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Implications of Russia's invasion of Ukraine for the governance of biodiversity conservation

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Maintaining peace and conserving biodiversity hinge on an international system of cooperation codified in institutions, but Russia's invasion of Ukraine brings recent progress to a crossroads. Against this backdrop, we address some implications of Russia's invasion of Ukraine for the governance of biodiversity conservation both within and beyond Russia. The Russian invasion of Ukraine threatens the governance system for biodiversity conservation, as it pertains to Russia and beyond, due to three interacting factors: (i) isolation of Russia from the international system, (ii) halt and delay of international cooperation, and (iii) changes in international and domestic policy priorities. We recommend making the existing international system of governance for conserving biodiversity more resilient and adaptable, while aligning security agendas with biodiversity conservation goals.

KEYWORDS

migratory species conservation, international conflict, conservation policy, transboundary conservation, global environmental governance, Russia's invasion of Ukraine

1 Introduction

Maintaining peace and conserving biodiversity hinge on an international system of cooperation codified in institutions, but Russia's invasion of Ukraine brings recent progress to a crossroads. The war in Ukraine has caused a humanitarian crisis, with loss of human lives, refugees, a paralyzed economy, as well as damaged property and infrastructure¹. This invasion is the exacerbation of increased international tensions and escalations with roots in historical legacies, existential nationalism, and tyranny (Gomza, 2022; Knott, 2022; Kuzio, 2022; Richter, 2022). Importantly, modern international cooperation for biodiversity conservation parallels peacekeeping efforts, as both have been marked by the same two milestones, World War II and the end of the Cold War. The former catalyzed the creation of the United Nations (UN) system and regional institutions that enabled environmental cooperation (Mitchell et al., 2020). The latter broke down geopolitical barriers across regions with transboundary ecosystems and migratory species that required international cooperation for their conservation (North, 2016).

Against this backdrop, our objective in this policy brief is to address key implications of Russia's invasion of Ukraine, launched in February 2022, for the governance of biodiversity conservation both within and beyond Russia. We do so with the goal of bringing these issues to the attention of governance scholars and practitioners, as these warrant further research and development of political strategies to sustain progress on biodiversity conservation. From a biodiversity conservation perspective, the war in Ukraine has, rightly so, received most attention as it pertains to tangible impacts on biodiversity in Ukraine (Pereira et al., 2022). However, we argue that the war can also have spill-over effects on biodiversity conservation at a global scale due to shocks to governance at international and domestic levels. In this article, we summarize the importance of biodiversity occurring in Russia, consider Russia's participation in the international governance system for biodiversity conservation, and propose approaches to foster biodiversity conservation governance in the face of emerging challenges from the Russian invasion.

Noteworthy, we do not consider the effects of warfare on biodiversity in Ukraine, a country with important biodiversity values (Ecodit, 2017). Such impacts, which remain to be quantified, have so far ranged from direct destruction of habitats and mortality of wildlife by military means, devastation of infrastructure important for management, to weakening of Ukrainian institutions tasked with biodiversity conservation arising from shifts in priorities within the country, a crippled economy, and warfare (Pereira et al., 2022; UNEP, 2022a). Some of these effects, for instance, have already been recognized officially by the international community through the Ramsar Convention on Wetlands². While we acknowledge the importance of this topic, including how the international community could support Ukrainian efforts to continue their work

on biodiversity conservation, we consider it to warrant scholarly attention in its own right as it has many other dimensions that require a different analytical approach. Conversely, here we focus on Russia because of its global importance to biodiversity conservation and bearing in the international governance system.

