Humans, Livestock, and Lions in northwest Namibia

A Dissertation
SUBMITTED TO THE FACULTY OF THE
UNIVERSITY OF MINNESOTA
BY
John Moore Heydinger

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

Adviser: Professor Susan Jones, DVM PhD

December 2019

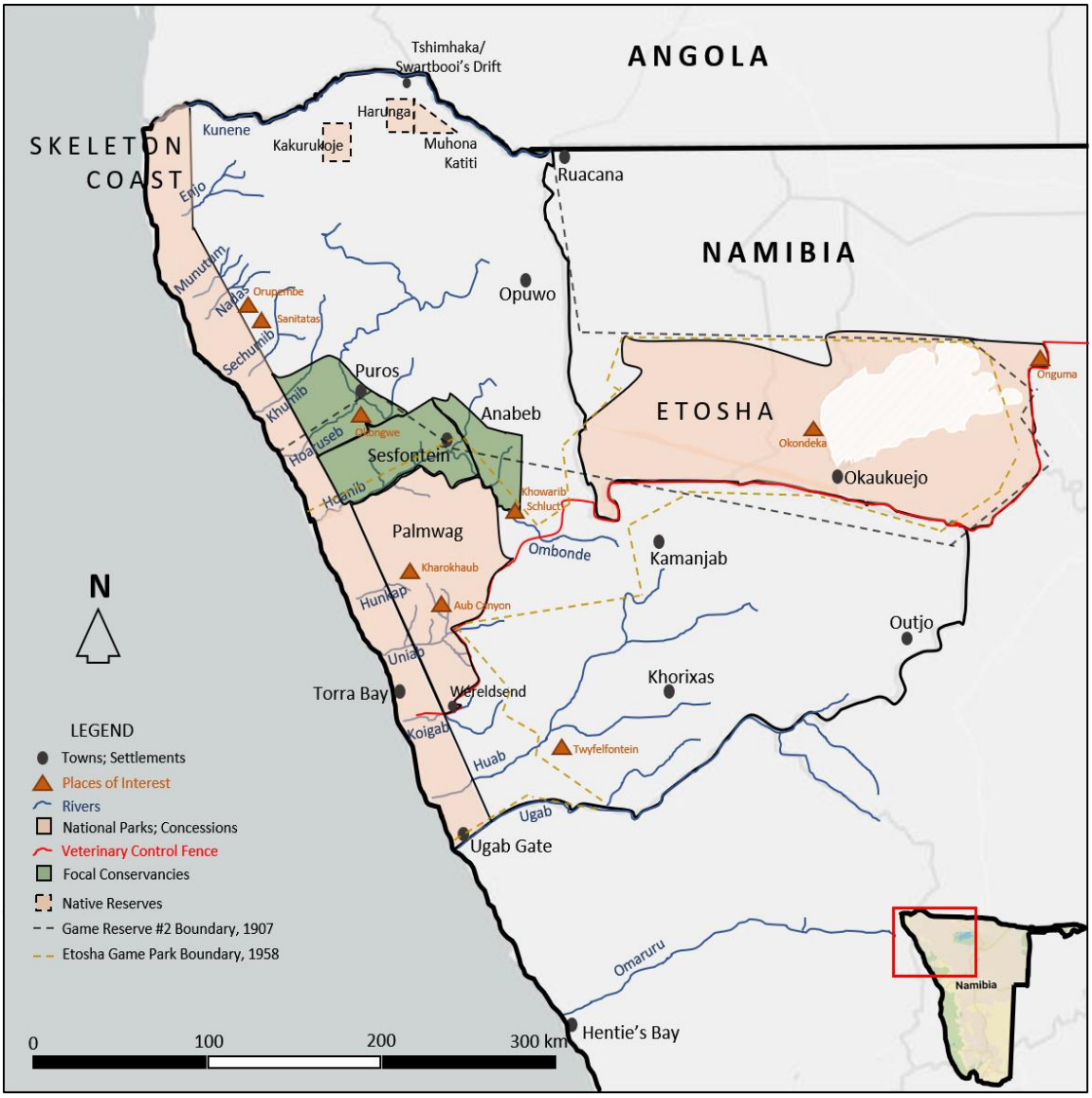

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Figure 1: Rivers, relevant historical and contemporary boundaries, towns, settlements, and places of interest mentioned in the text. Created by author.

DEDICATION

This dissertation is dedicated to John Steenkamp, Wandi Tsanes, Alfeus Ouseb, Jendery Tsaneb, and Leonard Steenkamp. Thank you so much for your time, friendship, and helping make Wêreldsend home.

ACKNOWLEDGEMENTS

Emily O'Gorman, my adviser at Macquarie University has read more of this dissertation, in more differing forms, than any other person. Her comments have improved it immeasurably. I thank her tireless efforts. Thanks also to Sandie Suchet-Pearson who read numerous drafts of chapters and papers and provided important feedback. Thank you to my adviser at the University of Minnesota Susan Jones for her trust, feedback, and encouragement. Thanks to Craig Packer for bringing me into the world of lions and for visiting northwest Namibia. Thanks to Nicholas Buchanan for IRB assistance. Thanks to the rest of my committee at the University of Minnesota, Mark Borrello, Jennifer Gunn, and Dominic Travis. Thanks to my external readers.

Thanks to past advisers: George Vrtis and Tsegaye Nega at Carleton College. Mike Meadows and Graeme Cumming at the University of Cape Town.

Thanks to numerous anonymous reviewers for their time and comments on improving chapters one, two, and appendix 1.

Thanks to Farhana Haque, Julia Knoll, and Emmie Miller for ensuring I never ran afoul of various administrations.

Thanks to Molly McCullers for Odendaal archival material. Thanks to Bernard Moore for his work digitizing a wide array of Namibian primary sources.

Thanks to Michele Elborough for opening her home in Kings Langley to us.

Thanks to my friends in Cape Town for support, listening, and a place to stay: Matthew and Catherine Lewis, John McCoy and Joy Waddell, Mark Samuel, Megan Banner, Nils and Keren Middlekoop, Ant Pascoe, Jonno Luies, and Nicky Lloyd.

Thanks to Amber and Jason Nott for a place to rest and chat in Windhoek.

Thanks to Gloria Shitthongela for keeping me in the country.

Thanks to Werner Wasserfall for keeping us on the road.

Thanks to Alphy Koruhama for refining some Otjiherero translations.

Thanks to the staff of Integrated Rural Development and Nature Conservation for supporting and partnering in this research: Willie Boonzaaier, John Kasaona, Winette Jansen, and Philemon Mwala in Windhoek and the staff of IRDNC Opuwo for space to work, sleep, and wait.

Thanks to the Northwest Lion Working Group.

Thanks to the staff at the Natural Selection Obab camp.

Thanks to the communities of Anabeb, Puros, and Sesfontein conservancies.

Thanks to Titus Runguundo, Useil Naub, and Karuhpere Musaso for facilitating surveys.

Thanks to Fritz and Birgit Schenk for being the first supporters of the Lion Ranger efforts.

Thanks to all the Lion Rangers: Kooti Karutjaiva, Ronald Karutjaiva, Phineas Kasaona, Steven Kasaona, Colin Kasupi, Pienaar Kasupi, Rodney Tjiara, Berthus Tjipombo, Uaperuako Virere, Langjohn Watokwia, Jackson Wazungu, and all the Rangers in-training.

Thanks to the Rapid Response Team Leaders: Cliff Tjikundi, Linus Mbomboro, German Muzuma, and Allu Uararavi. I am looking forward to more time together.

Thanks to Jeff Muntifering and Basilia Shivute for invaluable insights.

Thanks to Philip Stander. An inspiration.

Thanks to Uakendisa Muzuma and Kenneth //Uiseb at the Ministry of Environment and Tourism for your trust and partnership going forward.

Thanks to Garth Owen-Smith and Margie Jacobsohn for your friendship, lessons, and a place to stay.

To Russell and Tina Vinjevold: I cannot thank you enough for your support, thoughts, and friendship.

Thanks to my family at Ossipee for interest, encouragement, and space to write.

Thanks to my sister, Erin, and to Brad, for braving the Hoanib with us.

Alexandra Wattamaniuk: I could not have done this without your support.

Finally, which should have been first, I thank my parents.

ABSTRACT

Humans, livestock, and lions have inhabited shared landscapes in northwest Namibia for hundreds of years. Currently, human-lion conflict (HLC) threatens pastoral livelihoods and the viability of the region's desert-adapted lion population. In this dissertation I examine the history of human-livestock-lion relationships in the region. The goal is to create historically-informed solutions to HLC that are locally-inclusive. Drawing on archival, scientific, and governmental material, as well as social surveys and oral histories that I have performed, this is the first time that the disparate sources on human-livestock-lion relationships in northwest Namibia have been unified. While scholars of African environments have problematized interpretations of Africa's environmental colonial and postcolonial past, this is the first work to examine human-predator relationships as a fulcrum for understanding colonial and postcolonial politics and the current challenges of conserving African lions. As a document informing ongoing conservation interventions, this is the first attempt to explicitly frame applied lion conservation activities within historical contexts, critically assessing livestock as mediators of human-lion interactions. I begin by showing how the precolonial and early-colonial experience of the region's ovaHerero people was mediated through the control of livestock. I then examine how colonial era policies remade, and were aided by, the geography of predators. The effects of apartheid on the region's wildlife showcase some of the important legacies of colonial-era policies. I then reveal the long history of human-lion interactions with particular emphasis on the transformative role of livestock. I then focus on the behavior and ecology of the desert-adapted lions, highlighting important contrasts with other lion populations and emphasizing how recent monitoring induced a paradigm shift. Finally, I center ongoing HLC within communal rangelands as experienced by pastoralists and suggest one way of reframing HLC that is founded in local perspectives.

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~1830, Jonker Afrikaner and Oorlams establish sovereignty over central and southern Namibia.

1850-3, Swedish explorer CJ Andersson provides first written account of lions in NW Namibia.

1885, German rule begins, present-day Namibia known as German South West Africa.

1896/7, rinderpest epidemic in southern Africa.

1904-07, Herero-German War and the Herero Genocide.

1907, German colonial government proclaims Wildschutzgebiet Nr. 2 (Game Reserve No. 2); at approximately 80,000 km^2 it is the largest wildlife reserve in the world.

1912, lions heard roaring at Etosha for the first time in years.

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1920, South West Africa classified as a Class "C" Mandate by the League of Nations.

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1926, Etosha area lion population estimated at 200.

1931, death of Muhona Katiti.

1937, death of Harunga.

1947, Kaokoveld given dual status of Native Reserve and Game Reserve (within Game Reserve #2); Etosha Pan Game Reserve created.

1948, Nationalists triumph in South African elections; beginning of apartheid.

1958, Game Reserve #2 becomes Etosha Game Park; Etosha is split from Kaokoveld and its size is reduced (~55,000 km^2).

1963, Odendaal Commission redraws political boundaries of northwest Namibia; Kaokoveld reduced, Damaraland created, Skeleton Coast wildlife reserve created, Etosha reduced to present-day boundaries (22,270 km^2).

1967, Etosha game park becomes Etosha National Park.

1971, Skeleton Coast wildlife reserve becomes Skeleton Coast National Park (16,845 km^2).

1973, Etosha enclosed by fence.

1978/9, massive drought begins in Kaokoveld.

1981, Etosha lion population estimated at 500.

1982, last confirmed lion-caused human mortality in NW Namibia.

1987, Etosha lion population estimated at 200.

1990, Namibian independence; Kaokoveld, northern Damaraland, and commercial farmland integrated to form the Kunene Region.

1991, lions thought to have disappeared from communal land in NW Namibia.

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1999, Kunene Lion Project (later Desert Lion Conservation) formed; lion population on communal land estimated at 20 individuals.

2015, lion population within communal land in NW Namibia estimated at 180.

2017, Namibia Ministry of Environment and Tourism releases first comprehensive plan for ameliorating human-lion conflict in northwest Namibia.

ABBREVIATIONS

BAD	South Africa Department of Bantu Administration and Development
CPR	common-pool resource
CBNRM	community-based natural resource management
HLC	human-lion conflict
IRDNC	Integrated Rural Development and Nature Conservation (Namibia NGO)
IUCN	International Union for Conservation of Nature
LUKS	miscellaneous Odendaal Commission Documents (Namibia National Archives)
MET	Namibia Ministry of Environment and Tourism
NAN	Namibia National Archives
NAO	Native Affairs, Ovamboland (Namibia National Archives)
NACSO	Namibia Association of CBNRM Support Organizations (Namibia NGO)
NGO	non-governmental organization
NW	northwest
STS	science and technology studies
SWAA	South West Africa Administration (Namibia National Archives)
SWAPO	South West Africa People's Organization
TOSCO	Tourism Supporting Conservation (Namibia NGO)
UN	United Nations
VHF	very high frequency

PERMITS

Field research was performed with the permission of the Namibia Ministry of Environment and Tourism, research permit #2269/2017. Prior to implementation, social survey and oral history methods were submitted to the University of Minnesota Institutional Review Board (IRB ID: STUDY00001587), who exempted the project from further oversite. This exemption was accepted by the Macquarie University Research Office (MQ ethics ref. no. 5201700176). In each of the focal conservancies – Anabeb, Puros, and Sesfontein – written explanation of the research project was presented to representatives from the conservancy committee and was accepted in July 2017. A fourth conservancy, Torra, declined to participate in social surveys. Each respondent was verbally informed of survey methods and objectives and gave verbal assent to participate, which was audio recorded in mp3 format. One individual declined to participate.

SUPPORT

This research was supported by a Big History Anthropocene Grant from Macquarie University, by the Macquarie Department of Geography and Planning, and by the Program in the History of Science, Technology, and Medicine at the University of Minnesota. Additional support for field work was provided by Camelthorn Safaris Namibia and the National Geographic Society. Early archival work and travel was supported by the University of Minnesota Council of Graduate Students. Writing was supported by a Steuwer/Shapiro Fellowship from the Program in the History of Science, Technology, and Medicine.

Introduction

Northwest Namibia is home to a population of free-ranging desert-adapted lions (*Panthera leo*) inhabiting rural communities outside protected areas. It is also home to a diverse population of humans (*Homo sapiens*), including ovaHereros, Damara, Nama, and the Riemvasmakers, inhabiting communal land and primarily deriving their income from semi-nomadic pastoralism. As it is defined here, northwest Namibia encompasses an area bounded by the Omaruru River in the South, the Kunene River in the north, the Skeleton Coast along the Atlantic in the west, and the rim of Africa's escarpment and Etosha National Park in the east. The region is dominated by the northern Namib desert. Rainfall is low (50-250 mm per year) and erratic. Droughts are periodic, extreme, and can have multi-generational effects for humans and nonhumans. It has alternately been called an Arid Eden and the Land God Made in Anger.[1] The landscape teems with livestock and wildlife when rain is relatively plentiful, yet perennial grasses disappear during the hard years. The region is almost entirely unfenced: people and their livestock live side-by-side with wildlife. Whether humans, their livestock, and lions will continue to coexist in this hostile environment is uncertain.

The lives of humans, livestock, and lions are interwoven in northwest Namibia. This has long been the case. This dissertation examines human-lion conflict (HLC) in northwest Namibia as a social and ecological challenge rooted in the history of the region. It is primarily an environmental history with particular relevance to the historiography of twentieth century northwest Namibia, and human-lion relationships. It is envisioned as a document informing lion conservation in the region. The history of the region is populated with animals, both wild and domestic, who have acted and interacted in ways eluding human control but nevertheless affecting human lives. Here, as elsewhere, humans and animals continue to participate in an unfolding history through which they and the environment have been transformed. To-date, lion research and lion conservation interventions in other parts of Africa have been motivated by a variety of questions and objectives spanning numerous fields within the natural sciences. Though humanities and social science perspectives on historical and contemporary HLC are growing in visibility, this is the first scholarly work to incorporate previously unexamined historical and

[1] Garth Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld* (Johannesburg and Cape Town: Jonathan Ball, 2010); Jon Manchip White, *The Land God Made in Anger: Reflections on a Journey through South West Africa* (London: George Allen and Unwin Ltd, 1969), 97.

social science information into HLC and the first work to draw together disparate sources on lions in northwest Namibia.[2]

Change over time is the province of both historians and conservationists. The former aim to understand and account for it in the past, while the latter seek to implement it in the present to affect the future. Since 2005, HLC within the region has gained increasing attention from residents, conservationists, and Namibians beyond the northwest. HLC threatens both the livelihoods of residents and the survival of the desert-adapted lions. This challenge is multi-faceted: it touches economics, politics, restorative justice, animal welfare, land-tenure, duty, kinship, and tradition. Though pressing, it is, however, not unique. While HLC presents new problems to a new generation of residents and conservationists, these problems bear many similarities to those of the past. This dissertation is intended as a conservation intervention: the research informing my writing was motivated by the search for solutions to HLC on communal land in northwest Namibia. It is my conviction that history can provide important lessons with relevant applications, including new frames for wildlife conservation challenges. The aim is to bring together historical and social scientific methods to inform ongoing and future lion conservation interventions. This is the first multidisciplinary environmental history of northwest Namibia bringing humans, livestock, and lions onto a shared historical stage. My approach is practitioner-driven: through more than two years of immersive study and conservation intervention actions, I became convinced that the story of humans, livestock, and lions, is interwoven. I make no claim that the history presented here is definitive, only that it is important.

Environments, Humans, Livestock, and Lions

Northwest Namibia contains a variety of heterogenous environments, geographically dominated by mountains, gravel plains, and sandy dunes pocked by small marshes and oases, and bisected by ephemeral riverbeds. The basaltic soil is shallow, rocky, and low in productivity. The Namib desert runs the length of western Namibia. It receives little moisture from the Atlantic and the strong sea-breezes keep moist tropical air further inland, where it dries out as it sinks to the coast. Intermittent and low levels of rainfall mean the northwest is sparsely vegetated, though the further east one goes, the denser the vegetation becomes. Desert-adapted species and subspecies, such as black rhinoceros (*Diceros bicornis*), desert-adapted elephant (*Loxodonta africana*), oryx

[2] Amy J. Dickman, "Complexities of Conflict: The Importance of Considering Social Factors for Effectively Resolving Human-Wildlife Conflict," *Animal Conservation* 13, no. 5 (2010): 458–66; Keith Somerville, *Humans and Lions: Conflict, Conservation, and Coexistence* (Routledge, 2019); Jacalyn M. Beck et al., "Improving Human-Lion Conflict Research through Interdisciplinarity," *Frontiers in Ecology and Evolution* 7, no. JUN (2019): 1–8; Craig Packer, "The African Lion: A Long History of Interdisciplinary Research," *Frontiers in Ecology and Evolution* 7, no. JUL (2019): 1–6.

(*Oryx gazella*), and Hartmann's mountain zebra (*Equus zebra*), can thrive when there is enough rain. During the wet season (January-May) rains may come in brief, localized downpours. Sometimes they do not come at all. Prey species, including oryx, mountain zebra, and giraffe (*Giraffa camelopardalis*), follow the rains to find fresh grass and often congregate in ephemeral riverbeds during the dry season (June-December). Springbok (*Antidorcas marsupialis*) generally stay to the plains, while greater kudu (*Tragelaphus strepsiceros*) are found in stands of trees, thick bush, and cliffsides. Surface water in the region is sparse, however, an extensive government borehole-drilling program in the 1970s greatly increased available water for livestock and wildlife. Though borehole yields are among the lowest in the country, since that time livestock and wildlife are generally grazing-limited, not water-limited.[3] The boom-and-bust nature of the desert causes prey numbers to fluctuate widely. Beginning in 2000 the region experienced a relatively wet period, with the result that both wildlife and livestock numbers increased. However, from 2011 to 2016, indicator prey species diminished by as much as 60% and livestock numbers by as much as 67.9%, primarily due to an ongoing drought.[4] Drought has been a consistent feature of life in the northern Namib, and desert species are well adapted to surviving extended periods with limited water. However, relatively low amounts of rainfall over the past decade suggest that global climate change may increase aridity in the region – though this remains to be seen. (see map, Figure 1).

Figure 2: Wêreldsend Base Camp in the Palmwag Concession, Kunene Region. Photo: A. J. Wattamaniuk.

[3] John Mendelsohn et al., *Atlas of Namibia: A Portrait of the Land and Its People* (Cape Town, South Africa: David Philip, 2003); Philip E. Stander, *Vanishing Kings: Lions of the Namib Desert*, ed. Diane Mullen (Johannesburg, South Africa: HPH Publishing, 2018); Garth Owen-Smith, Personal Communication, 2018.

[4] NACSO, "The State of Community Conservation in Namibia: A Review of Communal Conservancies, Community Forests and Other CBNRM Initiatives; Annual Report 2016" (Windhoek, Namibia, 2016). See Appendix 1.

Northwest Namibia is home to the ovaHerero, Damara, Nama, and Riemvasmaker peoples, as well as small numbers of Ovambo, and white Namibians. Other groups of people are certainly present, and at different times step into significant roles, though they do not feature prominently. The history of the ovaHerero in northwest Namibia is engaged with extensively in chapter one and ovaHerero perspectives run throughout the dissertation. Though I focus on northwest Namibia, an ovaHerero diaspora exists across Namibia, southern Angola, and western Botswana. OvaHereros across this diaspora self-identify in different ways, but share the common language of Otjiherero. The term "ovaHerero" (those of yesterday, or the old people) encompasses today's Herero, Himba, and Tjimba groups. Within northwest Namibia, ovaHereros primarily reside in the northern part of the region, formerly known, and still often referred to as, Kaokoveld. They are, primarily, a people for whom cattle are the focus of their lives and culture. The Damara primarily reside in former Damaraland and have for hundreds of years. Their roots remain something of a mystery. They are related to the ovaHerero and have long practiced pastoralism, primarily of goats (*Capra aegagrus*) and sheep (*Ovis aries*). Yet, they speak a variant of the Khoekhoe language, similar to the Nama.[5] The Nama are the largest extant group of the Khoe-Sān people. They inhabit parts of Namibia, Botswana, and South Africa. Traditionally nomadic groups of hunter-gatherers, Nama in the Namib have been practicing pastoralism for hundreds of years.[6] As we will see, groups of Nama played a critical part in the history of nineteenth century Namibia and Kaokoveld. A small community of Nama still resides around the village of Sesfontein in Kunene. The Nama have been the subject of much scholarship. Studies relevant to this dissertation include the work of John Kinahan, Brigette Lau, and Nigel Penn.[7] The Riemvasmakers are a small group of immigrants forcibly moved to northwest Namibia from the Northern Cape in South Africa by the South African government in the 1970s. Very little is written of their culture or history. The Ovambo make-up the majority of Namibia's population and primarily reside in Ovamboland in the present-day regions of Omusati, Oshana, and Oshikoto. Their history and culture have been extensively documented. The works of Emmanuel

[5] Those interested in historical and ethnographic studies on the Damara should consult the following dissertations: Sian Sullivan, "People, Plants and Practice in Drylands: Socio-Political and Ecological Dimensions of Resource-Use by Damara Farmers in North-West Namibia" (University College London, 1998); Richard F. Rohde, "Nature, Cattle Thieves and Various Other Midnight Robbers: Images of People, Place and Landscape in Damaraland, Namibia" (University of Edinburgh, 1997).
[6] John Kinahan, *Pastoral Nomads of the Central Namib Desert: The People History Forgot* (Windhoek: Windhoek Archaeological Trust, 1991).
[7] Kinahan; Brigitte Lau, *Namibia in Jonker Afrikaner's Time* (Windhoek, Namibia: Windhoek Archives Publication Series, 1987); Nigel Penn, *The Forgotten Frontier: Colonist and Khoisan on the Cape's Northern Frontier in the 18th Century.* (Athens, Ohio and Cape Town, South Africa: Double Storey Books, 2005).

Kreike and Patricia Hayes offer overviews of Ovambo history.[8] White Namibians are primarily descended from Afrikaans-speaking South Africans who settled in the country during South African rule and people descended from German settlers. Many white Namibians have written their own history. Stassen's *The Thirstland Trek* provides a rich and nuanced account of earlier Voortrekker settlers in Kaokoveld. Green's *Lords of the Last Frontier* provides interesting insight into how settlers viewed themselves and their adopted land.[9]

Humans and Environmental History

The Namibian experience during the South African colonial period (1915-1990) has largely been ignored within the historiography of African environments and wildlife conservation. Histories by Christo Botha, Lorena Rizzo, and Giorgio Miescher are instructive exceptions, though they primarily focus on the early period of South African rule.[10] Botha presents Namibian environmental history during the colonial era as concerned with European attempts to secure land tenure. He argues that the 'land question' in colonial Namibia was the key to exercising political control by and over the white population as well as ensuring that the territorial economy was sufficiently robust. Environmental factors were largely subsumed by economic, and therefore political, interests. However, he shows that, despite propagating myths to the contrary, neither the colonial state nor the Territory's settlers could ignore the particularities of transforming a rough country into a European settler economy. Many lands suitable for agriculture were beyond the reach of white society in the northern 'native' areas.[11] I apply Botha's emphasis on political factors as generative of environmental transformations to the specific case of the northwest. Rizzo places hunting, the peasantry, and mobility at the center of her examination of northwest Namibia. Her insight, echoing James Scott, is that marginality can also be a position of power. I apply her critical eye to my reading of archival and colonial documents, the goal being to allow the men, women, and animals represented by others to speak in spite of often disingenuous

[8] Emmanuel Kreike, *Re-Creating Eden: Land Use, Environment, and Society in Southern Angola and Northern Namibia* (Portsmouth: Heinemann, 2004); Patricia Hayes, "Order out of Chaos: Mandume Ya Ndemufayo and Oral History," *Journal of Southern African Studies* 19, no. 1 (1993): 89–113.
[9] Nicol Stassen, *The Thirstland Trek, 1874-1881* (Pretoria: Protea Book House, 2016); Lawrence G. Green, *Lords of the Last Frontier: The Story of South West Africa and Its People of All Races* (Cape Town: Howard B. Timmins, 1952).
[10] Christo Botha, "The Politics of Land Settlement in Namibia, 1890–1960," *South African Historical Journal* 42, no. 1 (2000): 232–76; Christo Botha, "People and the Environment in Colonial Namibia," *South African Historical Journal* 52, no. 1 (2005): 170–90; Giorgio Miescher, *Namibia's Red Line: The History of a Veterinary and Settlement Border* (New York, NY: Palgrave Macmillan, 2012); Lorena Rizzo, *Gender and Colonialism: A History of Kaoko in North-Western Namibia, 1870s-1950s* (Switzerland: Basler Afrika Bibliographien, 2012).
[11] Botha, "The Politics of Land Settlement in Namibia, 1890–1960"; Botha, "People and the Environment in Colonial Namibia."

representations.[12] Miescher's history of Namibia's 'Red Line' reveals the formative role of veterinary science in shaping northern Namibia during the early colonial era. His emphasis on how physical and conceptual boundaries shift in response to different administrative, economic, and epidemiological priorities highlights the important role of policy and practice in creating tangible transformations in the lives of humans and nonhumans, as well as on the landscape. The interchange that he traces between veterinary, political, and racial boundaries is extended here to show how racialized policies interacted with wildlife to remake the landscape.[13]

At times I have found the currents of South African history to be relevant, perhaps more so than other historians of northwest Namibia. This is particularly evident in chapters two and three. However, I do not suggest that Namibia's history must be categorized within South African history.[14] The different experiences of the two countries, particularly the lack of scientific expertise and international partnerships in the conservation realm in Namibia when compared to South Africa, remain sources of postcolonial struggle. My extended focus on the apartheid era in chapter three, as well as my thematic focus on predator destruction and conservation, situates this research within certain broader discussions of African environmental history. How colonial policies and practices misunderstood and altered African environments is an important theme in African environmental history.[15] Founded alongside other postcolonial historiographical changes critiquing colonial rule, the historiography of Africa's rural environments (re)examines how actions taken by the peasantry were part of colonial-era social and political changes and environmental transformations.[16] Throughout the twentieth century, particularly following the end

