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RESEARCH ARTICLE

International Relations and the non-human: Exploring animal culture for global environmental governance

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Abstract

There is a paradox in global environmental governance that policymaking must ‘follow the science’ while environmental change is itself characterised by scientific uncertainty. This paper addresses this paradox by embracing that uncertainty. We bring International Relations (IR) into conversation with animal studies to further develop conceptual debates on integrating non-human actors. We focus on avian cultures to understand the nexus between bird crime, flyways, and global environmental governance. We analyse how bird migrations along flyways disrupt mainstream systems of knowledge production that global conventions rely on. Zooming in on bird crime along flyways, we demonstrate that crime relies on offenders’ understanding of avian cultures. We synthesise those findings with an analysis of the Convention on Migratory Species, as the only global convention that integrates animal cultures to develop more effective responses to wildlife crime. Our analysis demonstrates that international conservation overlooks the exploitation of avian culture for criminal activity, rendering policy responses less effective, particularly in contexts of scientific uncertainty. Integrating animal cultures can address scientific uncertainty and promote multispecies learning, creating more effective forms of global environmental governance. Ultimately, this renders the non-human visible and makes it possible to explore the implications for multispecies entanglements in IR.

Keywords: animal politics; Anthropocene; biodiversity conservation; bird crime; global conventions; global environmental governance; illegal wildlife trade; non-human animals; the non-human; wildlife crime

Introduction

Global environmental governance is characterised by scientific uncertainty, which can slow action and result in failure to reach agreement on the international stage. Yet the refrain of ‘follow the science’ is a popular call to action from policymakers, activist movements, and environmental NGOs alike. This leaves little room for integrating kinds of knowledge systems other than Western understandings of ‘scientific evidence’ to enhance global environmental governance.¹ Recent international negotiations on the post-2020 Global Biodiversity Framework demonstrated the restrictiveness with which evidence is selected and integrated into global environmental agreements.² Rates of biodiversity loss are subject to intense debate, but while the precise rates and

¹Kim TallBear, ‘Why interspecies thinking needs Indigenous standpoints’, *Fieldsights: Society for Cultural Anthropology* (2011), available at: <https://culanth.org/fieldsights/why-interspecies-thinking-needs-indigenous-standpoints>.

²Convention on Biological Diversity, ‘Kunming-Montreal global biodiversity framework: Draft decision submitted by the President’ (2022), CBD/COP/15/L.15.

patterns remain unknown, the latest IPBES Global Assessment clearly shows that the overall trend is negative.³ This demonstrates the need to change course.

In this paper, we argue for thinking with animals⁴ to develop more effective governance arrangements. Animals have been largely rendered invisible in debates about global environmental governance, although more recent scholarship in International Relations (IR) has sought to rectify this, including a recent special issue on animals in *International Relations*⁵ and in *Review of International Studies*⁶ on rethinking IR via more-than-human approaches.⁷ As Pereira and Renner state, it is essential that IR now considers animals as an important object of inquiry;⁸ Burke further suggests that the agency and flourishing of more-than-human lives must be central to the development of new approaches in IR.⁹ We take a multispecies approach, focusing specifically on animals, rather than a more expansive more-than-human IR (discussed below). This paper builds on and moves forward approaches to centring hitherto-hidden animals in IR. It does so through an exploration of avian cultures to examine the challenges in the governance of migratory birds along flyways. Their governance is fraught with uncertainty, not least because migratory bird populations, and harmful human activity related to them, traverse national jurisdictions.¹⁰ Acknowledging and integrating scientific uncertainty in the design and implementation of conservation practices requires a shift away from reliance on strict scientific validation towards the identification of broader trends. Animal culture is crucial in identifying these trends. Taking a multispecies approach can help global environmental governance mechanisms respond more quickly to acute threats, particularly those stemming from illegal activity. Here, we focus on the governance of songbirds migrating along flyways, and the threats posed by bird crime (illegal activity related to the killing, trapping, and trade of wild birds). Our analysis has wider implications for the integration of the non-human into IR as a field; this includes other wildlife including mammals, fish, plants, and fungi as well as domesticated, farmed, or companion animals. We focus on wild birds as one example of how to centre animal cultures in IR, which is relevant for thinking through environmental governance more broadly (notably of oceans, forests, freshwater, the

³IPBES, 'Global assessment report on biodiversity and ecosystem services of the intergovernmental science-policy platform on biodiversity and ecosystem services', IPBES Secretariat, Bonn.

⁴Elizabeth 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.

⁵Joana Castro Pereira and Judith Renner, 'Animals in International Relations: A research agenda', *International Relations*, 37:3 (2023), pp. 389–97.

⁶Matthew Leep, 'Introduction to the special issue: Multispecies security and personhood', *Review of International Studies*, 49:2 (2023), pp. 181–200.

⁷Matthew Leep, 'Toxic entanglements: Multispecies politics, white phosphorus, and the Iraq War in Alaska', *Review of International Studies*, 49:2 (2023), pp. 258–77; also see Tore Fougner, 'Engaging the "animal question" in International Relations', *International Studies Review*, 23:3 (2021) pp. 862–86; Gitte Du Plessis, 'Destructive plasticity and the microbial geopolitics of childhood malnutrition', *Review of International Studies*, 49:2 (2023), pp. 300–18; Joana Castro Pereira and Maria Fernanda Gebara, 'Where the material and the symbolic intertwine: Making sense of the Amazon in the Anthropocene', *Review of International Studies*, 49:2 (2023), pp. 319–38; Joana Castro Pereira, 'Towards a politics for the Earth: Rethinking IR in the Anthropocene', in David Chandler, Franziska Müller, and Delf Rothe (eds), *International Relations in the Anthropocene: New Agendas, New Agencies and New Approaches* (London: Palgrave Macmillan, 2021), pp. 21–37; Rafi Youatt, *Interspecies Politics: Nature, Borders, States* (Ann Arbor: University of Michigan Press, 2020); Rafi Youatt, 'Interspecies politics and the global rat: Ecology, extermination, experiment', *Review of International Studies*, 49:2 (2023), pp. 241–57.

⁸Pereira and Renner, 'Animals in International Relations'.

⁹Anthony Burke, 'Interspecies cosmopolitanism: Non-human power and the grounds of world order in the Anthropocene', *Review of International Studies*, 49:2 (2023), pp. 201–22 (p. 216); also see Anthony Burke, 'Blue screen biosphere: The absent presence of biodiversity in international law', *International Political Sociology*, 13:3 (2019), pp. 333–51; Benjamin Meiches, 'Non-human humanitarians', *Review of International Studies*, 45:1 (2019), pp. 1–19; Leep, 'Multispecies security and personhood'; Andrea Schapper and Cebuan Bliss, 'Transforming our world? Strengthening animal rights and animal welfare at the United Nations', *International Relations*, 37:3 (2023), pp. 514–37.

¹⁰João L. Guilherme, Victoria R. Jones, Inês Catry, et al., 'Connectivity between countries established by landbirds and raptors migrating along the African-Eurasian flyway', *Conservation Biology*, 37:1 (2023), p. e14002.

Arctic, and global climate). This paper offers theoretical innovations for IR because taking multispecies entanglements seriously requires a fundamental transformation of the anthropocentric foundations of the discipline.

We focus on the challenges to global environmental governance posed by bird migrations and bird crime across key range states along the Adriatic and eastern Mediterranean–Black Sea Flyway, particularly Cyprus and Italy. Flyways are important migration corridors for migratory bird species, which move between breeding and wintering grounds every year.¹¹ The Mediterranean–Black Sea Flyway, which connects Europe and Africa, sees more than 2 billion passerines (hereafter referred to as songbirds) and closely related taxa during the annual migration.¹² It is also one of the hotspots for the illegal killing, taking, and trading of birds, posing a ‘significant concern’ for regional biodiversity.¹³ Although actual figures are likely much higher, Brochet et al. estimate that between 11 and 36 million birds are killed in the Mediterranean region annually, with passerines disproportionately affected (pp. 1, 12).¹⁴ Although prohibited by European Union (EU) law (e.g. EU Birds Directive), many are killed and trafficked as delicacies in the Mediterranean, for example, cross-border between the western Balkans and Italy or Malta, or on the black market within Cyprus.¹⁵ The illegal trade of songbirds is often linked to culturally embedded traditions, meaning that their capture and consumption relate to social status or family occasions or convey a sense of exclusivity and luxury.¹⁶ Exact trading routes are unknown, but they are highly adaptive.¹⁷ Although it cannot be said with certainty which bird species and how many individuals are affected, Brochet et al. estimate that with 67 per cent of bird species subject to illegal killing in significant numbers, over-exploitation is a main driver of bird extinction.¹⁸ Enforcement-driven responses have been unable to curb illegal activities due to a mixture of legislative loopholes, lacking capacities, and crime displacement (i.e. the shift of criminal activity from one location to another).¹⁹ Addressing bird crime of such magnitude poses severe challenges to existing environmental governance regimes, which we explore in more detail in this paper.

First, we outline how IR engages with the non-human, and how centring animals can advance these debates and contribute to a more nuanced understanding of environmental governance. Second, we briefly set out the research methods. Third, we discuss uncertainty and bird crime in

¹¹Gerard C. Boere and David A. Stroud, ‘The flyway concept: What it is and what it isn’t’, in Gerard C. Boere, Colin A. Galbraith, and David A. Stroud (eds), *Waterbirds around the World* (Edinburgh: The Stationery Office, 2006), pp. 40–7; Jeff Kirby, ‘Review of current knowledge of bird flyways, principal knowledge gaps and conservation priorities’, CMS Scientific Council: Flyway Working Group Reviews (2010), UNEP/CMS/ScC16/Doc 10 Annex 2b, available at: <https://www.cms.int/en/document/review-2-review-current-knowledge-bird-flyways-principal-knowledge-gaps-and-conservation-0>.

