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ABSTRACT

CONFLICT AND CONSERVATION: THE LIVES OF AFRICAN WILD DOGS (LYCAON PICTUS) IN BOTSWANA, AFRICA

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In southern Africa, human-wildlife conflict (HWC) negatively affects both humans and wildlife. African wild dogs (Lycaon pictus) are the most endangered large carnivore in sub-Saharan Africa. Because of habitat loss, wild dogs move into human settlements and depredate on livestock and game animals; wild dogs are then persecuted by farmers whose livelihoods are threatened. HWC studies are traditionally managerial and focus on quantifying losses and identifying conflict mitigation strategies. However, scholars are now recognizing that HWC is driven by political-economic and socio-cultural structures and processes as well as conflicts between human groups. There is therefore a need for social science research because conservation biology is increasingly regarded as insufficient for understanding HWC. Moreover, there is a need to explore animal subjectivity and agency to understand wild dogs more fully as subjects, rather than objects of study, and their welfare in human-dominated landscapes. This dissertation draws and builds upon different trajectories in the human dimensions of conservation and animal geography scholarships. It argues that we need holistic approaches and examinations to understand and address HWC in its social context.

This research is predominately qualitative, consisting of semi-structured interviews with 121 participants from the agricultural, conservation, and wildlife tourism industries, secondary documents, and participant observation. Key findings reveal that: 1) HWC is driven by farmers’ socio-economic statuses; 2) human conflict over wildlife is driven by stakeholder groups’ diverging agendas, values, priorities, and national competing development trends; 3) wild dogs are sentient beings with agency whose welfare is negatively affected in human-dominated landscapes.

This study presents technical and structural mitigation strategies, such as responsible livestock herding practices, conservation education, poverty alleviation through community-based tourism, and integrative management planning. Ethical recommendations attend to the lives of wild dogs by engaging a compassionate conservation that positions animals as subjects. This research contributes a largely qualitative and holistic examination of a case study of human-large carnivore conflict and an exploration of animal subjectivity and agency to the HWC, human dimensions of conservation, and animal geography scholarships. Overall, this research demonstrates that humans and animals are entangled in Botswana’s physical, political-economic, and socio-cultural landscapes.
DEDICATION

To my parents, who support me completely and unconditionally,
to Botswana's remaining wild dogs, and to all the individuals who participated in this research.
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Chapter 1: Introduction

In this dissertation, I explore the human dimensions of human-wildlife conflict and the lives of animals through a case study of human-African wild dog (*Lycaon pictus*) conflict in Botswana, Africa. I investigate different stakeholders’ experiences with and perceptions of wild dogs and I explore wild dog subjectivity and agency using a predominately qualitative methodological approach. Furthermore, I consider animals as subjects in conservation scholarship, rather than objects, to build a more compassionate conservation. Results can be used to inform human-wild dog conflict mitigation strategies and conservation approaches in Botswana.

1. Research context: human-wildlife conflict

Human-wildlife conflict (HWC) is a global phenomenon that affects both humans and wildlife. In its simplest form, HWC occurs when “the needs and behavior of wildlife impact negatively on the goals of humans or when the goals of humans negatively impact the needs of wildlife.” (Madden, 2004, p.248). Human-wildlife conflict often emerges when wildlife damages crops or property, kills domestic animals, and / or threatens human safety (Madden, 2004). HWC also includes the preventative or retaliatory injuring or killing of wildlife by humans (Hemson et al., 2009, Madden, 2004). Examples of HWC include elephants raiding farmers’ crops or wolves killing herders’ sheep, with wildlife killed in response to these events. HWC frequently occurs in communities situated near protected area (PA) borders or in areas where wildlife is found outside PAs. In Kenya, for example, 70% of wildlife is found on communal or private land (Gusset et al., 2009; Madden, 2004; Okech, 2010; Ogra, 2008; Romañach, Lindsey & Woodroffe, 2007). Human-wildlife conflict also occurs in urban areas; for example, coyotes may inhabit large cities, where they have access to microhabitats and food sources, and where they sometimes stalk or attack humans and pets (Alexander & Lukasik, 2016; Alexander & Quinn, 2012).

Human-wildlife conflict occurs globally, and its extent and effects are severe. Ravenelle & Nyhus (2017) document instances of HWC occurring in at least 50 countries, in both rural and urban areas. Those countries include developed nations such as those in North America and Europe, as well as developing nations in Africa, Asia, and South America. Wildlife species involved in HWC include reptiles (e.g. crocodiles), birds (e.g. ducks, falcons, goose), sea mammals (e.g. otters), ungulates (e.g. deer, moose), and large carnivores (e.g. tigers, leopards, lions), as well as other terrestrial and aquatic mammals, both small and large (e.g. elephants, beaver). The impacts of HWC are damaging to both humans and wildlife in terms of injury and loss of life. Previous scholarship identifies two types of HWC effects on humans: 1) visible material impacts such as injuries, fatalities, crop damage, and livestock and game depredation, and associated economic losses; and 2) less obvious psychological and social impacts such as stress, abandonment of traditional practices, and decreased social contact (Barua, Bhabwat & Jadhav, 2013; DeMotts & Hoon, 2012; Mayberry, Hovorka & Evans, 2017; Ogra, 2008; Schiess-Meier et al., 2007). For example, in northeast India, 1,150 humans and 370 elephants died because of human-wildlife conflict between 1980 and 2003 (Choudhury, 2004). Between 1980 and 2017, $222 million USD was spent on compensation for conflict-related damages in 50 countries (Ravenelle & Nyhus, 2017).
As humans and wildlife continue to share space and resources, incidents of HWC are increasing in severity and frequency (Madden, 2004). Human-wildlife conflict poses a significant challenge for conservation (Gusset et al., 2009; Madden, 2004) because wildlife abundance and habitat are affected by sharing spaces with humans. Mitigating HWC is therefore a top conservation priority and is essential to people’s well-being and safety. Human-wildlife conflict mitigation is often managerial, and previous research focuses on three broad categories: 1) surveying attitudes towards wildlife, 2) documenting and quantifying the extent of damage caused by wildlife, and 3) identifying and evaluating conflict mitigation techniques (DeMotts & Hoon, 2012; Treves et al., 2006).

Human-wildlife conflict is a significant problem across Africa, where extensive wildlife populations exist alongside humans (Muir, 2010). In southern Africa, conflict between humans and large carnivores is particularly problematic. Income and livelihoods derived from agricultural activities such as subsistence and commercial cattle rearing come into direct conflict with the needs of large carnivores as well as activities that promote conservation, such as wildlife tourism. As a result, farmers are often negatively affected, both economically and psychologically, while large carnivores are threatened with local or global extinction because of conflict (Dickman, 2010; Muir, 2010).

1.1. Human-large carnivore conflict in southern Africa

Southern Africa’s large carnivores, categorized as carnivores that reach a weight of more than 20 kg (Delarum, Somers, Kunkel & Cameron, 2008), include lion (Panthera leo), cheetah (Acinonyx jubatus), leopard (Panthera pardus), African wild dog (Lycaon pictus), spotted hyena (Crocuta crocuta), and brown hyena (Hyaena brunnea). The focal species of this dissertation is the African wild dog (wild dog for short). Large carnivores are especially vulnerable to human-wildlife conflict for two main reasons, their ecological characteristics mean that they tend to have wide ranges, and they tend to conflict with human interests such as livestock and space (Romañach et al., 2007; Rust, 2015; Thorn et al., 2012). As a result, many large carnivore populations are in decline, despite extensive conservation efforts (Winterbach, Winterbach, Somers & Hayward, 2012).

Livestock depredation is the most widespread and persistent source of human-large carnivore conflict across southern Africa, and lethal control is the leading cause of declining large carnivore populations (Muir, 2010). For example, lions are now only found in sub-Saharan Africa following their extirpation from 12 African countries because of indiscriminate killing by humans (Bauer et al., 2015; Romañach et al., 2007). With almost every African large carnivore species negatively affected by HWC, mitigating that conflict is particularly important, especially in areas where agricultural domestic animal production is the dominant land-use activity (Muir, 2010; Thorn et al., 2012). Livestock depredation adversely affects farmer livelihoods and rural development in agricultural areas (Thorn et al., 2012). Subsistence farmers are especially affected because they have a minimal capacity to absorb the financial cost of livestock losses, which makes them vulnerable to livelihood instability and food insecurity (Dickman, 2010; Romañach et al. 2007; Thorn et al., 2012). As a result, local communities’ resentment towards wildlife often impedes conservation practices (Treves et al., 2006).

I use African wild dog (Lycaon pictus) (Figure 1) as a case study because it is persecuted in farming areas across southern Africa and is of particular conservation concern. Most recent population estimates indicate that southern Africa is home to approximately 2,302 wild dogs, or 235 packs, of which 725 individuals are protected. Wild dog is listed as endangered by the IUCN, meaning that the species faces a high risk of extinction in the wild (Woodroffe & Sillero-Zubiri, 2012). Habitat loss and
human persecution are the two main causes of wild dog population decline in Africa (Woodroffe & Ginsberg, 1999). Human encroachment and habitat fragmentation make the wild dog particularly vulnerable to conflict with farmers, road mortality, snaring, and disease passed from domestic dogs (Fanshawe, Frame & Ginsberg, 1991; Gusset et al., 2009; Rasmussen, 1999; Woodroffe & Ginsberg, 1999). Wild dogs have extensive home ranges, which can reach 1,500–2,000 km² (Burrows, 1995). Consequently, they often range outside of protected area borders and venture into human settlements, where they are often persecuted by farmers over livestock depredation (Woodroffe & Ginsberg, 1999). The wild dog has been extirpated from 25 of the 39 countries it historically inhabited (Creel & Creel, 1998), and only approximately 6,600 individuals remain on the African continent (Woodroffe & Sillero-Zubiri, 2012).

Botswana has approximately 1,310 wild dogs (131 packs), of which 318 individuals are protected (RWCP & IUCN/SSC, 2015). Although the total number is a relatively large population in the context of southern African numbers, human-wild dog conflict remains a significant conservation problem given the large number of cattle in the country (Gusset et al., 2008; Muir, 2010; Swarner, 2004). Human-wild dog conflict mitigation and conservation strategies are therefore particularly important in Botswana. As such, conflict mitigation strategies need to balance human interests with conservation goals, which demands “a clear understanding of the nature and underlying human […] drivers of conflict” (Thorn et al., 2012, p.24).

Figure 1: African wild dog (*Lycaon pictus*); Photo by Valli-L. Fraser-Celin
1.2. Large carnivore conflict mitigation strategies and conservation efforts

Several conflict mitigation strategies that aim to reduce livestock depredation and the persecution of large carnivores are detailed in the HWC literature. These strategies include effective livestock husbandry practices, conservation education, wildlife-based tourism, and compensation schemes (Gusset et al., 2008; Lindsey, du Toit & Mills, 2005; Muir, 2010; Ogada et al., 2003; Thorn et al., 2012; Woodroffe et al., 2005). Effective livestock husbandry practices include replacing traditional brush or wooden livestock enclosures with sturdier fencing such as chain-link fences (Thorn et al., 2012), increasing human presence around livestock (Ogada et al., 2003), and using livestock guardian dogs (Winterbach, Winterbach & Somers, 2014). Mitigation strategies, however, vary according to each large carnivore. For example, livestock guardian dogs are effective deterrents for cheetah, but not leopard, and bush-fenced enclosures are more successful against leopard than are pole-fenced enclosures, which deter hyena (Winterbach, et al., 2012). Livestock husbandry practices must therefore take into consideration which large carnivores are most problematic in the area.

Conservation education focuses on raising awareness about large carnivores, reducing fear, and dispelling myths, antagonism, and prejudices (Gusset et al., 2008; Lagendjik & Gusset, 2008; Lindsey, du Toit & Mills, 2005; Winterbach, et al., 2012). Conservation education programmes have been found to be successful at improving attitudes if they are long-term, rather than short-term or in the form of sporadic workshops (Gusset et al., 2008). Wildlife-based tourism is often seen as a way to reduce conflict by increasing benefits associated with wildlife (Hemson et al., 2009). The hope is that tourism will position wildlife as economically beneficial to local communities, thereby reducing antagonism towards wildlife (Kansky & Knight, 2014). Issues with wildlife-based tourism that may hinder coexistence include unequal distribution of funds, disproportionate revenue income compared to livestock losses (Barua, Bhagwat & Jadhav, 2013; Hemson et al., 2009), and lack of community involvement (Mbaiwa, 2017).

Finally, compensation schemes are an incentive meant to alleviate the financial burden of livestock losses (Gusset et al., 2009; Selebatso, Moe & Swenson, 2008). Compensation is also meant to incentivize farmers to report losses, and paying compensation can help governments understand the extent of depredation incidents (Selebatso, Moe & Swenson, 2008). Compensation schemes, however, fall under heavy criticism as being a means of buying tolerance rather than promoting long-term coexistence. Farmers are often left unsatisfied, with limited or nonexistent compensation and continued damage caused by wildlife (Hemson et al., 2009). Compensation is costly and difficult to implement logistically; lack of personnel, vehicles, and time to conduct investigations often hinder the process. Moreover, compensation does not account for the emotional or cultural elements that come with the loss of livestock and the costs associated with filing a claim and replacing an animal (i.e. transportation, time, etc.) (Hemson et al., 2009). As a result, compensation schemes do not guarantee improved attitudes, increased tolerance, or reduced conflict toward carnivores (Gusset et al., 2009; Muir, 2010; Selebatso, Moe & Swenson, 2008), and financial incentives that reward appropriate livestock husbandry and insurance programmes have been proposed as replacements for compensation (Hemson et al., 2009; McNutt, Stein, McNutt & Jordan, 2017).

Beyond conflict mitigation, one significant conservation strategy for large carnivores is habitat protection. Because large carnivores require more space than most wildlife, conserving large tracts of habitat or establishing buffer zones between protected areas and bordering agricultural areas contributes to large carnivores’ minimum spatial requirements (Winterbach et al., 2012). Other
conservation efforts focus on understanding the large carnivores’ ecological characteristics, for example, their distribution and population viability, wild prey availability and prey preference, interspecific competition, and behavioural and spatial adjustments (Swarner, 2004; Winterbach, et al., 2012; Valeix et al., 2012). Researching large carnivore ecological characteristics develops a better understanding of their needs and requirements on the landscape, which can shape conservation policies and practices.

2. Scholarly context: Human dimensions of conservation and animal geography

In this dissertation, I draw on a suite of traditions within conservation and geography to build a conservation practice that attends to human and animal subjects, to appreciate, and push further nuanced and holistic examinations and understandings of human-wildlife conflict and conservation. I draw primarily from the human dimensions of conservation scholarship, which broadly focuses on the political-economic and socio-cultural dimensions of conservation problems. I also draw from the animal geography scholarship which broadly focuses on socio-spatial aspects of human-animal relations and animal experiences. In this section, I detail the emergence and key tenets of each body of scholarship.

2.1. Human dimensions of conservation

I draw from the human dimensions of conservation literature because it is being increasingly recognized that conservation problems are often rooted in and driven by historical, political, economic, cultural, and social factors (Adams, 2007; Bruskotter & Shelby, 2010; Madden, 2004; Moon & Blackman, 2014). However, most people working in conservation are trained as biologists (Adams, 2007; Bennett et al., 2016; 2017; Teel et al., 2018; Rust et al., 2017), and western ideologies of conservation seek to preserve nature as separate from humans. This is most apparent through the concept of ‘fortress conservation’, characterized by an exclusionary model of nature preservation where local inhabitants are forcibly evicted from PAs and where PA borders are protected and defended from outsiders (Büscher & Wande, 2007; Massé, 2016; Vaccaro, Baltran & Paquet, 2013). Western concepts of conservation date back to the 19th century with the environmental movement spearheaded by men such as John Muir, Hendry David Thoreau, and Aldo Leopold; Yellowstone became the first national park in 1872, and the model was replicated worldwide (Cronon, 1995).

The contemporary field of conservation biology focuses on biological diversity and extinction. It emerged in the 1980s under the leadership of a few renowned biologists who established the discipline through important writings (e.g. Soulé, 1985 and see also Bradshaw, Sodhi, Laurance & Brook, 2011) along with the creation of the Society for Conservation Biology in 1987 and the development of the journal, Conservation Biology, in 1988 (Teel et al., 2018). While not a new science, conservation biology grew out of a need to address modern conservation problems that were more urgent and required more comprehensive approaches than previously realized (Meine, Soulé & Noss, 2007). The discipline has grown to focus on biological aspects of conservation such as genetics, evolution, and ecology (Mascia et al., 2003; Soulé, 1985; Teel et al., 2018). Research is used to inform policy because conservation biological studies can analytically and theoretically identify threatened species and ecosystems, and what is required to sustain them (Mascia et al., 2003).

The political objective of preventing species extinction and preserving biodiversity resulted in conservation biology becoming a “value-laden” field (Meine, Soulé & Noss, 2007; Soulé, 1985). As such, conservation biology is described as a ‘crisis discipline’ where “one must act before knowing all
the facts” (Soulé, 1985, p.727). This put into question the objectivity of the discipline because science is regarded as remaining value-free and grounded in empiricism (Wallington & Moore, 2005). Yet, Noss (2007) argues that personal bias and experiences, in other words, subjectivity, shapes what conservation biologists choose to study, how they interpret results, and the extent to which they advocate certain policies. Challenging positivist traditions in conservation allowed conservationists to recognize that “science is a historically situated cultural practice, and the knowledge constructed by scientists inevitably reflects the social context in which it is produced and used” (Robertson & Hull, 2001, p.972). This critique enabled the field of conservation biology to begin moving beyond siloed examinations of biodiversity to include the human dimensions of conservation.

The human dimensions of conservation focus on humans’ beliefs, attitudes, behaviours, and values, alongside broader historical, political-economic, socio-cultural elements (Adams, 2007; Bennett et al., 2016; 2017; Cowling & Wilhelm-Rechmann, 2007; Dickman, 2010; Madden, 2004; Madden & McQuin, 2014; Mascia et al., 2003; Rust, 2015). In the late 1940s, King (1948) expressed the need to “study man's [sic] relationship with our game management problems…” (p.10); this was one of the first instances in Western scholarship where a need to explore the human dimensions of wildlife was identified (Manfredo, 1989). It was in the mid-1970s, however, that the human dimensions of conservation began to figure more prominently in Western scholarship with Kellert’s (1976) attitudinal research on Americans’ perceptions of wildlife values. Zinn, Manfredo, Vaske & Wittmann (1998) claimed that “The gap between changing public expectations of wildlife management and the more traditional orientations of many decision-makers makes it essential to integrate sound social science information into policymaking processes” (p.650). This early work focused on the human dimensions of wildlife management and recreation-wildlife interactions through examinations of human thought and actions regarding wildlife and then how to use that information in decision-making.

Because conservation biology is grounded in quantitative studies, early social science studies conducted by conservation biologists continued this tradition by striving for large representative sample sizes, generalizability, and statistical analyses (Drury, Homewood & Randall, 2014). This research focused on measuring attitudes, values, norms, motivation, and satisfaction, usually through surveys (Manfredo, Vaske & Decker, 1995). For example, they examined public acceptance of wildlife management policies and practices (Zinn et al., 1998), and explored coexistence through co-management and participatory wildlife management (Treves, Wallace, Naughton-Treves & Morales, 2006). Studies were used to minimize conflicts between recreationists and wildlife (Manfredo, Vaske & Decker, 1995), to understand and integrate public opinions into decision-making (Zinn et al., 1998), and to resolve conflict through stakeholder engagement (Treves et al., 2006).

Other examinations of conservation took a more critical stance. Geographers in particular began focusing on the practices and outcomes of conservation on local populations by highlighting spatial and political inequalities and resource struggles (Adams & Hutton, 2007; Daniels & Basset, 2002; Massé, 2016; Neumann, 1992). For example, they have highlighted how fortress conservation practices spatially segregate and dispossess local people from their livelihoods, resources, and lands (Adams & Hutton, 2007; Lunstrum, 2016; Massé, 2016; Roth, 2008). They also focus on material outcomes of conservation discourse, for example, the economic and socio-political effects of increased state presence in rural areas where conservation areas are traditionally established (Roth, 2008; Sundberg, 2008).
Geographer Steven Hinchliffe (2008) describes traditional conservation philosophy as aiming to “retain something of a pre-existing state of nature. Nature in other words is pre-constituted and conservation comes after nature” (p.88). This philosophy reinforces nature-society dichotomy. By focusing on the human dimensions of conservation, geographers have brought the complexities involved in conservation discourse, processes, and practices to the foreground. As such, geographers began demonstrating that humans and nature cannot be regarded as separate and that nature-society interactions are grounded in uneven power relations. They demonstrate that conservation is a multifaceted concept that involves complex relations between nature and society. Human geographers (re)frame conservation as an interconnected human-environment process, rather than “ecologically and socially homogeneous, as well as politically neutral” (Daniels & Bassett, 2002, p.481). Geographers therefore problematize traditional conservation as a multi-scalar, spatial, relational process and practice that encompasses different human groups, the environment, political-economic and social conditions, inequalities, and relations of power.

However, due to the crisis-oriented nature of conservation biology, the human dimensions still often remain overlooked; as a result, Madden (2004) argues that “time and effort invested in achieving a fuller understanding of a particular wildlife species is often undercut by a less than full understanding of the motives, beliefs, and values of the humans involved” (p.250). Yet, with the rise of human populations, and the growing severity of global conservation problems, conservation biologists are now recognizing that “the natural science methods of conservation biology are insufficient to find solutions to complex conservation problems that have social dimensions” (Sandbrook, Adams, Büscher & Vira, 2013 p.1388).

Social science research is often used to better understand and include the human dimensions into conservation research and policy (Bennett et al., 2016; 2017). The social sciences have the analytical insights to explore, predict, and explain human behaviour, which is essential to the success of conservation at different scales (Bennett et al., 2016; 2017; Mascia et al., 2003). Bennett et al. (2017) summarize and present three broad categories of ‘conservation social science’ (i.e. improving conservation policies, practices, and outcomes through social science): 1) classic (e.g. human-environment geography, conservation ethics, conservation history, and environmental philosophy), 2) applied (e.g. conservation law, conservation education, policy sciences), and 3) interdisciplinary (e.g. political ecology, ecological economics). Conservation social scientists often work from different standpoints; Sandbrook et al. (2013) distinguish between social science research for conservation (i.e. increasing our understanding of the relationship between human society and biodiversity loss) and social science on conservation (i.e. studies of conservation as a social movement).

The earlier integration of quantitative social science studies into conservation biology, coupled with the critiques surrounding objectivity, provided an opportunity to integrate qualitative approaches and methodologies grounded in a more subjective understanding of science into conservation studies. While qualitative, ethnographic research on human-large carnivore conflict is still limited (Goldman, Roque De Pinho & Perry, 2010; Rust, 2015), qualitative studies are a valuable approach to gaining in-depth understandings of complex conservation problems (Drury, Homewood & Randall, 2011). Social scientists have the knowledge and skills to conduct and interpret qualitative research. Moreover, combining qualitative and quantitative social science approaches can present data in ways that can reach a wider audience of natural and social scientists who work toward understanding and resolving conservation problems.
2.2. Animal geography

Animal geography emerged in the mid-1990s as a sub-discipline of human geography, developing as a response to the ethical and political responsibilities we have toward the animals we share our world with (Johnston, 2008; Wolch & Emel, 1998). Animal geography critiques the way animals are treated as objects to be studied and classified and aims to include animals in social theory (Wolch & Emel, 1995) as ‘minded subjects’ (Van Patter, 2015). As such, animal geographers began by exploring human-animal relations in various spaces, such as laboratories, homes, farms, cities, and zoos (see Philo & Wilbert, 2000; Wolch & Emel, 1998). This initial focus was on these ‘animal spaces’ or, the conceptual and material spaces allocated to animals by humans (Bolla & Hovorka, 2012; Collard, 2012; Lukasik & Alexander, 2016; Philo & Wilbert, 2000). Much of the literature focuses on ‘animal spaces’ by exploring how animals are discursively constructed and how they are positioned in human society (see Bolla & Hovorka, 2012; Buller, 2013; Collard, 2012; Gullo, Lassiter & Wolch, 1998; Philo & Wilbert, 2000; Van Patter & Hovorka, 2017; Wolch & Emel, 1998). Exploring these spatial relations resulted in a recognition of animal agency, a concept that acknowledges and positions animals as having the capacity to act, to alter their own lives, and to affect the lives of others (Buller, 2013; Rutherford, 2013). This recognition introduced the concept of ‘beastly places’ or, the spaces that animals carve out for themselves and how they live their own lives apart from humans (Philo & Wilbert, 2000). ‘Animal spaces’ and ‘beastly places’ were foundational concepts in animal geography and, as a result, animals were “no longer the exclusive province of the sciences” (Buller, 2013, p.2).

Animal geographers began to explore the role of animals as “other forms of presence” (Wolch & Emel, 1998, p.xvi) in the construction of human identity, the politics of shared spaces, the production and political economy of animal bodies, and the legal and ethical dimensions of human-animal relations (see Wolch & Emel, 1998 and Philo & Wilbert, 2000). They adopted methodological approaches used by human geographers to explore human minority groups’ experiences to better understand animal experiences by paying attention to power relations and subjectivities (Johnston, 2008; Philo, 1998). Working from a posthumanist perspective, animal geographers sought to re-imagine society as relationally constituted by both humans and animals by decentering the human subject and breaking down nature/culture dualisms (Philo & Wilbert, 2000). However, the focus remained on human experiences of animals, rather than the experiences of animals in and of themselves; animal geographers therefore began to ask questions such as “How might we account for this sudden visibility of the animal within our erstwhile anthropocentric geography, and likewise in the (human) social sciences and the human-ities?” (Buller, 2013, p.3).

