

The Environment and Military Strategy

by

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War is never an isolated act. (Clausewitz, 1831)[1](#)

Introduction

Bats as bombs.

It sounds like a silly gimmick but the technique was actively researched and tested during World War II.[2](#) Americans trapped whole populations of wild bats in the desert southwest during the early 1940's and attached timed incendiary devices on them. The plan was that after the bats were rigged as self propelled weapons, they were to be metabolically cooled into a quiescent state, packed by the thousands into canisters and parachuted over enemy targets. Fortunately for the bats, the project failed in testing but it serves to illustrate a commonly found characteristic of war; that the environment and its components have little value other than as a military asset or liability.

Today, the growing worldwide awareness and sensitivity to the health and vitality of the environment compels analysis of the relationship between environmental security and national security. Are they intimately and irretrievably tied or is the anxiety about the earth's environmental perils overdrawn, thereby discounting the importance of the environment in war. To use the bat bomb as a metaphor, if a bat were a threatened mangrove ecosystem in South Vietnam, how many more bats (ecosystems) could we sacrifice without threatening the stability of the entire bat population (integrated global environment). Should any bats be sacrificed? If so, which ones? Does the genetic pool dangerously shrink as bats are destroyed? Beyond the strictly biological and physical questions is the issue of environmental ethics in war. These are provocative questions but are they pertinent to our national security?

The aims of this paper are twofold. The first is to demonstrate that at least some consideration of the environmental consequences of war is necessary in the strategic planning for force employment. The second is to recommend a US strategic force planning doctrine that accounts for the application of an environmentally responsible force. That is, this paper will address not the everyday peacetime problems of the Department of Defense such as the clean-up of hazardous waste sites nor the environmental resources that are likely to be fought over in the years to come. Rather, at issue is the environmental damage we are willing to accept and deliver for military gain when we wage war.

A Selected Historical Perspective of the Effect of Warfare on the Environment.

Throughout history, the physical environment and ecology of the earth during wartime have only presented either logistical problems to be overcome and defeated or opportunities to be exploited. There are abundant examples from World War II. In the Pacific Theater, entire tropical islands, above and below the waterline, were denuded by both the Allies and Japanese as an incidental consequence of conflict. Populations of indigenous birds and animals on many of these islands were rendered extinct. In the west, both the German and Allied armies destroyed much soil binding vegetation in North Africa increasing both windstorms and desertification. The Germans sunk an allied ship containing a quarter of a million pounds of mustard gas in an Adriatic port. The extremely toxic effect from the slow release of this chemical has been expected to threaten plant and animal life in this area for 400 years.³

The earth environment also has been frequently used as a weapon of war. Vegetation has been burned, soil and water supplies contaminated and the air fouled as it suited a military mission. The destruction of croplands has been commonplace. Two millennia ago, the Romans sowed salt on Carthaginian fields during the third Punic War to make them infertile. More recently, General Sheridan virtually decimated the remaining American bison herds in 1865, the staple of the plains Indian. A year earlier he had ravaged virtually all cropland in the Shenandoah Valley. In World War II, the Norwegians instigated land slides into their own fertile valleys and the Dutch broke dikes flooding a third of their own productive agricultural land in an attempt to dissuade German occupation. At the same time, the Germans were decimating the rich Czech beech forests.⁴

After the advent of the nuclear age when the prospect of global annihilation was a very real possibility, lower intensity warfare was still conducted with little regard for its ecological effect. A notorious example of this was the defoliation of many of the Indochinese forests in the 1960's. Here, the rich sub-tropical jungle that hid the Ho Che Min Trail and other areas of military interest were only so much dense foliage to be eradicated by aerial applications of toxic chemicals. In addition, much of the irrigated rice growing lands of Vietnam were drained allowing leaching of nutrients and sulfur accumulation that made the soil barren. The dry vegetation on the defoliated and drained lands was burned with permanent scarring. These were not fire dominated ecosystems such as exist in other parts of the world. Beside the loss of valuable cropland, several animal species were threatened or endangered as a result of these and other ecocidal practices.⁵

After World War II, strategic planning was built around the development of nuclear weapons types and arsenal sizes of such massive proportions that consideration of global human survivability was introduced into strategic thinking. Still, any concern about global or local environmental health was largely only an issue as it directly related in the short term to human survival, not the sustaining environment in which people would expect to live after war. During the 1950's, the US built fallout shelters fully expecting that civilians could eventually emerge unscathed after a nuclear attack into a fully functioning and liveable environment.

