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Conservation science and policy should care about violent extremism

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ABSTRACT

Protected areas are increasingly prone to violent extremism spillover, with dramatic consequences for both local people and wildlife populations. Due to the influence of violent extremist groups, science and policy generally fade away. We outline the case of the W-Arly-Pendjari complex of protected areas in West Africa (Burkina Faso, Benin, and Niger), 62% of which is currently under the control of violent extremist groups. The last large population of West African elephants may soon disappear if no action is taken. We discuss the roles of conservation science and policy in protected areas under violent extremism spillover, namely (i) maintaining and reinforcing international support, (ii) authentically engaging local communities in conservation and management strategies, and (iii) planning long-term conservation and security strategies.

1. Introduction

Violent extremism spillover into protected areas is increasing, with significant implications for both local people and conservation. Groups of violent extremists may be organized with official names (e.g., violent extremist organizations, non-state actors, rebel groups), have diverse motivations for violence (e.g., land access or rights, religious ideology, ethnicity, politics), and use different methods (e.g., kidnapping for ransom, terrorism, bombs). They can force local people to move onto marginal lands (Hanson et al., 2009), help arm rural populations involved in poaching (de Merode et al., 2007), reduce funds designated for conservation, and halt conservation projects (McNeely, 2003). These violent groups strategically take control of remote and inaccessible landscapes where central governments are weak (Hanson et al., 2009). Extremist groups may exploit natural resources as a major revenue source (Dudley et al., 2002), and also target rural populations, for instance by stealing cattle of pastoralists as another source of income (Pennaz et al., 2018). Violent extremism generates unique insecurity and lawlessness that amplifies existing threats in peacetime (Glew and Hudson, 2007), inducing warfare that appears to be slipping through the cracks of the international conservation science community's efforts. Security risks render protected areas inaccessible, resulting in a lack of scientific advancement in support to policy (Hickisch et al., 2019).

In sub-Saharan Africa, beyond dramatic human consequences, violent extremism in and around protected areas results in severe environmental impacts (Glew and Hudson, 2007). This is not a new issue: between 1946 and 2010, extensive armed conflicts occurred in 71 % of African protected areas, and conflict frequency was the most important predictor of the occurrence and severity of wildlife population declines, sometimes dropping wildlife population trajectories below replacement levels (Daskin and Pringle, 2018). The world's largest mammal populations are particularly impacted by warfare adjacent to protected areas: large mammals can face warfare-induced extinctions (Ripple et al., 2015). In 30 years, 95 % of the 35,000 elephants of the northern Central African Republic have been lost (Scholte et al., 2013). Conflict areas are also four times more likely to undergo deforestation compared to average deforestation rates (Landholm et al., 2019). Conservation scientists and policies have a critical role to play during such dark times.

In this perspective paper, we highlight the crucial functions of science and policy stakeholders when protected areas are under the threat of violent extremism. We alert on the urgent example of the W-Arly-Pendjari complex of protected areas, where violent extremist groups currently control the last stronghold for elephants in West Africa. Based on this case study and extant literature, we provide three concrete recommendations for the conservation science and policy communities, notably spotlighting the central role of research in times of conflict.

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2. The last large population of elephants in West Africa under the threat of extremist spillover

Situated astride Burkina Faso, Benin, and Niger, the W-Arly-Pendjari complex of protected areas (WAP) represents the largest block of savanna ecosystem in West Africa. The mosaic of game reserves and national parks covers nearly 33,000 km^2. For many endangered carnivores [e.g., lion (*Panthera leo*), leopard (*Panthera pardus*), and cheetah (*Acinonyx jubatus*)], the WAP constitutes one of the last refuges in this part of the continent (Henschel et al., 2016). A 2011 sub-region-wide count concluded the WAP held over 71 % of West Africa's remaining savanna elephants (Bouché et al., 2011).