Geographers’ interest in wildlife began with mapping species distributions on the landscape (Urbanik, 2012). However, through human geographers’ burgeoning interest in nature came an interest in wildlife (Thrift, 2002; Urbanik, 2012). Animal geography is therefore one way in which geographers continue to push forward conversations about conservation and human-wildlife conflict issues (Bolla & Hovorka, 2012; Collard, 2012; Doubleday, 2018; Gullo, Lassiter & Wolch, 1998; Jepson, Barua & Buckingham, 2010; Urbanik, 2012; Yeo & Neo, 2010). Animal geographers have investigated human-wildlife relations and conflict by focusing on the material and conceptual placement of wildlife and wildlife spatial belonging in urban areas (Bolla & Hovorka, 2012; Collard, 2012, Gullo, Lassiter & Wolch, 1998; Power, 2009; Yeo & Neo, 2010). They also focus on the disconnect between the discursive and material placement of wildlife, which positions certain animals as problematic in human societies and how human discourse about wildlife shapes socio-spatial practices toward them (Bolla & Hovorka, 2012; Collard, 2012; Doubleday, 2018; Yeo & Neo, 2010). They also examine how wildlife...
affect the well-being of humans in shared spaces (Barua, 2013; Power, 2009), and on wildlife agency, subjectivity, individuality, and nonhuman difference (Bear, 2011; Chambers & Main, 2014; Collard, 2012; Dempsey, 2010; Jepson, Barua & Buckingham, 2010). Animal geographers are therefore well-positioned to study human-wildlife conflict through a “critical analysis on wildlife’s capacity to co-create, maintain, and/or destabilize human-animal boundaries and to participate in the spatial relations maintained by conservation initiatives” (Doubleday, 2018, p.118).

Animal geographers therefore opened up a space for discussing “other-than-human subjects” (Adams, 1995, p.12) in conservation and human-wildlife conflict scholarship. Animal agency (the capacity to influence one’s life and the lives of others, to exert power, and to achieve goals) and subjectivity (animals’ experiences; animals as thinking, feeling, self-conscious beings) are two innovative concepts that position animals as subjects in research and scholarship by demonstrating their influence and by focusing on their lives in and of themselves (Bear, 2011; McFarland & Hediger, 2009; Rutherford, 2013; Van Patter, 2015). Animal geographers are now “moving more firmly from ‘the animal’ solely as a conceptual device to interrogate ‘the human’, towards more intimate lived and dwelt encounters with animals themselves” (Hovorka, 2017, p.2). This endeavour, however, poses ontological and epistemological challenges that animal geographers are attempting to overcome methodologically (Buller, 2015; Hodgetts & Lorimer, 2014; Hovorka, 2017). They do this by paying attention to animal bodies and physical characteristics (Geiger & Hovorka, 2015; Hovorka, 2008; Lorimer, 2010), by using concepts such as embodiment, performativity, and responsible anthropomorphism (Bear, 2011; Hovorka & Geiger, 2015; Johnston, 2008; Van Patter & Hovorka, 2017), and by analyzing behavioural and biological characteristics (Bear, 2011; Collard, 2012; Dempsey, 2010; Gullo, Lassiter & Wolch, 1998; Van Patter & Hovorka, 2017). For example, Gullo, Lassiter & Wolch (1998) attempt to understand cougar ideas of humans in urban and peri-urban areas by analyzing cougar behaviour in shared spaces. They posit whether cougars see humans as prey, or as dangerous and to be avoided. Other studies explore wildlife as influential actors in conservation (Jepson, Barua & Buckingham, 2010) and as actively shaping human spaces as (un)safe through their presence and absence (Collard, 2012).

3. Problem / rationale

Human-wildlife conflict is increasing in severity and frequency globally, especially in southern Africa. HWC is becoming increasingly difficult to mitigate and conflict damages the lives of both humans and wildlife. Human-wildlife conflict scholarship often focuses on understanding and managing conflict by quantifying losses and proposing technical solutions (DeMotts & Hoon, 2012; Dickman, 2010; Madden, 2004; Madden & McQuinn, 2014; Peterson et al., 2010). However, there is a lack of integrative approaches that consider the human dimensions of conservation in the context of human-wildlife conflict as well as the lives of animals within conservation and HWC scholarship.

The goal of this dissertation is to draw and build upon different approaches and trajectories in the human dimensions of conservation scholarship to illuminate the complexities of human-wildlife conflict. In this dissertation, I argue that we need holistic examinations to understand, explain, and address human-wildlife conflict in its social context (Bruskotter & Shelby, 2010; Dickman, 2010; Goldman, Roque De Pinho & Perry, 2010; Madden, 2004; Madden & McQuinn, 2014; Peterson et al., 2010). Taken together, the manuscripts in this dissertation reflect evolutionary trajectories in conservation, human dimensions of conservation, and human-wildlife conflict studies. This dissertation draws from three different trajectories in conservation and argues that they must all be considered and
pursued together to attend to human and animal lives in situations of HWC and to develop long-term mitigation strategies.

Manuscript 1 (chapter 3) is representative of a foundational study that uses both qualitative and quantitative methods to document and analyze human perceptions of large carnivores. Manuscript 2 (chapter 4) pushes this analysis further by exploring the broad social context of human-wildlife conflict in Botswana. It recognizes and applies a social constructionist approach to understand the ways one animal species has contrasting meanings to different social groups, how those meanings emerge, and what their implications are. This analysis re-frames traditional human-wildlife conflict studies as human conflict over wildlife. Finally, manuscript 3 (chapter 5) explores how we can come to understand how the lives of wildlife are affected in human-dominated landscapes. It also questions how we may come to embrace coexistence by positioning animals as subjects in a more compassionate conservation that considers the subjectivities, agency, and welfare of wildlife.

4. Study area: Botswana, Africa

This research took place in Botswana, Africa, a 581,730 km sq. land-locked arid country in southern Africa (Figure 2). Human-wildlife conflict is a significant issue in Botswana; wildlife such as elephants, lions, cheetah, and wild dogs share spaces with humans and livestock across the country. HWC is exacerbated by competing land use activities, specifically between the agriculture and conservation and tourism industries. Recognizing these industry trends is a key step toward gaining a deeper understanding of the region in order to position human-wildlife conflict in its social context (Rust, 2015).
4.1. Agriculture in Botswana

Cattle are an important economic and socio-cultural resource in Botswana. They are regarded as a bank account and an indication of social status (Hoon, 2004; Twyman, 2001). For example, the number of owned cattle defines a man’s wealth and social status. Cattle are also used for exchange during funerals and weddings. Hoon (2004) explains: “Cattle are dependable. They are largely self-producing. And they are mobile in the face of drought and danger. Cattle, in short, make an ideal basis for the stable storage, exchange, and seemingly spontaneous growth in wealth” (p. 150). Pre-colonial cattle ownership shaped today’s contemporary cattle ownership in Botswana. During pre-colonial times, cattle were owned by an elite few and distributed among cattle-less clients who then gained access to milk, draft power, and occasionally, offspring (Hillbom, 2014; Petitt, 2016). This mafisa system therefore guaranteed clients’ labour and political loyalty to the cattle owners. This type of cattle control and distribution was the foundation for class formation in the country, reflecting political power,
wealth, and social standing in Tswana society (Petitt, 2016). The production and exchange of cattle was the foundation of Botswana’s political-economy during pre-colonial times (Hoon, 2004) and set the direction of the industry’s commercialization during colonial1 times.

The pre-colonial emphasis on cattle rearing led the colonial administration to continue privileging cattle by channeling money into the industry’s development (Hovorka, 2012). The globalization of the livestock industry brought about by international trade relations meant that the industry became open to export markets, predominately to South Africa, Zimbabwe, Zambia, Mauritius, and eventually to the European Union (Hoon, 2004; Hovorka, 2012). The expansion of the cattle industry was heavily financed by Europe’s demand for beef, leading to the establishment of cattle ranches across the country. Borehole drilling, which facilitated water access in drier grazing lands in the Kalahari, was especially important for the expansion of the cattle industry. Boreholes were constructed, then handed over to a small number of wealthy and influential Tswana elites who were considered to be in the best position to run and maintain them. The result was an unequal division of water sources, with little opportunities afforded to the traditional sector (Hillbom, 2014). Meanwhile, agricultural policies favouring the cattle industry were established, such as land use planning focused on cattleposts, ranches, communal grazing land, Wildlife Management Areas (WMAs), and veterinary cordon fences alongside the establishment of the Botswana Meat Commission (BMC) and government subsidized veterinary services across the country (Darkoh & Mbaiwa, 2002; Hillbom, 2014; Hovorka, 2012).

Botswana’s livestock holdings remain skewed with a few elite farmers, many of them government officials, owning most of the national herd, who have been subsidized by the European Union, the World Bank, and through government diamond mining earnings (Darkoh & Mbaiwa, 2002). Cattle-oriented land use practices have led to environmental degradation in Botswana through overgrazing and desertification. Moreover, the veterinary fences crisscrossing the country have cut off wildlife migration routes and water access (Hovorka, 2012; Mbaiwa & Mbaiwa, 2006). Despite these ramifications, cattle in Botswana remain “spatially protected, nurtured and watched” (Hovorka, 2012, p. 879). Cattle were the primary export until 1978 (Hovorka, 2012) and continue to be essential to Batswana livelihoods and rural economies (Darkoh & Mbaiwa, 2002; Petitt, 2016). Today, there are between 1.5 and 2.2 million cattle in the country (Esterhuizen, 2015).

4.2. Conservation and wildlife tourism in Botswana

Botswana has some of the largest populations of wild animals in Africa (Mbaiwa & Mbaiwa, 2006). For example, the country is home to the largest population of wild African savannah elephants on the continent (~130, 450). Conservation and tourism are closely linked in Botswana. Botswana’s economy depended on beef exports until 1978, then on diamond exports (diamonds were discovered post-independence in 1967) (Hovorka, 2012). Cattle, however, are disease vulnerable and diamonds are a finite resource leading the Botswana government to realize the necessity of diversifying the national economy (Mbaiwa & Stronza, 2010; Stone, Stone & Mbaiwa, 2017). During the 1990s, wildlife tourism became regarded as “a new engine of growth in the country, with the potential to conserve natural resources, diversify the economy and improve local livelihoods” (Stone, Stone & Mbaiwa, 2017, p.59).

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1 Botswana’s colonial period (or the Bechuanaland Protectorate at the time) began in 1885; the country gained independence in 1966.
Today, Botswana has allocated 38% of its land to National Parks and Game Reserves (17%) and to Wildlife Management Areas (WMAs; 21%); the country has four national parks, Chobe, Nxai Pan, Makgadikgadi, and the Kgalagadi Transfrontier Park, and three game reserves, the Central Kalahari, Moremi, and Khutse. Wildlife Management Areas (WMAs) were established in the mid 1980s and stretch along protected area borders acting as buffer zones and migratory corridors where agricultural activities are allowed, but restricted (Arntzen, 2003). In Botswana, wildlife is a national resource and the government retains ownership of all wildlife (Hemson et al., 2009). The country maintains a protectionist conservation philosophy championed by former President Ian Khama (2008-2018). Wildlife tourism is now the second highest GDP contributor in the country following diamonds, and Botswana rivals other popular safari tourism destinations in Africa, such as Kenya and Tanzania (Mbaiwa, 2017).

5. Research aim and objectives

The aim of this research is to explore human-African wild dog (Lycaon pictus) conflict in Botswana. It considers the perspectives and circumstances of multiple stakeholders, the experiences of wild dogs, and political-economic and socio-cultural trends in the country. This dissertation informs human-wild dog conflict mitigation and wild dog conservation in Botswana and positions wild dogs as subjects in conservation scholarship. The following three research objectives were developed to meet the above aim; each research objective reflects one manuscript in this dissertation:

1) Examine farmer-wild dog conflict by documenting farmer perceptions of and experiences with wild dogs and wild dog impacts on farmer livelihoods;

2) Investigate human conflict over wild dogs by documenting different stakeholder groups’ perceptions of and experiences with wild dogs while considering national political-economic and socio-cultural trends and development trajectories;

3) Explore the lives of wild dogs through animal geography concepts of animal subjectivity and agency to build a more compassionate conservation.

6. Dissertation structure

This dissertation is a manuscript-style dissertation, comprising of 6 chapters. Chapter 1 (Introduction) introduced human-wildlife conflict as the broad research topic. It then focused more specifically on human-large carnivore conflict, conflict mitigation, and conservation efforts in southern Africa, and introduced African wild dogs as the focal species of this research. It then described the problem / rationale of this research followed by the scholarly context in which the research is situated: the human dimensions of conservation and animal geography scholarship. It then introduced the study area, Botswana, Africa, through a brief overview of important and relevant industries in this research, the agricultural, conservation, and wildlife tourism industries. Finally, it presented this dissertation’s research aim and objectives.

Chapter 2 (Methodology) discusses my philosophical position as a geographer, which is humanist, interpretivist, and posthumanist in nature. It details positivist and empiricist traditions in geography followed by humanist, interpretivist, and posthumanist traditions in geography. It then provides an in-depth discussion of my methodological approach, which is qualitative in nature, followed by my research design, which provides an overview of my case study approach and data collection and
analysis. I then discuss my positionality as a Western, white, middle-class, female researcher, followed by the ethical considerations I took in the field and through research dissemination. It concludes with overall thoughts on the research process.

Chapter 3 consists of manuscript 1 entitled Farmer-African wild dog Lycaon pictus relation in the eastern Kalahari, Botswana published in the journal Koedoe: African Protected Area Conservation and Science. This paper explores farmer-wild dog relations in the eastern Kalahari, an understudied region of Botswana. It documents commercial and subsistence cattle and game farmers’ experiences with, attitudes toward, and beliefs about wild dogs, as well as impacts of human-wild dog conflict on farmer livelihood. This research confirms the presence of wild dogs and that wild dogs are preating on livestock in this region. It also reveals that farmers’ perceptions of wild dogs are tied to their socioeconomic status whereby subsistence farmers, who lack education as well as means of absorbing costs associated with livestock losses, are more negative toward wild dogs than commercial cattle and game farmers. It also reveals that while farmers are negative toward wild dogs, they also have positive perceptions of them across farmer types related to wildlife tourism. Given these findings, human-wild dog conflict may be mitigated more effectively by capitalizing on positive perceptions and through programmes that consider and attend to people’s different experiences of the landscape and wildlife within it, to socioeconomic status, and access to social resources through a focus on poverty alleviation schemes and wildlife tourism as an alternative income strategy.

Chapter 4 consists of manuscript 2 entitled Human conflict over wildlife: Exploring social constructions of African wild dogs (Lycaon pictus) in Botswana published in Human Dimensions of Wildlife. This paper broadens out the initial investigation of farmer-wild dog conflict to explore conflict between different stakeholder groups about wild dogs. It focuses on individuals in the agricultural, conservation, and wildlife tourism industries in the country. It uses a social constructionist conceptual framework to reveal different meanings of wild dogs and considers how Botswana’s political-economic and socio-cultural context shapes these meanings. Wild dogs are constructed in three ways: as a problem animal by the agricultural industry, as an endangered species by the conservation and wildlife tourism industries, and as an economic resource by all three industries. These findings reveal that human-wild dog conflict is rooted in different stakeholder groups’ diverging agendas, values, and priorities concerning wild dogs and the government’s competing land use activities and development trends in the country. Given these findings, recommendations include re-framing human-wildlife conflict as human conflict over wildlife to increase communication between conservationists and affected communities and developing integrative management plans to increase collaboration among stakeholder groups.

Chapter 5 consists of manuscript 3 entitled Compassionate conservation: Exploring the lives of African wild dogs (Lycaon pictus) in Botswana. This paper argues that compassionate conservation begins with positioning animals as subjects in conservation scholarship. This requires paying attention to animal subjectivity, agency, and welfare in order to demonstrate that the lives of wild dogs are complex and nuanced, and shaped by broader social structures and their interactions with humans. It argues that merging biological studies and public communication (blogs and reports) with animal geography (attention to subjectivity and agency) produces a more-holistic (compassionate) conservation research, science, scholarship, and practice. Findings reveal that the lives of wild dogs in Botswana are complex and nuanced, and that their welfare is negatively affected. It recommends responsible anthropomorphism as a methodological bridge between traditional conservation scholarship, public
communication, and animal geography scholarship and further collaboration between conservation biologists and animal geographers to explore the lives of animals more holistically.

Chapter 6 concludes the dissertation. It details the key findings of the research, presents the scholarly and methodological contributions of the study, as well as structural, technical, and ethical recommendations for mitigating human-African wild dog conflict and promoting conservation. It then details research limitations and future research areas followed by concluding thoughts on human-wild dog coexistence in Botswana. This dissertation demonstrates that human and animal lives are wrapped up together on the physical landscape and within Botswana’s social landscape and argues that both humans and animals are entwined in political-economic and socio-cultural processes and structures of agriculture, conservation, tourism in the country as well as international conservation politics. Overall, the dissertation contributes a social science case study of human-wildlife conflict to the human dimensions of conservation and animal geography scholarship.
7. References


Chapter 2: Methodology

This chapter presents and discusses my philosophical position as a geographer, my methodological approach, and my research design. I then provide an analysis of my positionality followed by the ethical considerations I took in the field and through research dissemination. I conclude the chapter with overall thoughts on the research process.

1. Philosophical position: what kind of geographer am I?

A researcher’s philosophical position is a set of assumptions shaped by past experiences, beliefs, and the discipline the research is situated in; it shapes decisions in the research process and guides the researcher’s actions (Moon & Blackman, 2014). From the beginning of this research, I have been interested in people’s experiences with wild dogs, the lives of wild dogs themselves, and how societal structures shape human and wild dog circumstances. My past experiences include working in the conservation industry in South Africa while living in the Kruger National Park and traveling through eastern and southern Africa. I believe that humans and wildlife are inextricably linked in shared spaces, and that we need in-depth understandings of these dynamics from various perspectives to mitigate conflict and promote carnivore conservation and human and wildlife welfare. These experiences and beliefs, coupled with geography’s interest in human-environment relations and the place and role of animals in society, shape my philosophical position. My philosophical position is humanist, interpretivist, and posthumanist in nature, a position that differs from natural science philosophical positions which are traditionally positivist in nature. In this section, I describe the history and evolution of these philosophical traditions in field of geography, describe and contrast their central tenets, and explain how they are reflected in my research.

1.1. Positivist and empiricist traditions in geography

Positivism is a scientific and empirical philosophy that has played a foundational role in the way geographers understand the world (Golledge, 2012). In Western geographic scholarship, geography was historically a discipline that was descriptive in nature. However, during the 1950s, some geographers began arguing that the discipline needed to become more scientific in nature to explain and predict spatial processes and patterns (Kitchin, 2012). Positivism therefore became a significant philosophical approach during the 1960s, or the ‘quantitative revolution’. Barnes and Gregory (1997) describe the “scientific geographer” as a person (usually a man) “who occupied a position from which he [sic] could survey the world with a detachment and clarity” (p.15, cited in Mansvelt & Berg, 2016, p.396).

Positivists traditionally adopt a realist ontology and an empiricist epistemology. Positivism is premised on empirically verifiable knowledge derived from observation and applies scientific principles and methods to understanding social phenomena (Kitchin, 2012; Mansvelt & Berg, 2016). Positivist geographers emphasize observation over theory and make a strict distinction between objective and subjective knowledge (Aitken & Valentine, 2012; Mansvelt & Berg, 2016). Objective knowledge is an important foundational tenet of positivism and is defined as empirically observable phenomena that constitutes scientific, rigorous, and valid knowledge that establishes ‘the’ truth, revealing an objective reality that exists outside human perceptions and experience (Mansvelt & Berg, 2016).
Positivism is therefore generally associated with quantitative data and deductive approaches. Hypotheses are set and tested in a systematic way by using common, replicable methods of observation to explain and predict human behaviour (Kitchin, 2012). However, this underlying tenet inherently assumes that the social world has a predictable structure and that humans are both rational and devoid of history and ideology (Evely et al., 2008; Kitchin, 2012). While positivism gained ground in the 1960s, many human geographers began questioning its value, especially with regards to understanding complex human behaviour and the social world. They argued that positivism cannot fully account for the multiplicities, complexities, and subjective nature of human experiences, choices, and behaviour (Kitchin, 2012). Humanistic geographers proposed that geographic inquiry should use qualitative in-depth studies to capture the complex lives of humans. Rather than seeing geographers as objective observers, they argued that geographers are participants in the world, have their own politics and personal beliefs, and make value-laden choices about their research (Kitchin, 2012).

1.2. Humanist and interpretivist traditions in geography

I situate my own philosophical position in humanistic and interpretivist traditions in geography. During the 1980s, geographers began adopting a humanistic tenets as a critical response to positivism (Crotty, 1998; Kitchin, 2012). Beginning in the 1970s and 1980s, geography took a ‘cultural’ turn with many geographers critiquing positivism as lacking “a robust concept of individual agency or an interest in how geography might contribute to an understanding of ‘being-in-the-world’” (Entrikin & Temple, 2012, p.31). Human geographers began more complex investigations of human reality through concepts of human agency, imagination, experience, and meaning-making (Entrikin & Temple, 2012).

Humanistic geographers emphasized the human subject as a producer and interpreter of meaning which was understood in relation to subjects instead of within objects (Entrikin & Temple, 2012). Human geography began to separate itself from physical geography, moving into the realm of critical social science. With the rise of humanistic geography came a push for qualitative methods in order to delve deeper into explorations of human experiences and values (Entrikin & Temple, 2012; Winchester & Rofe, 2016). Qualitative methodologies are typically interpretivist in nature, which emphasizes the importance of understanding a person’s perspective in the context of their own circumstances; they traditionally use inductive approaches and qualitative methods such as semi-structured interviews and participant observation (Ritchie, 2003).

Ontologically, interpretivism favours multiple realities, or that different people have diverse ways of knowing and understanding the world (Johnson & Madge, 2016). I identify with sociologists Berger and Luckmann’s (1991) social constructivist ontological position that contends that “concepts are constructed rather than discovered yet maintain that they correspond to something real in the world” (Andrews, 2012, p.40). Epistemologically, I believe that knowledge is socially constructed through humans’ engagement with the physical world. This engagement creates meaning within a given social context (Hudson & Ozanne, 1988). I also view my own interpretation of the research process as subjective and constructed through the data analysis process based on my own ideas, assumptions, and experiences. In this way, humanistic and interpretivist geography is seen as being subjective, value-laden, and self-reflective (Entrikin & Temple, 2012). However, within human geography, some geographers began criticizing the exceptionalism associated with humans, and argued for centering the human in social theory (Ginn, 2015).
My humanistic and interpretivist philosophical position is reflected in manuscripts one and two where I reveal the multiplicities of different human groups’ perceptions of wild dogs. I explore and contrast individuals’ and different stakeholder groups’ circumstances and experiences in relation to their perceptions of wild dogs. I demonstrate that different people have varied perceptions of wild dogs based on their material conditions, experiences, values, agendas, and priorities. For example, in manuscript one, I demonstrate that while farmers are predominately negative toward wild dogs, they also have positive feelings toward them under certain circumstances. I also reveal that their material conditions, such as their socioeconomic circumstances, shape their perceptions of wild dogs. In manuscript two, I explore three different stakeholder groups’ (the agriculture, conservation, and wildlife tourism industries) discourses about wild dogs and reveal that perceptions of wild dogs are tied to diverging agendas, values, priorities, and national economic development plan.

1.3. Posthumanist traditions in geography

Posthumanist traditions in geography emerged in the 1990s as a response to the centrality of the human in Western political and philosophical thought. While humanism asserts that 'the human' is defined by unique characteristics such as culture and language, post-humanism “emphasizes that, just like other beings and objects, humans are continually and differentially produced through biological, technological, and other more-than-human forces” (Ginn, 2015, p.1). Posthumanism adopts a relational ontology and recognizes the networks in which humans are connected with other entities, including animals, technologies, microbes, and insects, and sees continuities between humans and non-humans rather than positioning them in discreet categories (Ginn, 2015; Snaza et al., 2014). It therefore aims to include other entities beyond humans in social theory by challenging anthropocentric ontologies that attempt to create a reality that situates “all things in relation to humans” (Snaza et al., 2014, p.46, emphasis in original). Posthumanism also aims to re-focus human-centric epistemologies by recognizing and understanding reality as constituted through engagements with other beings (Ginn, 2015; Snaza et al., 2014).

Animal geographies and more-than-human geographies, in particular, adopt a posthumanist stance by challenging human understandings of animals as resources or objects by focusing on animal subjectivities and agency. They contend that humans are not the only beings who are self-conscious, self-knowing, and self-aware, or, in other words, ‘minded subjects’ (Van Patter, 2015). For example, animals are seen as having political power (Evans & Adams, 2018; Hobson, 2007), as agents on the landscape (Evans & Adams, 2018; Jepson, Buckingham & Barua, 2011), and as being able to carve out their own ‘beastly places’ in human-dominated areas (Van Patter & Hovorka, 2017; Power, 2009). In this way, animal and more-than-human geographers position animals as agential beings who have the capacity to act, shape their own lives, affect the lives of others, and influence social structures.

My posthumanist philosophical position is reflected in the third manuscript in which I explore the lives of wild dogs themselves and position them as subjects rather than objects of study or units of analysis. I foreground their subjectivities, agency, and welfare rather than focusing solely on human perceptions of wild dogs. My posthumanist epistemological position is also reflected in manuscript one and two where I demonstrate that people’s attitudes, values, and priorities are shaped through their engagements with wild dogs.
2. Methodology

A researcher’s chosen methodology demonstrates their commitment to their philosophical position (Moon & Blackman, 2014). I chose to use a predominately qualitative research methodology because it aligns with my humanistic and interpretivist philosophical position. Qualitative research is defined as “in-depth and interpreted understanding of the social world of research participants by learning about their social and material circumstances, their experiences, perspectives and histories” (Snape & Spencer, 2003, p.3). In the following section, I first describe the traditional methodological approach used in conservation and human-wildlife conflict studies—quantitative research, and then describe qualitative geographic research. Finally, I describe my research design and the data collection and analysis.

2.1. Methodological approach

Quantitative methodological approaches are traditionally used within human-wildlife conflict studies (Goldman, Roque De Pinho & Perry, 2010; Rust, 2015; Rust et al., 2017). These typically use deductive approaches to test hypothesis-driven research questions, use large sample sizes geared toward population level inquiries, and employ statistical analyses to develop generalizable conclusions. As such, quantitative approaches aim for breadth rather than depth of knowledge (Rust et al., 2017). Although quantitative methods are useful for human-wildlife conflict studies, for example quantifying the relationship between livestock depredation, financial losses, and number of carnivores killed (Rust, 2015), these approaches cannot fully explain the complexities of human behaviour and the social factors that contribute to human-wildlife conflict or to other conservation problems that have human dimensions (Bennett et al., 2016; 2017; Madden, 2004; Rust et al., 2017).

