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“Environment” in the 21st Century, International Law, and the Consequences of Armed Conflict

I. Introduction

A primary motivation for including protection of environment and natural resources in the law of armed conflict and post-conflict legal rules is to establish productive, peaceful societies. Natural resources and environmental conditions influence a country’s ability to provide security, deliver basic services, restore its economy and livelihoods and rebuild governance—four peacebuilding objectives.¹ The principle of environmental integrity expresses a complex set of concepts that form the human view of a healthy, intact natural system that can support these processes. It reflects norms that have deep roots in the law of war, post-conflict reparations processes, and current state practice.² In my analysis of the ENMOD, Additional Protocol I and Treaty of Rome criteria for environmental harm (widespread, long-term and/or severe), I also sought to explain why they were inappropriate and to define “environmental integrity” more precisely. This present research aims to put the concept of environmental integrity into context with some important developments in ecology, conservation biology and natural resource management to advance the project of articulating legal principles that can be applied by military actors, reparations bodies, governments and others engaged in peacebuilding. These ideas apply as well to transitional justice measures, international criminal law proceedings, investment and development aid (particularly major infrastructure projects and development of high-value natural resources), peacekeeping deployments, and managing the toxic remnants of war.

The image that most of us have when we think of environmental integrity is some Edenic vision of pristine nature – quiet forests, sparkling rivers, silvery deserts. If we knew a city before it was bombed, we will think of it as we knew it. This is also the image that is conjured by the touchstone standard for reparations, stated by the Permanent Court of International Justice: “reparation must, as far as possible, wipe out all the consequences of the illegal act and re-establish the situation which would, in all probability, have existed if that act had not been committed.”³ From the perspective of ecology, it is an impossible image, as artificial as the restoration of Warsaw,⁴ although it is strongly echoed in early twentieth century thinking about protecting nature and culture⁵ by establishing national parks.⁶

¹ D. Jensen, S. Lonergan. 2012. Placing Environment and natural resource risks, impacts, and opportunities on the post-conflict peacebuilding agenda. In *Assessing and Restoring Natural Resources in Post-Conflict Peacebuilding*, ed. D. Jensen and S. Lonergan. London: Earthscan, 2, 7.

² C.R. Payne, *The Norm of Environmental Integrity in Post-Conflict Legal Regimes*, in *JUS POST BELLUM* (Carsten Stahn, Jennifer S. Easterday, and Jens Iverson, eds., Oxford University Press, 2014).

³ *Case Concerning the Factory at Chorzów (Germany v. Poland)* (Merits) PCIJ Rep Series A No. 17, 47 (1928).

⁴ UNESCO, World Heritage List: “During the Warsaw Uprising in August 1944, more than 85% of Warsaw’s historic centre was destroyed by Nazi troops. After the war, a five-year reconstruction campaign by its citizens

Appreciation of the lessons of ecology and related disciplines has not fully penetrated *jus post bellum*. Legal traditions persist into the present, defining harms in terms of private property, infrastructure, or iconic landscape elements. This is also how policy makers tend to perceive the environment and natural resources. For example, on the rare occasions when reparations are sought, claims are more likely to resemble Ethiopia's claim seeking compensation for loss of gum Arabic and resin plants before the Eritrea-Ethiopia Claims Commission⁷ than Jordan's claim to the UN Compensation Commission for "remediation of its rangelands, loss of forage production in its rangelands, damage to rangeland wildlife habitats, loss of wildlife, and disruption of a captive-breeding programme for two endangered species (the Arabian oryx and the sand gazelle)," resulting from Iraq's 1990 invasion and occupation of Kuwait.⁸ That is, states still perceive their environmental damage in terms of market-priced resources like crops and overlook pure environmental damage, such as a damaged ecosystem, which is likely to be more crucial to their long-term recovery from the conflict.⁹

To clarify the analysis of environment and natural resources in *jus post bellum*, two concepts are worthy of attention: coupled human and natural systems and change in the environment. National parks prove to be a good laboratory to observe the effects of perturbations on natural systems, management interventions to restore pre-existing conditions, and, ultimately, to return to the question of what concepts like "natural," "pristine," "pre-existing conditions" and "integrity" mean. So, although Yosemite and Yellowstone may seem remote from the scenes of conflict that preoccupy us, I will use the work of their

resulted in today's meticulous restoration of the Old Town, with its churches, palaces and market-place. It is an outstanding example of a near-total reconstruction of a span of history covering the 13th to the 20th century." <http://whc.unesco.org/en/list/30>

