

SPECIAL ISSUE ARTICLE

Toxic entanglements: Multispecies politics, white phosphorus, and the Iraq War in Alaska

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Abstract

This article explores avian experiences with toxic war processes that unfold across space and time. Joining together three evolving areas of interest in global politics – ontologies of war, interspecies relations, and sensory politics – the article develops a view of war that centres ongoing war processes that affect more-than-human life in and outside of international warzones. Advancing a multispecies form of inquiry attentive to local voices, including Upper Cook Inlet Tribes, the article examines how interspecies relations emerge in national security debates about long-lasting ecological costs of war. Specifically, it offers an analysis of US Department of Defense hearings surrounding the controversy over reopening Eagle River Flats – an Alaskan estuary that had been polluted with white phosphorus munitions – for weapons testing and training during the Iraq War. The article also considers the experiences of two migratory avian communities (northern pintails and tundra swans) with toxic white phosphorus pollution, illustrating more-than-human sensory perspectives on the space and time of war processes. These conceptual and empirical moves reposition national security concerns about wartime risk into a much broader post-anthropocentric perspective.

Keywords: Alaska; Birds; Iraq; Multispecies; Ontology; Sensory; Temporality; War; White Phosphorus

Introduction

In late 2004, the US military used controversial white phosphorus munitions in Fallujah, Iraq. A *New York Times* editorial described how exploded munitions would rain down ‘flaming chemicals, which cling to anything they touch and burn until their oxygen supply is cut off. They can burn for hours inside a human body.’¹ While the international community rightfully condemned these actions, it was not the first controversy involving the US military and white phosphorus. Twenty years earlier, the US Environmental Protection Agency listed Eagle River Flats, a salt marsh estuary in Alaska, as a ‘superfund’ site because of toxic military pollution. For decades, the estuary had been used as an impact range for white phosphorus munitions testing. In this estuarine habitat of Beluga whales, dabbling ducks, and nesting swans, thousands of birds were poisoned and killed from exposure to the munitions. The harm was long-lasting. Munitions used in the 1950s and recovered in 2006 still contained a high amount of white phosphorus.² The US military stopped testing white phosphorus weapons in Eagle River Flats in 1990, began remediating the estuary, and reduced live-fire training in the mid-1990s to winter months when ice might prevent white phosphorus from being disturbed. Still, dabbling ducks continued dying from exposure to these munitions.³

¹‘Shake and bake’, *New York Times* (29 November 2005).

²Michael R. Walsh, Marianne E. Walsh, and Øyvind A. Voie, ‘Presence and persistence of white phosphorus on military training ranges’, *Propellants, Explosives, Pyrotechnics*, 39:6 (2014), pp. 922–31.

³*Ibid.*

In 2007, the US military sought to reopen the estuary for year-round weapons testing as part of an effort to train more soldiers for combat in Iraq. According to military officials, the exigencies of national security required more time for military training in Eagle River Flats. The local community, including members of Upper Cook Inlet Tribes, responded with concerns about human and more-than-human risk. In a public hearing with military officials, a member of the Chickaloon Village Traditional Council (*Nay'dini'aa Na' Kayax*) expressed how they were 'certainly not in favor of sending any soldiers to Iraq that are not well trained' but called into question 'year-round-training to send people to die when it takes 24 years to protect a bird'.⁴ Given the history of military pollution, they were concerned about how national security claims regarding Iraq could perpetuate multispecies harm in Alaska:

It took from 1982 to 2006 to clean up Eagle River Flats before. And from my culture and our beliefs, the waterfowl are as important to life on this earth as any human being ... It goes against my basic beliefs about how life should work, to try and understand why the Army can defend the Iraqi people at the same time they're putting humans, my relatives, my friends, my neighbors at risk by exploding munitions.⁵

These comments gesture towards a view of international war as a set of multispecies, multi-spatial, and multitemporal processes. The Iraq War, from this vantage, was never exclusively a human affair in Iraq in the 2000s; rather, it was constituted by processes that extended across space and time and involved a multispecies tangle of actors. In other words, the Iraq War was not a discrete spatiotemporal event but part of a larger set of multitemporal and multispatial processes affecting human and avian life. This perspective prompts us to rethink the space and time of war, both in terms of its constitutive processes and multispecies sensory experiences.

The conceptual aim of this article is threefold. First, despite recent attention to ontologies of war, the processes of wartime violence occurring away from international warzones have been largely overlooked. In approaching war in terms of constitutively entangled war processes, the article facilitates a more fluid and more-than-human reflection on the kinds of ontological claims International Relations (IR) makes, particularly arguments about the spatiotemporal structure of wartime violence.⁶ It further draws this literature into conversation with work on sensory politics and bodily experiences of war, encouraging reflections on war that centre more-than-human perspectives on bodily risk and harm, both within and away from international warzones. Second, the article builds on recent scholarship describing non-human aspects and effects of war.⁷ Typically absent from these studies, however, is empirical attention to policy debates about wartime violence and risk involving non-human animals. Beyond gesturing towards an ontological

⁴US Army Garrison Fort Richardson, Department of the Army, *Draft Environmental Impact Statement for Resumption of Year-Round Firing Opportunities at Fort Richardson, Alaska, Volume 2* (2010), pp. B-122–3.

⁵Ibid.

⁶Astrid H. M. Nordin and Dan Öberg, 'Targeting the ontology of war: From Clausewitz to Baudrillard', *Millennium: Journal of International Studies*, 43:2 (2015), pp. 392–410; Caroline Holmqvist, 'War, "strategic communication" and the violence of non-recognition', *Cambridge Review of International Affairs*, 26:4 (2013), pp. 631–50; Caroline Holmqvist, 'War/space: Shifting spatialities and the absence of politics in contemporary accounts of war', *Global Crime*, 13:4 (2012), pp. 219–34; Caroline Holmqvist, 'Undoing war: War ontologies and the materiality of drone warfare', *Millennium: Journal of International Studies*, 41:3 (2013), pp. 535–52; Jens Bartelson, *War in International Thought* (New York, NY: Cambridge University Press, 2017). For a discussion of security and spatial ontologies, see Daniel Lambach, 'Space, scale, and global politics: Towards a critical approach to space in International Relations', *Review of International Studies* (2021), available at: {doi: 10.1017/S026021052100036X}.

⁷Matthew Leep, 'Stray dogs, post-humanism and cosmopolitan belongingness: Interspecies hospitality in times of war', *Millennium*, 47:1 (2018), pp. 45–66; Erika Cudworth and Stephen Hobden, 'The posthuman way of war', *Security Dialogue*, 46:6 (2015), pp. 513–29; Benjamin Meiches, 'Non-human humanitarians', *Review of International Studies*, 45:1 (2019), pp. 1–19. For interdisciplinary perspectives, see Ryan Hediger, *Animals and War: Studies of Europe and North America* (Boston, MA: Brill, 2013).

fluidity of war devoid of empirical relevance, I move towards a kind of multispecies empiricism grounded in human and more-than-human perspectives. Specifically, the article conducts an empirical inquiry into US Department of Defense (DoD) hearings to understand how debates about multispecies risk and violence unfold. Third, the article contributes to understanding multispecies features of national security and war by exploring how security matters are bound up with questions about non-human risk in times of war. It extends recent attempts to rethink national security as an ‘interspecies practice’ by assessing DoD hearings about white phosphorus pollution and avian harm in relation to the Iraq War.⁸ The article also widens our view of national security by considering avian perspectives on the space of wartime risk. In particular, it considers how migratory tundra swan and northern pintail communities encountered the spacetime of weapons testing and training as DoD officials pressed to reopen an avian habitat to bolster US national security during the Iraq War. Related to Antoine Bousquet, Jairus Grove, and Nisha Shah’s recent ‘martial empiricism’ that seeks to ‘follow the processes and operations of war wherever they lead us’,⁹ this article advances a form of inquiry that we might call ‘multispecies empiricism’, which involves assessing both human and more-than-human perspectives on war processes that unfold across space and time.

With these aims in mind, the article proceeds as follows. The first section considers ontologies of war that account for how multispatial and multitemporal processes of war pose violent risks to human and more-than-human life. With a view towards multispecies empiricism, the article calls into question certain spatiotemporal assumptions of what war is and whose experiences matter. Section two considers the time and space of the Iraq War in Eagle River Flats, Alaska. Offering an analysis of DoD hearings about multispecies risk in reopening an estuary for weapons training during the Iraq War, the article assesses debates over the meaning of time, space, and risk of war processes beyond the orthodox spatiotemporal event of war. The third section considers northern pintail and tundra swan encounters with these war processes, providing a glimpse into more-than-human sensory experiences of national security practices.