Human geographers are well-positioned to apply qualitative approaches to understanding conservation problems with human dimensions, such as human-wildlife conflict. Human-wildlife conflict is a conservation problem that is often more complex than what it may initially seem and, more often than not, has social drivers (Dickman, 2010). A geographic, qualitative approach can reveal a more in-depth understanding of the relationship between human-wildlife conflict and the social context, for example history, culture, and politics as the drivers of different attitudes and emotions (Drury et al., 2011; Rust, 2015; Rust et al., 2017). Qualitative research in human geography is used to explore complex socio-environmental phenomena related to people and place. Human geographers are broadly interested in two fundamental realms of geographic inquiry: 1) individual experiences of place and events and, 2) societal structures (political-economic, socio-cultural, and environmental) (Winchester & Rofe, 2016). Qualitative research typically uses inductive approaches, small sample sizes, and qualitative analyses such as thematic and discourse analysis to gain more in-depth understanding of a topic or a particular group within a given context (Rust et al., 2017). Qualitative research methods in geography include: oral methods (e.g. interviews, oral histories, focus groups), textual methods (e.g. documents, creative texts), and participatory methods (e.g. participant observation) (Clifford, French & Valentine, 2012; Winchester & Rofe, 2016). For example, qualitative methods can be used to explore the underlying values, conflicts, emotions, processes, and relationships that produce certain outcomes, such as human-wildlife conflict (Drury, Homewood & Randall, 2011; Rust et al., 2017).
2.2 Research design

The entry point of this research began by exploring farmer perceptions of and experiences with wild dogs from May through July 2013. Mitigating farmer-large carnivore conflict is a central concern in Botswana and understanding farmers’ relations with wild dogs can determine tolerance levels, impacts on livelihoods and behaviours, and how experiences with wild dogs shape farmer attitudes and behaviour (manuscript one). During this field season, I also recognized the different stakeholder groups involved in human-wild dog conflict and wild dog conservation as well as the discourses that emerged when talking about wild dogs. This recognition led to a second field season in Botswana from February through July 2015 to explore these discourses and attitudes of the various actors involved in wild dog (manuscript two). Finally, I also wanted to foreground the lives of wild dogs themselves (manuscript three). Data collection and analysis are detailed extensively in each manuscript. This section presents an overview of the research design. My methodological approach is qualitative in nature and consists of semi-structured interviews, document gathering, and participant observation.

2.2.1 Case study approach

This dissertation features a case study of human-large carnivore conflict in southern Africa from a variety of entry points and approaches based on the human dimensions of conservation and animal geography scholarships. A case study design was appropriate for this study because, like a qualitative research design, it does not aim to produce generalizable results. Rather, a case study frames the research within a particular place and time, aiming for in-depth understanding, exploration, and description (Cousin, 2005; Maxwell, 2013). A case study is “defined by and intimately linked to that place” (Marshall & Rossman, 1999, p.68), providing a holistic and in-depth understanding and portrayal of a specific research setting (Cousin, 2005). Case studies therefore help to recognize diversity among participants and the setting, and to contextualize the different actions, beliefs, and events observed or asked about during the course of the research (Maxwell, 2013).

One entry point into exploring human-large carnivore conflict was through a collaboration with natural scientists. For the first part of the research (manuscript 1), I worked directly with Dr. Glyn Maude from the Kalahari Research Group (KRC) who identified two study sites where wild dogs were present. Little is known about wild dogs and farmer-wild dog conflict in the Kalahari (Maude, 2011), and Dr. Maude identified a need for research examining the social dimensions of farmer-wild dog conflict in that region. Dr. Maude was my primary contact and gatekeeper (see section 3.1.2 of this chapter) during my first field season in 2013. I also worked with Mark Hovorka, a biologist and policy specialist from Ottawa, Canada. These collaborations were reflective of a particular approach to investigating the human dimensions of conservation by integrating social science research with natural science research with the aim of conserving biodiversity and preventing extinction (Sandbrook et al., 2013; Soulé, 1985). These partnerships reflect: 1) the broader argument that conservation biology alone is regarded as insufficient for addressing conservation problems such as human-wildlife conflict and, 2) the trajectory of integrating natural and social sciences to explore conservation problems (Bennett et al., 2016, 2017).

2.2.2 Data collection and analysis

This case study features data collected from four study sites and various data collection tools. Each manuscript reflects one facet of the case study as a whole. I selected the four study sites based on the
presence of wild dogs, human-wild dog interactions (including situations of conflict), and specific stakeholder groups (individuals involved in the agricultural, conservation, and wildlife tourism industries): Central Boteti and Kweneng East in 2013, and Maun and the Modisa Wildlife Project in 2015 (Fig. 3). I interviewed 12 key informants in 2013 who were chosen for their knowledge of my research topic. Key informants provided me with expert knowledge and information useful to my research project. They included cattle farmers and government officials from the Department of Wildlife and National Parks, and the agricultural, land board, and veterinarian departments. These interviews contributed to my understanding of important and relevant issues in Botswana and helped (re)shape the interview guide.

Figure 3: Map of study areas in Botswana
I used purposive, opportunistic, and snowball sampling by selecting participants based on their knowledge of and experience with wild dogs as well as their specialized industry knowledge. I interviewed a total of 121 participants. Participants included subsistence and commercial cattle farmers, game farmers, government officials, wild dog researchers, conservationists, eco-tourists, and other individuals working in the agriculture, conservation, and wildlife tourism industries. From May through July 2013, I interviewed 80 subsistence and commercial cattle farmers and game farmers in the Central Boteti and Kweneng East. From February through July 2015, I interviewed 41 individuals involved in agriculture, conservation, and wildlife tourism in and around the town of Maun, and at the Modisa Wildlife Project in the Ghanzi district. Participants provided a rich cross-section analysis of public, private, and civil society industry stakeholder groups’ experiences with and perceptions of wild dogs, and knowledge of political-economic and socio-cultural trends in Botswana. The interview guide was also refined during the initial interviews to clarify or expand themes and questions.

I complemented interviews with document gathering and participant observation. I gathered government documents, grey literature, and academic scholarship related to human-wildlife conflict, African wild dogs, Botswana’s political-economic and socio-cultural histories and context, conservation more broadly, human-wildlife relations more broadly, and other relevant literature. Participant observation occurred by immersing myself in the everyday context of living in Botswana. I documented thoughts on interviews and informal conversations, observations, and I drove and walked in villages, towns, and Protected Areas in order to gain a deeper understanding of how people and animals live and interact in Botswana. I also observed free-ranging wild dogs and human-wild dog interactions during both field seasons. At the Modisa Wildlife Project, I was able to observe and interact with 28 captive wild dogs.

The case study initially used GPS points from two collared wild dogs present in the two study sites (Central Boteti and Kweneng East) to determine interview locations. I conducted a ‘follow-the-wild dog’ purposive and snowball sampling method where I gathered data from farmers who had experiences with wild dogs or had been impacted by wild dogs in the area. I stopped interviewing when, to the best of my knowledge, there were no more farmers in the area where the collared wild dog had been. I also stopped interviewing new participants when I could no longer physically access certain areas with my truck, or if it was unsafe to travel to a certain area. During my second field season, I stopped recruiting and interviewing new participants when no new insights were coming through interviews; interview saturation is typically reached at 12 interviews, therefore I strived for this number for each stakeholder group (i.e. agriculture, conservation, wildlife tourism) (Guest, Bunce & Johnson, 2006).

I used latent and manifest content analysis to conduct the qualitative analysis which includes saturated presence of particular themes within the data. Latent content analysis involves searching the data for particular themes and relies on a coding system to sort and retrieve themes. Manifest content analysis involves seeking meaning from the data, constructing themes, identifying patterns, and relations between variables (Dunn, 2016). I read through each interview and document thoroughly at least twice (King, 2004). I coded text in the interviews and documents that were relevant to the research objective related to each manuscript (Dunn, 2016). I used word/sentence repetition and keyword-in-context to develop codes (Ryan & Bernard, n.d.), grouped codes into categories and organized them according to emergent themes (Dunn, 2016), and used Excel spreadsheets and margin coding to organize and analyze data.
Manuscript 1 (chapter 3) uses qualitative (thematic) and quantitative (frequency tabulation and statistics) analysis. Despite the presence of the quantitative analysis in this manuscript, it is primarily a qualitative study in its methodological approach and its presentation of the results. The quantitative analysis builds on foundational studies of the human dimensions of conservation which aim to measure humans’ attitudes, beliefs, values, and opinions concerning wildlife, as well as traditional human-wildlife conflict studies that measure impacts caused by wildlife. This manuscript is published in a conservation science journal (Koedoe), whose primary audience are conservation scientists and practitioners. The statistical analysis deemed necessary for publication in this journal reflects the tensions around what constitutes valid knowledge in conservation (Rust et al., 2017). The qualitative analysis adds a layer of nuance to the analysis and highlights the experiences of farmers living with and affected by wild dogs. While an ethnographic approach (living long-term in the communities affected by conflict) could have produced more nuanced examinations over time, the research design was well-suited for an exploratory study on farmer-wild dog conflict in an understudied area of Botswana.

Manuscript 2 (chapter 4) presents a qualitative study of stakeholder groups’ social constructions of wild dogs. The three social constructions of wild dogs presented in this manuscript reflect the three core themes that emerged through manifest content analysis with some limited nuance of respondents’ perceptions. While other themes emerged (e.g. wild dogs as feral dogs), I selectively presented the three social constructions to reflect the second research objective (Dunn, 2016) supported by literature on social constructions of wildlife and human conflict over wildlife (see Herda-Rapp & Goedeke, 2005). Manuscript 3 (chapter 5) presents a qualitative examination of wild dog subjectivity in agency to position wild dogs as subjects in conservation scholarship. I developed themes of through latent content analysis. I coded for characteristics animal subjectivity and agency defined through the animal geography scholarship.

3. Positionality and ethics

One fundamental characteristic of qualitative research approaches in geography is a reflexive consideration of power, the political, and the personal (Myers, 2010). To consider these elements a researcher must pay attention to one’s positionality and ethics. Positionality is defined as “facets of the self […] articulated as ‘positions' in a multidimensional geography of power relations” (Rose, 1997, p.308) and ethics consider the moral questions that arise before and during the research process (Proctor, 1998). In this section, I first discuss my positionality as a Western, white, middle class, female social scientist doing conservation-related research in Botswana and the power relations that arise from my identity and relations in the field. I also discuss how I mitigated power inequalities and my own shortcomings stemming from my positionality through field work preparation and hiring local research assistants. I then discuss the ethical considerations I undertook in the field and through research dissemination.

3.1. My positionality

Human geographers, in particular feminist and critical geographers, have called researchers to reflexively examine their positionality (Hopkins, 2007; Rose, 1997; Sylvester, 1995). Social scientists are inherently part of the research process and their positionality therefore shapes their research. Positionality includes aspects of a researcher’s identity; their race, class, gender, age, as well as their personal experiences and philosophical position (Hopkins, 2007). Being reflexive of positionality
means “thinking through the ways in which various identities may influence and shape research encounters, processes and outcomes” (Hopkins, 2007, p.387).

I am a Western, white, middle-class, female researcher with different life experiences and privileges than many of my participants, especially rural Batswana subsistence farmers, and I struggled with whether I was able to represent the experiences of those participants, and my relationship with them (Myers, 2010). In short, how can I—a Western, white, middle-class, female researcher, with no farming experience, no experience with human-wildlife conflict, little experience with Botswana culture, and the inability to speak Setswana—truly understand and represent the experiences of poor, rural, black, (predominately) male farmers? After reading about positionality in cross-cultural contexts, and reflecting on my research process, I agree with Milner IV (2007) who states that researchers do not necessarily have to come from cultural or racial community they are conducting research in, rather, “researchers instead should be actively engaged, thoughtful, and forthright regarding tensions that can surface when conducting research where issues of race and culture are concerned” (Milner IV, 2007, p.388).

Because of these differences and the inherent power relations that accompany them, it is important to for me to acknowledge, recognize, and take account of my own positionality, my experiences, my privileges, and how I attempted to reduce the distance and power inequalities between myself and my research participants. Moreover, my positionality must also be considered in the context of wildlife conservation in two ways: first, because of the colonial history of conservation in Africa, and second, because of my position as a Western social scientist in the contemporary African conservation context. Before, during, and after my field seasons, I undertook several measures to reduce the power relations and inequalities and close the distance between myself and many participants in my study.

3.1.1. Field work preparation

Before going to Botswana, I thought about my positionality and the power relations that would arise from, 1) doing cross-cultural research as a Western, white, middle-class, female, and, 2) doing conservation-related research as a social scientist with no access to wild dogs. I mitigated for these shortcomings in two ways before leaving for the field. First, I took Setswana lessons with a Motswana student from the University of Guelph, and second, my advisor arranged for me to collaborate with Dr. Glyn Maude from the KRC.

My limited knowledge of Botswana culture and my inability to speak Setswana were important shortcomings when conducting cross-cultural research. I was not able to pick up on nuances during interviews, I most likely overlooked small details, and I didn’t have knowledge of cultural practices. Leading up to my 2013 field season, I took Setswana lessons to learn some greetings, important words (e.g. wild dogs, cows), and some local customs (e.g. the role of the chief or kgosi). Knowing these greetings and words broke the ice during initial encounters with participants. I also believe that learning greetings in the local language demonstrates respect and I have always done this throughout my travels in Africa and other countries. I learned other customs in the field, for example, that I had to wear a long dress when visiting with a kgosi. While my Setswana language skills remain very limited, I believe that the time spent with the Motswana language instructor before going to Botswana was invaluable and provided me with some cultural insight. As a foreign researcher and social scientist interested in carnivores and their ecology, collaborating with Dr. Maude was essential for gaining access to wild dogs.
3.1.2. Power relations in the field

While I was conducting research in Botswana, I experienced two different types of power relations related to my positionality. First, with my participants in 2013 who were predominately rural Batswana subsistence farmers; I attempted to decrease the power inequality between myself and the farmers to the best of my abilities by learning greetings in Setswana, working with a local research assistant, offering a small gift in exchange for their time and information, and sending participants preliminary results. Second, I was in a position where Dr. Maude held relative power as my gatekeeper. This power inequality shifted over time through trust built through the working relationship.

Conservation across the African continent is deeply rooted in colonial wildlife preservation efforts (Adams & Hutton, 2007). Colonial and post-colonial conservation efforts in Botswana are evident in the forced relocation of the San (Basarwa or popularly known as ‘Bushmen’) from the Central Kalahari Game Reserve during the 1960s, 1970s, 1980s and with it the loss of their ancestral lands and cultural identity (Hitchcock, 2002). The combination of my race and the research topic put me in a position of relative power over rural subsistence Batswana farmers, especially Basarwa participants. As I approached cattle posts in my research vehicle, I was always very aware of my race and economic status; when I hopped out of the truck to greet people, my looks, clothes, and amenities immediately set me apart. While I was always warmly welcomed to sit down even before my research assistant and I introduced ourselves, we were often asked if I was from South Africa, a country that has been rife with race-related conflict, and where arguably, “people continue to see themselves in terms of racial categories of the past” (Kepe, 2009, p.872). I was therefore very aware of the relative power I held, and seen as holding by my participants, during the interview process (Mullings, 1999). One important aspect of the power relations is the consideration that participants were simply telling me what they assumed I wanted to hear. I mitigated for this by explaining that I would not use their names in any reports, that I did not work directly for the government, that I would not be reporting any attacks on or killing of wild dogs, and that I was only interested in their experiences with and perceptions of wild dogs.

During my 2015 field season, I was interviewing participants who were of a similar positionality. For example, I interviewed participants who were foreign and of similar race and/or gender, and if they weren’t, they were of a similar socio-economic background and spoke English. I therefore considered myself more of an “insider” than an “outsider” and not in a position of relative power. During that time, my positionality worked differently by reducing the distance between myself and my participants. These two experiences reflected that my positionality is dynamic and shaped by the research setting (Mullings, 1999).

Dr. Maude acted as a gatekeeper during my research process, particularly during my first field season. Gatekeepers are individuals who “provide— directly or indirectly— access to key resources needed to do research, be those resources logistical, human, institutional, or informational” (Campbell et al., 2006, p.98). Dr. Maude provided access to study sites, participants, research assistants, vehicles and other equipment, and ecological information on wild dogs. He also provided input on the questions in the interview guide used to interview farmers. As the only social scientist collaborating with natural scientists and as a new researcher, I inevitably encountered challenges while working with a local group of researchers who practice natural science research. We had different disciplinary language and understandings of methodologies and analyses. For example, while I have read about wild dog ecology, I am not very familiar with the methods that natural scientists use to collect and analyze data; similarly,
Dr. Maude was not as familiar with social science methodologies for participant sampling. I also experienced power imbalances since I was a foreign researcher who didn’t have first-hand knowledge and experience in Botswana. While trust was important, it only developed over time and by working together. For example, when it came to sharing data about wild dog locations and movements on the landscape, Dr. Maude only shared important data with me about wild dog locations in a study once I had committed to going to that particular study site; data on wild dogs from other study areas was off-limits. I finally felt that I had gained more respect as a researcher after I worked through a particularly challenging experience with a research assistant, which I detail below.

3.1.3. Local research assistants

I hired local research assistants as cultural guides and interpreters during the interview process (Turner, 2010). Research assistants are also a form of gatekeeper to communicating and understanding, which I experienced working with two different research assistants (Edwards, 2013). During my 2013 field season in Botswana, I hired two local research assistants, James Tsietsi and D., recommended by Dr. Maude to assist with interpreting the interviews with local farmers and translating between English and Setswana. Both were male Batswana. Issues related to wildlife in Botswana are traditionally the men’s domain given that they tend to the cattle. When we approached women to discuss conservation and HWC, we were often told to speak to the men if they were present. Moreover, because of the patriarchal nature of Botswana society, male research assistants of similar socio-cultural characteristics to the interviewees were able to engage in a rapport with participants that I may not have been able to with a female research assistant (Edwards, 1998).

Before the interviews, we conducted an induction process where we discussed the research topic and aim, went over the questions in the interview guide, and engaged in a mock interview to practice translating the questions and answers from English to Setswana and back to English to minimize information loss during the interview. During the interviews, I took measures to ensure that no-one felt isolated from the interview process; I engaged in some best practices where I asked the questions directly to the participants in English, maintained eye contact, arranged seating in a triangular setting if possible, and my research assistant translated answers back to me using direct speech (first person). We also engaged in debrief and review processes after interviews to discuss how the interviews went, including clarifying questions and participant answers (Edwards, 1998).

Working with James was a positive experience that embodied mutual respect, learning, and active engagement. James was able to facilitate the interview process (for example, if a participant went off-topic, he was able to bring them back to the initial question), knew the questions well, understood why we were asking them, and we had helpful conversations about the interviews and the process. Moreover, we were able to have fun and laugh together, which was important during long days of driving and interviewing. My experience with D. on the other hand was extremely negative and the week we were working together was characterized by continuous power struggles over the interview questions, the number of interviews being conducted, and over the food I had brought for us. For example, he would start falling asleep during interviews, later explaining that we were conducting too many interviews in one day, he sometimes argued about asking the participant a question, stating that

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I have chosen not to disclose this research assistant’s full name as the experiences I describe are reflective of our personal working relationship and dynamics.
they had already answered the question in a previous question, and he was unhappy about the amount of meat I had brought with us for the week we were working together.

I mitigated these issues by remaining as professional as possible. I made sure we took more short breaks between interviews and explained that although the questions we were asking may seem similar, they had subtle differences which were meant to capture as much detail as possible. Our hostess who was fluent in English and Setswana was able to translate the interview questions for him into Setswana so that he had a more well-rounded understanding of the questions, and I asked her to pick up some more meat when she went to town. Many times, however, I still felt undermined during the interview process and I was embarrassed that I had to negotiate with him in front of my participants, making the power struggle obvious to others and probably confusing to participants.

My assumption was that this working relationship was negative because I am a female. Botswana’s patriarchal societal power relations were reversed and therefore working for a woman may have been an issue for him. Race may have also played a factor, however, he had been previously hired by white, male conservationists to do similar work without any problems. I therefore assume that it was my gender that played the main role in this negative working dynamic. When I debriefed with Dr. Maude about my work with D., he also suggested that the gender difference may have resulted in the negative working relationship. In hindsight, I had collected all the data I needed and had reached saturation (Guest, Bunce, & Johnson, 2006). I could have ended the working relationship sooner, however, I wanted similar number of interviews from my two study sites. We were staying with a friend’s family at the time, which made me feel comfortable enough to finish the data collection. I made sure I checked in with the family so that they knew when I was leaving, where I was going, and when I would be back. While the relationship with D. was inherently a negative one, I did not feel that the data was compromised because I was receiving similar answers from participants as I had during earlier data collection periods with James.

3.2. Ethical considerations in the field

Qualitative research often involves the active participation of human participants frequently through in-depth, face-to-face interviews where participants may share personal life experiences. Therefore, trust and rapport must be established at the beginning and throughout the researcher-participant interaction. Ethical considerations are critical in the research process in order to ensure that no harm comes to the participants, that the researcher follows appropriate guidelines for conduct, and that the research process follows appropriate cultural customs, local engagement, and is conducted in a respectful manner. A detailed ethics protocol from the University of Guelph and a research permit from the Ministry of Environment, Wildlife and Tourism (MEWT) in Botswana were obtained before going to Botswana in 2013. Before I returned to Botswana in 2015, I completed an online Animal Utilization Protocol through the University of Guelph for the interaction with and observation of captive wild dogs to ensure both my safety and the safety of the wild dogs.

Obtaining a research permit was critical in order to be held accountable to local protocols (Howitt & Stevens, 2016). While the Government of Botswana encourages research and adopts an open research policy, many researchers in the past (and still today) were not communicating their research findings. As a result, all research is now carefully evaluated, and a research permit is granted on the basis of benefits to the area, areas not previously researched, and subjects of value to the country; priority is given to local institutions. The research is evaluated based on a number of criteria, including researcher
qualifications, references, support (institutional and financial), and the clarity of the research proposal (Embassy of the Republic of Botswana, 2018). The research permit enabled me to conduct research in an ethical manner and made me accountable to the research and dissemination process. During my 2015 field season, the Ministry of Environment, Wildlife and Tourism (MEWT) put the research permitting process on hold, and it remains on hold today. When I attended a research talk in July 2015, the Director of MEWT was present, explaining that lack of communication and follow-up reports from researchers and unethical field activities were the main reasons the permitting process had been put on hold.

In the field, I obtained oral or written consent from participants to conduct the interview and to use the data and I promised confidentiality and anonymity. This was especially important for participants in 2013 because some questions were sensitive in nature (e.g. have you ever killed or injured a wild dog?). Because of this, I took extensive notes rather than record interviews in 2013; I recorded interviews in 2015. During my 2013 field season, I discussed my research with the local kgosi (chief) if he was available in order to inform him of the research and the interviews I would be conducting in the area and to gain a deeper understanding site-specific issues. For example, when I returned to the Central Boteti in 2015 and talked to the kgosi again, he claimed that wild dogs were no longer as problematic as they were in 2013. Rather, elephants were now the main cause of conflict in the area. Having these conversations shows respect for local customs, sets the scene, points to specific issues, and allows for a more community-based engagement while remaining attentive to local interests. In 2013, I provided a gift bag of oil, sugar, coffee, and tea to subsistence farmers as a thank you for their participation and their time. I also took photos of all the participants and mailed or emailed them a copy. I was aware that I was potentially interrupting work (e.g. milking cows, letting them out to graze, cooking, cleaning, etcetera) and taking up time that may be allocated to other activities to discuss wild dogs.

3.3. Ethical engagement through local research dissemination

Dissemination is an important part of the research process and essential in Botswana as a condition of the research permit. Keeping participants and relevant government departments informed demonstrates respect and engagement with the government agencies that allowed me to conduct the research. In 2015, I was able to return to the Central Boteti field site and follow-up with some participants, including the kgosi and some of the farmers I spoke with in 2013. At the end of each field season, I sent a one-page summary of the preliminary findings (in English and/or Setswana) to all participants. I sent similar reports to the Ministry of Environment, Wildlife and Tourism and to the Department of Wildlife and National Parks. I also presented preliminary research findings to the DWNP in 2013 and presented my first manuscript at the Symposium for Wetlands and Wildlife in Maun in 2015. Once published, I sent manuscript one and two to participants, MEWT, the DWNP, the University of Botswana Research Repository (UBRISA), and other researchers in Botswana.

4. Concluding thoughts

My two field seasons in Botswana were very different from each other. My second field season was, in many ways, easier than my first— I had an established network of friends and other researchers, government contacts, I had my own vehicle, I was living with friends, and I was familiar with the town I was living in. My first field season, however, presented me with the most challenges and drew me out of my comfort zone. I especially grappled with conducting research in communities that I would not be
working in long-term, and I did not want my research to be extractive. However, I believe that through the measures I took—taking Setswana lessons, working with a local research group, hiring local research assistants, meeting with the kgosi, offering small gifts to participants for their time, disseminating findings, and following-up with 2013 participants in 2015—I was able to mitigate power inequalities that arose because of my positionality to the best of my abilities. I also engaged in a reflective process and, through my philosophical position and methodological approach, I hope that I was able to give participants, including wild dogs, a voice through the research process and outcomes.
5. References


Chapter 3: Farmer–African wild dog (*Lycaon pictus*) relations in the eastern Kalahari region of Botswana

The following chapter is the first manuscript reflecting the first objective of the research (Examine farmer-wild dog conflict by documenting farmer perceptions of and experiences with wild dogs and wild dog impacts on farmer livelihoods). It focuses on commercial and subsistence cattle and game farmer perceptions of and experiences with wild dogs, as well as impacts of wild dogs in the eastern Kalahari region of Botswana.