[12] Rizzo, *Gender and Colonialism*; Lorena Rizzo, "The Elephant Shooting: Colonial Law and Indirect Rule in Kaoko, Northwestern Nambia, in the 1920s and 1930s," *Journal of African History* 48, no. 2 (2007): 245–66; James C. Scott, *Weapons of the Weak: Everyday Forms of Peasant Resistance* (New Haven and London: Yale University Press, 1985).
[13] Miescher, *Namibia's Red Line*.
[14] Dag Henrichsen et al., "Rethinking Empire in Southern Africa," *Journal of Southern African Studies* 41, no. 3 (2015): 431–35.
[15] William Beinart, "African History and Environmental History," *Africa* 1492, no. 395 (2000): 269–302; Jane Carruthers, "Environmental History with an African Edge," in *Rachel Carson Center, Perspectives*, ed. Christof Mauch and Libby Robin (Munich, Germany: Rachel Carson Center for Environment and Society, 2014), 9–16; John R McNeill, "Observations on the Nature and Culture of Environmental History," *History and Theory* 30, no. 4 (2003): 5–43; Paul Sutter, "What Can U.S. Environmental Historians Learn from Non-U.S. Environmental Historiography?," *Environmental History* 8, no. 1 (2003): 109–29.
[16] Jane Carruthers, "Environmental History in Africa," in *A Companion to Global Environmental History*, ed. John R McNeill and Erin Stewart Mauldin (Malden, Massachusetts: Wiley-Blackwell, 2012), 96–115; Beinart, "African History and Environmental History"; Sterling D. Evans, *Bound in Twine: The History and Ecology of the Henequen-Wheat Complex for Mexico and the American and Canadian Plains, 1880-1950* (University of Texas A&M Press, 2013); Helen Tilley, *Africa as a Living Laboratory: Empire, Development, and the Problem of Scientific Knowledge, 1870-1950* (Chicago and London: University of Chicago Press, 2011); William Beinart and Lotte Hughes, *Environment and Empire* (Oxford University Press, 2009); Tom Griffiths and Libby Robin, eds., *Ecology and Empire: Environmental History of Settler Societies* (Edinburgh: Edinburgh University Press, 1997).

of the colonial era, Africa has been presented to western audiences, primarily by westerners, as a continent riven by social turmoil and ecological loss. African-centered perspectives of societal and ecological transformation continue to be an important part of African-forward postcolonial scholarship.[17] Each of the chapters of this dissertation are centered on African perspectives; keeping in mind that settlers of European descent also form part of Africa's increasingly diverse population. African perspectives can also be western perspectives. Analytical work by anthropologists and geographers have greatly contributed to important studies questioning declensionist interpretations of African landscapes and powerlessness among economic and political underclasses.[18] This study crosses the conceptual boundaries of several historical sub-disciplines. It contributes to the scholarly work examining the histories of African environments, postcolonial histories of Namibia, and human-animal histories. It also contributes to the historiography of African colonial-era environmental history and geography, which reveals how politics and environments drew together humans and nonhumans to drive historical changes.[19]

Livestock and Human-Animal Studies

Cattle (*Bos taurus*), and to a lesser extent other livestock, are an important mediator within this history. Anthropological scholarship of northwest Namibia emphasizing the importance of livestock with ovaHerero culture has formed a backdrop for my examination of human-livestock-lion relationships. Works by Michael Bollig, David Crandall, and Margaret Jacobsohn, all of whom focus primarily on the Himba, are particularly relevant. Bollig's extensive and immersive work in Kaokoveld demonstrates a commitment to examining how Himba culture and history are interwoven with the physical landscape. By reframing colonial-era isolation as the result of South African official policy and practice, Bollig is the first scholar I am aware of to emphasize the interrelated contingency of local people, livestock, and the environment as a formative component in northwest Namibia. His commitment to embodied experience and integrating archival and ethnographic study has informed and reinforced my application of these methods to

[17] Martin Meredith, *The Fate of Africa: A History of the Continent Since Independence* (New York: PublicAffairs, 2011); Jonathan S. Adams and Thomas O. McShane, *The Myth of Wild Africa: Conservation without Illusion* (Berkeley, Los Angeles, London: University of California Press, 1992).
[18] e.g. James Ferguson, *The Anti-Politics Machine: "Development," Depoliticization, and Bureaucratic Power in Lesotho* (Minneapolis and London: University of Minnesota Press, 1994); James Fairhead and Melissa Leach, *Misreading the African Landscape: Society and Ecology in a Forest-Savanna Mosaic.* (Cambridge: Cambridge University Press, 1996).
[19] William Beinart, *The Rise of Conservation in South Africa: Settlers, Livestock and the Environment, 1770-1950* (Oxford, UK: Oxford University Press, 2003); Kate B. Showers, "Soil Erosion in the Kingdom of Lesotho: Origins and Colonial Response, 1830s–1950s," *Journal of Southern African Studies* 15, no. 2 (1989): 263–86; James C. McCann, *Green Land, Brown Land, Black Land: An Environmental History of Africa, 1800-1990.* (Portsmouth, New Hampshire: Heinemann, 1999).

humans, livestock, and lions.[20] Crandall connects the Himba secular and spiritual worlds, grounding conceptions of time in cattle. His examination of the symbolic valuation of cattle is anything but abstract. By showing how objects, ideas, and time can stand-in for one another, he frames an alternate worldview – that of the Himba as a cattle culture – as consistent, valuable, and instructive. His work has been central to reframing the history of human-livestock-lion interactions and ongoing conservation interventions.[21] Jacobsohn's in-depth ethnographic work reveals important dimensions of gendered experience and recounts stories that add detail to historical outlines. By giving voice to under-represented people her work has enabled me to recover meanings in historical events that were otherwise beyond reach. Her dissertation drawing-together material culture and social relations captures transforming Himba society.[22] A common thread among these works is their relentless emphasis on the importance of materiality in understanding the ovaHerero of northwest Namibia. In its own way, each of these is inherently an environmental account. This speaks to the immediacy of the ongoing environmental challenges facing inhabitants of northwest Namibia. Incorporating these anthropological works into this environmental history enables me to view human-livestock-lion relationships through a different frame. Their emphasis on livestock, particularly cattle, was indispensable to understanding such diverse issues as economics, kinship, politics, culture, and HLC in northwest Namibia.

The transformation of human-livestock-lion relationships has been the motive force of this research and dissertation. As such it is informed by and contributes to the field of human-animal studies, particularly human-animal histories. Human-animal studies scholarship takes seriously the proposition that humans and animals share the world, and in doing so change one another. Some useful introductions to this field include works by Tim Ingold, Susan Jones, and Donna Haraway.[23] Human-animal studies scholars have begun asking a unique set of questions

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[20] e.g. Michael Bollig, "The Colonial Encapsulation of the North-Western Namibian Pastoral Economy," *Africa: Journal of the International African Institute* 68, no. 4 (1998): 506–36; Michael Bollig, "An Outline of Pokot and Himba Societies: Environmental, Political Economy and Cultural Beliefs," in *Risk Management in a Hazardous Environment: A Comparative Study of Two Pastoral Societies* (Springer, 2006); Michael Bollig, "Kinship, Ritual and Landscape among the Himba of Northwest Namibia," in *African Landscapes: Interdisciplinary Approaches*, ed. Michael Bollig and O. Bubenzer (Springer, 2009), 327–51.

[21] D. P. Crandall, "The Role of Time in Himba Valuations of Cattle," *The Journal of the Royal Anthropological Institute* 4, no. 1 (1998): 101–14; D. P. Crandall, "Female over Male or Left over Right: Solving a Classificatory Puzzle among the OvaHimba," *Africa* 66, no. 3 (1996): 327–48.

[22] Margaret Jacobsohn, "Negotiating Meaning and Change in Space and Material Culture: An Ethno-Archaeological Study among Semi-Nomadic Himba and Herero Herders in North-Western Namibia" (University of Cape Town, 1995).

[23] Tim Ingold, *What Is an Animal?* (London and Boston: Unwin Hyman, 1988); Susan D. Jones, *Valuing Animals: Veterinarians and Their Patients in Modern America* (Baltimore, Maryland: Johns Hopkins

not limited to aspects of meaning, embodiment, experience, and becoming that are revealed in the relationships between humans and animals. As noted by van Dooren et al., relationships between humans, and between humans and animals, have histories. Becoming, the creative act of transformation, never occurs in isolation. Becoming is always 'becoming-with.' For those who explicitly study and work at the human-animal interface, Haraway's question is especially pertinent: who are 'we' (humans) becoming-with? When humans and nonhumans interact becoming-with is part of the interrelated, ongoing formation of different entities. The outcome is how different humans and nonhumans are co-constituted.[24] Environmental humanities scholar Kate Wright has noted that becoming-with affirms that because the world is shared, identities partake of external influences, including the effects of nonhumans.[25]

I have sought to understand how human-livestock-lion relationships have formed a particular aspect of human becoming-with in northwest Namibia: HLC. The concept of becoming-with is important to understanding how humans in northwest Namibia interpret relationships with livestock and lions. More than this, becoming-with affirms that studying human history in northwest Namibia implies studying relationships between humans and nonhumans. Human-animal studies scholars search for specific contact locations where becoming-with can be highlighted and critically examined.[26] Key findings show that human becoming-with is always occurring in creative relationship with a variety of nonhumans, including lions, livestock, elk, plants, and microbes.[27] Such accounts enable historians and other scholars to refigure the once clear boundaries between human and nonhuman as permeable, even collapsible. The variety of historical and ongoing human-nonhuman interactions has given rise to the field of multispecies studies, wherein humans and numerous other actors are continually creating a shared world. Multispecies studies are providing 'thick' accounts of species other than our own, multiplying perspectives on human and nonhuman societies, and incorporating more-

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University Press, 2003); Donna J. Haraway, *When Species Meet* (Minneapolis and London: University of Minnesota Press, 2008).

[24] Haraway, *When Species Meet*, 244.

[25] Kate Wright, "Becoming-With," *Environmental Humanities* 5 (2014): 277-281.

[26] S. Eben Kirksey and Stefan Helmreich, "The Emergence of Multispecies Ethnography," *Cultural Anthropology* 25, no. 4 (2010): 545–76.

[27] Thom van Dooren, Eben Kirksey, and Ursula Münster, "Multispecies Studies: Cultivating Arts of Attentiveness," *Environmental Humanities* 8, no. 1 (2016): 1–23; Virginia DeJohn Anderson, *Creatures of Empire: How Domestic Animals Transformed Early America* (Oxford University Press, 2004); Londa Schiebinger, *Plants and Empire: Colonial Bioprospecting in the Atlantic World.* (Cambridge, Massachusetts: Harvard University Press, 2004); Rane Willerslev, *Soul Hunters: Hunting, Animism, and Personhood among the Siberian Yukaghirs* (Berkeley, Los Angeles, London: University of California Press, 2007); Bruno Latour, *The Pasteurization of France*, trans. Alan Sheridan and John Law (Cambridge and London: Harvard University Press, 1988).

than-scientific accounts of nonhuman organisms.[28] My original contributions to this field include applying insights from human-animal studies scholarship to human-livestock-lion relationships during the precolonial, early colonial, apartheid, and independence eras within northwest Namibia. I also show how political power and inequalities were manifest within and negotiated through livestock and lions and how government policies and practices, including the creation of boundaries, unequal access to technology, and lingering effects of colonialism, affect the lives of livestock and lions throughout this history.

Lions and Human-Predator Studies

African lions are currently reduced to 10% of their historic range. Since the mid-1990s, their numbers have decreased by 43%: there are currently an estimated 20,000 to 30,000 lions in Africa. Primary threats across the continent include loss of habitat and prey species, and mortality following HLC. Within fenced protected areas in southern Africa lion numbers are stable, even increasing.[29] However, across Africa, protected areas with lions are currently underfunded. A recent study estimated that an additional US$900 million to US$2.1 billion is needed, annually, to secure African lion populations within protected areas: nearly all protected areas containing lions are inadequately funded.[30] Only one-third of protected areas maintain lions at 50% carrying capacity.[31] Protected areas have also been challenged by social justice advocates for their histories of dispossessing indigenous people and serving as exclusionary spaces that further entrench economic and social inequalities.[32] Yet, beyond fenced protected areas, conservation budget requirements are greater and these places maintain lion numbers at a lower percentage of their estimated carrying capacity.[33] Human population growth is driving widespread transformations in sub-Saharan African environments. It is estimated that by 2050 the region will contain 2 billion

[28] Clifford Geertz, "Thick Description: Toward an Interpretive Theory of Culture," in *The Cultural Geography Reader* (Routledge, 2008), 41–51; Thom van Dooren and Deborah Bird Rose, "Lively Ethography," *Environmental Humanities* 8, no. 1 (2016): 77–94; Kirksey and Helmreich, "The Emergence of Multispecies Ethnography."
[29] Andrew Jacobson and Jason Riggio, "Big Cats in Africa: Status Update on the African Lion, Cheetah and Leopard, with Recommendations for Effective Big Cat Conservation Funding," 2018; Craig Packer et al., "Conserving Large Carnivores: Dollars and Fence," *Ecology Letters* 16, no. 5 (2013): 635–41.
[30] Peter A. Lindsey et al., "More than $1 Billion Needed Annually to Secure Africa's Protected Areas with Lions," *Proceedings of the National Academy of Sciences* 115, no. 45 (2018): E10788–96.
[31] Jacobson and Riggio, "Big Cats in Africa."
[32] Mark Dowie, *Conservation Refugees: The Hundred-Year Conflict between Global Conservation and Native Peoples* (Cambridge, Massachusetts: The MIT Press, 2009); Paige West, James Igoe, and Dan Brockington, "Parks and Peoples: The Social Impact of Protected Areas," *Annual Review of Anthropology* 35, no. 1 (2006): 251–77.
[33] Packer et al., "Conserving Large Carnivores."

people, by 2100, as many as 4.5 billion.[34] The effect this rapid growth will have on Africa's environments and wildlife is unknown. By these metrics the future for lions in the wild appears bleak.

An exception to these trends has been the desert-adapted lions of northwest Namibia. From a remnant population of perhaps 20 individuals in 1997, to approximately 180 in 2015, lions in northwest Namibia have achieved a remarkable recovery – almost 400%. This recovery has primarily taken place upon communal land. Desert-adapted lions inhabit communal conservancies, which they share with ovaHerero, Damara, Nama, and Riemvasmaker rural pastoralists, as well as unfenced tourism concessions and the Skeleton Coast National Park. Since 2005, overlap between desert-adapted lion home range and communal farmers has been generating a high frequency of HLC. Preventative and retaliatory killings associated with HLC are the biggest threat to this population. Since 2000, 89% of recorded lion (non-cub) mortalities on communal land have been associated with HLC.[35] Beginning in the late 1990s, a former Etosha National Park ranger, Philip Stander, moved permanently into the Kunene Region to study and work to conserve the desert-adapted lions.[36] In the ensuing twenty-plus years, he has been joined by a growing group of committed conservationists who monitor lion movements, partner with conservancies, government, and the local tourism industry, and work with rural pastoralists to limit HLC. Lion conservation interventions in the region have had successes and failures. As in other parts of Africa, the future of lions on communal land in northwest Namibia is uncertain.

The historical and ongoing challenges of HLC can be fruitfully understood by drawing on insights from scholarship focusing on the shared history of humans and predators. Particularly relevant is the work of Peter Boomgaard on tigers (*Panthera tigris*) in the Malay world, Jon Coleman's history of settler-wolf (*Canis lupus*) relations in colonial New England, Marcus Baynes-Rock's ethnography of people and spotted hyenas (*Crocuta crocuta*) in Harar, Ethiopia, and Mahesh Rangarajan's lion-centered history of the Gir Forest, India.[37] These scholars have made great strides in de-centering human experiences in human-predator relationships.

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[34] United Nations Department of Economic and Social Affairs - Social Division, "World Population Prospects 2019: Data Booklet," 2019, http://www.ncbi.nlm.nih.gov/pubmed/12283219.

[35] Namibia Ministry of Environment and Tourism, "Human-Lion Conflict Management Plan for North West Namibia" (Windhoek, Namibia, 2017), http://www.the-eis.com/data/literature/NW Lion Management Plan 20161222_V1.pdf.nami

[36] Stander, *Vanishing Kings*.

[37] Peter Boomgaard, *Frontiers of Fear: Tigers and People in the Malay World, 1600-1950* (New Haven and London: Yale University Press, 2001); Jon Coleman, *Vicious: Wolves and Men in America* (New Haven and London: Yale University Press, 2004); Marcus Baynes-Rock, "Hyenas like Us: Social Relations with an Urban Carnivore in Harar, Ethiopia" (Macquarie University, 2013), papers2://publication/uuid/BB11F5AC-BFFA-45DA-9BB8-14788EFC267E; Mahesh Rangarajan, "Animals with Rich Histories: The Case of the Lions of Gir Forest, Gujarat, India," *History and Theory* 52, no. 4 (2013): 109–27.

Boomgaard examines tigers as dynamic historical entities in the face of changing human policy and practice. Focusing upon the subject of human-eating, Boomgaard finds that tigers adopted this trait as a coping mechanism in response to particular human-environmental incursions. In his account tigers, humans, and the environment are dynamic. Drylands such as the northern Namib display high boom-and-bust variations. I show that how humans and lions react to, and interact with one another, within these challenging environments is an important part of this history. Coleman examines the process by which European settlers and wolves became enemies. He shows that settler violence against wolves was not perpetrated because of inborn fear, but rather because of the mediation of livestock, which were settlers' property. As settlers moved deeper into North America's interior, they replaced game with livestock, changing wolves' prey options. As Coleman notes, "[t]he colonization of North America was a profoundly zoological event." A "battle of reproduction" between wolves and settlers pitted wolf survival against livestock survival.[38] Livestock are central to this history and to ongoing conservation interventions in northwest Namibia. The insights of Coleman have been critical to the figuration of this project as addressing the human-livestock-lion nexus. I contribute to the understanding of HLC within northwest Namibia by refiguring it as a challenge of human-livestock-lion relations. Coleman's history is largely mute on the role of the colonial government in alternately encouraging or retarding human persecution of predators. The effect of government policy and practice, as well as government-sponsored research, is shown to be important to the emergence of contemporary HLC. Baynes-Rock examines how spotted hyena and their human neighbors within the walled city of Harar, Ethiopia, engage in a mutual "co-shaping" where the hyenas of the city, the city's human residents, and their livestock have each taken on their present aspect in relation to one another. Baynes-Rock's commitment to ethnographic practice as a means for understanding human and hyena actors has been central to my approach. His emphasis on socially-situated (human) culture as an interpretive lens is particularly pertinent to chapters four through six. Where Baynes-Rock remains focused on contemporary human-hyena interactions, I centrally locate history as a means for understanding conservation challenges. Rangarajan shows that lions and humans in India's Gir Forest are both products and drivers of history. By differentiating human-lion interactions by socioeconomic standing he shows that different people occupy different positions of vulnerability concerning large predators. I add to this by showing that livestock and lions can be weaponized to reinforce unequal socioeconomic, even racialized standings. Rangarajan's insistence that change can be driven by nonhumans echoes throughout this history. Each of these colonial and postcolonial human-predator histories indicate that human

[38] J. Coleman, *Vicious*, 196.

behavior and society shape and are shaped by the predators we encounter and the socioeconomic and political circumstances under which we encounter them. I draw on these approaches throughout this dissertation and build on them, particularly adding insights pertinent to the lions of northwest Namibia that can deepen the toolkit of human-predator researchers, including conservationists.

Conflict and Conservation

HLC is a type of human-wildlife conflict. Human-wildlife conflict is defined as conflicts occurring when an action by humans or wildlife has an adverse effect on the other.[39] Human-wildlife conflict has recently been growing in notoriety and valence as a wildlife conservation challenge, though it is not a new issue. Humans and wildlife have been struggling against one another for space, food, and to secure reproduction for millions of years, with the scale turning in favor of humans, particularly Europeans and European colonists and settlers, since the beginning of the 1500s. The current scale of human-induced transformation of the biosphere has nonhuman winners and losers. However, the preponderance of evidence suggests that ongoing habitat and species loss is likely the greatest collective process of human-wildlife conflict ever; overwhelmingly leading to losses experienced by wildlife and, not incidentally, human populations directly dependent upon ecosystem services.[40] In addition to local and species-level extinctions, human-wildlife conflict can lead to wildlife range collapses, large-scale population suppression, the creation of population sinks, and indirect effects including social and behavioral disruptions to animal communities, as well as trophic cascades, and habitat destruction.[41] On the human side, untold millions in property damage occurs annually from a wide array of terrestrial and avian species. In particular, predators and large herbivores cause life-altering economic destruction to individuals and families and every year kill humans across the world. Predators have been shown to be the sources of human-wildlife conflict considered the most threatening

[39] Stephen M. Redpath et al., "Understanding and Managing Conservation Conflicts," *Trends in Ecology and Evolution* 28, no. 2 (2013): 100.
[40] Elizabeth Kolbert, *The Sixth Extinction: An Unnatural History* (New York, NY: Henry Holt and Company, 2014); Stephane Hallegatte et al., *Cliamte Change and Development Series: Shock Waves-Managing the Impacts from Climate Change and Poverty* (Washington, DC: The World Bank, 2016); John M. Heydinger, "Reinforcing the Ecosystem Services Perspective: The Temporal Component," *Ecosystems* 19, no. 4 (2016): 661–73.
[41] Rosie Woodroffe, Simon Thirgood, and Alan Rabinowitz, "The Impact of Human-Wildlife Conflict on Natural Systems," in *People and Wildlife: Conflict or Coexistence*, ed. Rosie Woodroffe, Simon Thirgood, and Alan Rabinowitz (Cambridge: Cambridge University Press, 2005), 1–12.

among rural African pastoralists, chiefly because of the perceived dangers to people and livestock.[42]

HLC is considered a critical challenge to the survival of Africa's lions. Subsistence pastoralism is the primary land-use throughout much of the continent's arid and semiarid areas. Growing human populations are increasing pressure on rangelands and leading to habitat transformations that are constraining the limits of both livestock and lion range.[43] If lions and subsistence pastoralists are unable to coexist, it is likely that lion range will continue to disappear. A growing body of research examines the potentials of conserving lions within landscapes shared by subsistence pastoralists. Better understanding the drivers of HLC and implementing mitigation measures to combat HLC have been shown to reduce lion killings by subsistence pastoralists.[44] I add to this literature by incorporating an examination of the historical drivers of HLC.

Social and economic positions occupied by rural pastoralists are historically contingent. In northwest Namibia, the presence of both pastoralists and lions are also historically contingent. In chapter two in particular, I argue that lions persisted on communal land partially because of the legacies of racialized human-predator policies. Prior eras of HLC and lion killing highlight the recency of lion conservation. As chapter four shows, lions have long terrorized residents of northwest Namibia. Prior to the 1950s, lions in Namibia were extirpated as a matter of policy. Hunting, particularly of large and dangerous wildlife, was an important part of European expressions of masculinity in African settler societies.[45] Hunting dangerous predators was also a means for settlers to limit threats to livestock – often their main source of livelihoods. Africans also sought to destroy dangerous predators, though, as I show, they were less successful. The innovation of wildlife conservation during the twentieth century transformed human-lion relationships. Lions, formerly considered agonistic to human flourishing, became objects of conservation concern for certain people. Different perspectives on the importance of lion

[42] Amy J. Dickman et al., "Carnivores, Culture and 'Contagious Conflict': Multiple Factors Influence Perceived Problems with Carnivores in Tanzania's Ruaha Landscape," *Biological Conservation* 178 (2014): 19–27.
[43] IUCN SSC Cat Specialist Group, "Guidelines for the Conservation of Lions in Africa, Version 1.0 - December 2018" (Muri/Bern, Switzerland, 2018).
[44] Stephanie S. Romañach, Peter A. Lindsey, and Rosie Woodroffe, "Determinants of Attitudes towards Predators in Central Kenya and Suggestions for Increasing Tolerance in Livestock Dominated Landscapes," *Oryx* 41, no. 2 (2007): 185–95; Leela N. Hazzah et al., "Efficacy of Two Lion Conservation Programs in Maasailand, Kenya," *Conservation Biology* 28, no. 3 (2014): 851–60; Dickman et al., "Carnivores, Culture and 'Contagious Conflict': Multiple Factors Influence Perceived Problems with Carnivores in Tanzania's Ruaha Landscape."
[45] John M. MacKenzie, *The Empire of Nature: Hunting, Conservation, and British Imperialism* (Oxford, UK: Manchester University Press, 1988); William M. Adams, *Against Extinction: The Story of Conservation* (London and Sterling, VA: Earthscan, 2004), 19–41.

persistence within and beyond protected areas reveal historical fissures in the development and implementation of wildlife conservation in postcolonial African societies.

During the nineteenth century, conservation in southern Africa generally meant ensuring access to arable land for human subsistence. Wildlife protection only emerged as a concern for some settlers towards the end of the century. During this period, colonial governments passed laws restricting African hunting rights and expropriating millions of hectares of African land.[46] In the early twentieth century South Africa's national park model was the paradigm for wildlife conservation in sub-Saharan Africa. However, many governing regimes were under-resourced and parks often existed in name only. As noted by South African historian Jane Carruthers, parks are "ambiguous symbols" reflecting the politics and values of colonial-era rule, which often marginalized Africans.[47] Scientific professionalism among conservationists increased during the first half of the twentieth century and increasingly interventionist forms of wildlife management predominated. By the middle of the century the national park model was considered successful enough that it was adopted across southern Africa.[48] As was the case for Etosha, the creation of national parks often meant removing African residents from the area.[49] State control of resources fostered dissatisfaction among oppressed peoples and contributed to African independence movements. While formal colonialism diminished, ecological concerns were given precedence in conservation rhetoric. Postcolonial states rarely unmade parks and often adopted colonial-era conservation strategies. As in northwest Namibia, this often meant that colonial-era land designations remained in place. During the post-independence era emphases on national development and the rational division of land focused conservation efforts on selected areas where wildlife predominated but where humans had been removed.[50]

African social justice movements and developments in the ecological sciences began questioning the 'fortress conservation' national park narrative in the 1970s and 1980s.[51] During these years conservationists and governments more readily acknowledged the effects of exclusive protected areas on local people. Budget shortfalls in developing countries also frequently

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[46] Beinart, *The Rise of Conservation in South Africa*; Beinart and Hughes, *Environment and Empire*; MacKenzie, *The Empire of Nature*; Jane Carruthers, *The Kruger National Park: A Social and Political History* (Pietermaritzburg, South Africa: University of Natal Press, 1995).
[47] Carruthers, *The Kruger National Park*, 1.
[48] E. B. Worthington, *Science in Africa: A Review of Scientific Research Relating to Tropical and Southern Africa.* (London: Oxford University Press, 1938); Beinart and Hughes, *Environment and Empire*.
[49] Ute Dieckmann, *Hai||om in the Etosha Region: A History of Colonial Settlement, Ethnicity and Nature Conservation.* (Basel, Switzerland: Basler Afrika Bibliographien., 2007).
[50] David Hulme and Marshall Murphree, eds., *African Wildlife and Livelihoods* (Portsmouth, New Hampshire: Heinemann, 2001); Roderick P. Neumann, *Imposing Wilderness: Struggles of Livelihood and Nature Preservation in Africa* (Berkeley, California: University of California Press, 1998).
[51] Daniel Brockington, *Fortress Conservation* (Oxford, UK: Oxford University Press, 2002).

rendered governments impotent in the often-expensive task of managing and securing wildlife. During this era a "community conservation counter-narrative" emerged. Community conservation is predicated on two elements: that local people and conservation objectives can and should be able to make simultaneous claims to shared land, and that conservation objectives and local development needs must be aligned.[52] This can take a variety of forms and there is extensive scholarship on the history and philosophies behind community conservation movement. Work by Adams and McShane, Dzingirai, Wells, Brandon, and Hannah, and a volume edited by Adams and Hulme provide good introductions to the emergence of community conservation.[53]

In northwest Namibia community conservation was adopted as a partnership between local residents and professional conservationists concerned with the disappearance of wildlife and history of disempowering locals for conservation outcomes. In the 1980s wildlife populations in the region crashed and poaching appeared to be endemic. However, South West Africa still suffered under South African colonial rule and the apartheid government showed little concern for supporting either people or wildlife in the northwest. During this period a small group of committed white South African and Namibian conservationists approached local leaders to forge partnerships designed to halt poaching and rebuild wildlife numbers. In this poor and arid region, where people and wildlife were widely dispersed and there existed negligible infrastructure, local leaders and professional conservationists' worked together to craft means for simultaneously conserving wildlife and supporting locals' livelihoods; there was also a desire among locals for wildlife to persist for nonmonetary reasons.[54] When independence came in 1990, community conservation in Namibia was increasingly the *status quo*, much as the park model had been in other countries when they achieved independence. During this period three factors aligned to enable the formation of government-recognized communal conservancies: a network of like-minded actors committed to natural resource conservation and extending wildlife rights to local people, a policy environment amenable to reform and innovation, and a tradition of commercial capture of wildlife value. Prior to independence, freehold farmers received most of the country's income from consumptive wildlife use. After independence, the rights to directly benefit from wildlife were extended, with some limitations, to communities forming communal

[52] William M. Adams and David Hulme, "Conservation and Community: Changing Narratives, Policies and Practices in African Conservation," in *African Wildlife & Livelihoods: The Promise and Performance of Community Conservation*, ed. David Hulme and Marshall W. Murphree (Oxford: James Currey, 2001), 14.
[53] Adams and McShane, *The Myth of Wild Africa: Conservation without Illusion*; Vupenyu Dzingirai, "The New Scramble for the African Countryside," *Development and Change* 34 (2003): 243–64; Michael Wells, Katrina Brandon, and Hannah Lee, "People and Parks: Linking Protected Area Management with Local Communities" (Washington, DC, 1992); Hulme and Murphree, *African Wildlife and Livelihoods*.
[54] Owen-Smith, *An Arid Eden*; Margaret Jacobsohn, *Life Is Like a Kudu Horn* (Cape Town: Jacana, 2019); Brian T. B. Jones, Personal Communication, 2017.

conservancies.[55] As a form of community-based natural resource management (CBNRM) communal conservancies are based upon four conceptual pillars: sustainable use as a conservation paradigm, economic instrumentalism, devolving decision-making to residents whenever possible, and collective, community-level resource proprietorship.[56] Communal conservancies are officially-registered, legally-recognized entities to manage natural resources within a community-defined jurisdiction. The first conservancies in northwest Namibia were formed in 1998. By 2018 79.5% (58,943 km^2) of the region and 81.7% (59,207) of the region's inhabitants fell within communal conservancies.[57]

Within these areas, humans, their livestock, and wildlife coexist. Widely considered to be a shining light in African wildlife conservation, Namibia's conservancies attempt to unify contradictory forces. Because conservancies are designed to promote both livelihoods and wildlife, the existence of predators that are potentially dangerous to people and destructive of human property presents a difficult challenge. Though Namibian law empowers people to destroy wildlife when it threatens human life or property, this standard is open to interpretation and locals often lack the means to do so safely. As I will show, humans, livestock, and lions have struggled to maintain peaceable relationships within these shared landscapes. The goal of this project is to better contextualize ongoing HLC challenges and hopefully find new insights for crafting solutions to HLC that support the communal conservancy system. This dissertation brings to light the historical background for such possible solutions.

