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Article

The Political Ecology of Human-Wildlife Conflict: Producing Wilderness, Insecurity, and Displacement in the Limpopo National Park

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Abstract

Like conservation-induced displacement, human-wildlife conflict (HWC) has potentially negative implications for communities in and around protected areas. While the ways in which displacement emerges from the creation of 'wilderness' conservation landscapes are well documented, how the production of 'wilderness' articulates with intensifications in HWC remains under examined both empirically and conceptually. Using a political-ecological approach, I analyse increases of HWC in Mozambique's Limpopo National Park (LNP) and the subsequent losses of fields and livestock, as well as forms of physical displacement suffered by resident communities. While intensifications of encounters between wildlife on the one hand and people and livestock on the other result in part from increases in wildlife populations, I argue that HWC and the ways in which it constitutes and contributes to various forms of displacement results more centrally from changing relations between wildlife and people and the power and authority to manage conflict between them. Both of these contributing factors, moreover, are the consequence of practices that aim to transform the LNP into a wilderness landscape of conservation and tourism. HWC and its negative impacts are thus not natural phenomena, but are the result of political decisions to create a particular type of conservation landscape.

Keywords: human-wildlife conflict, political ecology, displacement, resettlement, transfrontier/transnational conservation, wildlife conservation, livestock, Mozambique

INTRODUCTION

As she grounded maize in a large wooden mortar beside her house in Massingir Velho, a village located within Mozambique's Limpopo National Park (LNP), Claudia, a local resident, spoke of the increase in human-wildlife conflict (HWC) she and her neighbours have experienced since the establishment of the park in 2001, "I will not stay. The animals attack us and kill our livestock. It is worth going where they [park authorities] want to take us." In the LNP, questions about the park or livelihoods often evoked powerful responses and concerns about conflicts with wildlife. In this, and similar laments, residents also reflected on the underlying relationship between HWC and their socio-economic and physical forms of displacement, a relationship also expressed by park and government authorities. Socio-economic displacement – or negative impacts on livelihoods – and the physical removal of communities as a result of protected area creation are central concerns of political-ecological work on conservation (Neumann 1992, 1998; Brockington 2002; Adams and Hutton 2007). Such work provides important insights regarding the ways in which such displacement can result from discursive and material practices aimed at producing wilderness based conservation areas (Neumann 1998, 2001; Brockington 2002; Brockington and Schmidt-Soltau 2004; Hughes 2005). There

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is also a substantial amount of work on the negative impacts of HWC, including losses suffered by communities within and adjacent protected areas (Madhusudan 2003; Treves and Karanth 2003; Woodroffe et al. 2005; Anthony 2007; Metcalfe and Kepe 2008; Ogra and Badola 2008; Treves et al. 2009; Anthony et al. 2010; Witter 2013). How practices of producing wilderness articulate with such conflict and result in displacement, however, remains under examined.

With both conservation-related displacements and HWC being of increasing concern, it is imperative to bring insights from these two bodies of literature together. Recent work has begun to trace the ways in which conservation-related displacement in southern Africa and elsewhere is a consequence of growing wildlife populations, corresponding intensifications of encounters with residents, and damage caused to fields and domestic animals (Milgroom and Spierenburg 2008; Kabra 2009; Witter 2013; Harihar et al. 2014; Lunstrum 2015). This is a perspective shared by LNP and state authorities who argue that the interior of the park has become unsafe for communities due to the increased number of wild animals present since its establishment, thus requiring their removal for their own safety (see also Witter 2013). Others demonstrate how damage to crops, livestock, and concerns about personal safety directly contribute to displacement in terms of residents' "accepting" to resettle in a program that is supposed to be voluntary (Milgroom and Spierenburg 2008; Witter 2013; Lunstrum 2015). Building on and complementing such insights, I take a step back to more fully account for the ways in which HWC and its displacement-related consequences – from the loss of crops, fields, and importantly livestock, to physical removal from the Park – articulate with broader political-ecological dynamics that seek to produce a particular type of 'wilderness' conservation landscape. While not ignoring the increase in wildlife populations, I argue that the increase in HWC and the intensification of its negative impacts that constitute and contribute to residents' displacement result more centrally from changing relations between wildlife and people and the power and authority to manage conflict between them. These changes, and the increase in wildlife populations itself, moreover, are the result of a suite of measures aimed at producing the LNP as a space of 'wilderness.' I thus extend insights from literature on the political ecology of conservation regarding the contribution of 'wilderness'-producing practices to the displacement of communities and examine the ways in which such practices interact with increases and intensifications of HWC and its displacement-related consequences. In doing so I also expand our understanding of HWC to suggest that it not be limited to conflict between humans and wild animals. While this is a primary concern, the loss of domestic animals to attacks or disease entails substantial and even invisible losses[1] for people experiencing this, and, as of yet, are an under-considered aspect of conservation-related resettlement and displacement.

This article proceeds in four sections. After I combine insights from literature on the political ecology of conservation-induced displacement and that on HWC to conceptualise the relationship between HWC, its displacement-related consequences, and the practices aimed at producing a conservation landscape based on notions of 'wilderness', I provide a brief outline of the LNP, describe my methodologies, and summarise the HWC occurring in the park. In the third section I examine how measures aimed at transforming the LNP into a space of wilderness result in an increase in HWC and intensification of its displacement-related consequences. I conclude with a broad discussion concerning the importance of a political-ecological approach to HWC and suggest areas for further research.