⁵ The inclusion of culture as an element of the environment is supported by such diverse organization as the International Union for Conservation of Nature in its definition of a protected area ("an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means." International Union for the Conservation of Nature. 2008. Guidelines for applying protected area management categories. IUCN, Gland, Switzerland.) and the US Army ("environmental considerations, to include the protection and the conservation of natural and cultural resources," Department of the Army, Environmental Considerations, FM 3-34.5/MCRP 4-11B (2010), 1-1)

⁶ The mandate of the US National Park Service, set forth in its organic statute, is to "conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." 16 U.S.C. 1 2 3, and 4), Act of Aug. 25 1916 (39 Stat. 535) and amendments thereto, section 1.

⁷ Sean D. Murphy, Won Kidane, and Thomas R. Snider, *LITIGATING WAR: ARBITRATION OF CIVIL INJURY BY THE ERITREA-ETHIOPIA CLAIMS COMMISSION* (Oxford University Press 2013) (n. 26) 146.

⁸ Report and recommendations made by the Panel of Commissioners concerning the fifth instalment of 'F4' claims" (30 June 2005) UN Doc. S/AC.26/2005/10, para 353.

⁹ Reparations for environmental damage are often resolved by reducing the harm to a monetary value, which can then be paid to the public trustee for the damaged resource. This is practical, but misleading if the international community comes to define environmental value in financial terms. A team of economists, whose work recently valued all ecosystem services provided by the planet, argue that "[m]any ecosystem services are public goods or the product of common assets that cannot (or should not) be privatized ... [their] value in monetary units is an estimate of their benefits to society expressed in units that communicate with a broad audience." Robert Costanza, Rudolf de Groot, Paul Sutton, Sander van der Ploeg, Sharolyn J. Anderson, Ida Kubiszewski, Stephen Farber, R. Kerry Turner, Changes in the global value of ecosystem services, *Global Environmental Change* 26 (2014) 152–158, 157 ("the estimate for the total global ecosystem services in 2011 is \$125 trillion/yr (assuming updated unit values and changes to biome areas) and \$145 trillion/yr (assuming only unit values changed), both in 2007 \$US. From this we estimated the loss of eco-services from 1997 to 2011 due to land use change at \$4.3–20.2 trillion/yr, depending on which unit values are used.")

scientists and managers to discuss fundamental empirical concepts that are relevant to peacebuilding and environmental damage in *jus post bellum*.¹⁰

II.

In international law, concern for the environment is framed almost entirely in anthropocentric terms.¹¹ However, human interests in environmental integrity are not uniform, and concern for environmental integrity functions within the context of earth systems according to laws that are independent of human interests and rules. For example, remediation of conflict-related pollution protects public health; demining allows safe public access to agricultural land; and restoration of natural resources and ecosystems can be essential to recovery of resource-based livelihoods.¹² The necessities of life figure centrally in humanitarian law: water and food, freedom from toxics (“poisons”). These are followed closely by access to means of economic activity and cultural objects and places.

The *jus post bellum* is intended to restore human society after traumatic events. Although the law of armed conflict permits violations of normal conduct, it draws a line at the place where violence goes too far for a community to reassert peace. Included in the conditions for human society to thrive are nature and culture. To understand the prohibition, it is first necessary to picture those peacetime conditions. The extent to which humans have historically managed the peacetime environment and the challenge of providing stable, familiar conditions provide important insights into the vulnerabilities that law must protect.

This section describes the current scientific understanding of change, the coupled human and natural system, and management guidelines that incorporate these concepts in a way that may be integrated into *jus post bellum*.¹³

A. CHANGE

¹⁰ Although my references are to US parks, the scientists and managers participate in an international community of protected area managers. According to the International Union for Conservation of Nature, “roughly a tenth of the world’s land surface is under some form of protected area.” International Union for the Conservation of Nature. 2008. Guidelines for applying protected area management categories. IUCN, Gland, Switzerland.

¹¹ For example, Anne Peters argues, with regard to recent UN Security Council resolutions sanctioning wildlife poachers in two conflict zones, “... if human needs and interests were not in the foreground, the Security Council would not have taken any robust action at all. ... In the long run, however, an ecocentric approach to peace and security seems more appropriate to guarantee a sustainable peace for all living beings on earth.” *EJIL Reflection*

¹² D. Jensen, S. Lonergan. 2012. Placing Environment and natural resource risks, impacts, and opportunities on the post-conflict peacebuilding agenda. In *Assessing and Restoring Natural Resources in Post-Conflict Peacebuilding*, ed. D. Jensen and S. Lonergan. London: Earthscan., 8.