Sources

The majority of information in this dissertation comes from first-person observations of interactions between humans, livestock, lions, and environments recorded within colonial archives, published personal accounts, contemporary research reports, interviews available in published sources, and social surveys and oral histories that I have collected.

Colonial-era documents at the National Archives of Namibia have been indispensable to this project. Government documents from the South West Africa Administration (SWAA) and Native Affairs of Ovamboland (NAO) have been particularly important. SWAA files include

[55] Brian T. B. Jones, "The Evolution of Namibia's Communal Conservancies," in *Community Rights, Conservation and Contested Land*, ed. Fred Nelson (London: Earthscan, 2010), 106–20.
[56] Brian T. B. Jones and Marshall W. Murphree, "Community-Based Natural Resource Management as a Conservation Mechanism: Lessons and Directions," in *Parks in Transition. Biodiversity, Rural Development, and the Bottom Line*, 2004, 63–103.
[57] NACSO, "The State of Community Conservation in Namibia - a Review of Communal Conservancies, Community Forests and Other CBNRM Activities (Annual Report 2017)." (Windhoek, Namibia, 2018), http://www.nacso.org.na/sites/default/files/2014-15_SoCC-Report.pdf.

official communications concerning the functions of South West Africa's territorial government as collected in Windhoek. During the early South Africa era (1915-1947), administration of Kaokoveld fell within the purview of the Native Affairs Ovamboland. Throughout most of this era (1922-1946) Carl 'Cocky' Hahn served as the Native Commissioner for Ovamboland and Kaokoveld. Based at Ondangua in Ovamboland, Hahn was chronically understaffed. During the early years he ventured to Kaokoveld infrequently. Beginning in the late 1920s a small deployment of South West African Police officials was stationed at Tshimhaka/Swartbooi's Drift Kunene River crossing. Much of the early archival information comes from their reports to Hahn, who in turn reported back to the administration in Windhoek. By the late 1930s this station was closed and Hahn had a subordinate Officer-in-Charge of Kaokoveld, primarily based at Opuwo. Reports by these officials contributed greatly to information from this era. These archival sources have not previously been assessed for information specifically pertaining to lions, HLC, or other predators. During the early colonial era, predators were classified as 'vermin' because of the threats they posed to settler-farmers. Records of vermin destruction within white settler areas during this period come from SWAA archival files. Generally, these documents take the form of administrator and police communications, appeals to the administration by white settlers, and official communications between 'vermin clubs' and colonial staff. Historian Bernard Moore is currently engaged in an in-depth historical analysis of vermin persecution and African labor on white-controlled land in southern Namibia during the colonial era which, once completed, will serve as an interesting contrast to parts of this study. To facilitate comparison between predator persecution on white-controlled lands bordering Kaokoveld, and so-called 'native reserves' I focused primarily on vermin club information along the border of these areas. Archival information for chapters one and two also provided an extensive set of records for lion presence in northwest Namibia from the late-nineteenth to mid-twentieth century, which comprises much of the information in chapter four. Archival information concerning the implementation of the Odendaal Plan in the northwest corner of South West Africa comes from "Miscellaneous Odendaal Files" at the National Archives. These were passed along to me by historian Molly McCullers. The Odendaal archives, along with a selection of non-official communications between officials and between white settlers and government, were written in Afrikaans and translated by me. The rest were written in English.

Grey literature sources are an important part of reconstructing conservation interventions and lion research in this area, which has seen little historical or scientific research. Because northwest Namibia fell under the shadow of apartheid rule until 1990, almost no outside observers – researchers or journalists – were allowed into the 'native reserves' or 'homelands.'

The documents available have come from government reports, primarily collected and digitized by the Environmental Information Service Namibia, available at the African Studies and Government Publication Libraries at the University of Cape Town, or housed at the Namibia Scientific Society, Windhoek. These reports and limited-circulation publications are an important part of reconstructing human, livestock, and lion life and death in northwest Namibia during the South African colonial era and early years following independence. Northwest Namibia remains an area for which little scholarship exists. Personal reflections in the form of memoirs and scattered accounts provided to limited-circulation regional publications have been an important basis of information. The research reports of Philip Stander, which have been collected by the Environmental Information Service Namibia, have been key to understanding contemporary human-livestock-lion interactions and reconstructing historical interactions. Information about the desert-adapted lions of northwest Namibia has not been previously incorporated into either literature on pan-African lion conservation or within international lion conservation efforts. This dissertation not only is the first time that disparate sources about lions in northwest Namibia have been unified, it is the first reconstruction of the rebounding desert-adapted lion population which contextualizes the population's recovery within a longer history of human-livestock-lion interactions.

First-person perspectives of inhabitants of northwest Namibia have been drawn from research by anthropologists, personal accounts, as well as social surveys and oral histories that I have collected. The works of anthropologists Bollig, Crandall, and Jacobsohn have been particularly important for recovering perspectives on past political confrontations as well as experiences of human-livestock-lion interactions. In particular Bollig's collection of oral histories, *When War Came the Cattle Slept*,[58] Crandall's published articles, and Jacobsohn's dissertation formed the basis for centering ovaHerero perspectives in portions of this dissertation. The published memoir of Garth Owen-Smith, *An Arid Eden*, is the only comprehensive history of wildlife conservation in northwest Namibia from the 1970s to 2010. Owen-Smith's account has been an important repository of different local voices, particularly of individuals that have since passed-away. A great opportunity was lost to further interrogate Owen-Smith's personal records when they were destroyed by fire in October 2017.

Perspectives of inhabitants sharing landscapes with lions in northwest Namibia have also been recorded via social surveys and oral histories. Throughout more than two years of work in northwest Namibia communal land, I collected eighty-six social surveys and twenty-one oral histories, totally more than one hundred hours of information. Social survey methods were

[58] Michael Bollig, *When War Came the Cattle Slept: Himba Oral Traditions* (Koln: Koppe, 1997).

developed following guidelines outlined in the work of Robert Chambers, and received extensive feedback from researchers who have implemented successful wildlife conservation-oriented community surveys, both in northwest Namibia and others parts of Africa.[59] These interviews were conducted in three conservancies – Anabeb, Puros, and Sesfontein – identified by the Ministry of Environment and Tourism (MET) as core lion-range conservancies where HLC was a particularly pressing problem.[60] The management committee for a fourth conservancy, Torra, declined to participate in the social surveys, though oral histories, which only examined individual experiences not quantitatively compared to those of other conservancy residents, were performed with a selection of residents there. Social survey and oral history information, and the perspectives collected therein, form the basis of chapter six. However, the perspectives revealed in these interactions cannot be disentangled from the approach I have taken to better understanding how contemporary HLC has been forged by the history of human-livestock-lion interactions in northwest Namibia. Oral history methods were developed based upon the work of Chambers, Jacobsohn, Donald Ritchie and based-upon my own experiences working in northwest Namibia.[61] Social survey and oral history methods were approved by the University of Minnesota Institutional Review Board and the Macquarie University Research Office.

Additionally, more than two years of on-the-ground lion conservation interventions and close contact with communities greatly informed the approach and perspectives employed here. Immersing myself in the lives of people in northwest Namibia and the challenge of HLC there is based-upon van Maanen's perspective that "'experience' underlies all understanding of social life."[62] During my time in northwest Namibia I have worked closely with eight communal conservancies, partnered with NGOs, including Integrated Rural Development and Nature Conservation (IRDNC), Desert Lion Conservation, Tourism Supporting Conservation (TOSCO), AfriCat North, and the Namibia Association of CBNRM Support Organizations (NACSO), and have also partnered with staff at Namibia's Ministry of Environment and Tourism (MET). In my research and conservation intervention capacity I am a member of the Northwest Lion Working Group and have authored policy recommendation documents for IRDNC and MET. The goal

[59] Robert Chambers, *Whose Reality Counts?: Putting the First Last* (Intermediate Technology Publications Ltd, 1997); Leela N. Hazzah, "Living Among Lions (Panthera Leo): Coexistence or Killing? Community Attitudes Towards Conservation Initiatives and the Motivations Behind Lion Killing in Kenyan Maasailand" (University of Wisconsin-Madison, 2006); Dickman, "Complexities of Conflict: The Importance of Considering Social Factors for Effectively Resolving Human-Wildlife Conflict."
[60] Namibia Ministry of Environment and Tourism, "Human-Lion Conflict Management Plan for North West Namibia."
[61] Donald A. Ritchie, *Doing Oral History: A Practical Guide*, Second (New York, NY: Oxford University Press, 2003).
[62] J Van Maanen, *Tales of the Field: On Writing Ethnography* (Chicago and London: University of Chicago Press, 1988), 3.

within these interventions and this dissertation is to incorporate a more comprehensive understanding of the history to craft inclusive, equitable, and sustainable solutions to HLC that incorporate the lived experience of human-livestock-lion relationships. These objectives are themselves formed by perspectives that I have adopted from communal pastoralists in northwest Namibia. Field experience with communal residents has included extended periods staying at homesteads and livestock posts, assisting with herding, watering, milking, slaughtering, and feeding, collecting and transporting livestock, and providing various types of support to these communities. Lion monitoring and HLC interventions have been undertaken alongside community members and the partners mentioned above. Beginning 2018 I helped restart the Lion Ranger program, which works with community-nominated conservationists to monitor desert-adapted lions and works alongside pastoralists to mitigate and limit HLC. How these activities feed into developing understandings of HLC and writing this dissertation is perhaps the most difficult aspect of 'source material' to capture. The conviction that humans and lions can and ought to coexist within shared landscapes is not a consensus either among lion conservationists or among residents in northwest Namibia.[63] The recognition that humans, livestock, and lions long have shared this space, and that this history provides lessons for how they might continue to do so in the future is an original contribution of this dissertation. Throughout, I have sought to accurately represent life on-the-ground as I have come to know it. I have frequently checked the insights drawn from various sources with my understanding of embodied experience as I witnessed it alongside inhabitants of the area. Whenever possible I have consulted with local people and I believe my interpretations of past events would be familiar to many residents of northwest Namibia. Any shortcomings are my own and are not meant to offend or disempower those represented here, either living or dead.

Interpretation of these primary sources is also informed by secondary literature drawn from relevant environmental-focused disciplines, primarily environmental history, human-animal studies, histories of ecology and conservation, and social science approaches to wildlife conservation. My original contribution is bringing together a variety of disparate sources, including archival documents, social surveys, oral histories, and grey literature that have largely been unavailable or only enjoying limited distribution, and to subject this information to careful analysis and certain unique interpretations, through the lens of ongoing HLC. The analysis of

[63] Packer et al., "Conserving Large Carnivores"; Helge Denker, "Lion Trouble in North-West Namibia," *African Indaba* 13, no. 4 (2015); Garth Owen-Smith, "Too Many Lions in Kunene," *The Namibian*, November 14, 2017, https://www.namibian.com.na/171619/archive-read/Too-Many-Lions-In-Kunene. See chapter six.

primary sources and incorporation of secondary literature has been undertaken to, as fully as possible, tell and interpret the history that has led to ongoing HLC in northwest Namibia.

Organization and Outline of Chapters

The dissertation is broken into three thematic groups of chapters that speak to one another. Chapters one through three emphasize the formative human sociopolitical developments pertaining to northwest Namibia during the colonial era. Chapters four and five center lions in particular from the precolonial era to the 2010s. Chapter six integrates these themes to explore the ongoing manifestation HLC. In chapter one I show how control over livestock and livestock-related resources were among the central expressions of power in northwest Namibia, from the 1800s-1942, particularly emphasizing the 1920s-1940s. I refer to this period as *Eserewondo Ozongombe* – 'the Century of Cattle.' In particular, I draw upon archival sources to examine how inter-group politics during the colonial era were affected by violence predating colonialism and how livestock served as a location through which power was negotiated. The approach of centering livestock and local perspectives is important for understanding colonial control of the region and how difficulties with predators would be experienced in years to come. In the chapter I review important aspects of ovaHerero experiences of becoming-with livestock, emphasizing cattle. This approach accords with historian Luise White's position that African-centered histories must place historicized subjects in relation to dynamic interests, selves, and embodiments specific to them.[64] This ovaHerero-centered and multispecies history – primarily humans and cattle, but including other livestock – builds upon scholarship of northwest Namibia, particularly work by anthropologists Bollig, Crandall, and Jacobsohn, and environmental historians Miescher and Rizzo. My original contribution is employing archival sources to show how livestock enabled and constrained everyday forms of resistance to precolonial violence and colonial rule. Centering ovaHerero experiences provides an important frame for how human-livestock-lion interactions are understood in later chapters. I also add to the anthropological scholarship by emphasizing the importance of intra-African politics and violence as negotiated by Kaokoveld ovaHereros, and to the historical scholarship by centering ovaHerero experiences as mediated through cattle. This chapter further contributes to the historiography of African colonial-era environmental history and geography, which has revealed how politics and environments drew together humans and

[64] Luise White, *Speaking with Vampires: Rumor and History in Colonial Africa* (Berkeley, Los Angeles, London: University of California Press, 2000); Thom van Dooren, Eben Kirksey, and Ursula Münster, "Multispecies Studies: Cultivating Arts of Attentiveness," *Environmental Humanities* 8, no. 1 (2016): 1–23; Aaron Skabelund, "Animals and Imperialism: Recent Historiographical Trends," *History Compass* 11, no. 10 (2013): 801–7.

nonhumans to drive historical changes.[65] The picture that emerges is of ovaHereros working to maintain their independence by negotiating and creatively re-appropriating colonial rule and regulations. A version of this chapter is under-review with the journal *Environment and History*.

Chapter two examines the contrasting effects that colonial policies and practices had on predators on settler- and African-controlled land. In the first half of the twentieth century, the policies of racial segregation affected not only the people of South West Africa but the predator population as well. This chapter explores how South West Africa's colonial administration enabled the destruction of predators on white settler farmland while frustrating African efforts to combat livestock depredation by predators in 'native' reserves. I begin by reviewing the pertinent historical and political background to this case study, including how the 'land question' was integrally related to human-predator relationships. The contrasting focuses, on white settlers on private farmland and ovaHereros in Kaokoveld, highlights the experiences of racialized colonial era policies. To show the differing experiences and effects of differently placed human actors and predator species, I examine the history of two species indicative of the human-predator tensions during the period: the African wild dog (*Lycaon pictus*) and the lion. How these two species interacted with and were targeted by people across differing political and geographic designations deepens perspectives of the relationship between politics and the interactions between humans and predators. The near-total eradication of wild dogs, a unique fate among Namibia's predator species, when contrasted with the persistence of lions, is revealed to be an outcome of interwoven species' ecology and geography as well as racialized government policies. Drawing-upon archival sources and published government documents, I show that the persecution of predators was an expression of white supremacist policies founded primarily in economic concerns. This chapter is an original contribution to histories of human-predator relationships during colonialism as well as a clear demonstration of how economic and political policies can affect predators. These themes are interwoven throughout and also illuminate other topics familiar to environmental historians, such as the history of veterinary science, rural history, frontier spaces, and questions surrounding environmental justice. The inclusion of this multispecies and colonial history is an important part of examining both historical and ongoing relationships between humans, livestock, and lions in

[65] William Beinart, *The Rise of Conservation in South Africa: Settlers, Livestock and the Environment, 1770-1950* (Oxford, UK: Oxford University Press, 2003); Kate B. Showers, "Soil Erosion in the Kingdom of Lesotho: Origins and Colonial Response, 1830s–1950s," *Journal of Southern African Studies* 15, no. 2 (1989): 263–86; James C. McCann, *Green Land, Brown Land, Black Land: An Environmental History of Africa, 1800-1990.* (Portsmouth, New Hampshire: Heinemann, 1999); James Fairhead and Melissa Leach, *Misreading the African Landscape: Society and Ecology in a Forest-Savanna Mosaic.* (Cambridge: Cambridge University Press, 1996).

northwest Namibia. A version of this chapter is in-press at *The Journal of Southern African Studies*.

Chapter three focuses upon a particular environmental transformation in the apartheid era, when South Africa more strongly asserted colonial rule over northwest Namibia. At the height of the South African government's confidence in the state to achieve narrowly-defined goals it published the *Report of the Commission of Enquiry into South West African Affairs* (Odendaal Commission).[66] The Odendaal Commission was charged with extending the policies of South Africa's ethnonationalist government to South West Africa. To do so, the Commission deployed an Afrikaner-centric brand of social anthropology, known as *volkekunde*. *Volkekunde* scholars (*volkekundiges*) were committed to reinforcing preconceived notions of the exceptionalism of Afrikaners and the inherent inferiority of Africans. This home-grown 'science' mobilized a powerful language of rationality that was part-and-parcel of the logic behind, and defense of, apartheid rule within South Africa and abroad. *Volkekunde* logic infused the Odendaal Report, which was largely the work of Dr. J. P. van S. Bruwer, a leading *volkekundige* figure. To show how the South African government's statist approach, resting upon principles of ethnonationalism and high modernism,[67] spatially re-arranged people and wildlife in Etosha-Kaokoveld, I examine the history of apartheid leading to the Odendaal Commission's recommendations. To highlight the environmental effects of the Commission's social policies, I contrast them with an alternate report on Etosha-Kaokoveld, put forward by ecologist Ken L. Tinley in 1969. Formerly employed by South West Africa's Department of Nature Conservation, Tinley introduced the public to ecological concerns within Etosha-Kaokoveld that the Odendaal Commission overlooked. The contrast between the Commission's recommendations and Tinley's report reveals the respective statuses of two scientific disciplines, *volkekunde* and ecology, within the South African government during this period. The privileging of one science over another was interwoven with the state's ethnonationalist goal of securing minority rule. However, both the Commission and Tinley were operating within a paradigm of confidence in the state. Borrowing from historian of science Peter Taylor, I refer to this confidence as "technocratic optimism."[68] Yet, the state could not control the Etosha-Kaokoveld environment entirely: the Commission's apartheid social policies had unintended environmental consequences. Reviewing some of these

[66] Government of South Africa, "Report of the Commission of Enquiry into South West Africa Affairs" (Pretoria, South Africa: Government Printer, Republic of South Africa, 1964). This Commission was chaired by F. H. Odendaal, Transvaal Governor and National Party member.
[67] James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven and London: Yale University Press, 1998).
[68] Peter J. Taylor, "Technocratic Optimism, H. T. Odum, and the Partial Transformation of Ecological Metaphor after World War II," *Journal of the History of Biology* 21, no. 2 (1988): 213–44.

consequences highlights the linkages between politics and the environments which constitute the physical space of nation-states. This period of technocratic optimism reset the ecology of northwest Namibia, encapsulating Etosha and separating it from Kaokoveld. My original contribution is drawing a clear connection between apartheid-era policies and landscape transformations in northwest Namibia. This is also the first scholarly examination of the formation of Etosha National Park as an outcome of domestic and international politics surrounding apartheid. As such it adds to the small amount of scholarship framing colonial Namibia as part of the South African empire.[69] This chapter draws-upon grey literature including government publications and limited circulation documents, archives, and scholarship on apartheid.

Chapters four and five turn the focus squarely upon lions; this is second thematic group of chapters. The change in type of source material being examined from chapter four forward is distinct, and requires brief comment. Chapters four, five, and six mix historical, scientific, and social scientific approaches to understanding lions and human-livestock-lion interactions in northwest Namibia more explicitly than the first three chapters do. Turning towards scientific approaches to understanding lions and human-livestock-lion interactions does not suggest either that I am uncritical of scientific knowledge collectives or that they are free from politics.[70] Latour has described the work of science and technology studies (STS) scholars as centrally concerned with the question of what counts as a social explanation of any phenomena.[71] This dissertation, particularly chapters four, five, and six, begins with the premise that HLC is an ongoing challenge with historical drivers. What gets incorporated into history besides the human as narrowly-defined is a question that STS and human-animal studies scholars continue to grapple with. This dissertation showcases one approach to integrating a variety of epistemologies and source materials for understanding human-livestock-lion interactions, including historical research, natural science literature, social science methods, and ethnographic practice.

Whether it is primary material from oral histories and social surveys, archival documents, lists of vermin destroyed, quantified measurements of lion movements, or recovering ovaHerero voices from the colonial era (to name just a few of the sources used), I treat these sources not as positivist statements, but as different expressions of meaning around the central challenge of uncovering the historical (human and nonhuman) factors giving rise to contemporary HLC. In

[69] Jeremy Silvester, "Forging the Fifth Province," *Journal of Southern African Studies* 41, no. 3 (2015): 505–18; Henrichsen et al., "Rethinking Empire in Southern Africa."
[70] Bruno Latour, *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge and London: Cambridge University Press, 1999). In particular, chapter two and Latour's glossary.
[71] Bruno Latour, "When Things Strike Back: A Possible Contribution of 'science Studies' to the Social Sciences," *British Journal of Sociology* 51, no. 1 (January 1, 2000): 107–23.

each of these knowledge-meaning figurations it is not an actor's distance, but their proximity – their embodied becoming-with the challenge of living alongside lions (or, in the lions' case, alongside humans and their livestock) – that makes their perspectives relevant.[72] This approach applies Haraway's assertion that all knowledge is situated and that the world can be understood in a plurality of ways. As Haraway notes, partiality, not universality, can be an important condition for being heard in dialogues concerned with understanding human interactions with the world.[73]

Privileging human perspectives risks an asymmetric accounting of HLC. An important goal of this dissertation is to familiarize a broader audience with the history of nonhumans (emphasizing livestock and lions) as historical agents in northwest Namibia. Chapters four and five turn the emphasis towards lions as both products and drivers of history. In northwest Namibia, lions and humans have interacted for thousands of years. Yet, there has been no attempt to integrate information about lions from the variety of available sources. Chapter four examines early accounts of lions in northwest Namibia, providing a historically-informed baseline for understanding lions' changing presence there. By centering lions, chapter four reveals how transformations in human society affected lions' prospects. My original contribution contextualizes different human actions in regards to lions, showing that, though lion behavior towards and around humans may not have altered greatly, how certain humans regarded and interacted with lions in northwest Namibia shifted dramatically. As historian and human-animal scholar Etienne Benson has pointed out, if, sensu Latour, we have never been modern, then neither have we been human. What this means is that a hierarchical understanding of human over animal never properly captured human-animal relationships. Relationships between humans and animals are too uncertain, contingent, riven with exchanges of agency, and dependent upon context and physicality. Imagine the difference between seeing a lion enclosed at the zoo versus coming across one walking back to your tent at night in the bush! If, as Benson contends, all history is animal history, chapter four is a history of lions in northwest Namibia as recorded by their human companions/antagonists there.[74] This chapter calls into question the role of livestock in creating HLC and driving differences in human-lion relationships. As we will see, by the latter-half of the twentieth century, human-livestock-lion interactions were greatly differentiated by geographic location and by differing livelihood and ethical commitments among humans. In Etosha, lions were protected, even fed, while just beyond Etosha's borders they were persecuted.

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[72] Haraway, *When Species Meet*.
[73] Donna J. Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature* (New York and London: Routledge, 1990).
[74] Etienne S. Benson, "Animal Writes: Historiography, Disciplinarity, and the Animal Trace," Making Animal Meaning, 2011, https://repository.upenn.edu/cgi/viewcontent.cgi?article=1045&context=hss_papers.

In the northern Namib lions were simultaneously persecuted by farmers and protected by conservationists. Source material for chapter four is drawn from published and archival accounts of farmers, the writings of European 'explorers,' government officials and conservationists in the region, and from oral histories that I have collected. Practices of 'reading against the grain' or 'resistant reading,' whereby texts are examined for alternate meanings to uncover the writers' assumptions, or to derive taken-for-granted aspects of human-livestock-lion relationships, have enabled me to recover marginalized perspectives and (re)center lion experiences. This is augmented by scientific literature providing background information on lions across Africa.

Chapter five extends the history of lions into the independence era and twenty-first century. Beginning in the 1980s, information on lions in northwest Namibia took on a decidedly scientific guise. This was primarily due to the work of Etosha ranger, later independent lion researcher, Philip Stander. In the mid-1980s to early-1990s, Stander used new technologically-mediated methods to intensively studied numerous aspects of the behavior and ecology of lions in Etosha. What he found were notable differences between these lions and lions elsewhere. In 1998, Stander began applying these methods to studying lions primarily inhabiting communal land in the northern Namib. Since then Stander has generated extensive amounts of knowledge emphasizing differences between the desert-adapted lions and lions elsewhere. Focusing on differences in behavior, including grouping patterns, density, and home ranges, and in hunting and prey selection, shows these lions as adapted to the extreme demands of desert living. Centering desert-adapted lions is an important part of what Benson calls forging a relationship with past animal lives.[75] Though historical scholarship can no longer recover specific details of lions inhabiting northwest Namibia before Stander's research, the contemporary ecology of desert-adapted lions is a useful frame for inhabiting alternate perspectives: both human and lion. Notably, Stander's work centered lions, while largely, though not entirely, overlooking human-livestock-lion interactions. This created a new information paradigm concerning lions in northwest Namibia. This new paradigm brought new human actors into the human-livestock-lion arena. Digging into the specific knowledge generated by Stander provides a more nuanced perspective on the lives of lions in northwest Namibia past and present, as well as the challenges of HLC there. Because Stander's work is the only available scientific information on lions inhabiting the communal areas of northwest Namibia it has greatly affected understandings of HLC there. In certain cases, Stander's work reinforces anthropological, archival, and oral accounts of human-livestock-lion relationships, at other times these differing approaches are at odds. Chapter five is the first time that scattered historical and contemporary scientific, limited-

[75] Benson.

circulation, and semi-popular accounts of these lions have been compiled. What emerges is the history of the population's recovery from near extirpation to a new era of growth on communal land, which morphs into challenges stemming from HLC. Bringing these sources together not only reconstructs the independence-era history of lions in northwest Namibia, it also generates important comparisons between lions in northwest Namibia and lions elsewhere. This can serve as a resource for lion researchers and conservationists and is already providing the foundation for further research and conservation interventions concerning human-livestock-lion interactions on communal land in northwest Namibia and comparative studies with lions elsewhere.