¹²BirdLife International, Mediterranean/Black Sea Flyway, (n.d.), available at: http://datazone.birdlife.org/userfiles/file/sowb/flyways/5_Mediterranean_Black_Sea_Factsheet.pdf accessed 20 May 2024.

¹³Convention on the Conservation of European Wildlife and Natural Habitats, Standing Committee, ‘Rome Strategic Plan 2020–2030: Eradicating illegal killing, taking and trade in wild birds in Europe and the Mediterranean region’, T-PVS(2019)3rev, Strasbourg (4 November 2019), p. 6. Note that we use Bern Convention as the abbreviated in-text reference.

¹⁴Anne-Laure Brochet, Willem Van Den Bossche, Sharif Jbour, et al., ‘Preliminary assessment of the scope and scale of illegal killing and taking of birds in the Mediterranean’, *Bird Conservation International*, 26:1 (2016), pp. 1–28 (pp. 1, 12).

¹⁵Lynn Schlingemann, Isidoro de Bortoli, Filippo Favilli, et al., ‘Combating wildlife and forest crime in the Danube-Carpathian region: A UN Environment–Eurac Research–WWF report’ (2017), available at: https://wedocs.unep.org/bitstream/handle/20.500.11822/22225/Combating_WildlifeCrime_Danube.pdf?sequence=1; Katalina Engel, ‘Uncovering the invisible. Successes and challenges for wildlife crime prosecution in Europe: European summary report’, *Successful Wildlife Crime Prosecution in Europe*, WWF Romania (2023), pp. 26–7.

¹⁶BirdLife International, ‘A best practice guide for monitoring illegal killing and taking of birds’, BirdLife International (2015), available at: https://www.birdlife.org/wp-content/uploads/2022/05/guidelines_for_monitoring_ikb_final_version.pdf.

¹⁷Europol, *Environmental Crime in the Age of Climate Change: Threat Assessment* (The Hague: Europol, 2022), p. 23.

¹⁸Brochet et al., ‘Preliminary assessment’, pp. 2, 6; Engel, ‘Uncovering the invisible’.

¹⁹Teresa Lappe-Osthege, ‘The ripple effects of compliance: Reconfiguring EU policy effectiveness in transboundary environmental governance’, *Journal of Common Market Studies*, 62:3 (2023), pp. 1–18, <https://doi.org/10.1111/jcms.13519>.

the key range states of Cyprus and Italy along the Adriatic and eastern Mediterranean–Black Sea Flyways; we demonstrate that wildlife crime offenders already harness their knowledge of avian cultures, while official responses are slow to catch up. Fourth, we set out how the Convention on the Conservation of Migratory Species of Wild Animals (CMS) is attempting to embrace animal cultures to develop more effective forms of global environmental governance, in line with Burke's call for global ecological governance systems that centre non-human life.²⁰ Finally, we examine how our analysis challenges the broad field of IR, and not just specific schools of IR, to integrate animal lives into understandings of global politics.

Animals in International Relations

Several schools of IR thinking have a growing body of work on understanding how non-human nature shapes global politics, which is part of a wider post-human turn in the social sciences.²¹ This engagement challenges the whole discipline of IR to be less anthropocentric because it demands a complete change in understanding the world.²² In this section, we first sketch out the recent attempts by IR scholars to engage with multispecies approaches. Second, we examine how greater engagement with animal studies can address current limitations and push forward these new approaches in IR. Third, we examine how centring animals can mitigate scientific uncertainty in global environmental governance.

International Relations has, to some degree, always grappled with the non-human, from understanding governance of climate change to debates around the role of water in conflict. But more recently, the integration of the non-human into IR thinking has accelerated. Fishel argues that IR 'needs a bigger vocabulary' and should embrace interdisciplinarity to address the overlapping planetary scale crises of biodiversity loss, climate change, and health. Further, in analysing how the boundaries of IR can be expanded by centring forests, she suggests that 'in the pendulum swing between ontological rigidity and openness, IR needs to turn its attention from the human and its institutions to engage with the Earth system and the more-than-human'.²³ The increasing use of the term Anthropocene demands that IR scholars develop a fuller understanding of the relations between humans and the non-human. This is especially important in environmental politics debates.²⁴ Much of this work centres on understanding the challenges posed by the Anthropocene or by climate change to existing 'great debates'.²⁵ Focusing on climate change and multispecies justice, Tschakert suggests that the Anthropocene compels us to scrutinise the entanglements and encounters between human and non-human beings that the climate emergency reveals in both visible and intangible ways.²⁶ Embracing the Anthropocene poses a major intellectual challenge

²⁰Burke, 'Blue screen biosphere'.

²¹For example, see Leep, 'Multispecies security and personhood'; Schapper and Bliss, 'Transforming our world?'; Stefanie R. Fishel, 'The global tree: Forests and the possibility of a multispecies IR', *Review of International Studies*, 49:2 (2023), pp. 223–40; Rafi Youatt, *Counting Species: Biodiversity in Global Environmental Politics* (Minneapolis: University of Minnesota Press, 2015); Pereira and Gebara, 'Where the material and the symbolic intertwine'; Meiches, 'Non-human humanitarians'.

²²Youatt, *Counting Species*; Eva Giraud, *What Comes after Entanglement?* (Durham: Duke University Press, 2019); Fougner, 'Engaging the "animal question"'; Fishel, 'The global tree'; Burke, 'Interspecies cosmopolitanism'; Pereira and Renner, 'Animals in International Relations'.

²³Stephanie R. Fishel, *The Microbial State: Global Thriving and the Body Politic* (Minneapolis: University of Minnesota Press, 2017), p. 225; Pereira and Renner, 'Animals in International Relations', p. 320; Burke, 'Blue screen biosphere'.

²⁴Pereira, 'Towards a politics for the Earth'; Dahlia Simangan, 'How should IR deal with the "end of the world"? Existential anxieties and possibilities in the Anthropocene', *Review of International Studies*, 49:5 (2023), pp. 855–71; Dahlia Simangan, 'Where is the Anthropocene? IR in a new geological epoch', *International Affairs*, 96:1 (2020), pp. 211–24; Du Plessis, 'Destructive plasticity', p. 408.

²⁵Matthew MacDonald, *Ecological Security: Climate Change and the Construction of Security* (Cambridge: Cambridge University Press, 2021); Simon Dalby, *Anthropocene Geopolitics: Globalization, Security, Sustainability* (Ottawa: University of Ottawa Press, 2020); Simangan, 'How should IR deal with the "end of the world"?'; Simangan 'Where is the Anthropocene?'; Kevin Grove and David Chandler, 'Introduction: Resilience and the Anthropocene: The stakes of "renaturalising" politics', *Resilience*, 5:2 (2017), pp. 79–91.

²⁶Petra Tschakert, 'More-than-human solidarity and multispecies justice in the climate crisis', *Environmental Politics*, 31:2 (2022), pp. 277–96 (p. 278).

because, as Fishel suggests, it profoundly questions human notions of time, scale, democracy, agency, power, and representation.²⁷

It is arguable that IR does integrate the non-human. After all, discussions about climate change, nuclear waste, whaling, and ozone depletion, among others, have been conducted by IR scholars for decades. These debates have tended to focus on the impacts on people and (human) political responses to their management, mitigation, and adaptation. As Burke²⁸ suggests, there is a need for a new form of global ecological governance that values, and is underpinned by, the health and survival of the biosphere. In order to achieve this, we argue that what is needed now, to address the changes wrought by planetary crisis, is a much more nuanced understanding of the role of non-human actors and an integration of multispecies approaches. Debates about the Anthropocene provide a strong and growing platform to do so; in embracing the non-human, to date, IR has not fully engaged with considering what it means for the discipline to include animals specifically. This paper, therefore, centres animals more fully to understand how embracing non-human agency can reshape governance arrangements to ensure they are more effective.

Apart from a few studies, there is little in IR which centres the lives of animals, leading to calls to make animals much more visible.²⁹ Meiches³⁰ suggests as non-humans become more of a focal point in IR, there is a need to create more capacious forms of politics in tandem with human counterparts; in so doing, IR theorists can introduce greater complexity into traditional areas of human politics, but in ways that do not abandon the figure of the human. There has been some research addressing biodiversity. For example, Duffy examines the international politics of wildlife conservation and the importance of conservation NGOs in informing and shaping responses to the illegal wildlife trade.³¹ Youatt focuses on biodiversity conservation, suggesting it is a form of biopolitics which works on and through humans, as well as the non-human, and considers what a less anthropocentric form of politics might look like. This work draws on longer-standing debates in political theory around animal rights and the development of forms of politics that are less speciesist to think through how animal interests can be effectively represented.³² However, IR needs to go beyond examining biodiversity conservation as a practice in order to address what it means to centre animal lives in the discipline.