¹³ Gregory Aplet has addressed this from multiple perspectives: Aplet, G.H. and D.N. Cole, The trouble with naturalness: rethinking park and wilderness goals, Ch. 2 in, *Beyond Naturalness: Rethinking Park and Wilderness Stewardship in an Era of Rapid Change* (Cole, D.N. and L. Yung (eds.) Island Press, Covelo, CA, 2010); Aplet, G., and J. Gallo, Applying Climate Adaptation Concepts to the Landscape Scale: Examples from the Sierra and Stanislaus National Forests (The Wilderness Society, Washington, DC, 2012); Aplet, G., On the nature of wildness: exploring what wilderness really protects, *University of Denver Law Review* 76:347-367 (1999); Other authors who have considered this question include Ulrich Heink, Robert Bartz & Ingo Kowarik, How Useful are the Concepts of Familiarity, Biological Integrity, and Ecosystem Health for Evaluating Damages by GM Crops? *J Agric Environ Ethics* (2012) 25:3–17.

Ecological systems were previously believed to be relatively stable, and to tend toward static “climax” states, a belief that subsequent research shattered. So, the author of a classic study wrote “the climax forest ... is the final and permanent vegetation stage, toward the establishment of which all other plant societies are successive steps.”¹⁴ However, since at least the 1960s, scientists have observed that particular ecosystems change over time with and without human intervention.¹⁵ For example, fire and drought are natural perturbations that occur with varying frequency, and long-term pre-industrial changes in climate have caused observable longer-term shifts in ecosystems.¹⁶

In a static world, concepts of preservation and conservation would have objective meaning and legal standards could be defined to maintain those conditions. The example of national parks illustrates the tension between the image of a natural world and the reality of the modern world. Parks, after all, represent the most prized places identified by nations around the world.¹⁷ An influential advisory document prepared for the US National Park Service (NPS), the Leopold Report, recommended that,

As a primary goal ... the biotic associations within each park be maintained, or where necessary recreated, as nearly as possible in the condition that prevailed when the area was first visited by the white man [*sic*]. A national park should represent a vignette of primitive America.¹⁸

The Leopold Report proposed active management techniques to reestablish and then to maintain that static view of the ecosystems that were perceived to be original, or “natural.”

The 2012 review that the National Park Service commissioned a half-century after the Leopold Report reflects a very different view of the world, one which includes stewardship for “continuous change that is not yet fully understood, in order to preserve ecological integrity and cultural and historical authenticity.”¹⁹ While weather and ecological functions are only partially understood, the report also records a host of new anthropogenic changes added to the conditions that shaped the park lands over hundreds and thousands of years: “biodiversity loss, climate change, habitat fragmentation, land use change, groundwater removal, invasive species, overdevelopment and air, noise, and light pollution,” and cultural and socioeconomic changes in the people who interact with the land.²⁰ These are changes that are predicted to affect the environment everywhere, sometimes to levels that risk passing a tipping point into system collapse.²¹

¹⁴ Cooper (1913), quoted in Daniel B. Botkin and Matthew J. Sobel, *Stability in Time-Varying Ecosystems*, *The American Naturalist*, Vol. 109, No. 970 (Nov. - Dec., 1975), pp. 625-646. [Cooper, W. S. 1913. The climax forest of Isle Royale, Lake Superior, and its development. *Bot. Gaz.* 55:1-44, 115-140, 189-234.]

¹⁵ Botkin & Sobel (1975) 628-629.

¹⁶ Botkin & Sobel (1975) 626-629.

¹⁷ The 1972 Convention concerning the Protection of the World Cultural and Natural Heritage recognizes some sites as “parts of the cultural or natural heritage [that] are of outstanding interest and therefore need to be preserved as part of the world heritage of mankind as a whole.”

¹⁸ Advisory Board on Wildlife Management appointed by Secretary of the Interior Udall, *Wildlife Management in the National Parks: The Leopold Report* (March 4, 1963), available at http://www.cr.nps.gov/history/online_books/leopold/leopold4.htm

¹⁹ NPS 2012 at 11.

²⁰ NPS 2012 at 4-5.