Publication details:

Abstract

African wild dogs (*Lycaon pictus*) are the most endangered large carnivores in southern Africa. Direct and indirect persecution by farmers causes significant conservation challenges. Farmer–wild dog conflict in Botswana commonly occurs as a result of cattle and stocked game depredation by wild dogs, affecting farmer livelihood and causing economic and emotional distress. Although wild dogs predate livestock at lower levels than other carnivores, they continue to be killed both indiscriminately and in retaliation for incidents of depredation. Investigating farmer–wild dog conflict is a necessary step towards establishing appropriate conflict mitigation strategies. Eighty livestock and game farmers were interviewed in order to examine farmers’ value of, perceptions of and experiences with wild dogs as well as their insights on wild dog impacts and conservation in the eastern Kalahari region of Botswana. Interviews were semi-structured and used open-ended questions to capture complexities surrounding farmer–wild dog relations. This research contributes baseline data on wild dogs in understudied tribal land and commercial livestock and game farms in eastern Kalahari. It confirms the presence of wild dogs, livestock and stocked game depredation by wild dogs and negative perspectives amongst farmers towards wild dogs and their conservation. Mean losses were 0.85 livestock per subsistence farmer, 1.25 livestock per commercial livestock farmer, while game farmers lost 95.88 game animals per farmer during January 2012 through June 2013. Proportionally, more subsistence farmers than commercial livestock farmers and game farmers held negative perspectives of wild dogs ($\chi^2 = 9.63, \text{df} = 2, p < 0.05$). Farmer type, education level, socioeconomic status and land tenure, as well as positive wild dog characteristics should be considered when planning and operationalising conflict mitigation strategies. As such, conservation approaches should focus on conservation education schemes, improved wild prey base for wild dogs, poverty alleviation, and community engagement in order to offer long-term opportunities for addressing farmer–wild dog conflict in Botswana.

Conservation Implications

Our research contributes to wild dog conservation in Botswana by confirming the presence of wild dogs and the occurrence of livestock and stocked game depredation in previously understudied tribal land and commercial livestock and game farms in eastern Kalahari. To improve predominately negative perceptions of wild dogs and reduce conflict, practitioners should focus their efforts on conservation education schemes, improved wild prey base for wild dogs, poverty alleviation, and community engagement.
1. Introduction

Human encroachment on large carnivore habitat leads to competition for space and food (livestock and stocked game) and threats to human safety. As a result, humans often engage in indiscriminate and retaliatory killings of large carnivores, the main cause for this being livestock depredation (Hemson et al. 2009; Madden 2004; Muir 2010; Sillero-Zubiri & Laurenson 2001; Valeix et al. 2012). Human-caused mortality remains a leading cause of large carnivore population declines (Hemson et al. 2009; Lindsey, Du Toit & Mills 2005), while the well-being and livelihoods of those sharing space with carnivores are often compromised (Dickman 2010; Gusset et al. 2009; Muir 2010; Swarner 2004). With the persecution of large carnivores occurring outside protected areas across Africa, conflict with humans, especially farmers, remains a significant challenge for carnivore conservation (Woodroffe & Ginsberg 1999). Community support for conservation is, therefore, essential for large carnivore populations to persist in shared spaces (Sillero-Zubiri & Laurenson 2001).

African wild dogs (*Lycaon pictus*) are listed as ‘endangered’ by the International Union for Conservation of Nature (IUCN) Red List, with the current population estimated at 6600, of which 1400 are considered mature individuals (Woodroffe & Sillero-Zubiri 2012). Wild dogs are social canids, recognised by their individually unique brown, black and white coat patterns and large ears. Their social structure typically includes four to eight adults, with one adult breeding pair, non-breeding male and female adults as well as their dependent juvenile pups (litters average 10 pups). During the denning season (May–August), wild dogs tend to remain in one location within their home range (Fanshawe, Frame & Ginsberg 1991; Swarner 2004). Wild dogs feed predominately on medium-sized ungulates, such as impala, wildebeest and kudu (Childes 1988; Hayward et al. 2006). They are typically wide-ranging, often occurring in human-dominated landscapes (Woodroffe & Ginsberg 1999), with up to two-thirds of potential wild dog range falling outside of protected areas (IUCN/SSC 2007). Furthermore, human encroachment leading to habitat fragmentation makes wild dogs vulnerable to conflict with farmers over livestock and stocked game, road incident mortality, snaring and disease (Creel & Creel 1998; Fanshawe et al. 1991; Gusset et al. 2008, 2009; Woodroffe & Ginsberg 1999; Woodroffe et al. 2005, 2007). Therefore, focusing conflict mitigation efforts outside protected areas is a significant conservation strategy (Lindsey et al. 2005).

Northern Botswana supports approximately 700–800 wild dogs (Department of Wildlife and National Parks [DWNP] 2009). Most recent IUCN estimates from 2012 of adult and yearling wild dogs in Botswana’s Central Kalahari/Khutse Game Reserves was 150 and the Chobe Complex (Chobe Enclave) was 363 (Woodroffe & Sillero-Zubiri 2012). In Botswana, conflict between humans and wild dogs most commonly occurs because of wild dog depredation of cattle essential for local livelihoods and ungulates stocked for hunting and photographic safaris (Boast 2014; Gusset et al. 2009; Muir 2010). Livestock depredation affects subsistence farmers, causing economic and emotional distress (Gusset et al. 2009; Muir 2010; Swarner 2004). Cattle in particular represent a source of income and sociocultural status and have been assigned moral and social importance greater than simply their economic value; as such, they are often referred to as ‘a God with a wet nose’ (Hoon 2004). Stocked game depredation affects commercial farmers, causing financial burden over time (Boast 2014). Wild dogs like other carnivores may be feared by humans as posing risk to their personal safety (Dickman 2010; Lagendijk & Gusset 2008). Although wild dogs predate livestock at lower levels than other carnivores, they are killed indiscriminately and in retaliation (Gusset et al. 2009; Muir 2010; Schiess-Meier et al. 2007; Swarner 2004). As such, humans, cattle, stocked game animals and wild dogs
themselves, experience vulnerability in and around human settlements outside of protected areas (Fanshawe et al. 1991; Woodroffe & Ginsberg 1999).

Implementing appropriate and effective conflict mitigation strategies in such areas represents an important goal for conservation agendas (Boast 2014). Yet, wild dog needs and interests often come into direct conflict with those of humans. For example, when local communities believe that wild animals are prioritised over domesticated or procured game animals, there is increased antagonism towards wildlife and tension between communities and government wildlife departments (Lagendijk & Gusset 2008; Madden 2004). In Botswana, communities often hold the DWNP directly responsible for livestock depredation, as the government has ownership over the country’s wildlife (Hemson et al. 2009). This, in turn, compromises local support for and participation in predator conservation efforts (Hemson et al. 2009; SilleroZubiri & Laurenson 2001).

Research on farmer–wild dog relations remains an important step towards planning and implementing appropriate conflict mitigation strategies (DWNP 2009). Researchers investigate the conditions under which wild dogs may prey on livestock by exploring problem animal control records, natural prey monitoring, wild dog population monitoring and scat analysis (Schiess-Meier et al. 2007; Swarner 2004). Other researchers explore how ecological consequences, including habitat loss, genetic diversity loss, edge mortality and changes in population structures, may impact wild dogs particularly in human-populated landscapes (Maude 2011a, 2011b, 2012, 2015; Woodroffe & Ginsberg 1998, 1999). Relatively little research has been conducted on local people’s attitudes towards and experiences with wild dogs, despite being a necessary step towards understanding conflict scenarios and designing mitigation strategies (Dickman 2010; Kansky & Knight 2014; Muir 2010). The need for more ethnographic methodological approaches is thus warranted (Goldman, Roque De Pinho & Perry 2010).

Our objective for this research was to document farmers’ value of, perceptions of and experiences with wild dogs, as well as their insights on wild dog impacts and conservation, in the eastern Kalahari region of Botswana. We used an openended qualitative interview guide to explore the ‘complex and sometimes ambivalent ways in which local people think about, and relate with, wildlife’ (Goldman et al. 2010:333). We also generated baseline data of farmer–wild dog relations in understudied tribal land and commercial livestock and game farms in eastern Kalahari in Botswana to complement existing research in the Okavango Delta (McNutt & Boggs 1997); the Ghanzi area in western Kalahari (Boast 2014; Klein 2013; Muir 2009); the Hainaveldt, Samedupi and Makalamabedi areas in northern Kalahari (Boast 2014; Gusset et al. 2009); the Central Kalahari Game Reserve (CKGR) (Maude 2011a, 2011b, 2012, 2015); the Khutse Game Reserve (Schiess-Meier et al. 2007) and in the southern Kalahari (Klein 2013).

2. Research Methods and Design

2.1. Study area

We conducted research in the eastern Kalahari region of Botswana (Figure 1), focusing specifically on villages, cattleposts on tribal land and commercial farms in the Central Boteti region (Figure 2) and Kweneng East (Figure 3). The two study sites exhibit similar ecological circumstances given that they fall within the Kalahari Basin – a large lowland area of semi-arid climatic conditions, scrub vegetation and sandy soils. The study areas also exhibit similar socioeconomic and land tenure circumstances. They are characterised by moderate human population density, with 57 376 persons residing in Central Boteti and 256 752 in Kweneng East (Botswana’s total population is 2 024 904); residents
predominantly belong to a variety of Tswana subgroups, with a few persons of Asian and European descent (Statistics Botswana 2014a). The minority of farmers in this area depend upon cattle ranching or stocked game hunting or photographic safaris. The majority of residents depend upon subsistence cultivation and cattle rearing. Subsistence farmer households tend to experience high levels of poverty, with an average monthly income of Botswana Pula (BWP) 2425 ($242) (Central Statistics Office [CSO] 2004). They base their herding activities in settlement areas known as cattleposts, comprising a thatched hut and fenced enclosures (kraals) to house livestock (Hemson et al. 2009; Perkins 1996). They (or their hired herders) release cattle for grazing during the day – often unattended – and wait for cattle to return to the cattlepost for drinking water. An estimated 13% of cattle are left out at night (Valeix et al. 2012).

Figure 4: Study areas of Central Boteti (north) and Kweneng East (south), eastern Kalahari, Botswana, Africa
The wild dog population in the Kalahari is relatively undocumented and believed to be lower than in other areas of the country (Maude 2015). The study area is close to the Central Kalahari Game Reserve, Makgadikgadi Pans National Park and Khutse Game Reserve, and had recently identified wild dog packs. Individual wild dogs from two such packs were used to establish geographical boundaries for the study area. One wild dog in Boteti was collared and tracked on a game farm and within surrounding village and cattlepost areas from November through December 2011 until it was killed in a road incident with subsequent pack sightings noted through July 2013. One wild dog in Kweneng East was collared and tracked – again on a game farm and within surrounding village and cattlepost areas – from January through June 2013 with subsequent pack sightings and dynamics, including relocation of three wild dogs to CKGR in February 2014.

2.2. Data collection and analysis

Our methodological approach was primarily ethnographic, generating quantitative data (e.g. frequencies and statistical analysis) and qualitative data (e.g. thematic texts) similar to recent work by other conservation biologists and social scientists (e.g. Goldman et al. 2010; McGuiness & Taylor 2014). We collected data from May through July 2013; 80 farmers were selected for interviews (Central Boteti n = 43, Kweneng East n = 37) based on purposive and snowball sampling within the established range areas of the two collared and tracked wild dogs in each locale. Our goal was to provide a resultant sample that includes a cross-section of subsistence farmer households and commercial stocked game and cattle farmers. Semi-structured interviews included 14 open-ended questions on the following topics: (1) value (e.g. importance, role of wild dogs), (2) perception (e.g. attitudes and emotions towards wild dogs, beliefs about and knowledge of wild dogs), (3) experiences (e.g. specific interactions with and behaviour around wild dogs during the last year), (4) impacts (e.g. depredation or damage caused by or attributed to wild dogs during January 2012 through June 2013) and (5) conservation (options regarding protection, tolerance, coexistence). Open-ended interviews were selected in order to elicit dialogue between the researcher and the respondent, and to capture nuances, complexities and contradictions that traditional surveys may overlook (Goldman et al. 2010; Seymour & Wolch 2010). Because of language differences, interviews were conducted in English and translated into Setswana with the assistance of a research assistant. Interviews lasted between 20 and 60 min. Anonymity and right of refusal were explained to each participant; only one commercial cattle farmer refused to participate in the study. Because of the sensitive nature of certain questions, interviews were recorded through extensive note-taking instead of tape-recording.

We based quantitative analysis on a frequency tabulation of responses, where we calculated the percentage based on the number of respondents who answered each question, and based the qualitative analysis on thematic coding. We initially analysed data according to each study site, yet comparable themes were found and no significant differences emerged. Thus, results from Central Boteti and Kweneng East were combined to ensure robust analytical insights on farmer–wild dog relations in eastern Kalahari. We explored demographic trends in these data by analysing aggregate responses for each respondent and farmer subgroup. A chi-square test was used to test the null hypothesis that subsistence, commercial livestock and game farmers are equally negative towards wild dogs. Bonferroni simultaneous confidence intervals were used to compare if similar proportions of subsistence, commercial livestock and game farmers have negative attitudes towards wild dogs (Byers, Steinhorst & Krausman 1984). The expected proportions were calculated from the total number of farmers with negative attitudes, and the number of subsistence farmers (n = 60), commercial livestock farmers (n = 8) and commercial game farmers (n = 8) interviewed with either positive or negative
perspectives (n = 76 of 80); perceptions were compared with the observed number with negative attitudes in each category (k = 3, α = 0.05, Z = 2.6383).

3. Results

We collected data from May through July 2013; 80 farmers were selected for interviews (Central Boteti n = 43, Kweneng East n = 37). We approached 81 farmers, but one commercial cattle farmer in the Central Boteti refused to participate.

Figure 5: Respondent and wild dog locales in Central Boteti, eastern Kalahari, Botswana, Africa
3.1. Value

Fifty-two per cent of respondents (n = 39 of 75) claimed that wild dogs are not important animals to Botswana given their perceived and actual predatory role whereby they ‘destroy livestock’ and ‘can kill a cow before [the owner] can sell it’. Thirty-two per cent of respondents claimed that wild dogs are important given their role in tourism and the national economy. Some farmers noted that ‘if we kill them here, they go extinct and we become poor’ or ‘they can escape to other countries and make them rich’. Twelve per cent of respondents argued that wild dogs are only important to certain groups of people, such as the Government of Botswana who ‘put them in parks and tourists come to see them and government gets money’. 
3.2. Perceptions

Eighty per cent of respondents (n = 62 of 78) held a negative attitude towards wild dogs, as illustrated by their response to what first came to mind when thinking about them. The most frequent words were destroy (42%) and dangerous (14%), with less frequent yet still negative words including kill, troublesome, tricky, shoot, chase, dead animal, sadness and poor. Twelve per cent of respondents held a positive attitude towards wild dogs, reflected by words such as beautiful, conservation, endangered and exceptional hunters. Seven per cent of respondents held a neutral attitude towards wild dogs, reflected by the words dog and animals. One respondent held mixed attitudes towards wild dogs: ‘as a farmer, [my word is] destroy/do not protect; as a tourist, beautiful; as a conservationist, protect’.

Fifty-three per cent of respondents (n = 41 of 77) selected sadness as their predominant emotion associated with wild dogs, given livestock depredation, resulting in income loss or mourning the loss of the cow or the bull itself. Twenty-three per cent of respondents selected fear given the potentially dangerous behaviour of wild dogs towards humans or their cattle, and the fear of livestock loss; an additional 7% of farmers selected anger on account of potential livestock loss caused by wild dogs. Of the remaining respondents, 9% selected happiness given past positive experiences or because of their uniqueness amongst wild animals, while 6% of respondents selected mixed emotions (e.g. happiness seeing them but sadness when considering potential livestock loss). Additionally, when asked specifically about perceptions of risk, 53% of respondents (n = 40 of 76) claimed to be fearful because of threats to personal safety, while 95% (n = 69 of 73) claimed to be fearful because of potential depredation.

3.3. Experiences

Seventy-nine per cent of respondents (n = 57 of 72) learned about wild dogs from family members, elders, community members, other herders or personal experience. The most prominent topic discussed was their threat to livestock. They were also taught how to identify wild dogs, that they kill wild animals and how to react if they encounter a wild dog, which included chasing them, running away from them and ignoring them. Only one respondent learned from their family to kraal livestock in order to prevent depredation. Eleven per cent of respondents learned about wild dogs at school or from books or television, 5% learned about wild dogs by visiting game reserves or working on game farms, one respondent learned about wild dogs from a DWNP workshop on conflict mitigation.

Respondents claimed a historical presence of wild dogs since the 1990s in both study sites. Wild dog observations for the study period were noted particularly between March and July 2013 with spoor observed throughout the year. Wild dogs were often sighted on game farms and surrounding cattleposts. Respondents provided multiple reports of packs of at least 10 wild dogs, with the largest pack comprising 26 individuals in Central Boteti and wild dogs were seen as lone individuals in several instances.

Seventy-eight per cent of respondents (n = 49 of 63) confirmed having direct encounters with wild dogs in the study areas during the past year. Specific interactions with wild dogs included observing them while driving, walking or working in fields or at cattleposts, watching them on game farm camera traps, coming across them during a kill, tracking them on foot or by vehicle or being chased by them. Seventy per cent of these direct encounters were characterised as negative given that they involved livestock or stocked game depredation or feeling threatened by wild dogs; 22% of encounters were
characterised as neutral, where respondents had no strong reaction to the encounter and 8% were described as positive encounters.

Fifty-three per cent of respondents (n = 32 of 60) claimed that direct encounters with wild dogs encouraged them to change their behaviour. Thirty per cent of respondents improved their livestock husbandry practices following encounters. These practices included increased kraaling of cattle especially at night time, kraaling calves for extended periods of time, accompanying cattle into the bush during grazing, actively watching for wild dogs and training domestic guard dogs. Other behaviour changes included increased vigilance while walking in the bush often accompanied by domestic dogs or other persons, shouting at wild dogs, walking less often at night time, leaving cattle out more often and carrying a stick for protection. The remaining 47% of respondents claimed that they did not change their behaviour as a result of direct wild dog encounters.

Seventy-seven per cent of respondents (n = 55 of 71) claimed that they had never injured or killed a wild dog in retaliation or for deterrence. Notably, 21% of these respondents explained that they did not have the means to do so given lack of firearm access or fear of government punishments. According to one farmer: ‘I would kill all of them. I’m afraid of government regulations of killing them. Once I kill the wild dogs I’ll be imprisoned’. Additionally, one respondent admitted to shooting wild dogs as a population control technique, one respondent shot three wild dogs (one was caught in the fence, one had a broken leg and one was deemed a nuisance), two respondents tried to kill wild dogs by shooting at them and chasing them with domestic dogs and one respondent witnessed a fellow community member shooting and burying the largest wild dog of the pack. A total of four wild dogs were killed in Central Boteti and no reports of killed wild dogs were identified in Kweneng East. Respondents were more inclined to use scare tactics rather than outright killing, although perceptions that ‘the best wild dog is a dead wild dog’ were notable.

3.4. Impacts

Respondents confirmed livestock and stocked game depredation by witnessing wild dog kills or identifying their tracks at kill sites. According to respondents, 61 livestock animals were killed by wild dogs during the study period (January 2012 through June 2013), including 23 cows, 17 calves, 2 goats and 1 donkey in Central Boteti and 9 cows, 8 calves and 1 bull in Kweneng East. The economic losses reportedly totalled BWP239 740 ($23 974). Moreover, historical livestock losses were noted as follows: in Kweneng East 15 cows in 1997, 7 in 2005 and 15 in 2011, as well as 1 cow in Central Boteti during 2005. Farmers expressed disappointment with government compensation offering 35% of livestock market value (based on 2004 value), with no compensation offered for those livestock injured during a wild dog attack. Farmers noted that application processes were arduous and compensation was rarely received. Additionally, respondents estimated that wild dogs killed one game animal per day in the last year; one respondent estimated that 17 game animals were lost in the past year worth BWP960 ($96); others confirmed losses but could not provide estimates. No government compensation is provided to commercial farmers for game animals. Job loss was also a concern for game farm workers if stocked game were to disappear because of wild dogs. Finally, respondents noted that wild dogs cause damage to farm fences during hunting episodes, requiring minimal repair costs but frequent repairs deemed time consuming and an obstacle to other livelihood activities. Furthermore, damage to fences can also result in game animals escaping from farms and increasing overall losses; one respondent estimated 20 game animals lost to fence damage in addition to depredation.
3.5. Conservation

Thirty per cent of respondents (n = 24 of 79) claimed that wild dogs should be protected because of their status as endangered species or government-owned animals or because of their role in tourism and the national economy. Twenty-nine per cent of respondents claimed that wild dog protection is necessary to ensure that they are confined and kept away from livestock and people. Twenty per cent of respondents believed that wild dogs should not be protected given extensive livestock losses, limited compensation and lack of utility as food or skin. Nine per cent of respondents said that wild dogs should only be protected or confined for certain groups of persons, including government, tourists and future generations. Eleven per cent did not know if wild dogs should be protected, while the rest had mixed feelings, for example, wild dogs should only be protected if compensation is provided.

Sixty-two per cent of respondents (n = 48 of 77) felt that coexistence with wild dogs is not possible given livestock losses or the potential for losses, their potentially dangerous nature, their lack of confinement and their supposed fear of humans. Eleven per cent of respondents claimed that coexistence with wild dogs was possible given their contributions to tourism, that they ensure ‘balance in a harmonious ecosystem’, because wild dogs ‘were here before humans’, that humans can defend themselves, and that the government has mechanisms to promote harmony or control populations. According to one farmer: if we ‘can’t live together, wild dogs would be extinct’. Twenty-seven per cent of respondents expressed an ability to live with or tolerate wild dogs under certain circumstances, including restricted numbers of wild dogs, confinement, depredation prevention, decreased livestock dependence, domestication, increased education regarding wild dog behaviour and changing attitudes through education. For example, ‘If I don’t have livestock, I can afford to live with six. It’s not many. With livestock, none’. Or ‘(I can) own them like my domestic dogs and sell them to people’.

Respondents claimed that certain groups of people are able to coexist with wild dogs more easily than others: ‘The people that won’t, we all know that it is the farmers’, with tourists and those with non-agrarian livelihoods viewed as more likely to coexist in harmony with wild dogs.

4. Demographic trends

Ninety-two per cent of these respondents (n = 70 of 76) had less than 12 years of education, while 54% never attended school. Only 8% (n = 6 of 76) of respondents had over 12 years of education (Table 1). Farmers with less than 12 years of education had less knowledge about wild dogs and referred mainly to predation of cattle, with references to their threat to human safety, their pack sizes, their carnivorous nature and their hunting abilities. Farmers with over 12 years of education had more knowledge of wild dogs and broader conservation issues, such as habitat encroachment, their endangered status, gene pools, pack dynamics and social structure, and hunting abilities. One hundred per cent of subsistence farmers lived on tribal land (n = 60 of 60); 25% (n = 4 of 16) of commercial farmers lived on tribal land and 74% (n = 12 of 16) lived on freehold or state-held land.

Livestock owners suffered few losses than game farmers (Table 2). Mean livestock losses of subsistence farmers (0.85 animals per farmer per year) were similar to commercial livestock farmers (1.25 animals per farmer per year) while game farmers lost an estimated (based on general approximations of losses) 95.88 game animals per farmer per year. Small sample sizes limited statistical analysis of education, income and stock losses on the perspectives of wild dogs held by respondents.
Eighty per cent of respondents (n = 61 of 76) held overall negative perspectives of wild dogs and 20% of respondents (n = 15 of 76) held overall positive perspectives of wild dogs. We rejected the null hypothesis that equal proportions of subsistence, commercial livestock and game farmers hold negative perspectives of wild dog ($\chi^2 = 9.63, df = 2, p < 0.05$). More subsistence farmers held negative perspectives of wild dogs than expected and fewer commercial livestock farmers and game farmers held negative perspectives than expected (Table 3).

Table 1: Demographic summary data on respondent perspectives of wild dogs in Central Boteti and Kweneng East, eastern Kalahari, Botswana, Africa, collected between May and July 2013

<table>
<thead>
<tr>
<th>Description</th>
<th>Negative perspective</th>
<th>Positive perspective</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial game, education &lt; 12 years, income &lt; P1900</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Commercial game, education &lt; 12 years, income ≥ P1900</td>
<td>1</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Commercial game, education ≥ 12 years, income &lt; P1900</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Commercial game, education ≥ 12 years, income ≥ P1900</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Commercial livestock, education &lt; 12 years, income &lt; P1900</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Commercial livestock, education &lt; 12 years, income ≥ P1900</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Commercial livestock, education ≥ 12 years, income &lt; P1900</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Commercial livestock, education ≥ 12 years, income ≥ P1900</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Subsistence, education &lt; 12 years, income &lt; P1900</td>
<td>57</td>
<td>2</td>
<td>59</td>
</tr>
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<td>Subsistence, education &lt; 12 years, income ≥ P1900</td>
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<td>0</td>
</tr>
<tr>
<td>Subsistence, education ≥ 12 years, income &lt; P1900</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Subsistence, education ≥ 12 years, income ≥ P1900</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>61</strong></td>
<td><strong>15</strong></td>
<td><strong>76</strong></td>
</tr>
</tbody>
</table>

Table 2: Perspectives of wild dogs based on farmer type and losses in Central Boteti and Kweneng East, eastern Kalahari, Botswana, Africa

<table>
<thead>
<tr>
<th>Farmer type</th>
<th>Negative perspective</th>
<th>Positive perspective</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of farmers</td>
<td>Number of animals lost</td>
<td>Mean loss per farmer</td>
</tr>
<tr>
<td>Subsistence</td>
<td>58</td>
<td>48</td>
<td>0.83</td>
</tr>
<tr>
<td>Commercial livestock</td>
<td>2</td>
<td>1</td>
<td>0.50</td>
</tr>
<tr>
<td>Commercial game</td>
<td>1</td>
<td>385</td>
<td>385.00</td>
</tr>
<tr>
<td>Total</td>
<td>61</td>
<td>434</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 3: Bonferroni simultaneous confidence intervals to compare if similar proportions of subsistence, commercial livestock and game farmers in Central Boteti and Kweneng East, eastern Kalahari, Botswana, Africa have negative attitudes towards wild dogs

<table>
<thead>
<tr>
<th>Category</th>
<th>Observed</th>
<th>Expected</th>
<th>Chi-square</th>
<th>Expected proportion P exp</th>
<th>Observed proportion P</th>
<th>Bonferroni intervals for observed proportion P</th>
<th>Use index P/Po</th>
<th>Significant (α = 0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial game negative</td>
<td>1</td>
<td>6.42</td>
<td>4.58</td>
<td>0.105263</td>
<td>0.036593</td>
<td>-0.0265 ≤ Pi ≤ 0.0593</td>
<td>0.16</td>
<td>-</td>
</tr>
<tr>
<td>Commercial livestock negative</td>
<td>2</td>
<td>6.42</td>
<td>3.04</td>
<td>0.105263</td>
<td>0.032787</td>
<td>-0.0274 ≤ Pi ≤ 0.0929</td>
<td>0.31</td>
<td>-</td>
</tr>
<tr>
<td>Subsistence negative</td>
<td>58</td>
<td>48.16</td>
<td>2.01</td>
<td>0.789474</td>
<td>0.950820</td>
<td>0.8778 ≤ Pi ≤ 1.0239</td>
<td>1.20</td>
<td>+</td>
</tr>
<tr>
<td>Total</td>
<td>61</td>
<td>61.00</td>
<td>9.63</td>
<td>-</td>
<td>1.000000</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>


5. Ethical considerations

Ethical and logistic guidelines for involvement of human participants (Research Permit #EWT 8/36/4 XXII [3]) and animal subjects (Research Permit #EWT 8/36/4 XXVII [37]) were followed in accordance with those provided and approved by the Ministry of Wildlife, Environment and Tourism, Government of Botswana, as well as the University of Guelph Research Ethics Board (Protocol #12MY031).