2 Russia's importance for biodiversity

Russia is of global importance for biodiversity in multiple dimensions (Figure 1). Within the context of genetic diversity, for instance, Russia is home to subspecies of large carnivores, such as the Kamchatka brown bear (*Ursus arctos beringianus*). At the species level, Russia is an important range state for many transboundary migratory species, including insects (e.g., red-veined darter, *Sympetrum fonscolombii*), fish (e.g., stellate sturgeon, *Acipenser stellatus*), birds (e.g., red-breasted goose, *Branta ruficollis*), and mammals (e.g., Altai argali, *Ovis ammon ammon*). As a case in point, Russia is a breeding stronghold for over 550 migratory bird species, of which 52 are threatened, that spend the boreal winter across Europe, Africa, southern Asia, Australasia, and northwest North America (BirdLife International, 2022; Figure 1). At the ecosystem level, Russia holds more of Earth's remaining wilderness than any other country (Watson et al., 2016), with half of the top 25 Arctic wilderness areas (Lysenko et al., 2001) and more forest area than any other country, including more of the most intact forest (Grantham et al., 2020). Consequently, Russia is crucial to reach ecosystem integrity targets within the Global Biodiversity Framework, an overarching strategy for advancing biodiversity conservation through the global biodiversity-related conventions, the UN system, and other actors^{3, 4}. Russia contains half of the world's boreal forest, and the largest area of peatlands of any country, representing significant nature-based climate change mitigation solutions (Rockström et al., 2021; UNEP, 2022b). Furthermore, about half of the Caucasus Biodiversity Hotspot, a globally important region owing to its high irreplaceability and imminent threats, occurs within Russia (Myers et al., 2000), as well as over half of the Arctic Ocean's coastline (Laruelle, 2014).

3 Russia's participation in international institutional arrangements for biodiversity conservation

Russia is centrally placed in the international governance system, with its permanent status in the UN Security Council, and being amongst the countries that has entered the most international environmental agreements (Hollway and Koskinen, 2016; Carattini et al., 2023). Importantly, Russia played an early role in international environmental governance, as demonstrated by its membership to the now defunct 1911 North Pacific Fur Seal Convention (Dorsey, 1998). Currently, Russia is a

1 <https://www.npr.org/2022/08/24/1119202240/ukraine-russia-war-by-numbers> [Accessed December 24, 2022]

2 https://www.ramsar.org/sites/default/files/documents/library/cop14_18_24_rev2_dr_ukraine_e.pdf [Accessed December 14, 2022]

3 <https://www.cbd.int/sp/> [Accessed December 14, 2022]

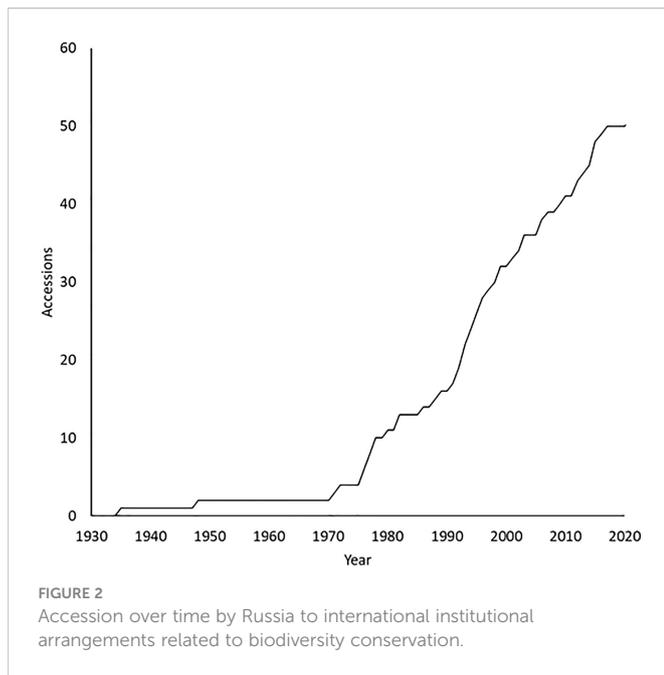
4 <https://www.cbd.int/article/draft-1-global-biodiversity-framework> [Accessed December 23, 2022]