The WAP did not experience any armed conflicts between 1946 and 2010 (Daskin and Pringle, 2018). But today, approximately 62 % of the WAP complex is under the control of violent extremist groups (Fig. 1), engaging in roadside bombings and cross-border attacks (Mukpo, 2022). Multiple groups have commandeered Arly Park and W Park in Burkina Faso and Niger. All hunting concessions in Burkina Faso, which in the past supported diverse human benefits such as space, management, surveillance and economic flows, have been attacked and evacuated, along with forestry posts and state structures such as schools and dispensaries. Some forestry officials and international journalists have been assassinated. Protected area rangers are increasingly engaging in militarized counterinsurgency in lieu of "traditional" conservation activities (Mukpo, 2022). Pendjari National Park and part of W National Park in Benin remain supported and protected by African Parks Network in partnership with the Beninese government; the other protected areas have been transformed into lawless zones with high insecurity. Scientific research has been halted over much of the area and the conservation community is not able to adequately assess the situation. What data is available about the status of animal populations in the region is alarming. The most recent WAP aerial survey report (Ouindeyama et al., 2021) concluded that W Park in Burkina Faso should henceforth be considered practically devoid of elephants and other wildlife. The whole Burkinabe part of the WAP complex has been invaded by livestock, which was previously prevented by the surveillance in hunting concessions, and farmers are increasingly planting crops inside park boundaries (Mukpo, 2022).

The European Union designated the WAP complex as one of the priority landscapes in its vast NaturAfrica conservation funding plan (European Commission, 2021), as it remains some of the last wild landscapes in West Africa. However, in the absence of governmental structures capable of both restoring security and negotiating sustainable and just arrangements between local stakeholders, international conservation and development agencies in Burkina Faso and Niger operate marginally on the periphery. Urgent interventions are needed, including at least (i) sustainable resolution to the extreme violence, (ii) re-establishment of state authority over protected areas, (iii) establishment of a "New Deal" with transhumant populations and riparian villages based on more equitable and just distribution of decision-making