Conservation-induced displacement: from fortress conservation to insecure space

Political ecology is an approach to understanding the political, economic, and social factors that help shape human-environment relations, including those related to conservation, and the various discursive and material practices used to create protected areas (Neumann 1992, 2001). Central to work on the political ecology of conservation has been the examination of conservation-induced displacement. Such displacement takes the form of both the physical removal of people and communities from spaces deemed in need of protection (Brockington 2002; Brockington and Igoe 2006; Rangarajan and Shahabuddin 2006; Milgroom and Spierenburg 2008; Agrawal and Redford 2009) as well as more indirect or socio-economic forms of displacement including loss of access to land and resources and restrictions on or loss of livelihood activities (Cernea 2006a,b; Witter 2013). Both forms of displacement have long been tied to the discursive and material production of conservation areas as spaces free from communities, their livestock, and related activities (Adams and McShane 1997; Neumann 1998; Brockington and Schmidt-Soltau 2004).

The discursive production of conservation areas entails practices that represent, imagine, or "conjure" these spaces in a certain way (Hughes 2005: 157). Of particular importance throughout the history of conservation and its related displacements has been the conjuring or representation of spaces as 'pristine' nature or 'wilderness', both of which see 'nature' as separate from and excluding resource or agricultural-based communities, livestock, and related livelihood activities (Cronon 1996; Adams and McShane 1997; Cronon 1996; Neumann 1998; Fletcher 2010). While such representations are tied to ecological and conservationist goals, they may also be connected to creating spaces for the purposes of nature or wildlife-based tourism and other market-oriented conservation initiatives (Hughes 2005; Igoe and Brockington 2007; Brockington and Duffy 2010). Conservation-related displacements thus emerge from the production of a "third nature" or the representation of "the potential of landforms in a given area to support specific types of wildlife communities." (Hughes 2005: 158).

Wilderness and conservation landscapes may also necessitate their deliberate material creation through processes aimed at physically transforming the space or landscape in question (Neumann 2001; Geisler 2003; Rangarajan and Shahabuddin

2006; Brockington, et al. 2008). Removing communities and livestock is one way of achieving this goal. Another includes the re-introduction of wildlife into certain areas along with measures aimed at promoting population growth (Milgroom and Spierenburg 2008; Witter 2013). Other practices are less concerned with moving human and animal populations in and out and are more concerned with policing the interaction between the two (Neumann 1998; Brockington 2002; Cernea, 2006a,b). Such practices include legislative and policy changes that seek to mediate human-environment relations such as prohibitions on the killing of animals for hunting or other purposes, and restrictions on activities like agriculture, livestock rearing, and the collection of natural resources. How such changes in human-wildlife relations might contribute to HWC and problems of crop destruction, livestock predation, and disease transmission from wild to domestic animals deserves more attention given the devastating consequences such conflict can have for subsistence-based communities, especially those who rely heavily on livestock and livestock-based livelihoods (Treves and Karanth 2003; Woodroffe, et al. 2005; Metcalfe and Kepe 2008; Ogra and Badola 2008; Treves, et al. 2009).

Recent work has begun to highlight the connections between HWC and the physical displacement of people from protected areas (Madhusudan 2003; Kabra 2007, 2009; Milgroom and Spierenburg 2008; Harihar, et al. 2014; Lunstrum 2015). Witter (2013) uses the phrase "elephant-induced displacement" to describe how conflict with elephants leads to the destruction of livelihoods and loss of access to resources on the part of local communities inducing them to accept resettlement (also see Milgroom and Spierenburg 2008). In a similar vein, Kabra (2009: 250) argues overlapping spaces of tiger conservation with those of agriculture-based livelihoods "and the resultant human-wildlife conflicts, underlie some of the most acrimonious debates on conservation issues in India", including resettlement. The negative socio-economic impacts wrought by conflict with wild animals also raises questions about the voluntary nature of some resettlement programs (Milgroom and Spierenburg 2008; Witter 2013; Lunstrum 2015). The ways in which displacement – both outright removal and restrictions on livelihood activities and access to land and resources – is shaped by discursive and material practices that seek to create particular types of conservation landscapes is tied to ecological, political, and economic interests and values is well documented (Neumann 1998; Brockington 2002; Geisler 2003; Hughes 2005; Brockington and Igoe 2006; Agrawal and Redford 2009; Lunstrum 2010). How such practices of producing wilderness landscapes of conservation articulate with increases and intensifications in HWC, on the other hand, has been less explored.

To address this empirical and conceptual gap I draw from the above scholars and build on their insights connecting HWC to the displacement of communities in the LNP and elsewhere. However, I depart from and complement them in several ways. First, I highlight the ways in which HWC and its displacement-related consequences articulate with efforts to produce spaces of wilderness. These are efforts that not only lead to more wildlife, but also provoke changes to human-wildlife relations that prevent residents from protecting themselves, their fields, and their livestock. Second, I expand our understanding of HWC to explicitly include problems affecting livestock, including predation and disease transmission from wild to domestic animals.

METHODOLOGY

The Limpopo National Park

The Limpopo National Park was officially established on November 27, 2001. Previous to the designation of the LNP, the area it encompasses was the hunting reserve, Coutada 16. Approximately half the size of the neighbouring Kruger National Park in South Africa, it stands at 1,213,315 ha (GLTP 2002). Like Kruger, the LNP is part of the Great Limpopo Transfrontier Park (GLTP) that was established in 2002 and unites the LNP in Mozambique, Kruger in South Africa and Gonarezhou National Park in Zimbabwe in an effort to create a 3,577,144 ha borderless space for wildlife and tourism and to promote political cooperation (Wolmer 2003; van Amerom and Büscher 2005; Munthali 2007). The LNP was created with the specific goal of being part of this transfrontier initiative and the larger Great Limpopo Transfrontier Conservation Area (GLTFCA), a reality that is central to understanding many of the changes and processes that characterise its development (see Figure 1). Prior to 2001, wildlife populations in the area of the LNP were all but decimated, a grim reality largely attributed to Mozambique's civil war ending in 1992 (Rodgers 2009). As such, a primary goal of the GLTP is to re-habilitate wildlife populations in the area through the translocation of wildlife and the removal of the fence separating the LNP from Kruger.