Chapter six focuses squarely on conflict by (re)centering the embodied contemporary experiences of human-lion-livestock relationships among communal pastoralists, thus forming its own theme which builds upon the preceding chapters. HLC remains a contentious ground of violence threatening the livelihoods of people and the lives of livestock and lions. The success of CBNRM in northwest Namibia has led to rebounding prey and predator populations. Among predators, lions are considered particularly problematic by communal pastoralists. Adopting concepts of nonhuman charisma introduced by geographer and human-animal studies scholar Jamie Lorimer, I identify three distinguishing properties of lions among communal pastoralists. These distinguishing properties are that lions are fearsome, destructive, and increasing in number. These properties resemble historical experiences of living with lions and challenge the premises of CBNRM. Conflict between communal perspectives and those who experience human-lion relationships without the mediation of livestock may exacerbate the effects of HLC and generate greater amounts of lion killing. Placed within the context of the history presented in this dissertation, human-human ruptures due to non-congruent perspectives on HLC require new approaches. I propose reframing lion conservation interventions within the type of human-livestock-lion relationships that have been explored in this history. This may be achieved through dialogue around ways of becoming-with lions, based on insights from ovaHerero cattle culture further detailed by the 'boundary object' concept developed within STS. The boundary object concept emphasizes the ability of certain entities to bring together disparate social groups around shared goals. One process for implementing this reframing is by reinvigorating Elinor Ostrom's seven Design Principles for common-pool resources, which were formative in the foundation of CBNRM in the region. Ostrom's Design Principles emphasize the importance of inclusive approaches to common-pool resource governance, predicated on ownership communities delineating boundaries, linking appropriation and provisioning conditions, developing collective-choice mechanisms, performing monitoring, imposing graduated sanctions, mobilizing conflict-resolution mechanisms, and enjoying rights to operate. In addition to this reframing, my original

contribution is to give voice to the perspectives of communal pastoralists in northwest Namibia, who have largely been marginalized in crafting lion conservation policy and defining acceptable official parameters for human-livestock-lion interactions there. Such experiences do not weaken the ability of communal pastoralists to effectively assess human-livestock-lion relationships, they strengthen it. As part of a broader project aimed at locally-centered lion conservation outcomes, the results of this chapter, contextualized within the rest of this history, provide innovative new ways for human-livestock-lion relationships to form the foundation for CBNRM governance. Source material comes from social surveys and oral histories, as well as more than two years of immersive field work. Conceptual framing is informed by CBNRM scholarship, human-animal studies, STS, and ovaHerero cattle culture.

Taken together, these chapters contribute a multidisciplinary intervention for reframing HLC in northwest Namibia. The ongoing challenge of HLC facing communal pastoralists there is revealed as driven by specific historical contingencies. At different points in this history humans, livestock, lions, and the natural environment, have been drivers, as well as products, of interrelated transformations. By examining these interrelated drivers of historical change, this dissertation uses HLC as simultaneously a point of arrival and departure; it is both premise and outcome. How was this contemporary challenge formed, and, how do we (re)understand the history of the region through the lens of HLC? The presence and dynamic relationships between humans, livestock, and lions within northwest Namibia are historically contingent, but not aberrant: changing positions of power among humans, livestock, and lions in relation to one another define this history. The prospects for mediating, even removing, HLC and replacing it with more positive human-livestock-lion relationships for all three categories of actors infuse this work. The approach taken is both an academic and embodied exploration of how historical and the social scientific methods can be applied to wildlife conservation challenges.

Chapter One: Eserewondo Ozongombe: livestock as sites of power and resistance in Kaokoveld, Namibia, 1800s-1940s

Omutenga (First)

When the ovaHerero Tribal Council of Kaokoveld, in northwest Namibia, ceded control over livestock movements to the South West African government in February 1942, they were acting in light of a decades-long process of political marginalization and erosion of ovaHerero autonomy. During the 1930s, disillusioned young ovaHerero men had been defying the government-recognized Tribal Council in Kaokoveld. In response councilors requested that the South West African administration implement a permit system to control all movements of African-owned livestock. This request signals the end of a period during which control of cattle and other livestock was the primary expression of political power in Namibia and appears particularly stunning because of the important role that livestock, in particular cattle, play in ovaHerero culture. The important role of livestock in ovaHerero culture – how ovaHereros experience becoming-with livestock[76] – is central to understanding the local experiences of HLC in northwest Namibia.

Postcolonial scholars have written extensively about how colonial subjects resisted and re-appropriated colonial power structures to achieve their own ends. As historian Steven van Wolputte has pointed-out of later eras, resistance to colonial rule in Kaokoveld took on everyday forms.[77] What anthropologist and agrarian scholar James Scott calls "passive noncompliance, subtle sabotage, evasion, and deception" were methods employed by Kaokoveld ovaHereros to survive the colonial system to their "minimum disadvantage."[78] Resistance to colonial rule in southern Africa had many expressions. While militant resistance has received much attention, environmental historians in particular have shown how forms of everyday resistance were often more pervasive. These could include an unwillingness to abandon time-tested environmental coping strategies, unlawful occupation of land and trespassing, and wildlife destruction. Histories of other environments similarly show the linkage between state attempts to limit resource access and different forms of everyday resistance. These and many other studies have helped refigure how scholars examine, and the public understands, forms of environmental protest and justice. [79]

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[76] Haraway, *When Species Meet*.
[77] Steven van Wolputte, "Subject Disobedience: The Colonial Narrative and Native Counterworks in Northwestern Namibia, c.1920–1975," *History and Anthropology* 15, no. 2 (2004): 151–73.
[78] James C. Scott, *Weapons of the Weak: Everyday Forms of Peasant Resistance* (New Haven and London: Yale University Press, 1985), 31, Hobsbawm, from: 301.
[79] P. A. McAllister, "Resistance to 'Betterment' in the Transkei: A Case Study from Willowvale District," *Journal of Southern African Studies* 15, no. 2 (1989): 346–68; Jane Carruthers, "Creating a National Park,

During the early South African colonial era, ovaHerero residents of Kaokoveld resisted certain aspects of colonial rule. However, resistance was not total. Rather, while the ovaHerero recognized certain benefits to colonial rule, their resistance focused on maintaining autonomy over their livestock: its movements and well-being. The colonial era initially signaled the end of a period of great political and livelihood uncertainty for Kaokoveld ovaHereros. Prior to colonial governance, the region's inhabitants had been beset by violent incursions from livestock raiders, known as the ovaKwena. Increasingly, the German and then South African colonial regimes implemented the rule of law, enacted via a group of government-recognized 'chiefs.' However, because the colonial regime was under-resourced, conflicts among these chiefs also threatened livelihoods and affected inter-group politics in Kaokoveld. Only as the colonial regime sought to broaden its control of the region, and when the most powerful generation of these chiefs had passed-away, did conflicts in Kaokoveld lessen. This led to a decentralization of power, which further exacerbated difficulties in controlling livestock movements. During this period, a new generation of chiefs, in the form of a government-created Tribal Council, turned to colonial administrators to support their ability to dictate livestock movements. Unable to wield historical forms of power based-upon kinship, charisma, or coercion, the Tribal Council sought state support to exercise authority. The actions taken by the Tribal Council in 1942 were thus a recognition that a new form of hybrid 'traditional' and state-sponsored rule was required to govern people and livestock in Kaokoveld.[80] Using archival and published sources, this ovaHerero-centered, human-animal history examines flows of political power and resistance that took place from the mid-nineteenth to the mid-twentieth century in precolonial and colonial Namibia, contextualizing the importance of cattle within Kaokoveld ovaHerero culture during the period. Emphasizing the importance of cattle enables one to differentiate how colonial power was experienced among differently positioned subjects, as well as the decisions taken by the Tribal Council to seemingly cede control over the all-important arena of livestock movements. It also provides insight into a period of uncertainty and change in northwest Namibia which formed the foundation for much of the history that followed. Human-livestock interactions are central to this chapter, but lions are only obliquely addressed in this background history. However, this foundation is important to understanding the politics, people, and livestock that will be so central to examinations of human-livestock-lion interactions in later chapters.

1910-1926," *Journal of Southern African Studies* 15, no. 2 (1989): 188–216; Roderick P. Neumann, *Imposing Wilderness: Struggles Over Livelihood and Nature Preservation in Africa*, *Progress in Human Geography*, vol. 24 (Berkeley, Los Angeles, London: University of California Press, 1998); Karl Jacoby, *Crimes against Nature: Squatters, Poachers, Thieves, and the Hidden History of American Conservation* (Berkeley, Los Angeles, London: University of California Press, 2001).

[80] Homi K. Bhaba, *The Location of Culture* (London: Routledge, 1994).

I refer to this period as *Eserewondo Ozongombe*, which in Otjiherero means 'the Century of Cattle.' During Eserewondo Ozongombe, control over livestock and livestock-related resources were among the primary expressions of political power in Namibia, particularly within Kaokoveld. Because Kaokoveld was largely beyond the reach of colonial administrators, the important role played by cattle and other livestock in African intra- and inter-group politics persisted longer there than in the central and southern regions of colonial Namibia. Re-centering ovaHerero perspectives allows for a new periodization more aligned with ovaHerero experiences. The role of cattle is understood as an active one: the needs of cattle and other livestock, in terms of access to grazing, water, and, later, veterinary concerns, shaped expressions of individual and group autonomy, and cattle became a site of both ovaHerero and colonial power-politics. Many ovaHerero during this period experienced becoming-with cattle as a personal, familial, and political process. The emphasis on livestock accords with historian Luise White's position that African-centered histories must place historicized subjects in relation to dynamic interests, selves, and embodiments specific to them.[81]

Recovering ovaHerero voices is difficult, particularly without homogenizing ovaHerero experiences among differently culturally, economically, and temporally positioned groups. There is no written historical record among the ovaHerero from this period. Within the archival record certain stories, concerns, and topics are highlighted and others are marginalized. Not only do colonial archives tangibly demonstrate power over memory and identity, they also record who was enabled to speak; between these voices the silence of others is apparent. Most strikingly from the 1920-1940s, when the balance of archival information comes from, is the gendered nature of these records: there are no female voices at all. This is itself telling. Redirecting power from scattered ovaHerero homesteads, first to 'chiefs' and then the Tribal Council, colonial officials gather designated elites in centralized locations. This removed leaders from their homesteads and conversations with their family members – though it is likely they were accompanied by certain kin to the meetings. This geographical rearrangement of decision-making likely affected policy in the region. Practices of 'reading against the grain' or 'resistant reading,' whereby texts are examined for alternate meanings, are an important tool for scholars to recover marginalized voices, as well as uncover the politics surrounding silence. To more fully center ovaHerero voices I incorporate Otjiherero words and explain the meaning behind them as given by ovaHereros in northwest Namibia. Translations taken from anthropologists Margaret Jacobsohn and D. P. Crandall are noted. Otherwise translations are my own, based upon Viljoen and Kamupingene's

[81] White, *Speaking with Vampires: Rumor and History in Colonial Africa*.

Otjiherero Dictionary and in consultation with Otjiherero speakers in northwest Namibia. Himba chronologies are adapted from anthropologist Gordon Gibson.[82]

Historiography of the OvaHerero, Human-Animal Studies, and African Environments

The label 'ovaHerero' (those of yesterday, or the old people) encompasses the forerunners of today's Herero, Himba, and Tjimba groups, all of whom speak variants of the Otjiherero language. How Kaokoveld ovaHereros became divided into three groups provides important insight into the different experiences of Eserewondo Ozongombe. Though I focus on Kaokoveld, an ovaHerero diaspora exists across Namibia, southern Angola, and western Botswana. To-date ovaHerero and Herero remain inclusive terms which may encompass the Himba and Tjimba. A Himba saying states it clearly, "omuHimba omuHerero," a Himba is a Herero. I use the label ovaHerero when referring to the time before these groups became separable, and retain it when speaking of all three groups together. As noted by anthropologist John Friedman, a close reading of history illuminates the differences and similarities among groups of Otjiherero-speakers, better than more static categories such as ethnicity or culture. The historical processes differentiating the lived-experiences of Herero, Himba, and Tjimba, and the South African governmental obsession for racially dividing people made these labels relevant during Eserewondo Ozongombe.[83]

This chapter contributes to a small but rich corpus of scholarship on the ovaHerero of Kaokoveld, and on Namibia more broadly. Historian Lorena Rizzo places peasant mobility at the center of her examination of late-nineteenth and early-twentieth century Kaokoveld. Her insight, echoing Scott, is that marginality can also be a position of power.[84] Rizzo's critical eye for examining the colonial archive is adopted here. Giorgio Miescher's history of Namibia's 'Red Line' reveals the formative role of colonial veterinary science in shaping northern Namibia.[85] His emphasis on how physical and conceptual boundaries shifted in response to changing administrative, economic, and epidemiological priorities reminds us that policy and practice

[82] Gayatri Chakravorty Spivak, "Can the Subaltern Speak?," in *Marxism and the Interpretation of Culture* (London: Macmillan, 1988), 24–28; Joan Schwartz and Terry Cook, "Archives, Record, and Power: The Making of Modern Memory," *Archival Science* 2, no. 1–2 (2002): 1–19; J. J. Viljoen and T. K. Kamupingene, *Otjiherero Dictionary* (Paarl, South Africa: Gamsberg Macmillan, 2006); Gordon D. Gibson, "Himba Epochs," *History in Africa* 4 (1977): 67–121.
[83] Margaret Jacobsohn, *Himba: Nomads of Namibia* (Cape Town, South Africa: Struik, 1998), 17; John T. Friedman, "Making Politics, Making History: Chiefship and the Post-Apartheid State in Namibia," *Journal of Southern African Studies* 31, no. 1 (2005): 23–51.
[84] Rizzo, *Gender and Colonialism: A History of Kaoko in North-Western Namibia, 1870s-1950s*; Rizzo, "The Elephant Shooting: Colonial Law and Indirect Rule in Kaoko, Northwestern Nambia, in the 1920s and 1930s."
[85] Miescher, *Namibia's Red Line*.

transform the lives of humans and nonhumans, as well as the landscape. Van Wolputte has examined resistance in Kaokoveld focusing primarily on inversions of colonial discourse by the ovaHerero. His insight that resistance during the war for independence (1966-1989) took on 'everyday' forms is an important refiguration of the role the ovaHerero played during that period.[86]

Anthropological work by Michael Bollig, Crandall, and Jacobsohn is central to historical understandings of Kaokoveld ovaHereros. Bollig's reframing of colonial-era isolation as the result of South African official policy and practice emphasizes the interrelated contingency of local people, livestock, and the environment within northwest Namibia.[87] Crandall's work connecting Himba secular and spiritual worlds is treated extensively below – it is central to reframing politics around livestock as interpreted within ovaHerero social worlds.[88] Jacobsohn's in-depth ethnographic work reveals stories that add detail to historical outlines. A common thread among these works is their emphasis on materiality as a means of understanding ovaHerero experiences. In its own way, each of these is an environmental and human-animal account.[89]

Cattle are central to the lives of the ovaHerero and therefore to this history. Human-animal scholarship takes seriously the proposition that humans and animals share the world and affect one another.[90] Human-animal scholars have begun asking a unique set of conceptual questions probing relationships between humans and animals. Works focusing on livestock by such historians as Virginia DeJohn Anderson, Erica Fudge, and Elinor Melville, have helped build scholars' toolkits for de-centering human agency in human-animal relationships.[91] Key findings have shown that human becoming is always occurring in creative relationship with a variety of nonhumans, that domestication is a two-way street, and that livestock remade colonial environments. I could not adequately relate either the history of the ovaHerero in Kaokoveld or the history of human-lion relationships there without the inclusion of livestock, particularly cattle.

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[86] Steven van Wolputte, "Cattle Works: Livestock Policy, Apartheid and Development in Northwest Namibia, c 1920–1980," *African Studies* 66, no. 1 (2007): 103–28; van Wolputte, "Subject Disobedience: The Colonial Narrative and Native Counterworks in Northwestern Namibia, c.1920–1975."

[87] Bollig, "The Colonial Encapsulation of the North-Western Namibian Pastoral Economy"; Bollig, "An Outline of Pokot and Himba Societies: Environmental, Political Economy and Cultural Beliefs."

[88] Crandall, "The Role of Time in Himba Valuations of Cattle."

[89] Jacobsohn, "Negotiating Meaning and Change in Space and Material Culture: An Ethno-Archaeological Study among Semi-Nomadic Himba and Herero Herders in North-Western Namibia"; Jacobsohn, *Himba: Nomads of Namibia*.

[90] Useful introductions include: Ingold, *What Is an Animal?*; Jones, *Valuing Animals: Veterinarians and Their Patients in Modern America*; Haraway, *When Species Meet*.

[91] Anderson, *Creatures of Empire: How Domestic Animals Transformed Early America*; Erica Fudge, "What Was It Like to Be a Cow?," in *The Oxford Handbook of Animal Studies*, vol. 1, 2014, 1–37; Elinor G. K. Melville, *A Plague of Sheep: Environmental Consequences of the Conquest of Mexico* (Cambridge: Cambridge University Press, 1997).

Because livestock were, and for many people continue to be, expressions of autonomy, livelihoods, and, for the ovaHerero, so much more, they were and are sites of power and resistance.[92]

Examining conflicts and alliances surrounding livestock from the ovaHerero point of view contributes to environmental histories of Namibia and of colonialism in southern Africa. Works by Christo Botha help place the Kaokoveld experience within the environmental history of colonial Namibia. Botha presents this history as primarily concerned with European attempts to secure land tenure and support a white-dominated territorial economy. Botha's emphasis on political factors are applied to the specific case of the northwest.[93] How colonial policies and practices misunderstood and altered African environments is an important theme in African environmental history. William Beinart's history of the settler-livestock economy of the Cape is particularly relevant.[94] Kate Showers' examination of how the colonial state framed landscape changes suggests that peasant approaches to agriculture were re-conceptualized through colonizer's lenses.[95] Jane Carruthers provides a recent, useful introduction to the field.[96] James McCann's overview of African environments enables one to put the Namibian and South African experience in a continental context.[97]

"Don't Start your Farming with Cattle; Start it with People"[98]

The ovaHerero were not the first pastoralists in northwest Namibia, though their arrival coincides with the earliest clear evidence for widespread, intensive pastoralism. The area was already inhabited by small bands of highly-mobile Khoe-Sān hunter-gatherers and, later, the Damara people.[99] As occurred with the introduction of new fauna and flora to the Americas beginning in the fifteenth century, the arrival of livestock likely remade vast swaths of the region's ecology.[100] However, in south-western Africa, this process occurred in a number of waves extending over

[92] van Dooren, Kirksey, and Münster, "Multispecies Studies: Cultivating Arts of Attentiveness"; William Cronon, *Changes in the Land: Indians, Colonists and the Ecology of New England* (New York, NY: Hill and Wang, 1983).
[93] Botha, "The Politics of Land Settlement in Namibia, 1890–1960"; Botha, "People and the Environment in Colonial Namibia."
[94] Beinart, *The Rise of Conservation in South Africa: Settlers, Livestock and the Environment, 1770-1950*.
[95] Showers, "Soil Erosion in the Kingdom of Lesotho: Origins and Colonial Response, 1830s–1950s."
[96] Carruthers, "Environmental History in Africa."
[97] McCann, *Green Land, Brown Land, Black Land: An Environmental History of Africa, 1800-1990.*
[98] Jacobsohn, "Negotiating Meaning and Change in Space and Material Culture," p. 38.
[99] John Kinahan, "Archaeological Evidence of Domestic Sheep in the Namib Desert During the First Millennium AD," *Journal of African Archaeology* 14, no. 1 (2016): 7–17.
[100] Alfred Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492* (Westport, Connecticut: Praeger, 2003).

hundreds of years stretching back to approximately the last few centuries BCE.[101] Early domesticates were sheep and perhaps goats. In a region without meaningful agricultural prospects due to its aridity, the arrival of livestock in northwest Namibia was significant but the adoption of intensive pastoralism took time. Cattle arrived later, likely not in large numbers until the last one thousand years. Though livestock numbers in northwest Namibia likely never rivalled those of the Cape,[102] evidence for intensive pastoralism in the region increases in the sixteenth century, coinciding with the arrival of the ovaHerero people who migrated to northwest Namibia from the central African lakes' region during a period of exceptionally cool temperatures.[103] OvaHerero oral historians trace ovaHerero origins to a mountain in Angola called *Okarundu Kambeti*.[104] With the ovaHerero came large numbers of cattle. However, throughout the eighteenth and early-nineteenth century merchant ships passing the Skeleton Coast, seeking provisions for the ocean voyage, remained largely unaware of the extensive ovaHerero herds within the mountainous Kaokoveld. [105]

Cattle (*ozongombe*, sing. *ongombe*) were and remain "everything" for the ovaHerero.[106] As noted by an ovaHerero elder to historian Heinrich Vedder in the early twentieth century: "Have not the Hereros been cattle breeders ever since God created them? … One treks with the herd wherever water and grazing can be found and, in the meantime, the cattle increase… That is the life of a Herero."[107] Small stock, goats (*ozongombo*, sing. *ongombo*) and sheep (*ozondu*, sing. *ondu*), have also been kept, but are not as culturally significant. Reviewing precolonial property relations, Namibian historian Tshuutheni Shithigona notes the existence of highly-structured social classes and differentiation in cultural activities centered around livestock (*otutumbo*), particularly cattle.[108] In contrast to ethnically-drawn land-tenure boundaries common among East African pastoralists, ovaHerero 'ownership' over specific grazing lands centered around access to water. This was tied through kin-networks that managed dry- and wet-season pastures together.

[101] Karim Sadr, "Livestock First Reached Southern Africa in Two Separate Events," *PLoS ONE* 10, no. 8 (2015): e0134215.
[102] Beinart, *The Rise of Conservation in South Africa: Settlers, Livestock and the Environment, 1770-1950*.
[103] K. Holmgren et al., "A Preliminary 3000-Year Regional Temperature Reconstruction for South Africa," *South African Journal of Science* 97, no. 1–2 (2001): 49–51.
[104] Kuni Rodney Tjuarua, Personal Communication, 2018.
[105] John Kinahan, "Human and Domestic Animal Tracks in an Archaeological Lagoon Deposit on the Coast of Namibia," *The South African Archaeological Bulletin* 51, no. 164 (1996): 94–98; John Kinahan, "The Origins and Spread of Pastoralism in Southern Africa," *Oxford Research Encyclopedia, African History*, 2019.
[106] Jacobsohn, *Himba: Nomads of Namibia*, 23.
[107] Heinrich Vedder, *South West Africa in Early Times* (Windhoek, Namibia: Namibia Scientific Society, 1934), 145.
[108] Tshuutheni Neruru Shithigona, "Trends in the Development of Property Relations in Namibia before 1884," in *Namibia 1884 - 1984: Readings on Namibia's History and Society*, ed. Brian Wood (London, England: Namibia Support Committee, 1988), 132.

Private property was not unknown but was limited to moveable property. Grazing grounds could not be alienated without broad consent; other land was deemed of little value. When grazing land became a scene of conflict in the nineteenth century, the ovaHerero ensured the safety of their cattle first, stashing them beyond the reach of invaders, in Kaokoveld, or selling them to the Ovambo.[109]

Historically, ovaHerero cattle were of the indigenous Sanga breed.[110] Sanga are considered the longest-tenured cattle in southern Africa, only thought to have become broadly hybridized in Namibia around the 1960s.[111] Relatively small-framed, they are well-adapted to arid and semiarid areas, which characterize the majority of Namibian environments. Sanga are "extremely hardy through drought conditions," and can subsist on limited bush-browse longer than other breeds while remaining able to trek over long distances. Sanga can consume the less-nutritious foliage of very young mopane trees (*Colophospurmum mopane*), which will grow in the region's ephemeral riverbeds into the advanced stages of drought; though even Sanga cannot subsist without available grazing for long. Sanga are also resilient to ticks and bovine diseases. Throughout Namibia, these small-frame, wide-ranging cattle are more productive (in terms of beef production and calving) across different stocking rates than their large-frame counterparts.[112]

The scale of livestock ownership in Kaokoveld during the precolonial and early colonial era is difficult to ascertain. Relative to other pastoral African societies, Kaokoveld Herero and Himba have maintained a high proportion of cattle to small stock. However, small stock compose a numerical majority of herds, as was the case during the colonial era. Police data from 1929 put the number of cattle in Kaokoveld at just under 20,000 and small stock at roughly 38,000, while veterinary data from 1942 estimates cattle in Kaokoveld at 47,000. These numbers indicate a substantial loss relative to the precolonial era. Jacobsohn recounts stories of cattle loss from

[109] Michael Bollig, "Towards an Arid Eden? Boundary-Making, Governance and Benefit Sharing and the Political Ecology of the New Commons of Kunene Region, Northern Namibia," *International Journal of the Commons* 10, no. 2 (2016): 771–99; Jan-Bart Gewald, *Herero Heroes: A Socio-Political History of the Herero of Namibia 1890-1923* (Oxford, UK: James Currey, 1999), 23.

[110] Emmanuel Kreike, "De-Globalisation and Deforestation in Colonial Africa: Closed Markets, the Cattle Complex, and Environmental Change in North-Central Namibia, 1890-1990," *Journal of Southern African Studies* 35, no. 1 (2009): 81–98.

[111] Glenn-Marie Lange, Jon Barnes, and Daniel Motinga, "Cattle Numbers, Biomass, Productivity, and Land Degradation in the Commercial Farming Sector of Namibia, 1915 to 1995" (Windhoek, Namibia, 1997), 11.