We focus on animals as central to a multispecies approach, rather than taking a more-than-human perspective which seeks to break down wider binaries between human, animal, nature, culture, man, woman.³³ Youatt puts forward the idea of *interspecies internationality* as a way to think through ‘the entanglement of life, forms of signification, and materiality of the world, and the production of significant cleavages, violence, and inequality and forms of commonality from within different arrangements of these elements.’³⁴ Such approaches are significantly different from foregoing debates about the International, the Global, the Anthropocene, and Geopolitics, precisely because they offer a way of expanding IR to encompass the non-human world. The central

²⁷ Fishel, ‘The global tree’, p. 235.

²⁸ Burke, ‘Blue screen biosphere’, pp. 335–6.

²⁹ Fougner, ‘Engaging the “animal question”’; see also Tschakert ‘More-than-human solidarity’; Erika Cudworth and Stephen Hobden, ‘Animalising International Relations’, *International Relations*, 37:3 (2023), pp. 398–422; Pereira and Renner, ‘Animals in International Relations’.

³⁰ Meiches, ‘Non-human humanitarians’, p. 19. See also Columba Gonzalez-Duarte, ‘Borders of care: Ethnography with the monarch butterfly’, *American Ethnologist* (2022), available at: <https://americanethnologist.org/features/reflections/borders-of-care-ethnography-with-the-monarch-butterfly>.

³¹ Rosaleen Duffy, *Security and Conservation: The Politics of the Illegal Wildlife Trade* (New Haven, CT: Yale University Press, 2022); Rosaleen Duffy, *Nature Crime: How We’re Getting Conservation Wrong* (New Haven, CT: Yale University Press, 2010).

³² Alasdair Cochrane, *Sentientist Politics: A Theory of Global Inter-Species Justice* (Oxford: Oxford University Press, 2018); Danielle Celermajer, Sria Chatterjee, Alisdair Cochrane, et al., ‘Justice through a multispecies lens’, *Contemporary Political Theory*, 19:3 (2020), pp. 475–512; Josh Milburn and Sara Van Goozen, ‘Counting animals in war: First steps towards and inclusive just war theory’, *Social Theory and Practice*, 47:4 (2021), pp. 657–585; Burke, ‘Blue screen biosphere’.

³³ Celermajer et al., ‘Justice through a multispecies lens’.

³⁴ Youatt, ‘Interspecies politics and the global rat’, p. 246.

contribution of this paper is to move beyond the inclusion of animals in IR debates, to address what this means for transforming approaches to global environmental governance.

Animal studies has paved the way for social scientists to consider the lives of animals.³⁵ Geographers, in particular, have a long-standing engagement with human–animal relations,³⁶ demonstrating the importance of understanding how people and animals are entangled.³⁷ Van Dooren suggests that while the natural sciences can provide an account of animal lives, there is a need to move beyond simplistic divisions between human and non-human, the cultural and the natural.³⁸ Cudworth and Hobden argue for ‘animalising’ IR to ensure greater inclusivity.³⁹ More engagement with these debates would move IR debates beyond simply including animals and instead move towards understanding what this means for global environmental governance more precisely. Non-human animals, with their own powerful presence, history, memory, emotions, and experience of humans, disrupt neat ways of knowing, experiencing, and acting upon the world.⁴⁰ Animals have interests, desires, thoughts, feelings, and points of view concerning what happens to them, and therefore it is essential to understand and integrate their lives into IR debates.⁴¹

This paper focuses on migratory birds travelling along the flyways and draws on Van Dooren’s call to curate and tell more stories of birds and their complex multispecies entanglements.⁴² Youatt’s argument for conceptualising borders as mobility regimes comprising norms and rules that govern cross-border movement is a significant step towards recognising how human and non-human entanglements question key conceptual assumptions in IR.⁴³ By shifting the focus away from state- and human-centric visions of borders towards mobility regimes, we can become more attuned to the norms and interspecies practices that restrict or facilitate movement.⁴⁴

The wider conceptual implications of integrating multispecies entanglements in IR become evident if we consider the importance of geographic space in governance. As Glückler et al. argue, space is both a product and object of governance, such as geographically bounded jurisdictions simultaneously created and regulated by governance mechanisms.⁴⁵ Effective governance is contingent on considerations of space. Flyways pose significant challenges to existing modes of governance because they transcend boundaries created by the practices of governance, crossing jurisdictions and institutions while demanding the reconceptualisation of existing spaces of governance. Borders, in a Westphalian sense, are irrelevant. The dissolution of geographic spaces of governance also results in a blurring of who or what is regarded as the object of regulatory interventions. For example, Leep demonstrates how migratory tundra swans and northern pintails can be regarded as more-than-human victims of toxic warfare as a result of phosphorous testing by the

³⁵ Thom van Dooren and Deborah Bird Rose, ‘Lively ethnography: Storying animist worlds’, *Environmental Humanities*, 8:1 (2016), pp. 77–94; Deborah Bird Rose, *Shimmer: Flying Fox Exuberance in Worlds of Peril* (Edinburgh: Edinburgh University Press, 2022).

³⁶ Donna Haraway, *When Species Meet* (Minneapolis: University of Minnesota Press, 2007); Jamie Lorimer, ‘Multinatural geographies for the Anthropocene’, *Human Geography*, 36:5 (2012), pp. 593–612; Chris Philo and Chris Wilbert (eds), *Animal Spaces, Beastly Places: New Geographies of Human–Animal Relations* (London: Routledge, 2000).

³⁷ Giraud, *What Comes After Entanglement?*; Cudworth and Hobden, ‘Animalising International Relations’; Pereira and Renner, ‘Animals in International Relations’.

³⁸ Thom Van Dooren, *Flight Ways: Life and Loss at the Edge of Extinction* (New York: Columbia University Press, 2014), pp. 144–6.

³⁹ Cudworth and Hobden, ‘Animalising International Relations’.

⁴⁰ Nayanika Mathur, *Crooked Cats: Beastly Encounters in the Anthropocene* (Chicago: University of Chicago Press, 2021); Youatt, *Counting Species*; Meiches, ‘Non-human humanitarians’; Burke, ‘Blue screen biosphere’.

⁴¹ Celemajer et al., ‘Justice through a multispecies lens’; Rosemary-Claire Collard, *Animal Traffic: Lively Capital in the Global Exotic Pet Trade* (Durham, NC: Duke University Press, 2020).

⁴² Van Dooren, *Flight Ways*, pp. 144–6.

⁴³ Youatt, *Interspecies Politics*, p. 33.

⁴⁴ Youatt, *Interspecies Politics*, p. 33; Leep, ‘Multispecies security and personhood’.

⁴⁵ Johannes Glückler, Gary Herrigel, and Michael Handke, ‘On the reflexive relations between knowledge, governance, and space’, in Johannes Glückler, Gary Herrigel, and Michael Handke (eds), *Knowledge for Governance* (Cham: Springer, 2020), pp. 1–24 (p. 13).

US military in Eagle River Flats, Alaska.⁴⁶ The failure to address other species as ‘referent objects’ in security debates has rendered these animal casualties invisible. Van Dooren argues that the worlds of birds are woven into relationships with a diverse array of other species, including humans; and as so many species are ‘slipping out of the world,’ these entanglements, which form social practices and cultures, take on new significance.⁴⁷ Centering animals challenges ideas of borders, space, and objects of governance while bringing the nature of these entanglements to light.

The importance of developing IR in a less anthropocentric direction addresses scientific uncertainty as a central problem in global environmental governance. We understand global environmental governance to denote the norms, rules, and practices of ordering multispecies entanglements. There is not space here to analyse the rich and long-standing debates on global environmental governance,⁴⁸ and the more recent Earth System Governance approach.⁴⁹ In this vein, we recognise that the structures (e.g. regulatory frameworks and networks) and agents (e.g. institutions, policymakers) of governance are mutually constitutive;⁵⁰ however, we move beyond human-centric visions of governance based on artificial hierarchies between the human and non-human spheres.⁵¹ Instead, as Burke suggests, we recognise that multispecies entanglements are crucial in shaping governance efforts;⁵² but this has not received sufficient attention in dominant – and largely anthropocentric – approaches to global environmental governance.⁵³

Scientific uncertainty is a ‘crucial environmental condition’ that changes the parameters within which governance operates.⁵⁴ The production and availability of scientific knowledge can mitigate such uncertainty and is a prerequisite for effective policy intervention, but it is often imperfect and subject to interpretation by the agents of governance⁵⁵ because of poor-quality data and competing claims over who or what holds authority. In the case of flyways, a core challenge stems from a misfit between ecosystemic dynamics (i.e. large-scale bird migration) and institutional response (i.e. regional conservation based on national political priorities within bounded jurisdictions). Galaz et al. identified this ‘problem of fit’ as a significant weakness in contemporary global environmental governance,⁵⁶ where socio-political boundaries challenge the effectiveness of biodiversity conservation.⁵⁷

⁴⁶ Leep, ‘Toxic entanglements’.

⁴⁷ Van Dooren, *Flight Ways*, p. 4.

⁴⁸ Frank Biermann, *International Organisations and Global Environmental Governance* (London: Routledge, 2009); Hannah Hughes, ‘Actors, activities, and forms of authority in the IPCC’, *Review of International Studies*, 50:2 (2024), pp. 333–53; Peter Newell, ‘The political economy of global environmental governance’, *Review of International Studies*, 34:3 (2008), pp. 507–29; Nasiritousi and Faber, ‘Legitimacy under institutional complexity: Mapping stakeholder perceptions of legitimate institutions and their sources of legitimacy in global renewable energy governance’, *Review of International Studies*, (2021), pp. 377–98.