While wildlife populations struggled to recover in the post-war era in the LNP area, due in large part to the erection of the security fence by South Africa along the border with Mozambique in 1976 that obstructed the migration of wildlife from Kruger to Mozambique (Ellis 1994; Lunstrum 2014), livestock populations of resident communities did improve. Over a decade after the park's establishment, it is the approximately 9,000 head of domestic cattle that accounts for the most abundant animal species in the interior of the park (SEDAE 2012). These 9,000 head of cattle, among other livestock, belong to over 7,000 people living in eight (now six) different communities in the interior of the park who are slated to be resettled outside of its boundaries (see Figure 2). Two communities, Nanguene and Macavene, have already been removed[2]. These communities depend largely on subsistence agriculture, hunting, fishing, and livestock rearing for their livelihoods, livelihoods that have been impacted by the park's establishment and related legislation which restricts certain activities and increases levels of HWC. Such livelihoods are not limited to the contemporary period and the area of the LNP is not what one might call a 'wilderness' free from people and livestock, nor was it before the decimation of the area's wildlife. Palaeo-ecological analyses not only confirm "the PNL [LNP]

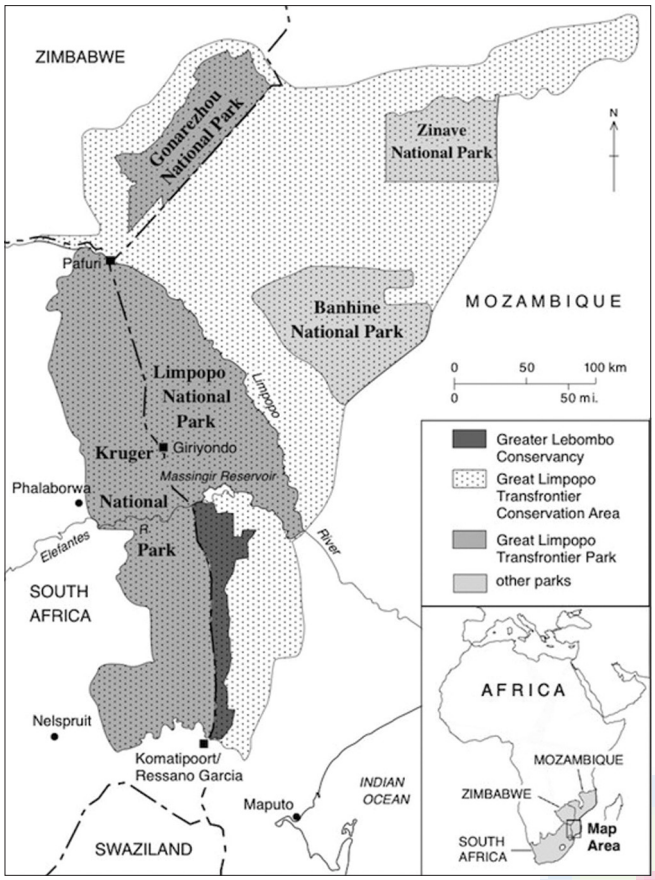

Figure 1
Map of the Great Limpopo Transfrontier Conservation Area. (Cartography by Carolyn King, York University)

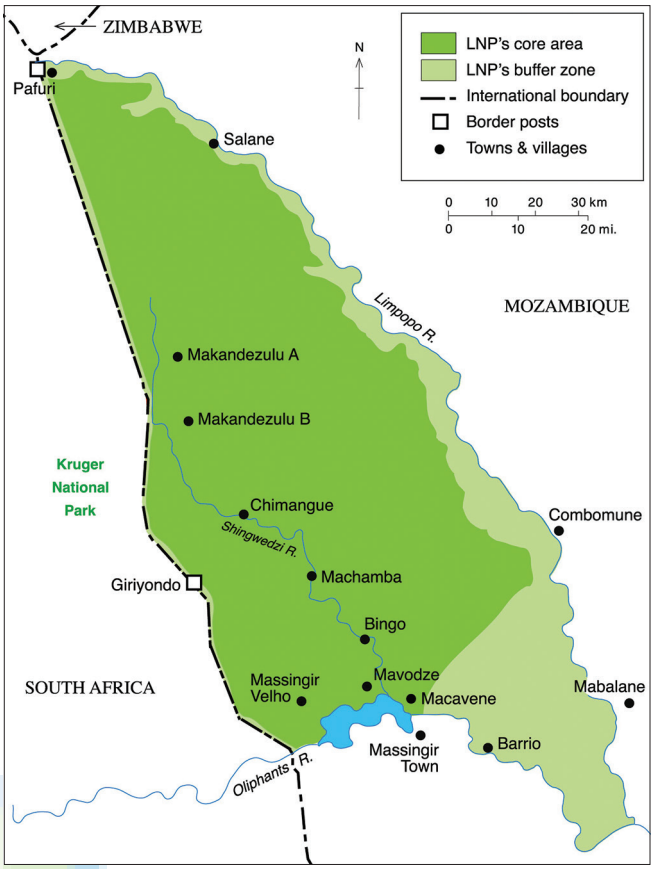

Figure 2
Map of the Limpopo National Park with communities. (Cartography by Carolyn King, York University)

area and the northern KNP [Kruger National Park] are far from isolated wilderness areas" (Ekblom et al. 2011: 24), but demonstrate how the area has been shaped by approximately 1,200 years of human-environment interactions with "social and natural histories embedded in the landscape" (Ekblom et al. 2011: 3; see also Ekblom and Gillson 2010). This is a reality that Park planners have largely ignored (Wolmer 2003; Hughes 2005).

Most recently, the GLTFCA has been impacted by the unprecedented increase in rhino poaching (Vaughan 2015). Kruger is where the large majority of poaching is happening, but the LNP, along with the Greater Lebombo Conservancy to its south, act as an important and strategic buffer to Kruger as the large majority of poachers enter Kruger from the Mozambican borderlands (Lunstrum 2014, 2015; Massé and Lunstrum 2016). The poaching crisis has re-invigorated efforts to develop the transfrontier conservation area, including community resettlement (Interviews: July 2013, June 2014), but has also stalled efforts to remove further sections of the international border fence (Büscher and Ramutsindela 2016).