[112] Emmanuel Kreike, "De-Globalisation and Deforestation in Colonial Africa: Closed Markets, the Cattle Complex, and Environmental Change in North-Central Namibia, 1890-1990," *Journal of Southern African Studies* 35, no. 1 (2009): 81–98; Glenn-Marie Lange, Jon Barnes, and Daniel Motinga, "Cattle Numbers, Biomass, Productivity, and Land Degradation in the Commercial Farming Sector of Namibia, 1915 to 1995" (Windhoek, Namibia, 1997), p. 11; "Nguni Breeders Society of Namibia," 2017, http://www.nguni-namibia.org/index.php/sanga; Michael Bollig, *Risk Management in a Hazardous Environment: A Comparative Study of Two Pastoral Societies.* (Springer, 2006), p. 59.

invaders and rinderpest towards the end of the nineteenth century. Environmental historian Emmanuel Kreike notes declining cattle numbers in neighboring Ovamboland during the early colonial era. Bollig too traces declining livestock ownership in Kaokoveld resulting from colonial policies which exacerbated environmental challenges. Depressed cattle ownership during this era points to an extended process of social and political marginalization within ovaHerero society.[113]

Cattle bind ovaHerero families and kin-networks. The ovaHerero trace kin relationships through a dual-descent system of matriclans (*omaanda*, sing. *eanda*) and patriclans (*otuzo*, sing. *oruzo*). Omaanda are how ovaHereros trace family relationships. Most wealth is inherited through one's eanda (matriclan). When a man dies it is traditionally his sister's eldest son who inherits the eanda cattle. This effectively diffuses wealth and power across a kin-network. Such cattle are used in important ceremonies such as name-giving, marriage, and ritual slaughter and may be bartered or sold. Otuzo (patriclans) link living ovaHereros to their ancestors and are the structure through which male leadership is inherited. Yet, even when oruzo leadership is passed to a man's son, his wealth mostly will not be. However, sacred (*zera*) cattle remain tied to the holy fire (*okuruwo*) which connects the generations of an oruzo and can be alienated only in exceptional circumstances. Via the holy fire the oruzo leader (*Ondangere poo Omupweye*) and his advisors commune with their ancestors (*ovakuru*/*ovatate*). In this way access to certain power remains within the oruzo. While categories of cattle are unidirectionally mutable – non-sacred cattle can be transformed into sacred cattle, though not vice-versa – they are distinct: the category a cow falls into greatly influences its role as a mediator of human relationships. Regarding the Herero of eastern Namibia and western Botswana, Gibson contrasts omaanda familial bounds as forces of 'conjunction,' while otuzo-based political power can be forces of 'disjunction.' However, in his work with the Himba at the end of the twentieth century, Crandall shows that omaanda forces of conjunction and otuzo forces of disjunction co-mingle. While omaanda bind families across space in the present, otuzo bind individuals and extended kin-networks across time. As historian Erica Fudge has pointed out, self-consciousness is not a prerequisite for historical agency. Cattle

[113] Michael Bollig, "Hazards and Damages," in *Risk Management in a Hazardous Environment: A Comparative Study of Two Pastoral Societies* (Springer, 2006), 58–59; South West Africa Administration, Namibia National Archives (SWAA) 1168, "Removal of Natives from the Southern Kaokoveld to the North. Correspondence between Officer in Charge of Native Affairs, Ovamboland and Secretary of South West Africa, Windhoek." (1929); John M. Heydinger, Craig Packer, and Jendery Tsaneb, "Desert-Adapted Lions on Communal Land: Surveying the Costs Incurred by, and Perspectives of, Communal-Area Livestock Owners in Northwest Namibia.," *Biological Conservation* 236 (2019): 496–504; Michael Bollig and Diego A. Menestrey Schwieger, "Fragmentation, Cooperation and Power: Institutional Dynamics in Natural Resource Governance in North-Western Namibia," *Human Ecology* 42 (2014): 167–81; "Nguni Breeders Society of Namibia"; Kreike, "De-Globalisation and Deforestation in Colonial Africa."

themselves have been an important part of ovaHerero culture and this history, and all cattle are not created equal.[114]

Crandall has shown that, among the Himba, different categories of cattle also provide a window into different human relationships to time. Time (*oruveze*) is divided into two types, the impermanent (*kamanga*) and the timeless (*karerera*). Day-to-day, month-to-month, and year-to-year living is understood as impermanent; this is the primary way time is measured by the Himba. Crandall calls this element the present-progressive and shows how non-sacred cattle mediate relationships within an eanda and may be traded, alienated, used to build alliances and so on; mutable exchanges between living persons. In contrast, sacred (zera) cattle embody timeless (karerera) ties between the generations of an oruzo – an inalienable bound that continues beyond a person's death. These connections are a manifestation of the timeless, or the unchanging elements of multi-generational life. Crandall calls this the present-eternal. For the Himba these two conceptions of time exist simultaneously, but the permanent is prized above the impermanent. These cosmologies are not uniform among the ovaHerero, but they are indicative of the importance of cattle running throughout Eserewondo Ozongombe.[115]

Centering ovaHerero perspectives requires that, as much as possible, cattle are given the meanings ovaHerero have of them. Applying Haraway's concept of becoming-with for the ovaHerero means placing cattle at the fulcrum of many aspects of human living. Though the archives are largely silent on this point, precolonial theft of cattle, colonial restrictions upon cattle, and cattle destruction spanning the precolonial and colonial eras could be an intensely personal, even familial experience. Historians are left to imagine the extent of personal and cultural loss endured by the ovaHerero throughout this period.

Oorlams

During the eighteenth and early-nineteenth century groups of Otjiherero-speaking pastoralists migrated southwards from Kaokoveld, occupying desirable grazing lands in central Namibia. At the same time, recently dispossessed agropastoral communities from the Cape Colony (South Africa) were moving northward across the Orange River. The Oorlams, a poly-ethnic group of Khoisan, Nama, Cape Coloured, and Malays, as well as variety of runaway slaves and desperados, were largely expelled from the Cape. However, through the development of a form of mounted combat known as the commando system, they emerged as the premier economic and

[114] Fudge, "What Was It Like to Be a Cow?"
[115] Gordon D. Gibson, "Double Descent and Its Correlates among the Herero of Ngamiland," *American Anthropologist* 58 (1956): 109–39; Crandall, "The Role of Time in Himba Valuations of Cattle."

military power along the present-day border of Namibia and South Africa. Engaging in immense stock raids, the Oorlams took violent control over central and southern Namibia during the 1830s.[116] During Oorlam hegemony, many Otjiherero-speaking pastoralists in these areas lost their wealth, were separated from long-standing kin networks, and adopted a hunter gatherer-type lifestyle, which led them to be termed *ovaTjimba*: the people who live like the ant-bear (*tjimba*). Some impoverished pastoralists sought refuge with their kin in the rugged Kaokoveld.[117] During this process, decentralized transhumant kin-networks, who had formerly recognized no authority beyond oruzo leadership, became an increasingly centralized, spatially-rooted, and militarily successful ovaHerero society in central Namibia.[118]

Near present-day Windhoek, Tjimba clustered around missionary stations, combining with Europeans and other ovaHereros to fight against the Oorlams. By the end of the 1860s, Oorlam forces splintered. Newly-organized Otjiherero speakers, numbering between 64,000 and 96,000, began to dominate the region, where a cohesive Herero identity emerged during the 1860s-70s. The rise of centralized political power, eventually coalescing around the 'paramount chief,' became a distinguishing characteristic differentiating Hereros in central Namibia from their Kaokoveld kin. Contact with missionaries and regional trade networks also exposed these communities to a wider array of material and cultural influences. After taking power back from the Oorlams, those who remained as Tjimba took what money they had earned through wage-labor and largely retreated to the hinterlands to (re)build their herds while the Herero now controlled much of central Namibia. No longer hunters and gatherers like the ant-bear, the Tjimba label largely disappeared until another crisis befell ovaHerero groups in Kaokoveld. While ovaHerero society in Kaokoveld still revolved around decentralized otuzo and omaanda ties, Herero chiefship in central Namibia was grafted onto these networks.[119]

OvaKwena

While the ovaHerero in Kaokoveld remained temporarily inured to the conflict further south, they were not isolated. Beginning in the 1850s, Oorlam commandos engaged in bloody stock raids in Kaokoveld, where the arid and rugged environment kept ovaHerero pastoralists decentralized and thus unable to mount a common defense. Kaokoveld residents, relatively easy prey, still remember these Oorlam raiders as the *ovaKwena*.

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[116] Lau, *Namibia in Jonker Afrikaner's Time*.
[117] Gewald, *Herero Heroes: A Socio-Political History of the Herero of Namibia 1890-1923*, 14.
[118] Nicolaas Jacobus van Warmelo, "Ethnological Publication No. 26: Notes on the Kaokoveld (South West Africa) and Its People" (Pretoria, 1951), 11.
[119] Gewald, *Herero Heroes*, 10–28; Wallace, *A History of Namibia*, 47–104.

The late nineteenth century was an era of great fear and violence in Kaokoveld. Between the 1850s and 1890s as many as 2,000 cattle were stolen annually.[120] The ovaKwena were aggressive, violent, and fearsome. Memories of women having their harms hacked-off for copper bangles persisted to the end of the twentieth century. Jacobsohn's work with the Himba of Kaokoveld more than ninety years later reveals the enduring magnitude of these losses in terms of wealth and status.[121] One elder man remembered,

> "this land trembled under the hoofs of the oukambe (horses) of the ovaKwena [Oorlams]. After the ovaKwena drove off my grandfather's cattle, our people hid in the hills. Now they had no cows' milk but they did not die. They remembered the ways of the old people…They ate from the trees and shrubs and knew which plants hid their edible store under the ground…If they had not paid attention to their elders when they were boys and girls, the family's bones would now lie white and scattered in those hills, picked clean, under the sun, like the bones of wild animals."[122]

An oruzo head insisted the cattle losses suffered at the hands of the ovaKwena dealt the Himba a more enduring blow then any of the difficulties during the colonial era.

> "Before the war the people here had lots of cattle. Then came the Ovambo and the Ovakwena [Oorlams]. They took the cattle. Our people had to chew old skins. Clever people ran away and took some of their stock. The stupid stayed here and lost all. So now only some of us have cattle. From that day we have struggled."[123]

This period of violence perpetuated a split among the ovaHereros in Kaokoveld. Those who stayed either retreated to the rugged mountains in northern Kaokoveld, or cooperated with the Oorlams.[124] In 1895-6, Swedish explorer Peter Möller noted the use of the Tjimba label to describe the ovaHerero who remained in Kaokoveld.[125] Those who fled to southern Angola were given the name *ovaHimba* by other people residing there; meaning "those who beg," for food or land. The result was a diaspora straddling the Kunene River, that was greatly impoverished and had lost much of its autonomy.[126]

Dispersed throughout the region's mountainous areas or beyond the Kunene River in Angola, Kaokoveld's pastoralists set-about rebuilding their herds of Sanga cattle and small stock,

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[120] Jacobsohn, "Negotiating Meaning and Change in Space and Material Culture: An Ethno-Archaeological Study among Semi-Nomadic Himba and Herero Herders in North-Western Namibia," 24.
[121] Bollig, *When War Came the Cattle Slept: Himba Oral Traditions*, 15.
[122] Jacobsohn, *Himba*, p. 23.
[123] Jacobsohn, "Negotiating Meaning and Change in Space and Material Culture," p. 34.
[124] Wallace and Kinahan, *A History of Namibia: From the Beginning to 1990*, 87.
[125] Peter Möller, *Journey in Africa through Angola, Ovampoland and Damaraland.* (Cape Town: Struik, 1899), 163–64.
[126] Garth Owen-Smith, "Proposals for a Game Reserve in the Western Kaokoveld," *South African Journal of Science* 68, no. 2 (1972): 32; J. S. Malan, *Peoples of Namibia* (Pretoria, South Africa: Rhino Publishers, 1995), 88.

having little business with German colonial interests. Though their direct circumstances (kamanga) had altered, ovaHerero commitment to cattle was undiminished (karerera). In 1885, the Herero paramount chief residing near Windhoek signed a treaty ceding formal control to Germany over what became known as German South West Africa. In 1886, an Oorlam *kaptien* sold Kaokoveld to a German merchant. The area was then sold to the Berlin and London-based Kaoko Land and Mining Company. Initially, this had little effect on the ground: Kaokoveld remained defined primarily by personal and livelihood insecurity. OvaHerero south of the Kunene (in Kaokoveld) suffered at the hands of, and fought back against the ovaKwena. In Portuguese Angola disparate groups of ovaHerero organized by powerful and charismatic leaders were rebuilding their herds and availing themselves of regional trade networks.[127]

Yotjita Tjozongombe (Cattle Death)

As the ovaHerero and ovaKwena navigated the increasing colonial presence, societies across southern Africa were being transformed by another, unforeseen, nonhuman threat. For two years (1896-7) an epidemic of rinderpest – a disease effecting ruminants – swept through German South West Africa. Likely imported to the Horn of Africa by Italian soldiers in 1887, the disease crossed the Zambezi by 1896, killing perhaps 2.5 million cattle in South Africa that year. The toll on African livestock remains unknown, though a majority perished in the German colony.[128] Fifty years later Kaokoveld residents still remembered the near-annihilation of their remnant cattle herds by rinderpest and some other, unnamed, disease around the same time. Likely only the ovaKwena based around Sesfontein possessed large herds during this period suggesting they were hardest hit among Kaokoveld pastoralists. In contrast, an aggressive inoculation campaign among settler-owned livestock may have saved as many as 50-90%.[129]

The rinderpest epidemic hastened the end of ovaKwena domination of Kaokoveld. The colonial administration believed a growing settler society required protection against African-induced veterinary threats. In late 1896, colonial officials began establishing a veterinary cordon dividing German South West Africa in two. The "Red Line" (for how it appeared on maps) began as a west to east stock-free corridor enforced by a series of military posts. These posts indicated the extent of German administrative control but could not be erected and occupied without local

[127] Bollig, *When War Came the Cattle Slept*, p. 216.
[128] Bollig, *Risk Management in a Hazardous Environment: A Comparative Study of Two Pastoral Societies.*, 122; Pule Phoofolo, "Epidemics and Revolutions: The Rinderpest Epidemic in Late Nineteenth-Century Southern Africa," *Past & Present* 138 (1993): 112–43; Miescher, *Namibia's Red Line: The History of a Veterinary and Settlement Border*, 27.
[129] van Warmelo, "Ethnological Publication No. 26: Notes on the Kaokoveld (South West Africa) and Its People," 53.

assistance. Such assistance was not forthcoming along Kaokoveld's southern border, where ovaKwena and ovaHerero leaders banded-together to resist colonial control of livestock. This was the last stand for ovaKwena domination of Kaokoveld. Defeated in March 1898, ovaKwena leaders surrendered that following August. The relative peace that followed allowed ovaHereros on both sides of the river to begin rebuilding their herds.[130]

Though the ovaKwena's defeat enabled greater colonial incursion into Kaokoveld, the under-resourced state could not effectively govern most of the region. Following the rinderpest outbreak, ovaHerero nomadism conflicted with increasingly scientific approaches to veterinary health and livestock management propagated by the German regime. The creation of what Miescher calls an "imperial barbarian border" dividing northern 'native' areas from what became known as the "Police Zone" in the south, had lasting effects upon Kaokoveld's ovaHereros.[131] White settler society and livestock was limited to the Police Zone south of the Red Line, while African livestock in the north were deemed unhealthy and could only cross the Red Line following veterinary examination and quarantine. As van Wolputte notes of a later era, veterinary restrictions became a means to "sedentarize" the population and livestock.[132] The initial effects of German rule were thus mixed in Kaokoveld: while the ovaKwena threat was pacified, new veterinary concerns gave rise to increasing state-based attempts to control livestock.[133]

In central Namibia, the rinderpest epidemic undermined Herero autonomy, engendering tensions which led to the Herero-German War (1904-7). What followed forever altered the place of the Herero in Namibian society. Uprooted by fear, threats, violence, and subject to an 'Extermination Order' many Hereros fled eastward into the Omaheke desert or hid in Kaokoveld. Across central Namibia an estimated 70 to 80%, perhaps as many as 64,000 Herero, were killed or died from starvation, disease, and dehydration. Remaining Hereros were enclosed upon reserves as a colonial labor pool; many later joined their kin in Kaokoveld. In some cases, fleeing Hereros subjugated and absorbed Kaokoveld Tjimba who were still recovering from ovaKwena violence and rinderpest. Kaokoveld pastoral society was neither destroyed, nor undermined by the Herero-German War, but the influx of refugees reconfigured power structures in the region.[134]

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[130] Miescher, *Namibia's Red Line*, 33–34.
[131] Miescher, 9, 65.
[132] van Wolputte, "Cattle Works: Livestock Policy, Apartheid and Development in Northwest Namibia, c 1920–1980," 104.
[133] Bollig, *When War Came the Cattle Slept: Himba Oral Traditions*, 162–63.
[134] Gewald, *Herero Heroes*; William Malcolm Hailey, "A Survey of Native Affairs in South West Africa" (Unplublished, Retrieved: Center for Research Libaries, 1946), 16; Bollig, "The Colonial Encapsulation of the North-Western Namibian Pastoral Economy"; Miescher, *Namibia's Red Line*; Silvester and Gewald, *Words Cannot Be Found*, 75–81.

Following the war, colonial gerrymandering remade Kaokoveld. In 1907, the area and its residents became part of the newly-created Game Reserve #2. Stretching from the Kunene River in the north, to the Hoaruseb river in the south, Game Reserve #2 encompassed 80,000 square kilometers, making it the world's largest such reserve.[135] The creation of Game Reserve #2 had the effect of further isolating Kaokoveld residents and their stock from the rest of the colony. In coming years Reserve legislation alienated residents from full rights over the landscape: while trading and farming were allowed, wildlife became protected.[136] Kaokoveld ovaHereros now inhabited a space which, as long as livestock did not trespass the Police Zone boundary, was peripheral to German colonial concerns. This created something of a power vacuum: with the ovaKwena no longer in control and the Germans unable to meaningfully rule the area, Kaokoveld became a political frontier. During this period a Tjimba 'chief' named Kakurukouje, emerged as an ally of the German government. Possibly benefitting from partnership with the ovaKwena, Kakurukouje had maintained some wealth during the period of conflict. Presented with a gun by the German government as a token of his leadership, Kakurukouje was tasked with crossing the Kunene to bring his brethren back from Portuguese Angola. However, across the river, two men had been building their own bases of livestock wealth and attracting followers. Their return would have long-lasting effects on Kaokoveld politics and colonial livestock regulations to, again, remake the region.[137]

Policy changes and the Territory's transfer to South Africa following World War I enabled a gradual return to prominence for the ovaHerero in Kaokoveld.[138] The region became subject to the Native Commissioner for Ovamboland who was forced to indirectly govern Kaokoveld through a system of newly-installed, officially-recognized traditional authorities. The historical processes which had split the ovaHereros now enabled the categorization of three separate, but related, ovaHerero groups: the Herero, Himba, and Tjimba. In the eyes of the South African administration, each 'tribe' would have its own 'chief' who was responsible for governance and working with the administration.[139]

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[135] H. H. Berry, "Historical Review of the Etosha Region and It Subsequent Administration as a National Park," *Madoqua* 20, no. 1 (1997): 3–12.

[136] Though hunting by residents was initially tolerated by unofficial administration sanction it was revoked in 1928.

[137] Miescher, *Namibia's Red Line*, p. 203; H. H. Berry, "Historical Review of the Etosha Region and It Subsequent Administration as a National Park," *Madoqua* 20, no. 1 (1997): 3–12; Bollig, *When War Came the Cattle Slept,* 20–21.

[138] The changes developed slowly: neither the effective (1915) nor the official power transfer (1919) was recorded in Kaokoveld oral traditions. See: Michael Bollig, "Power and Trade in Precolonial and Early Colonial Northern Kaokoland, 1860s-1940s," in *Namibia under South African Rule: Mobility and Containment, 1915-1946*, ed. Patricia Hayes et al. (Oxford, UK: James Currey, 1998), 185.

[139] Government of South West Africa, "Native Reserves" (1923).

Ovahona (Chiefs)

As ovaKwena power waned, ovaHerero refugees began returning to Kaokoveld. The first substantial wave of immigrants fell under the leadership of Muhona Katiti, who, having profited from two decades of raiding and sometimes aligning with the Portuguese in southern Angola, returned to Kaokoveld in 1910. Later, as ethnic categories became concretized, Katiti was re-imagined as the "only…leader amongst the Himba influential enough to be regarded as a chief."[140] Katiti was powerful and viewed with suspicion by colonial officials. Of his appearance, one colonial administrator remarked that Katiti was "a real savage in sundry metal ornaments, grease, skin girdle, wool or hair bunched and bound with fine leather behind the head."[141]

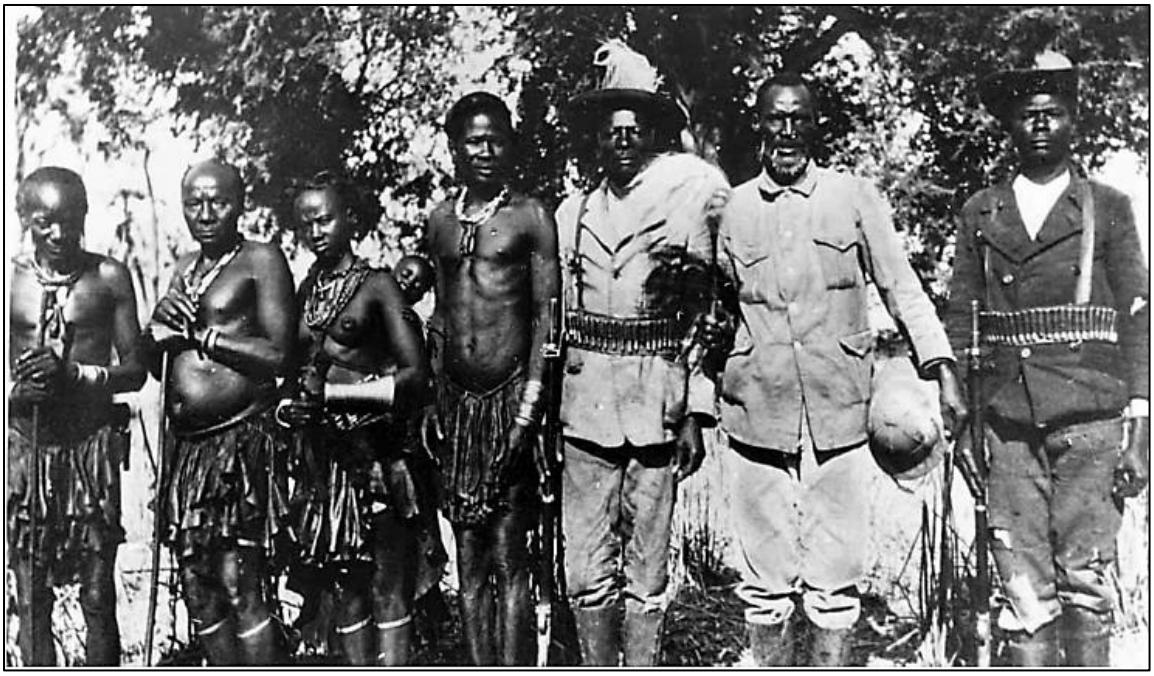

Figure 3: Muhona Katiti (second from left) and Harunga (second from right). Source: Namibia National Archives

During his years in Portuguese Angola, Katiti crossed paths with, and became an enemy of Oorlog (War) Tom. Known to the ovaHerero as Harunga (War), he was an ovaHerero originally from central Namibia. Harunga had been militarily-aligned with the Portuguese in Angola since the 1880s but was driven, along with his followers, to Kaokoveld by Boer commandos in 1915/16. Seeking a place to settle, Harunga and Katiti quarreled over grazing

[140] van Warmelo, "Ethnological Publication No. 26: Notes on the Kaokoveld (South West Africa) and Its People," 13.
[141] Friedman, "Making Politics, Making History: Chiefship and the Post-Apartheid State in Namibia," 28.

space. In 1917/18, Kakurukouje brokered a peace, whereby Katiti and his large herds would occupy favorable grazing lands further east along the River, while Harunga and his followers occupied areas favorable for cultivation.[142] The brokered settlement was ineffective: Kakurukouje passed-away in ca. 1921 and the rivalry of Harunga and Katiti dominated Kaokoveld politics during the 1920s. Harunga, who was more westernized than Katiti, quickly became favored by South African officials as "the dominating figure in Kaokoveld."[143] Normally dressed in military fatigues reminiscent of the German *Schutztruppe* and seen to be more reliable than Katiti, Harunga's "fine look[s]…excellent manners and personality" curried administration favor and was consistently reinforced throughout the 1920s. However, even Harunga's power was beholden to the ruling government: a military campaign against King Mandume of the Ovambos in 1917 served as "an object lesson to all Native Chiefs," including Kakurukouje, Katiti, and Harunga.[144] The message could have hardly been clearer: in his defeat, King Mandume had been decapitated.[145]

Due to growing tensions between Harunga and Katiti, in 1923 South African officials sub-divided Kaokoveld into four reserves, one for each of the traditional authorities in the north, along with a fourth, principally for the remnant ovaKwena, at Sesfontein. The allocation of these reserves and the instantiation of the three traditional authorities as their *de facto* rulers, gave Katiti, Harunga, and Kakurukouje's heir Kahewa-Nawa, a base for extending their power within Kaokoveld.[146] The central responsibility of each was to ensure the livestock of 'their people' remained within each designated reserve to limit the spread disease from Angola or Ovamboland to the Police Zone. True to his name Harunga and his followers did not abide by their reserve boundaries. For other ovaHerero, the era of Harunga's dominance was likened to the violence of the ovaKwena. Livestock were taken and people were again being killed. By propping up his rule, the South African government helped concretize Harunga's power in this intra-colonial frontier.[147] Harunga's status as an outsider (born in central Namibia) reinforced tensions in the region. Because he fell outside of local omaanda and otuzo networks, Harunga's hand in dealing with enemies was less constrained.

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[142] Bollig, *When War Came the Cattle Slept*, 133.
[143] Native Affairs Ovamboland, Namibia National Archives (NAO) 018, "Annual Report: Native Commisioner, Ovamboland" (1929).
[144] NAO 018, "Kaokoveld Annual Report, Native Commissioner, Ovamboland" (1928).
[145] Jan-bart Gewald, "On Becoming a Chief in the Kaokoveld, Colonial Namibia, 1916-25," *Journal of African History* 52 (2011): 23–42.
[146] Government of South West Africa, Native Reserves.
[147] Gewald, "On Becoming a Chief in the Kaokoveld, Colonial Namibia, 1916-25," 25.