⁴⁹ Frank Biermann and Rakhyun E. Kim, *Architectures of Earth System Governance* (Cambridge: Cambridge University Press, 2020); Michele M. Betsill, Tabitha M. Benney, and Andrea K. Gerlak (eds), *Agency in Earth System Governance* (Cambridge: Cambridge University Press, 2020).

⁵⁰ Frances Cleaver and Luke Whaley, ‘Understanding process, power, and meaning in adaptive governance: A critical institutional reading’, *Ecology and Society*, 23:2 (2018), p. 49.

⁵¹ Krithika Srinivasan and Rajesh Kasturirangan, ‘Political ecology, development, and human exceptionalism’, *Geoforum*, 75 (2016), pp. 125–28; Rose, *Shimmer*; Giraud, *What Comes after Entanglement?*; Van Dooren, *Flight Ways*.

⁵² Burke, ‘Blue screen biosphere’; Youatt, *Interspecies Politics*.

⁵³ See Tschakert, ‘More-than-human solidarity’; Burke, ‘Blue screen biosphere’.

⁵⁴ Glückler, Herrigel, and Handke, ‘On the reflexive relations’, p. 17.

⁵⁵ *Ibid.*, pp. 6–8.

⁵⁶ Victor Galaz, Per Olsson, Thomas Hahn, Carl Folke, and Uni Svedin, ‘The problem of fit among biophysical systems, environmental and resource regimes, and broader governance systems: Insights and emerging challenges’, in Oran R. Young, Leslie A. King, and Heike Schroeder (eds), *Institutions and Environmental Change: Principal Findings, Applications, and Research Frontiers* (Cambridge, MA / London: The MIT Press, 2008), p. 147.

⁵⁷ Martin Dallimer and Niels Strange ‘Why socio-political borders and boundaries matter in conservation’, *Trends in Ecology & Evolution*, 30:3 (2015), pp. 132–39.

One avenue to mitigate these challenges is to reconsider the processes of knowledge production and social learning in global environmental governance. Drawing on adaptive governance,⁵⁸ implementing effective policies requires synthesising different forms of knowledge to identify new solutions to collective action problems amid uncertainty and volatility.⁵⁹ Bird crime along flyways is one such problem of collective action that requires novel forms of knowledge and learning to mitigate the effects of scientific uncertainty. If we accept Glückler et al.'s position that the process of learning 'requires bridging the barriers to communication between different communities',⁶⁰ the question arises of whether we can expand this approach towards a multispecies practice of learning which allows us to think – and *learn* – with animals. If we centre animals in debates about scientific uncertainty, it is possible to reveal hidden details about animal lives which can assist in mitigating the unknowns and lead to more effective international-level governing arrangements.⁶¹

Therefore, paying greater attention to animal cultures can inform global environmental governance via the creation of alternative knowledge systems. Animal cultures are the outcomes of processes of social learning among groups of animals.⁶² Flyways are an expression of animal culture that we use to explore the possibilities of a multispecies practice of social learning. By taking multispecies entanglements seriously, we open up how we 'do environmental governance', integrating the hidden and marginalised forms of knowledge. This is essential for understanding the governance challenges posed by transboundary flyways. As bird crime exploits blind spots in cross-border governance, more comprehensive responses that correspond to avian movements are required.

Bird crime on the flyways

We now turn our attention to songbirds on the flyways as a means of analysing how centring animals can advance debates in IR. We draw on fieldwork conducted as part of the wider UK Research and Innovation (UKRI) funded Beastly Business research project on the illegal wildlife trade in European species.⁶³ We took a qualitative and iterative approach, and material for this paper is primarily drawn from semi-structured interviews with key informants, official documents, and observations during fieldwork by Teresa Lappe-Osthege in Cyprus and Italy, and at key events in Hungary and Germany. Interviewees were invited to participate in the research project based on their expertise and knowledge of bird crime between 2021 and 2023. The 30 participants were drawn from government and policymakers (4), NGOs (6), hunting communities (4), businesses (3), enforcement (3), supranational organisations (3), and civil society, including those of direct experience with killing and trapping of birds (3).⁶⁴ We acknowledge that while the empirical analysis uses both Italy and Cyprus as case studies, longer fieldwork in Cyprus meant that we gathered

⁵⁸ An in-depth discussion of the debates around adaptive governance lies beyond the scope of this article. For an overview, see Cleaver and Whaley, 'Understanding process, power, and meaning'.

⁵⁹ Cleaver and Whaley, 'Understanding process, power, and meaning'; Glückler, Herrigel, and Handke, 'On the reflexive relations', p. 4; Lisen Schultz, Simon West, and Cláudia Florêncio, 'Nurturing adaptive governance through environmental monitoring: People, practices, politics in the Kruger to Canyons biosphere region, South Africa', in Joannes Glückler, Gary Herrigel, and Michael Handke (eds), *Knowledge for Governance* (Cham: Springer, 2020), pp. 293–318 (p. 294).

⁶⁰ Glückler, Herrigel, and Handke, 'On the reflexive relations', p. 5.

⁶¹ Mathur, *Crooked Cats*.

⁶² Philippa Brakes, Emma L. Carroll, Sasha R.X. Dall et al., 'A deepening understanding of animal culture suggests lessons for conservation', *Proceedings of the Royal Society B*, 288 (2021), p. 20202718.

⁶³ More information on the project and relevant outputs are available at: <https://beastlybusiness.org/>. CRediT Statement: Lappe-Osthege: data collection, conceptualisation, methodological development, writing original draft. Duffy: data collection, conceptualisation, writing original draft, funding, project management.

⁶⁴ Interviews were carried out online or in person by Teresa Lappe-Osthege or by Rosaleen Duffy, and a small number were interviewed by both (author and author). Interviewees were informed of the purposes of the research, all comments were fully anonymised, and participants were given the opportunity to review and amend the full transcript of the interview. Research on illegal activity is ethically complex and poses significant safeguarding challenges. The research was subject to strict ethical protocols to ensure that neither participants nor researchers were exposed to risks and harms arising from the research. For that reason, the identity of all interviewees is strictly confidential, and all identifying information (including references to employers, countries of residence or work, etc.) has been redacted.

more primary material there, which is reflected in the examples we use. This imbalance reflects the challenges of conducting fieldwork during and/or in the immediate aftermath of the pandemic, making it impossible to spend equal amounts of time in both Cyprus and Italy. We chose both countries as illustrative case studies as they are important range states along pan-European flyways that feature high levels of bird crime. However, criminal activity differs because the illegal bird trade targets different black markets (in the case of Italy, the market is both domestic and international, linking to illegal activity in the western Balkans, whereas in Cyprus, it is largely domestic).

Our analysis concentrates on bird crime along flyways which are a crucial expression of avian culture. Songbirds can migrate huge distances along the flyways and are sought-after targets of illegal activity in the key flyway range states of Cyprus and Italy. Before zooming in on the ways that bird crime intersects with avian culture, we set out why flyways are an object of global environmental governance and illustrate the challenges posed by uncertainty.

Scientific uncertainty along the flyways

Flyways are a good example of why international cooperation is needed in wildlife conservation, and in tackling environmental issues more broadly. Flyways span political and legal jurisdictions, covering a vast intercontinental geographic region.⁶⁵ Although regional conservation frameworks exist, their design and implementation are based on anthropocentric notions of scale and agency and tend to depend on national political priorities rather than ecosystemic dynamics. This results in variable levels of implementation of conservation efforts along the flyways, hampering the effectiveness of regional initiatives.⁶⁶ Regional bird conservation is largely shaped by four complementary and overlapping regulatory frameworks. The first is the Convention on the Trade in Endangered Species (CITES), established in 1973,⁶⁷ which is one of the longest-standing forms of international regulation of animals. CITES governs trade in birds listed under the convention. However, it focuses on how legal and illegal trade in whole animals, parts, or derivatives could drive extinctions;⁶⁸ the lives of the animals and their cultures do not feature precisely because it is not part of the 'management regime' for CITES. Second, the Convention on Migratory Species (CMS, or the Bonn Convention) was established in 1979 under the auspices of the United Nations (UN) to promote cooperation on the conservation of migratory species across national jurisdictions.⁶⁹ Third, the Bern Convention⁷⁰ (also called the Convention on the Conservation of European Wildlife and Natural Habitats) was established by the Council of Europe in 1979 and entered into force in 1982 to protect wild fauna and flora across Europe.⁷¹ Fourth is the EU's conservation policy framework, which is constituted predominantly by the Birds Directive,⁷² Habitats Directive,⁷³ and the Biodiversity Strategy.⁷⁴ While protection under the Birds Directive extends across all EU

⁶⁵ Boere and Stroud, 'The flyway concept'.

⁶⁶ Convention on Migratory Species, 'Joint meeting of the Bern Convention network of special focal points on eradication of illegal killing, trapping and trade in wild birds and the CMS intergovernmental task force on illegal killing, taking and trade of migratory birds in the Mediterranean', online meeting, 9–11 June 2021: UNEP/CMS/MIKT4/Final Meeting Report.

⁶⁷ Available at: <https://cites.org/eng>.

⁶⁸ Alfie C. Gaffney and Darrick Evensen, 'Addressing the elephant in the room: Learning from CITES CoP17', *Global Environmental Politics*, 20:1 (2020), pp. 3–10.

⁶⁹ Available at: <https://www.cms.int>.

⁷⁰ Available at: <https://www.coe.int/en/web/bern-convention/home>.