Data collection

My research methodology consisted of semi-structured, in-depth interviews and observation with residents of Massingir Velho, a village of approximately 160 households and 1,200 people located in the south west of the LNP. I conducted 58 interviews with village residents and engaged in significant observational activities such as accompanying people to pastures, fields and important sites like watering holes and rivers.[3] Observation and walking allowed an opportunity for important insight that could be gained from a more informal discussion. In addition, I conducted 21 interviews with park authorities and employees past and present, personnel from funding bodies supporting the LNP and its resettlement program, and officials and personnel from various government departments and agencies involved in the park's development including Mozambique's Transfrontier Conservation Area Unit (TFCA-Unit), National Directorate of Conservation Areas (DNAC), National Directorate of Veterinary Services (DNSV), and the Provincial Livestock Services. Interview excerpts were selected based on their ability to represent and support trends and conclusions emerging from the data set. I conducted research over four trips between 2012 and 2014 for a total of seven months living in Massingir Velho and the surrounding area. Research began with a preliminary trip in March 2012 to talk with park authorities and I then conducted research over a period of four months from May to August 2012 and June-July 2013. A follow-up trip was conducted in June 2014. Repeat trips allowed for insightful follow-up interviews and an

opportunity to witness change over time. As with community members of Massingir Velho, I was able to accompany park staff as they conducted some of their routine work that allowed different views into park dynamics.

I first started my research with a focus on displacement and resettlement and how it was part of the larger process of creating the transfrontier park. Interviews and conversations with residents initially focused on the looming resettlement that was facing them and broader questions concerning the transformation of their village since the park's creation. During these conversations residents consistently returned to the problems they faced with HWC and how their interaction with wild animals had transformed over the past decade. Similarly, when I spoke with park and state officials, HWC repeatedly emerged as a problem and as a motivating reason for resettlement. As my research progressed I thus focused more intently on HWC, its impacts, and how it has changed over time. Given the symbolic and material importance of livestock and especially cattle for households, livestock-related losses often became a point of focus in conversations about conflict with wildlife. In an effort to corroborate interview data I conducted a brief questionnaire on HWC with 42 households. I supplemented interviews and observations with park planning documents and a variety of LNP and government reports including quantitative data collected by the *Short-term Consultancy in Human-Wildlife Conflict Resolution in the Limpopo National Park* (Lebel 2011).[4]

Data on Human-Wildlife Conflict in the LNP

Human-wildlife conflict is a widely recognised problem in the LNP. As reported by Lebel (2011: iii), "despite low game density, HWC has a significant social and economic impact on communities [that] will increase given the free movement and growing populations of wildlife species from Kruger" (Lebel 2011: iii). Both park and government authorities repeatedly shared this perspective. HWC can also have important ecological costs, such as the death of wildlife. Using data collected by the LNP, the above report indicates there were 384 incidents of HWC in the park between 2007 and 2010 for an average of 96 incidents per year with 144 cases in 2008.[5] Moreover, Massingir District, covering the southern portion of the park, where Massingir Velho is located, saw 75% of all HWC incidents in the LNP with two-thirds of these incidents occurring in the dry season. HWC is thus temporally and geographically concentrated.

Out of the 384 incidents reported, 82% were of crop destruction, 8% were of livestock predation, and 3% were cases of human casualties. The remainder falls into other categories such as damage to infrastructure. From 2007-2010 elephants destroyed 319 fields in the LNP for a total of 17 ha, 13 of which were in the district of Massingir (Lebel 2011: 43). Interviews and time spent in Massingir Velho also highlight the importance of hippos for crop destruction. The report does not list the number of incidents of livestock predation, but these incidents largely take the form of lions attacking goats, and importantly cattle. Carlos from Massingir Velho spoke of the increase in lion-cattle conflict he and his village have experienced since the establishment of the LNP and GLTP. "The risks that occur in the bush, at pasture, is that cattle are available to lions, the lions are dangerous, the lions attack and kill the cows. Lions, when they find cows and they are alone, can kill 10 cows alone" (Interview: August, 2012). Luis similarly lamented, "the cattle go out to pasture, but sometimes not all of them come back because there are animals like lions that eat our livestock" (Interview: August, 2012). The LNP's 2010 Annual Report lists five cows killed in Massingir Velho and six cows killed in the community of Macavene, both of which are in the Massingir District of the LNP (PNL 2010b).

There is a third category of HWC in the LNP that is not mentioned in the report, but has the potential to amount to devastating and largely invisible losses to communities and is especially important with regards to their resettlement; that is disease transmission from wild to domestic animals. Of particular importance are diseases affecting livestock that are present in Kruger like Bovine Tuberculosis, Foot-and-Mouth Disease and Corridor Disease and are brought into the LNP when infected or host animals like buffalo and other ungulates migrate from the former to the latter. At the beginning of this research in 2012, Bovine Tuberculosis had emerged in the LNP, including fourteen cases in July and August of 2012 (SEDAE 2012). Another report documents how the movement of buffaloes from Kruger led to the re-emergence of Corridor Disease in the LNP in 2004, the first time it had been present in the area since 1960 (Costa 2008). Officials from the DNSV and DNAC confirm this re-emergence. For example, one official stated, "there is a high record of mortality [of cattle] as a result of Corridor Disease in areas where buffalo go" (Interview: June, 2012). The situation has only worsened with the recent detection of Foot-and-Mouth Disease in cattle populations in the LNP and to its south in May 2015 (All Africa 2015). In response, the government has banned the movement of all livestock in and out of Gaza province where the LNP is located. Historically the movement of livestock has been controlled, but new controls are different. They are the result of an outbreak of Foot-and Mouth Disease sparking a blanket restriction on the movement of cattle, not merely its regulation. The remainder of this article is dedicated to examining how the above-mentioned HWC emerges in large part from efforts to produce the LNP as a wilderness landscape, efforts that also shape HWC's ability to displace communities.