Livestock, which had long bound ovaHerero networks, now bound ovaHerero power structures to the colonial state in new ways. During the 1920s the rule of Harunga and Katiti in particular created an intermediary space between residents and colonial administrators, reminiscent of Mahmood Mamdani's bifurcated state, in which Kaokoveld residents navigated politics of chiefship and the colonial state.[148] During this period livestock were often the site through which power was expressed and the means of resisting it. Katiti and his followers in particular were often instructed not to move their cattle beyond the bounds of their reserve. Time and again these orders were contravened exposing the limits of colonial rule and revealing how different forms of everyday resistance could be used against it. One official reported that Katiti's stock had been moved without permission. When confronted, Katiti was evasive, stating that the stock had been moved without his knowledge. When herders were instructed to return livestock to their reserve, the herders would make use of Kaokoveld's rugged topography: hiding stock in remote places where colonial officials could not retrieve them.[149] Trespassing livestock also revealed the limits of direct rule. When a young herder was caught outside Harunga's reserve without permission, the Officer-in-Charge of Kaokoveld directed Harunga to fine the boy two cattle, rather than do it himself.[150] Unable to govern the area directly, officials relied on Harunga and Katiti. During the 1920s the peasantry continued to frustrate state rule through livestock movements. Such pastoral strategies kept the semiarid and arid Kaokoveld a suitable space for grazing relatively large herds, according to ovaHerero standards. In 1928, 1,633 adult ovaHerero inhabited Kaokoveld's three reserves. All told this population owned approximately 15-23,000 cattle and 35,000 small stock.[151]

Omakutu (Sacks of Grain)

The creation of a buffer between South West Africa 'proper' (the Police Zone) and the livestock diseases of the African interior was the motivating force of South African rule in Kaokoveld during the inter-war period.[152] At the time, South West Africa was a favored destination for many landless white South African farmers. Economic and political policies within the Territory were intended to secure the livelihoods of white farmers within the Police Zone. During the 1920s the South African administration aided 1,261 newly-arrived settler families. Substantial cash advances, debt-forbearance and forgiveness, loans for infrastructure-development, and an

[148] Mahmood Mamdani, *Citizen and Subject: Contemporary Africa and the Legacy of Late Colonialism* (Princeton, New Jersey: Princeton University Press, 1996).
[149] SWAA 2513, "Tshimaka Police, Patrol Report: June, 1926." (1926).
[150] SWAA 2513, "Monthly Reports Tshimaka, April 1927" (1927).
[151] NAO 018, "Kaokoveld Annual Report, Native Commissioner, Ovamboland."
[152] Botha, "The Politics of Land Settlement in Namibia, 1890–1960."

administration-backed Land Bank, made aid packages among the most generous in the world.[153] During this period Kaokoveld was conceptualized as an arid livestock buffer between areas such as Ovamboland and Portuguese Angola, and the settler economy within the Police Zone. The veterinary paradox was that the settler economy relied upon livestock but settlers were prohibited from trading for sought-after African-owned livestock in the north.[154]

Once the livestock trade from the reserves to the Police Zone was disallowed, regulations on livestock movements within the reserves became a priority. In theory, Kaokoveld residents were supposed to inhabit one of the three reserves. In practice, the lack of available grazing and water reinforced nomadic strategies. These ecological limitations forced ovaHereros to choose between their livestock's well-being and the important social ties cattle represented, and abiding by laws founded upon alien veterinary health standards unrefined by colonial practitioners.[155] Historically, ovaHerero herders had moved back-and-forth across the Kunene River, to make use of grazing on both sides, and visit their kin. In contrast, colonial officials considered the northern side of the Kunene River to be a source of livestock diseases. Whereas cattle wellbeing was freighted with social considerations for the ovaHerero, livestock were essentialized in the eyes of the colonial state: either healthy or unhealthy. Administration officials recognized that livestock movements kept herders and stock beyond the reach of the state, complicating attempts to police the region. The rationale attributed to herders in official documents, was that the region's arid environment necessitated trekking between available water sources. The consistent resistance to colonial regulations, particularly among Katiti and Kahewa-Nawa's followers, led to a tone of resignation within official communications.[156]

In 1925 lungsickness broke out on Katiti's reserve. The signs and symptoms of lungsickness would have been horrible to these people, so dedicated to their cattle. Though not dangerous to people, cattle suffering from lungsickness can sicken, become emaciated, develop internal and external lesions, and die, within a matter of days. In drought-prone areas, where cattle may be weakened and highly mobile, the disease can spread rapidly with devastating effects. In subsequent years the administration toughened its stance against possible lungsickness, turning a tone of resignation into one of administrative action. By the late 1920s, the threat of

[153] Government of South West Africa, "Report of the Land Settlement Commission" (Windhoek, Namibia, 1927), 17–18.
[154] NAO 018, "Kaokoveld Annual Report, Native Commissioner, Ovamboland"; SWAA 1168, "Removal of Natives from the Southern Kaokoveld to the North. Correspondence between Officer in Charge of Native Affairs, Ovamboland and Secretary of South West Africa, Windhoek."
[155] Steven Van Wolputte, "Vicious Vets and Lazy Locals: Expermintation, Politics and CBPP in North-West Namibia, 1925-1980," *Journal of Namibian Studies* 13 (2013): 79–100.
[156] NAO 018, "Monthly Report: June and July. Officer in Charge, Native Affairs, Ovamboland to Secreatary for South West Africa. 11 August." (1927).

lungsickness coming from Ovamboland or across the Kunene, via Kaokoveld, into the Police Zone was considered grave. The slightest indication of the disease within Kaokoveld, no matter the distance from the Police Zone boundary, was sufficient cause to destroy livestock as a "precautionary measure," generally without compensating the owner. This was justified on veterinary grounds but with a clearly racial valence: officials felt that natives were not sufficiently concerned about the threats posed by livestock diseases. This all took place even as certain officials recognized that lungsickness was first introduced to Kaokoveld by an "irresponsible" white stock owner in 1925. It may not have originated in Ovamboland at all.[157]

During this period of increasing emphasis by South Africa on buttressing the territorial economy, colonial restrictions became increasingly proscriptive. The boundary between Ovamboland and Kaokoveld was turned into a closed border through which people and livestock could not pass without official permission. In 1929, the administration began creating a vast corridor separating native livestock from settler livestock. To do so, administration officials forcibly relocated 1,127 men, women, and children along with more than 7,500 cattle and 22,000 small stock from southern Kaokoveld further north.[158] This movement effectively shifted the Kaokoveld boundaries and created a 60-80-kilometer stock-free corridor in the west and was remembered long into the future as a terrifying event – some groups of people and their stock fled northwards in the night from administration officials.[159] This relocation strained internal Kaokoveld politics by forcing together kin-networks that otherwise desired to remain separate. Previously, political tensions were ameliorated by Kaokoveld's vast space relative to the small population and transhumant practices. Now, certain displaced ovaHereros were wary of falling under Harunga's authority. Harunga was considered a "traveler" who was insufficiently connected to the ovaHerero of Kaokoveld by kin-networks, and had only grown in prestige due to the assistance of the colonial state and his violent stock-raiding in both Portuguese Angola and in Kaokoveld since his return.[160] One Kaokoveld leader, Langman Tjahura, who was being forced north-westwards from near present-day Etosha, asked that, rather than stay in northern Kaokoveld, he and his followers be allowed to move on to Ovamboland. The possibility of encouraging regular movements between Kaokoveld and Ovamboland was deemed an

[157] SWAA 2513, "Tshimaka Police, Patrol Report: June, 1926."; Wolputte, "Vicious Vets and Lazy Locals: Expermintation, Politics and CBPP in North-West Namibia, 1925-1980"; SWAA 2513, "Movement of Cattle" (1931); SWAA 2513, "Monthly Reports, Tshimaka Police, Febraury 1928" (1928); SWAA 2513, "Report on the Outbreak of Lungsickness at Otjuerungu" (1929); NAO 028, "Lungsickness: Ehomba and Kauapehuri. June 1931" (1931).
[158] SWAA 2513, "Monthly Report, February, 1930" (1930); SWAA 2513, "Monthly Reports: November and December, 1930. Tshimaka." (1931).
[159] Uakendisa Muzuma, Personal Comunication, 2019.
[160] Bollig, *When War Came the Cattle Slept: Himba Oral Traditions*, 165.

unacceptable veterinary risk and the request was denied.[161] Though nominally a Herero, and therefore designated as falling under Harunga's leadership, omaanda and otuzo kinship ties binding Tjahura did not extend to Harunga, who was born further south near Otjimbingwe (west of Windhoek). The colonial penchant for simplifying ovaHerero kin-networks within 'ethnic' categories further exacerbated social tension within Kaokoveld.

From an administration perspective, the political difficulty between Harunga and other leaders could be partially solved by the needs of cattle. Rangeland constraints resulting from livestock concentration were considered an administrative asset: due to recent low levels of rainfall the Hereros from southern Kaokoveld would have to increasingly "intermingle" with northern residents and fall under Harunga's leadership.[162] This solution was short-lived, some Hereros contravened administration orders and returned to their place of origin. Simultaneously, groups of hired Khoe-Sān were thought to be sneaking stock across the Kaokoveld-Ovamboland border.[163] While Kaokoveld's rugged and arid environment could aid administration goals of forcing ovaHereros together, an inability to control stock movements still frustrated colonial administrators, as this excerpt from the Native Commissioner's report shows:

> "The Hereros and Ovambos have been very sternly warned on many occasions and I consider it useless to waste further words. If it is found that they have moved stock without authority I would suggest that Constable Cogill be instructed to the places mentioned by him and shoot the cattle without further ado."[164]

This led to fear and uncertainty among Kaokoveld pastoralists over administration designs on their livestock. Still, it was uncertain whether the area was free from lungsickness: the movement restrictions may or may not have reduced the transmission of the disease.[165]

Official intransigence exacerbated environmental pressures. From the early to mid-1930s, drought further strained rangelands. In 1931 Kaokoveld was gripped with famine. Even the recently-cleared stock-free corridor "was as devoid of pasturage as the rest of the Kaokoveld" – though the effects were felt most keenly in the north. Rizzo notes that during the 1930s the contravention of regulations against moving livestock "became a strategy of survival."[166] The

[161] SWAA 1168, "Extract from Monthly Report for May and June" (Namibia National Archives, 1929).
[162] SWAA 2513, "Monthly Report, February, 1930; S.W.A. Police, Tshimhaka."
[163] SWAA 1168, "Removal of Natives from the Southern Kaokoveld to the North. Correspondence between Officer in Charge of Native Affairs, Ovamboland and Secretary of South West Africa, Windhoek."
[164] SWAA 2513, "Monthly Reports: November and December, 1930. Tshimaka; Native Commissioner, Ovamboland to Secretary for South West Africa."
[165] NAO 028, "Livestock and Agricultural Census" (1930); SWAA 2513, "Official Letter, Concerning Famine in Kaokoveld; Secretary for SWA to Consul for Portugal, Windhoek." (1932).
[166] Rizzo, *Gender and Colonialism: A History of Kaoko in North-Western Namibia, 1870s-1950s*, 154–55; 159.

strength of favored chiefs such as Harunga could not supersede the needs of livestock. Even Sanga could not cope with the drought: cattle numbers plummeted and people faced starvation.[167] As Bollig notes, it was not the especially challenging environment but the limits imposed by an increasingly oppressive political regime which disallowed the ovaHerero from employing time-tested strategies for mitigating the effects of drought.[168] This is similar to indigenous peoples' efforts to cope with drought in other places during the colonial era, reinforcing the perspective that inappropriate policies can exacerbate environmental challenges.[169] Himba chronologies reflect the memories of these years as "the year of seed" (*Ondjara Yomekunu*) or "the year of one milking" (*Ondjara Yekandukemwe*).[170] Acutely suffering from the drought, some inhabitants took the extraordinary step of offering to trade cattle for grain. Unfortunately, this offer was of little interest: due to veterinary restrictions "the cattle received may not leave the Kaokoveld." In the end grain was provided and officials shot thirty zebra to feed the people.[171]

Harunga Tja Koka (Death of Harunga)

As the colonial state shifted humans and livestock during the 1930s, ovaHerero power structures were eroding. The death of Kakurukouje had left Kaokoveld polarized between Katiti and Harunga, whose followers came into increasing conflict. Many of Kakurukouje's followers were absorbed among Katiti's, leaving them open to Harunga's depredations. The rest maintained a marginal hunter-gatherer-type existence in Kaokoveld's northern mountains and largely disappear from the historical record. Harunga remained an object of fear,

> "Chief Oorlog [Harunga], as usual, is the dreaded man in the Kaokoveld, principally because of his 'slim' ways and associates, i.e. his Oorlams followers [sic] and relatives who are always ready to make trouble with the savage Ovahimba [Himba]. Of late several of the principal Ovahimba natives have left his area and gone over to Muhona Katiti. Although Oorlog very much resents this I have given him very clearly to understand that natives will live where they receive fair treatment and are left unmolested. A feeling of dissatisfaction appears to be brewing amongst certain of his Herero followers and Oorlog is finding it more and more difficult to keep his band playing in tune."[172]

[167] NAO 028, "Drought in Kaokoveld. Official Letter, Native Constable in Charge, Kaokoveld to Commandant, South West Africa Police, Windhoek." (1932).
[168] Bollig, "The Colonial Encapsulation of the North-Western Namibian Pastoral Economy."
[169] Mike Davis, *Late Victorian Holocausts: El Niño Famines and the Making of the Third World* (London: Verson, 2001).
[170] Gibson, "Himba Epochs."
[171] NAO 028, "Kaokoveld: Drought. Official Letter, Native Commissioner, Ovamboland to Secretary for South West Africa, Windhoek." (1932); NAO 028, "Official Letter, Secretary for SWA to Native Commissioner, Ovamboland," 1932.
[172] NAO 018, "Monthly Report: June and July. Officer in Charge, Native Affairs, Ovamboland to Secreatary for South West Africa. 11 August. (1927)"

Kaokoveld was further plunged into political uncertainty with the death of Muhona Katiti, in 1931.[173] Within months Harunga and his followers, using the ongoing drought as justification, began grazing within the late Katiti's reserve, effectively using their cattle and other livestock to assert dominance over that area.[174] Complaints of Harunga's rule exposed further rifts in the colonial system. Many of 'Katiti's Himba' reverted to an array of loosely-organized kin-networks reminiscent of the pre-ovaKwena era.[175] While the ovaKwena attacked isolated homesteads, a key difference in this new era of South African rule was that Harunga was somewhat pacified by an increasingly interventionist colonial state. In this regard latter-day Himba remember the early colonial era with mixed feelings,

> "Sometimes the government would hurt you…but in many other instances it would help you. I differentiate: sometimes it caused harm, sometimes it did good things…They divided the cattle because of diseases. They prevented somebody from here from going over there." … "Later when the [government] came they introduced a law which said that everyone should keep his own belongings and nobody should take things from anybody else by force. That was one thing which was implemented by the government of the whites…this one (probably Harunga) was pacified by the law of the white people, so that he would not steal livestock anymore."[176]

Many ovaHerero trusted the administration to govern in terms of rule of law and participated in projects such as road-building. They appreciated that, generally, a tone of peace prevailed in Kaokoveld. However, the restrictions placed on livestock movement were a source of ongoing antagonism between the administration and ovaHerero pastoralists. Forms of everyday resistance were consistently evident in livestock movement, particularly among the Himba. When Harunga died in 1937 the last of the truly strong traditional authorities was gone. His designated heir had neither the personal force, nor, because Harunga had married a non-ovaHerero, did he have the omaanda bonds required to consolidate leadership across Kaokoveld.[177] This illustrates the veracity behind Crandall's claim that eanda (matriclan) and oruzo (patriclan) forces 'co-mingled': though chiefship could be passed through the patriclan, it was ineffectual without the matriclan

[173] NAO 028, "Death of Chief Muhona Katiti" (1931).
[174] NAO 018, "Monthly Report: June and July. Officer in Charge, Native Affairs, Ovamboland to Secreatary for South West Africa. 11 August."
[175] SWAA 1168, "Removal of Natives from the Southern Kaokoveld to the North. Correspondence between Officer in Charge of Native Affairs, Ovamboland and Secretary of South West Africa, Windhoek."; NAO 028, "Lungsickness: Kaokoveld; Native Commissioner, Ovamboland to Secretary for SWA. 25 March." (1932).
[176] Bollig, *When War Came the Cattle Slept*, 162–63, 165.
[177] Garth Owen-Smith, Personal Communication, 2018.

bonds to support it. Still, the government sought to rule Kaokoveld indirectly. Into this new power vacuum stepped a Tribal Council (*Ombongero yomuhuko*) of government-created and supported traditional authorities drawn from the different Herero, Himba, and Tjimba groups. However, these new administration-backed leaders could not replace Harunga and Katiti, whose power rested on methods increasingly considered anathema to South African rule.

Ombongero Yomuhuko (Tribal Council)

Colonial administrators and the newly-minted councilors struggled to govern livestock and human movements in Kaokoveld. Periods of low rainfall persisted, forcing pastoralists to choose between livestock wellbeing or colonial directives. Following an inoculation campaign in 1939 (largely regarded as a failure), it was considered obligatory for all natives to request permission to move stock within Kaokoveld.[178] Responsibility fell to the Ombongero yomuhuko to ensure this regulation was followed. For twenty years, colonial officials had been persuading the Himba in particular to abide by colonial regulations through the system of indirect rule, yet the Officer-in-Charge, Mr. A. M. Barnard believed that it was not working. "The [Himba] have never submitted to tribal control and their headmen are faced with an impossible task…[they could not] even persuade them to attend meetings and had to travel from place to place to discuss matters with a few at a time."[179] This sentiment was shared by the councilors tasked with dictating policy. Councilors insisted upon their inability to enforce administration rules, stating they had no power. As had long been the case, unsanctioned movement of livestock was the point of contention.[180] Whereas the state previously worked through Harunga and Katiti to keep livestock in place, the dissolution of their centralized leadership made the region's inhabitants increasingly uncontrollable. On the one hand inhabitants considered each of the reserves as simply too small to accommodate livestock needs. On the other, the state made strategic miscalculations concerning how traditional authorities built and maintained power within Kaokoveld.

As control of Kaokoveld became increasingly state-sponsored, the Ombongero yomuhuko faltered. One councilor complained that, "the head of every family considers himself

[178] SWAA 2513, "Monthly Report, December, 1939. Officer in Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek." (1939).
[179] SWAA 1168, "Holding of Big Meeting at Otjijanjasemo, 26 October, 1939. Reported by Officer in Charge of Native Affairs, Kaokoveld." (1939).
[180] SWAA 2513, "Holding of Big Meeting at Otjijanjesemo; Chief Native Commissioner, Windhoek to Officer-in-Charge of Native Affairs, Ohopuho." (1939); SWAA 2513, "Monthly Report, December, 1939. Officer in Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek."; SWAA 1168, "Minutes of a General Meeting Held at Ohopuho on the 31st January and the 1st and 2nd February, 1940." (1940); NAO 029, "Annual Report of Native Affairs, 1942. Officer in Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek." (1942).

the headman of his people and will not listen to us…The Government must not think that the [Himba] are like the Europeans who respect their superiors. They do not listen to their headman and treat us like dogs because every stock owner is a big man." In response to such perceived insubordination, this same councilor requested that the administration deploy "European Police" to enforce his rule. "Native police are no good; the [Himba] will just look at them and say: 'You are just as black as I am.' I want white police to help me."[181] Seeking to maintain a form of control reminiscent of that enjoyed by Harunga and Katiti, the councilors needed administrative backing to exercise the authority which was supposed to replace the otuzo-based system of allocating rangelands. The difference was that the colonial administration, rather than kin-networks of lineage, exchange, and patronage, had become the repository of power for influencing livestock-mediated social standing and wealth. Perhaps the rising generation of Himba herdsmen recognized that neither 'traditional' nor governmental authority could dictate range use and cattle movements across the vast and rugged Kaokoveld.

These difficulties led to the collapse of the Ombongero yomuhuko's autonomous power, forcing the councilors to draw the government closer. At a meeting in February 1942, the council's agenda of repurposing government power for their own uses became explicit:

Mr. A. M. Barnard, Officer-in-Charge of Native Affairs, Kaokoveld: "*In the Native Reserves in the South it is the law that no one may move stock without a written permit...Here in the Kaokoveld you often quarrel about grazing. The Government has suggested that we should introduce the permit system because it will stop quarrels over grazing rights and at the same time prevent the spreading of lungsickness and other diseases.*
Please tell me what you think of this suggestion."

Sub-Headman Adrian: *"[In Waterberg Reserve in the Police Zone] we were not to move large or small stock without permits...When a man wants to move his stock for grazing, he must first ask the Headman of the area to which he wants to move. If the Headman and his people have water and grazing to spare, he accompanies the applicant to the [administrator's] Office and asks that he be allowed to move...It is a good law and there are never any quarrels about grazing and water."*

Headman Langman Tjahura: *"That is also the old Herero Law. In the olden days no one was allowed to move stock for grazing without the permission of the Headman of the area to which the stock is moved. We want that law in the Kaokoveld."*

Headmen Veripaka & Mariha: *"That is a good law. We want it here."*

[The other Himba agree with Veripaka and Mariha.]

[181] SWAA 1168, "Holding of Big Meeting at Otjijanjasemo, 26 October, 1939. Reported by Officer in Charge of Native Affairs, Kaokoveld."

Mr. Barnard: *"Seeing that all of you are in favour of the permit system, we'll introduce that law from today and the Council of Headmen will punish people who move stock without permission."*[182]

Livestock remained the key to political power in Kaokoveld. When councilor Langman Tjahura harkened-back to "the old Herero laws…to move stock for grazing," he was appealing to the administration to enforce a modified form of traditional rule which the councilors could not. This new permit process, much of which would have transpired as a negotiation far from the administrator's office, created an extensive, undefined political space for councilors to assert control over livestock. The difference now was that power ultimately rested on the consent of colonial administrators, who could remove councilors if they contravened administration goals. If the Ombongero yomuhuko wanted to retain power it had to enforce government policy. Control over livestock, and therefore people, necessitated that councilors hybridize 'traditional' approaches with administrative mechanisms for expressing power.[183] This clarifies the importance of examining livestock as an expression and site of power and resistance. Control over livestock movements was not simply about self-determination. It was, also, a means to the end of wielding power over lives, livelihoods, and the environment. In the past oruzo heads (ovakuru) would decide where their followers' livestock could graze, but adherence to such decisions was secured through informal channels of reciprocity and kinship. In theory these networks were replaced by state-sponsored jurisdiction. Paradoxically, requesting administrative sanction – subsuming themselves to colonial regulations – was effectively a power grab by the Ombongero yomuhuko. But it was not to be: the Ombongero yomuhuko remained ineffectual and ineffective.[184]

Omusenina (Last)

The willful alienation of cattle control by ovaHerero councilors was the beginning of the end of Eserewondo Ozongombe. Still reckoning with ruptures to the Kaokoveld social fabric which were catalyzed by events in the previous century, and earlier in the colonial era, the ovaHerero leadership sought to use livestock control as a means for channeling power through themselves. They were largely unsuccessful. By 1943, the Officer-in-Charge could confidently assert that, "[t]here are no Chiefs in Kaokoveld."[185]

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[182] SWAA 1168, "Minutes of Tribal Meeting Held at Ohopoho from the 2nd to the 14th February, 1942. Recorded by Officer in Charge of Native Affairs, Kaokoveld." (1942).
[183] Bhaba, *The Location of Culture*.
[184] SWAA 1168, "Minutes of Tribal Meeting Held at Ohopoho from the 2nd to the 14th February, 1942. Recorded by Officer in Charge of Native Affairs, Kaokoveld."
[185] NAO 029, "Kaokoveld: Annual Report, 1943. Officer in Charge, Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek. 29 December, 1943." (1943).

The resistance to livestock movement restrictions continued to erode the state's willingness to dictate livestock policy within Kaokoveld. At an end of the year meeting with the Ombongero yomuhuko in 1942, the newly-appointed Acting Officer-in-Charge of Native Affairs for Kaokoveld, Mr. L. M. de Witt, delivered important, surprising news to the councilors: the administration would no longer enforce restrictions on moving livestock across the Kunene River, rather leaving it up to Kaokoveld residents to police themselves:

> "If you move cattle from the Kaokoveld over the river into Angola and they contract any diseases there, you will be blamed for it, and suffer the losses. If you allow the Angolan natives to move their cattle into the Kaokoveld and you sustain losses through any disease that may break out amongst your cattle the Government will not be responsible for it. You are now your own Police, and it is up to you to guard against any disease of cattle coming from Angola."[186]

The assembled councilors greeted this news with enthusiasm, but did not fully trust the administration's shifting policies. Said Veripaka: "My heart feels very happy to hear this news, but I will first wait [sic] let other natives take their cattle down to the river to see what happens to them." The positive reaction suggests that the councilors' attempts to govern livestock movements with administrative backing – though only agreed-upon earlier that year – remained ineffective. Whether it was due to this ineffectiveness, or the persuasiveness of long-standing resistance in the form of livestock movements, in his 1942 Annual Report on Kaokoveld, Acting Officer-in-Charge de Witt adopted the ovaHerero's embodied position that Kaokoveld's separate reserves were too small to accommodate the number of livestock present. By this time administrative approval to move stock beyond reserves was unnecessary: most livestock were at-large in Kaokoveld anyway. The administration then formalized what was effectively the case: it abandoned the separate reserves in favor of treating Kaokoveld as a single 'native reserve.'[187] Though livestock still needed to remain within Kaokoveld, the administration declaimed responsibility for enforcing livestock movements there. The ovaHereros did not overthrow colonial rule of Kaokoveld, but their consistent noncompliance removed illusions of administrative control.

In some ways, Eserewondo Ozongombe ended as it had begun, with decentralized kin-based networks moving their livestock within negotiated political and geographic spaces. Though the administration may have found Kaokoveld 'chiefs' largely ineffective, the power of Kaokoveld residents was not eroded, but strengthened by the decentralization of livestock

[186] NAO 029, "Minutes of General Meeting Held at Ohopoho from the 17th to the 24th December, 1942." (1942).
[187] NAO 029, "Annual Report of Native Affairs, 1942. Officer in Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek. (1942)"; Wolputte, "Vicious Vets and Lazy Locals"

governance. Consistent, seemingly apolitical noncompliance within this semiarid and arid landscape at the boundaries of the colonial state enabled ovaHerero pastoralists to reassert their autonomy. The ability of Kaokoveld pastoralists to largely self-define their relationships to livestock within the area set the tone for how governance of livestock movements was experienced during the rest of the colonial era. The government's limited presence in Kaokoveld also meant that when humans and livestock came into conflict with predators, they were largely forced to fend for themselves. In chapter two I show how colonial policy concerning livestock predation differed greatly between white farmlands, which were seen as integral to the South West Africa economy, and within 'native reserves,' which fell outside of the formal economy. Throughout the following chapters, the role of livestock is inextricably linked to human perceptions of, and actions taken towards, lions and the ovaHerero maintained their commitment to livestock which would have important effects on present-day approaches to HLC.

Chapter 2: Vermin: predator eradication as an expression of white supremacy in colonial Namibia, 1921-1952.

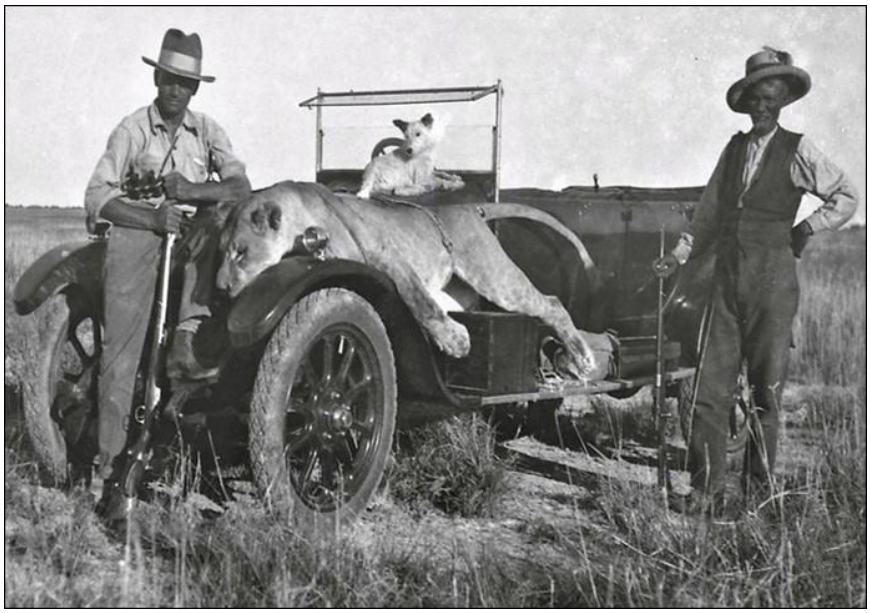

Figure 4: Native Commissioner of Ovamboland and Kaokoved, Carl 'Cocky' Hahn (left) with unknown man. Source: Namibia National Archives

Introduction

Ideologies of racial supremacy touch all aspects of public life within a society. Apartheid in South Africa is among the most well-known expressions of white supremacy, whereby a minority population of 'white' descendants of primarily Anglo, Dutch, and French colonists attempted to exercise absolute supremacy over 'black' and 'coloured' Africans as well as a polyethnic non-white immigrant community. Less well-known are South Africa's policies of white supremacy in colonial Namibia. Mandated to control the Territory of 'South West Africa' by the League of Nations in 1919, South Africa built a white supremacist colonial state upon German colonial policies in force since the end of the Herero-German War.[188]

Flush with victory following World War I, the South African government viewed this expansive Territory and its inhabitants as effectively annexed to the South African Union.[189] As part of the burgeoning South African empire, South West Africa could serve as a useful release-valve for the political challenge of South Africa's increasing poor white population. To support the immigration of white, mostly impoverished Afrikaans-speaking farmers from South Africa,

[188] See: J. Gewald, *Herero Heroes: A Socio-Political History of the Herero of Namibia 1890-1923*.
[189] C. Botha, "The Politics of Land Settlement in Namibia, 1890–1960," *South African Historical Journal* 42, no. 1 (2000), p. 238.

the newly-minted territorial government embarked upon a series of policies entrenching white supremacy within South West Africa, laying the foundation for 'native' exclusion and poverty.[190] This was primarily achieved through land policies privileging white farmers and the contributions they could make to the South West and South African economy through intensive livestock husbandry – mostly of cattle and sheep.

These policies were frustrated by an environment which proved less-than-hospitable to livestock husbandry as practiced by white settlers. While landed pastoral prospects were marginal, the relatively successful methods of transhumant pastoralism long-practiced by Namibians, such as the ovaHereros, were well-adapted to the Territory's arid and semiarid landscape, where vegetation can be both meagre and unappetizing for livestock. Colonial administrators and white settler-farmers sought to replace Africans' communal land systems with a regime founded upon private land ownership. Yet, even with generous government support, settlers struggled to make ends meet.