Ontologies of war and (multispecies) sensory politics

International war is one of the defining subjects of International Relations (IR). Yet, as Tarak Barkawi and Shane Brighton argue, there has been a ‘fundamental problem of the conceptual black hole surrounding the notion of war itself’.¹⁰ ‘What is it? How ought we to think about it, inquire into it?’ they ask, suggesting that war is ‘largely under-theorized at the most basic level: ontology’.¹¹ Initiating a kind of ontological turn in war studies, Barkawi and Brighton urge us to see that ‘war is defined by fighting or its immanent possibility’.¹² An intriguingly productive way to think about ontologies of war, this approach nonetheless sidesteps important questions about the time and space of war processes (for example, weapons testing, soldier training, and weapons research). These processes do not involve fighting or its possibility, and they occur far away from any potential warzone. Yet fighting depends on these processes. US combat soldiers, for example, would test weapons and train elsewhere before fighting in Fallujah. These processes can entangle human and non-human life in forms of slow violence (for example, toxic pollution) or quick bursts of violence (for example, inadvertent bombing).¹³ Ontologies of

⁸Rafi Youatt, *Interspecies Politics: Nature, Borders, States* (Ann Arbor, MI: University of Michigan Press, 2020), p. 68.

⁹Antoine Bousquet, Jairus Grove, and Nisha Shah, ‘Becoming war: Towards a martial empiricism’, *Security Dialogue*, 51:2–3 (2020), p. 99.

¹⁰Tarak Barkawi and Shane Brighton, ‘Powers of war: Fighting, knowledge, and critique’, *International Political Sociology*, 5:1 (2011), p. 129.

¹¹*Ibid.*, pp. 129, 134.

¹²*Ibid.*, p. 134.

¹³For discussion of toxic experiences, see Jen Bagelman and Sarah Marie Wiebe, ‘Intimacies of global toxins: Exposure and resistance in “Chemical Valley”’, *Political Geography*, 60 (2017), pp. 76–85. For a discussion of ‘slow violence’, see Thom

international war that privilege human fighting in and adjacent to warzones miss experiences of war processes that can be toxic and deadly – to human and non-human life. In a critique of ontological work on war in IR, Bousquet et al. aptly suggest that ‘every attempt to conceptually shackle war’ can be ‘undone’ by considering ‘its new modes ... and intensities’.¹⁴ Relatedly, I argue that ontological reflection can also open or intensify a multispecies view of war by attending to processes and experiences that challenge customary definitions of what counts as the time and space of war. Ontological reflection need not determine or limit empirical possibilities but instead open our options for reconsidering the manifold ways in which war processes operate across space, time, and species.

What kind of ontological shift can encompass more-than-human experiences with the constituent processes of war – processes that occur away from the spacetime of international warzones? Such a shift could involve thinking in terms of *ontologies* rather than *ontology*, eschewing claims towards fundamental, foundational, or essential truths of war.¹⁵ Ontologies, in this sense, are contestable portraits of the world that ‘disclose the world to us in such a way that we think and feel it differently than we might otherwise’.¹⁶ On this point, this article does not posit an ontology of war in order to extract a solution to the question of what war is. Instead, it engages in ontological reflection to problematise certain spatiotemporal assumptions of what war is in order to expand our ethical and empirical horizons into the spatiotemporal complexity and multispecies experientiality of war. Certain forms of ontologising war risk distilling it in ways that make particular features or experiences of wartime less visible. In contrast, ontological reflection refuses to secure an essentialised coherence to war as a means of making more evident how the relational mechanisms of war affect human and non-human bodies across time and space. Rather than locating war in the restricted spatiotemporal and human terms of fighting in international war zones (or war zone-adjacent spaces) during bounded ‘times of war’, we might conceive war in terms of ongoing processes that affect more-than-human life in and outside of the spacetime of warzones.¹⁷

Attending to war as constitutively entangled war processes follows in the path of others focusing on sensory politics and bodily experiences.¹⁸ Judith Butler, for instance, posits a ‘bodily ontology’ as a means of taking seriously how political forces condition possibilities of vulnerability, injurability, and flourishing.¹⁹ Butler moves from ontology as ‘a description of fundamental structures of being that are distinct from any and all social and political organization’ to a concern with the ‘normative production of ontology’ that makes certain lives knowable in ways that structure ethico-political modes of acknowledgement and action.²⁰ Such a move intensifies attention

Davies, ‘Slow violence and toxic geographies: “Out of sight” to whom?’, *Environment and Planning C: Politics and Space* (2019), available at: {doi: 2399654419841063}.

¹⁴Bousquet et al., ‘Becoming war’, p. 100.

¹⁵Stephen K. White, *Sustaining Affirmation: The Strengths of Weak Ontology in Political Theory* (Princeton, NJ: Princeton University Press, 2000). For a related argument, see Bousquet et al., ‘Becoming war’.

¹⁶White, *Sustaining Affirmation*, p. 10.

¹⁷On these points, this article is connected to the recent militarism literature. See Anna Stavrianakis and Maria Stern, ‘Militarism and security: Dialogue, possibilities and limits’, *Security Dialogue*, 49:1–2 (2018), pp. 3–18. The arguments advanced here should find resonance with and provide a more-than-human sensibility to Stavrianakis and Stern’s insightful and open-ended agenda. The study of militarism, which emphasises gendered norms and the normalisation of military violence, might pursue a fuller account of how non-human lives inform or are influenced by these norms and normalisation processes.

¹⁸Tanya Narozhna, ‘The lived body, everyday and generative powers of war: Toward an embodied ontology of war as experience’, *International Theory* (2021), available at: {doi: 10.1017/S1752971921000129}; Christine Sylvester, *War as Experience: Contributions from International Relations and Feminist Analysis* (New York, NY: Routledge, 2013); Swati Parashar, ‘What wars and “war bodies” know about International Relations’, *Cambridge Review of International Affairs*, 26:4 (2013), pp. 615–30; Linda Åhäll, ‘Feeling everyday IR: Embodied, affective, militarising movement as choreography of war’, *Cooperation and Conflict*, 54:2 (2019), pp. 149–66.

¹⁹Judith Butler, *Frames of War: When is Life Grievable?* (New York, NY: Verso, 2009), pp. 2–3.

²⁰*Ibid.*, p. 2.

to the life and death effects of multispecies politics. ‘Life’, Butler notes, is politically precarious as it depends on sustaining conditions and involves the ‘interdependency of persons ... relations to the environment and to non-human forms of life’.²¹ As such, ontologies of the ‘human’ and the ‘animal’ are not separable.²² Military violence produces multispecies vulnerability. In warzones, human and more-than-human life is structured by manifestations of military force that convert the space and time of living into spatiotemporalities of psychological harm and bodily destruction. Yet IR scholars have only recently begun to touch on questions about sensory multispecies experiences of war.²³ Deeper elaboration of more-than-human sensory experiences with wartime violence – in and away from warzones – brings into view certain multispatial and multitemporal forms of (human and non-human) bodily violence.

Butler’s ontological reflections importantly centre bodily exposure to wartime risk. ‘Times of war’, they argue, produce ‘heightened risk’ for ‘sentient life of all kinds’.²⁴ Wartime risk involves contestable articulations and calculations about potential exposure to harmful effects of war. Central to wartime decision-making and the legitimization of contemporary warfare is framing certain populations as ‘risky or ‘at risk’.²⁵ With a focus on how governments mitigate and manage wartime risk, Louise Amoore and Marieke de Goede raise an important question about ‘the gaps, ambiguities and resistances to these practices’.²⁶ There are several notable gaps that this article addresses, which include exploring how precisely multispecies risk is articulated in policy debates and how we might more adequately articulate non-human animal experiences of risk. The article also zooms in on multispecies risk in terms of war processes that pose violent risks ‘outside’ of traditionally defined international wars.

Though war processes play a constitutive role in the manifestation of traditional wartime events, they are importantly associated with multispecies risks away from the battlefield. One of the more alarming cases of US military violence involving non-human animal life occurred in the late 1960s – not in Vietnam but near a weapons testing site in Utah. Created ‘in the desert wasteland of Utah’ for the purpose of ‘field testing, proof firing, and surveillance of chemical agents and munitions under temperate zone conditions’, the Dugway Proving Ground began as a Second World War US military project to study and test chemical weapons.²⁷ At Dugway, the US military tested chemical anti-crop agents – ‘agent orange’ weapons – that would be used extensively in Vietnam throughout the 1960s.²⁸ A 1959 report notes that phosgene, cyanogen chloride, and hydrogen cyanide bombs were tested in Dugway in order ‘to estimate the quantity of munitions required to lay down a lethal concentration of gas upon a given area’.²⁹ Hundreds of pounds of VX – a toxic nerve agent – were sprayed on the proving ground. In 1968, VX was found in vegetation and snow water in nearby Skull Valley. It was also found in the bodies of thousands of dead sheep. A deputy sheriff witnessed the scene and observed their convulsions and deaths. Approximately six thousand sheep were killed.³⁰

These convulsions and deaths reveal wartime experience as something that cannot be limited to certain species or contained within the time and space of international war. To return to

²¹Ibid., p. 19.