ARGUMENT

Producing wilderness and the political ecology of Human-Wildlife Conflict

The LNP is thoroughly represented as a 'wilderness' area by Park and State authorities, a logic that has been central to park planning and transformation (Wolmer 2003; Hughes 2005; Spierenburg and Wels 2006; Rodgers 2009; Ekblom et al. 2011). Park planning documents designate the interior

of the LNP as a "wilderness area", "prime wildlife area", and "wilderness zone" to be to be free from agriculture and livestock and set aside for conservation and tourism (GLTP 2002; PNL 2010a). Alongside eighteen references to the LNP as a space of "wilderness" in the LNP Tourism Development Strategy (PNL 2010a), maps illustrating future land-use are largely silent about villages, agriculture, and livestock that dominate some of the very areas set aside for wildlife tourism concessions, a reality resulting from the type of tourism being developed. As explained by an official from one of the bodies funding the LNP's development, tourism in the LNP is to be rooted in a "pure wildlife experience" with tourists wanting to "see wild animals" (Interview: July, 2012). Hence, while the discursive production of the LNP as a certain space of wilderness is connected to it being an ideal habitat for wild animals and subsequent conservation, it cannot be disconnected from ideas of conservation that see 'nature' and communities as separate, or hegemonic ideas that view a people-less nature as a tool for both biodiversity conservation and economic development (Igoe et al. 2010; Büscher 2013). Given the socio-ecological history and realities of the area of the park (Ekblom et al. 2011), the LNP as a space of wilderness needed to be actively produced through material practices to match this discursive rendering. These wilderness producing practices consist of increasing the population of wildlife and regulating interactions between wildlife and park residents, two processes that shape the increase and intensification of HWC and its negative impacts on communities.

Human-Wildlife Conflict and wilderness I: more wildlife

An explicit goal of the LNP is to re-habilitate wildlife populations decimated by the civil war. Park authorities and partners like South African National Parks (SANParks) and the Peace Parks Foundation (PPF) are achieving this through two measures. First is the translocation of wildlife where a total of 3,885 mammals were loaded onto trucks in South Africa and transported to the LNP between 2001 and 2006 (SANParks 2015). The majority of these animals were moved into a 40,000 ha fenced-in wildlife sanctuary allowing them to acclimatise so when the sanctuary fence was eventually removed, they would feel comfortable in the LNP and not return to Kruger (GLTP 2002). The sanctuary, however, overlapped with land and water sources used by Massingir Velho. When the sanctuary was removed, the animals within it were essentially released into the village's backyard where many of its fields, pastures, and water sources are located. The second maneuver to increase the wildlife population reflects a more long-term and continuous process of transformation: the removal of approximately 60 kms of border fence separating the LNP from Kruger in South Africa. This enables the free movement of wildlife between the two parks, a movement that is largely unidirectional – from Kruger to the LNP – because of ecological differences between the two parks that work as push and pull factors.

Efforts at increasing the wildlife population have been successful. At the time of the park's opening, the buffalo and elephant populations in the LNP stood at approximately 150 and "very few" respectively (GLTP 2002: 70). The most recent census in 2010 showed the population of both at around 1,200 (LNP 2010b) with park administrators confidently claiming this number is now higher. On all accounts, park administrators say the wildlife population is "encouraging" with one aspect of this being the fact that wild animals, including large mammals such as elephants, are moving further south towards areas of the park that are more heavily populated by people and livestock. Plans are even in motion to open up a tourism game drive by a waterhole close to the most heavily populated section of the park. If wild animals are "proxies for wilderness" as Witter (2013: 411) argues, then the LNP is successfully being transformed into a wilderness space.

Human-Wildlife Conflict and wilderness II: changing relations between communities and wildlife

Promoting the growth of wildlife populations and creating conditions for them to not only flourish, but remain in the LNP has also entailed legislative changes to protect them by regulating residents' behaviour. Such changes include those that prevent residents from killing wildlife whether for hunting or, importantly, to protect themselves, their fields and their livestock. The ways in which such measures are connected to transforming the area of the LNP is made clear by park and state authorities. As explained by a senior LNP official, "if you want the flora to improve and if you want the wildlife to improve you need to also create conditions for that to happen […] you need to give that flora and fauna a space and an opportunity to develop" (Interview: May, 2012). Another official similarly stated, "you need to create certain areas within a national park where there is no disturbance of the wildlife and the flora, where you can promote a growth of wildlife and a product to offer […] for tourism" (Interview: May, 2012). The LNP's designation as a national park also entails other changes that combine with these new resource use rules to manage residents' interaction with wild animals. These measures include anti-poaching activities, monitoring and surveillance to prevent hunting, and the enforcement of park legislation in order to produce a safe space for wild animals by regulating the behaviour of residents, not wildlife. The LNP's 2010 Annual Report, for example, lists eight arrests and the confiscation or destruction of a long list of items including firearms, bikes, dogs, traps, and bush meat (LNP 2010). Such management requires substantial human and financial capacity. Indeed, the LNP and the funding it attracted meant a large increase in the presence of rangers that carry out these activities. An interview with an official from one of the key donors funding the LNP described how when he first went to the area of the LNP shortly before it was established, he met two rangers who had no shoes and a bicycle with a flat tire (Interview: July, 2012). The GLTP Management Plan paints a similar picture describing how there were only ten field rangers for the area of the LNP in 2002 (GLTP 2002). Furthermore, these rangers did not have their own weapons and their only vehicle was located

in the provincial capital of Xai-Xai, some 300 kms away. The Plan goes on to say that "there was virtually no involvement of government or NGOs in the area" (GLTP 2002: 104). Since 2002, funding for rangers has increased substantially and there are now more rangers who are better trained and equipped to monitor the LNP and enforce park laws.