Within this challenging environment, predators such as lions and African wild dogs were seen by officials and settlers to further threaten settler livelihoods deemed so critical to socioeconomic prospects. In retaliation the colonial administration empowered rural white settlers to eradicate so-called 'vermin' on settler land. The Territory's African population suffered financially and physically in their own right at the teeth and claws of predators, but they were effectively prohibited from engaging in similar predator persecution. The justifications for this policy difference were primarily socioeconomic but with racial valences: while predation of white-owned livestock threatened the Territory's economic prospects, predation of African-owned livestock compromised African livelihoods. This forced Africans to find alternative economic opportunities within the Territory's cash economy, which supported the administration's economic goals.

This chapter examines how South West Africa's predators were sites through which white supremacist policies were mediated and reinforced during the early years of South African colonialism. Understanding this process extends the ability of scholars and policymakers to account for the nonhuman effect of social policies and deepens the toolkit for assessing how political and socioeconomic arrangements became manifest within landscapes. The effects of racialized policy are examined in terms of two species: the African wild dog and the African lion. Some may argue that animal welfare concerns are rendered unimportant in the face of grave social injustice. I disagree. How these two species interacted with and were targeted by people

[190] R. First, *South West Africa* (Baltimore, Maryland: Penguin Books, 1963), p. 106. Patricia Hayes et al., eds., *Namibia under South African Rule: Mobility and Containment, 1915-1946* (Oxford, UK: James Currey, 1998).

across differing political and geographic designations deepens understandings of the relationship between politics and the world humans share with other species. In this case, social (human) injustice not only affected the geography and survival of particular predator species in Namibia, but predators *also* were unwitting agents of government-desired socioeconomic and political outcomes. This shows that politics and predators were deeply entangled with one another. Much has been written about the human cost of the apartheid system. Less is known about its more-than-human valences. The history of this differently experienced predator eradication bears continued importance for the geography of predators and experiences of HLC in northwest Namibia. I will show that lions persisted in 'native' areas and within the newly formed Etosha park. These geographic spaces are also where lions persisted throughout the colonial era. Chapters four through six further elaborate lions' persistence in these spaces and the effects this had beyond the colonial era, including ongoing challenges of HLC.

Livestock and the Land Question

Between the tenth and eighteenth century, groups of Otjiherero-speaking pastoralists entered present-day Namibia through the northwest extent of the territory, called Kaokoveld. As I have shown in chapter one, by the early-1800s segments of ovaHerero society were settled in the center of the territory, while many of their kin remained in Kaokoveld.[191] Here the ovaHerero dominated land-use through their extensive livestock herds. Throughout the 1800s the ovaHerero violently clashed with the Oorlams. White colonists from Germany and the Cape began moving into this space of political and physical conflict. As the Germans' took control of the territory through treaties and trade, Oorlam power waned. This created political and geographic space for ovaHereros in central and southern Namibia to rebuild their herds, though they continued to be constrained by German colonial policies and private European concession companies which attained rights to the vast majority of pastoral land in the central and southern areas. In 1885 Germany took formal control of the Territory.[192]

The rinderpest epidemic (1896/7) transformed the economic and political structure of German South West Africa. During this period the Herero political structure around Windhoek collapsed within a matter of months. The complicated effects of this collapse led to escalating Herero-German tensions culminating in the Herero-German War and genocide of the Herero people. Remaining Hereros were either enclosed upon reserves as a colonial labor pool, or

[191] G. Borg and M. Jacobsohn, "Ladies in Red – Mining and Use of Red Pigment by Himba Women in Northwestern Namibia," *Tangungen Des Landesmuseums Fur Vorgeschichte Halle* 10 (2013), 43–51.
[192] W. Werner, "A Brief History of Land Dispossession in Namibia," *Journal of Southern African Studies* 19, no. 1 (1993), p. 138.

retreated deep into the mountains of Kaokoveld with their ovaHerero kin.[193] The rinderpest epidemic motivated colonial authorities to craft policies separating settler livestock from 'unhealthy' African-owned livestock. The primary mechanism for achieving this separation was a veterinary cordon known as the Red Line which effectively spilt the Territory in two; severing the ongoing livestock trade between settlers and Africans.[194] Land beyond the cordon was *terra incognita* for whites. Though livestock health, and by extension economic well-being, was the stated purpose for implementing the veterinary cordon, this Territory-wide internal boundary gradually became a fixed border through which Africans and settlers could only pass with official permission. Historian Giorgio Miescher details how German and South African colonial administrators used livestock health concerns along this boundary/border to entrench white supremacy in the Territory.[195]

To protect settler livestock from the veterinary threats of African-owned stock, ovaHerero and Nama land in the Police Zone was expropriated by the German colonial state.[196] The Germans then began a widespread German-oriented land settlement program. Failures, however, were common: both the brevity of German rule and limited state support kept farmer numbers low. In 1913 settler farms in the Territory totaled 1,331, occupied by 1,587 farmers, with 193 farms standing empty.[197] This history of conflict and transformation pivoting upon cattle and livestock ownership is the foundation upon which South African colonial land policy was built. Land appropriation driven by livestock concerns set the tone for how white supremacy was experienced by the Territory's humans and predators during the South African era.

South West Africa's Settlers

During World War I, the Territory fell under South African control and was renamed South West Africa. The efficient disposal of available land was the paramount concern of South Africa's Union government for the new Territory. In 1920, the Union's Land Settlement Act was adapted to the Territory with minimal alterations. With this action, South West African administrators were encouraging a hoped-for influx of poor white settlers while entrenching German colonial

[193] W. Hailey, "A Survey of Native Affairs in South West Africa" (Unplublished, Retrieved: Center for Research Libaries, 1946); M. Bollig, "The Colonial Encapsulation of the North-Western Namibian Pastoral Economy," *Africa: Journal of the International African Institute* 68, no. 4 (1998), 506–36.
[194] Rizzo, *Gender and Colonialism: A History of Kaoko in North-Western Namibia, 1870s-1950s*.
[195] G. Miescher, *Namibia's Red Line: The History of a Veterinary and Settlement Border* (New York, NY: Palgrave Macmillan, 2012). See chapter one.
[196] F. Adams, W. Werner, and P. Vale, "The Land Issue in Namibia: An Inquiry" (Windhoek, Namibia, 1990), 11–12.
[197] Botha, "The Politics of Land Settlement in Namibia, 1890–1960," 235–36.

policies which kept wealth concentrated in white hands.[198] While 14,830 white settlers in 1913 owned some 11,490,000 hectares of farmland, in 1920 8,394 Africans occupied 317,243 hectares within designated 'native' reserves in the Police Zone. This imperfect comparison indicates that whites already occupied at least twenty times the amount of land within the Police Zone as the African population did when South Africa took over the Territory.[199] Confining Police Zone 'natives' to reserves and imposing limitations on their livestock ownership was an important part of supporting white land ownership and creating an exploitable labor pool to staff white farms. Such policies of 'Native Control' were aimed at driving Africans into the Territory's cash economy. During this period the requirements placed upon Africans, such as the imposition of 'dienstbuchs' (pass books), and the compulsion to sign employment contracts, were increasingly enforced.[200]

From 1920 to 1930 South West Africa was being transformed into a space primarily for immigrating South African whites. During this decade an additional 1,261 white farms were allocated within the Police Zone, almost doubling the number in existence before World War I. This ten-year period accounted for just under half of all farms distributed in South West Africa through 1960.[201] To support white South African settlers, the administration replaced the German approach of intensive small-scale farms centered around watercourses with a policy encouraging ownership of large plots focused primarily on livestock husbandry. While the German administration insisted upon minimum capital requirements and provided limited assistance to settler farmers, during the 1920s the South West African administration did-away with minimum requirements and provided aid packages to settlers considered among the most generous in the world, including substantial cash advances, debt-forbearance and forgiveness, loans for infrastructure development, and the founding of an administrative-backed Land Bank.[202] Aid recipients were primarily poor whites from the Union, who received encouragement to immigrate from Union Prime Minister Jan Smuts and South African war hero, General Louis Botha, the

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[198] Bennet Bristol Fuller, "Institutional Appropriation and Social Change Among Agropastoralists in Central Namibia, 1916-1988" (Boston University, 1993); Jeremy Silvester, Marion Wallace, and Patricia Hayes, "'Trees Never Meet,' Mobility and Containment: An Overview, 1915-1946," in *Namibia under South African Rule: Mobility and Containment, 1915-1946*, ed. Patricia Hayes et al. (Oxford, UK: James Currey, 1998), 8.

[199] White settler figures from: First, *South West Africa*, 248. Native reserve figures from: Government of South West Africa, 'Report of the Native Reserves Commission' (Windhoek, 1921), 8. Land set aside for native reserves grew markedly during in 1923-4. Adams, Werner, and Vale, "The Land Issue in Namibia: An Inquiry", p. 29. Unclear is the untold thousands of Africans confined to the 'northern reserves' beyond the Police Zone.

[200] Government of South West Africa, 'Report of the Native Reserves Commission'

[201] Botha, "The Politics of Land Settlement in Namibia, 1890–1960," 244.

[202] Botha; B. Lau and P. Reiner, *100 Years of Agricultural Development in Colonial Namibia: A Historical Overview of Visions and Experiments* (Archeia 17, 1993), p. 3; Government of South West Africa, *Report of the Land Settlement Commission* (Windhoek, 1927), 17–18.

latter remarking that: “Wes Afrika bested is vir arme blanken die geen grond heft” (“West Africa was meant for poor white[s] who had no land”).[203] Yet, even as the Union and territorial governments oriented South West Africa’s economy towards the benefit of whites, conditions for many settlers were described as “bad…suffering from a lack of markets…and financial depression.”[204] Certain predators, so-called ‘vermin’ by settlers, were seen as further endangering settlers’, and by extension the Territory’s, fragile financial prospects. If the government could not solve the problem of rainfall, poor soil, or livestock diseases, at least it could help settlers with the scourge of vermin.

Figure 5: African wild dog. Source: National Geographic Society[205]

Settler Farmland: The Problem of Wild Dogs

Humans and predators have long shared space in southern Africa. Precolonial Africans and early European explorers each had their, not necessarily dissimilar, perspectives on how predators affected human lives and livestock. African wild dogs in particular aroused the ire of white settlers in South West Africa. In the not-so-distant past, there were hundreds of thousands of wild dogs in sub-Saharan Africa, occupying every manner of habitat, save the driest of deserts and the moistest of forests, up to the top of Kilimanjaro.[206] Also known as the “Cape hunting dog,” “wildehonde” in Afrikaans, or “ohakane” in Otjiherero, these highly social predators were never

[203] Namibia National Archives, A 3 12,9, item 25, letter to Administrator, 24 May 1921; from Botha, "The Politics of Land Settlement in Namibia, 1890–1960," p. 249, ft. 57.
[204] Report of the Commission on the Economic and Financial Relations between the Union of South Africa and the Mandated Territory of South West Africa, (Pretoria, 1935), U.G. No 16-1935; p. 151. From: Adams, Werner, and Vale, "The Land Issue in Namibia: An Inquiry," p. 21.
[205] https://www.nationalgeographic.com/expeditions/get-inspired/inside-look/10-facts-about-african-wild-dogs-cape-hunting-dogs/
[206] P. Raffaele, "Curse of the Devil’s Dogs," *Smithsonian Magazine*, 2007, https://www.smithsonianmag.com/science-nature/curse-of-the-devils-dogs-151075828/; J. Fanshawe, L. Frame, and J. Ginsberg, "The Wild Dog - Africa’s Vanishing Carnivore," *Oryx* 25, no. 3 (1991), 137–46.

comprehensively accounted for in the Territory until G. C. Shortridge surveyed South West Africa's mammals in 1934. He found wild dogs to be "widely distributed…hunting packs may be met with periodically almost everywhere except in the extreme south."[207]

In many ways the African wild dog was the perfect foil for livestock owners. Reputed to be fearsome hunters, one Khoe-Sān tradition has hunters spreading wild dog bodily fluids on their feet to achieve boldness and agility in pursuit of game.[208] Because they hunt in large packs, at regular times of day, almost never making two meals of a single kill, and tire prey by running it down or fighting it to exhaustion, it is likely that wild dog hunts and kills were more frequently witnessed by Africans and settlers then were those of nocturnal hunters like leopards (*Panthera pardus)* or lions, or predators that capture and kill prey quickly, like cheetah (*Acinonyx jubatus*). This, combined with the near-bedlam which attends the first moments of the prey's demise, may partially explain wild dogs' longstanding fearsome reputation across Africa.

Yet, wild dogs are also intensely social and can be highly devoted to other pack members. In 2007, Greg Rasmussen, a long-serving biologist in Zimbabwe's Hwange National Park, recalled an instance when a vet recommended that a recently-injured wild dog be euthanized. "The pack knew better than the vet…[they] looked after it for three months." Even "appoint[ing]" one pack member "to act like a medic, constantly licking the wound and making sure the injured dog got food after the pack returned from a kill." The dog survived to once again partake in group hunts. Rasmussen, however, is a new generation of conservationist. Like the coyote and wolf in North America, or the dingo of Australia, it is only very recently that many people have had a nice word for wild dogs.[209]

Predators are not ahistorical actors. Historians of human-predator relations provide important tools for understanding the effects of colonial environmental transformations on and with predators. Historian Peter Boomgaard asks whether tigers adapted their behavior in proximity to humans and in response to changes in human social behavior during the colonization of the Malay world. Focusing upon the subject of human-eating, Boomgaard finds that tigers adopted this trait as a coping mechanism in response to particular human-environmental incursions. Anthropologist Marcus Baynes-Rock examines how spotted hyena and their human neighbors within the walled city of Harar, Ethiopia, engage in a mutual "co-shaping" where the hyenas of the city, the city's human residents, and their livestock have each taken on their present

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[207] Guy C. Shortridge, *The Mammals of South West Africa ; a Biological Account of the Forms Occurring in That Region* (London: Heinemann, 1934): 181 from: Eugene Joubert and P. K. N. Mostert, "Distribution Patterns and Status of Some Mammals in South West Africa," *Madoqua* 9, no. 1 (1975): 20.
[208] A. Reinhart, "African Wild Dog," 2015, https://legacyhotelsblog.wordpress.com/2015/03/12/african-wild-dog/.
[209] from: Raffaele, "Curse of the Devil's Dogs." W. Adams, *Against Extinction: The Story of Conservation* (London and Sterling, VA: Earthscan, 2004), p. 128.

aspect in relation to one another. Within northwest Namibia, relationships between the Himba and spotted hyena reveal how predator actions and physiology influence the way predators are interpreted in human moral systems. In anthropologist D. P. Crandall's examination, Himba render hyena physiology and ecology as anomalous, which in turn affects Himba natural and moral classification of hyenas. Michael Wise has shown how even categories such as predator, and the social implications humans link to them, have been historically constructed in the Northern Rockies of the United States.[210] Finally, human and predatory becoming-with is evident in the history of the thylacine (*Thylacinus cynocephalus*), which became extinct from Australia following the country's nineteenth century transformation into a colonial reservoir of timber and wool resources. Even in its extinction, the thylacine still affects human society. Thylacines remind many Australians of humanity's destructive powers, suggesting the possibility of 'de-extinction' through cloning, and serve as motivating quarry for those seeking to find and protect, rather than destroy, a hoped-for remnant thylacine population.[211]

In his book on human-wolf relations in colonial North America, historian Jon Coleman examines the process by which European settlers and wolves became enemies. He shows that settler violence against wolves was not perpetrated because of inborn fear, but rather because of the mediation of livestock, which were settlers' property. As settlers moved deeper into North America's interior, they replaced game with livestock, changing wolves' prey options. As Coleman notes, "[t]he colonization of North America was a profoundly zoological event." A "battle of reproduction" between wolves and settlers pitted wolf survival against livestock survival.[212] Each of these colonial and post-colonial human-predator histories indicate that human behavior and society shape and are shaped by the predators we encounter and the socioeconomic and political circumstances under which we encounter them.

Settler incursion into the Cape and South West Africa radically transformed the region's landscape and zoology. Herds of springbok, mountain and plains (*Equus quagga*) zebra, oryx and kudu were replaced by intensively-farmed Sanga and Afrikaner cattle, sheep, goats, and donkeys

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[210] Wise, Michael D. *Producing Predators: Wolves, Work, and Conquest in the Northern Rockies*. Lincoln and London: University of Nebraska Press, 2016.

[211] P. Boomgaard, *Frontiers of Fear: Tigers and People in the Malay World, 1600-1950* (New Haven and London: Yale University Press, 2001); M. Baynes-Rock, "Hyenas like Us: Social Relations with an Urban Carnivore in Harar, Ethiopia" (Macquarie University, 2013); D. Crandall, 'Himba Animal Classification and the Strange Case of the Hyena,' *Africa: Journal of the International African Institute* 72, no. 2 (2002), 293–311; D. Owen, *Thylacine: The Tragic Tale of the Last Tasmanian Tiger* (Crows Nest: Allen & Unwin, 2003).

[212] J. Coleman, *Vicious: Wolves and Men in America* (New Haven and London: Yale University Press, 2004), p. 196.

(*Equus africanus*), likely leading to a temporary predator population boom.[213] The scales may have tipped against wild dogs when ecologies changed, and concerted human efforts including improved weapons-technology turned towards their destruction.

Though they speak in different registers than us,[214] predators too have histories, and wild dogs were not passive agents in how human (inter)actions reconfigured wild dog geographies. Wild dog individual and group traits were the product of thousands of years of evolutionary pressures which were altered by widespread European colonialism in Africa. Relatively high historical numbers of wild dogs may belie a sensitivity to external stress. The highly social, even communal, form of pack-living makes wild dogs susceptible to diseases such as canine distemper, which has periodically broken-out across Africa during the past one hundred years, likely repeatedly spilling-over from domestic dogs (*Canis familiaris*). Though he could not explain why, in observing wild dogs in the Serengeti during the late 1960s, renowned carnivore scientist George Schaller noted an unusually high predominance of young within packs, suggesting high juvenile mortality rates, even within this protected area.[215]

Although long-recognized as particularly difficult quarry for human hunters, wild dogs may have been ill-suited to persist in the face of weapons-technology developments. When people hunted with snares, traps, plant-based poisons, assegais, bow-and-arrow, or even smooth-bore muskets, wild dogs must have been difficult to kill or capture in large numbers. Because they travel in packs ranging from two to thirty-two,[216] wild dogs are difficult to ambush in the field or corner in a den like solitary predators. Because they will not return to a kill, as lions do, they are difficult to poison – though, being willing scavengers, this can occur. However, their highly social nature and regularity of habits may have made wild dogs particularly susceptible to extermination as increasingly accurate, long-range rifles became commonplace. It was no great feat for even a solitary farmer to shoot-down a third or more of a pack at a time.[217] Already farming at the margins of empire and struggling against recurrent drought, disease outbreaks, and relatively unproductive soils, settlers and administrators sought to control the environmental

[213] Beinart, *The Rise of Conservation in South Africa: Settlers, Livestock and the Environment, 1770-1950*; Botha, "The Politics of Land Settlement in Namibia, 1890–1960."
[214] Juno Salazar Parreñas, "Multispecies Ethnography and Social Hierarchy," Engagement, 2015; Baynes-Rock, "Hyenas like Us: Social Relations with an Urban Carnivore in Harar, Ethiopia."
[215] A. McCarthy, M. Shaw, and S. Goodman, "Pathogen Evolution and Disease Emergence in Carnivores," *Proceedings of the Royal Society B: Biological Sciences* 274, no. 1629 (2007), 3165–74; G. Schaller, *The Serengeti Lion: A Study in Predator-Prey Relations, Wildlife Behavior and Ecology Series* (Chicago and London: University of Chicago Press, 1972); South West Africa Administration, Namibia National Archives (SWAA) 2328, "Letter from Peter Muller, Farmer, to Secretary of the Protectorate, 3 May." (Windhoek, 1916).
[216] Mean: 9.9. from: Schaller, *The Serengeti Lion: A Study in Predator-Prey Relations.*
[217] SWAA 2332, "Wild Dogs. Official Correspondence: District Commandant and Deputy Commissioner, South West Africa Police." (1920).

variables they could. Because they were a highly visible, clearly destructive threat to fragile settler livelihoods, wild dogs appeared to be a problem that settlers and the administration could combine to solve.

Extermination

Long before predators threatened Union financial interests, policies and practices of 'vermin' persecution were imported to the Cape by the earliest European settlers. As had long been the case in European countries, 'vermin' was a legal category of animals that, historian Mary Fissell points out, "threatened the always tenuous balance between ease and hardship." Since the early days of Cape colonization, "Wild Carnivora" received particular attention as vermin needing to be destroyed.[218] Around the turn of the twentieth century, the Cape government frequently enacted policies to combat the depredations of leopards, wild dogs, caracals (*Caracal caracal*), 'jackals,' and baboons (*Papio ursinus*); lions having been destroyed at the Cape by the 1820s. The Dutch word "ongedierte," which translates as "un-animal" or "non-animal," is common in nineteenth century South African and early twentieth century Namibian documents concerning the eradication of wild carnivora. Ongedierte appropriately conveys the treatment of these species; that is, they were unworthy of the consideration extended to game and more charismatic creatures.[219] By the late-nineteenth century many of the more imposing predators, including wild dogs, had been extirpated from the Cape. The primary concern of farmers and administrators were jackals, particularly the so-called "rooi" or red jackal (*Canis mesomelas*). Reviewing nineteenth century Cape jackal extermination policies, environmental historian Lance van Sittert traces how harassment and depredations of jackals upon livestock were thought to not only destroy valuable property, but to adversely affect the health and well-being of all a farmer's stock. Because jackals and similar predators are primarily nocturnal, livestock had to be kraaled (safely enclosed) at night. In the morning stock would be moved to the field and back to the kraal before sunset. This increased stock's caloric output, diminishing body condition, and had the knock-on effect of trampling grasses in certain areas. Furthermore, the close confines of kraals were thought to heighten risks of livestock disease. These adverse effects were viewed through the lens of the Cape's economically important karakul sheep industry.[220] What van Sittert terms the

[218] M. Fissell, "Imagining Vermin in Early Modern England," *History Workshop Journal*, no. 47 (1999), 2; Adams, *Against Extinction: The Story of Conservation*, 21–22.
[219] B. Moore points this out in, "Killing for Sheep: Locating 'Vermin' in the Namibian Archives," *AHA Today*, 2017, https://www.bernardcmoore.com/2017/08/04/vermin/.
[220] L. van Sittert, "'Keeping the Enemy at Bay': The Extermination of Wild Carnivora in the Cape Colony, 1889-1910," *Environmental History* 3, no. 3 (1998), 333–56; W. Beinart, "The Night of the Jackal: Sheep, Pastures and

"genocidal" exterminations of predators also had adverse ecological effects such as explosions in rodent populations, niche-replacement of large predators with small ones, and unintended mortalities of other wild species from improperly placed poisons. Even so, by 1917 vermin eradication had become compulsory within the Cape Province. Van Sittert hypothesizes that the compulsion to vermin eradication coincided with a social crisis among the Cape's rural population, who were suffering acute economic and social stress.[221]

As was true of policy in other arenas, South West Africa administrators sought to apply Union vermin policy where they could.[222] Complaints surrounding vermin depredations appear in Namibia's National Archives from the beginning of the twentieth century. Already in 1913, vermin were considered a sufficient problem within the Territory to warrant government bounties. However, the South African administration did not have the resources to continue the German program.[223] During World War I the South African Military Constabulary controlling the Territory refused to issue civilian licenses for firearms and carefully managed ammunition availability. During this period livestock losses to predators were considered prodigious in some areas. In one eastern community twenty-six members of the local Farmer's Association claimed losses of twenty-nine large stock, 186 small stock, and seven calves to wild dogs over a period of "six or twelve months." Two southern Namibian farmers estimated losing 20% of their herds to vermin – though this was likely an overestimate. In each case access to firearms and ammunition was the favored remedy. Another farmer who had recently lost three cows, two oxen, and one calf to wild dogs found it "almost impossible to catch these animals in traps, the only way to extinguish them is by shooting."[224] In response, the Constabulary deployed Military Police as-needed to destroy these vermin and "other Carnivora" and authorized police to shoot wild dogs at-will within the Police Zone. When Military rule of the Territory was ending, officials pushed for settlers to take

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Predators in the Cape," *Past & Present* 158 (1998), 172–206; C. W. de Kiewet, *A History of South Africa - Social and Economic* (London: Oxford University Press, 1941).

[221] L. van Sittert, "Routinising Genocide: The Politics and Practice of Vermin Extermination in the Cape Province c.1889–1994," *Journal of Contemporary African Studies* 34, no. 1 (2016), 111–28.

[222] Silvester, Wallace, and Hayes, "'Trees Never Meet,' Mobility and Containment: An Overview, 1915-1946," 35.

[223] Government of the Cape of Good Hope, "Report of the Select Committee on Wild Carnivora" (Cape Town, 1896); L. van Sittert, "'Keeping the Enemy at Bay': The Extermination of Wild Carnivora in the Cape Colony, 1889-1910," *Environmental History* 3, no. 3 (1998), p. 346; SWAA 2328, "Reward for the Destruction of Vermin. Official Correspondence: Military Magistrate Maltahoehe to Secretary for the Protectorate. 16 March." (1917).

[224] SWAA 2328, "Destruction of Vermin, Office of the Military Magistrate, Gobabais to the Secretary for the Protectorate" (1919); SWAA 2328, "Issue of Arms and Ammunnition to Farmers - Confidential; Malthahohoe Magistrate to Secretary for the Protectorate, January" (1919); SWAA 2328, "Personal Letter, Farm Okonjati to Military Magistrate, Omaruru. 25 December." (1918).

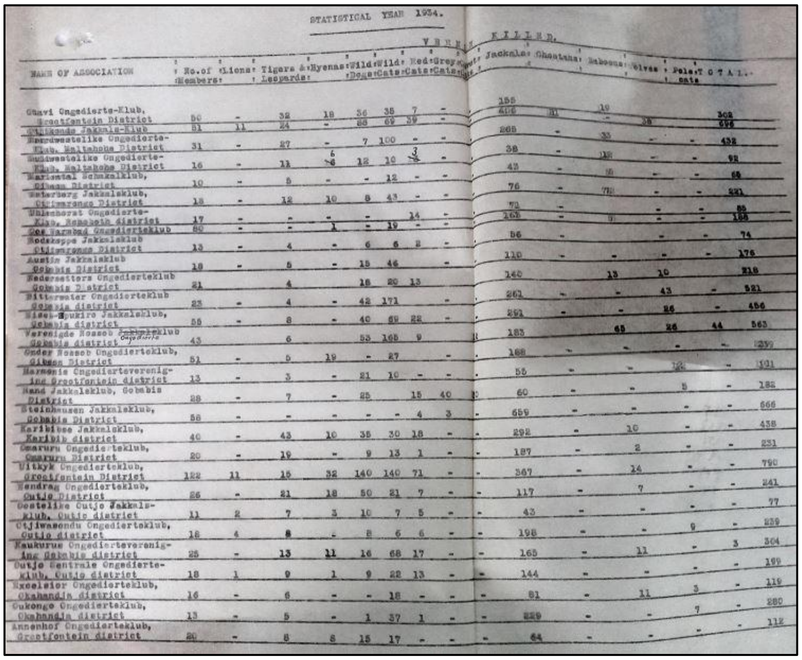
greater responsibility for vermin eradication. Restrictions on firearm licenses and ammunition were rescinded soon after the war.[225]

Many white farmers still pleaded for assistance in destroying predators, requesting government-supplied rifles, ammunition, and poisons either free or at a nominal charge.[226] Within the Union, policies differed. In the Cape, rewards were given for pelts turned-in to officials, subsidies for hunting dogs were provided, and strychnine was supplied to farmers at cost price. In contrast, the Transvaal and Orange Free State made no provision for vermin destruction.[227] Settlers in South West Africa pursued assistance more akin to the Cape's policies, which the administration felt unable to support for financial reasons.[228] Time and again bounties were sought for destroying predators, each time the Administration excused itself for lack of funds.[229] For white settlers the main difference between Cape policy and its application in the Territory was the relative poverty of the South West Africa administration.