²²Ibid., p. 76.

²³Matthew Leep, *Cosmopolitan Belongingness and War: Animals, Loss, and Spectral-Poetic Moments* (Albany, NY: SUNY Press, 2021).

²⁴Butler, *Frames of War*, p. 46.

²⁵Louise Amoore and Marieke de Goede, ‘Introduction: Governing by risk in the war on terror’, in Louise Amoore and Marieke de Goede (eds), *Risk and the War on Terror* (New York, NY: Routledge, 2008), pp. 5–19.

²⁶Amoore and de Goede, ‘Introduction: Governing by risk in the war on terror’, p. 7.

²⁷Leo P. Brophy, Wyndham D. Miles, and Raymond C. Cochrane, *The Chemical Warfare Service: From Laboratory to Field* (Washington, DC: Center of Military History United States Army, 1959), p. 39.

²⁸Alvin L. Young, *The History of the US Department of Defense Programs for the Testing, Evaluation, and Storage of Tactical Herbicides* (Arlington, VA: Office of the Under Secretary of Defense, 2006).

²⁹Brophy et al., *The Chemical Warfare Service*, p. 39.

³⁰Lee Davidson, ‘Lethal breeze’, *Deseret News* (5 June 1994).

Barkawi and Brighton, fighting (or its possibility) is certainly a key aspect of international war and security. Yet fighting depends on war processes such as weapons testing and training, which have profound effects on non-human life far away from the time of fighting in and around warzones. A distillation of international war to an essence of fighting within warzones forecloses the possibility of many more-than-human sensory experiences of violence to emerge as subjects of war and national security. The ontological boundary lines that mark the spatiotemporal 'inside' and 'outside' of war therefore matter in a significant way. Ontological commitments shape attention to which events constitute war, informing possibilities for not only acknowledging but giving meaningful attention to non-human perspectives as well as influencing which bodily experiences count as wartime/space violence.

In order to understand what war is and what it does to bodies, IR scholars must re-envision when it emerges and how its time and timing shape political decisions.³¹ Recent attention to the temporality of war provides us with a diverse set of insights into how memories of wartime shift or become fixed, as well as how claims about time and timelessness of war inform possibilities of counterterrorism operations.³² Without 'an intelligible definition of victory', for example, Andrew Hom argues that 'counterterrorism war become a self-propagating political timing practice' that shifts into 'a perpetual "time of peril"'.³³ A central feature of this literature therefore is a critique of the cultural production of the 'exceptionalism' of wartime – a time marked off from 'non-war' time, which gives rise to forms of politics and law that legitimate torture, drone strikes, and additional fighting. Mary Dudziak notably shows how the persistence of war destabilises the rigid distinction between 'wartime' and 'peacetime'.³⁴ Given the United States' continuous use of force abroad, including the 'countless "small wars" and the so-called forgotten wars', Dudziak reminds us that 'war is not an exception to normal peacetime, but instead an enduring condition'.³⁵ This point is well taken, though there is a commitment to a certain spatiality that underpins this temporal perspective. The 'enduring condition' of war refers to the use of force *abroad* – against particular kinds of targets. Yet the use of force abroad is entangled with 'war systems' that are spatially scattered and involve quick and slow forms of toxic multispecies violence.³⁶ Rather than tempering this violence with mitigating terms such as militarism or preparation, considering multispecies experiences of toxic violence to be central to the time of war offers a more inclusive and accurate view of its costs.

Related to Dudziak's points, Christopher McIntosh calls attention to how the 'Iraq War begun in 2003 is often positioned as somehow distinct from US actions in Afghanistan and separate still from ongoing operations in northern Iraq and Syria'.³⁷ Such a claim astutely illuminates how the

³¹Andrew R. Hom, *International Relations and the Problem of Time* (New York, NY: Oxford University Press, 2020).

³²Victoria M. Basham, 'Telling geopolitical tales: Temporality, rationality, and the "childish" in the ongoing war for the Falklands-Malvinas Islands', *Critical Studies on Security*, 3:1 (2015), pp. 77–89; Lee Jarvis, 'Times of terror: Writing temporality into the war on terror', *Critical Studies on Terrorism*, 1:2 (2008), pp. 245–62; Kimberly Hutchings, 'Happy anniversary! Time and critique in International Relations theory', *Review of International Studies*, 33:S1 (2007), pp. 71–89; Olivier Schmitt, 'Wartime paradigms and the future of Western military power', *International Affairs*, 96:2 (2020), pp. 401–18; Anna Agathanagelou and Kyle Killian (eds), *Time, Temporality, and Violence in International Relations: (De)Fatalizing the Present, Forging Radical Alternatives* (New York, NY: Routledge, 2016).

³³Andrew R. Hom, 'Timing is everything: Toward a better understanding of time and international politics', *International Studies Quarterly*, 62:1 (2018), p. 76.

³⁴Mary L. Dudziak, *War Time: An Idea, Its History, Its Consequences* (New York, NY: Oxford University Press, 2012).

³⁵*Ibid.*, p. 5.

³⁶For a discussion of war systems and preparation, see Mark Woods, 'The nature of war and peace: Just war thinking, environmental ethics, and environmental justice', in Michael W. Brough, John W. Lango, and Harry van der Linden (eds), *Rethinking the Just War Tradition* (Albany, NY: SUNY Press, 2007), p. 19. See also Marcus Hedahl, Scott Clark, and Michael Beggins, 'The changing nature of the just war tradition: How our changing environment ought to change the foundations of just war theory', *Public Integrity*, 19:5 (2017), pp. 429–43.

³⁷Christopher McIntosh, 'Theorizing the temporal exception: The importance of the present for the study of war', *Journal of Global Security Studies*, 5:4 (2020), p. 553.

Iraq War continues elsewhere in different forms; however, the ontology animating these claims appears to be informed by a view of wartime violence defined as the persistence of combat operations abroad. The time of war, I argue, involves processes that precede and persist beyond these forms of violence abroad. McIntosh insightfully argues for a temporal imaginary of war that is focused on present articulations of time, suggesting wars ‘exist as events and are constituted via a collective imaginary’, which, importantly, ‘must be continually produced and reproduced in moments of the present to enable these actions and practices to be made intelligible as discernable events’.³⁸ But what assumptions underpin the language of war in terms of a discernable wartime *event*? How do temporal claims of eventness rely on certain spatial imaginations of war? Perhaps we can draw attention not only to ‘dominant’ or coherently ‘collective’ imaginations of war, but also to the contestable and resistant (human and more-than-human) imaginations of war that exist on the margins. To this point, perhaps we can productively interrogate certain ontological impulses that form our spatial assumptions of wartime violence.³⁹ Such queries and suggestions press us to see the event of war in relational and more-than-human terms.

On the concept of the event, philosopher John Dewey reminds us that the beginning and end of an event are spatiotemporal demarcations, which are the result of judgements made within the process of inquiry.⁴⁰ An ‘*event* is a term of judgment, not of existence apart from judgment’, he writes.⁴¹ As Dewey claims, it is within inquiry that fluid processes that move across space and time are delimited into certain spatiotemporal separations. With an inquiry into war as an array of potentially violent processes, we begin ‘seeing together ... what before had been seen in separations and held severally apart’.⁴² The ‘events’ selected and judged as ‘isolated and self-enclosed’ are part of a larger relational flow of processes ‘involved in a continuing course of existence’.⁴³ Temporal judgements about what the event of war ‘is’ are intricately tied into judgements about spatiality. Dewey argues that ‘events do not occur just in time. They take place somewhere, and the conditions of this “somewhere” stand in coexistence with one another and also in coexistence with things taking place elsewhere. Locations, places, and sites are relative to one another; they co-exist’.⁴⁴ Phosphoric moments in Fallujah and Eagle River Flats, for example, have a kind of spatiotemporal coexistence. How the spatiotemporal assessment of these events becomes separated or connected, in Dewey’s terms, is ‘relative to the objective intent set to inquiry’.⁴⁵ The objective of this article is in part a response to Astrid H. M. Nordin and Dan Öberg’s important question: ‘Are there processes of warfare through which experiences of injury are made to appear distant and irrelevant?’⁴⁶ This question demands not only a theoretical critique but empirical attention to the human and more-than-human perspectives on violent war processes.

The objective of this article is also related to a long history of feminist scholars offering criticisms of an event view of war.⁴⁷ Feminist scholars have drawn attention to sexual assaults in and

³⁸Ibid., p. 552.

³⁹For similar points, see Michael J. Shapiro, *Violent Cartographies: Mapping Cultures of War* (Minneapolis, MN: University of Minnesota Press, 1997) and Derek Gregory, ‘The everywhere war’, *Geographical Journal*, 177:3 (2011), pp. 238–50.