6. Discussion

Our research confirms historical and present-day presence of wild dogs in the eastern Kalahari of Botswana, including in and around villages, cattleposts and commercial farms beyond protected areas. According to the IUCN/SSC (2007:34) Southern African Conservation Strategy for Cheetah and Wild Dogs, a significant amount of wild dogs’ geographical range falls outside government-protected areas. Therefore, areas outside protected areas are important for the conservation of wild dogs in Botswana and southern Africa in general. Eastern Kalahari is an area where resident populations are present and has potential as a connecting range for wild dogs. As with cheetahs (*Acinonyx jubatus*), it is possible that stocked game farming has contributed to wild dogs moving into human settlements, with livestock depredation as an unintended consequence of broader zoning practices (Selebatso, Moe & Swenson 2008). With large carnivores in general preferring wild prey to livestock, the presence of wild prey outside protected areas could mitigate livestock depredation (SchiessMeier et al. 2007). For example, Woodroffe et al. (2005) found that livestock depredation by wild dogs in areas with serious wild prey
depletion cost residents $389 per wild dog per year compared to $3.40 per wild dog per year in areas where wild prey was present. Wild prey availability is an important conservation strategy, as the unavailability of wild prey may increase livestock depredation and the subsequent retaliatory killing of wild dogs and other predators (Boast 2014; Winterbach, Winterbach & Somers, 2014). Research focused on the role of land-use decisions shaping farmer–wild dog relations is thus warranted.

We found livestock losses that fall within the numbers documented by others (e.g. Gusset et al. 2009; Schiess-Meier et al. 2007) and we found significant stocked game animal depredation. Wild dogs present an economic and emotional concern to farmers in Central Boteti and Kweneng East given livestock and monetary losses, as well as psychological stress that accompanies compromised livelihood. Farmers’ perceptions of risk to their personal well-being and safety also emerged as a concern, despite no human fatalities reported in Botswana to date. These concerns could result from an intrinsic fear of carnivores (Dickman 2010; Lagendijk & Gusset 2008), a lack of knowledge of wild dog behaviour and ecology, and the emotional and psychological impact of witnessing or experiencing livestock depredation. Additional research exploring the specific causes of fear will be important, given that intrinsic dread of carnivores drives hostility and may impede conservation efficacy (Dickman 2010).

While our findings confirm farmers’ overall negativity towards wild dogs (Boast 2014; Gusset et al. 2008, 2009; Muir 2010; Romañach, Lindsey, Woodroffe 2007; Woodroffe et al. 2005), the following notable trends emerged with implications for conflict mitigation schemes.

Firstly, perspectives of wild dogs vary according to farmer type. Subsistence farmers hold primarily negative views of wild dogs given livestock depredation (Boast 2014; Davies & Du Toit 2004; Gusset et al. 2008, 2009; Lindsey et al. 2005; Muir 2010; Selebatso et al. 2008). Negative views may also originate from the social, moral and cultural significance of cattle in Botswana and the relative lack of cultural importance assigned to wild dogs (and their perceived threat to cattle). For subsistence farmers, the loss of a single cow is substantial, compromising livelihood security in terms of food, status or capital access. Compensation did not improve attitudes towards wild dogs, with respondents claiming that compensation was never received or that it did not provide adequate remuneration. They also have fewer options for responding to conflict (Carter, Riley & Liu 2012) and are more inclined to support wild dog conservation in fenced protected areas. Cattle’s diminished anti-predator defence, coupled with the relaxed nature of livestock husbandry practices in Botswana, make cattle particularly vulnerable to predation (Hemson et al. 2009; Muir 2010). Given that the cattle industry is dominated by the traditional sector (27 583 farm workers work in the traditional sector, cattle holdings cited for the traditional sector was 1 985 595 versus 262 298 for the commercial sector in 2012, Statistics Botswana 2014b; commercial farms represent less than 1% of all farms [approximately 63 000 farms] and 8% of the total land area, USAID n.d.), subsistence farmers are key to wild dog conservation and mitigation actions.

Learning about wild dogs’ ecology would fill a gap in the knowledge of many farmers and equip them to properly deal with or avoid conflict scenarios (Parker et al. 2014). Furthermore, learning about alternative livestock husbandry would also be beneficial for those farmers wishing to be more proactive in their relationship with wild dogs through techniques including accompanying cattle during grazing and secure fencing. Farmers with higher levels of formal education are more likely to have positive attitudes towards wild dogs (Parker et al. 2014). Conservation education has been cited as an important way to gain public support for large carnivores and their conservation (Sillero-Zubiri & Laurenson 2001). Education programmes can shift negative attitudes, develop tolerance and explain
the potential value of carnivores to local communities (Goldman et al. 2010; Romañach et al. 2007). However, they can become costly, and it can sometimes take up to a generation to notice a positive difference in attitude (Sillero-Zubiri & Laurenson 2001). Nevertheless, conflict mitigation strategies that engender positive attitudes towards carnivores may have a more substantial long-term impact than those that focus on simply preventing livestock depredation (Thorn et al. 2002). Therefore, conservation education focused on wild dog ecology and effective domestic animal husbandry may engage farmers directly in conflict mitigation strategies and generate productive avenues for coexistence (Gusset et al. 2008; Parker et al. 2014; Rasmussen 1999; Winterbach et al., 2013; Woodroffe et al. 2005).

Commercial game farmers in our study hold primarily positive views of wild dogs (see also Boast 2014) despite depredation, potential job loss for game farm workers and lack of compensation for stocked game animals, recounting encounters emphasising their natural characteristics and ecological significance. Our small sample of commercial game farmers supported wild dog conservation beyond protected areas. Given that even though some game farmers suffer significant losses, their continued positive attitudes towards wild dogs means that game ranches could potentially be an important land-use practice for wild dog conservation (Boast 2014). However, implications for wild dogs over time could have negative conservation consequences if tolerance diminishes and conflict with game farmers increases. Therefore, conserving wild prey populations outside protected areas and alongside livestock could minimise interactions between stocked game and wild dogs (Gusset et al. 2009).

Those farmers providing or acquiring socioeconomic security are less likely to be antagonistic towards predators (Dickman 2010). Therefore, what is required is a broader, structural approach that considers and genuinely addresses the marginalised position of subsistence farmers who have little means of coping with livestock loss or the immobility caused by wild dogs’ impeding daily activities. Government commitments to poverty alleviation schemes (e.g. community-based tourism), encouraging diversified and robust livelihoods options rather than simply relying on compensation schemes, which reinforce government ownership of wildlife (Demotts & Hoon 2012), are essential to this end.

Secondly, interactions with wild dogs were memorable across farmer type. Farmers recalled specific sightings, numbers or behaviours, observed tracks and shared stories with others. They also highlighted positive wild dog attributes, such as their importance to tourism and the national economy, and the sense of wonderment they inspire on account of their appearance or hunting skills. Farmers expressed an aesthetic value of wild dogs, describing them as ‘the tattoo of Africa’ and explaining that they ‘decorate our nature’. They also expressed a desire to domesticate them and to ‘witness and know how a wild dog lives’. Capitalising on such positivity through meaningful community engagement that results in achievable and measurable conflict mitigation outcomes may aid in ensuring the continued viability of wild dogs in human-dominated landscapes.

7. Conclusion

Our research contributes to wild dog conservation in Botswana by confirming the presence of wild dogs in the eastern Kalahari region and the occurrence of cattle and stocked game animal depredation. More subsistence farmers held negative perceptions of wild dogs than commercial livestock farmers and commercial game farmers. Alleviating poverty through community-based tourism would provide diversified livelihood strategies for marginalised communities while conservation education, effective livestock husbandry practices and wild prey availability outside protected areas may reduce conflict in
the long term. Although farmers’ perceptions remain predominately negative, positive perceptions were expressed by both commercial and subsistence farmers. Positive perceptions focused on wild dogs’ importance to tourism and the national economy, a sense of wonderment associated with their appearance and hunting skills, their aesthetic value and the desire to domesticate them. Capitalising on such positive perceptions may provide an opportunity for meaningful community engagement with wild dog conservation and conflict mitigation programmes, thereby fostering more positive relations between farmers and wild dogs in Botswana and elsewhere.
8. References


Maude, G., 2011b, Kalahari African wild dogs, Wilderness Wildlife Trust, Johannesburg, South Africa.


Maude, G., 2015, Summary of large carnivore estimates obtained from spoor surveys in the CKGR, Khatse Game Reserve and surrounding areas in March 2012 and November 2014, Quarterly Report, Kalahari Research and Conservation to the Department of Wildlife and National Parks, Gaborone, Botswana.


Chapter 4: Human conflict over wildlife: exploring social constructions of African wild dogs (*Lycaon pictus*) in Botswana

The following chapter is the second manuscript reflecting the second objective of the research (Investigate human conflict over wild dogs by documenting different stakeholder groups’ perceptions of and experiences with wild dogs while considering national political-economic and socio-cultural trends and development trajectories). It focuses on social constructions of wild dogs by individuals in the agricultural, conservation, and wildlife tourism industries to reveal how human conflict over wildlife drives human-wildlife conflict.

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Abstract

Researchers argue that human–wildlife conflict (HWC) can be understood better in terms of conflict between humans over wildlife. We explore human conflict over wildlife by using a social constructionist approach to examine meanings of African wild dogs in Botswana. In 2013 and 2015, we conducted a qualitative study in four study sites by completing: (a) 113 semi-structured interviews with individuals in the agricultural, conservation, and tourism sectors; (b) participant observation; and (c) document analysis. Our results reveal that wild dogs are socially constructed as problem animals, as an endangered species, and as an economic resource, reflecting stakeholders’ diverging agendas, priorities, and values. The social constructions are driven by and emblematic of politico-economic and sociocultural trends, and competing development trends in Botswana. We propose: (a) seeing HWC as human conflict over wildlife can increase communication between conservationists and affected communities, and (b) integrative management plans that increase collaboration among stakeholder groups.

Keywords: African wild dogs (*Lycaon pictus*); Botswana; human dimensions of wildlife; human–wildlife conflict; social constructions of nature
1. Introduction

In 1973, A.C. Campbell, the Director of Wildlife and National Parks at the time, described Botswana’s politico-economic and sociocultural landscape as “the old dilemma of cattle versus wildlife” (p.12, emphasis in original). By referring to cows and wild animals in competition with one another, Campbell was actually pointing to competing human visions for the agricultural and the conservation and wildlife tourism sectors, and the role they might play in Botswana’s economic development trajectory (Darkoh & Mbaiwa, 2002; Gupta, 2013; Mbaiwa, 2017). In this article, we are concerned with how intersecting interests in and visions for economic development are at the root of human–wild dog conflict, where wild dogs negatively affect the needs and well-being of cattle farmers and when the actions of farmers negatively affect the welfare of wild dogs (Baruch-Mordo, Breck, Wilson, & Broderick, 2009; Bond & Mkutu, 2017; Carter, Riley, & Liu, 2012; Dickman & Hazzah, 2016; Madden, 2004).

In this article, we explore the tension described by Campbell (1973) through a qualitative empirical case study that reframes human–wildlife conflict (HWC) as conflict between humans over wildlife while taking into account the broader politico-economic and sociocultural context in Botswana. Specifically, we explore the tensions manifested between three stakeholder groups, namely individuals involved in the agricultural, conservation, and tourism sectors in Botswana concerning endangered African wild dogs (*Lycaon pictus*). Recently, Hill (2015) claimed that “knowledge of different symbolic meanings of wild animals, their social importance, and how different groups use a particular species or wildlife construction to define or articulate an environmental problem is fundamental to understanding conflicts around wildlife” (p.299). Building on this statement, we use a social constructions of nature approach to identify stakeholder meanings of wild dogs. Wild dogs are an important focal species for this research because of their endangered status, the urgency behind their conservation, and the significant population of wild dogs sharing spaces with people in Botswana leading to incidents of livestock depredation. Consequently, mitigation of human conflict with wild dogs is an important conservation strategy in Botswana.

Therefore, we ask the following questions in this article. What do wild dogs mean to different people? How and why do these social constructions (or meanings) emerge? And, what are the implications of these meanings? We argue that the social constructions of wild dogs elucidated by different stakeholder groups reflect diverging agendas, priorities, values, and feelings that all contribute to human conflict over wildlife. We also argue that the social constructions are driven by and emblematic of politico-economic and sociocultural trends, and competing development directions in Botswana (Fraser-Celin, Hovorka, Hovorka & Maude, 2017).

2. HWC or human conflict over wildlife?

Much of the research on HWC focuses on managing wildlife and quantifying losses (DeMotts & Hoon, 2012). However, in the last 15 years, there has been a growing recognition that for conflict resolution strategies to be effective long term, attention must be paid to broader social drivers of conflict, including history, geography, culture, education, religion, wealth, risk perception, and vulnerability (Bond & Mkutu, 2017; Dickman, 2010; Goldman, Roque De Pinho, & Perry, 2010; Madden, 2004; Madden & McQuinn, 2014; Massé, 2016; Muir, 2009; Peterson, Birkhead, Leong, Peterson, & Peterson, 2010; Rust, Tzanopoulos, Humle, & MacMillan, 2016). Moreover, various scholars focusing on human dimensions of conservation have also argued that HWC involves conflict between human groups over the management, appropriate place, and value of wildlife, as well as between conservation
and development goals (Dickman, 2010; Fisher, 2016; Madden, 2004; Marshall, White, & Fischer, 2007; Peterson et al., 2010; Redpath, Bhatia & Young, 2015; Yurco, King, Young, & Crews, 2017). As such, wildlife “can therefore be thought of as peripheral players pulled into the debate of wildlife management by individuals who hold contrasting values, whereas the true causes of the conflict often lie more deeply in cultural, historical, political, and sociological factors” (Rust et al., 2016, p.2).

Research focusing on human dimensions of HWC often involves examining attitudes toward wildlife (Carter et al., 2012). However, more research investigating attitudes as a means of uncovering underlying tensions between human groups over wildlife is needed as a way for identifying drivers of conflict (Dickman, 2010; Gusset et al., 2008; Herda-Rapp & Goedeke, 2005; Madden, 2004; Madden & McQuinn, 2014; Marshall et al., 2007). Peterson et al. (2010) argued that the term “human-wildlife conflict” positions wildlife as “conscious human antagonists” and distracts from the human groups actually involved in conflict, as well as the sociopolitical systems that produce environments where conflict occurs (p.74). Wildlife is then often targeted because frustrations cannot be directed at the government, wildlife authorities, and conservation agencies; wildlife becomes a scapegoat for anger, resentment, and feelings of powerlessness (Hemson Maclennan, Mills, Johnson & Macdonald, 2009; Madden, 2004).

Other terms suggested in this scholarship include: human–wildlife coexistence (Madden, 2004), human–human conflicts (Marshall et al., 2007; Peterson et al., 2010), biodiversity conflicts (Marshall et al., 2007), and conservation conflicts (Pooley et al., 2016). For the purpose of our article, we use the term “human conflict over wildlife” to describe conflict between people with different priorities, beliefs, attitudes, experiences, and socioeconomic needs (Madden, 2004).

3. The Botswana context

Botswana’s politico-economic development depends on the diamond export, livestock, and tourism industries (Darkoh & Mbaiwa, 2002). Cattle has historically been the backbone of Botswana’s economy (Hoon, 2004), but shifted once diamonds were discovered post independence in 1967 (Hovorka, 2008) and when a lung disease outbreak in 1996 resulted in the culling of 400,000 head of cattle by the government to prevent the spread of disease, a traumatic event for many Batswana (Hoon, 2004). The cattle population has recovered and estimates indicate that Botswana has approximately 2.2 million cattle (Esterhuizen, 2015), demonstrating that cattle continue to be significant to Botswana’s socioeconomic development (Marsh, 2013). Although agriculture only accounted for 2.2% of the country’s GDP in 2015, 85% of agricultural output is still derived from livestock production (Esterhuizen, 2015) and 40% of households own cattle (National Development Plan 10, 2016). Moreover, cattle are “part of the fabric of everyday life for the Batswana people” (Botswana Meat Commission, 2013) who have a long-standing emotional attachment to cattle, often referred to as “a God with a wet nose” (Hoon, 2004, p.149).

Current President Khama has pushed the conservation agenda and is heralded as the “Father of Conservation in Botswana,” as he champions the protectionist wildlife management model and sits on the board of Conservation International, a well-known and heavily financed nongovernmental organization. The dominance and influence of one individual on conservation is notable and unique to Botswana (Rihoy & Maguranyanga, 2010). Given this conservation mandate, a primary objective of Botswana’s national development goal since the formulation of the 1990 Tourism Policy is the diversification of the economy through natural resource development (GoB, 2013; National
At independence in 1966, tourism was virtually nonexistent, but by 2000, it had grown to be the second largest economic activity in the country, contributing 4.5% to the national GDP (Mbaiwa, 2005). Today, Botswana rivals long-standing popular safari destinations such as Kenya (Rihoy & Maguranyanga, 2010), with 38% of Botswana’s land allocated to protected areas, game reserves, and wildlife management areas. Tourism depends on wildlife and its total contribution to Botswana’s GDP in 2016 was 10.9%, and this is forecasted to rise to 12.2% by 2027 (WTTC, 2017).

The dominance of agriculture, wildlife conservation, and tourism industries results in competition for the uses of marginal land (National Development Plan 10, 2016) and incidents of human conflict over wildlife. For example, the 2003 Chobe District Development Plan, stated (Gupta, 2013, p.242) an “acute land shortage” due to 80% of this district’s land being allocated to conservation resulting in little room for settlement expansion (Gupta, 2013).

Several conflict mitigation strategies are present in Botswana. To alleviate economic stress due to livestock depredation, the government offers a compensation scheme that reimburses the owner a percentage of the value of a livestock animal killed by carnivores (Kgathi, Mmopelwa, Mashabe, & Mosepele, 2012). To promote coexistence, conservation education workshops are offered throughout the country and wildlife management practices such as buffer fences with movement corridors aim to keep animals within protected areas and limit contact between wildlife and humans and cattle (Bowie, 2009; National Development Plan 10, 2016).

4. African wild dogs (Lycaon pictus)

The International Union for the Conservation of Nature and Natural Resources (IUCN) classifies African wild dogs (Lycaon pictus) as an “endangered” species, meaning that this species faces a “very high risk of extinction in the wild,” with only approximately 6,600 wild dogs remaining on the African continent (Woodroffe & Sillero-Zubiri, 2012). Most recent population estimates indicate that Botswana has approximately 1,310 wild dogs in 131 packs; 318 are protected (RWCP & IUCN/SSC, 2015).

Wild dogs are endangered because of habitat loss and subsequent human encroachment resulting in disease, snaring, road incidents, and conflict with farmers (Woodroffe & Sillero-Zubiri, 2012). Given that wild dogs pose a threat to cattle, they are often killed or injured in retaliation, or as a preventative measure to livestock depredation regardless of their culpability (Gusset et al., 2008). For example, within the 3 months following Gusset, Swarner, Mponwane, Keletile, and McNutt’s (2009) study on human–wild dog conflict in northern Botswana, six adults and 19 pups were (most likely) shot and killed despite being categorized as protected game animals in Botswana’s Wildlife Conservation and National Parks Act.

Much of the research on human–wild dog interactions has focused on impacts of livestock losses, attitudes toward wild dogs, and wild dog ecology, status, and distribution (Childes, 1988; Creel & Creel, 1998; Gusset et al., 2009; Lindsey, Du Toit, & Mills, 2005; Parker, Whittington-Jones, Bernard, & Davies-Mostert, 2014; Rasmussen, 1999; Woodroffe, Lindsey, Romañach, Stein, & Ole Ranah, 2005). Few studies, however, have examined conflict between different human groups over wild dogs; the exception is Gusset et al. (2008) who examined competing stakeholder (i.e., tourists, local community members, private landowners) interests over wild dog reintroduction in South Africa.
5. Conceptual framework: social constructions of nature

The components that make up nature (e.g., mountains, lakes, trees) are filtered through experiences, perceptions, cultural frameworks, and expectations (Fine, 1997; Herda-Rapp & Goedeke, 2005; Scarce, 1998). When elements of nature are understood through culture, experiences, and beliefs, they are socially constructed (Herda-Rapp & Goedeke, 2005; Scarce, 1998). According to Scarce (1998), social constructions are synonymous with meaning. The diversity of social constructions frequently produces competing meanings of elements that make up nature (Herda-Rapp & Goedeke, 2005; Scarce, 1998) such as landscapes (Greider & Garkovich, 1994), animals (Goedeke, 2005; Russell, 1995; Scarce, 1998), and oceans (Steinberg, 2001). Understanding different meanings attributed to nature helps to recognize the existence of contrasting versions of those elements and their implications (Herda-Rapp & Goedeke, 2005; Scarce, 1998). This is a useful approach for examining different social groups’ diverging meanings of wildlife and roots of those meanings in the context of human conflict over wildlife.

Concerning animals specifically, Collard (2015) explained that “Questions about how nature is constructed, how people know nature, how expertise is formed, and how representations of nature circulate and compete all often involve animals as the part of nature being represented” (p.132). Social constructions of wildlife materialize in the form of lists, categories, classifications, discourse, and land-use policies that all have different outcomes and implications, and often determine an animal’s fate (Herda-Rapp & Marotz, 2005; Lawrence, 1994, 1997; Russell, 1995; Scarce, 1998). As Hill (2015) explained, competing social constructions of species reveal how the same animal can be a highly valued species and in some cases granted legal protection and, at the same time, a hated and vilified pest.

Different social constructions of animals reveal points of contention and (dis)agreements over their use, where they belong (e.g., in national parks, homes, zoos), and management goals and practices (Goedeke, 2005; Leong, 2008). Goedeke (2005) presented different stakeholder groups’ characterizations of otters (Lontra canadensis) and through document analysis, interviews, and meeting observations, revealed competing otter constructions that reflected conflict over their management. Scarce (1998) used in-depth interviews to investigate the reintroduction of wolves in Yellowstone National Park and explained that residents in towns bordering the park assigned different meanings to wolves that reflected their ideas and opinions of the federal government and the reintroduction process. Rikoon and Albee (1998) examined contrasting constructions of freeroaming horses (Equus ferus), either natural or feral, by local community residents and the National Park Service. They investigated how individuals determined what the horses are, what they mean, and whether they should be protected. The authors asserted that conflict over the management of horses reflected the role and imposition of the government in local identity and culture. The common theme in these studies was that the wildlife in question became symbols for politico-economic and sociocultural issues, and conflict among different human groups. In the future, government agencies may be able to investigate social groups’ competing social constructions of wildlife during the early stages of policy implementation and implement those understandings into conflict mitigation processes (Scarce, 1998). For example, Goedeke (2005) found that the social constructions of river otters directly reflected management strategies and conflict resolution solutions promoted by each social group; those solutions could be evaluated and implemented in various capacities at early conflict resolution stages.
The main criticism of social constructionism is that it detracts from the objective reality of environmental problems such as species decline and habitat loss. However, the contribution lies in its consideration of the processes that enable these outcomes to occur. Social constructionists contend that “environmental problems must be understood as subjective, social realities, in addition to physical conditions” (Herda-Rapp & Goedeke, 2005, p.6). By exploring social constructions of wildlife, we can understand the broader processes, systems, experiences, and beliefs among social groups that engender conflict “on-the-ground,” as well as the material implications of conflict for both humans and wildlife (Herda-Rapp & Goedeke, 2005). Our article: (a) empirically engages this social constructionist conceptual framework, (b) demonstrates that wild dogs are constructed in some contrasting and some similar ways among stakeholder groups, (c) reveals thoughts on management and conservation strategies, and (d) reframes human–wild dog conflict as human conflict over wild dogs.

6. Methods

We used a qualitative methodology consisting of semi-structured interviews, document gathering, and participant observation to capture complexities and nuances that are often overlooked through the use of traditional quantitative data collection techniques in conservation (Goldman et al., 2010; Seymour & Wolch, 2010). We were thus able to collect narratives about wild dogs that were sometimes complex and contradictory. We followed ethical guidelines for involvement of human participants and animal subjects in accordance by those provided and approved by the Ministry of Wildlife, Environment and Tourism (Government of Botswana), as well as the University of Guelph Research Ethics Board.

6.1. Study areas

We collected data in four study sites over two field seasons in Botswana, a land-locked country in southern Africa (Figure 1). From May through July 2013, we interviewed subsistence and commercial cattle farmers at two study sites: (a) Central Boteti in the northeast and (b) Kweneng East in the southeast. From February through July 2015, we interviewed individuals involved in agriculture, conservation, and tourism sectors: (a) in and around the town of Maun in the Ngamiland district in the north, and (b) at the Modisa Wildlife Project in the Ghanzi district in the northwest.