Although the concept of fallout shelters was later abandoned as folly, it was not until the notion of nuclear winter was hypothesized using some general atmospheric circulation models (GCMs) results during the late 1980's that the effect of war on global ecosystem functioning and energy budgets was seriously considered. Now, after evaluating the climatic prospects of global nuclear

war, scientists are more pessimistic but not unanimous in their conclusions about the resilience of the earth to such insult.

In spite of the uncertainty in the environmental debate that grew around the potential consequence of the use of strategic nuclear weapons, still relatively little attention among force planning strategists has been directed at the environmental consequences incumbent in the conduct of either conventional warfare and especially the use of tactical nuclear weapons. Indeed, some nations continue to act without any apparent environmental ethic. Modern day examples of truly environmentally irresponsible wartime acts have not been difficult to find. The most conspicuous recent example was the loathsome destruction of Kuwaiti oil wells by Iraq in 1990 resulting in damage to Persian Gulf estuaries and the wasteful loss of an increasingly valuable finite natural resource.⁶

The most important thing to be said about the consequences of all these examples of assaults on the environment is that they caused either or both a physical and a biological change. In some cases, ecosystem function was permanently damaged while in others, natural processes invoked a new ecosystem paradigm. In some cases, as in the reef building around sunken ships, the change has actually benefited the environment. Of course, changes of the same magnitude have occurred and will continue to occur during peacetime. Examples are the Exxon Valdez oil spill, the huge hydroelectric generation project in the James Bay drainage of eastern Canada and our long term use of CFCs, although environmental awareness is playing a greater role in identifying damaging human activities and preventing and mitigating them. The question is, "Should the important environmental considerations in peacetime also be a concern during operations of war?" Stated another way, "Why spend enormous sums to manage, mitigate and improve the environment in everyday commerce if during wartime, all bets are off?" Such actions may soon be suicidal.

Are There Potential National Security Risks from the Adverse Environmental Effects of War?

To postulate that the environment should be a factor in the planning for force employment requires a demonstration that national security risks are posed by the adverse environmental effect of war today and into the future. In other words, and more to the point, whether or not a certain battle should be fought or a certain weapon should be used, is a decision that should be made, at least in part, after evaluating the probable environmental consequences of that action and its relationship to the national security.

The potential environmental effects of an action can be more easily understood as a national security issue by dividing the problem into two broadly defined spatial scales; global and local. At the global scale such things as changes in global energy budgets as a consequence of changes in patterns of vegetative cover, atmospheric carbon dioxide, methane and particulate concentrations are important. Local scale effects occur in our or the enemy's backyard and are usually readily contained. An example is the contamination of drinking water reservoirs or farmland soils from the sabotage of a nuclear power plant. The purpose for the two scales in this assessment is to discriminate between environmentally adverse wartime effects that can be physically contained (local) and those that cannot (global).

The issue of whether or not man is even capable of causing global change, after a strategic nuclear exchange or in any other way, is not a settled debate. At least two extreme views exist together with a number of more moderate ones. On one extreme, is the argument that the enormous planetary engine powered by the sun and balanced by the oceanic, atmospheric and terrestrial heat sinks dwarfs any meager effort by man to seriously disrupt this equilibrium. In this scenario, anthropogenically caused perturbations in the earth's energy balance likely would be short-lived lasting perhaps only weeks. The earth would again soon reach a favorable energy balance.

A corollary to this theory is that the earth's climate continues to change naturally despite our poor power to affect it. Our climate may radically change naturally to an uncomfortable or unlivable level and the change would be erroneously attributed to this or that human event.