⁴⁰Jonathan Isacoff elaborates on these points by arguing that ‘events’, for Dewey, ‘have no beginning or end of which we can be certain’. As Isacoff insightfully notes, this ‘suggests the somewhat radical notion that historical reality is characterized only by process and as such is fundamentally indeterminate’. Jonathan B. Isacoff, ‘Pragmatism, history, and IR’, in Harry Bauer and Elisabetta Brighi (eds), *Pragmatism in International Relations* (New York, NY: Routledge, 2009), p. 72.

⁴¹John Dewey, *Logic: The Theory of Inquiry* (New York, NY: Henry Holt, 1938), p. 222.

⁴²John Dewey and Arthur Bentley, *Knowing and the Known* (Boston, MA: Beacon Press, 2008 [orig. pub. 1949]), p. 134.

⁴³Dewey, *Logic*, pp. 223–4.

⁴⁴Ibid., p. 239.

⁴⁵Ibid., p. 222.

⁴⁶Nordin and Öberg, ‘Targeting the ontology of war’, p. 399.

⁴⁷Robin May Schott, ‘Gender and postmodern war’, *Hypatia*, 11:4 (1996), pp. 19–29.

around foreign military bases, revealing how the experience of war is inclusive of military preparation and readiness efforts.⁴⁸ Decades ago, Chris Cuomo contended that ‘accounts of war that only focus on events are impoverished’ and argued for a view of ‘war as part of enmeshed continua or spectra of state-sponsored and other systemic patriarchal and racist violence’.⁴⁹ Cuomo confronted our ‘willingness to think of war without considering the presence of war in “peaceful” times’, and suggested that ‘wars become conceptual entities – objects for consideration – rather than diverse, historically loaded exemplifications of the contexts in which they occur.’⁵⁰ Multispecies empiricism responds to what Cuomo identified as the need to look at war in a diverse array of contexts. It also aligns with Kimberly Hutchings’ recent claim that ‘wars cannot be reduced to sets of individual decisions, and if we are going to think seriously about wars at all we need also to think about war as an ongoing institution, ideology and set of practices.’⁵¹ With greater sensitivity to more-than-human life and loss, this kind of reflection fosters recognition of what gets lost amid certain ontological attachments and assumptions.

National security, white phosphorus, and the Iraq War in Alaska

While there has been increasing focus on interspecies aspects of global affairs, there is little attention to how interspecies issues emerge in national security debates. Rafi Youatt has quite powerfully demonstrated the interspecies complexity of national security in the context of US practices in Guantánamo Bay.⁵² Ben Meiches’ work on dog deminers in humanitarian operations likewise provides important insights into ‘different ethical horizons of humanitarianism’.⁵³ But how are interspecies issues conceptualised and debated by national security officials and the public? Certainly, non-human animals are often left outside of national security considerations. Yet there is an important need to generate descriptive and empirical accounts of how interspecies relations emerge in security debates among officials and the public. Tying theoretical or ethical attention to real-world policy debates can add considerable depth to our understanding of multispecies politics by closing, to some extent, the ‘gap between the tangled realities of practice and the abstract forms of theory’.⁵⁴ There has been recent normative attention to the multitemporal effects of white phosphorus weapons on civilians.⁵⁵ These important reflections, however, focus on its effects in recognisable times of war in Iraq and Gaza without much emphasis on debates about the multispecies effects in contexts away from warzones.⁵⁶ With this in mind, this section illustrates the upshot of multispecies empiricism in the context of DoD hearings on reopening Eagle River Flats for weapons training during the Iraq War.

Eagle River Flats (ERF) is a salt marsh estuary near Anchorage, Alaska. The estuary undergoes seasonal transitions relevant to wildlife. In winter months the estuary is iced over. In warmer months, its marshes, ponds, tidal swamps, and mudflats are teeming with plant and fish life.

⁴⁸Cynthia Enloe, *Maneuvers: The International Politics of Militarizing Women’s Lives* (Berkeley, CA: University of California Press, 2000); Kozue Akibayashi and Suzuyo Takazato, ‘Okinawa: Women’s struggle for demilitarization’, in Catherine Lutz (ed.), *The Bases of Empire: The Global Struggle against U.S. Military Posts* (New York, NY: New York University Press, 2009), pp. 243–69.

⁴⁹Chris J. Cuomo, ‘War is not just an event: Reflections on the significance of everyday violence’, *Hypatia*, 11:4 (1996), pp. 31, 36.

⁵⁰*Ibid.*, p. 36.

⁵¹Kimberly Hutchings, ‘From just war theory to ethico-political pacifism’, *Critical Studies on Security*, 7:3 (2019), p. 193.

⁵²Youatt, *Interspecies Politics*.

⁵³Meiches, ‘Non-human humanitarians’, p. 8.

⁵⁴John Dewey, ‘Three independent factors in morals’, in Larry A. Hickman and Thomas M. Alexander (eds), *The Essential Dewey, Volume 2: Ethics, Logic, Psychology* (Bloomington, IN: Indiana University Press, 1998), p. 320.

⁵⁵Mark Griffiths, ‘The geontological time-spaces of late modern war’, *Progress in Human Geography* (2021), available at: {doi: 10.1177/03091325211064266}.

⁵⁶Joseph Pugliese, *Biopolitics of the More-than-Human: Forensic Ecologies of Violence* (Durham, NC: Duke University Press, 2020).

From April through October it serves as an attractive location for shorebirds and migratory waterfowl.⁵⁷ Trumpeter swans are frequently observed with their cygnets. Mallards, northern pintails, and green-winged teals migrate into the estuary for the summer months. Geese, including Canada, greater white-fronted, and snow, arrive between April and August. In total, over one hundred different types of birds dwell in the estuary.⁵⁸ It is a home, a source of life, and a space for avian activities, including the raising of young waterfowl and fledglings. Beyond birds, beluga whales swim and fish in the Eagle River from June through October. They likely swim under the ice during winter months, though scientists have difficulty tracking them.⁵⁹

The 22,000 acres of ERF is also sovereign space of the US military, as it is located within the parameters of Joint Base Elmendorf Richardson (known as JBER). The base covers 64,000 acres of coastal lowlands. The majority of JBER's land has been used for various forms of military training. About one-third of it serves as artillery ranges and impact areas for weapons testing, ordnance detonation, and firing practice.⁶⁰ Since the 1940s, ERF has been used for live-fire training exercises and the testing of mortar rounds, rockets, and grenades. The estuary was also a testing location for white phosphorus smoke munitions.

After decades of testing white phosphorus munitions in ERF, controversy emerged when the munitions were found to be poisoning birds. In the early 1980s, it was discovered that dabbling ducks in ERF were dying in significant numbers. Due to suspicions that military activities were the cause, the US Army temporarily suspended its activities in ERF in 1990.⁶¹ It was later confirmed that the military had contaminated the estuary with white phosphorus.⁶² Researchers found white phosphorus particles in the sediments of the estuary and in the tissue of dead birds.⁶³ It is estimated that thousands of birds ingested white phosphorus particles while eating aquatic plants, poisoning and killing them. The birds likely thought the particles were food. As one study puts it, 'particles of P4 [white phosphorus] at ERF [Eagle River Flats] range in length from 0.15 mm to 3.5 mm and fall within the size range of naturally occurring seeds. Thus, waterbirds may confuse them as food.'⁶⁴ In addition to death, white phosphorus also caused liver damage, lethargy, inappetence, ataxia (impaired balance and coordination), rapid head shaking, and severe convulsions in birds exposed to white phosphorus munitions.⁶⁵ Field reports reveal that many poisoned birds likely drowned after they could no longer keep their heads above water because of convulsions. The convulsions could last for more than two hours.⁶⁶ The avian experience of white phosphorus poisoning was excruciating.

Part of what we know about the avian experience of white phosphorus poisoning disconcertingly comes from lab experiments. US government researchers conducted white phosphorus experiments on mute swans from the Chesapeake Bay of Maryland due to their similarities to the tundra and trumpeter swans that were 'affected by white phosphorus at a military base in

⁵⁷Dennis Marks and Julian Fischer, 'Abundance, Distribution and Timing of Fall and Spring Waterfowl Migration on Eagle River Flats 2012–2013' (Anchorage: US Fish and Wildlife Service, 2013).

⁵⁸Ibid.

⁵⁹NOAA Fisheries, 'Acoustic Monitoring of Belugas in Eagle River, Cook Inlet', available at: {<https://www.fisheries.noaa.gov/resource/document/acoustic-monitoring-belugas-eagle-river-cook-inlet>}.

⁶⁰Joint Base Elmendorf-Richardson (2012), available at: {<https://www.jber.jb.mil/Portals/144/units/JPARC/PDF/JPARC-Joint-Base-Elmendorf-Richardson.pdf>}.

⁶¹Marianne E. Walsh, Charles M. Collins, and Charles H. Racine, 'Persistence of white phosphorus (P4) particles in salt marsh sediments', *Environmental Toxicology and Chemistry: An International Journal*, 15:6 (1996), pp. 846–55.