The majority of residents in the Central Boteti district consisted of farmers dependent on subsistence cattle rearing and cultivation, whereas a minority depended upon commercial cattle ranching. All farmers in Kweneng East were subsistence livestock farmers. These two sites were chosen because of the presence of farmer–wild dog conflict. The town of Maun is the administrative center for the Ngamiland district and considered a wildlife tourism hub as the gateway to the Okavango Delta, therefore providing access to multiple participants selected for this study. The Modisa Wildlife Project is a volunteer-based wildlife conservation project located on the Grassland Bushman Lodge game farm bordering the western side of the Central Kalahari Game Reserve and is an area with high potential for human–carnivore conflict (Muir, 2009). Grassland Bushman Lodge and the Modisa Wildlife Project work together to provide space for carnivores that are predating on cattle in the area. Carnivores are captured and housed in large bush-filled enclosures, fed, and provided with veterinary care. Twenty-eight wild dogs were present at the time of the field site visit in 2015.
6.2. Sampling

We interviewed a total of 74 individuals in the agriculture sector, 16 in the conservation sector, and 23 in the tourism sector, for a total of 113 participants. We selected participants based on their involvement in agriculture, conservation, and tourism, as well as their experiences with and knowledge of wild dogs. We used purposive and opportunistic sampling to recruit participants who fit these predetermined criteria, followed by snowball (i.e., respondent-driven) sampling. We interviewed subsistence and commercial cattle farmers, government and parastatal officials involved in agriculture, wild dog researchers, self-identified conservationists, environmental consultants, government officials working in conservation (Department of Wildlife and National Parks) and tourism (Ministry of Environment, Wildlife and Tourism), guiding instructors, filmmakers, safari guides, lodge managers,
safari business owners, community-based tourism managers, and international tourists. This variety of individuals provided a rich and diverse range of perceptions and specialized knowledge about agriculture, conservation, tourism, wild dogs, and development trends in different areas of Botswana. They also represented perspectives from civil society, public, and private sectors at local, national, and international scales. It was important to include these multiple sectors and scales because social constructions take shape and have implications at various levels. Therefore, we are able to present a multi-scalar cross-section of stakeholders affected by or affecting wild dogs in Botswana.

6.3 Data collection

We used semi-structured interviews, document gathering, and participant observation to collect data. We explained the aim of our research to all participants before the interview, offered right of refusal, and guaranteed confidentiality and anonymity for the participants to trust us and the research process. Only one participant refused. As white, middle-class, expat researchers, we recognize that we were engaged in asymmetrical power relations with many participants (Dowling, 2016). To mitigate this, we used a number of strategies such as speaking with local chiefs, hiring local research assistants, structuring a qualitative research design that allowed participants to actively participate in the interview, revisiting study sites or following up with participants when possible, providing compensation (a bag containing sugar, oil, coffee, and tea) for subsistence farmers who took time away from work that was otherwise essential to their livelihoods, and sending detailed preliminary results to participants.

Forty-four interviews were conducted in English and 69 were conducted in Setswana with the assistance of a Botswanan research assistant. To mitigate for any potential loss of data through translation, we conducted practice interviews where our assistant repeated questions and answers back to us in English to ensure accurate translation, and then made changes according to this feedback. Finally, we debriefed daily to ensure that the interview questions were being presented to participants in an appropriate and clear manner, and to discuss and further contextualize participant responses. We also ensured that critical data was not lost in translation through interview saturation and triangulation (Guest, Bunce, & Johnson, 2006).

Documents included government documents available from the Maun Government Printer or online websites and scholarship and grey literature related to agriculture, conservation, tourism in Botswana, and human–wildlife/wild dog conflict (e.g., the Wildlife Conservation and National Parks Act, IUCN Red List of threatened species). We analyzed documents for national politico-economic and sociocultural trends such as GDP sector trends, sector statistics, and HWC policies.

Participant observation meant that we engaged in “the contexts of everyday life” in Botswana (Ohlbrecht, 2004, p.375). We interacted with individuals involved in the three sectors on a daily basis, which familiarized us with the local context. We also went on guided safaris with tourists and with wild dog researchers where we were able to observe reactions toward wild dogs and have informal conversations. We walked and drove around villages, towns, cattle posts, cattle farms, game reserves, and national parks, which enabled us to gain a greater sense of the landscape and how people and animals live in Botswana. We kept field notes on thoughts and impressions about interviews, conversations, and participant observation.
6.4. Data analysis

The analysis was also qualitative in nature; we used content analysis to “attain a condensed and broad description of the phenomenon, and the outcome of the analysis is concepts or categories describing the phenomenon” (Elo & Kyngäs, 2008, p.108). Categories and themes were derived from the literature, the data, and our previous knowledge of and experience with the subject matter (Elo & Kyngäs, 2008; Ryan & Bernard, n.d.). Data from the 2013 field season provided initial themes that led to further in-depth research in 2015. Keeping field notes was also essential as a reflective process that helped to “see” the themes and trends developing throughout the field seasons (Elo & Kyngäs, 2008), and open coding was used as the initial stage of analysis to further identify the themes in the data. We then used selective coding by inputting data into Excel spreadsheets to further develop and organize the identified themes and trends in the data. We used content analysis techniques such as word/sentence repetition and keyword-in-context (Ryan & Bernard, n.d.). Finally, we compared answers and themes across participants, and categorized them according to stakeholder groups (Ryan & Bernard, n.d.). We selected quotes from interviews and documents based on their capacity to represent and support themes and trends that we found in the data (Massé, 2016). This way, the quotes substantiate and provide a narrative of the factors shaping each social construction, including participant feelings, thoughts, experiences, and social context.

Using multiple methods of data collection and relating them to each other allowed us to validate our data through triangulation (Flick, 2004). We triangulated themes that emerged from the interview data with document analysis of scholarship and grey literature focused on human–wild dog conflict in Botswana (e.g., Gusset et al., 2009; Maude, 2011; Muir, 2009; Schiess-Meier, Ramsauer, Gabanapelo, & König, 2007), human-human conflict over wildlife (e.g., Madden, 2004; Peterson et al., 2010), and national development trends (e.g., Darkoh & Mbaiwa, 2002; Mbaiwa, 2017; National Development Plan 10, 2016; Rihoy & Maguranyanga, 2010), as well as participant observation and field notes to verify themes and trends in the data.

7. Results

Wild dogs were socially constructed as problem animals by many individuals in the agricultural sector, as an endangered species by the conservation and tourism sectors, and as an economic resource by individuals across all three sectors.

7.1. Wild dogs as problem animals

Wild dogs were characterized as problem animals by individuals involved in the agricultural sector. Experiences with wild dogs were often stressful for these participants and feelings of both hopelessness and helplessness were often expressed by cattle farmers: “I gave up. I think they are wild animals. There is nothing we can do. The destruction is growing.” A subsistence farmer explained: “I feel sad. They destroy my livestock. I wonder what my kids will eat. They pulled me down by killing three of my cows,” whereas another subsistence farmer explained their emotional attachment to cattle: “it’s not about the money. [I] loved that cow.” As such, attitudes toward wild dogs were predominately negative among these respondents and when asked to describe wild dogs in a single word, these participants used words such as “destroy,” “kill,” and “poverty.”
Consequently, individuals in the agricultural sector explained that wild dogs should be kept within conservation areas and not be allowed to venture into human and livestock dominated landscapes, as one participant working in the agriculture industry explained: “The conservation [industry] tries to conserve animals and the agriculture [industry] try to conserve their cattle, so the two cannot live together.” Given the incidents of depredation, wild dogs are often killed or injured, as one subsistence farmer explained: “Once, [we] killed a wild dog in 2005 when we found it had killed a cow. Shot it with a gun [and] buried the wild dog.” However, these individuals discussed being fearful of the government if they were to defend themselves and their livestock against wild dogs, as one subsistence farmer explained: “I’m afraid of being arrested.” Other times, wild dogs are relocated from farming areas to protected areas by the Department of Wildlife and National Parks, and/or private conservation organizations (based on personal observations).

Despite the government compensation scheme in place, farmers were often left unsatisfied by the minimal and often complete lack of compensation: “The wild dog, they make big destruction and we don’t get good compensation from the government” (subsistence farmer) and “Those things should be killed because the government doesn’t pay us” (subsistence farmer).

7.2. Wild dogs as an endangered species

Wild dogs were characterized as an endangered species by individuals involved in the conservation and tourism sectors. The endangered species social construction is produced at the international scale through global conservation discourse beginning with the IUCN’s classification of threatened species. Human population growth accompanied by urbanization processes, specifically agricultural land conversion, threatens those spaces needed for wild dogs to persist, as one conservationist explained: “Even here in Botswana, the average population of Botswana in my life went from 400,000 to...over 2 million. Commensurate with that growth has been the growth of livestock.” A wild dog researcher echoed this statement: “[Wild dogs have] been very successfully eradicated from landscapes in which people have taken over wilderness to use resources for domestic grazing livestock.”

Both conservationists and individuals in the tourism sector described wild dog sightings as rare and special; experiences with wild dogs made participants feel happy, excited, and privileged: “I get really excited when I see them because they’re just such a special creature that not many people have the opportunity to see” (safari guide). Attitudes toward wild dogs were positive with these participants using words such as “spectacular,” “social,” and “captivating” to describe the species. Botswana is regarded as a stronghold for wild dog populations to thrive, as one wild dog researcher claimed: “. . .if we can’t find a sustainable future for this endangered species here, there is no future for them.” As such, habitat conservation was identified as a priority by these participants, as explained by one wild dog researcher: “There are very few places in the world where there’s enough space for wild dog.” Reducing conflict with farmers was also cited as a significant conservation strategy among these participants, and similar to other studies on HWC and conservation in southern Africa, individuals in the conservation and tourism sectors identified conservation education and tourism as important ways to promote coexistence (Fraser-Celin et al., 2017; Lindsey et al., 2005; Romañach, Lindsey & Woodroffe, 2007).
7.3. Wild dogs as an economic resource

Wild dogs were characterized as an economic resource by individuals across all three sectors. According to Botswana’s Vision 2036, the country recognizes “the multi-functional roles of biological diversity (animals and plants) as economic resources” (Statistics Botswana, 2016, p.22). Despite negative attitudes toward wild dogs by individuals in the agricultural sector, tourism was still regarded as an important contributor to the national economy, as one farmer explained: “Tourism is becoming another business, we are obliged to accept it whether we like it or not. [It’s] pumping a lot of money into Botswana.” Another participant involved in agriculture explained: “Tourists come in, place their money and this money is also being used for development.” In some instances, farmers demonstrated positive attitudes toward wild dogs only when discussed in the context of tourism: “When it comes to tourism, wild dogs are beautiful animals which are very attractive” (subsistence farmer).

Wild dogs were considered exciting to see on safari because of their hunting skills and endangered status. Although participants across all stakeholder groups discussed the role and value of tourism, wild dogs may not be an immediate attraction for tourists: “They also have underplayed, an underutilized role in generating tourism revenue for Botswana […] they’re not very well marketed I don’t think” (wild dog researcher). Only one ecotourist at the Modisa Wildlife Project had a significant amount of knowledge about wild dogs before volunteering, whereas the rest had very limited or no knowledge before volunteering or visiting Botswana or southern Africa. Perceptions of tourists’ limited knowledge was also echoed by an individual working in the tourism sector: “I think probably most of them have heard of them, perhaps seen them on television, but certainly don’t know anything about them, have never witnessed them (tour operator).” Tourism was also described as a way to protect wild dog habitat: “Without the tourism, we’re just going to convert more and more areas into farms or mining” (conservationist). It was also described as a way to foster coexistence between farmers and wild dogs: “If you put the value to wild dogs, they are not just there to kill your livestock, but they can rather bring tourism revenue, people will start to appreciate them more positively than negatively. If you don’t put any value to them, then the people will devalue them automatically” (wild dog researcher).

However, participants discussed national socioeconomic benefits as opposed to individual and local benefits derived from tourism, demonstrating antagonism toward the wildlife tourism industry. As one participant in the agricultural industry explained: “They put them in parks and tourists come to see them and government gets money. I don’t see any money, government doesn’t give me anything, I make my kraal [livestock enclosure], my home (commercial cattle farm employee).” Most individuals we interviewed who were involved in agriculture did not derive direct benefits from tourism.

8. Discussion

“The old dilemma of cattle versus wildlife” (Campbell, 1973, p.12, emphasis in original) is clearly still present today, as revealed through three significant trends in our findings. First, wild dogs were socially constructed in two competing ways: as problem animals by the agricultural sector and as an endangered species by the conservation and tourism sectors. Second, all three stakeholder groups perceived wild dogs as an economic resource in Botswana. Third, all three of these social constructions of wild dogs are driven by and emblematic of politico-economic and sociocultural trends, and competing development directions in Botswana. Although the social constructionist framework can be
applied to other species, the drivers of conflict, in this case, are unique to human–carnivore conflict in Botswana.

The problem animal and endangered species social constructions revealed human conflict over wildlife represented by stakeholder groups’ different priorities, attitudes, experiences, and diverging conflict resolution and management strategies. For example, individuals in the agricultural industry wanted wild dogs to remain in protected areas or be killed, alongside better government compensation. Conversely, individuals in the conservation and wildlife tourism industries explained that conservation education, habitat protection, and economic benefits derived from wild dogs through tourism would reduce conflict. These diverging wild dog management and conflict mitigation strategies demonstrate the disconnect among stakeholder groups concerning wild dogs, conservation, and livestock depredation. Although the agricultural industry’s goal is to avoid contact with wild dogs and minimize livestock depredation, the conservation and tourism industries aim to instill in farmers positive values and attitudes toward wild dogs to create long-term coexistence. Consequently, the agricultural industry prioritizes cattle, whereas the conservation and wildlife tourism industries prioritize wildlife.

For individuals in the agricultural industry, attitudes and experiences were predominately negative because of livestock depredation and lack of compensation, creating antagonism toward and fear of the government. Although technical solutions may reduce wild dog impacts on livelihoods, and will likely continue to play a role in conflict mitigation strategies, they do not address feelings of injustice or antagonism between and toward social groups (Madden & McQuinn, 2014). The compensation scheme overlooks the importance of cattle beyond economic reasons (Hoon, 2004) and attempts to buy tolerance instead of promoting coexistence (Demotts & Hoon, 2012; Hemson et al., 2009). In addition, government ownership perpetuates state control, reproduces the problem animal construction (DeMotts & Hoon, 2012), and drives antagonism toward wild dogs themselves. Conversely, for individuals in the conservation and wildlife tourism industries, attitudes and experiences were positive predominately because of the endangered status of wild dogs and their appearance and behavior.

In Botswana, cattle represent prestige, wealth, and social standing, and were the backbone of the national economy through the beef export industry to South Africa and Europe before the discovery of diamonds in 1967 (Hoon, 2004). However, the economic dependence on diamonds (a finite resource) and cattle (a stagnant economic industry and disease-vulnerable livestock animal) resulted in a drive for economic diversification in the form of wildlife tourism (Gwebu, 2012; Hoon, 2004). This diversification trend has been called “de-agrarianization” where rural people have been forced to diversify their livelihoods away from solely an agrarian lifestyle, creating tensions between agricultural and wildlife conservation livelihoods (Gupta, 2013). However, many individuals from the agriculture industry regarded wild dogs as an economic resource, demonstrating that the government’s mandate for economic diversification through wildlife tourism has reached far and wide in Botswana, and that wildlife tourism is indeed seen as an economically viable activity.

That farmers see wild dogs as an economic resource should be capitalized on through local involvement and decision-making in tourism and conservation (Mbaiwa, 2017). Marketing Botswana’s endangered wild dog population at the international scale, as is being done by safari companies such as Kwando Safaris and Great Plains Conservation, could increase tourism and conservation (Takahashi, Verissimo, MacMillan, & Godbole, 2012). Fostering more community ownership instead of state ownership over wildlife and community-based tourism initiatives could support rural development,
local economies, and conservation in Botswana (Demotts & Hoon, 2012; Mbaïwa, 2017). The presence of wild dogs and other wildlife presents an opportunity to increase tourism development, leading to employment opportunities and personal and national economic growth, and benefitting communities at the local scale, thus allowing for wild dogs to be regarded as more valuable. Wildlife tourism may, therefore, provide an important avenue for reducing farmer antagonism toward conservation, the government, and wild dogs themselves.

What we demonstrated through these social constructions of wild dogs is that human conflict with wild dogs is driven by land-use competition and conflicting economic development sectors, namely the agricultural sector and the wildlife sector (conservation and tourism; Darkoh & Mbaïwa, 2009; Yurco et al., 2017) and that human conflict over wildlife involves antagonism between social groups. Land-use conflict between national park managers and local communities occurs when the government fails to include communities in wildlife management, resulting in a lack of control over natural resources by local communities (Darkoh & Mbaïwa, 2009).

The social constructionist approach used in our study reveals how different meanings of wildlife reflect the human dimensions of conflict that are often the underlying, yet overlooked drivers of conflict, such as historical, politico-economic, and sociocultural trends, competing development directions, as well as feelings of injustice and helplessness. Recognizing this and addressing these issues as the root of the problem will benefit longterm conservation.

We therefore propose two mitigation and conservation recommendations that address the human conflict over wildlife where the agriculture and wildlife conservation industries work interdependently to consider the needs of humans, livestock, and wildlife. First, by reframing HWC as human conflict over wildlife, conservationists can recognize and acknowledge feelings of injustice and antagonism, as well as diverging agendas, priorities, and management strategies. This could allow for continued and further meaningful engagement and open dialogue with affected communities (Madden, 2004; Madden & McQuinn, 2014; Redpath et al., 2015).

Second, a lack of integrated planning demonstrates the disconnect among industry sectors, where certain government ministries and departments implement development policies (e.g., tourism) without consulting and considering the policies of other ministries, departments, and communities (e.g., agriculture). As such, we propose that integrated management plans that “will enhance coordinated and integrated planning between the various sectoral departments in the district” (Darkoh & Mbaïwa, 2009, p.165) should be developed to foster stronger communication and collaboration among stakeholder groups, namely community representatives; the Department of Wildlife and National Parks; the Ministry of Environment, Wildlife and Tourism; the Ministry of Agriculture; the Botswana Meat Commission; The Department of Tourism; and different Land Boards (Darkoh & Mbaïwa, 2009).

9. Conclusion

Taken together, conflict is not always a straightforward problem of carnivores killing livestock animals and then farmers killing carnivores (Rust et al., 2016), as stated on the Botswana Meat Commission’s website: “The balance between conservation of wildlife, a valuable resource for tourism, and the needs of the commercial cattle industry is a complex one.” Viewing HWC as conflict between humans and wild animals, instead of conflict between human groups, masks the reality of the broader systemic drivers while conflict mitigation strategies continue to focus on material and economic solutions rather
than underlying social factors (Madden & McQuinn, 2014). As we have illustrated through this case study of human conflict over wild dogs in Botswana, the social constructionist approach reveals how different meanings of wildlife reflect feelings of antagonism among social groups, politico-economic and sociocultural trends, and competing land-use activities and development directions. These are the human dimensions that are often the underlying, yet overlooked drivers of conflict. We therefore propose continued and further engagement between conservationists and affected communities, and the development of integrative management plans to address the disconnect between industry sectors in Botswana.
10. References


Chapter 5: Compassionate Conservation: Exploring the Lives of African Wild Dogs (Lycaon pictus) in Botswana

Abstract

This paper argues for a more compassionate conservation by positioning animals as subjects in research and scholarship. Compassionate conservation is a multidisciplinary field of study that broadly attends to the ethical dimensions of conservation by merging conservation and animal welfare science. However, animal geography is missing from the compassionate conservation scholarship despite sharing similar tenets addressing humans’ ethical relations with animals. This paper uses responsible anthropomorphism and animal geography concepts of animal subjectivity (lived experiences) and agency (capacity to act) to position African wild dogs as subjects in conservation research and scholarship. It merges biological research, public discourse, and interview and participant observation data to present wild dogs as thinking, feeling, self-conscious animals with agency, and whose welfare is negatively affected in human-dominated landscapes in Botswana. This paper argues for more attention to be paid to animal subjectivity and agency in order to foster more compassionate relations with wildlife. It argues that positioning animals as subjects in research and scholarship is an ethical starting point for moving compassionate conservation forward. This ‘enriched’ scholarly approach moves us closer to appreciating the lives of wildlife and the complexity of their circumstances and experiences.

Keywords: Compassionate conservation, animal geography, animal subjectivity, animal agency, wildlife conservation, animal welfare, African wild dogs (Lycaon pictus), Botswana
1. Introduction

Compassionate conservation is an emerging multi-disciplinary field that broadly focuses on the ethical dimensions of conservation. In particular, the field is concerned with wildlife welfare, and aims to bridge conservation and animal welfare science, two disciplines that have historically been seen as separate (Bekoff, 2013; Soulé, 1985). There is a growing interest in the field to produce ‘creative ethical’ dialogue when attending to the welfare of wildlife (Wallach et al., 2015). To contribute to this dialogue and to the growing field of compassionate conservation, I argue that animals must be considered subjects in conservation scholarship and practice rather than objects of study. I use a case study of African wild dogs (*Lycaon pictus*) in Botswana to position wild dogs as subjects by considering their subjectivity, agency, and welfare. To consider these concepts, I merge biological studies, wild dog researcher public communications (i.e. blog posts and reports), and animal geography methodologies (semi-structured interviews and participant observation). I argue that positioning animals as subjects extends theoretical and conceptual underpinnings of compassionate conservation, while at the same time, contributes a multidisciplinary approach to understanding the lives of animals more fully. It demonstrates that we must consider the lives of wild dogs in the political-economic and socio-cultural context of Botswana alongside human-wild dog dynamics. As such, we cannot fully understand wild dogs through biology alone, rather, to fully understand wild dogs as subjects, we need to consider their influence, their emotions, and their welfare. By doing this, I demonstrate that wild dogs are thinking, feeling, and sentient beings who shape their own lives, their circumstances, and the lives of others.

This paper is based on an empirical case study of human-African wild dog conflict and conservation in Botswana, Africa. Research in the natural sciences often takes an objective or neutral stance on its subjects of study; this includes animals. Criticisms circulate that conservation biology, and some common conservation narratives informed by that literature, portray animal behaviour as predetermined by instincts and genes, and actively avoid considering animals as individuals with their own lives and experiences (Crist, 2013; Kiley-Worthington, 2017; Kuhl, 2011; Oakley et al., 2010; Philo, 1998; Philo & Wilbert, 2000; Rees, 2001; 2007). Eileen Crist (2013) extends this argument, claiming that the denial of animal minds is implicated in the destruction of the earth: “As animals became successfully represented in dominant discourses as devoid of agency and experiential perspective- thereby becoming construable as a means for human ends- a fortiori the (apparently) nonsentient domains of forests, rivers, meadows, oceans, deserts, and mountains (in fact, of any landscape or seascape) were made accessible to the human race without accountability or restriction” (p.46).

There have been several calls by critical animal scholars, including animal geographers, to attend to the inner lives, experiences, and worldviews of animals (Bear, 2011; Dempsey, 2010; Gullo, Lassiter & Wolch, 1998; Hovorka, 2008; Jepson, Buckingham & Barua, 2011; Urbanik, 2012; Van Patter & Hovorka, 2017). Animal geographers attempt to address and move beyond mechanistic representations of animals by highlighting animals’ role in human societies and identities, and in particular, their agency as beings with inner thought and intentionality (Emel & Wolch, 1998; Philo & Wilbert, 2000; Urbanik, 2012). However, in this paper, I argue that while conservation biologists’ scientific scholarship may portray animals as driven by instinct and genes (i.e. mechanistic), they are indeed producing insights into the lives of wild dogs; animal geographers have recently begun to recognize this and have made calls for more collaboration with natural scientists (Bear, 2011; Hodgetts &
Lorimer, 2015; Hovorka, 2017). Multidisciplinary perspectives of animals may therefore be more fruitful for understanding the inner lives of animals (Bear, 2011; Hovorka, 2017).

Animal geography, a sub-discipline of human geography, emerged as a response humans’ ethical and political concerns toward animals. Animal geography is therefore well-positioned to contribute to developing the field of compassionate conservation. By engaging with responsible anthropomorphism and highlighting animal subjectivity and agency, wildlife can be positioned as subjects by acknowledging that they suffer, experience pleasure, and make decisions that affect their own lives and the lives of others. I also discuss animal welfare and how it is represented in conservation biology, public communication, and animal geography examinations (interviews and participant observation) of the lives of wild dogs in Botswana. This multidisciplinary approach, which combines biological studies and public communication with animal geography concepts and methodologies enables us to better understand animals as ‘minded subjects’ (Van Patter, 2015). By attending to animal agency and subjectivity, we can position wildlife as “thinking, feeling, beings, with lives worthy of consideration” (Kuhl, 2011, p.119). In doing so, we can work toward a more compassionate conservation in an multidisciplinary capacity that attends to animals more holistically by recognizing them as subjects and by considering their welfare in the context of subjectivity and agency.

I organize the remainder of this paper as follows: first, I define compassionate conservation and discuss central tenets, research, key debates, and gaps in the scholarship. I also present a brief overview of the fields of conservation and animal welfare and how these disciplines differ and share similar tenets and discuss the concept of animal sentience. Second, I discuss the sub-discipline of animal geography and responsible anthropomorphism as a methodological framework that brings into focus the experiences and circumstances of animals. I contend that we can make preliminary explorations about what animals think and feel through shared mental capacities and experiences. I then discuss wild dogs in Botswana and data collection and analysis. Next, I present wild dog subjectivity, agency, and welfare through different data sources that explore the lives of wild dogs in Botswana. I argue that the next step in compassionate conservation is to position wild dogs as subjects in conservation research by paying attention to these elements in order to demonstrate that the lives of wild dogs are complex and nuanced, and shaped by broader social structures and their interactions with humans.

2. Human(e) dimensions of conservation: compassionate conservation

The field of compassionate conservation is concerned with reconciling the long-standing disconnect between conservation and animal welfare (Bekoff, 2013). While the contemporary fields of conservation and animal welfare developed alongside each other, they have largely remained politically and scientifically separate. Conservation developed as a science focused on preventing extinction, and the conservation movement began with protecting populations and ecological systems from exploitation. Today, conservation research and practices remain broadly focused on species, populations, and ecosystem preservation (Fraser, 2010; Paquet & Darimont, 2010; Soulé, 1985).

Animal welfare science, on the other hand, emerged in response to the cruelty and neglect of domestic and captive animals, resulting in numerous laws banning animal cruelty in agriculture, sports, work, and research. Sentience, defined as the capacity to experience positive and negative affective states, is central. The capacity for animals to suffer was the common-sense perception among communities interacting daily with animals as early as the Renaissance. However, sentience became of interest to biologists only in the last 40 years and quickly became a central concept within contemporary animal
welfare, with two theoretical schools of thought emerging with regard to its definition and measurement (Duncan, 2006). Initially concerned with physiological stress during the 1960s and 1970s, more in-depth welfare studies resulted in theoretical debates and schools of thought around whether animal welfare was associated with animals’ biological functioning or feelings. While the ‘biological functioning school’ focuses on the absence of stress, the ability to cope, and the animal’s biological needs, the ‘feelings school’ associate sentence with suffering and pleasure (Duncan, 2004).