member to at least 51 international institutional arrangements related to biodiversity conservation (Supplementary Information 1; Dataset S1). Membership to these arrangements emerged in the 1930s and increased steadily from the 1970s until 2021 (Figure 2). Russia has a recognized leadership role in some of them, for example, as the 2021-2023 Chair of the Arctic Council and the 2022 Chair of the World Heritage Committee under the World Heritage Convention. The spatial and political scope of these arrangements range from regional (e.g., Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean) to global (e.g., Convention on Biological Diversity), as well as from intergovernmental (e.g., Convention on the Conservation of Antarctic Marine Living Resources) to public-private partnerships (e.g., East Asian-Australasian Flyway Partnership). Noteworthy, some of these arrangements focus specifically on threatened species, such as the polar bear (*Ursus maritimus*; VU, IUCN Red List; Agreement on Conservation of Polar Bears), the Saiga antelope (*Saiga tatarica*; CR, IUCN Red List; Memorandum of Understanding on the Conservation of the Saiga Antelope), and the spoon-billed sandpiper (*Calidris pygmaea*; CR, IUCN Red List; Russia-China Migratory Bird Agreement).

4 Implications of Russia's invasion of Ukraine for the governance of biodiversity conservation

The Russian invasion of Ukraine threatens the governance system for biodiversity conservation, as it pertains to Russia and beyond, due to three interacting factors: (i) isolation of Russia from the international system, (ii) halt and delay of international cooperation, and (iii) changes in international and domestic policy priorities. Here, we outline mechanisms under each of these factors with concrete, and some immediate, implications for governance of biodiversity conservation and the eventual flow-on effects on the ground. These mechanisms and implications are illustrative of each factor and by no means are claimed to be exhaustive. We define the West as all countries that were officially classified as unfriendly to Russia by its government on March 7, 2022 (Supplementary Information 2).



4.1 Isolation of Russia from the international system

Biodiversity conservation will be vulnerable to the increased isolation of Russia from the West, as many conservation initiatives rely on ongoing international cooperation processes that enable actions on the ground. These disruptions can potentially derail ongoing conservation efforts in Russia that cannot be switched on and off, such as intensive management of declining populations (Figure 3; Box 1). Intergovernmental processes have already been halted as a result of the invasion with effects for biodiversity in Russia and elsewhere. For instance, the Arctic Council, the prime international institutional arrangement on Arctic cooperation (www.arctic-council.org), has paused all official meetings⁵, including its subsidiary working group on biodiversity, known as Conservation of Arctic Flora and Fauna (CAFF), and associated work streams, such as the Arctic Migratory Bird Initiative (AMBI). AMBI's goal is to advance the conservation of Arctic breeding birds, which includes cooperation with non-Arctic countries as many of such species migrate south of the Arctic circle. Even though there is already a signal of potential resumption of some of the Arctic Council's activities, Russia will be excluded from them⁶. The pause on CAFF's work, including AMBI, and potential resumption without Russia could impact conservation efforts for the many bird species that breed in this country and migrate south outside its jurisdiction, as well as to biodiversity in general (Sellheim Environmental, 2022). Likewise, Russia has now been

5 <https://www.state.gov/joint-statement-on-arctic-council-cooperation-following-russias-invasion-of-ukraine/> [Accessed March 28, 2022]

6 <https://www.state.gov/joint-statement-on-limited-resumption-of-arctic-council-cooperation/#:~:text=We%20remain%20convinced%20of%20the,participation%20of%20the%20Russian%20Federation> [Accessed July 5, 2022]

suspended from the Barents Euro-Arctic Council⁷, a platform for international cooperation that advances biodiversity conservation in terrestrial and marine ecosystems across the Barents Sea region⁸. Beyond intergovernmental processes, market-based tools have also been affected, with the Forest Stewardship Council (FSC) having banned all trade of FSC-certified products from Russia⁹. Sanctions on Russia that are already in place, as well as likely additional ones, will also limit support for research, as illustrated by the European Federation of Academies of Sciences and Humanities suspension of the Russian Academy of Sciences membership¹⁰ and the suspension of cooperation on research with Russia by the European Commission, which includes biodiversity conservation-related funding¹¹. Financial support from abroad for biodiversity conservation in Russia has also now been affected through the suspension of the SWIFT interbank system¹² (Box 1), precluding international transfers, and the halt to Russian participation in large international collaborative projects, such as the German funded 'climate-resilient site network in the African-Eurasian flyway'. Moreover, increasing mistrust of Russia may lead to conservation-specific limits on funding and technical assistance from other countries (Matejova et al., 2018).