²¹ Rockström, J., W. Steffen, K. Noone, Å. Persson, F. S. Chapin, III, E. Lambin, T. M. Lenton, M. Scheffer, C. Folke, H. Schellnhuber, B. Nykvist, C. A. De Wit, T. Hughes, S. van der Leeuw, H. Rodhe, S. Sörlin, P. K. Snyder,

The concept that ecosystems are inherently changing alters the approach to management and puts in question traditional management techniques. Drought is a classic unplanned-for change that impacted the Iraqi Marshes restoration project discussed below.

B. COUPLED HUMAN AND NATURAL SYSTEMS AND THE “PRISTINE MYTH”

The 2012 NPS report conceptualized humans as participants in ecosystems – a very different vision from the pre-contact²² conditions imagined by the Leopold Report. The 2012 report advised that cultural and natural resources cannot be separated and must be managed together; it used the American Bison as an example of a resource that is both ecologically important in maintaining grassland ecosystems and culturally significant.²³ The report defines *ecological* integrity as “the quality of ecosystems that are largely self-sustaining and self-regulating. Such ecosystems may possess complete food webs, a full complement of native animal and plant species maintaining their populations, and naturally functioning ecological processes such as predation, nutrient cycling, disturbance and recovery, succession, and energy flow.”²⁴ This image of the human-nature relationship resulted from decades of research that revealed human influences on what had appeared to be a virtually untouched continent.

It will be obvious that in Europe the human imprint is everywhere and “pristine” environments are essentially nonexistent; it is less obvious but equally true in places like the pre-contact Americas. Just as idealized images of climax ecosystems reflect limited knowledge and short-term observations, the “pristine myth” has been refuted by evidence that Native Americans altered their environments to enrich the species, location and life-stage of plants and animals that they used for food, shelter and goods.²⁵ There is evidence that fire and cultural practices have shaped Amazonian forests, the Great Plains, and the

R. Costanza, U. Svedin, M. Falkenmark, L. Karlberg, R. W. Corell, V. J. Fabry, J. Hansen, B. Walker, D. Liverman, K. Richardson, P. Crutzen, and J. Foley. 2009. Planetary boundaries: exploring the safe operating space for humanity. *Ecology and Society* 14(2): 32. [online] URL: <http://www.ecologyandsociety.org/vol14/iss2/art32/>. The boundaries are: climate change (CO₂ concentration in the atmosphere <350 ppm and/or a maximum change of +1 W m⁻² in radiative forcing); ocean acidification (mean surface seawater saturation state with respect to aragonite 80% of pre-industrial levels); stratospheric ozone (<5% reduction in O₃ concentration from pre-industrial level of 290 Dobson Units); biogeochemical nitrogen (N) cycle (limit industrial and agricultural fixation of N₂ to 35 Tg N yr⁻¹) and phosphorus (P) cycle (annual P inflow to oceans not to exceed 10 times the natural background weathering of P); global freshwater use (<4000 km³ yr⁻¹ of consumptive use of runoff resources); land system change (<15% of the ice-free land surface under cropland); the rate at which biological diversity is lost (annual rate of <10 extinctions per million species); chemical pollution (no boundary determined yet) and atmospheric aerosol loading (no boundary determined yet).

²² “Pre-contact” refers to the period before Europeans contacted the peoples of the Americas.

²³ National Park System Advisory Board Science Committee, *Revisiting Leopold: Resource Stewardship in the National Parks* (2012) 9. M. Kat Anderson argues that “many of the classic landscapes of our national parks ... were shaped by the unremitting labor of generations of indigenous peoples,” that they are now changing because the cultural and natural processes that shaped them are missing, and that restoration will not work unless indigenous practices are reintroduced. M. Kat Anderson & Michael G. Barbour, *Simulated Indigenous Management: A New Model for Ecological Restoration in National Parks*, *Ecological Restoration* 21:4 (Dec. 2003) 270..

²⁴ NPS 2012 at 12.