While animal welfare continues to focus predominately on domestic animals, some animal welfarists are becoming concerned with conservation practices that trade-off one species to benefit another, or practices that trade-off individuals to benefit the species (Dubois & Harshaw, 2013; Fraser, 2010). Compassionate conservation was conceptually developed by the Born Free USA foundation in partnership with the Wildlife Conservation Research Unit (WildCru) at Oxford University. In 2010, the first compassionate conservation conference was held, bringing together scholars and practitioners from disciplines across the natural and social sciences and humanities to discuss animal welfare issues in conservation. The conference established compassionate conservation as a growing multidisciplinary field.

Compassionate conservation involves cross-disciplinary research conducted predominately by conservation biologists concerned with wildlife welfare (Fox, 2013; Moore, Wihermanto & Nekaris, 2014; Paquet & Darimont, 2010; Ramp, 2013; Wallach et al., 2015) and animal welfarists concerned with conservation practices’ welfare implications for wildlife (Bekoff, 2013; Dubois & Fraser, 2013; Dubois & Harshaw, 2013; Dubois et al., 2017; Fraser, 2010). The field encompasses work situated in architecture and planning (Beatly & Bekoff, 2013), veterinary science (Beausoleil, 2014), and conservation psychology and economics (Clayton, 2013; Czech, 2013), among other disciplines from the social sciences and humanities (Garlick, Matthews & Carter, 2011; Crist, 2013; Tedeschi, Bexell & NeSmith, 2013; Vucetich & Nelson, 2013; Waldau, 2013). Research to date has broadly focused on wildlife welfare in human-dominated landscapes (Bekoff, 2013; Dubois & Fraser, 2013; Paquet & Darimont, 2010; Fraser, 2010; Fraser & MacRae, 2011), wildlife captivity, rehabilitation, and translocation (Dubois & Fraser, 2013; Moore, Wihermanto & Nekaris, 2014), and conservation ethics (Fraser & MacRae, 2011; Ramp, 2013). For example, Paquet & Darimont (2010) discuss the various ways wildlife welfare is compromised in human-dominated landscapes, such as noise pollution and habitat fragmentation, Ramp (2013) describes and discusses the ethical dilemma of the wild kangaroo harvest in Australia, and Moore, Wihermanto & Nekaris (2014) examine viable options that address the welfare and conservation goals of wildlife in rescue centres.

By bringing conservation and animal welfare together, compassionate conservationists are tackling the long-standing debate that the two disciplines should be regarded as separate (see Soulé, 1985). Despite the two fields’ different topics of interest and research, conservation and animal welfare both share a social concern for animals (Fraser, 2010). With humans and wildlife increasingly sharing spaces, the same human activities that cause wildlife extinction also cause suffering and trauma in individual wild animals, an important argument for bringing conservation and animal welfare into conversation (Paquet & Darimont, 2010). Compassionate conservationists are therefore laying the groundwork for future studies to begin taking wildlife welfare more seriously in both conservation and animal welfare research and scholarship. Moreover, the compassionate conservation field’s inclusion of various disciplines opens up space for more interdisciplinary and collaborative research and practice. Collaboration among individuals who can bring different theoretical, conceptual, and methodological
approaches is regarded as a step toward improving conservation practices by addressing conservation problems that are interdisciplinary in nature, such as wildlife welfare (Adams, 2007; Mascia et al., 2003; Paquet & Darimont, 2010). Animal geography, however, is conspicuously missing from the compassionate conservation scholarship despite sharing similar important tenets.

3. Animal geography: animal subjectivity and agency

Compassionate conservation and animal geography share two important foundational tenets: 1) both bodies of scholarship developed as a response to the ethical responsibilities we hold toward the animals we share our world with (Bekoff, 2013; Buller, 2015; Hodgetts & Lorimer, 2014; Johnston, 2008) and 2) both bodies of scholarship seek to ensure that animals’ needs are not simply ignored or unthinkingly placed below humans’ needs (Bekoff, 2013; Johnston, 2008). For example, animal welfare science focuses on animal sentence, with studies examining animals’ physical and emotional responses to environmental conditions; animal geographers focus on animal welfare by exploring the politics around the treatment of animals. Animal geographers examine socio-spatial and political-economic structures and processes that may affect animals’ circumstances; they have explored the wildlife trade, environmental politics of caring for wildlife, the politics around habitat destruction, and human-animal relations of power (see Geiger & Hovorka, 2017; Gullo, Lassiter & Wolch, 1998; Michel, 1998; Proctor, 1998). Building on these shared tenets, I argue that engaging with animal geography concepts of animal subjectivity and agency will: 1) integrate animal geography more broadly into compassionate conservation scholarship, and, 2) position animals as subjects in compassionate conservation scholarship.

Subjectivity, in this case, refers to how animals live in the world and what they experience; subjectivity also portrays animals as thinking, feeling, sentient, and self-conscious individuals (Bear, 2011; Geiger & Hovorka, 2015; McFarland & Hediger, 2009; Van Patter, 2015). One important conversation in animal geography concerning animal subjectivity centres around how we can understand the experiences of other animals. Animal geographers, such as Bear (2011), Buller (2015), Hodgetts & Lorimer (2015) Hovorka (2017), contend that greater engagement with disciplines such as the animal sciences, ethology, and biology, which have the tools and in-depth knowledge of animal behaviour, is needed. For example, Geiger & Hovorka (2015) use animal welfare methods to consider donkey subjectivity as a “lived experience of the body” (p.1102) by assessing donkeys’ physical and emotional experiences and welfare. The authors consider donkey lives through donkeys’ daily activities, relations with their owners, and body conditions, finding that most donkeys in Botswana experience trauma and hardship.

Agency, in this case, refers to the capacity to influence one’s life and the lives of others, to exert power, and to achieve goals (McFarland & Hediger, 2009; Rutherford, 2013). Animal agency is defined in various ways in animal geography. Dempsey (2010), Van Patter & Hovorka (2017), and Notzke (2013) argue that agency is not an inherent or fixed trait; rather it is made through relationships, conflict, negotiations, and alliances with other animals, humans, and the environment. Philo (1998) takes another approach by discussing agency as reactive to human spatial orderings.
animals enact their agency when they resist or transgress the material and conceptual spaces allocated to them by humans. For example, Power (2009) describes how possums engage in ‘border ruptures’ by leaving the ‘wild’ and inhabiting the walls and ceiling cavities of people’s homes in Australia, contributing to individuals’ feelings of anxiety or homeliness within their households. Rutherford (2013) sees agency as being enacted both directly and indirectly; it is enacted directly when animals evade humans and indirectly when policies and laws that affect humans or landscapes are written because of animals. Meanwhile, Lorimer (2007), Hovorka (2008), Dempsey (2010), and Notzke (2013) focus on the role of animals’ aesthetic and ecological characteristics in shaping their own lives through their interactions with humans and their environments.

Including animal subjectivities and agency into compassionate conservation scholarship means that we may be able to make some preliminary explorations about how wild dogs may be feeling and thinking, and their affect in the world, positioning them as subjects in research rather than objects of research. This would provide fuller account of their lives and welfare in Botswana by foregrounding their sentience, and their “conscious, emotional, cognitive and creative inner life” (Hovorka, 2017, p.4).

4. Responsible anthropomorphism

How do we position animals as subjects in conservation scholarship? Animal geographers are interested in exploring “what an animal worldview may be, how an animal may wish to represent itself, and how we may come to know these expressions” (Hovorka, 2017, p.2). Exploring an animal’s point of view is a matter of understanding and representing different ways of knowing the world (Bekoff, 2006; Kiley-Worthington, 2017). Yet, how do we come to know this other way of knowing? And how do we accurately represent them? Anthropomorphism, or the use of human characteristics and mental states to describe, explain, or anticipate animal behaviour, is one way humans attempt to understand animal worldviews and expressions (Horowitz & Bekoff, 2007; Kiley-Worthington, 2017; Serpell, 2003). As humans, we empathize everyday with other humans in order to understand them, and as researchers, we represent our subjects’ perspectives through our own personal lens. It is therefore only a “short empathetic step” to imagine the world through the eyes of animals (Jickling & Paquet, 2005, p.130). Anthropomorphizing occurs because people develop an empathetic understanding of how animals behave through shared experiences and mental capacities, developing understandings of animals based on co-relationality (Johnston, 2008; Kiley-Worthington, 2017; Kuhl, 2011). Responsible anthropomorphism is therefore based on more fully understanding other animals and their lives by learning from individuals who spend their time with them and by merging multiple data sources about animals, in this case, scientific scholarship, anecdotes, stories, and observations (Johnston, 2008; Yeo & Neo, 2010).

Conservationists often use anthropomorphism as a tool to promote target species by developing public empathy and conservation awareness (Chan, 2012). Within scientific scholarship, however, researchers are expected to remain detached from the lives of animals and to use language that does not assume animal mental states or emotions (Kiley-Worthington, 2017; Rees, 2001; 2007). However, some scholars argue that humans can achieve mutual understanding and plausible empathy with animals based on shared sociality, intelligence, and sentience (Jickling & Paquet, 2005; Johnston, 2008; Kiley-Worthington, 2017; Bekoff, 2006); this is notably reflected in the work of primate ethologists Jane Goodall, Dian Fossey, and Birute Galdika (Rees, 2001). While conservationists use methods such as camera trapping, tagging, and tracking to understand and analyze the daily habits and lives of animals (Bear, 2011; Hodgetts & Lorimer, 2014), anthropomorphizing occurs through personal experiences,
anecdotes, stories, myths, and lore (Bekoff, 2006). Bekoff (2006) argues that these data sources are also important because there are many correct ways to describe or explain what animals feel or do. Similarly, Russell (2005) asserts that stories help us to imagine an animal’s perspective and experiences, while Rollin (1997) contends that plausibility and common sense assumes that animals, like humans, feel emotions such as pain, fear, curiosity, and other mental states.

Anthropomorphizing, however, may put unrealistic expectations on animals to behave in human-like ways (Root-Bernstein et al., 2013) and fail to consider that animals most likely see the world in a very different way than we do (Rivas & Burghardt, 2002). A responsible anthropomorphism therefore relies on the stories, anecdotes, and narratives of individuals who spend time with those animals, such as biologists, naturalists, hunters, and trackers. For example, Lorimer (2008) explores the embodied skills and emotions of scientists involved in corncrake counting in the UK. The scientists ‘tune-in’ to the corncrake through scientific and folk knowledge of corncrake behaviour and ecology. They attempt to embody the birds’ behaviour in order to track them in their natural habitat, as Lorimer (2008) explains: “In this wild ethology they immerse themselves in the field and feel for the bird” (p.384).

Timberlake and Delameter (1991) propose that to understand animal behaviour, researchers “not only need to put themselves in the subject’s shoes, they need to wear them – walk, watch, hear, and act like the subject” (p.39). Feminist scholars in particular have been exploring and promoting embodied experiences and approaches to research within animal studies by focusing on the body as a unit of analysis, feminist ethics of care, and empathic relations and understanding (Hovorka, 2015). Feminist concepts of performativity and embodiment, or embodied knowing, have been applied to explore how animal bodies perform and reproduce power relations, experiences, and place-based dynamics and context (Birke, 2012; Geiger & Hovorka, 2015; Hovorka, 2015; Kuhl, 2011; Warkentin, 2010). For example, Geiger & Hovorka (2015) use the concept of performativity to explore the relationships between donkey bodies, place-based power relations, and donkey identity in Botswana. Exploring animal experiences through embodied practices means “sharing across boundaries of bodily responses” (Birke, 2012, p.154, emphasis in original). Ultimately, a responsible anthropomorphism enables humans to recognize (vertebrate) animals as interactive subjects in the world who share commonalities with humans yet, at the same time, have their own unique experiences, thoughts, and individuality.

5. Learning about Botswana’s wild dogs

Botswana is a semi-arid, land-locked country in southern Africa and home to some of the most diverse and largest populations of wildlife on the continent. Predominately unfenced, wildlife roam freely across Protected Area and Game Reserve borders into human settlements; in Botswana, humans and wildlife share the landscape. The country’s socio-economic reliance on cattle, which imbues men with social standing and acts as a bank account and source of food security, engenders incidents of human-large carnivore conflicts, where large carnivores predate on cattle and farmers engage in retaliatory killing and injuring of carnivores. At one time, African wild dogs roamed freely across the African continent. Today, they have lost most of the habitat they historically occupied due to human encroachment and subsequent persecution, disease, and road mortality. Effectively eradicated from north and west Africa and largely reduced in north-east and central Africa, southern Africa and the southern part of east Africa are home to the remaining 6,600 wild dogs on the continent (Woodroffe and Sillero-Zubiri, 2012). Botswana is home to approximately 1,310 wild dogs (RWCP & IUCN/SSC, 2015).
To understand wild dogs and their lives, I used multiple data sources including biological studies, public communication, interviews, and participant observation. Together, these data sources explore the lives of wild dogs in Botswana beyond only biological studies, including the way they live apart from humans, their interactions with each other, humans, and other animals, their emotions, aspects of their welfare, and considers their lives in Botswana’s social context. I gathered documents such as biological studies, publicly available blog posts, and reports on wild dogs in Botswana. Biological studies were written by conservationists who study wild dogs in Botswana. Conservation biologists explore the lives of wild dogs in Botswana using methods and tools such as GPS activities and location data, VHF and aerial tracking, sightings, photographs, videotapes, direct observations, historical data, general health recordings (e.g. blood samples, body measurements), as well as questionnaires and analyses of Problem Animal Control registers. Blog posts and reports were written by biologists from the Botswana Predator Conservation Trust (BPCT) the Kalahari Research and Conservation (KRC) group. BPCT and KRC are the two main groups conducting research on wild dogs in Botswana; together they provide data on wild dogs across almost the entire country (BPCT conducts research in northern and the Ghanzi area in Botswana and KRC conducts research on wild dogs in the eastern Kalahari region and in the Central Kalahari Game Reserve). Blog posts and reports are considered to be accounts of both scientists’ field work and what animals do and why. Rees (2007) describes these as “part adventure story, part autobiography, part textbook” (p.7). Blog posts and reports were therefore useful for understandings wild dog subjectivity, agency, and welfare from a different perspective.

Finally, researching human-wild dog conflict and conservation in Botswana put me in a unique position to hear narratives, stories, and anecdotes about wild dogs, and to observe wild dogs in Protected Areas and in captivity. I spent 10 months in Botswana, from May through July 2013 and again from February through July 2015. I conducted 110 interviews in four study sites (Central Boteti, Kweneng East, Maun, and at the Modisa Wildlife Project), where I interviewed individuals who had in-depth knowledge of and experiences with wild dogs, or who shared similar environments. Participants included individuals working in the agriculture, tourism, and conservation industries (e.g. cattle and game farmers, government officials, wild dog researchers, safari guides). I also engaged in participant observation by immersing myself in the everyday context of living in Botswana by having informal conversations and exploring how people and wildlife live in the country, as well as observing free-ranging and captive wild dogs. I grounded the qualitative, thematic analysis in the animal geography and animal welfare scholarship. I used latent content analysis to analyze the data for passages that reflected animal subjectivity, agency, and welfare according to the animal geography and animal welfare scholarship.

6. Wild dog subjectivity, agency, and welfare

The following section positions wild dogs as subjects by paying attention to wild dog subjectivity, agency, and welfare in Botswana. It brings together the different ways natural and social scientists are exploring the lives of wild dogs in Botswana. By merging the conservation biology, public communication, interviews, and participant observation data sources, I demonstrate that the lives of wild dogs are complex, nuanced, and emotional. This study also reveals that we cannot understand the lives of wild dogs through biology alone; attention must be paid to human-wild dog dynamics and the broader context in which wild dogs live their lives. Through the following narratives, I present a depiction of the animals as the subjects who are truly “at the heart of the research process” (Rees, 2007, p.3).
6.1. **Wild dog subjectivity**

Wild dogs are thinking, feeling, self-conscious animals with personalities, moods, and strong social bonds. Lila, Kubu, Thuto, Dotski, Trinity, Taryn; Mula Pack, Tsau Hills Pack, Mankwe Pack. These are some of the names conservation biologists in Botswana have given to individual wild dogs and wild dog packs. While these names do not appear in conservation biology scholarship, researchers use names to identify and engage with individuals. At the same time, naming implies individuality and personality (Candea, 2010). Wild dog moods and emotions were discussed in blog posts and in interviews. Wild dogs were described as “playful”, “curious”, and “happy”, as one participant explained: “…their chittering when they get really excited, the squeaking noise that they make. You just know that they’re excited and that they’re happy, happy animals”. My own interactions with wild dogs reminded me of my experiences with domestic dogs; they exhibited similar behaviours such as curiosity, caution, excitement, and playfulness; they wag their tails and bark like domestic dogs. However, wild dogs were also described by participants as being “tricky”, “destructive”, and “cruel”. One participant explained: “Have you ever seen a wild dog kill? It is one of the most vicious things. They run it [prey animals] down, it’s tired, they virtually start to feed on it live, disembowel it.” While these latter characterizations may be critical of wild dogs, they do lend wild dogs the capacity to think, make decisions, and act (Gullo, Lassiter & Wolch, 1998).

Wild dogs are social animals with strong pack bonds who hunt, feed, and raise pups as a group (Hubel et al., 2016a; 2016b; Swarner, 2004). Many participants likened them to a human family: “I like their spirit of being together, like a real family, together. We always see them together, how the mothers take care of the puppies […] It’s really serious care.” Participants also described them as altruistic: “they’re probably the best example in the animal kingdom that I can think of a social system that actually works on altruism.” In Botswana, wild dogs have been found to engage in group decision-making where certain pack members sneeze to make decisions around rallying (i.e. group departures). This illustrates that “specific behavioural mechanisms (here, sneezing) allow for negotiation (in effect, voting) that shapes decision-making in a wild, socially complex animal society” (Walker et al., 2017, p.1). Wild dogs also use scent-marking through urination to communicate the limits of their territory with other packs (Jackson, McNutt & Apps, 2012; Jordan et al., 2014).

Life histories of wild dogs are shared through stories of wild dog dispersal and pack membership in BPCT blog posts: “The pack I spent most of my time with was the local Apoka Pack, in the area since 2013. Darius, an immigrant male of unknown origins and Seronera, a disperser from the extinct Mathews pack were - and still are - the Apoka pack dominants” and “…three of the older sub-ordinate males - known to us as Claudio, Stets and Toque - were absent. It seemed that that day they had left their natal pack to try and establish one for themselves.” By sharing the life histories of wild dogs, we learn more detail about the individuals that make up the biological studies of wild dogs as a species. This brings us closer to compassionate conservation by considering the lives of individual animals within a species and demonstrates that “there can be variation between individuals and within an individual” (AAWV Secretary, 2016, p.S4).

6.2. **Wild dog agency**

Wild dogs shape their own lives, the lives of other animals and humans directly and indirectly, and exert power. Wild dogs enact their agency by crossing Protected Area borders and moving into human
settlements where they prey on livestock animals and use human structures such as fences and roads (Abrahms et al., 2016; Cozzi et al., 2013; Gusset et al., 2009; Jackson, McNutt & Apps, 2012; Swarner, 2004; Schiess-Meier et al., 2007). Wild dogs learn about and understand the changing dynamics of their habitats and adapt to make use of different features to their advantage. These attributes demonstrate how wild dogs shape their own lives and address challenges posed to them such as the presence of and competition with lions and hyena, lack of wild prey, and presence of human settlements (Abrahms et al., 2015; Cozzi et al., 2013; Gusset et al., 2009; Swarner, 2004; Schiess-Meier et al., 2007; Pomilia, McNutt & Jordan, 2015).

Biological studies and blog posts discuss wild dogs’ movements into human settlements as reactionary to habitat loss / fragmentation and the presence of other large carnivores. However, in doing so, wild dogs not only move out of a space that is allocated to them, but they also move out of the role humans assign to them- as wild animals who belong in Protected Areas (Bolla & Hovorka, 2012; Philo, 1998), as one participant explained: “It would be better if it [wild dog] was fenced in to be separated from domestic animals because they destroy my livestock.” Through an animal geography lens, wild dogs do not only react to habitat loss, but they also work with their circumstances and adapt to their changing natural environments by moving into human settlements. Further, while biological scholarship discusses habitat through scent-marking and home ranges, their habitat is also their home. Establishing home ranges and territories through scent-marking and movements across the landscapes are actions that “coalesce in a narrative of getting to know a space, marking one’s territory, and making a place one’s home” (Van Patter & Hovorka, 2017, p.16). This positions wild dogs not as occupants of a space, but rather as inhabitants of Botswana’s landscapes (Van Patter & Hovorka, 2017).

In public communications, conservationists discussed how wild dogs affect them: “When you spend your time studying wild dogs, you cannot help but come to know them as individuals” (BPCT blog post) and “I had developed a special affection and a quite personal bond with those two individuals. It saddens me that my last memory of those inquisitive and adept individuals is of them rotting in the sun beside the buffalo fence, stark reminders of the challenges that predators face in man’s [sic] world” (BPCT blog post). Conservationists expressed excitement at seeing wild dogs alongside the challenges of finding such elusive animals and wild dog agency is apparent through their elusive nature when they evade researchers: “We immediately followed them into the bush. Despite many obstacles, we managed to stick with the dogs for roughly 300m. But then, suddenly, we lost them in a relatively open area” (BPCT blog post). The emotions and challenges wild dogs present are rarely discussed in the conservation scholarship, yet, through these blog posts, we gain a greater sense of wild dog agency through their capacity to affect biologists.

Wild dogs also enact their agency through their conflict with farmers and negotiations with researchers (Dempsey, 2010; Van Patter & Hovorka, 2017; Notzke, 2013). Many farmers expressed feelings of hopelessness concerning livestock depredation by wild dogs: “Due to destruction, they make me sad because they make people poor. Instead of more livestock, they decrease the numbers”. Some farmers changed their behaviours because of wild dogs: “If I’m alone I don’t go get my cows, I went alone before. I’m scared of walking alone. Every time I go out I make sure there is somebody or else I don’t go out […] If these cows have gone far into thick bush, I won’t go.” Moreover, because of their endangered status, wild dogs are listed as ‘protected game animals’ in Botswana’s Wildlife Conservation and National Parks Act meaning they cannot be legally killed even if they pose a threat to livestock. Because of this policy, farmers often fear the government and the repercussions of injuring
or killing a wild dog, as one farmer explained: “I’m afraid of being arrested”. Wild dog agency is therefore apparent both directly and indirectly in the ways they shape the lives of farmers through their actions. Wild dog agency is also apparent in their negotiations with the biologists studying them. When wild dogs evade or move away from researchers, they are demonstrating and asserting their role in the research process.

6.3 Wild dog welfare

While not explicitly discussed, wild dog physical and emotional welfare is affected by habitat loss, fragmentation, and conflict with farmers. Habitat loss and fragmentation was described as a leading contributor to long-term population viability and wild dog extinction (Cozzi et al., 2013; Jackson, McNutt & Apps, 2012; Pomilia, McNutt & Jordan, 2015; Schiess-Meier et al., 2007; Swarner, 2004). According to Abrahms et al. (2016), “an ability to move through its landscape has fundamental consequences for both individual fitness (e.g. resource acquisition, survival) and long-term population persistence” (p.247). A blog post explains: “Of Africa’s prized large carnivore species, the endangered African wild dog needs the most space to survive and as a result has suffered the greatest impacts from the loss and fragmentation of its habitats”. Anthropogenic landscapes also result in disease transmission from domestic dogs such as rabies and canine distemper as well as road incidents (Swarner, 2004).

Conflict with farmers significantly affects wild dog welfare. For example, in the three months following Gusset et al.’s (2009) study of human-wild dog conflict in northern Botswana, 19 pups and six adults disappeared from the area, presumably shot. A blog post details the death of two wild dogs, Taryn and Trinity: “We wondered about snakebite, but that didn’t make sense, the two dogs dying together.[…] upon returning to the carcasses, we found 12 dead and dying vultures; white-backed, white-headed and lappet-faced. We didn’t need to do any tests. The vultures’ deaths proved poison was involved” and a report by the KRC details the persecution of wild dogs in the Kalahari region: “We met with farmers whom have confessed to shooting the missing pack members and nine pups in the last few weeks”. Moreover, with wild dogs being persecuted, packs may become disbanded; one participant explained that losing pack members can be devastating for wild dogs, and that a lone wild dog would “die of a loneliness of heart”. Given the social nature of wild dogs and that animals are sentient, feel emotions, and have social knowledge (Kiley-Worthington, 2017), they may indeed feel loneliness and sadness when pack members are killed. These stories of wild dog deaths show the stark reality of what wild dogs experience, demonstrating that their lives in human-dominated landscapes are indeed “bloodier than we might like to think” (Johnston, 2008, p.646).

States of suffering such as pain, fear, frustration and social deprivation have been elucidated in mammals and birds for at least 30 years (Dawkins, 1980, 1990; Duncan, 1981, 2004, 2006). More recently conservationists have begun to accept that animals can experience fear, pain and distress as well as psychological and emotional trauma (Paquet & Darimont, 2010; Barua, 2013). Wild dogs must therefore feel a certain amount of fear, stress, and other negative mental, emotional, and physical states in these conflict situations.
7. Wild dog subjects

“...scientists are privy to a rare and precious opportunity when we come to know intimately nonhuman animals living in their own worlds. We have a responsibility to these animals to show other people who they really are – sentient beings who matter to one another, living lives as full of drama, and emotion and poetry as our own.” (Smuts, 1999, p.xv)

This paper argues that positioning animals as subjects in conservation research and practice is a ‘next step’ in compassionate conservation. Merging biological studies and public communication (blogs and reports) with animal geography (attention to subjectivity and agency) produces a more-holistic account of the lives of animals and of conservation research, science, and scholarship. While conservation biologists may not use the same language and methodologies as animal geographers, they do discuss animal subjectivity and agency in their research and scholarship, and they also present animals as subjects in their informal, public communication writings by giving them names, by detailing their moods, and by describing how wild dogs affect them. Conservation perspectives provide insights into wild dogs’ life histories, daily habits, moods, behaviour, and their lives apart from humans. Animal geography builds upon these biological studies and public communications by exploring wild dog thoughts and feelings through a responsible anthropomorphism, relying on interviews with people who know wild dogs and their environments, participant observations, and shared mental capacities. Merging these data sources portrays wild dogs as thinking, feeling, sentient beings who have agency, and whose welfare is negatively affected in human-dominated landscapes. This demonstrates that the lives of wild dogs are complex, nuanced, and emotional, and that we cannot study the lives of animals through biology alone.