A contrasting position contemplates the tenuous circumstances upon which life is based. In it, the survival of life on earth is critically dependent on maintaining a favorable, but very sensitive energy and lifecycle balance, not disrupted by man. Here the thought is that once the balance is seriously disturbed, it cannot be brought back into an equilibrium favorable to life as we know it.

With such a strong dichotomy of opinion, the prudent person would likely agree that the conservative approach is certainly safest. In other words, the high degree of uncertainty evident in the science suggest that we should hedge against nuclear war by taking steps that are well understood to be beneficial even if the global environment turns out to be very robust. Research climatologist Dr. Stephen Schneider suggests that "tie-in" benefits be considered when deciding on wise and economically favorable global strategies.⁷ In the case of climate change, he suggests that reducing fossil fuel use has a resource conservation benefit in the long run even if the climate warming prediction falls short. The analogy in weapons use is apparent; even if the use of nuclear weapons does not cause a nuclear winter, their eradication will have at least resulted in a safer world. Although some may argue that the world would be, in fact, less safe without nuclear weapons because the knowledge to build them still exists, first use⁸ in anger is still a step further afield than when the weapon is already available. Inspecting for weapon construction is a far safer activity than managing the weapons themselves.

An example of a local scale adverse environmental effect is a low intensity conflict using conventional weapons in an amphibious landing of a Marine Division. Planners might conclude with some confidence that the landing would destroy coral reefs adversely affecting fisheries in shallow waters and flatten coastal forests during initial fighting on shore. Further action might result in assured destruction of nearby productive oil wells fouling estuaries and further damaging fisheries. Preplanning might also determine that if the enemy were defeated, the conquered nation would need either to feed themselves using local resources or, to avoid anarchy, receive assistance from the conquerors. The cost in the eventual clean-up of the soil and water, loss of oil production and the rendering of food and water assistance to indigenous peoples may be more than the victorious nation is willing to cope with. Thus, that nation might conclude that the disruption to the local environment caused by the environmental consequences of the military action outweighs the political or economic gains that could be made if the operation proceeded or if some alternative military or diplomatic alternative were to be found. The costs can be characterized in terms of both present dollar economic costs and possibly in

continuing support costs. Clearly, the environment can be an important consideration at both the local and the global scale.

A provocative additional consideration could be posed if the operation endangers the last known surviving pod of threatened whales, for example. Linking the survival of a whale species to national security or even to ecosystem balance is not straight-forward but it is a legitimate ethical problem. This illustration serves to pose the dilemma, "how much and what kind of environmental damage is acceptable in the furtherance of military objectives?" Unfortunately, there are no easy prescriptions for such considerations. At least the dilemma should be answered with the rhetorical question, "will we be better off achieving the military objective and, in this example, losing the whale to extinction or is there a satisfactory alternative that meets the military objective and saves the whale?" Like most difficult strategy questions, the consequences of each possible alternative cannot be fully known a priori. We do not know which thread in the web of life and human existence the whale occupies, ethically as well as biologically, nor are we likely to know this for many other environmentally destructive wartime actions. Increased size and scope of the adverse environmental effects short of clear global destruction only serve to make the problem of identifying acceptable levels of damage more difficult.

At least two wartime force application opportunities deserve attention when assessing the national environmental security risk; the offensive application of force and the counter-offensive response. In the offensive action, we have the greatest latitude to choose the battlefield, specifically the time and place to fight. If a valuable environmental resource, such as a water supply or a productive forest, were at risk during an offensive attack, it probably would be prudent to work harder to locate and eliminate the keystone to the enemy, if it exists, rather than prolong a fight. Finding and destroying the enemy's center of gravity is obviously the objective of any fight, but in this case, we might assume that putting tanks on the field of battle is harm to be avoided, if possible. Timing of an offensive action may be desirable to gain favorable soil moisture, await forest reseedling or to avoid migratory birds, for instance. The capability to accomplish a mission with these constraints requires superior intelligence, accurate weapons and added patience.

An environmentally responsible counter-offensive response leaves fewer alternative choices on the battlefield but nonetheless necessitates consideration of the weapons type and application including whether or not a fight should be carried on.