4.2 Halt and delay of international cooperation

International cooperation through various governance mechanisms has been brought to a halt, and delay, with implications for biodiversity conservation both within and outside Russia. For instance, the next meeting of the World Heritage Convention's decision-making process for inscription of new sites, originally scheduled for June 2022, had been paused indefinitely as Russia was the Chair and host of the 45th World Heritage Committee session at the time of the invasion¹³. This decision was influenced by 46 state parties to the World Heritage Convention opposing to hold

7 https://um.fi/barents-news/-/asset_publisher/CT4Fi7JxZWeA/content/joint-statement-of-finland-denmark-iceland-norway-sweden-and-the-european-union-regarding-barents-euro-arctic-cooperation [Accessed December 14, 2022]

8 <https://barents-council.org/working-groups/environment> [Accessed December 14, 2022]

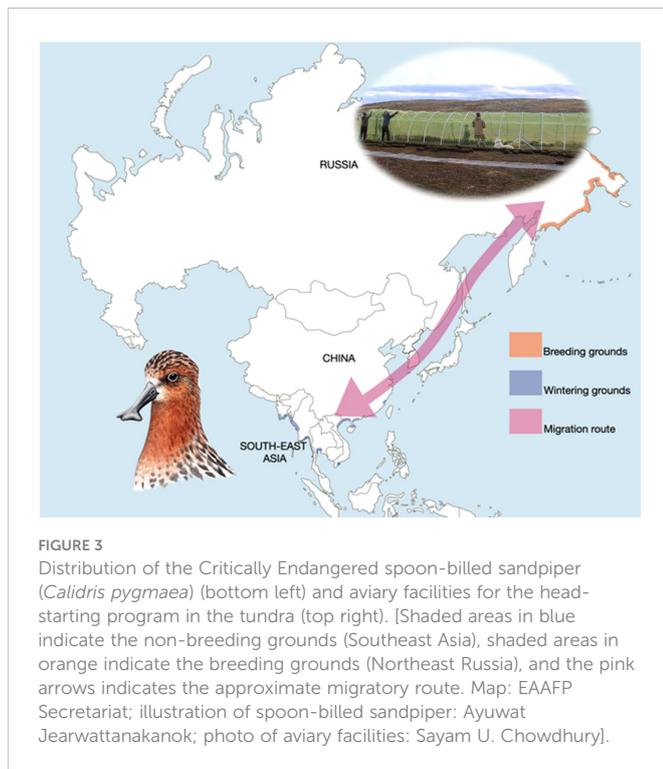
9 <https://fsc.org/en/newsfeed/no-fsc-material-from-russia-and-belarus-until-the-invasion-ends> [Accessed July 5, 2022]

10 <https://allea.org/wp-content/uploads/2022/03/ALLEA-Board-Statement-Ukraine-2022.pdf> [Accessed March 28, 2022]

11 https://ec.europa.eu/commission/presscorner/detail/en/STATEMENT_22_1528 [Accessed December 14, 2022]

12 <https://www.swift.com/news-events/news/message-swift-community> [Accessed March 28, 2022]

13 <https://www.theartnewspaper.com/2022/04/22/unesco-postpones-world-heritage-meeting-russia> [Accessed February 2, 2023]



the meeting either in Russia or under Russian leadership¹⁴. Russia subsequently resigned from its role as a Chair, unlocking the stalemate and allowing for the potential resumption of the World Heritage Committee work in the near future¹⁵. However, such a delay has put on hold the potential inscription of 14 sites important for migratory waterbirds in the Yellow Sea¹⁶, part of a migratory flyway with urgent conservation priorities due to, among other threats, ongoing large-scale habitat loss (Murray et al., 2014). Hindrances also come from the war taking precious floor time at high-level meetings of some international institutional arrangements, potentially diverting much needed attention in substantive issues related to their mandate. This has been the case of the most recent Conference of the Parties of the Commission for the Conservation of Antarctic Marine Living Resources¹⁷ and the Ramsar Convention on Wetlands¹⁸, at which debates took place related to repudiation of the war. Conservation planning projects have also been affected by the war, with a pause until further notice of an international project on