The above changes have altered how residents interact with wildlife, and especially their ability to manage conflict with them. Over the course of many interviews, residents repeatedly expressed how the change in and policing of relations between them and wild animals directly contributes to the increase in HWC and its negative impacts as they are no longer permitted to defend themselves, their crops and their livestock. As Bartolomeu, a local resident explained with regards to livestock predation, "if an animal was attacked and killed in a certain place, we would set up traps in this place in order to kill the lion that caused us harm. When this occurred it was very rare that other lions returned again to this area" (Interview: July, 2012). Such protective measures not only prevented that specific lion from coming back, but residents argue it would also act as a deterrent to other lions. If they were unable to kill the lion then and there, residents would set a trap by baiting it with meat and setting a snare, poisoning the meat, or shooting it as it approached. As Carlos, another village resident elaborated, "if they [cattle] encountered a wild animal before the park, the animal could kill our livestock but we would set traps. And soon after, the lion would get trapped because it would eat and leave some meat. And when it would return to eat again from the meat it left, it would get caught in the trap and we would kill the lion. Like this we reduced the incidents of death of domestic animals because the lions would no longer return to kill our animals. But since the park entered it does not want this" (Interview: July, 2012).

Apart from legislation, the presence of the rangers and the threat of punishment in the form of fines or prison sentences discourage residents from killing animals, even in defense of their cattle, a point that became most salient in a conversation I had with a large cattle owner in Massingir Velho, Luiz, who spoke about the presence of rangers and its impact on cattle's safety. "I don't do anything [to deal with lions]. Before we would hunt the animals and kill them but now it is very hard to do this because the men from the park are here to punish us. The park does not allow us to kill an animal even if [it] has eaten a cow. There is no strategy to be able to kill because the park will always know. They [rangers] circulate here in the bush and they will find the dead lion and find out someone killed it and pursue this until they find out who killed it. You can be arrested and put in jail simply because of a lion, because of the park that exists here" (Interview: August, 2012).

Hence, before the establishment of the park and measures that altered their relations with wildlife, residents were able to more effectively manage lion-livestock conflict through measures that are no longer allowed. A survey conducted of households in Massingir Velho further corroborates findings that changes in relations between humans and lions and their ability to manage conflict with them are central to increases in livestock predation and associated losses. Asked about their perceptions of livestock predation, 65% of households see the prohibition of killing predators as the most important factor contributing to the increase in predation compared to 35% of households who attribute higher levels of conflict to the increase in lion numbers. Similar patterns can be seen with crop destruction as well.

Elephant-induced crop destruction, for example, has also increased and not only because of the growing elephant populations around Massingir Velho. A conversation between Paulo and myself elucidates this -

Paulo: Elephants cause a lot of problems […] they eat our corn.

Myself: Before the park did you have these problems with animals?

Paulo: Before the park there were animals, but they did not invade our fields because every time they would try we would expel them with guns.

Myself: Why do you no longer shoot animals?

Paulo: Because the park prohibits it.

How changing relations between people and large herbivores contribute to the intensification of conflict and associated losses is perhaps illustrated best by hippo-related crop destruction that occurs along the banks of the Olifants River, an area known as the Baixa. Few residents continue farming in this area because conflict with hippos has become unsustainable. Judite, one of the few remaining women farming in the Baixa, explained, "before the park we would punish the animals by hunting them or by setting traps and the animals would not come back. But now we are suffering a lot because we are not allowed to kill the animals." What is most significant here is that this newly transformed conflict is not the result of hippo migration. Hippos are not migrating from anywhere. Rather, the increase in incidences of conflict with hippos and loss of crops is tied to the inability of residents to deter these dangerous and aggressive animals from eating their crops through the use of lethal traps and/or killing them once in their field.

Non-lethal methods at protecting fields from hippos and elephants such as using trip wires to alert residents to the presence of wildlife and banging on metal drums placed in the middle of the field are employed, but they are minimally effective. Similarly, while there might be more lions because of their migration as they follow the movement of ungulates across the border, the risk of predation and associated losses are greater because residents are no longer allowed to defend their cattle. Residents are now reliant on the park staff to deal with wildlife attacks. By the time a lion has attacked, however, it is too late, and even then the park does not always respond (also see Witter 2013). As Lidia explained, "the lions enter and eat our livestock and our only recourse is to call the LNP officials, but they don't do anything." According to the LNP's annual report, in 2010, Massingir Velho lost five cows as a result of predation along with a number of fields destroyed by other wild animals.[6] The only "action taken", according to the report, was evaluation (PNL 2010b).

It is the changes aimed at regulating human behaviour in conjunction with increasing numbers of wildlife that result

in increasing levels of HWC and the associated losses, or socio-economic displacement that residents face. Without any effective way to mitigate HWC, communities are subject not only to increasing levels of crop destruction and livestock predation, but to recurring instances of conflict that affect the same spaces time and time again. It is this recurring conflict that contributes to the physical displacement of residents as they are compelled to abandon spaces of agriculture and grazing given the insecurities they face.

From socio-economic to physical displacement

Losses of crops and livestock due to HWC not only constitute a form of displacement in and of themselves, but also contribute to the direct physical displacement of communities. First, residents are compelled to leave long-standing spaces of agriculture and livestock rearing. Despite being the most reliable source of water and best soil for farming, many residents in Massingir Velho stopped farming in the Baixa because of the risk posed by hippos who destroy their crops and threaten their physical safety. A visit to the Baixa quickly reveals how the hippos are literally lying in wait in the shallows. In addition, the near impossibility of carrying out other activities like attending to livestock because of the need for twenty - four hour surveillance of their fields was a common reason put forward in interviews as to why residents no longer farm there. The hardship of protecting their fields is compounded by the reality that they can only do so much and often lose a substantial portion of their crops to hippos anyways. It is simply no longer worth the effort to farm there.