⁶²Walsh et al., 'Persistence of white phosphorus (P4) particles'.

⁶³Donald W. Sparling, 'White phosphorus at Eagle River Flats, Alaska: A case history of waterfowl mortality', in David J. Hoffman, Barnett A. Rattner, G. Allen Burton Jr, and John Cairns Jr (eds), *Handbook of Ecotoxicology* (2nd edn, Boca Raton: Lewis Publishers, 2003), pp. 767–85.

⁶⁴Sparling, 'White phosphorus at Eagle River Flats', p. 771.

⁶⁵Donald W. Sparling and Nicholas E. Federoff, 'Secondary poisoning of kestrels by white phosphorus', *Ecotoxicology*, 6 (1997), pp. 239–47; Sparling, 'White phosphorus at Eagle River Flats'.

⁶⁶Sparling, 'White phosphorus at Eagle River Flats', p. 771.

Alaska'.⁶⁷ They justified their experiments by claiming mute swans were introduced in the Chesapeake Bay 'for aesthetic purposes and [had] become a nuisance'.⁶⁸ The researchers collected eggs from nests, raised the swans, and eventually 'gavaged [the swans] with P4 [white phosphorus] and sufficient distilled water to wash the pellets into the esophagus and prevented [the swans] from regurgitating by gentle but firm clasping of the neck'.⁶⁹ After dosing them with white phosphorus, they observed that 'at death two of the birds given the highest doses had a strong garlic odour and white smoke characteristic of P4 emanating from the cloaca. Upon necropsy we found that all birds given two doses retained P4 in their gizzard as determined by emission of smoke from the gizzard contents ("smoking gizzards") and by the garlic odor'.⁷⁰ They found that 'most or all of the swans ... died from subacute liver dysfunction'.⁷¹ Another team of biologists experimented on chickens from local farms in New England. They dosed hens with sublethal levels of white phosphorus to determine the secondary effects of poisoning on eggs, confirming the likelihood of reproductive toxicity from white phosphorus exposure.⁷² These studies were another iteration of non-human animal (and human) experiments conducted in the context of war.⁷³ In the 1950s, scientists in the US Air Force's Arctic Aeromedical Laboratory experimented on non-human animals and infamously conducted studies with radioactive tracers on indigenous Alaskans.⁷⁴ While such experiments are not the focus of this article, they point to another form of violence related to war processes far away from the traditional spacetime of war.

ERF was ultimately deemed a 'Superfund' site in 1994 because of white phosphorus contamination.⁷⁵ In the autumn of 1998, a Record of Decision – a formal decision of the USEPA – required remediation plans for the estuary. It outlined an extensive recovery project that included cleaning up white phosphorus and monitoring the health of wildlife. It stipulated that within five years that the 'dabbling duck mortality rate attributable to white phosphorus' should be reduced to '50 percent of the 1996 mortality rate attributable to white phosphorus', which 'would be approximately 500'.⁷⁶ The Record of Decision also stated that within twenty years the mortality rate should be 'no more than 1 percent of the total annual fall population of dabbling ERF ducks'.⁷⁷ The Record of Decision further required that parts of the estuary would be drained so that white phosphorus could dry and vaporise. Areas not drained would be capped with gravel. The Superfund designation, therefore, changed the meaning of ERF by committing the US government to environmental action. Its meaning shifted from primarily a space for war preparation to a Superfund site that was recognisably deadly to wildlife. However, within a few years, military officials were poised to resume military activities.

Concerns about toxins – particularly among indigenous communities and local government employees – remained. In April 2002, roughly four years after the Record of Decision, a group

⁶⁷D.W. Sparling, D. Day, and P. Klein, 'Acute toxicity and sublethal effects of white phosphorus in mute swans, *Cygnus olor*', *Archives of Environmental Contamination and Toxicology*, 36:3 (1999), p. 316.

⁶⁸*Ibid.*, p. 316.

⁶⁹*Ibid.*, p. 317.

⁷⁰*Ibid.*

⁷¹*Ibid.*

⁷²Sae-Im Nam, Denise L. Macmillan, and Bill D. Roebuck, 'The translocation of white phosphorus from hen (*Gallus Domesticus*) to egg', *Environmental Toxicology and Chemistry*, 15:9 (2006), pp. 1564–9.

⁷³Elizabeth R. Johnson, 'Of lobsters, laboratories, and war: Animal studies and the temporality of more-than-human encounters', *Environment and Planning D: Society and Space*, 33:2 (2015), pp. 296–313.

⁷⁴Matthew Farish, 'The lab and the land: Overcoming the Arctic in Cold War Alaska', *Isis*, 104:1 (2013), pp. 1–29.

⁷⁵In 1980, the US Congress enacted the 'Comprehensive Environmental Response, Compensation, and Liability Act', more commonly known as the 'Superfund' law. The law's intended effect was to clean hazardous waste sites known as 'Superfund' sites.

⁷⁶USEPA, 'Record of Decision: Fort Richardson Anchorage, Alaska Operable Unit C', p. iv, available at: {<https://semsub.epa.gov/work/10/100040781.pdf>}.

⁷⁷*Ibid.*, p. iv.

of citizens including the Chickaloon Village Traditional Council sued the DoD for failing to investigate and remediate unexploded white phosphorus ordnance, claiming that white phosphorus munitions continued to pose health risks to non-human animals and humans.⁷⁸ The DoD was alleged to be in violation of state laws in Alaska, and the plaintiffs argued that the DoD had a legal responsibility to remove thousands of unexploded rounds and shells and to cease weapons training in Eagle River Flats until the military received a Clean Water Act permit.⁷⁹ A settlement was reached in 2004, and the military agreed to monitor the health of beluga whales, conduct water samples to monitor for toxic chemicals, conduct a feasibility study for munitions that would be less harmful to the environment, initiate consultations with Upper Cook Inlet Tribes, and ensure live-fire training was restricted to winter months to better protect migratory birds.⁸⁰ While moving forward with this settlement, the DoD was simultaneously pushing for legislation in the US Congress to change environmental laws that would make it easier to train for war in ecologically sensitive areas.⁸¹

On 20 August 2007, the US Army proposed eliminating the restrictions on winter-only live-fire training by filing a 'Notice of Intent' to create an environmental impact statement (EIS). As part of the EIS process, the military was required to hold meetings with and gain input from community members about its plans to reopen ERF for year-round munitions firing. The meetings began within a week of the Notice, leaving the local community with little time to prepare. In 2010, the Federal Register published DoD transcripts of these meetings. The meetings, which occurred in August and September 2007 with Alaska Department of Fish and Game (ADF&G) agency staff, Upper Cook Inlet Tribes (including the Chickaloon Village Traditional Council), and other members of the public, were invited to be part of a drafting process for an EIS that would be used by the DoD in support of reopening ERF.

What follows is an interpretive account of these hearings. This account is guided by an interest in the multispecies ethics and politics of national security risk. Gabriella Blum and David Luban have importantly called attention to the ethics of 'risk transfer' in war.⁸² In the context of ending war, they assess how using force to mitigate risk from foreign enemies often comes at the price of increasing risk to foreign civilians. In particular, they are interested in determining the point at which a state should cease using force and accept some risk to its security. Since decreasing security risks to national citizens often involves harming foreign civilians, the ethical question of how much risk is tolerable is not only double-sided but intricately interconnected: how much security risk is tolerable for national citizens and how much risk of harm is tolerable for foreign citizens? In the context of ERF, *national* security involves ethical questions about *interspecies* security. In this setting, relevant questions include whether the military activities to reduce security risks abroad outweigh domestic interspecies harm. How much wildlife risk is the potential increased security from weapons testing and soldier training efforts worth? At what point does the security risk transferred to domestic environments become intolerable? How should more-than-human interests inform this calculation of risk?

These questions are at the heart of the article's interpretive account of Department of Defense hearings about reopening ERF for year-round military training. Central to these questions are the articulations of moral imaginations of the space and time of risk in war. The normative questions

⁷⁸Charles W. Schmidt, 'The price of preparing for war', *Environmental Health Perspectives*, 112:17 (2004), pp. 1004–05.

⁷⁹*Ibid.*, p. 1004.

⁸⁰Stephen Dycus, 'Osama's submarine: National security and environmental protection after 9/11', *William & Mary Environmental Law and Policy Review*, 30:1 (2005), pp. 1–54.

