead Sea, because of its environmental impact on Jordan (as well as the political ramifications for Palestinian independence), with only the U.S. and Israel voting against. On the basis of this, UNEP's Governing Council adopted several decisions condemning Israeli actions that had led to environmental damage against the Palestinians and their Arab neighbours including reaffirming the General Assembly position on the canal in 1983. UNEP have also contributed to this normative wave by advancing the *idea* of environmental protection in war. The Disasters and Conflicts Programme offers services and advice on: post-crisis environmental assessment, post-crisis environmental recovery, environmental cooperation for peacebuilding and disaster risk reduction which have been utilised in Afghanistan, Democratic Republic of the Congo and Sierra Leone. UNEP also lead the initiative ENVSEC, linking it with the United Nations Development Programme, Organization for Security and Cooperation in Europe and other inter-governmental organisations in researching the environmental impacts of war. In 2006, ENVSEC carried out a scientific assessment of the environmental impact of the Israeli invasion of Lebanon in 2006, submitting a detailed report just four months after the ceasefire.

Intergovernmental forums outside of the UN system have also taken up the cause of exposing and stigmatising military ecocide. The Parliamentary Assembly of the Council of Europe have called for the environment to be more explicitly cited in Geneva Protocol I and argued that conflicts in Bosnia-Herzegovina and Chechnya should have seen prosecutions mounted on the basis of that legal instrument (CoE, 2011). This body, representing all of Europe bar the dictatorship of Belarus, have also called for the strengthening of existing international legislation and for greater funding for UNEP and ENVSEC for carrying out of environmental impact assessments on conflict zones.

Whilst there has only been the one clear legal ecocide case (against Iraq), we can see some small steps being taken by other culpable but unprosecuted governments to make amends for historical environmental war crimes. The Japanese Government, having denied knowledge of the chemical weapons used in Manchuria for over half a

century, in 1997 finally entered into talks with the Chinese Government over how to remedy the damage. This led to a 1999 memorandum committing Tokyo to a plan to locate and destroy some 700,000 abandoned weapons at a cost of over \$500 million (BBC, 2004). Whilst accepting no international legal liability for Operation Ranch Hand, President Ford in 1975 ratified the Geneva Protocol and issued Executive Order 11850, renouncing the military use of herbicides 'as a matter of national policy'. Thirty year on the U.S. position, articulated in response to a persistent campaign by Vietnam War victims by Judge Weinstein, was that 'there is no basis for any of the claims of plaintiffs under the domestic law of any nation or state or under any form of international law' (USDC, 2005, p. 233). However, the fact that U.S. war veterans suffering from dioxin exposure have received compensation from the chemical manufacturers for injuries inflicted and international support for the Vietnamese victims made this a difficult position to sustain and maintained pressure on Washington. Hence in 2012, whilst still not accepting liability, the U.S. initiated a clean-up of ecological damage by dioxin in Vietnam. Washington gave \$43 million to two American firms working in conjunction with the Vietnamese Defence Ministry in an operation Hanoi hope to complete by 2020. Partial atonement was also apparent in 2012 when the U.S. returned to Subic Bay in the Philippines in preparation for the reopening of the naval base in 2015. In re-establishing military relations with their former colony, the Americans were now cooperating with a government party to MARPOL and not having to accept being literally 'crapped on' as a price of their protection. The Subic Bay Metropolitan Authority now provides Philippine oversight of the U.S. naval presence and has helped highlight concerns at the dumping of waste and even hosted maritime pollution conferences.

Realpolitik could still be said to underpin these cases of atonement since twenty-first-century U.S. foreign policy still values South-East Asian influence and a flat-lining Japanese economy cannot ignore the resuscitating possibilities offered by its growing neighbour, but moral pressure has undoubtedly played a part. Global civil society has been highly vocal with groups like the Alliance for Bases Clean Up (ABC) (formerly known as the People's Task Force for Bases Clean Up (PTFBC)) and the Vietnamese Association of Victims of Agent Orange (who have led the legal campaign) presenting the U.S. with a reputational incentive to act. The Manchuria case presents a clear illustration of how normative forces can influence governments both by shaming and encouragement. The Chinese came to throw their weight behind the Chemical Weapons Convention by recognising that abandoning their own stockpile (a condition of ratification) would be a price worth paying in order to secure a moral victory over their

old adversary and remedy a festering environmental and health sore. At the same time, the Japanese, as champions of arms control on the international stage, felt compelled to confront their past demons and make reparation for the sins of their grandparents (Frieman, 2004).