Similar dynamics are occurring in other areas because of elephants. For example, further north of Massingir Velho in the village of Makandezulu A, a set of abandoned huts sits across a large, equally abandoned field. A park official explained how the family that used to live there was compelled to move because of the recurring conflict with elephants that destroyed their crops and threatened their physical safety. Too afraid and unable to cope with the precarious nature of agriculture in this new context, they moved to the larger village of Makandezulu B leaving behind the empty houses and fields (Interview: June, 2012).

Residents and their livestock are also being displaced from grazing areas because of conflict with lions. Grazing areas are not fenced-in delineated spaces, but general areas of pasture located on the outskirts of villages that livestock regularly use, return to, and rotate between. Residents of Massingir Velho stopped grazing cattle in areas where repeated lion attacks occurred. As a resident with one of the largest cattle herds, Luiz, explained, "the park does not allow us to kill an animal even if it has eaten a cow, so the strategy we use is that when a cow is killed in a certain area of pasture, we move to a different area so the lion is not able to kill more cows" (Interview: August, 2012).

During interviews, residents also repeatedly described how they now rarely leave cattle out to pasture at night. As one resident Carlos explained, "we left cattle there, up until a week in the bush, even leaving them there at night" (Interview: July, 2012). What used to be a common practice that saved long distances of travelling to and from grazing areas – a practice that contributed to the health of cattle as it minimised their walking back and forth each day – has been largely abandoned as leaving cattle out to pasture overnight has become too dangerous. Even without being removed from the park, residents are physically displaced within it.

Returning to the opening excerpt of this article, HWC-induced insecurity faced by communities is also contributing to their displacement from the park as a whole as it induces them to leave (Milgroom and Spierenburg 2008; Witter 2013; Lunstrum 2015). As explained by one mother, Celietta, who repeated what many residents explained during interviews, "[Human-wildlife conflict] justifies that there is resettlement [because] we lose our domestic animals. They are eaten by lions. Beyond this, they threaten peoples' lives. On the other side, the elephants come and destroy our crops and eat our corn […] This is one of the big factors that makes us leave here" (Interview July, 2012).

In addition to compelling residents to leave the park, HWC is also advanced as a principal reason by the park and the state for their removal and resettlement, what Witter (2013) refers to as a "narrative of protection." As clearly articulated by a senior official from the TFCA-Unit, "there are conditions where fields are being destroyed because of elephants and there have been some animal attacks on domestic animals by wildlife like lions that have crossed the border and attacked cows and goats. This is a concern. The solution to this concern is the resettlement program" (Interview: July, 2012).

Another official from DNAC similarly stated, "the reason for resettlement is that there is human-wildlife conflict inside of the park because the people are there and the pattern is that the number of animals is going to increase" (Interview: July, 2012).

Importantly, livestock is central to this narrative. Even in the original park planning documents, before there were increased levels of HWC, resettlement was put forward as a way to manage the potential risk of disease transmission from wild to domestic animals. The Management Guidelines for veterinary issues in the GLTP/LNP state, "the gradual removal of domestic livestock from the LNP is recommended" (GLTP 2002: 82). Citing the increasing risk of disease transmission, a veterinary assessment conducted in 2006 recommends resettlement as a solution, a resettlement that "will include the movement of livestock out of the Park" (MINAG and MITUR 2007: 8). The physical displacement of communities as a result of HWC is thus happening at two scales: at the scale of fields and pastures that residents depend on for their livelihoods and subsistence within the park and at the scale of villages and the park with communities being removed entirely.

The resettlement of communities either through their inducement or as a protective measure is at the centre of the HWC/wilderness-producing nexus. In responding to my inquiry about protecting cattle from predation, an LNP official commented that the park wants people out of its interior as it is supposed to be a space of conservation, and hopefully

tourism, so why would they do something to protect them and related livelihoods, especially when they are trying to get these activities out (Interview: June, 2012). Indeed, the fields and homesteads that were abandoned outside of Makandezulu A because of recurring conflicts with elephants have been taken over by vegetation and wildlife and resemble less of a space of agriculture and human settlement than it does a 'wilderness' landscape. A similar transformation has occurred where the village of Nanguene once stood. The area of Macavene village is also beginning to take a similar form. Speaking of Nanguene's resettlement, one government official remarked, "now the vegetation is coming back and animals can go there without any problem" (Interview: July, 2012). Another LNP official said of the village of Macavene's resettlement: "… you will have quite a big area in the lower Shingwedzi valley where game can live and that is close to Albufeira camp […] Then you have a game product within proximity of Albufeira gate [and] it will start to improve the profile of the park as a wildlife destination" (Interview: June, 2012).

Once spaces of agriculture, livestock, and human habitation, these are now spaces of wildlife and potential tourism. HWC and its negative impacts on resident communities are thus not only the result of wilderness producing practices, but also help to transform areas into desired spaces of wilderness and tourism by contributing to the physical displacement of people within and from a protected area.

DISCUSSION/CONCLUSION

Political-ecological analyses of conservation demonstrate how conservation landscapes are far from being natural or apolitical phenomena (Adams and McShane 1997; Neumann 1998; Brockington 2002; Hughes 2005). Often supported by a vision of 'wilderness' that forgets the socio-ecological history of spaces in question, conservation and state authorities implement measures to protect and promote so-called 'wilderness' and regulate human-environment interactions. These measures often have negative consequences for communities. As this article demonstrates, practices that aim to produce wilderness lead to increases in HWC and related negative impacts. By recognising that there is little 'natural' about contemporary protected areas and their consequences it becomes possible to more fully understand and conceptualise HWC, how it changes, the ways in which it impacts communities to different degrees, and its connections to the creation of wilderness landscapes of wildlife and tourism. A focus on the increase in wildlife numbers and advancing a "narrative of protection" (Witter 2013) as done by state and park authorities obscures decisions made by these very actors. Furthermore, it ignores how measures to increase wildlife populations combine with a simultaneous effort to re-shape relations between wildlife and resident communities.