Clausewitz discussed the virtues of mountains, rivers, streams and swamps as assets to either a defensive or an offensive position, but, of course, he did not address the short or long term ecological consequences of using these resources in war since, at the time, the earth's resources were largely thought to be resilient and boundless. The quote at the top of this article was originally in reference to the political causes of war. Nevertheless, it can be reasonably postulated that Clausewitz, were he alive today, might also agree that the statement has validity when applied generally to war and specifically to war and the environment. This seems especially likely since the earth today is generally regarded to be facing a critical and growing threat from activities less violent than war.

How Does the Department of Defense Address Environmental Issues Today? The current administration has made responsible environmental actions around military bases and with defense contractors a high priority.^{9,10} The theme of this strategy was summed up in "C3P2" (clean-up, comply, conservation and pollution prevention). Clean-up refers to the removal or immobilization of hazardous substances on military installations. All entities of the Department of Defense (DoD) are instructed to fully comply with federal, State and local laws and regulations. Conservation encourages resource users to find ways to accomplish missions using fewer resources. Pollution prevention is an emission concept that is simple enough; if a pollutant is not emitted, it does not have to be cleaned-up.

The National Security Strategy recognizes that the increased competition for the "free" goods of clean air and water, productive fisheries and arable land may well lead to political instability around the world.¹¹ The strategy goes further to recognize the multiplying problems of drought, climate change and natural catastrophes to world order and the need for a long term US policy. The question posed here is what consideration should be given to force employment (i.e. military operations). The current defense guidance is silent on this issue.

The Army professes "environmental stewardship"¹² and the Navy "environmental security"¹³ but both refer only to their peacetime intentions similar to C3P2.

Only the recent Bottom-up Review in the current prominent National Security literature mentions the consideration of weapons performance and military operations as a matter of environmental concern.¹⁴ These points are raised in the context of a variety of threats from global to national. To date, apparently no strategy has been articulated to address these concerns.

What Environmental Considerations Should Our Force Employment Planning Include for Wartime Applications?

As the sole superpower in combined wealth and strength, the US is an likely target for ecocidal attacks by those wishing to garner attention. The US in it's role as preeminent champion against tyranny is also very likely to be faced with the dilemma of determining the best course of action, whether diplomatic or military among many, to achieve military objectives while protecting natural resources. Ethical, responsible and prudent behavior that has the strategic best interest of the US and the future world populations will be essential.

Force employment strategies must complement these responsibilities with two fundamental precepts:

- That the US never deliberately wages war on the environment.
- That the US abides by pertinent treaties and conventions, even though other countries may renege on them.

Further, the following policy positions should be specifically adopted by the US.

1. As a general consideration, the US should include environmental effects as an issue of central value along with politics, economics and social effects when deciding whether or

not to wage war and, if so, in what manner. It may well be that the potential long-term environmental risk due to loss of productivity outweighs the importance of other considerations.

2. The US should prioritize potential battlegrounds around the world for their strategic environmental importance. For instance, a particularly productive estuary might be an important area to avoid for an amphibious operation if an air assault would be as effective and the post war rebuilding required a stable source of seafood. In another area of the world, destruction of a forest during a war might be expected to lead to severe erosion and thereby substantial loss of productivity, possible elimination of species with proven or unproven medical utility. SIPRI suggests that valuable natural areas could be permanently protected if they have the following characteristics:
 - They are part of a substantial contribution to the global climate balance.
 - Their ecosystems are recognized to be intrinsically fragile.
 - They support unique habitats.
 - They provide habitat to an endangered or threatened species.[15](#)
3. The US should match conflict type (e.g., low intensity conflict (LIC)) and associated expected damage with ecosystem priority. For example, for a short LIC, a moderately robust and elastic ecosystem might be able to tolerate the expected disturbance, while an already stressed and unstable one would not.
4. Retaliation to an environmentally destructive attack with an in-kind response (as in Mutually Assured Destruction) is, by definition, a lose-lose situation for both aggressor and defendant. Suitable responses whether military or diplomatic should be ready in case of such an attack. When essential, offensive and counter-offensive actions should be aimed at perpetrators and military capabilities. These actions should be decisive and trenchant, not broad and imprecise.
5. Treaties and Conventions. International agreements in place serve to provide a foundation, though of course, do not guarantee ethical environmental actions in war. Four of importance to responsible environmental actions in war are:

Convention on the Prohibition of the Development, Production and Stockpiling of Biological and Toxin Weapons (1972).