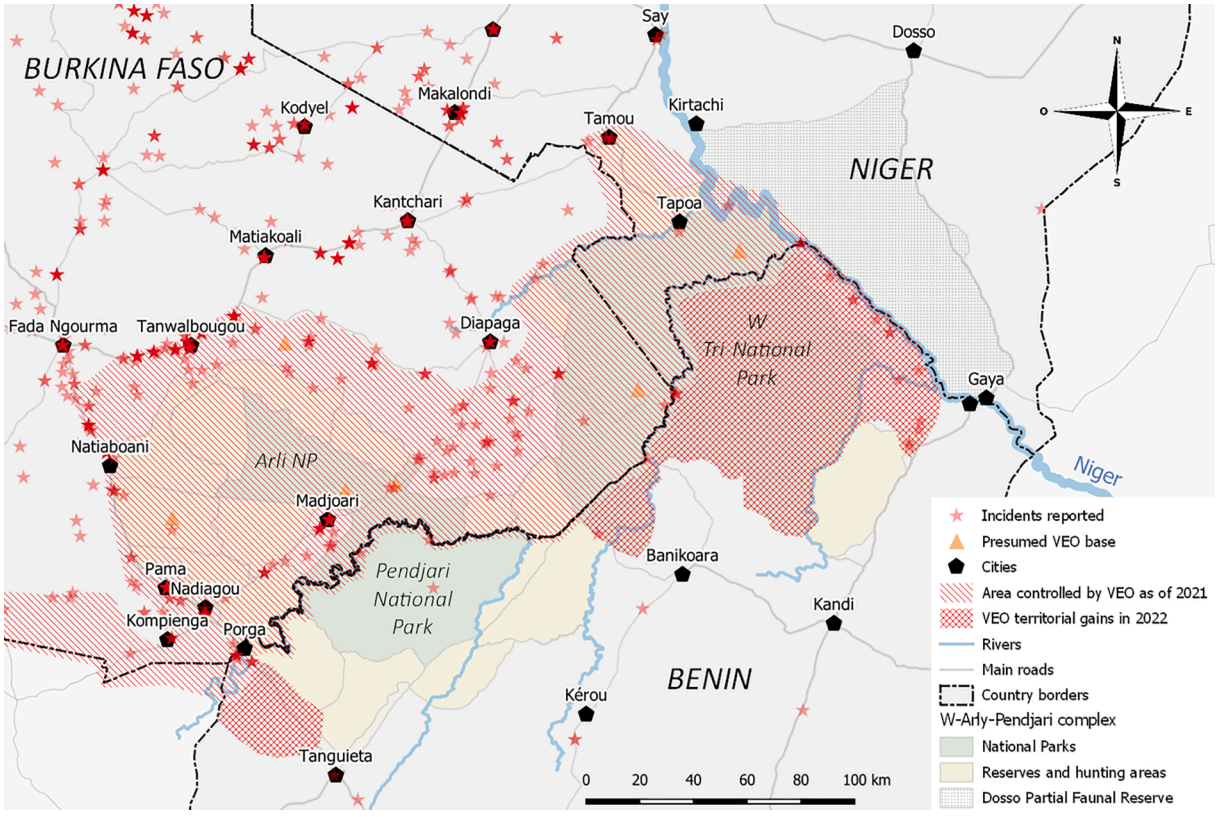

Fig. 1. Area under the influence of violent extremist organizations (VEO) in the W-Arly-Pendjari complex of protected areas in early July 2022. Red stars represent locations of reported security incidents from January 1, 2021 to July 1, 2022, with the intensity of the red color being proportional to the number of reported incidents. Security incidents are actions carried out by VEO, such as direct attacks, clashes, irruptions, raids, kidnappings, targeted assassinations, rackets and intimidations. The map was produced using data from the public databases ACLED (https://acleddata.com) and International Crisis Group (https://www.crisisgroup.org/crisiswatch), completed with Safer Access private security incident reporting database (http://www.safer-access.com), and contacts with experts stationed in the sub-region. This information is derived from the sum of incidents recorded by these security actors through verified reports obtained by field officers of NGOs and private firms, local informants, and official channels. The red zone, which is considered ungoverned space controlled mostly by VEO, where no activities can be conducted, is deduced from the cross-referencing of incident maps and confirmation of protected area managers. Parts of eastern Burkina Faso and western Niger are not in the red zone because they are not yet fully controlled by the VEO and basic services are still provided, but these areas have experienced numerous incidents, are very dangerous and are inaccessible to most people.

power, revenues, and space, and (iv) transformation of the system of conventional safari hunting concessions into concessions co-managed by local populations. Without urgent action, West Africa's last major block of savanna dedicated to biodiversity conservation and livelihood preservation may become only a memory, and benefits to local people from the wildlife economy will not be realized. Unfortunately, other conservation areas in West Africa have tipped into conflict zones (almost all protected areas in South-East Mali, and part of Niger's protected areas) and others are extremely close to tipping, such as the Comoe transboundary area in Burkina Faso and Ivory Coast.

Central Africa is unfortunately not exempt from violent extremism. In the Congo Basin, several wildlife massacres were perpetrated by complex networks of violent extremists sometimes going beyond their countries of origin, including the killing of more than 300 elephants in 2012 in Bouba Ndjida National Park (Cameroon) by poachers coming from abroad (Scholte et al., 2013). Other killings of rangers and elephants have been committed by violent extremists in the protected areas of the Congo Basin, including Garamba National Park in the Democratic Republic of Congo, and Dzanga-Ndoki National Park in the Central African Republic.

3. A unique role for conservation science and policy

Wildlife conservation juxtaposed with violent extremism requires case-specific consideration and close coordination with local conservation stakeholders, carrying with complex and multiscale implications beyond the immediate confines of conflict-ridden areas or the time period of active violence (Hanson et al., 2009). While natural sciences are essential to conservation and have largely dominated conservation research, we need more socio-political sciences in situations of violent conflicts. Conservation actions are ultimately human behaviors (Fox et al., 2006), and the success of conservation efforts always depend on the local socio-political situation (Mair et al., 2018). A better understanding of the human dimensions of environmental issues through social sciences can help design conservation policies, implement actions, and achieve outcomes that are more legitimate, salient, robust, and effective (Bennett et al., 2017). In the face of armed conflicts, especially across socio-political boundaries (Dallimer and Strange, 2015), social sciences help to better understand the complex dynamics of governance, institutions, militarization, economies, cultural beliefs, and movements of people over space and time (Gaynor et al., 2016). Based on our collective experience and expertise, we identify three unique functions for the conservation science and policy communities in protected areas under violent extremism spillover.