14 <https://www.gov.uk/government/publications/open-letter-to-the-unesco-world-heritage-committee-7-april-2022/open-letter-to-the-unesco-world-heritage-committee> [Accessed December 14, 2022]

15 <https://www.theguardian.com/world/2022/nov/24/russian-resignation-unesco-committee-resume-work-source> [Accessed December 14, 2022]

16 <https://whc.unesco.org/en/decisions/7358/> [Accessed December 23, 2022]

17 <https://www.wilsoncenter.org/blog-post/no-16-antarctic-treaty-system-shows-resilience-face-ukraine-war-tensions> [Accessed December 24, 2022]

18 https://www.ramsar.org/sites/default/files/documents/library/cop14_18_24_rev2_dr_ukraine_e.pdf [Accessed December 23, 2022]

European bison (*Bison bonasus*) straddling Poland, Ukraine, Belarus, and Russia (IUCN Bison Specialist Group). This species has been recovering recently, but the continuation of this trend is now uncertain with Russia's invasion of Ukraine, which has already disrupted conservation actions¹⁹ (Olech and Perzanowski, 2022; Perzanowski et al., 2022). Additionally, research underpinned by international collaborations, which is important to inform conservation policy and action, has been impacted. For example, United States-Russia collaborative research projects on polar bears and salmon have been suspended with no clear prospects for their resumption (Cornwall, 2022) and satellite tracking of animals, such as sea turtles and migratory birds, has been disrupted as a large research platform, ICARUS, relies on the Russian space agency, which ended data sharing on March 3, 2022 (Jetz et al., 2022; Supplementary Information 3).

4.3 Changes in international and domestic policy priorities

Policy areas operate in a crowded space with limited financial resources and political bandwidth (Kingdon, 2003). The increased focus on national, regional, and global security will likely limit the capacity of states to engage in international cooperation for biodiversity conservation, with implications both at the international and the domestic levels^{20, 21} (Carbonell, 2016). In addition to security concerns, the humanitarian crisis created by Russian attacks will also continue to take center stage as the conflict unfolds, rightly drawing political bandwidth²². For instance, as of November 2022, an estimated total of \$109.4 billion in military and humanitarian assistance have been provided to Ukraine by other countries²³. In turn, Russia will likely lower the priority of biodiversity conservation, as its economy will be crippled by sanctions and boycotts, which could also increase the natural resource-intensity of its economy (Madani, 2020). Under these conditions, Russia will be less likely to give priority to implementing existing biodiversity conservation commitments and working on new international institutional arrangements, such as migratory waterbird conservation in the Central Asian Flyway. Nor is it likely to prioritize joining existing international institutional arrangements to which it is not a member, such as the Convention on Migratory Species (CMS) and ten of its subsidiary arrangements for which it is a

19 <https://scienceinpoland.pl/en/news/news%2C93339%2Cwar-puts-transport-polish-bison-chernobyl-hold.html> [Accessed December 23, 2022]

20 <https://breakingdefense.com/2022/03/seven-european-nations-have-increased-defense-budgets-in-one-month-who-will-be-next/> [Accessed March 28, 2022]

21 <https://www.politico.eu/article/ukraine-war-global-biodiversity-cop15-summit/> [Accessed December 19, 2022]

22 <https://news.un.org/en/story/2022/03/1114632> [Accessed March 28, 2022]

23 <https://www.csis.org/analysis/aid-ukraine-explained-six-charts> [Accessed December 14, 2022]

BOX 1 The spoon-billed sandpiper (*Calidris pygmaea*) is one of the most threatened shorebirds in the world with a population of less than 300 mature individuals.

In order to halt the rapid population decline, a head-starting program was initiated in Chukotka, Russia, in 2012 which involved collection of eggs from wild nests, hatching the eggs in captivity, hand-rearing and releasing the birds back into the tundra after three weeks. Between 2012–2021, a total of 237 juvenile Spoon-billed Sandpipers were released in the wild under this program (Tomkovich et al., 2021). The head-starting program has been a pivotal component of conservation efforts for this species and is considered to have slowed down population declines. The current isolation of Russia has already halted this program because of barriers for travel of collaborators from other countries, as well as to sending international funds to Russia on which this effort depends (Tomkovich et al., 2022).