²⁵ M. Kat Anderson, *The Fire, Pruning, and Coppice Management of Temperate Ecosystems for Basketry Material by California Indian Tribes*, *Human Ecology*, Vol. 27, No. 1, 1999, 79-113. William M. Denevan, *The Pristine Myth: The Landscape of the Americas in 1492*, *Annals of the Association of American Geographers* (1992) 369-385. Sep92, Vol. 82 Issue 3

Pantanal to suit the human inhabitants to such an extent that Denevan says “There are no virgin tropical forests today, nor were there in 1492.”²⁶

Coupled human and natural systems, like those observed in these examples, are now studied in different settings, including cities, rural areas, developed and developing countries.²⁷ They can be defined as “integrated systems in which people interact with natural components.”²⁸ A synthesis study of six case studies observed several common features: “nonlinear dynamics with thresholds, reciprocal feedback loops, time lags, resilience, heterogeneity, and surprises ... past couplings have legacy effects on present conditions and future possibilities.”²⁹

This realization led land managers to the conclusion that desirable ecological conditions that seemed to characterize the Americas have to be actively managed,³⁰ an enterprise which has its own problems when applied to natural or cultural landscapes. To explain the problem, the ecologist David Ehrenfeld invoked von Neumann and Morgenstern’s theorem demonstrating the mathematical impossibility of maximizing more than one variable at a time in an interlinked system.³¹ In other words, it might be possible to manage a forest to maximize the deer population, but the results (empirically demonstrated) are likely to reduce or extirpate populations of other species. There is no general rule to solve the paradox that this creates, that there is no “natural” condition; that there are preferable conditions; that management is necessary to maintain them; and that managing complex natural systems³² is prone to failure.

In a typical post-conflict situation, humanitarian efforts to provide potable water and fuel for human survivors may have widespread negative consequences for key components of the ecosystems they will rely on in the future – fisheries, agricultural land, forests, and so on.

C. GOALS

The pristine myth dissipates in light of the knowledge that environmental conditions are and have been shaped by natural forces and human intention. The 2012 NPS report argued that essential characteristics and processes of healthy ecosystems are equally important management goals as “observable features of iconic species and grand land- and seascapes.”³³ One of these is system resilience.

²⁶ Denevan (1992) 375.

²⁷ Jianguo Liu, Thomas Dietz, Stephen R. Carpenter, Marina Alberti, Carl Folke, Emilio Moran, Alice N. Pell, Peter Deadman, Timothy Kratz, Jane Lubchenco, Elinor Ostrom, Zhiyun Ouyang, William Provencher, Charles L. Redman, Stephen H. Schneider, William W. Taylor, *Complexity of Coupled Human and Natural Systems*, 317 *Science* 1513-1517 (2007).

²⁸ Liu et al., 1513.

²⁹ Liu et al., 1513.

³⁰ M. Kat Anderson & Michael G. Barbour, *Simulated Indigenous Management: A New Model for Ecological Restoration in National Parks*, *Ecological Restoration* 21:4 (2003) 269-277.

³¹ David Ehrenfeld, *The Management of Diversity in Ecology, Economics, Ethics: The Broken Circle* (F. H. Bormann & S.R. Kellert, eds. New Haven: Yale University Press, 1991) 26-39, 30.

³² Note that “complex system” is a term of art in systems theory. Systems may be simple, complicated, complex, or chaotic. In complex systems, “there is no immediately apparent relationship between cause and effect, and the way forward is determined based on emerging patterns.” Snowden, D. & Boone, M. 2007. “A Leader’s Framework for Decision Making.” *Harvard Business Review*. November 2007: 69-76, 72. *See also*, C. R. Payne, *Balancing the Risks: Choosing Climate Alternatives*, *IOP Conf. Ser.: Earth Envtl. Sci.* 8 (2009) at notes 53-57.

³³ NPS 2012 at 10.

System resilience can be analyzed in terms of “animal movements, gene flow, and response to cycles of natural disturbance”³⁴ or other features like watersheds and airsheds. For seasonally mobile migratory species and other species that move in response to short- and long-term system changes (including armed conflict), life-cycle stewardship and collaborative resources management are needed to achieve system resilience.

Lonergan makes this point in his analysis of the stop and start restoration of the Iraqi Marshes (perhaps the original Garden of Eden).³⁵ The marshes were drained by Saddam Hussein to quash political dissidents in the region. After the 2003 invasion forced Hussein from power, an international coalition contributed funds, technical support, and political assistance to restore the marshes. Fed by the Tigris and Euphrates Rivers, the marshes’ ultimate health would depend on cooperation with the upper riparians – Syria and Turkey – and with neighboring Iran. Natural drought conditions, exacerbated by the failure of collaborative management efforts with Turkey and Iran, have led to inadequate water supply. Lonergan predicts that climate change will worsen this situation. He also finds that in some areas the marshes had lost so much ecosystem function that “the marshes’ resiliency might be exhausted,” although other areas began to recover naturally once water was restored. In his view, though the Convention on Wetlands of International Importance (the Ramsar Convention) could provide a useful institutional structure for the riparian states to cooperate, it lacked incentives to force them to work together. He believes that the Iraqi Marsh restoration was not a peacebuilding success.