Binds signatory nations not to use biological weapons.

Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (1977).

Binds signatory nations not to deliberately manipulate nature to suit military purposes.

The Law of the Sea.

A broad agreement on maritime activities which includes provisions not to degrade the sea to suit military objectives.[16](#)

The Chemical Weapons Convention (1992)

Binds signatories not to use "chemical weapons for any reason, including retaliation".[17](#)

Other broad international laws regulating ethical behavior need to be adopted to protect the international environment. For example, a "Law of the Atmosphere" might stipulate as illegal the intentional befouling of the atmosphere or the use of weapons or techniques which have a reasonable probability of changing the weather or climate. In addition, the importance of including a non-retaliation clause, as provided in the Chemical Weapons Convention, cannot be overstated.

6. The US should eliminate all nuclear weapons from its arsenal, as General Charles Horner, retired Commander of US Space Command suggests, while simultaneously pursuing a vigorous policy of urging every other nation to do the same.¹⁸ The reasoning which substantiates a "zero" policy begins with the question of whether we should ever actually use such a weapon for any purpose. The answer is "no", sufficient space supported conventional forces will be all that we need. A more difficult question is "would we ever use nuclear weapons in anger again?" The answer postulated here is, "no", for these reasons.

Consider first-use. Understanding, as we do, the politically destabilizing, morally detrimental and environmentally adverse consequences of using nuclear weapons, it is difficult to imagine any situation in which US first-use is to our advantage.

Consider our opportunity for a retaliatory nuclear strike. Would our reply to launches against the US from within the Ukraine or Russia, as an example, be in kind retaliation? Most likely not since the enemy would not apt to be rational or responsible and therefore would not fear retaliation. Such an event would, most probably, not be nationally sponsored or involve the full coordination of all nuclear weapons within or between these countries. Our response to such an attack likely would be measured and consist of conventional weapons. Taking a non-first-use example, if a nuclear exchange were initiated between Pakistan and India, would the US ever enter the fray with nuclear weapons? This prospect seems remote because the escalation, environmental and moral risks are simply too high. Strategic nuclear don't have value in either case because they offer no deterrence and the potential global environmental disaster with their use would have to be avoided at all political costs.

The mere presence of these nuclear weapons in the world is destabilizing primarily because of the persistent danger of unintended use, such as their falling into the hands of terrorists groups or states who sponsor terrorism. The belief that responsible nations who have nuclear weapons should perpetuate a base level arsenal to discourage their acquisition by those who don't have such weapons ignores the typical terrorist motives. Terrorists groups, such as the Hamas, will not bow to the kind of deterrence effective during the cold war. Further, reprisal with nuclear weapons of our own would be impossible since such groups usually conceal their operations within populated areas and certainly absurd in terms of the necessary force to accomplish the objective, that is, of stopping the terrorist acts. The practical advantage of the "zero" policy is that we need only be concerned about the cheaper alternative of detecting weapons production rather than both tracking existing weapons and detecting production.

The earth and it's atmosphere have tolerated more than a thousand nuclear bomb explosions since the dawn of the nuclear age, many of them much greater in size than the two dropped on Japan in 1945, yet the continued presence of thousands more nuclear weapons still poses the most environmentally devastating potential on earth. The real danger in their existence is in controlling their use after the initial contemporary wartime use. Highly tenuous and questionable command, control and accountability of the thousands of nuclear weapons in various locations around the world would be difficult. First-use today makes the subsequent use far more probable

and begets continued use, truly a potential Pandora's box whereby more frequent and, likely, very reckless use would occur.

Conclusion.

As the world population continues to grow and the effective land and sea areas available to sustain stable, healthy and productive communities of people and other living organisms shrinks, a legitimate international security issue balances on the question of where the equilibrium between population and consumption is to be found. Wars can be expected to be fought over these issues using these very same resources.