range state (Hensz and Soberón, 2018; Supplementary Information 4). In Ukraine, biodiversity conservation has likely been sidelined as defense and humanitarian goals become paramount (Stone, 2022) and many protected areas are now occupied by Russian forces or have been affected by the war (UNEP, 2022a). Likewise, countries in the Global North, particularly in Europe and North America, will likely increase their defense budgets²⁴, both domestically and through international aid, which could potentially compromise budgets for biodiversity conservation domestically (Akkerman et al., 2022; Mervis, 2022). Constrained conservation budgets in these countries could have ripple effects as many are important donors for conservation initiatives in the Global South (Miller et al., 2013). As the policy agenda becomes dominated by national security concerns, biodiversity conservation goals will likely decline in importance. For instance, the imperative to reduce dependency on Russian exports and address shortages of commodities from Ukraine due to the invasion could potentially lower biodiversity conservation priorities, such as rolling back environmentally friendly agricultural policies²⁵ (Morales et al., 2022).

5 Actionable recommendations

While negotiations remain a possible diplomatic solution to the current conflict, war continues to ravage Ukraine²⁶. However, if and when there is a ceasefire, how then to move forward? For governance entrepreneurs, this could include designing a more resilient system by reinforcing the global system of multilateral governance for biodiversity conservation, while promoting and fostering regional alliances with potential broker countries, such as China, to fill gaps left by Russia's isolation from the West, as well as eroded capacity to deliver conservation domestically and engage internationally. Such regional alliances could be coordinated with current global governance mechanisms, as well as with overlapping regional alliances that exclude Russia. Additionally, non-state actors, such as non-governmental organizations (NGOs), could play critical roles in bypassing geopolitical roadblocks and addressing

domestic governance deficits. For instance, there have been over 300 international initiatives gathering thousands of state and non-state actors engaging in governance for biodiversity conservation (Negacz et al., 2020). The post-2020 Global Biodiversity Framework, which was adopted in December 2022²⁷, could provide a platform to further showcase such initiatives and spur more commitments through the Sharm El-Sheikh to Kunming Action Agenda for Nature and People (Pattberg et al., 2019; Chan et al., 2022). However, the possibility of working outside the state realm will depend on the domestic policies imposed by Russia regulating interactions with the West, which were already tight even prior to the invasion (Newell and Henry, 2017; Matejova et al., 2018). Over time, high-level politics may abate enough to allow, as in the past, for Russian researchers to work collaboratively with researchers from the West. Indeed, international governance for biodiversity conservation could foster 'low-politics' détente that might help initiate, catalyze, and rebuild amicable relationships between Russia and other countries, including through such mechanisms as greening borders²⁸ (Hünemörder, 2010; Krampe et al., 2021).

We recommend monitoring and researching the implications of the Russian invasion of Ukraine to the international governance system for biodiversity conservation as this could further inform governance scholarship and practice. For instance, here we have highlighted specific international institutional arrangements that have been affected by Russia's invasion of Ukraine. However, other biodiversity-related institutional arrangements seem to remain unaffected so far by means of the continuation of their decision-making procedures and membership of Russia. This is the case of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, whose latest Conference of the Parties was held in November 2022 and has not made any decisions to suspend Russia's membership despite Ukrainian demands^{29, 30}. Furthermore, Ukraine has now taken on a leadership role as the incoming Chair of the Commission for the Conservation of Antarctic Marine Living Resources for the 2022-2024 period, to which Russia did not

24 https://www.nato.int/cps/en/natohq/topics_67655.htm [Accessed December 21, 2022]

25 https://ec.europa.eu/neighbourhood-enlargement/news/commission-acts-global-food-security-and-supporting-eu-farmers-and-consumers-2022-03-23_en [Accessed March 28, 2022]

26 <https://www.defense.gov/News/Transcripts/Transcript/Article/3220910/secretary-of-defense-lloyd-j-austin-iii-and-army-general-mark-a-milley-chairman/> [Accessed December 14, 2022]

27 <https://www.cbd.int/article/cop15-cbd-press-release-final-19dec2022> [Accessed December 23, 2022]