⁷¹ Council of Europe, 'Convention on the conservation of European wildlife and natural habitats' (1979), available at: <https://rm.coe.int/CoERMPublicCommonSearchServices/DisplayDCTMContent?documentId=0900001680078aff>.

⁷² Available at: https://environment.ec.europa.eu/topics/nature-and-biodiversity/birds-directive_en.

⁷³ Available at: https://environment.ec.europa.eu/topics/nature-and-biodiversity/habitats-directive_en.

⁷⁴ Available at: https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en; see also European Union, Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora: Official Journal of the European Communities, L 206, pp. 1–56 (1992), available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:01992L0043-20130701&from=EN>; European Union, Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds: Official Journal of the European Union, L 20 (2010), pp. 7–25; European Commission, 'EU Biodiversity Strategy for 2030: Bringing nature back into our lives': COM(2020) 380 final,

member states, the Bern Convention and CMS aim to cover a much broader geographic area linking range states across major pan-European flyways. Although their coverage is comprehensive in theory, it is much patchier in practice because of derogations, exemptions, or non-binding instruments. Therefore, although they are designed to address the material nature of the non-human, they do not always adequately mirror animal movement.

Scientific uncertainty is a key challenge in governing flyways. Tracing bird movements to understand how specific threats impact their behaviour and populations (e.g. through survival data) is complicated and fraught with uncertainty.⁷⁵ Data are often patchy, if they exist, or of poor quality due to lacking in-country capacities, political will, and the absence of standardised monitoring methodologies.⁷⁶ This can have real consequences for bird populations across range states. One interviewee explained the difficulty in identifying where and how bird crime occurs because flyways are interconnected and bird populations fluctuate:

some species will be still common breeders or relatively common in some countries, but when they're on the flyway, that's when they're persecuted with hunting and trapping. So, each year, less are going back to that country, so yes, they all join, the whole flyway joins, from wintering grounds to migration routes to where they actually go to breed, it's all joint, but ... difficult to track them through it.⁷⁷

Uncertainty is a key feature of environmental governance in range states along the Adriatic and Mediterranean and Black Sea Flyways, which impacts the success of policy interventions. Still, the joint CMS–Bern Convention Rome Strategic Plan aims to halve the scale of illegal killing, taking, and trade of birds (IKB) in range states by 2030 against national 2020 baselines.⁷⁸ While this is crucial progress to improve conservation across the flyways, its potential success will be determined by stakeholders' abilities to mitigate or circumvent uncertainties; due to uncertain data, establishing such a baseline against which progress can be measured poses significant difficulties.⁷⁹ Therefore, as reflected in Objective 1.1 of the Rome Strategic Plan, identifying the scale and scope of IKB is the first priority of regional conservation efforts. In the next section, we turn our attention to bird crime as a key threat to birds along the flyways and indicate how thinking with animals can address gaps in scientific knowledge. Doing so demonstrates how centring non-humans can assist in developing a more nuanced understanding of non-human agency in IR.

Bird crime on flyways

A 2023 report on the dimensions of wildlife crime in Europe from the Successful Wildlife Crime Prosecution in Europe (SWiPE) project stated that birds were by far the most targeted animals in wildlife crime in 7 of the 11 case-study countries.⁸⁰ While bird crime is a major threat to migratory songbirds, it is difficult to assess the exact dimensions, types, and impacts of bird crime on bird populations, not least because of its clandestine nature. One interviewee working on a supranational task force to develop and streamline the conservation of target species across range states referred to the creation of reliable data on bird crime as 'obviously almost impossible'.⁸¹ There is no standardised methodology for monitoring bird crime, significantly hampering information-sharing across flyway range states.⁸² Where data do exist because of long-term national surveys, the methodologies may be disputed and affect cooperation among conservation and enforcement

Brussels (20 May 2020), available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52020DC0380>; Engel, 'Uncovering the invisible', p. 19.

⁷⁵ Interview WP2.16; also see Guilherme et al 'Connectivity between countries'.

⁷⁶ See Engel, 'Uncovering the invisible'.

⁷⁷ Interview WP2.07.

⁷⁸ Rome Strategic Plan 2020–2030, p. 6.

⁷⁹ Ibid.

⁸⁰ Engel, 'Uncovering the invisible', p. 71.

⁸¹ Interview WP2.16.

⁸² BirdLife International, 'A best practice guide'; see also Engel, 'Uncovering the invisible'.

stakeholders; as one interviewee expressed, ‘I do not accept the methodology used 15 years ago or 10 years ago. We need to change.’⁸³ It is not simply uncertainties stemming from the data on bird crime that can derail effective conservation. The volatility with which birds adapt to threats, or offenders adapt to either the change in bird behaviour or a change in an official response to bird crime, can also affect the methodologies, quality, and use of data in identifying appropriate policy responses.

Often, statistics on how many birds are affected by bird crime in specific locations shape policy responses aimed at tackling it.⁸⁴ There are two caveats which limit the relevance of these statistics in informing responses to bird crime across range states of the flyways. First, although conservation measures aim to tackle the illegal killing, trapping, and trade of wild birds in Europe, the statistics upon which they are based appear to disproportionately reflect the number of illegally killed birds. While this is largely due to the difficulty in detecting illegal activity, it means that official statistics may not accurately reflect the number of live birds that are trapped and traded within Europe. Second, such an oversight is likely the result of taking the conservation status of a species and the extent to which it is threatened by extinction as a measure to prioritise conservation and enforcement interventions; many of the bird species affected by illegal killing, trapping, and trade in Europe are not threatened, such as Eurasian blackcaps or European goldfinches.⁸⁵ Their conservation status has direct implications for their treatment in global environmental governance. For instance, these species are not classed as CITES-regulated species, meaning that the trade in them is not subject to the same official and coordinated reporting. Europol found that wildlife offenders exploit this lack of monitoring and shift their activity towards these endemic non-threatened bird species to avoid detection.⁸⁶ The uncertainties around levels, types, and impact of bird crime on the flyways are examples of the scientific uncertainties that typically characterise global environmental governance and thereby hamper effective cooperation.

Despite these uncertainties, it is crucial to pay attention to bird crime in Europe because it can mean big business, illustrated by the appeal of CMS to its parties to ‘prioritise cases of illegal killing taking and trade of birds, with special attention to profit-motivated crime and organised crime’.⁸⁷ Up-to-date statistics are unavailable, but in 2010 illegal bird trapping in Cyprus was thought to be worth EUR15 million.⁸⁸ While organised crime can be involved, the group of offenders is much more varied. Europol found that criminals increasingly use the cover of legally registered entities (e.g. restaurants, ecotourism companies, pet shops) to conceal illegal activities.⁸⁹ Van Uhm refers to this as ‘green collar crime’,⁹⁰ that is, environmental crimes committed knowingly or unknowingly by legal entities.⁹¹ One interviewee who frequently encountered poachers in Cyprus highlighted that:

most of the poachers in Cyprus are not criminals. They’re normal people. They’re completely normal people. If you would see an average poacher, you would be thinking, in normal life, this would be your friend, or this would be your grandfather.

⁸³ Interview WP2.10.

⁸⁴ Brochet et al, ‘Preliminary assessment’.

⁸⁵ BirdLife International, *Sylvia atricapilla: The IUCN Red List of Threatened Species* (2016), e.T22716901A87681382, available at: {<https://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T22716901A87681382.en>}; BirdLife International, *Carduelis carduelis: The IUCN Red List of Threatened Species* (2019), e.T103764950A152615959, available at: {<https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T103764950A152615959.en>}.

⁸⁶ Europol, *Environmental Crime in the Age of Climate Change*, p. 22.

⁸⁷ Convention on Migratory Species, ‘The prevention of illegal killing, taking and trade of migratory birds. Adopted by the Conference of the Parties at its 13th Meeting’, Gandhinagar (February 2020). UNEP/CMS/Resolution 11.16 (Rev.COP13), p. 4.

⁸⁸ Interview WP2.11; BirdLife Cyprus, ‘The problem’, available at: {<https://birdlifecyprus.org/combating-bird-crime/the-problem/>} accessed 20 May 2024.

⁸⁹ Europol, *Environmental Crime in the Age of Climate Change*, p. 23; Engel, ‘Uncovering the invisible’.

⁹⁰ Daan Van Uhm, *The Illegal Wildlife Trade: Inside the World of Poachers, Smugglers and Traders* (New York: Springer, 2016).

⁹¹ George Iordachescu, Rosaleen Duffy, Hannah Dickinson, Teresa Lappe-Osthege, and Charlotte Burns, ‘Political ecologies of green collar crime: Understanding the illegal wildlife trade in European species’, *Environmental Politics*, 32:5 (2023), pp. 923–30.

Observations by another interviewee support this assessment, arguing that many trappers in Cyprus are less organised and more opportunistic:

There are a lot of opportunistic trappers as well I would say, yes, who would maybe see that there has been a fall of birds, and they'll decide, "Okay. I'm going to get 20 lime sticks, and I'm going to set up for the next three days because I've been seeing a lot of blackcaps around."⁹²

Profits from bird crime are considered 'easy money',⁹³ with birds of higher quality, meaning, as one interviewee explained, 'the really fat ones',⁹⁴ selling for around 100 euros per dozen. The group of offenders is very varied. This matters because existing policies to curb bird crime may miss that offenders actively seek out such opportunities to make an easy profit by using their knowledge of bird behaviour (or bird cultures).