⁸¹*Ibid.*

⁸²Gabriella Blum and David Luban, 'Unsatisfying wars: Degrees of risk and the jus ex bello', *Ethics*, 125:3 (2015), pp. 751–80. On risk transfer, see also Martin Shaw, 'Risk-transfer militarism, small massacres and the historic legitimacy of war', *International Relations*, 16:3 (2002), pp. 343–59. See also Daniel Brunstetter for work on 'risk imposition' issues involving risking civilian life in order to preserve cultural heritage sites. Daniel R. Brunstetter, 'A tale of two cities: The just war tradition and cultural heritage in times of war', *Global Intellectual History*, 4:4 (2019), pp. 369–88.

about risk, posed above, necessitate resolving the meaning of what ERF is in relation to its past and future, and in relation to the use of force abroad. The social meaning of ERF is in part derived from articulation of moral imaginations. I refer to these articulations as *imaginative practices*. I illustrate how different moral imaginations were associated not only with divergent calculations of risk but also conflicting meanings of the spatiotemporality of war. An important point of this analysis also relates to the choice to examine public hearings in the first place. How do scholars decide on which forms of wartime violence and voices to elevate? Such decisions are guided by certain ontological commitments. Choices about where we look for questions about war, and which voices and lives we pay attention to, are part of the value of multispecies empiricism. It directs us to look to neglected places, times, and voices.

In the case study that follows, I conceptualise arguments about ERF as expressions of *exigent* and *ecological* imaginations – speculative claims that ultimately supported different views of multispecies risk. In this case study, *imagination* and *imaginative practices* refer to how the past and future of ERF are envisioned in relation to the ethics of risk management. These practices involved envisioning the ethics of risk transfer (assessing live-fire training to mitigate risk to US soldiers abroad in relation to the risk of harm to local humans and wildlife). They also involved determining the very meaning of what Eagle River Flats was and should become in relation to the spacetime of US war efforts abroad. The meaning of the estuary involved speculating on the risks of munitions to local communities and its more-than-human inhabitants. ‘Imagination’ is used here to highlight speculative and relational activities aimed at envisioning the purpose and future of a geographic location in broader spatiotemporal contexts of war. These activities sought to establish the ‘world’ of ERF – its past, futures, and possibilities that connect the past and future. This focus on imaginative practices also shifts us from coherently ‘collective’ imaginations of war to the everyday imaginations that reveal a more complicated sense of multispecies national security politics.

Exigent and ecological imaginations

Comments made by the public, Tribes, and agency staff were often characterised by an *ecological* imagination, which involved a view of ERF as not only materially significant for military purposes but also meaningful in terms of wildlife-human relations. These comments were attuned to an estuarian future in which the loss of wildlife is not easily calculable and non-human animals should be protected from potential military harm. Beyond protection, there was a sense that wildlife co-creates the very meaning of what ERF is – in the present and future. In this ecological imagination, the spatiotemporal meaning of ERF comes into being in relation to the non-human lives that inhabit it. The estuary was imagined as a place in which human and animal thriving should rarely (if ever) come at the expense of military projects, whether inside the space of ERF or in relation to wars abroad. The future of ERF should be guided not by ambitions for combat training but by a desire to reduce risk to estuarian life from potential military harms. While recognising that the military needed to train its soldiers for war, the public, Tribes, and agency staff also imagined alternative possibilities that would not jeopardise a sensitive and critically important space for non-human life. In terms of risk calculations, the potential harm to wildlife could not be justified by ostensible needs for all-year training. The imagination of non-human life involved a relational duty of care. The potential risk was infused with the ethical salience of place – for humans and wildlife.

While military officials consistently voiced concern about protecting the environment, they also articulated a pressing desire for year-round military training in part because of the demands of the Global War on Terror (GWOT) and the Iraq War. The future of ERF, as imagined in their statements, was one in which military training and ecological health would coexist – with some acceptable risk to the environment. The urgency of war was therefore central to military officials’ imagining of what ERF was and what it should continue to be. ERF, in essence, was an urgent

resource for military training and war preparation. ERF was also ethically salient in relation to the national security urgency of fighting abroad. As one military official put it,

we have more units, more soldiers, and they need to be able to fire year-round in order to meet their training requirements, obviously, so that they can be ready to be deployed to Iraq or Afghanistan or wherever else and be successful and come home alive ... they need to be able to train here in Anchorage, need to have this kind of a *resource* open year-round.⁸³

While this official also described ERF as a ‘productive wetland’ and a ‘staging area’ for migratory birds, explanations for reopening ERF for year-round live-fire training tended to draw on notions of the military as a good steward of the environment. In terms of multispecies ontologies, the ‘environment’ in this sense was primarily imagined as a resource for the military, with some room for accommodating the non-human lives inhabiting this space. But there is little sense of non-human agency or the time of this space before military sovereignty. Ultimately, in this view, the military could do right by the human and non-human animals in and around ERF at the same time that it reopened ERF for live-fire training. Some risk to non-human life was considered to be tolerable given the perceived urgent need to prepare for combat operations abroad. The space of ERF was many things for military officials, but the wider relational context of war abroad shifted the risk calculation towards accepting some harm to avian life.

Military officials were certainly concerned with environmental protection; however, this concern was often articulated as burdensome given the exigencies of war. An acute sense of burdened urgency to reopen ERF is evident in several exchanges that pivoted on exigent logics in relation to the GWOT and Iraq. For instance, one ADF&G staff member noted that the military ‘justified this [opening up ERF for year-round firing] partially ... because of the Iraq situation’.⁸⁴ In response, a military official argued that the US military has transitioned ‘from the old Cold War model ... to the rapidly deployable brigade combat teams ... and the model for training has ramped up even more to where at a moment’s notice the brigade combat teams have to be ready to go’.⁸⁵ The time and timing of war meant demands for military speed rendered ERF as primarily an impact range and secondarily a habitat. In this spatiotemporal imagination, some risk to birds and belugas was tolerable in light of the need for additional munitions firing. This official also noted how there was ‘a brigade in combat in Iraq from Fort Richardson’, pressing the connection between ERF and contemporary warfare requirements, and further arguing that ‘the tempo of training operations far exceeds what we’ve experienced in the past’.⁸⁶ In such exchanges, the past, present, and future are connected. In this moral imagination of space, the estuarian ecology of ERF shifts in relation to ideas of time and tempo.

Imagining the future of ERF as a more robust space for munitions testing was connected to desires for readiness training for war abroad. ‘Supporting readiness ... is our number one goal ... that’s why we do what we do is [*sic*] to support that mission’.⁸⁷ The project of the military – to train and support combat readiness – shapes the meaning of ERF in exigent terms. If ERF is primarily military space for combat training, then its spatial possibilities become intertwined with this ontological commitment. The future of ERF – like its past – belongs to military interests and its meanings are articulated in terms of an exigent imagination of war readiness desire. For military officials, having to train soldiers outside of ERF was considered to be ‘a huge drain when we have to fight this war’ because training elsewhere would require more time for transportation to other areas.⁸⁸ If time is of the essence, then ‘what’ ERF ‘is’ becomes

⁸³US Army, *DEIS for Resumption of Year-Round Firing*, pp. B-9–10, emphasis added.

⁸⁴*Ibid.*, p. B-51.

⁸⁵*Ibid.*, pp. B-52–3.

⁸⁶*Ibid.*, p. B-104.

⁸⁷*Ibid.*

⁸⁸*Ibid.*, p. B-9.

imaginable within this temporal register of exigency. Imagining ERF futures in relation to speed, tempo, and Iraq allowed military officials to confront the ecological-imaginative logics of local community members. Given the tempo of training for the GWOT, what ERF *was* or *should be* emerged within this vision of exigent military space. In this way, the ontological status of ERF becomes a spatially and temporally entangled possibility that emerges in relation to the time and space of war abroad. This had serious implications for risk and risk management practices, as the spacetime of ERF was understood in terms of the time of war in Iraq and Afghanistan. As such, the tolerance of risk to soldiers abroad defined the contours of tolerable risk of violence to non-human life in Alaska.

The military also needed to take into account the potential for ERF to become (again) a site of toxic harm for non-human life. This polluted past and human arguments for mitigating non-human risk complicated military desires to reopen ERF for year-round weapons training. The military certainly took the potential for harm seriously by conducting several studies, which seemed to indicate that reopening ERF in winter months would not result in much harm to local avian life. Indigenous Alaskans, government employees, and other members of the public, however, expressed scepticism about the military's calculations of wildlife harm and community health. ADF&G staff members, in particular, often argued that military disturbances and harm to avian life could not easily be calculated, and might in fact be *incalculable*. One ADF&G staff member with knowledge of the history of removing white phosphorus in ERF noted that, despite all of the remediation efforts to remove white phosphorus, 'it's impossible to find it all'.⁸⁹ The presence of even small amounts would be deeply troublesome for wildlife, as 'the unburned white phosphorus from just one round ... has thousands and thousands and thousands of lethal doses.'⁹⁰ The staff member also noted that:

It only takes one errant AG round ... to expose thousands of lethal doses of WP [white phosphorus]. And we know that a one-millimeter parcel at 77 degrees Fahrenheit in fresh water can take up to eight years to degrade ... That's the risk I think that you are taking ... with firing AG point projectile rounds out there in the summertime.⁹¹

There was pushback on this point as not sounding 'awfully realistic' but the military could 'do the statistics' on the likelihood of errant rounds disturbing white phosphorus.⁹² Given the prevalence of white phosphorus in ERF, however, a staff member noted that 'I don't think you can do the statistics on it. That's the problem.'⁹³ While there were no longer records of the amount of white phosphorus used in ERF from the 1940s through the 1980s, the staff member noted that they did have records on the period between 1987 and 1990, 'which wasn't really a period of heavy firing', and during this time 'there was an average of 424 kilograms per year of white phosphorus fired into the Eagle River Flats'.⁹⁴ Such comments reflect a sense that the prevalence of toxins and complex ecological dynamics frustrate attempts to grasp the meaning and possibilities of risk. In terms of risk calculations, this argument comes close to suggesting it would be ethically illegitimate for weapons training – meant to increase national security – to pose such a risk to domestic avian life. The risk of even a small disturbance of white phosphorus would pose an unreasonable risk of significant harm to birds.