28 <https://www.europeangreenbelt.org/> [Accessed February 8, 2023]

29 <https://www.kmu.gov.ua/en/news/mindovkillya-ukrayina-vimagaye-viklyuchiti-rosiyu-z-mizhnarodnih-prirodzahisnih-organiv-ta-ugod> [Accessed March 28, 2022]

30 <https://cites.org/sites/default/files/notifications/E-Notif-2022-020.pdf> [Accessed December 14, 2022]

object³¹. Importantly, scholarship attention will need to be given to other countries that have been supportive of Russia's invasion of Ukraine, as they could also present similar effects on governance due to potential isolation from the international system. Ultimately, how the war may affect other institutional arrangements beyond those we have showcased here, how international cooperation may continue amidst the war, how cooperation may be restored wherever lost, and what measurable impacts on the ground the war can have beyond Ukraine due to shocks to governance, remain matters warranting scholarly attention.

6 Final remarks

The Russian invasion of Ukraine, though a rapidly changing situation, has already shocked the international governance system for biodiversity conservation with some immediate implications for Russia and beyond. Notably, the invasion of Ukraine shows Russia's disregard for international institutions, a foreign policy already in place prior to this event as indicated by the annexation of Crimea in 2014 and the recent ongoing rejection of science-based decisions under the Commission for the Conservation of Antarctic Marine Living Resources³². This war has brought international cooperation to a halt in key regions, such as the Arctic, where spillovers from proxy wars had been previously deemed unlikely (Rahbek-Clemmensen, 2017). Governance responses to problems are swifter and more decisive when they pose imminent risks to humans, such as those related to national security and public health, and, hence, override concurrent biodiversity conservation considerations. Both the Russian invasion and the COVID-19 pandemic are receiving attention for governance reform. However, unlike the COVID-19 response, which has arguably created synergies for biodiversity conservation due to its wildlife trade linkages (Borzée et al., 2020), the Russian invasion may result in antagonistic interactions at least in the short term³³. As national security takes priority, it will likely draw much needed funding and political bandwidth away from biodiversity conservation, stalling or reversing some of the progress that has been made in recent decades. Governance entrepreneurs can look for opportunities to align national security agendas with biodiversity conservation goals, as in the case of accelerating renewable energies to reduce dependency on Russia's fossil fuel exports³⁴. Even during these grim days, hope remains for efforts to end the Russian invasion of Ukraine, keeping it a free and at peace state, while also maintaining progress on international governance for biodiversity conservation.

31 <https://www.ccamlr.org/en/news/2022/meeting-antarctic-experts-comes-close> [Accessed December 14, 2022]

32 <https://www.wilsoncenter.org/blog-post/no-16-antarctic-treaty-system-shows-resilience-face-ukraine-war-tensions> [Accessed December 24, 2022]

33 <https://www.reuters.com/markets/commodities/coal-rush-energy-crisis-fires-global-hunt-polluting-fuel-2022-09-20/> [Accessed December 14, 2022]

34 <https://www.reuters.com/business/sustainable-business/germany-has-earmarked-220-billion-industrial-transformation-by-2026-2022-03-06/> [Accessed December 14, 2022]

Author contributions

EG-C, NDo, and AP conceived and framed the initial idea. EG-C wrote the first draft and all authors contributed equally to subsequent iterations of the final manuscript. EG-C, PH, and DB compiled and edited the final version. BW prepared the map figure of Russia and SC prepared the text box of the spoon-billed sandpiper. All authors contributed to the article and approved the submitted version.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fcosc.2023.989019/full#supplementary-material>

SUPPLEMENTARY INFORMATION 1

Search strategy and key definitions for determination of current international institutional arrangements related to biodiversity conservation to which Russia is a member.

SUPPLEMENTARY INFORMATION 2

Official list of unfriendly countries to Russia.

SUPPLEMENTARY INFORMATION 3

Suspension of Icarus data sharing.

SUPPLEMENTARY INFORMATION 4

List of subsidiary institutional arrangements under the Convention on Migratory Species for which Russia is a range state but not a member.

SUPPLEMENTARY DATASET 1

List of current international institutional arrangements related to biodiversity conservation to which Russia is a member.

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