Use of animal cultures in bird crime

Perpetrators of bird crime draw on their knowledge of avian cultures to increase their chances of success and profit. Yet there is little or no discussion of animal cultures in IR debates or global environmental governance structures, which is a critical oversight that this paper aims to address. While the scale and scope of bird crime are disputed, there is robust evidence outlining the methods and motivations of bird crime which can help to identify broader trends. Our data complement existing studies,⁹⁵ confirming that these methods draw directly on (traditional) knowledge of bird culture. As one interviewee said, 'if you know what you are doing, you can catch a lot of birds'.⁹⁶ This knowledge allows offenders to (a) adapt methods to migration patterns and bird behaviour, (b) target and create suitable habitats or 'hotspots', and (c) construct an artificial continuity between traditional practices and their business interests, justifying the continuation of killing, trapping, and trading of protected wild birds in the Mediterranean. Thereby, offenders can intervene in and reshape avian mobilities.

First, bird crime adapts to migration patterns and behaviour, for example, by increasing activities to match high-peak migration and targeting specific species. As birds migrate along the Adriatic and eastern Mediterranean and Black Sea Flyways between wintering and breeding grounds, illegal activity peaks in the spring and autumn.⁹⁷ One interviewee explained that migration paths determine the location of trapping sites in Cyprus at specific times of the year:

In autumn, the birds funnel on the East side of the island, which is the hotspot, so anywhere from Cape Greco and basically up to Larnaca. ... Whereas in the spring, there's a much broader front as birds are arriving in the West through Paphos, through Limassol and in the East through Larnaca as well. ... And they know that, the trappers, hunters, they know that.⁹⁸

Along these migration corridors, birds may avoid urban surroundings because of light and noise pollution, concentrating in the rural areas surrounding the cities.⁹⁹ Offenders adjust their activities and target these hotspots.¹⁰⁰ Such knowledge of what another interviewee called 'the geography of trapping' contributes to the devastating effect targeted bird crime can inflict on migrating bird populations.¹⁰¹ The use of non-selective methods increases the damage; they are banned under

⁹² Interview WP2.03.

⁹³ Interview WP2.06.

⁹⁴ Interview WP2.09.

⁹⁵ For example, see BirdLife International, 'A best practice guide'.

⁹⁶ Interview WP2.03.

⁹⁷ Interviews WP2.03, WP2.07.

⁹⁸ Interview WP2.07.

⁹⁹ Yana Yakashina, 'The response of the Bonn Convention on Migratory Species to light pollution', *IOP Conf. Series: Earth and Environmental Science*, 1099 (2022), p. 012048. doi:[10.1088/1755-1315/1099/1/012048](https://doi.org/10.1088/1755-1315/1099/1/012048); Interview WP2.10.

¹⁰⁰ Interview WP2.10.

¹⁰¹ Interview WP2.11.

the EU's Birds Directive.¹⁰² Mist nets are made of fine nylon mesh, difficult to detect, and usually erected in openings among lush vegetation (e.g. orchards), live trapping a large number of passing birds.¹⁰³ Limesticks are equally non-selective. They are made of small branches covered in natural glue, hidden in trees or bushes and catching any birds perching on them.¹⁰⁴ Shooting is theoretically more selective but still affects protected species.¹⁰⁵ Often, offenders use prohibited calling devices or live decoys to boost the number of birds in their trapping or shooting site. In Italy, trapped songbirds are used as live decoys and kept in specific ways to encourage their song. Exploiting their instinct, as one interviewee explained, 'it's obviously something that many countries ... have learned that, if you want a bird to sing, keep it in the dark and as soon as it sees light, it will sing,' adding 'because they think it's spring'.¹⁰⁶ The success of these methods is not simply contingent on the season or the ability to exploit bird behaviour but also on targeting the correct habitat.

Second, knowledge of bird cultures informs the selection and, at times, even the artificial creation of attractive habitats for illegal activities. Trappers may plant specific types of trees to attract target species. One interviewee, for whom songbird trapping with limesticks was a family tradition, explained that 'we used to plant some special fig trees. ... During the day, they [songbirds] go to eat figs. ... There are some fig trees that ... are more attractive than others because the fruits have thinner skins and are easier to eat and digest'.¹⁰⁷ It is this detailed knowledge and understanding of bird behaviour which is often passed down through the family and that allows criminals to fine-tune their activities. The large-scale use of specific infrastructure also contributes to the artificial creation of habitats. One interviewee explained that Cypriot law enforcement was tasked to clear 'kilometres of water pipes' from an acacia tree plantation because trappers had installed them to encourage tree growth and attract birds even during low-peak seasons, such as in the summer when birds would seek shelter from the heat.¹⁰⁸ These insights illustrate that specialised knowledge of bird cultures directly informs the types of criminal activities that can inflict the greatest damage on biodiversity by interfering directly with their behaviour and movement or ways of living.

Third, knowledge of bird culture not only enables offenders to intervene in avian ways of life; it also makes it possible to shape human attitudes and responses to bird crime, demonstrating the multidirectional entanglements between the human and non-human. Offenders use the knowledge of bird culture to frame their illegal business interests as the continuation of traditional and cultural practices. Contemporary methods and scales bear little to no resemblance to cultural traditions of bird trapping. For instance, stakeholders observed a shift towards the use of synthetic glue in the making of limesticks, shifting away from the use of traditional natural materials such as Syrian plums.¹⁰⁹ Where trapping in Cyprus may have focused on seaside locations because of favourable natural vegetation, the use of calling devices allowed illegal activity to expand inland. One Cypriot interviewee describes the change in practice and location:

[In] the '90s, they started bringing these recordings, but it was a tradition, a habit. Everybody used to do it. Not everywhere. It was supposed to be special villages near the sea because we had the impression that the birds used to come from Africa. ... Then, it became like a trade in the '90s. Some people were earning a lot of money. ... With the devices, other people from

¹⁰² Article 8 of the European Union, Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds: Official Journal of the European Union, L 20 (2010), pp. 7–25.

¹⁰³ Angus Nurse and Tanya Wyatt, *Wildlife Criminology* (Bristol: Bristol University Press, 2021), pp. 43–4.

¹⁰⁴ Convention on the Conservation of European Wildlife and Natural Habitats, 'Methodology document to identify black-spots of illegal killing of birds', T-PVS/Inf(2015)3. Council of Europe: Strasbourg, 1–4 December 2015, pp. 5–6.

¹⁰⁵ Alma Mikuška, Dario Horvat, Adrian Tomik, and Tibor Mikuška, 'Impact of hunting on strictly protected bird species in Croatia', 2nd Adriatic Flyway Conference, Durres (Albania), 1–3 October 2014; available at: https://www.bib.irb.hr/875336/download/875336.AF_Proceedings_web_04-05-17.pdf.

¹⁰⁶ Interview WP2.07.

¹⁰⁷ Interview WP2.14.

¹⁰⁸ Interview WP2.09.

¹⁰⁹ Interview WP2.03.

villages not near the beach, they started as well. They were getting them [birds] down with the devices.¹¹⁰

Contemporary bird trapping has little to do with traditional practices that were used for subsistence hunting by poorer members of the community.¹¹¹ The knowledge of bird cultures allows offenders to create a continuity between such traditions and illicit business interests and political agendas. Recent surveillance data by BirdLife Cyprus corroborates this assessment.¹¹² Commercial capture and trade of illegally killed birds are closely interlinked with green-collar crime, serving luxury demand for local delicacies (such as *polenta e osei* or *ambelopoulia*) and promoting specific political interests. One interviewee explained that in Cyprus, ‘all the villages, all the people who are in this trade, they are voters and they are blackmailing politicians. Not only that, a lot of politicians, they eat the songbirds.’¹¹³ These linkages between bird crime, business interests, and political leverage are enabled and strengthened by the exploitation of knowledge about bird cultures.

Therefore, offenders can exploit the regulatory vacuum that scientific uncertainty about bird crime creates. By exploiting knowledge about bird cultures, they can exert direct control over avian mobility regimes. They do so by adapting their tactics to migration patterns and bird behaviour, intervening directly in avian ways of life by changing birds’ relations with their natural habitats and framing their practices as activities rooted in traditional knowledge, ensuring their continuation despite impacts on biodiversity. In contrast, institutional responses to bird crime are much slower to adapt to changes in bird behaviour and do not yet utilise animal cultures to improve conservation.

Responses to bird crime

Recent policy processes have begun to respond to the volatility and nuances of bird crime, for example, by integrating calls for addressing business interests in the wildlife trade in Europe despite persisting uncertainties about the scale, scope, and impact of the trade;¹¹⁴ however, they are yet to translate this into responses that address the ability of wildlife crime offenders to exploit their knowledge of animal cultures. This inability is partly due to the reliance of interventions on proven scientific evidence and comprehensive data and the lack of political will, slowing down collective action and hampering the integration of alternative knowledge systems and ways of learning. One interviewee stated it had not been a priority: ‘My suspicion is very strongly that that is not evidence of absence, but more that energy hasn’t necessarily been spent on looking at that.’¹¹⁵ They explained that while the scientific understanding of animal lives has developed substantially, global environmental governance mechanisms have not kept pace with integrating this growing understanding of animal cognition into international regulatory regimes has proven to be ‘actually quite a wicked problem.’¹¹⁶ The reasons for the difficulties in integrating knowledge about animal cultures become apparent when we consider what type of knowledge is created in international conservation frameworks and how.