Military officials acknowledged risks to wildlife and expressed desires to minimise them; however, they noted that it was not realistic to 'choose zero risk because we don't have that choice.

⁸⁹Ibid., p. B-38.

⁹⁰Ibid., p. B-37.

⁹¹Ibid., p. B-39.

⁹²Ibid., p. B-54.

⁹³Ibid., p. B-55.

⁹⁴Ibid., p. B-36.

We have to train soldiers.⁹⁵ In this view, a reasonable degree of risk to wildlife is tolerable given the national security needs of war preparation. But what determines the threshold of reasonable risk? For Blum and Luban, identifying it involves a calculation of harm in relation to the benefits of military actions, which they acknowledge is a difficult task as it involves disputes that can be characterised by both epistemic and normative intractability.⁹⁶ We can also consider how risk calculation is informed by the meaning of space, time, and imagination. Spatial meanings emerge within discursive practices that posit a spatial imagination of the past and future in relation to military desires abroad. The significance conferred on these spatiotemporal relations is central to calculations of conceivable harm and acceptable risk. In the case of ERF, thresholds of tolerable risk of harm were informed by evidence from the past but also speculative views on the future of wildlife harm. Tolerable risk in ERF was calculated not only in terms of evidence, data, or predicted waterfowl mortality numbers but in terms of the future purpose of ERF. Exigent imaginations of military officials were associated with the idea that potential avian harm from additional military live-round firing was outweighed by the normative demands of military training for war – in the present and future – and that the very space of ERF was for this purpose. As a counterweight, many members of the local public made it clear that ERF was geographically and materially much more than a space for military training. Within this ecological imagination, ERF's future was conceptualised on the basis that it was and is a space for multispecies thriving. ERF was just as much sovereign space for wildlife as it was for the military.

Illustrating this *ecological imagination*, one individual at a public hearing noted that they did not want 'to be interpreted as someone who's against protecting the health and welfare of soldiers who are going to be forced to go to Iraq', but suggested 'I think there have to be better options than using a very sensitive estuary as a training ground and weapons testing range.'⁹⁷ On the issue of alternatives, another individual noted that part of the 2004 settlement with the DoD required the US military to conduct a feasibility study of green munitions, which was never done.⁹⁸ It was further argued that:

There have to be better alternatives for this type of training. And I want to note that this weapons testing displaces traditional subsistence uses of the local Tribes. It's inappropriate, we believe, to create additional harm to an area that's ... been designated under CERCLA as one of the most polluted sites in the nation.⁹⁹

Here, the issue of additional live-fire training is imagined as posing additional harm to an already toxified habitat and doing damage to indigenous ways of life. ERF is envisioned as a space of military pollution and a threat to indigenous life. The possibility of an estuarian future of additional munitions training becomes almost inconceivable in light of these toxic pasts.

In *jus ex bello* ('justice after war') contexts, Blum and Luban note how 'risks are tricky to estimate and evaluate.'¹⁰⁰ As a response to this estimation/evaluation problem, and because states might be self-serving in transferring risk to civilian populations, they suggest that states should convince the international community of the need for the continuation of force. Relatedly, in war process contexts involving risk to (human and more-than-human) life, there might be important attention to the views of local communities. In addition to arguing that states convince local communities to accept risk, we might inquire into how local communities imagine and speak about the multispecies ethics of risk. Interspecies injustice and risk are not free-floating or abstract; rather, they are encountered and experienced on the ground. Normative and empirical

⁹⁵Ibid., p. B-56.

⁹⁶Blum and Luban, 'Unsatisfying wars', p. 772.

⁹⁷US Army, *DEIS for Resumption of Year-Round Firing*, p. B-123.

⁹⁸Ibid., p. B-124.

⁹⁹Ibid., p. B-126.

¹⁰⁰Blum and Luban, 'Unsatisfying wars', p. 754.

analysis of interspecies/international relations might therefore encompass the important work of seeking to understand local community voices about the ethics of risk.

This section shows the value of attending to divergent moral imaginations in wartime spaces of toxic risk. It suggests that risk from military toxins is extraordinarily difficult to estimate, and that any evaluation of risk is contingent upon certain moral imaginations of the spacetime of war. In a sense, calculation of risk is an *incalculable* task. Different moral imaginations are associated not only with different calculations of risk but also divergent meanings of the space and time of war. Risks are therefore not only ‘tricky to estimate and evaluate’, as Blum and Luban put it; there are also conflicting meanings of the spatial location of war and its temporal connection to the preparation of war – the space and time where and when war is both produced and exerts effects on human and non-human life. This means that scholarly claims about the ethics of risk can look radically different depending on which perspectives are prioritised. But what of non-human perspectives?

Avian encounters

The previous section explored divergent meanings of the spacetime of war and wartime risk in the context of US Department of Defense hearings. Given that these hearings prioritised birds and bird mortality, the absence of avian perspectives is striking though unsurprising. A fuller and more anti-anthropocentric account could engage with avian views of the spacetime of war risk. Shifting avian experiences into the ontological foreground, this section attends to the sensory experiences of northern pintails and tundra swans (Figure 1). Regarding white phosphorus risk, these avian communities were considered to be two of the most affected species in ERF.¹⁰¹ Pursuing avian perspectives on national security and wartime risk, however, involves a certain unknowability and irrecoverability of these viewpoints. This venture is further complicated by the humanism colouring the attempt to grasp more-than-human animal perspectives. However flawed, moving towards a more pluralistic and multispecies IR means creatively extending our analysis of war into the sensory world of non-human perspectives.¹⁰² Relying on scientific accounts of avian life, this section hopes to provide a glimpse into avian vantages in a step towards a more post-anthropocentric perspective on toxic entanglements of war.

Northern pintails (*Anas acuta*) are migratory dabbling ducks. In North America, they winter on the coasts of California and Oregon, forming pairs before migrating to northern habitats such as ERF to dwell for the summer. The Alaskan estuaries have served as attractive spring and summertime habitats for generations of pintails, who prefer ‘shallow marshes, quiet rivers, or shallow lakes’.¹⁰³ The pools and ponds of ERF are rich with seeds, softstem bulrushes, wigeon grasses, and horned pondweeds. These food resources help pintail families thrive. In this resource-rich environment, northern pintails lay eggs, build nests, raise their young, and engage in various forms of recreation. The time of the estuary is alive with avian intimacies and social pursuits, with pintails congregating in large groups, preening, and chasing each other.¹⁰⁴ The sounds of spacetime include acoustic communication such as a pintail’s ‘rough stuttering quack’ and a ‘wheezy trainlike whistle’ call.¹⁰⁵

Before migrating to ERF, tundra swans (*Cygnus columbianus*) winter on the Pacific coastline of the continental United States. They migrate to Alaska for its summertime supply of aquatic plants

¹⁰¹US Army Engineer Research And Development Center, Cold Regions Research And Engineering Laboratory, *Remediating and Monitoring White Phosphorus Contamination at Eagle River Flats (Operable Unit C), Fort Richardson, Alaska* (Fort Richardson, AK: US Army, 2000).

¹⁰²For a discussion of an ‘interspecies-sensory focus on global politics’ that merges poetic and scientific inquiry, see Leep, *Cosmopolitan Belongingness and War*, p. 3.

¹⁰³Paul A. Johnsgard, *Ducks, Geese, and Swans of the World* (Lincoln, NE: University of Nebraska Press, 2010), p. 235.

¹⁰⁴Cornell Lab of Ornithology, ‘Northern Pintail Life History’, available at: {https://www.allaboutbirds.org/guide/Northern_Pintail/lifehistory}.

¹⁰⁵Ibid.