Responsible anthropomorphism can act as a methodological bridge between portrayals of animals-as-objects and animals-as-subjects within conservation. By integrating biological studies with other data sources we can engage in a compassionate conservation that attends to animals’ welfare and inner lives more robustly by recognizing their subjectivity and agency. This multidisciplinary approach therefore elicits more “holistic and meaningful insights into the lives of animals” (Hovorka, 2017, p.7). If this type of compassionate conservation was implemented more broadly within conservation, it would portray animals as thinking, feeling, and agential beings, and would consider how their welfare is tied to their subjectivity and agency. If science informs conservation policy, perhaps we need a science that attends to wildlife in a more compassionate way; a conservation science that “prompts us to see target species not as animals that can be directly managed, but as creatures with an agency of their own” (Jepson, Buckingman & Barua, 2011, p.234).

Wildlife are suffering because of human activities. The new field of compassionate conservation aims to address this suffering by bridging conservation biology and animal welfare. I argue that positioning animals as subjects in research and scholarship is an ethical starting point for moving compassionate conservation forward. This ‘enriched’ scholarly approach moves us closer to appreciating the lives of wildlife and the complexity of their circumstances and experiences. From this starting point, compassionate conservation practice can consider the lives and welfare of individuals and the broader social context in which wildlife live and how humans intricately affect them. Conservation practices that consider wildlife as subjects can (re)include ethics, values, and morals within conservation decision-making practices and policies (Ramp & Bekoff, 2015), while challenging conservation ‘best practices’ in conservation of objectivity and distance from animal subjects (Rees, 2007).
Portrayals of animal subjects, their emotional lives, as well as their relationships with researchers can raise public awareness, because “The stronger the sense of kinship that can be created in the mind of the reader, the greater the likelihood that a sense of shared responsibility and of mutual participation in a moral community will also develop” (Rees, 2007, p.15). Conservationists and animal welfarists who wish to further engage with compassionate conservation may begin to include anecdotes and descriptive narratives of the lives of wildlife in their scholarship. They may also wish to engage in more interdisciplinary work with social scientists, for example animal geographers and feminist scholars, who have different philosophical, theoretical, conceptual, and methodological approaches to getting to know animals; similarly, animal geographers and other social scientists may wish to work with biologists who have access to and insights into the inner lives and daily habits of animals apart from humans (Bear, 2011; Echeverri et al., 2018; Hovorka, 2017). Through more multidisciplinary engagements to understanding the lives of animals more vividly and holistically (Hovorka, 2017), compassionate conservation scholarship can treat animals as “characters, as individuals with lives, feelings, histories and motives of their own” (Rees, 2007, p.883).
8. References


Chapter 6: Conclusion

1. Introduction

This chapter concludes the dissertation. The aim of this dissertation was to explore human-African wild dog (Lycaon pictus) conflict in Botswana. It considers the perspectives and circumstances of multiple stakeholders, the experiences of wild dogs, and political-economic and socio-cultural trends in the country. This dissertation informs human-wild dog conflict mitigation and wild dog conservation in Botswana and positions wild dogs as subjects in conservation scholarship. To meet this aim, the research objectives were to:

1) Examine farmer-wild dog conflict by documenting farmer perceptions of and experiences with wild dogs and wild dog impacts on farmer livelihoods;

2) Investigate human conflict over wild dogs by documenting different stakeholder groups’ perceptions of and experiences with wild dogs while considering national political-economic and socio-cultural trends and development trajectories;

3) Explore the lives of wild dogs through animal geography concepts of animal subjectivity and agency in order to build a more compassionate conservation.

This chapter details the dissertation’s key findings and scholarly and methodological contributions. It also presents technical, structural and ethical recommendations, the limitations of the research, future study areas, and concluding thoughts.

2. Key findings

The key findings of this dissertation reveal that human-wild dog conflict is shaped by peoples’ circumstances, access to social resources and opportunities, and government economic development and land use trajectories. Moreover, key findings suggest that wild dogs are sentient beings whose welfare is negatively affected in human-dominated landscapes. Several specific points underlie these assertions.

First, this dissertation confirms the historical and present-day presences of wild dogs in the eastern Kalahari region of Botswana. It also confirms that wild dogs are predating on livestock, as well as game animals in the study areas and human-wild dog conflict is occurring in the region. More attention toward mitigating conflict between farmers and Kalahari wild dogs is vital for the survival of wild dogs in the area, and for farmer livelihood security.

Second, this dissertation reveals that socioeconomic status plays a role in farmers’ perceptions of wild dogs. Those farmers who have access to or are afforded economic security were less likely to be antagonistic toward carnivores (Dickman, 2010), while farmers with higher education are more likely to feel positive. These findings indicate that socioeconomic status is key in shaping perceptions of, attitudes toward, and beliefs about wild dogs in Botswana. Many subsistence farmers are antagonistic toward or fear the government because conservation policies dictate negative repercussions for killing or injuring wild dogs. Moreover, that the government owns wildlife in Botswana reinforces state ownership and limits opportunities for farmers to value wildlife. Cattle therefore remain an important resource for individuals’ social and economic stability and livelihoods.
Third, findings demonstrate that despite incidents of depredation, farmers across type and socioeconomic status have positive perceptions of wild dogs because of wildlife tourism. These positive perceptions demonstrate that wildlife is important to local people despite the threat to local livelihoods through livestock depredation.

Fourth, findings reveal that human-wild dog conflict is driven by human conflict over wild dogs. This is summarized by Campbell (1973) who describes Botswana’s development landscape as “The old dilemma of cattle versus wildlife” (p.73, emphasis in original). While the government aims to diversify the economy away from diamonds and beef toward conservation and wildlife tourism, cattle remain central to Batswana livelihood and social well-being. As such, farmers viewed wild dogs as problem animals who threatened livestock and by extension farmer livelihood. Meanwhile, conservationists and individuals in the wildlife tourism industries want to conserve wild dogs and saw wild dogs as an endangered species. This conflict between stakeholder groups is perpetuated by the Botswana government’s political-economic development trajectories, alongside Batswana’s socio-cultural attachment to and economic reliance on cattle. This dissertation therefore re-frames human-wildlife conflict as conflict between key industry stakeholder groups in Botswana, namely the agricultural (livestock) and wildlife (conservation and tourism) sectors. Human conflict over wild dogs is revealed by stakeholder groups diverging values, priorities, and agendas concerning wild dogs. Moreover, conflict is also driven by land-use competition and diverging economic development sectors in Botswana.

Fifth, findings point toward responsible livestock herding practices, conservation education, wildlife tourism, and integrative management planning as conflict mitigation strategies. Human-wildlife conflict mitigation practitioners must also focus on how HWC is also perpetuated as human conflict over wildlife. That socioeconomic status is a significant facet of human-wild dog conflict means that HWC may be more effectively and justly mitigated through poverty alleviation programmes that attend to various social groups and economic sectors. Wildlife tourism is regarded as a key conflict mitigation strategy through more community inclusion in the tourism sector. While Botswana has seen an incredible growth in tourism since the 1990s, the industry is dominated by foreign safari companies, with managerial and higher-wage jobs reserved for expatriates and lower salary positions held by Batswana (Mbaiwa, 2017). Findings demonstrate that wildlife tourism is seen as a way to derive economic benefits from wildlife and alleviate conflict. However, communities must derive direct benefits from the industry, for example, more control over natural resources and direct income.

Finally, by focusing on wild dog subjectivity and agency through biological studies, conservation public communication, and animal geographic perspectives, this dissertation positions wild dogs as thinking, feeling, and sentient subjects in conservation scholarship. It reveals that wild dogs have agency by adapting to their environments and by affecting the lives of humans. It also demonstrates that their welfare is negatively affected in Botswana’s contested landscapes through habitat loss / fragmentation and human-wild dog conflict.

3. Contributions

This dissertation has scholarly and methodological contributions. Overall, this dissertation contributes a study that draws from different traditions and trajectories in conservation and geography to the human-wildlife conflict, human dimensions of conservation, and animal geography scholarships. Methodologically, this research builds on trajectories within the human dimensions of conservation
scholarship. More broadly, it contributes to human-environment geography by demonstrating that the lives of humans and animals in Botswana are interconnected and shaped by national political-economic and socio-cultural processes, as well as international and national conservation politics.

3.1. Scholarly contributions

This study illustrates that human-wildlife conflict is varied, context-dependent, and multi-dimensional (Bolla & Hovorka, 2012; Echeverri et al., 2018). I argue in this dissertation that we need holistic examinations to understand, explain, and address human-wildlife conflict in its social context and its various implications for humans and animals (Bruskotter & Shelby, 2010; Dickman, 2010; Goldman, Roque De Pinho & Perry, 2010; Madden, 2004; Madden & McQuinn, 2014; Peterson et al., 2010). In the last 15 years, human dimensions of conservation scholars have argued that conservation biology alone is insufficient for investigating and addressing conservation problems, such as human-wildlife conflict. These scholars argue that conservation has to do with people and society just as much as biology. Therefore, to more fully address conservation problems, historical, political-economic, and socio-cultural structures and processes, conflict between human groups, as well as peoples’ relationships with wildlife must be considered (Adams, 2007; Bennett et al., 2016; 2017; Dickman, 2010; Madden, 2004; Madden & McQuinn, 2014; Mascia et al., 2003; Redpath, Bhatia & Young, 2015). While the human dimensions of conservation are being recognized as relevant, the field of conservation remains grounded in biology (Madden & McQuinn, 2014). As such, the social sciences are increasingly being integrated into conservation research. By focusing on how social structures shape and affect conservation, this integration attends to and develops more in-depth understandings of conservation processes and practices; further, social sciences have the capacity to explore and analyze human experiences, perceptions, and behaviour related to and shaped by conservation processes (Bennett et al., 2016; 2017; Teel et al., 2018).

Meanwhile, animal geographers are using innovative concepts of animal subjectivity and agency to push for alternative examinations and portrayals of animals within research and social theory. Animal geographers are therefore concerned with how animals shape human societal structures and the lives of animals themselves. Yet, conservation research is critiqued for treating animals as objects of study rather than minded subjects. As such, animal geographers aim to reposition animals as subjects with agency (Hovorka, 2008; Jepson, Barua & Buckingham, 2014) and to attend to their inner lives (Bear, 2011).

This research contributes an examination of human-large carnivore conflict through an integrative and holistic approach that considers different social groups’ experiences with and attitudes toward African wild dogs, the social context in which conflict occurs, and the lives of wild dogs in and of themselves and in human-dominated landscapes. This dissertation demonstrates that human-large carnivore conflict is not just a linear problem of large carnivores killing livestock or game animals, and farmers then killing large carnivores (Rust, 2015). It also demonstrates that humans have different relationships with the “physical (embodied) and cultural (symbolic) animal” (Brownlow, 2000, p.144). This study uses various approaches within the human dimensions of conservation scholarship to show that HWC is a complex conservation problem with social dimensions. Through this lens, this dissertation reveals that people’s experiences with wildlife are shaped by their circumstances, including their socio-economic status, land tenure, and cultural associations. Therefore, HWC may be more justly mitigated through programmes that attend to the circumstances of different social groups, such as more actively considering their access to social and economic capital. Consequently, it moves beyond only using
biological studies of animals and quantifying losses as ways to understand and explain HWC; rather, it considers the social context in which HWC occurs, and presents mitigation strategies that attend to this context (Madden, 2004; Rust et al., 2016).

HWC is also not simply a problem that occurs on-the-ground between humans and wildlife, but it involves conflict between different human groups over diverging meanings of wildlife. This study uses a social constructionist approach to illustrate that these meanings are shaped by opposing agendas, priorities, and values, as well as competing government economic development trends. This social constructionist approach illustrates that HWC often has little to do with the animals themselves, yet, they often become targets for feelings of anger, frustration, sadness, and injustice (Madden, 2004; Peterson et al., 2010). This supports the notion that human-wildlife conflict may be better understood as human conflict over wildlife, which is rooted in and driven by broader socio-economic structures and processes, as well as people’s circumstances (Madden, 2004).

This research positions animals as subjects in conservation research by drawing on animal geography scholarship that aims to foreground the lives of animals (Bear, 2011; Gullo, Lassiter & Wolch, 1998; Hovorka, 2008; 2017). The innovative concepts of animal subjectivity and agency are useful for considering the lives of wild dogs in Botswana and to focus on their welfare in human-dominated landscapes. This study presents wild dogs as thinking, feeling, intelligent, social, and sentient animals. Further, it illustrates that animals affect humans by exerting their own agency through their actions and potential intent. Considering animals as subjects contributes a conceptual approach to enhancing our knowledge of, and insights into, the lives and welfare of wildlife. It also further develops the conversation about how humans and animals affect each other in shared spaces.

More broadly, this dissertation contributes a social science study to conservation scholarship, and to the growing human dimensions of conservation scholarship that considers the broader social context in which human-wildlife conflict occurs (Doubleday, 2018; Goldman, Roque de Pinho & Perry, 2010; Madden, 2004, Madden & McQuinn, 2014; Rust et al., 2016). It also contributes to animal geography scholarship through in-depth insights into the lives of animals (Bear, 2011; Bolla & Hovorka, 2012; Chambers & Main, 2014; Hovorka, 2008; Van Patter & Hovorka, 2017). Additionally, while numerous animal geographers have focused on wildlife (Urbanik, 2012), southern Africa is a region that does not yet feature very prominently in the literature (however, see Bolla & Hovorka, 2012; Hovorka, 2008; Geiger & Hovorka, 2015). This dissertation therefore also contributes a case study of human-wildlife relations in southern Africa to the animal geography scholarship.

This research contributes to geography by demonstrating that humans and the environment are closely interconnected. Combined, the manuscripts in this study illustrates that the lives of humans and wildlife are inextricably wrapped up together, not only physically on the landscape, but within Botswana’s social landscape as well, with both humans and animals entangled in political-economic and socio-cultural structures and processes of agriculture and tourism in the country, as well as international conservation politics. It therefore contributes to human-environment geography by demonstrated that society and nature are not dichotomous; rather, they are closely interconnected and shape each other, especially in the context of habitat loss, diverging political-economic development trajectories, and shared landscapes.
3.2. Methodological contributions

Recent research in the human dimensions of conservation proposes that qualitative methodologies can help further our understanding of conservation problems that have social dimensions, such as human-wildlife conflict (Drury, Homewood & Randall, 2011; Goldman, Roque de Pinho & Perry, 2010; Rust et al., 2017). HWC studies are traditionally quantitative, focusing on quantifying losses and attitudes toward wildlife (DeMotts & Hoon, 2012; Goldman, Roque de Pinho & Perry, 2010; Rust et al., 2017). However, with HWC regarded as rooted in and driven by underlying social structures and processes, different methodological approaches that attend to the complexities of HWC are needed, including collaboration between natural and social scientists. Yet, such collaboration in the context of HWC is limited. The first manuscript (chapter 3) of this dissertation contributes collaborative research between conservation biologists and social scientists exploring the human dimensions of conservation and HWC. While there were challenges (e.g. different understanding of methodological approaches), this collaboration led to shared data sources (e.g. wild dog GPS points, study areas, participant contacts) and consultations (e.g. interview guide) and resulted in the co-authored publication of manuscript 1. This manuscript uses both qualitative and quantitative analyses to present methodological trajectories within the human dimensions of conservation scholarship. Manuscripts 2 (chapter 4) and 3 (chapter 5) use a geographic methodological approach to further develop and contribute qualitative methodologies to the human dimensions of conservation and human-wildlife conflict scholarship. Together, the manuscripts draw on a suite of traditions within the human dimensions of conservation and geography to contribute methodologically to these bodies of scholarship.

Human geographers have been using and developing qualitative methodologies to understand human-environment relations since the 1980s by exploring and understanding the complexities of social phenomena related to place and people (Winchester & Rofe, 2016). Geographers are particularly interested in understanding the complex relationships between humans and their environments in different places and at various scales. Winchester & Rofe (2016) also explain that human geographers using qualitative methodologies are concerned with individual experiences and social structures. In keeping with this geographic approach, this study provides an in-depth exploration of human-environment relations while taking into account and retaining the broader social context (Rust et al., 2017).

Through their focused, in-depth exploration of social phenomena, qualitative methods have the capacity to examine social structures and processes in ways quantitative studies may not. This is because qualitative methodologies often “lack the sensitivity to explore difference, inconsistency and meaning” (Drury, Homewood & Randall, 2011, p.19). As such, qualitative methodologies can uncover nuances and complexities involved in human-large carnivore relations (Goldman, Roque de Pinho & Perry, 2010; Rust et al. 2016). They are also a less threatening method of researching sensitive issues, such as retaliatory killing and injuring of protected large carnivores (Rust et al., 2016). Finally, qualitative methodologies lend a degree of power and control to participants, for example, by allowing them to express themselves using their own words and understandings about the issue (Drury, Homewood & Randall, 2011). By employing a geographic, and predominately qualitative methodology, this dissertation contributes to the growing human dimensions of conservation scholarship that uses qualitative research in human-wildlife conflict studies (Doubleday, 2018; Goldman, Roque de Pinho & Perry, 2010; Rust et al., 2016; 2017).
Other contributions of the qualitative approach is its ability to derive nuanced meanings from data that may not appear through quantitative approaches, and to delve into sensitive topics (Goldman, Roque de Pinho & Perry, 2010; Rust et al., 2017). For example, the nuances in farmers’ perceptions of wild dogs revealed positive perceptions of wild dogs alongside negative ones despite incidents of depredation. It also allowed an exploration of the different ways stakeholder groups socially construct wild dogs and how these meanings reflect diverging personal priorities, values, and agendas. The qualitative methodological approach also allowed for some participants, who otherwise may lack agency or opportunity, to express their concerns and opinions (Winchester & Rofe, 2016). For example, farmers were able to express their fear of the Botswana government and conservation policies. It also allowed participants to recount detailed stories about their experiences with wild dogs, which provided in-depth insights into the lives of wild dogs in Botswana, as well as more nuanced understandings of human-wild dog dynamics.

4. Structural, technical, and ethical recommendations

To meet the aim of this research, this section details recommendations that inform human-wild dog conflict and conservation strategies in Botswana. This dissertation provides technical conflict mitigation recommendations to address the immediate impacts of conflict on farmer livelihoods. It also presents broader structural recommendations to address the human dimensions of human-wild dog conflict in Botswana. Finally, it presents ethical recommendations focused on more compassionate relations with animals through conservation discourse and scholarship.

Given that the traditional sector dominates the cattle industry in Botswana, subsistence farmers are key to wild dog conservation efforts in human-dominated landscapes. Human-wild dog conflict in Botswana requires certain technical solutions to mitigate livestock depredation and the immediate impacts of wild dogs on farmer livelihoods. First, more effective livestock husbandry, such as accompanying livestock during the day, would make livestock less vulnerable to wild dogs. Second, conservation education focused on wild dog ecology would engage farmers in conflict mitigation, producing more immediate coexistence strategies. Finally, wild dogs prefer wild prey over livestock, therefore the presence of wild prey outside protected areas could mitigate livestock depredation.

Structural recommendations focus on broad scale social structures. First, this research reveals that farmers who are in a better socioeconomic position (higher education, income, and living on state or freehold land) are more likely to be positive toward wild dogs despite incidents of depredation. Given that compensation schemes are considered inadequate, government poverty alleviation schemes and diversified livelihood options (e.g. community-based tourism) are broader structural approaches that could foster long-term coexistence between farmers and wild dogs. Second, HWC is engendered by conflict between the agricultural and wildlife tourism and conservation, and therefore should be re-framed as human conflict over wildlife in order to consider the broader drivers. Conservation efforts are often compromised due to the lack of consideration of history, as well as cultural and social conflicts (Madden & McQuinn, 2014). This re-framing would therefore allow conservationists to acknowledge stakeholders’ feelings of antagonism and injustice, and identify diverging priorities, agendas, and management strategies. As such, conservationists could further engage in open dialogue with communities affected by wild dogs. Finally, integrated land-use management planning, where different government sectors and agencies work together toward achieving land-use planning that considers the needs of people, livestock, and humans, should be considered as a way forward.
Ethical recommendations focus on a more compassionate conservation ethic which begins with how animals are represented in conservation science writing. By recognizing animal subjectivity and agency, we can consider animals as subjects rather than objects. In doing so, we can have a fuller understanding of their lives and can acknowledge their experiences and welfare in human-dominated landscapes. Conservation practices can therefore begin to include wildlife welfare alongside other biological examinations of wildlife. To raise more awareness, conservationists may consider including data and information from blog posts, reports, and the stories and anecdotes from other individuals who spend time with wild dogs. They may also consider collaborating with animal geographers and other social scientists who have different theoretical, conceptual, and methodological approaches to understanding the lives of animals. This would present a more-holistic compassionate conservation scholarship and practice that positions wildlife as sentient, thinking, and feeling beings and illustrates their lives as both complex and nuanced, and shaped by human social structures.

5. Limitations and future research areas

This dissertation has limitations that should be addressed. It also opens the door for future research. First, by using a case study approach, this research produced context-dependent knowledge tied to the study area that may not be transferable to another regional context. Second, the transferability of the research findings is limited to human-large carnivore conflict in Botswana. Large carnivores present unique issues compared to other wildlife (e.g. livestock depredation) with specific responses and recommendations for conflict mitigation purposes (e.g. effective livestock husbandry). However, while the findings are limited to regional (i.e. Botswana and southern Africa) human-large carnivore conflict and mitigation, the broad methodological approach of this dissertation can be applied to other contexts and animals. This would allow researchers to account for the human dimensions of conservation and to explore the nuanced dynamics of HWC and conservation. Third, I was only able to spend a limited amount of time in the Central Boteti and Kweneng East where human-wild dog conflict was occurring. Additional nuance may have been uncovered through a longer term ethnographical approach (e.g. living in impacted communities for several months).

Fourth, this research did not address gender or race in the context of human-wildlife conflict. In the Central Boteti and Kweneng East, I spoke with men more frequently than women. When I approached women, I was often told to speak to the men who were present. Research has shown that HWC affects women differently than men (Ogra, 2008), therefore more in-depth examinations of how women and men are differentially affected by large carnivores is warranted. I did not explore perceptions according to race or the relationships between white and black farmers on the same farm. Recent research has found that racial tensions between black farm employees and white employers influence the occurrence of HWC (Rust et al., 2016). Given that the legacy of apartheid is not limited to South Africa and is present across southern Africa, examining how race shapes HWC on farms would contribute a more nuanced examination of how the human dimensions of conservation shape HWC. Future research should therefore build upon the socio-economic aspects (i.e. class) of this dissertation to explore gender and race in the context of HWC in Botswana.

Fifth, African wild dogs are extremely difficult to find without access to tracking devices, and even then, they are particularly elusive. As a social scientist interested in the lives of animals, I lacked the formal ethological training that may have given me deeper insight into their lives. I therefore had to rely on human experiences with wild dogs, stories about wild dogs, and biological scholarship in order to gain a sense of their subjectivity and agency.
Sixth, this study focused predominately on wild dogs as a species. Some animal geographers and compassionate conservationists have called for more focus on individual animals rather than species (Bear, 2011; Bekoff, 2013; Chambers & Main, 2012). Focusing on individual animals may give a greater sense of difference within a species (Bear, 2011) and attend to individuals and their welfare within conservation (Bekoff, 2013).

Seventh, I did not explore the lives of cattle in situations of human-wildlife conflict. Cattle are important actors in Botswana and are negatively affected by HWC. Exploring the circumstances of cattle would provide an additional exploration the role of animals in situations of human-wildlife conflict, and how different animals are affected by conflict.

Finally, as a social scientist, I was invited to take on research needed by an already established conservation research group. Recently, there has been a call to integrate conservation and natural sciences with animal geography and other social science and humanities scholarly realms focusing on human-animal relations (Bear, 2011; Echeverri et al., 2018; Hodgetts & Lorimer, 2015; Hovorka, 2017); Echeverri et al. (2018) argue that “Unless conservationists engage with academics and practitioners trained in other fields, such as the multitude of fields comprising human-animal studies, we will likely miss effective solutions to the worlds' problems” (p.59). Oftentimes, when social scientists conduct conservation-related research, they are invited to collaborate after the initial project is set up (Campbell, 2005). Future research on human-wildlife conflict, and conservation more broadly, should integrate social science research from the outset in order for the human dimensions of conservation and conflict to be considered before mitigation strategies are proposed. Moreover, social science studies on the lives of animals could include more collaboration with conservation biologists to gain a more in-depth sense of animal subjectivity and agency in order to more fully consider and attend to their welfare and inner lives (Bear, 2011; Kiley-Worthington, 2017).

6. Concluding thoughts

Will humans and wild dogs ever peacefully coexist in Botswana? I believe that there will always be a certain amount of conflict when national development and economic trajectories focus on two industries that compete with each other. I contend that the historical, socio-cultural attachment to cattle in Botswana needs to be recognized and valued by conservation biologists working with farmers in order to better understand the socio-cultural drivers of conflict. Farmers’ positive perceptions of wild dogs as a national economic resource should also be acknowledged and recognized, in that not all farmers hate wildlife. Further, rather than simply relying on technical conflict mitigation strategies, more meaningful communication and collaboration between stakeholder groups is essential. This can be achieved through integrative management plans and government commitment to poverty alleviation schemes through community involvement in Botswana’s wildlife tourism industry.

This dissertation demonstrates that human-wildlife conflict is wrapped up in social processes and, in keeping with a geographic approach, demonstrates that humans and the environment cannot be studied in isolation of each other. For human-wildlife conflict mitigation to be successful, more interdisciplinary collaborations between conservation biologists and conservation social scientists are needed. More holistic approaches to understanding the root causes of conflict by focusing on political-economic and socio-cultural conditions, and the experiences, values, and beliefs of different stakeholder groups involved, including the experiences of animals themselves, is essential to further our understandings of the drivers of human-wildlife conflict and how to mitigate it.
7. References


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