The United Nations has adopted the Lovelock concept of earth as Gaia, an interdependent set of components functioning together in homeostasis.¹⁹ Gaia is sensitive to perturbations such as pollution, changes in land use and, of course, war. Those concerned about the health and vitality of the global ecosystem view current anthropogenic perturbations as radical enough to seriously alter the natural and relatively benign balance of life and climate. Others persuasively argue that the earth has demonstrated a remarkable resilience and adaptability which defies man's poor power to disrupt or even to understand its function. Deciding whether or not to account for the environmental consequences of war depends on who is most credible. Prudence dictates actions that are effective with the least disturbance.

Robinson sees two major ways to reduce the effect of war on the environment. One is to preserve certain ecosystems as no-fight zones and the other is to expand the practical knowledge in the civilian community so people are generally knowledgeable about the issue and its intrinsic perils.²⁰

Past wars have been environmentally destructive, but just how important this destruction has been in the long term ecological balance of the earth is not clear. With more people to feed, less arable land and more polluted oceans, national security is increasingly dependent on a healthy global ecosystem and a stable climate. Yet highly destructive weapons in the hands of nations and special interest groups who do not share these concerns (i.e., are irrational) have the potential to threaten our national security when used in environmentally irresponsible ways. In the face of this uncertainty, a prudent path is to minimize as much as possible the human caused change, including that from war, on the environment.

That adverse environmental effects from war should be minimized is perhaps axiomatic. Yet, actions have historically belied intentions. Fortunately, the US has recognized that the global environment is a US national security issue. But implementation of this policy to the fullest extent requires the development of complementary military strategies and doctrine to shape the force structure and the application of force in the future. &127;

Notes

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2. Conrad Crane, The Air War in Europe (Lecture presented to the Naval War College, 13 Oct 94).
3. Susan Lanier-Graham, The Ecology of War: Environmental Impacts of Weaponry and Warfare (New York: Walker & Co., 1993), 52-68.
4. Lanier-Graham, 52-68.
5. SIPRI (Stockholm International Peace Research Institute), Ecological Consequences of the Second Indochina War (Stockholm: Almquist and Eiksell, 1976), 58-72.
6. Kattalai S. Ramachandran, Gulf War and Environmental Problems (New Dehli: Ashish Publishing House, 1991), xiii.
7. Stephen H. Schneider, "The Changing Climate: The Risky Planetwide Experiment" Greenhouse Glasnost: The Crisis of Global Warming (New York: The Ecco Press, 1990), 128.
8. It is presumed here that the first use in wartime, fifty years ago, has been sufficiently forgotten so as not to be an important consideration today.
9. Les Aspen, Annual Report of the Secretary of Defense to the President of the United States (Washington DC: Government Printing Office, 1994), 82-83.
10. Sherri Wasserman Goodman, "Vision for Environmental Security," Defense 94, Issue 3, 1994, 25-39.
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12. Togo D. West and Gordon R Sullivan, A Statement of the Posture of the United States Army Fiscal Year 1995 (Washington DC: US Department of the Army, 1994), 70.
13. John H. Dalton, Department of the Navy Posture 1994 Statement (Washington DC: Department of the Navy, 1994), 47.
14. Les Aspen, Report of the Bottom-up Review (Washington DC: US Department of Defense, 1993), 99.
15. SIPRI, 58-72.
16. Arnd Bernaerts, Guide to the 1982 UN Convention on Law of the Sea (Surrey, England: Fairplay Publications, 1982), 64-65, 126-128.
17. Colin L. Powell, Roles, Missions and Functions of the Armed Forces of the United States (Washington DC: US Department of Defense, 1993), II-5.

18. "Why Not Zero?", Air Force Times, 1 Aug 94, 6.

19. Frank Barnaby, ed., The Gaia Peace Atlas (New York: Doubleday, 1988), 10).

20. J.P. Robinson, The Effects of Weapons on Ecosystems (Elmsford, NY: Pergamon Press, 1979), 68.

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