In practice, international conventions which act as key players in mitigating the adverse effects of wildlife crime on biodiversity, such as CMS or the Bern Convention, take a ‘zero tolerance

¹¹⁰Interview WP2.14.

¹¹¹BirdLife International, ‘A best practice guide’, p. 32; Interviews WP2.12, WP2.24.

¹¹²BirdLife Cyprus, ‘Update on illegal trapping activity in Cyprus’ (2023), available at: {https://birdlifecyprus.org/wp-content/uploads/sites/3/2023/02/BirdLife-Cyprus_Autumn_2022_Trapping_report-FINAL-for-Publication.pdf}.

¹¹³Interview WP2.12.

¹¹⁴For example, European Parliament, ‘European Parliament resolution of 5 October 2022 on the EU strategic objectives for the 19th meeting of the Conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), to be held in Panama from 14 to 25 November 2022’ (2022/2681(RSP), Strasbourg, 5 October 2022.

¹¹⁵Interview WP2.25.

¹¹⁶Interview WP2.25.

approach to illegal killing, trapping and trade of migratory birds.¹¹⁷ In 2019, CMS recognised that there is a lack of official guidance on how to produce an assessment of the scale of illegal activity related to bird crime, acknowledging that the creation of this data would be 'likely to require some effort to generate'.¹¹⁸ This comes six years after the Tunis Action Plan, established under the Bern Convention, set out specific steps to close such data gaps by encouraging signatories to combine enforcement data with data on the effects of illegal activity on bird populations¹¹⁹ and the 2014 CMS Strategy for Migratory Species aimed to align instruments and cooperation across the flyways.¹²⁰

In the meantime, CMS and the Bern Convention established specific networks or task forces to mitigate uncertainty and improve conservation efforts by facilitating learning and cooperation, such as the Bern Convention Network of Special Focal Points on Eradication of Illegal Killing, Trapping and Trade in Wild Birds and the CMS Intergovernmental Task Force on Illegal Killing, Taking and Trade of Migratory Birds in the Mediterranean (MIKT).¹²¹ For instance, MIKT promotes the implementation of national conservation efforts through the development of national scoreboards. These scoreboards assess existing activities on tackling bird crime and are collated regularly every three years. Through its voluntary self-assessment process, MIKT brings together stakeholders from different sectors and significantly contributes to filling data gaps and promoting cooperation in flyway range states.¹²² The task force functions as a coordinated attempt at mitigating the effects of scientific uncertainty on environmental governance structures by promoting multilevel cooperation and learning.

In theory, task forces such as MIKT support the processes of knowledge production in global environmental governance. In practice, the combination of scientific uncertainty with a lack of political will can reduce the effectiveness of such initiatives by creating two problems: first, national stakeholders, such as enforcement agencies and civil society organisations, carry much of the responsibility for driving progress forwards despite the lack of political will by national governments,¹²³ and second, the need for cross-country standardisation of data-collection methodologies means that only specific types of knowledge are taken into consideration. One interviewee outlined that NGOs monitor trapping and bird populations as best as possible to 'create trends for trapping activity. We see if it has gone up or down for the year, and we write up a report based on that information which we use to lobby the "powers that be", government and Europe and all this to try and help bird protection.'¹²⁴ Another interviewee explained that the lack of political will poses a severe problem in addressing bird crime. For example, reducing the fines for trapping specific bird species in Cyprus meant that criminal activities continued: 'It's illegal, but they [the police and government] allow it to go on. They allow it to happen. That was proven at the beginning

¹¹⁷Convention on Migratory Species, 'MIKT Workplan 2021–2025' (2021) UNEP/CMS/MIKT4/Outcome 1, p. 2; Convention on the Conservation of European Wildlife and Natural Habitats, 'Larnaca Declaration' (2011), available at: [https://rm.coe.int/ref/Decl\(2011\)01](https://rm.coe.int/ref/Decl(2011)01).

¹¹⁸Convention on Migratory Species, 'Scoreboard to assess the progress in combating illegal killing, taking and trade of wild birds (IKB)' (2019). UNEP/CMS/MIKT3/Inf.9, p. 16.

¹¹⁹Convention on the Conservation of European Wildlife and Natural Habitats, 'Draft Recommendation on the implementation of the Tunis Action Plan 2020, on the eradication of illegal killing, trapping and trade of birds'. T-PVS (2013) 4, Strasbourg, 3–6 December 2013.

¹²⁰Convention on Migratory Species, 'Programme of work on migratory birds and flyways'. UNEP/CMS/Resolution 11.14, Quito, 4–9 November 2014.

¹²¹Convention on the Conservation of European Wildlife and Natural Habitats, Standing Committee, 'Beyond 2020: Bringing an end to illegal killing, taking and trade in wild birds as a conservation concern for the flyways: A concept note'. T-PVS/Inf(2018)3, Strasbourg, 26 October 2018, p. 6.

¹²²Convention on Migratory Species, 'Scoreboard to assess the progress in combating illegal killing, taking and trade of wild birds (IKB): A self-assessment framework for national use. Annex 1 to Resolution 11.16 (Rev.COP12)' (2017), available at: <https://www.cms.int/en/document/scoreboard-assess-progress-combating-illegal-killing-taking-and-trade-wild-birds-ikb-1>.

¹²³BirdLife International, 'A best practice guide'; and Brochet et al., 'Preliminary assessment'.

¹²⁴Interview WP2.03.

of last year [2020] when they reduced the fines.¹²⁵ Other accounts matched the assessment that governments were not doing their part in addressing bird crime and fulfilling their obligations to implement international agreements.¹²⁶ The result of this combined lack of political will and the slowness of collective action due to scientific uncertainty appears to be a reliance on enforcement-led interventions to produce quantifiable data, as illustrated by the use of voluntary guards in Italy to monitor hunting practices in specific areas.¹²⁷

Such a reliance on enforcement-backed monitoring means that only specific types of data are integrated into the design of responses to bird crime. For instance, for national monitoring of progress in addressing bird crime, the CMS national scoreboards rely on ‘expert-based assessment indicators’ to review the scale of bird crime, the adequacy of national legislation, or the judicial response to criminal activity.¹²⁸ While CMS acknowledges that responses may not always be indicative, its guidance document suggests different ‘approaches that can be followed to generate a single national rating’, such as relying on the assessment by the most competent authority or taking a precautionary approach by lowering the rating.¹²⁹ Although this ensures that data are malleable to instrumental policy processes, this approach restricts the types of knowledge that can inform and shape responses to bird crime. After all, the decision on which authority is the most competent or whether a precautionary approach is necessary is an inherently political one determined by existing power structures. CMS itself acknowledges the simplicity of the self-assessment methodology, stating that further engagement and analysis of the data is needed because the methodology ‘fails to provide a full picture of the complex issue at stake’.¹³⁰ Even if monitoring data on illegal activity is corroborated with tracking data of migratory bird species, knowledge gaps are likely to persist, not least because tracking studies depend on the allocation of financial resources and political will and are often driven by underlying agendas or skewed towards high-profile, threatened species or geographies.¹³¹ Therefore, uncertainty is a perpetuating problem that existing methodologies do not address sufficiently.

These examples illustrate persistent difficulties in creating reliable data on bird crime that slow down collective action to curb the much more adaptable type of bird crime, responding much more quickly to changes in bird behaviour – or even aiming to create those changes itself. As one interviewee reflected, ‘Why then might it be that in the management frameworks, our understanding and information spread more slowly? It’s because we have a higher bar for validation.’¹³² Increased enforcement and monitoring within the parameters of existing knowledge systems are unlikely to provide a durable solution. Greater attention towards bird cultures can provide alternative avenues for analysing existing data and create new multispecies processes of social learning.

Integrating animal cultures in global environmental governance

Our paper demonstrates the constraining effect of scientific uncertainty on global environmental governance and the inability of existing governance frameworks to function effectively in spite of it. Characterised by its anthropocentric outlook and reliance on specific versions of scientific validity, the prominent emphasis in biodiversity conservation on mitigating such uncertainty means that it overlooks two crucial processes already taking place. First, that the exploitation of knowledge

¹²⁵ Interview WP2.07.

¹²⁶ Interviews WP2.11, WP2.12, WP2.13.

¹²⁷ Interviews WP2.01, WP2.22.

¹²⁸ Convention on Migratory Species, ‘Scoreboard to assess the progress in combating illegal killing, taking and trade of wild birds (IKB)’ (2019). UNEP/CMS/MIKT3/Inf.9, pp. 13–16.

¹²⁹ *Ibid.*, p. 15.

¹³⁰ *Ibid.*, p. 16.

¹³¹ Guilherme et al., ‘Connectivity between countries’, p. 3; Alice Bernard, Ana S. L. Rodrigues, Victor Cazalis, and David Grémillet, ‘Toward a global strategy for seabird tracking’, *Conservation Letters*, 14:3 (2021), p. e12804.

¹³² Interview WP2.25.

of animal culture already contributes to rising levels of biodiversity loss, as the case of bird crime along the Adriatic and eastern Mediterranean–Black Sea Flyway demonstrates. Second, understanding and centring animal cultures can play a crucial role in adapting governance structures to volatility and ambiguity by helping to identify trends, making global biodiversity conservation more effective. The latter requires us to think with and learn from animals in a way that does not match the existing production of knowledge systems in global environmental governance. To shed light on these blindspots, we outline below the potential of the targeted CMS Expert Group on the Conservation Implications of Animal Cultures and Social Complexity to contribute to the integration of animal cultures into conservation institutions; and we explore how this process challenges existing approaches in IR.