First, it is paramount that international support to protected areas is maintained during times of conflict and violent extremism (McNeely, 2003). The erosion of funding, destruction of infrastructure such as roads and telecommunications, and removal of capital during violent conflicts can result in evacuation and isolation of field staff, collapse of wildlife populations, and degradation of local livelihoods. International support for biodiversity conservation in conflict zones can include justice-informed security, reconstruction, humanitarian programs (Hanson et al., 2009), and international scientific support for national researchers still active in the area or its periphery. Most protected areas lack sufficient capital to maintain effective conservation and protection during peacetime, raising major concerns for destabilized futures where violent extremism spills over conservation boundaries (de Merode et al., 2007). Socially just investments from the high-income countries into security through conservation development in Africa can concomitantly advance livelihood preservation and biodiversity conservation (Barichievy et al., 2017). For instance, in Zakouma National Park in Chad, local communities have been actively and consistenly engaged in the design, implementation and evaluation of interventions under the management of African Parks Network. Sustained support during post conflict periods is also crucial for long term security and effective conservation outcomes (Daskin and Pringle, 2018), as total withdrawal can propagate unintended security consequences and collateral damage to nearby protected areas of the region (Glew and Hudson, 2007). Collaborations between conservation, security, and development sectors allow to collect and share baseline data, increase the support of protected area governance, and include local populations in community conservation approaches (Luizza, 2017). Scientific research is typically conducted over long periods of time; the activity should thus not be suspended but rather supported, particularly in relation to activities that can be carried out remotely (e.g., remote sensing) or beyond the physical reaches of violent conflicts (e.g., archival research, media analysis). On-the-ground scientists can help with assessing trends and drawing inferences about violent extremist activities and wildlife population status.

Second, authentic engagement with local communities in conservation and management strategies is crucial, notably by training and supporting dedicated local staff. Continuous, just, and fair support of local communities by NGOs, such as salaries, reliable communication infrastructure, housing and rebuilding funds, can play a vital role in maintaining morale, trust, continuity of operations, and security. No people should be put in harm's way, but often local people and conservation staff want to stay in their homes, demonstrating why a continuous support is a moral obligation that also contributes to conservation outcomes (Hanson et al., 2009). Sharing the benefits of the various revenues generated in a protected area with local communities is also critical. By showing a true commitment to the welfare of local people during violent conflicts, conservation organizations set a basis for sustained collaborations over the long term (McNeely, 2003). Successful collaborations between conservation organizations and local social institutions can also reduce management costs of protected areas while achieving conservation outcomes more effectively (de Merode et al., 2007). The maintenance and support of the international research community for national researchers, students, and local technicians is also part of these principles which are too often forgotten.

Third and last, in all countries and protected areas, planning conservation and security strategies allows taking appropriate actions during turbulent times, involving the relief agencies, conservation organizations, funders, and the private sector (Hammill et al., 2016). Each institution and stakeholder must be well aware of how conservation and humanitarian issues have evolved and interact to take appropriate preventative actions when needed while ensuring just and transparent outcomes (McNeely, 2003). Projecting future risks of armed conflict due to climate change and demographic change also contributes to the development of sustainable policy agendas (de Bruin et al., 2022). After a conflict period, it is often possible to transform policy and regulatory frameworks based on the newly acquired natural and social science information, implement new legislation to help fill newly exposed gaps in the knowledge base, build resilience and capacity among staff in response to a transformed conservation landscape, and design more reliable decision-making process in collaboration with local stakeholders (Daskin and Pringle, 2018). The scientist's analytical skills, situational awareness of on-the-ground context and familiarity with the current state of literature can be decisive in training activities, formulations of solutions, and observations of process. Robust site-based conservation programs associated to the professional development of national staff is the best preparation in African conflict areas, with the support of an international structure that endures when formal governance regimes degrade because of violent extremist activities (Hart and Hart, 1997). We plead for the participation of national and international researchers to be maintained and supported in all these initiatives, on the one hand to bring the specific viewpoint of science to conservation challenges, and on the other hand to guarantee more transparency in areas where conflicts cast a shadow of secrecy over reality.

4. Data and materials availability

Data used for producing the map are from the public databases

ACLED (https://acleddata.com) and International Crisis Group (https://www.crisisgroup.org/crisiswatch), completed with Safer Access private security incident reporting database (http://www.safer-access.com).

CRediT authorship contribution statement

Simon Lhoest: Conceptualization, Funding acquisition, Investigation, Project administration, Writing – original draft, Writing – review & editing. **Julie Linchant:** Data curation, Formal analysis, Visualization. **Meredith L. Gore:** Writing – review & editing. **Cédric Vermeulen:** Conceptualization, Investigation, Project administration, Supervision, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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