Figure 1. Tundra swans. Photographer/source: Peter Pearsall/USFWS {www.flickr.com/photos/usfws_alaska/51102290580/}.

such as pondweeds, grass seeds, and various species of algae. Like pintails, the space and time of ERF are understood in terms of breeding. Tundra swans form permanent bonds with mates, attend to eggs, and jointly raise their young in the estuary. The spacetime of ERF involves intergenerational processes of swan development. Together, swan pairs teach their young cygnets where and how to forage. Swan parents occasionally treadle (use their feet to move plants to the surface) to assist cygnets in accessing submerged plants.¹⁰⁶ Vigilant in protecting their young, swan parents are often in an ‘alert posture’ and lead their cygnets away from potential predators by swimming to the centre of ponds or taking flight if they detect trouble. Summer breeding in Alaska can also involve interspecific territoriality. Observers have witnessed tundra swans attacking and defending territory from outsiders (for example, geese) and performing ritualistic triumph displays after these attacks.¹⁰⁷ While IR scholars have recently illustrated how global politics involves ritual features and symbolic performances regarding territory,¹⁰⁸ these

¹⁰⁶Susan Leigh Earnst, *Behavior and Ecology of Tundra Swans During Summer, Autumn, and Winter* (Columbus, OH: Ohio State University, 1992).

¹⁰⁷Robert M. Burgess and Alice A. Stickney, ‘Interspecific aggression by tundra swans toward snow geese on the Sagavanirktok River delta, Alaska’, *The Auk*, 111:1 (1994), pp. 204–07.

¹⁰⁸Maria Mälksoo, ‘A ritual approach to deterrence: I am, therefore I deter’, *European Journal of International Relations*, 27:1 (2021), pp. 53–78.

actions underscore the extent to which ritual performances in the context of territorial defence are not limited to states and human actors. In their own terms, swans display complex-yet-common ways of being in the world *vis-à-vis* certain outsiders.

Seen in this light, ERF is not only a space for training and testing weapons for war but also an ancestral and multigenerational space for raising young birds. Military practices certainly define the spacetime of ERF, but avian breeding, parenting, and recreational practices offer another definition. ERF, in this sense, is an 'ecological process' shaped by war processes as well as avian processes of living and thriving.¹⁰⁹ Avian experiences of the estuary also precede the presence of the US military. Adopting a more expansive spatiotemporal scale of estuarian life not only recontextualises the significance of US military practices in ERF but also reminds us of pre-human estuarian times. Considering avian imaginations of the spacetime of ERF repositions ecological claims about environmental health and exigent arguments centring national security concerns into a larger spatiotemporal flow of more-than-human perspectives, experiences, histories, and futures. This repositioning does not necessarily downplay national security risks abroad. It does, however, focus our understanding of ecological and exigent assertions through the lens of birds that have their own perspectives on space, time, and risk. With avian perspectives in mind, we might envision the spacetime of war in terms of avian ancestral habitats. We might bear witness to the past and future possibilities of violent risk to more-than-human lives in the context of war processes that unfold across space and time.

We might also reflect on more-than-human bodily violence that results from war processes. Christine Sylvester suggests that war can be 'understood as a range of body-based experiences', and in this context scholars should consider 'the fate of everyday people'.¹¹⁰ Sylvester is not referring to birds, but we might consider northern pintails and tundra swans to be more-than-human persons.¹¹¹ While a full discussion of avian personhood is beyond the scope of this article, certain features of personhood, such as agency, sentience, and consciousness are present in birds.¹¹² Birds are decision-makers, have their own kinds of language, and exhibit self-awareness in relation to time and space.¹¹³ Recent work on agency in IR looks at practices and contextual forms of agency, but much of this work privileges agentic actors who are 'identifiably human'.¹¹⁴ Moving towards a post-anthropocentric view, we might welcome birds as non-human actors who exhibit forms of avian agency in international relations.

As non-human actors, birds are more than members of their species. Thinking only in terms of species and species behaviour sidesteps important questions about the individual lives of birds.¹¹⁵ Each northern pintail and tundra swan in ERF is not merely an interchangeable member of the *Anas acuta* and *Cygnus columbianus* species, respectively. Pintails and swans experience the estuary and encounter war processes as individuals. Losing one's appetite and coordination because of white phosphorus poisoning is an *individual* sensory experience. Convulsing and drowning are experienced by distinct birds with families, histories, and lost futures. Avian

¹⁰⁹For a discussion of ecological processes and interspecies meanings of political space, see Youatt, *Interspecies Politics*.

¹¹⁰Christine Sylvester, 'Experiencing war: A challenge for International Relations', *Cambridge Review of International Affairs*, 26:4 (2013), pp. 670–1. See also Leep's 'interspecies-sensory' approach, which considers the 'often invisible and unmarked sensory details of experiences'. Leep, *Cosmopolitan Belongingness and War*, pp. 3–4.

¹¹¹Certainly, personhood is not a singular notion simply 'ascribed by humans to nonhumans'. Youatt, *Interspecies Politics*, p. 99. For a discussion of non-human personhood and relational agency, see Rafi Youatt, *Counting Species: Biodiversity in Global Environmental Politics* (Minneapolis, MN: University of Minnesota Press, 2015).

¹¹²Soumya Iyengar, Pooja Parishar, and Alok Nath Mohapatra, 'Avian cognition and consciousness: From the perspective of neuroscience and behaviour', in Sangeetha Menon, Nithin Nagaraj, and V. V. Binoy (eds), *Self, Culture and Consciousness: Interdisciplinary Convergences on Knowing and Being* (Singapore: Springer, 2018), pp. 23–50.

¹¹³*Ibid.*

¹¹⁴Benjamin Braun, Sebastian Schindler, and Tobias Wille, 'Rethinking agency in International Relations: Performativity, performances and actor-networks', *Journal of International Relations and Development*, 22:4 (2019), p. 788.

¹¹⁵For a discussion of views on bird individuality, see Christian Hunold, 'Why not the city?: Urban hawk watching and the end of nature', *Nature and Culture*, 12:2 (2017), pp. 115–36.

choices, actions, and motivations can be approached from this experiential perspective of individual birds. Ornithologists suggest that differences in head shapes and bill patterns of tundra swans might be ‘important bases for *individual* recognition among the arctic-breeding swans’ and that it is ‘highly probable that individual differences in vocalizations may also play a role in mate recognition’.¹¹⁶ In thinking of the singular decisions, desires, and the moments of recognition of individual birds, we might reflect on whether birds poisoned by white phosphorus in ERF communicated their struggles to other birds who knew them as individuals – perhaps family members or estuarine acquaintances who recognised them as they struggled to keep their heads above water amid the toxic effects of white phosphorus. In this wartime context, perhaps there were bird witnesses who observed the pain and loss of particular individuals, not merely members of their species.

Conclusions

The experience of war exceeds our capacity for theoretical reflection, representation, and empirical analysis. We can, however, continue cultivating attention to the lived experiences of war, the felt embodiment of its violence, and national security debates over its spatiotemporal manifestations. This attention extends to more-than-human experiences with military violence, both in and away from warzones. In order to understand what war is and what it does, this article has argued that we need a fuller sense of when and where its violence emerges. Conceptualising war in terms of constitutively entangled war processes, the article contributes to the ontologies of war literature, particularly arguments about the spatiotemporal structure of wartime violence. The perspective developed here is one step towards expanding our theoretical and empirical horizons into other forms of war’s spatiotemporal complexity and multispecies experientiality.

While there has been increasing conceptual attention to interspecies aspects of national security, this article offers a distinct empirical account of public hearings surrounding the controversy over reopening Eagle River Flats – an Alaskan estuary that had been polluted with white phosphorus munitions – for weapons testing and training during the Iraq War. I suggest that focusing on such real-world policy debates adds insight to our theoretical claims about multispecies politics by enabling us to consider how more-than-human lives figure into spatiotemporal conceptualisations of national security risk. This empirical attention further reveals how the meanings of war’s space and time are complicated by divergent views on multispecies risk, histories of multispecies harm, and competing ecological and national security pressures. War processes from the past, such as white phosphorus weapons testing, forcefully make their way into the present and future – into debates about training for war and into the bodies of human and non-human individuals. Empirical inquiry into these ongoing processes and toxic experiences complicates their exclusion from studies of the space and time of war.

The article has also considered the spatiotemporal experiences of two migratory avian communities – northern pintails and tundra swans – on a US military base in Alaska that was subjected to possibilities of toxic disruption during the Iraq War. Engaging with the experience of these birds moves us towards more-than-human sensory perspectives on the space and time of war processes. Moving away from a view of war that is bound up with the sensory and bodily experiences of the human, our understanding of war and national security can be readjusted to better account for avian individuals who have their own perspectives on space, time, and security risk. Taken together, the arguments in this article are hopefully helpful – theoretically, methodologically, and empirically – in moving us in the direction of post-anthropocentric accounts of war that are more inclusive of interspecies and spatiotemporal complexity.

¹¹⁶Paul A. Johnsgard, *Swans: Their Biology and Natural History* (Lincoln, NE: Zea Books, 2016), p. 69, emphasis added.

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