It is no coincidence that political ecology rose to prominence at the same time as the backlash against the U.S. intervention in Vietnam and the rise and persistence of the powerful green social movement since then has given impetus to the anti-ecocide campaign. However, the green wave has not always advanced the proscription of ecocide. The mainstreaming of the ecological agenda has sometimes served to weaken its tradition of pacifism and even advance the military-industrial complex. The controversy stoked by German Green Foreign Minister Joschka Fischer's backing for NATO in the Kosovan War is a case in point. Assigning increased political significance to the environment through 'securitisation' by governments has enhanced the profile of issues like climate change on the international political stage but often in profoundly anthropocentric, state-centric and militaristic ways. Since the 1990s, environmental security has featured in the stated foreign policy aims of countries like the U.S., U.K. and Russia, IGOs like NATO and been debated at the UN Security Council. This, though, has actually been a very traditional security discourse driven by the 'resource wars' thesis that environmental changes, such as increased droughts, will trigger political tensions and make wars more likely. For these reasons, many ecologists remain sceptical about securitisation in spite of the advance of the ontological challenges presented by critical and human security perspectives in advocating urgent political action on environmental issues on the basis of the threats posed not to national interests but to people in general or even non-human life forms.

However, not all environmental securitisation has been of the state-centric and militaristic form and a 'green tide' continues to advance ecocentric norms in other situations. The Netherlands' 2006 Foreign Policy Agenda acknowledges the potential role that environmental degradation plays in triggering conflicts but notably goes on to declare as one of eight goals a commitment 'to protect and improve the environment', without the addition of any clause indicating that this is another case of valuing the environment for instrumental rather than intrinsic reasons (Netherlands, 2006). This ecocentric turn of making the environment the referent object of security has also been advanced in a different political form in recent years outside of the Western World as part of the 'new left' wave in Latin America from the late 2000s. One expression of the critical stance on Western capitalism and focus on indigenous people that marks this political movement has been the empowerment of nature. In 2008, Ecuador's new

constitution declared that nature had the 'right to exist, persist, maintain and regenerate its vital cycles, structure, functions and its processes in evolution' and mandates the government to take 'precaution and restriction measures in all the activities that can lead to the extinction of species, the destruction of the ecosystems or the permanent alteration of the natural cycles' (Ecuador, 2008). Whilst many countries have cited environmental protection in their constitutions, none have done so in such unambiguously ecocentric terms. This 'rights of nature' approach has also been followed by the Morales government in Bolivia where the 'Law of Mother Earth' has defended the right of nature 'to not be affected by mega-infrastructure and development projects that affect the balance of ecosystems and the local inhabitant communities' (Bolivia, 2011). For both of these Andean countries, this idea of environmental rights comes from the twin impact of indigenous people's empowerment and a legacy of particularly dire environmental pollution. The rights of long-marginalised indigenous Americans (of which Morales is one) have become an important domestic political concern aided by greater international discourse promoted within the UN system by the Trustee Council, Working Group on Indigenous Populations, Human Rights Council, Human Rights Council and the International Labour Organization. In addition, the long-standing problem of 'industrial ecocide' from pollution by oil in Ecuador and tin in Bolivia has heightened environmental concerns beyond that witnessed in most developing countries.