CMS is the only global environmental convention that has a specific initiative on animal cultures. It established a CMS Expert Group on Animal Cultures (decision 13.103) in 2014 and since then has held four workshops. The purpose of the Expert Group is to (a) develop and test a management tool for identifying priority species and social groups for animals listed by CMS; (b) continue further development of case studies; (c) develop a work plan on animal cultures; and (d) make recommendations to the Meeting of the Sessional Committee of the Scientific Council preceding the 14th meeting of the Conference of the Parties (COP14) (held in Samarkand in February 2024).¹³³ Much of its work has focused on high-profile species that display animal cultures, such as cetaceans and elephants. As one CMS expert remarked, the initial focus was on cetaceans because several are listed by CMS and they display forms of social learning that are deemed to meet the threshold for animal cultures. The expert also emphasised how the group was interested in developing work on the animal cultures of a much wider range of species which were now included in the Expert Group remit:

We had experts from a really wide range of species. We had a fish expert there. We had lots of different bird people. We had primatologists. We had obviously lots of cetacean folks. We had reptile specialists because the fact of the matter is that social learning, we are understanding, there is more and more evidence that social learning is a process that is happening in lots of different vertebrate taxa.¹³⁴

The ability of the group to shape the policies of the convention around animal cultures has been limited in part by the very high scientific threshold for what constitutes a culture rather than simply social learning.¹³⁵ It was clear that being able to shape policy in ways that embrace scientific uncertainty could be beneficial to a wider range of species. In essence, incorporating animal cultures to address scientific uncertainty is difficult to integrate in global conventions like CMS because doing so fundamentally challenges the existing knowledge systems on which the architecture of global environmental governance is based. The lack of engagement with animal cultures stands in stark contrast to the ways that wildlife crime offenders are able to utilise their knowledge of animal cultures to ensure success, as discussed in the case above. As a result, the governance of migratory birds lags behind the threats faced by the birds on their long journeys along flyways. The policy implication of this is that being able to draw on animal cultures could allow global conventions to respond to threats more quickly and effectively.

This opens broader questions about how IR can reconceptualise global environmental governance via thinking with animals. For both the practice of global conventions and IR as a discipline, it is essential to address their inherent anthropocentrism. First, animal culture challenges dominant

¹³³Decisions 13.102 to 13.105: Conservation Implications of Animal Culture and Social Complexity | CMS; see Historic UN Wildlife Meeting Concludes with Major Set of Actions for the Conservation of Migratory Species of Wild Animals | CMS, available at: <https://www.cms.int/en/news/historic-un-wildlife-meeting-concludes-major-set-actions-conservation-migratory-species-wild> accessed 20 May 2024.

¹³⁴Interview WP2.25.

¹³⁵Interview WP2.25; also see Brakes et al., 'A deepening understanding of animal culture.'

understandings of scale and borders in IR. Existing interspecies approaches in IR are terrestrial in outlook because the terrestrial landscape is the foundation of human perceptions of scale. Human institutions can mould terrestrial space; taking animal cultures seriously forces IR debates and global environmental governance structures to integrate those spaces over which human institutions have little to no direct control. For example, Youatt's conceptualisation of borders¹³⁶ discussed above provides an opportunity to rethink the role of flyways in regional conservation measures as being constituted of both human and non-human actors. It raises questions about how we understand and regulate avian mobility regimes that cannot be managed in the same way as their terrestrial counterparts.

Although this emphasis on mobility regimes is a considerable step towards bridging the separation of the human and the non-human in IR, it situates the effects of multispecies entanglements in the terrestrial space, overlooking that some ecosystems (such as flyways) require an even broader conceptualisation. As Yakashina argues in the context of CMS's responses to the impact of light pollution on migratory birds, 'the airspace habitat should be also considered a part of a valuable dimension in terms of conservation biodiversity'.¹³⁷ While this observation is still fundamentally anthropocentric, it is helpful to draw on perspectives from geography which emphasise the need to move beyond terrestrial space to include 'vertical space'.¹³⁸ This is particularly challenging as the structures of global environmental governance are currently ill equipped to do so. In this context, scientific uncertainty around flyways and avian cultures is a multiplying factor undermining the effectiveness of existing conservation measures. The discrepancy between the impact of harmful human activity on birds (e.g. bird crime) and the inability of traditional governance mechanisms to regulate avian mobility regimes creates significant challenges for conservation.

Second, integrating animal cultures into global environmental governance poses particular questions in terms of who or what is to be regulated. Is it human behaviour in relation to animal behaviour, or animal behaviour in relation to human activities (particularly in context of the global political economy), or both? Our analysis indicates that existing conservation strategies target human behaviour in particular, thereby overlooking how the human and non-human spheres are entangled in a circular relationship. Following Leep,¹³⁹ this challenges dominant approaches in IR that acknowledge the relevance of interspecies relationships in regulatory activities but do so from an inherently human-centric viewpoint, i.e. those that see the human as the referent object of regulatory intervention.

Already in 2013, the Tunis Action Plan¹⁴⁰ (a joint initiative of CMS and the Bern Convention 2013–20) recognised that non-human species were 'the "beneficiary" of wildlife conservation legislation, and thus that changes in human behaviour towards wildlife may have to occur'.¹⁴¹ If we apply Youatt's argument of mobility regimes,¹⁴² we find that human activity linked to bird crime aims to regulate bird behaviour to serve a particular purpose (i.e. the maximisation of profits by catching a larger number of birds). Human institutions, such as regional conservation frameworks like CMS, do not have the same regulative effect on bird behaviour as they centre first and foremost on the regulation of human activity and the creation or preservation of terrestrial habitat. By integrating animal cultures into global environmental governance structures, we can expand beyond such an

¹³⁶Youatt, *Interspecies Politics*.

¹³⁷Yakashina, 'The response of the Bonn Convention', p. 2.

¹³⁸Elizabeth Lunstrum, 'Green militarization: Anti-poaching efforts and the spatial contours of Kruger National Park', *Annals of the Association of American Geographers*, 104:4 (2014), pp. 816–32.

¹³⁹Leep, 'Toxic entanglements'.

¹⁴⁰Tunis Action Plan, CMS, available at: <https://www.cms.int/en/document/tunis-action-plan>.

¹⁴¹Convention on the Conservation of European Wildlife and Natural Habitats, 'Draft Recommendation on the implementation of the Tunis Action Plan 2020, on the eradication of illegal killing, trapping and trade of birds'. T-PVS (2013) 4, Strasbourg, 3–6 December 2013, p. 5.

¹⁴²Youatt, *Interspecies Politics*.

anthropocentric vision of regulation towards the acceptance of multispecies entanglements as the referent object of regulatory intervention.

Greater attention towards animal culture, therefore, enables us to expand the parameters of existing knowledge systems by taking seriously the complexities of multispecies entanglements. This requires the expansion of our understanding of knowledge production and the power dynamics that structure this process, such that we need to transform who produces what kinds of knowledge and for what purpose. Doing so opens up exciting possibilities for effectively integrating traditional knowledges into policy processes in ways that render global environmental governance more effective.

Conclusion

It is essential that IR develops a more nuanced understanding of animal agency, and the role of non-humans, in order to move beyond its anthropocentric roots. In doing so it needs to expand its vocabulary, as Fishel argues.¹⁴³ This paper built on and moved forward current approaches to developing a less anthropocentric IR by scholars such as Leep, Burke, Meiches, Fougner, Pereira, Fishel, Youatt, and others. We took these debates one step further by bringing IR more fully into conversation with animal studies, which has a much longer-standing engagement with multispecies approaches. Doing so opened an opportunity to examine what a multispecies approach means in practice. We examined how thinking with animals¹⁴⁴ can address current shortcomings in IR, moving beyond arguing for the inclusion of the non-human in IR debates towards analysing what it means in practice for global environmental governance. By focusing on the movement of birds across the flyways, the threats they face, and the ways that bird crime offenders use avian cultures, we argue for embracing animal cultures to address scientific uncertainty. Ultimately, this is necessary to counteract the exploitation of knowledge about bird cultures to exert direct control over avian mobility regimes and harm bird populations. By examining the new initiatives in CMS, we demonstrate how integrating insights from animal cultures can allow conventions to respond to biodiversity threats more quickly and effectively; doing so could create the very kind of global ecological governance proposed by Burke. More broadly, embracing animal cultures challenges the practice of global environmental governance and IR as a discipline because it encourages us to rethink the systems of knowledge production and the power structures that underpin them; doing so will enable the broad field of IR to move beyond anthropocentrism and integrate knowledge systems other than Western understandings of scientific evidence. Exploring what a multispecies process of social learning could look like is crucial to expand the parameters of existing knowledge systems and create a more holistic basis for the creation of scientific evidence in global environmental governance. While we focused on songbirds in this paper, our analysis has implications for governance of oceans, forests, freshwater, the Arctic, and the global climate. In sum, centring animals in our analyses expands the boundaries of IR in ways that address the complex challenges posed by global environmental change and uncertainty, including ongoing rates of biodiversity loss. It is necessary for IR as a discipline to move beyond its anthropocentric roots to meet the intellectual demands of understanding, interpreting, and responding to the scale and implications of global environmental change.

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¹⁴³Fishel, 'The global tree'.

¹⁴⁴Johnston, 'Of lobsters, laboratories, and war'.

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