A political-ecological analyses uncovers the wilderness producing practices and motivations that drive and sustain HWC and account for the ways in which such conflict results in the socio-economic and physical displacement of communities, including their resettlement. Like conservation-induced displacement more generally, increases in HWC and intensifications in losses of crops and livestock are the direct result of political decisions aimed at creating a specific type of conservation landscape. Building on insights that examine how conservation policies shape human-environment relations (Neumann 1992, 1998, 2001; Brockington 2002; Adams and Hutton 2007), a central aspect of these decisions regulates the behaviour of residents, their relations with wildlife, and their ability to manage conflict with them. HWC is thus a relational issue, a finding that requires further empirical and conceptual work. Further work must also pay specific attention to how these changing relations not only concern people and wildlife, but domestic animals as well. The case of the LNP effectively highlights that in certain contexts livestock is central to HWC's potentially negative consequences, related narratives of protection as seen in Africa (Witter 2013) and elsewhere (Kabra 2009), and thus resettlement.

Highlighting how HWC results from changing relations between wildlife and people (and how such relations are shaped by political decisions) and not necessarily an increase in wildlife populations or overlapping spaces of conservation and livelihoods offers several practical implications. First, the findings suggest that spaces of wildlife conservation and those of agriculture and livestock rearing do not necessarily have to be separate in order to manage HWC. Second, maintaining agricultural spaces does not necessarily have to involve the removal of wildlife for people, lions for cattle, or elephants for fields. Such separations become false choices. Communities in the park's buffer zone, for example, are experiencing similar increases in encounters with wild animals given the increase in wildlife populations (Interviews: May and June, 2012, August, 2013; Lebel 2011). Yet, they are not suffering the same losses nor are they being physically displaced or removed. Instead, these communities and their livestock are being protected through the erection of fences around community areas along with increased park support to mitigate the negative impacts of increasing wildlife populations (Interviews: May and June 2012, August 2013; Lebel 2011). Why can the park not implement similar measures in the interior of the park instead of reverting to long-critiqued practices of "imposing wilderness" (Neumann 1998) that act in the detriment of already vulnerable communities? The ways in which the narrative of protection concerning HWC is manifested on the ground and why it takes the shape it does thus warrants further inquiry.

The restoration of wildlife populations in the LNP and elsewhere ought to be supported. In the case of the LNP such restoration has the potential to be an important ecological and political achievement demonstrating that wildlife populations left decimated by conflict and other factors can not only be revitalised, but that such rehabilitation can be achieved through transnational cooperation between once hostile countries. While the recent rhino-poaching crisis has sparked new tensions between Mozambique and South Africa (Büscher and Ramutsindela 2016), it is also catalysing transboundary collaboration and the further development of the GLTFCA

(Interviews: July 2013, June 2014). Apart from revitalising wildlife populations, the GTLP and transfrontier conservation more broadly can thus demonstrate that it can be part of the solution to a political-ecological crisis (poaching) and not part of the problem. As such, the LNP and the larger GLTP have the potential to stand as important material and symbolic manifestations of the power of transfrontier conservation's ability to rehabilitate and protect wildlife populations. Unfortunately, combating rhino poaching has provided further impetus to remove communities within the LNP and the broader GLTFCA (Lunstrum 2015; Massé and Lunstrum 2016) demonstrating how the goal of community removal remains consistent, but the discourses justifying it shift, a shift that now entails a second narrative of protection that motivates resettlement, namely the protection of rhinos from commercial poaching.

Rectifying past ecological errors (such as removing the border fence), rehabilitating wildlife populations, and developing a protected area must act in the benefit local communities, not to their detriment. This is especially the case if such communities have a history of sustainable co-existence with wildlife. This is not to say that communities should have a carte blanche to kill wild animals. But, if the designation of a space where people are living, farming, and raising livestock as a protected area entails a fundamental change in the relations between wildlife and people and the latter's ability to manage conflict between them, then other measures need to be put in place to ensure that new forms of co-existence are viable for both wildlife and resident communities. As much insightful work has demonstrated, HWC may not be good for people and their livelihoods, but it is not good for conservation efforts and wildlife either as it can lead to resentment among affected populations towards wildlife, protected areas, and conservation more generally (Anthony 2007; Kabra 2009; Ogra 2009; Anthony, et al. 2010). The displacement of communities as a result of conservation efforts may also alienate the very people from nature who depend on it and without whose support conservation will never be fully successful (Brockington and Igoe 2006). The need for positive park-community relations and having communities benefit from conservation instead of alienating them even further is compounded in the LNP given the poaching crisis. Understanding how HWC and its consequences intersect with efforts to create new and rehabilitate existing conservation landscapes is a first step in thinking about how to avoid HWC and related problems and address them as they arise so that conservation initiatives can meet their full ecological and social potential.

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NOTES

1. Defined as "extramaterial losses that are commonly unrecognised, undervalued, or neglected" (Witter and Satterfield 2014: 7).
2. Massingir Velho was moved out of the park in the latter part of 2015 after this article had been accepted.
3. The names of residents have been changed to pseudonyms.
4. Important obstacles to research included a lack of systematic recording of HWC–related data, as explained by Lebel (2011). I thus rely on quantitative data collected by the Short-term Consultancy in Human-Wildlife Conflict Resolution in the Limpopo National Park (Lebel 2011) in combination with qualitative data gained through interviews.
5. It is likely that HWC is underrepresented in this report as quantitative data is based on reported cases only. The report also states that the perception of HWC among Park rangers is higher than the number of cases reported.
6. Other communities in the LNP also suffered losses that year.
7. Many residents repeatedly confirmed this rationale for accepting resettlement in interviews from 2012, 2013, and 2014.

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