Protecting the environment has sustained itself as a populist political strategy in the West since the 1960s and continues to attract activists around the world. As Sen's 'entitlements thesis' convincingly argues, the empowerment of people through democratisation or self-determination leads to the establishment of a right to food and health (Sen, 1981). Democratic governments are compelled to be responsive to the needs of ordinary people whose security is imperilled, either directly or indirectly due to the pressure of the media or other concerned citizens, for reasons of their own self-preservation if nothing else. Hence, today health and safety standards, welfarism and the notion of 'social security' are accepted as integral to the governance of most developed democracies. Increasingly, this thesis is coming to have applicability in non-democratic settings also with a clear example being the implementation of a range of anti-pollution measures by the Chinese Government over recent years in the face of public protest at the levels of smog in many cities. We can also see evidence from political evolution in many developed, democratic states that public demands on government are not always self-serving and anthropocentric. Ecocentrism has been apparent in much domestic policy on the environment since the U.S. responded to Rachel

Carson's critique and restricted the use of DDT in the 1960s, even though the use of the organochlorine as a pesticide had been successful in increasing food yields. Human co-responsibility and a respect for non-human life sometimes supersede economic and government self-interest in democratic domestic governance, because people demand that to be the case. In several countries, rights comparable to those enshrined for humans have been granted to other species, such as with apes (in New Zealand and Spain) or dolphins (in India). New Zealand has also seen this status granted to inanimate elements of nature with the Wanganui River in 2014 granted legal personality in the culmination of a campaign by the Iwi Maori dating back to the nineteenth century.

The maturation of politics in this way can also be observed at the global level as the globalisation of ideas and ethics advances, aided in particular by global civil society and global epistemic communities of transnational experts usually working within the UN system. Sociologists Inoue and Drori, in an empirical analysis of global health policy, observe that this political arena has evolved in a process of 'discursive sedimentation' in which a 'right to health' for all has gradually begun to emerge after centuries of international policy driven by self-interest or charity (Inoue & Drori, 2006, p. 211). Charity, fear and commercialism persist as values underpinning the motivations of actors in the global health world, but a rights-based approach has gradually been built on top of this and is now the foremost culture evident in the discourse of the WHO and NGOs like MedAct and Medecins Sans Frontier. In general, the existence of 'global ethics' can be seen in the development of human rights law and in many other dimensions of global law and policy. The reform of the World Bank, from being an advocate of 'unreconstructed liberalism' into a more socially oriented set of institutions, is a clear example of such normative change. The World Bank now routinely considers the environmental or social cost of any development project, as well as its economic viability, before granting it its seal of approval. This metamorphosis occurred through the development of a different epistemic community working within the system of organisations making up the 'bank', largely in response to pressure group and academic criticism. Similar change has occurred in the UNDP as the normative shift from advocating 'pure' economic growth to more human-centred development has occurred amongst experts in the field. An emergent global discourse has promoted the normative change that has seen principles like a right to health and concrete aims such as the Millennium Development Goals become established on the international stage not directly equitable with national interests. Promoted by an epistemic community of scientists, lawyers and expert campaigners, respected as acting outside of parochial interests by an

ever more enlightened global public, environmental rights can be understood as part of this progression. Whilst it is hardly likely to be eradicated, it is difficult to imagine anything other than there coming to be increased international awareness of and an increased desire to restrict military ecocide.

7. Conclusions

Military necessity will probably always be argued to trump environmental concerns at times of crisis, as is still regularly seen in the enactment of emergency measures which compromise democracy and human rights on the grounds of national interest, but this is not to say that moral restraints cannot advance. Just War principles continue to be sidestepped in contemporary conflicts but they have, nevertheless, greatly advanced in the years since the end of the cold war. Globalisation makes national reputations more important than ever and exposes illegality and immorality more easily than ever. In this way, moral laws and norms tend not to unravel once established. The recent U.S. and Japanese ecocide clean-up operations show that the passage of time, both in terms of the building up of moral pressure in support of victims and in creating 'distance' for the perpetrator, can permit small, initial steps to be taken in making amends for historical crimes. Doubtless governments will continue to carry out acts of ecocide if they feel they can get away with it, but they are increasingly unlikely to get away with it, even if only reputationally rather than legally.

However, as is the case in many facets of environmental politics and the politics of securitisation, the high-profile catastrophes are but the tip of the iceberg. We may be unlikely to witness again anything comparable to Operation Ranch Hand or the burning oilfields of the Persian Gulf, but beneath the surface of international political attention lies a huge military-industrial complex eating up the earth's resources and spitting and belching what it does not need back out. As with security politics in general, the instinctive treatment of international military matters as more important than environmental concerns covers a multitude of sins and human insecurities.

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