III. Lessons for *Jus post Bellum*

The laboratory of the park system offers several lessons for those designing post-conflict interventions and legal regimes.

1. Account for change.

The role of change seems most relevant to future-oriented post-conflict activities, such as remedies for environmental harms, economic development projects and environmental restoration efforts. The lessons from studies of ecosystem management suggest that change at multiple scales, resulting from both natural and human causes, means that active management of ecosystem characteristics replaces fixed management of a historic condition. This might lead to difficult choices, which will require thoughtful analysis of normative and empirical questions. For example, if sea level rise and storm surge are predicted to inundate a conflict-damaged wetland in the next ten years, how should a legal right to restoration be implemented? How should local community interests in restoring preexisting conditions be weighed in such a scenario?

2. Consider how human activities and environment function as an interactive system, do not focus exclusively on one element.

The implication for judicial processes, civil or criminal, is to take account of the coupled human and natural system. Measures would include: at the outset, when soliciting claims, to inform potential

³⁴ NPS 2012 at 9.

³⁵ Steve Lonergan, *Ecological Restoration and Peacebuilding: The Case of the Iraqi Marshes in Assessing and Restoring Natural Resources in Post---Conflict Peacebuilding* (D. Jensen & S. Lonergan, London: Earthscan 2012).

claimants that systemic harmful impacts are compensable; to define liability and causation in terms that account for interactions within the system; to obtain expert assistance to evaluate complex claims in light of current scientific knowledge; and to consider the systemic effects of remedies provided.³⁶

For interventions in the immediate post-conflict period, like supplying water and fuel to refugees, information about coupled systems will be limited and certain priorities will predominate. However, best practices can be incorporated to minimize unintended harm.³⁷

For long-term investments by international aid donors, private investors or governments, safeguards established for similar activities during peacetime may be used to evaluate and control for collateral damage. For example, environmental impact assessment is a common practice used to discern this kind of information. It is widespread in domestic legal regimes and the International Court of Justice³⁸ and Law of the Sea Tribunal³⁹ have recognized environmental impact assessment as an international obligation in cases of potential significant transboundary harm. However, armed conflict can be used as a pretext to suspend peacetime laws, and urgency to initiate post-conflict projects may encourage accelerated approvals.⁴⁰ It is important that military forces and investors alike recognize the continuing applicability of environmental safeguards.

3. Recognize that armed conflict constitutes a severe disruption to the environment and that recovery to the conditions before the conflict may not be possible or desirable.

A preferred historical condition may not be recoverable. As *jus post bellum* rules evolve, new criteria may be used, including:

- System resilience;
- Regional, including transboundary, analysis and potential for collaborative management;
- Biodiversity and evolutionary potential;

Expanding the focus of law from single concerns – gold mining, refugee water supply, a fishery – to complex systems complicates the task of post-conflict activities but is likely to make the result more robust.

³⁶ For example, Kuwait sought compensation to excavate and remove the asphalt-like layer of oil residue left on its desert surface from the oil well fires set by retreating Iraqi troops. Scientific experts advised that excavation of the tarcrete layers (although it would have restored the visual appearance of the sites) could reduce the success of revegetation efforts. “Report and recommendations made by the Panel of Commissioners concerning the third instalment of ‘F4’ claims” (18 December 2003) UN Doc. S/AC.26/2003/31, 47.

³⁷ Annica Waleij, Timothy Bosetti, Russ Doran, and Birgitta Liljedahl, “Environmental Stewardship in Peace Operations: The Role of the Military” in Carl Bruch, William Carroll Muffet, and Sandra S. Nichols (eds), *Strengthening Post-Conflict Peacebuilding through Natural Resource Management*, Vol. 6: Governance, Natural Resources, and Post-Conflict Peacebuilding (forthcoming).

³⁸ *Pulp Mills on the River Uruguay (Argentina v. Uruguay)* Merits, Judgment, I.C.J. Reports 2010.

³⁹ *Seabed Disputes Chamber of the Int’l Trib. for the Law of the Sea, Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area*, Advisory Opinion, (2011), paras 145-148.

⁴⁰ Jensen & Lonergan at 8.

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