The application of Union policies had vastly different effects for white settlers and the African population. Near-replication of Union policy not only meant that 'natives' had to fend for themselves, but that Africans were precluded from taking many of the anti-vermin measures available to settlers. Since the mid-nineteenth century poisons, in particular strychnine, were made widely available to white farmers in the Cape. By the mid-1920s, the South West African administration was providing settlers even along the remote edges of the Police Zone with supplies of strychnine at cost prices, to be applied upon a farmer's land at their own discretion. In contrast, Africans, now confined to reserves or living upon their employers' farms, were not trusted to safely apply strychnine without white supervision.[230] The availability of arms and ammunition for Africans was also carefully controlled. When arms were occasionally distributed individually to African traditional authorities within reserves, only marginal amounts of

[225] SWAA 2332, "Wild Dogs. Official Correspondence: District Commandant and Deputy Commissioner, South West Africa Police."
[226] SWAA 2328, "Letter, Farmers in Gobabis to the Magistrate, Gobabis, March." (1921); SWAA 2328, "Supply of Poison for Destruction of Vermin. Magistrate Omaruru to Secretary for South West Africa. 30 September." (1921).
[227] SWAA 2328, "South West African Administration: Supply of Strychnine for Destruction of Vermin. Administrator, Cape Town to Secretary South West Africa; 10 November." (1921); SWAA 2328, "Vermin Destruction. Official Correspondence: Secretary Agriculture to Secretary South West Africa. 30 June." (1921).
[228] SWAA 2328, "Destruction of Jackals. Official Correspondence: Provincial Secretary Cape Town to Secretary for South West Africa. 30 November." (1922).
[229] e.g.: SWAA 2328, "Destruction of Jackals. Official Correspondence: Provincial Secretary Cape Town to Secretary for South West Africa. 30 November."; SWAA 2328, "Premium for Killing Vermin. Magistrate Outjo to Secretary for South West Africa." (1925).
[230] SWAA 2328, "Destruction of Vermin: Sale of Strychnine. Secretary for South West Africa. 2 March." (1923); SWAA 2328, "Wild Dogs: Aminuis Reserve; Superintendent Aminuis Native Reserve to Magistrate, Gobabis" (1931).

ammunition – sometimes as little as five to ten rounds – were provided.[231] In both white-owned farmland and African reserves regulations around predator persecution operated within and reinforced racial ideologies.



STATISTICAL YEAR 1934.

VERMIN KILLED.

NAME OF ASSOCIATION	No. of Members	Lions	Tigers & Leopards	Hyenas	Wild Dogs	Wild Cats	Red Cats	Grey Cats	[illegible]	Jackals	Cheetahs	Baboons	Wolves	Pole-cats	TOTAL
Otavi Ongedierte-Klub, Grootfontein District	50	-	32	18	36	35	7	-		155		10			302
[illegible] Jakkals-Klub	51	11	24	-	88	69	39	-		406	31	-	38		696
Noordwestelike Ongedierte-Klub, Maltahohe District	31	-	27	-	7	100	-	-		265	-	33	-	-	432
Suidwestelike Ongedierte-Klub, Maltahohe District	16	-	11	6	12	10	3	-		38	-	18	-	-	92
Mariental Jakkalsklub, Gibeon District	10	-	5	-	-	12	-	-		43	-	5	-	-	65
Waterberg Jakkalsklub, Otjiwarongo District	18	-	12	10	8	43	-	-		76	-	72	-	-	221
Uhlenhorst Ongedierte-Klub, Rehoboth district	17	-	-	-	-	-	14	-		72	-		-	-	85
[illegible] Ongedierteklub	60	-	-	1	-	19	-	-		165	-	9	-	-	198
Rodekoppe Jakkalsklub Otjiwarongo District	13	-	4	-	6	6	2	-		56	-		-	-	74
Austin Jakkalsklub Gobabis District	18	-	5	-	15	46		-		110	-	-	-	-	176
Nedersetters Ongedierteklub Gobabis District	21		4		18	20	13			140		13	10		218
Bitterwater Ongedierteklub Gobabis district	23	-	4	-	42	171		-		261	-	-	43	-	521
Wisel-Epukiro Jakkalsklub, Gobabis district	55	-	8	-	40	69	22	-		291	-	-	26	-	456
Verenigde Nossob Jakkalsklub (Ongedierte) Gobabis district	43		6		53	165	9			183		65	26	44	563
Onder Nossob Ongedierteklub, Gibeon District	51	-	5	19	-	27		-		168	-	-	-	-	239
Harmonie Ongedierteverenig-ing Grootfontein district	13	-	3	-	21	10	-	-		55	-	-	12	-	101
Rand Jakkalsklub, Gobabis District	28	-	7	-	25		15	40	[illegible]	60	-	-	5	-	182
Steinhausen Jakkalsklub, Gobabis District	58	-	-	-	-	-	4	3	-	659	-	-	-	-	666
Karibibse Jakkalsklub, Karibib district	40	-	43	10	35	30	18	-	-	292	-	10	-	-	438
Omaruru Ongedierteklub, Omaruru District	20	-	19	-	9	13	1	-	-	187	-	2	-	-	231
Uitkyk Ongedierteklub, Grootfontein District	122	11	15	32	140	140	71	-	-	367	-	14	-	-	790
Rendrag Ongedierteklub, Outjo District	26	-	21	18	50	21	7	-	-	117	-	7	-	-	241
Oostelike Outjo Jakkals-klub, Outjo district	11	2	7	3	10	7	5	-	-	43	-	-	-	-	77
Otjiwasondu Ongedierteklub, Outjo district	18	4	8	-	8	6	6	-	-	198	-	-	9	-	239
Kaukurus Ongedierteverenig-ing Gobabis district	25	-	13	11	16	68	17	-	-	165	-	11	-	3	304
Outjo Sentrale Ongedierte-klub, Outjo district	18	1	9	1	9	22	13	-	-	144	-	-	-	-	199
Excelsior Ongedierteklub, Okahandja district	16	-	6	-	-	18	-	-	-	81	-	11	3	-	119
Oukongo Ongedierteklub, Okahandja district	13	-	5	-	1	37	1	-	-	229	-	-	7	-	280
Annenhof Ongedierteklub, Grootfontein district	20	-	8	8	15	17	-	-	-	64	-	-	-	-	112

Figure 6: List of predators killed by Vermin Clubs in South West Africa, 1934. Page 1 of 2. Source: Namibia National Archives

Vermin Clubs

With administration support, settlers destroyed predators as much as they could, with particular emphasis on wild dogs. One of the more effective and visible approaches was the organization and official recognition of Vermin Hunt Associations and Clubs. Enshrined in territorial law in 1927, so-called 'vermin clubs' mimicked similar organizations on the books in the Cape since 1917 and implemented in the Transvaal in 1925. Handwritten notes on copies of the Transvaal Provincial Vermin Destruction Ordinance, retrieved from the Namibian National Archives, suggest that high-ranking South West African administrators sought to apply the Transvaal ordinance with only minimal cosmetic changes.[232] Vermin clubs came into effect as part of the Dog Tax Ordinance (14/1927) which registered and levied fees upon all dogs within the Territory. Historian Bernard Moore, who is examining economic and labor history in southern Namibia, has

[231] SWAA 1187, "Report on Zessfontein Native Reserve. Station Commander South West Africa Police, Outjo to Magistrate, Outjo. 7 August." (1936); Native Affaris Ofvamboland, Namibia National Archives (NAO) 031, "Zessfontein Native Reserve: Application by Natives for Strychnine. Officer in Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek. 14 December, 1943" (1943).

[232] SWAA 2328, "Compilation of Transvaal Vermin Destruction Ordinances, 1925-1930." (1930). The document's marginalia and position in the archive suggest the handwriting belongs to F. P. Courtney-Clarke, Secretary for South West Africa at the time.

written that this tax was not explicitly about generating state revenue, but was primarily aimed at coercing Africans to enter the labor population as farm workers by taxing the dogs needed to protect livestock herds.[233] This makes sense in light of the fact that a key aspect of vermin club membership was the exemption members received from the Dog Tax for up to two dogs. Beyond receiving tax relief, club members were empowered to go on coordinated extermination campaigns in search of leopards, hyenas (both *Crocuta crocuta* and *Hyaena brunnea*), jackals, wild dogs, caracals, baboons, and lions. This included laying traps and poisons, shooting, and even forcibly entering farmland where owners had abdicated their responsibility to keep vermin numbers down. Each club was meant to hold meetings, go on group hunts, elect officers, and be composed of at least ten landowners. This final requirement was questioned in 1930: was it required that all members be landowners, or simply an initial ten (additional members being free of this requirement)? In August 1930, the Territory Attorney-General interpreted the law to mean that only an initial ten members must be landowners. By October the law was amended to clarify what must have been the original intention: only owners or lessees of land could be registered as club members. Even if the language adopted from the Transvaal ordinance was initially unclear, in South West Africa the racial undertones were unmistakable: since Africans were effectively prohibited from owning or leasing land, vermin clubs were for whites only.[234]

The toll of vermin clubs upon predators was immense. In 1934 alone, thirty-eight clubs from across the Territory reported a total 10,221 predators destroyed. The majority of which (6,071) were jackals. Topping the scales for wild dogs that year was the Gobabis District where 206 wild dogs were reported destroyed. The Outjo District, bordering Kaokoveld in the extreme northwest of the Police Zone, in 1934 alone, counted 756 vermin destroyed by clubs; including forty-five wild dogs and five lions. There was no financial incentive to over-report and the numbers for 1934 appear typical for the early 1930s.[235] Clearly, the predators of South West Africa could no longer safely rely upon the relative caloric bonanza which settler livestock represented. At the same time, a boom in karakul sheep farming provided economic respite for the settler population.[236] Between the organization of vermin clubs and the generous

[233] B. C. Moore, "Stock Theft and Taxes in Namibia," *The Namibian*, May 27, 2016. https://www.namibian.com.na/151226/archive-read/stock-theft-and-taxes-in-namibia..
[234] SWAA 2328, "Qualifications of Membership of Vermin Clubs. Official Correspondence: Magistrate Okhandja and South West Africa Attorney-General." (1930); Government of South West Africa, 'Regulations for the Recognition of Vermin Associations and Clubs,' Pub. L. No. 210 (1930).
[235] SWAA 2230, "Vermin Killed, Statistical Year 1934." (1934). e.g.: Outjiwasandu Vermin Club Records: 1931 – 302 (total); 1934 – 239; 1935 – 233. Otjokondo Jackal Club: 1931 – 504; 1934 – 696; 1936 – 823. Oostelike Vermin Club: 1933 – 86; 1934 – 77. The Grootfontein District topped the heap for lion destroyed in 1934 – 22.
[236] Silvester, Wallace, and Hayes, "'Trees Never Meet,' Mobility and Containment: An Overview, 1915-1946," 37–38.

administration subsidies to ensure settler success in securing livestock, predators dwindled on white farmland. This almost sounded the death-knell for wild dogs in Namibia. Though no population estimates for predator species across the Territory are available for the period, 1934 is the same year Shortridge found wild dogs "widely distributed in South-West Africa." By the end of the 1940s the wild dog population was "severely depleted." Within a generation, Nature Conservation administrators could write that wild dogs were "virtually eradicated from farmland."[237] Never numerous within reserves north of the Red Line and unable to persist on the limited 'black islands' that were native reserves in the Police Zone, remnant populations of wild dogs survive only in Namibia's eastern conservancies and national parks. In contrast, 'native reserves' north of the Red Line, and one of Africa's largest national parks, became something of a safe haven for Africa's most famous predator, the lion. Focusing on Kaokoveld, I now turn to the problems which Africans inhabiting northern reserves faced in dealing with predators, particularly lions. The lack of colonial government support for Africans stands in stark contrast to the support provided to white settlers in the Police Zone. This asymmetry enabled predators to effectively reinforce official goals and entrenched a new geography of predator populations in Namibia.

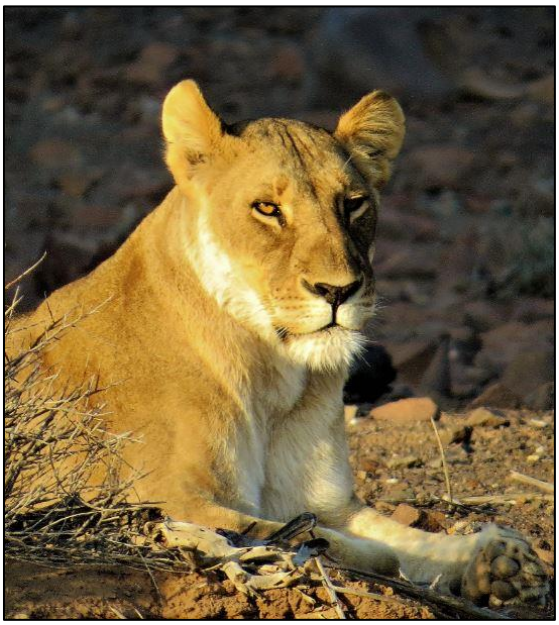


Figure 7: Desert-adapted lioness in northwest Namibia. Photo: Tina Vinjevold

[237] Shortridge, *The Mammals of South West Africa ; a Biological Account of the Forms Occurring in That Region*, 180–86. from: C. Hines, 'Past and Present Distribution and Status of the Wild Dog Lycaon Pictus in Namibia,' *Madoqua* 17, no. 1 (1990), 31, 33. E. Joubert and P. Mostert, "Distribution Patterns and Status of Some Mammals in South West Africa," *Madoqua* 9, no. 1 (1975), p. 20.

Native Reserves: The Problem of Lions

While racially exclusive vermin clubs were eradicating predators south of the Red Line, Africans in the northern reserves sought predator solutions, largely without administration assistance. Kaokoveld, lying just over the Police Zone border of the Outjo District, shared many of that farming area's environmental challenges: erratic rainfall, limited grazing, poor (basaltic) soil conditions, and great distance from markets. The difference for African pastoralists in Kaokoveld was not only that they received little government support, but they were effectively constrained by administration policies from protecting their livestock against predators. Lions, "leeus" in Afrikaans, or "ongeama" in Otjiherero, stood out as a particular threat to Kaokoveld residents, not only for their depredations on livestock, but for the danger they were seen to pose to humans.

That lions are dangerous to people is a well-accepted part of African culture from Cape Town to Mombasa. The natural history, folklore, and records of HLC across Africa have been extensively recorded. The latter is especially a growing topic of conservation scholarship. Stories of 'man-eaters' in Kenya, Tanzania, and Mozambique are common and well-known.[238] In precolonial Namibia also, lions were a terror to the ovaHerero within the country's rugged western expanse. In the mid-nineteenth century, Swedish explorer C. J. Andersson travelled overland from the mouth of the Swakop River towards Lake Ngami and the Okavango Delta. Andersson was well-acquainted with local fears of lions, recording that the ovaHereros would fall to "cursing and vilifying the lions most lustily." Andersson shares numerous harrowing tales of lions threatening, injuring, and even killing his porters and local Africans. Upon hearing lions near camp one evening, Andersson's porters "rushed about like maniacs lamenting most piteously…They seemed fully convinced that their last hour had come and that they should perish miserably by the fangs of the wild beasts." On a separate trip Andersson recalls "a death-like groan…Two lions had entered the enclosures, and succeeded in carrying away a poor fellow, whom they tore to pieces and devoured within a short distance of our camp."[239] For the Himba of Kaokoveld, encounters with lions were common enough that they could speak of the predators with familiarity and specificity, but also with empathy.

> "Those of us who have lived with lion know that, like all animals, and indeed like people, each lion is different. Most lions cannot be allowed to remain near stock.

[238] Philip Caputo, *The Ghosts of Tsavo: Stalking the Mystery Lions of East Africa* (National Geographic, 2001); James C. Clarke, *Save Me from the Lion's Mouth: Exposing Human-Wildlife Conflict in Africa* (Cape Town: Struik Nature, 2012); Somerville, *Humans and Lions: Conflict, Conservation, and Coexistence*.

[239] C. J. Andersson, *The Okavango River: A Narrative of Travel, Exploration, and Adventure* (New York, NY: Harper and Brothers, 1861), 63, 109; C. J. Andersson, *Lake Ngami; Or, Explorations and Discoveries during Four Years' Wanderings in the Wilds of Southwestern Africa* (New York: Harper and Brothers, 1856), 53.

> They are killers of cattle and must die. Others who do not know cattle may be timid and leave cattle to graze in peace. But in the old days, our people did not slaughter indiscriminately…Why go out of your way to kill a lion if it causes you no pain?"[240]

Lion behavior and ecology is most authoritatively set-down in George Schaller's *The Serengeti Lion: a study in predator-prey relations* and in the ongoing work of Craig Packer.[241]

However, published research mostly does not account for desert-adapted lions of northwest Namibia. Inhabiting a unique environment across extant African lion range, desert-adapted lion grouping patterns, behavior, and ecology differ from Serengeti, savanna, or forest lions. Chapter four examines the historical records of lions in northwest Namibia and chapter five examines the differences in sociality, behavior, and predation between lions in Etosha and the northern Namib. How desert-adapted lion behavior is manifest in human-lion relationships, in particular HLC, is examined in chapter six. A co-authored paper from my research examines the effects of lion predation on pastoralists' livelihoods within the communal areas of the northern Namib.[242] As with wild dogs, lion populations in Namibia were never extensively accounted for until Shortridge in 1934, who believed lions to be plentiful within the northwest.[243] There have been no known lion-caused human mortalities in northwest Namibia since 1982.

Lion complaints among Africans and administration officials within Kaokoveld in the 1930s and 40s were numerous. During this period, Kaokoveld was governed by the Native Commissioner for Ovamboland, who was assisted by a skeleton crew of white officials and government-recognized traditional authorities. From 1926 to 1939 a small detachment of colonial police officers maintained a border post at Swartbooisdrift/Tshimhaka, on the Kunene River. These officers were charged with monitoring African livestock and prohibiting its movement across the river into Portuguese Angola. Relatively isolated at the furthest reaches of the South African empire, these border officials also periodically contended with the local lion population.

> "Lions seem to favour Tshimhaka for their hunting grounds. Practically every morning and every evening, they can be heard roaring all around and quite close to the station. During the early hours of 24/2/39, three lions passed right in front and 60 yards from the station."[244]

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[240] M. Jacobsohn, *Himba: Nomads of Namibia* (Cape Town, South Africa: Struik, 1998), 47.
[241] Schaller, *The Serengeti Lion: A Study in Predator-Prey Relations*. e.g.: C. Packer, *Into Africa* (Chicago: University of Chicago Press, 1994); C. Packer, *Lions in the Balance: Man-Eaters, Manes, and Men with Guns* (Chicago: University of Chicago Press, 2015).
[242] See Appendix 1.
[243] P. E. Stander, *Vanishing Kings: Lions of the Namib Desert*, (Johannesburg, South Africa: HPH Publishing, 2018); Government of Namibia, "Human-Lion Conflict Management Plan for North West Namibia" (Windhoek, 2017).
[244] SWAA 2513, "Monthly Report: Kaokoveld: February, 1939. Station Commander SWA Police, Tshimaka" (1939).

The month before, lions had injured a policeman's mule and had to be chased away into the bush at risk of life to the African assistant charged with the task. Periodic meetings with traditional authorities and quarterly reports from administrators frequently returned complaints of the damage lions were causing to cattle and donkeys, with various ovaHerero groups insisting they "sustained very heavy losses."[245] Though administrators were satisfied that lions, as well as other predators, were a real problem in Kaokoveld, they also editorialized that "the natives are inclined to exaggerate their losses, and that a high percentage of these losses are due to the carelessness of their herd[er]s, also to the neglect of adequate kraaling at night."[246] Administration officials often recorded African complaints about lions but rarely did such complaints generate an effective government response. When livestock losses around the village of Sesfontein became serious enough to warrant a special communication to the Chief Native Commissioner in Windhoek, it was editorialized that such losses were "largely due to the rank carelessness of herd[er]s." The official response was that the traditional authorities at Sesfontein "be supplied with ammunition…say 5 to 10 rounds could be issued – for a limited period – together with a rifle."[247] In contrast to the settler population, Africans in Kaokoveld had been disarmed as a matter of policy at the beginning of the South African colonial era. Because Africans were not permitted to hunt wildlife without official permission and because the administration sought to exercise control over the Kaokoveld population, there was no reason why Africans should be allowed to keep firearms and ammunition.[248] Without access to firearms, Kaokoveld herders in the 1930s and 40s may have been less able to fight off predators than their predecessors were. Though the native inhabitants also requested access to effective poisons such as strychnine, the Commissioner for Kaokoveld thought it unwise to issue poison to Africans.[249] Only whites were entrusted to use strychnine,[250] and no officials were convinced that the problem in Kaokoveld warranted the direct involvement of white staff. What became of the requisitioned ammunition and the problem lions is unknown. Kaokoveld inhabitants continued to defend their herds and persecute lions using the

[245] e.g.: NAO 029, "Annual Report of Native Affairs, 1942. Officer in Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek." (1942), 4; NAO 029, "Kaokoveld Annual Report: 1944. Officer in Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek. 20 December." (1944).
[246] NAO 061, "Kaokoveld Annual Report, 1946. Officer in Charge, Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek." (1946), 12.
[247] NAO 031, "Zessfontein Native Reserve: Application by Natives for Strychnine. Officer in Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek. 14 December, 1943."
[248] Lorena Rizzo, "The Elephant Shooting: Colonial Law and Indirect Rule in Kaoko, Northwestern Nambia, in the 1920s and 1930s," *Journal of African History* 48, no. 2 (2007): 245–66.
[249] NAO 031, "Zessfontein Native Reserve: Application by Natives for Strychnine. Officer in Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek. 14 December, 1943."
[250] SWAA 2328, "Destruction of Vermin: Otjohorongo Reserve, Native Commissioner Omaruru to Chief Native Commissioner" (1945).

means at-hand, including plant-based poisons and even spears. Three years later there were numerous reports of Himba men killing lions with assegais. A largely predictable result was that one man was treated at the administration station for an arm wound caused by a lion, while "two of his less fortunate comrades were laid up with more serious wounds at their [homesteads]."[251]

The seeming disinterest of the administration stands in clear contrast to the support provided to settler farmers, both earlier and throughout the 1930s and 40s. The disparity was in accordance with official goals in the Territory. White supremacist policies, exercised through access to weapons-technology to combat predators, shows the administration would not protect and defend African livestock as it did settler livestock. Because African livestock were thought to present a veterinary threat to the health of settler livestock, an internal border was erected across the Territory to keep the herds separate. In the Police Zone, officially-imposed limitations on the keeping of livestock adapted from the German colonial era made it nearly impossible for Africans to build personal or family wealth as pastoralists. Furthermore, the territorial administration sought to bring all Africans into the formal economy as low-wage employees on white farms. These policies accorded with the interrelated socioeconomic goals of the administration, which sought to buttress settler economic opportunity by ensuring a pool of workers for white farms and by protecting livestock health.[252] There was, therefore, no need to persecute predators in the northern reserves who were unwittingly assisting the administration in achieving its economic goals.

Even though livestock concerns were the primary cause for isolating Africans in northern reserves, beyond the Police Zone administration officials could not successfully control African livestock. Crucially, an asymmetry existed between how administrators and Kaokoveld's ovaHereros viewed livestock ownership. Because African-owned stock was thought to harbor disease and allow Africans a measure of economic independence it was seen by administrators as playing a negative role in the territorial economy. For the ovaHerero of Kaokoveld, struggles over livestock well-being, in particular cattle, touched not just economic, but spiritual, familial, and political concerns. As I show in chapter one, the loss of livestock, whether to predation or government policies, could be interpreted not just an economic loss, but as an assault upon a family's identity and sense of continuity. Livestock loss had gendered components as well. Small stock, goats and sheep, were traditionally women's responsibility, which provided them with a measure of autonomy from their fathers, brothers, and husbands and served as a source of

[251] NAO 061, "Kaokoveld Annual Report, 1946. Officer in Charge, Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek." 13–14.
[252] Bollig, "Power and Trade in Precolonial and Early Colonial Northern Kaokoland, 1860s-1940s."

insurance, should cattle succumb to drought or predators. When men lost cattle, they could usurp women's rights over small stock. Finally, political alliances and kin networks flowed through livestock exchanges and could be interpreted in regards to the composition of a family's herds.[253] For Kaokoveld ovaHereros to abandon pastoralism would have been tantamount to abandoning a whole way of living and their connections with their past and future. Understanding how these additional arenas were interwoven with the control of livestock, particularly cattle, and the experience of HLC is necessary to understanding not only the contours of disagreements over predator policies, but also how they were freighted with meaning by different groups.[254] Though Kaokoveld possessed a cash-poor economy into the 1950s, administrative efforts at labor recruitment remained ineffectual.[255] Purposefully disengaged from the territorial economy, the 'subsistence' pastoral economy which emerged in Kaokoveld during the early South African colonial era served as another form of ovaHerero everyday resistance to the area's limited governmental control, which enabled the population to maintain a measure of autonomy and cohesion. Anthropologist Michael Bollig, details how these societies were well-adapted, even resilient to factors adversely affecting their livestock and financial well-being.[256] In the face of colonial opposition and predator attacks, colonial administrators reported that a wealth of livestock still existed in Kaokoveld.[257]

Some Kaokoveld residents made their understanding of the connection between official policy and African economic autonomy explicit, believing that the territorial government of the 1930s and 40s was purposefully attempting to eliminate African-owned stock. Administrators' willingness to destroy Kaokoveld livestock suspected of harboring disease supports this conclusion.[258]

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[253] D. Crandall, "The Role of Time in Himba Valuations of Cattle," *The Journal of the Royal Anthropological Institute* 4, no. 1 (1998), 101–14; Jacobsohn, *Himba: Nomads of Namibia*; M. Jacobsohn, "Negotiating Meaning and Change in Space and Material Culture: An Ethno-Archaeological Study among Semi-Nomadic Himba and Herero Herders in North-Western Namibia" (University of Cape Town, 1995).

[254] M. Wallace, *A History of Namibia. From the Beginning to 1990* (New York, NY: Columbia University Press, 2011), 218; S. Van Wolputte, "Power to Da Cattle: Counterworks in Himbaland, Northern Namibia", in S. van Wolputte and G. Verswijver *(eds) At the Fringes of Modernity: People, Animals, Transitions*, 2004, 201–31.

[255] Rizzo, *Gender and Colonialism: A History of Kaoko in North-Western Namibia, 1870s-1950s*.

[256] Bollig; S. van Wolputte, 'Subject Disobedience: The Colonial Narrative and Native Counterworks in Northwestern Namibia, c.1920–1975', *History and Anthropology*, 15.2 (2004), 151–73.

[257] NAO 061, "Re: Annual Report Period 1/1/50 to 31/12/50 Your Mintue Dated 17/10/50. Manager, Ondangua Store to Native Commissioner, Ovamboland." (1951); NAO 061, "Annual Report on Native Affairs, 1952. Officer in Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek." (1952).

[258] Fuller, "Institutional Appropriation and Social Change Among Agropastoralists in Central Namibia, 1916-1988," 136. e.g.: SWAA 2513, "Tshimaka Police; Monthly Report, July 1926" (1926); SWAA 2513, "Monthly Report: June & July, 1940. Officer in Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek." (1940).

Conclusion: The Mobility of Vermin

Across South West Africa, land allocation made with an eye towards socioeconomic outcomes affected the population distribution of the Territory's predators. Though still subject to persecution, the resources arrayed against predators in the northern reserves were quantitatively and qualitatively less. As a result, the Territory north of the Red Line became a relative safe haven for lions and other predators. This outcome was reinforced by the establishment of Etosha Pan Game Reserve (later Etosha National Park) within Kaokoveld, just north of the Red Line in 1947. Among other things, Etosha became a space where predator persecution was prohibited. As the South West Africa Game Reserve Commission wrote in 1948 "[within the reserve] no game and no bird or wild animal of any sort (whether regarded outside the Reserve as vermin or not) may be killed or captured without the knowledge and consent of the warden in charge."[259] Because veterinary concerns had rendered land north of the Red Line unsafe for settler livestock, the area could be repurposed as a space where even 'vermin' were protected. The forced removal of the Hai||om (Khoe-Sān) and ovaHerero communities inhabiting Etosha, and the separation of the Game Reserve from neighboring Kaokoveld and Ovamboland, introduced a third type of land-use that the Territory's predators now adapted to – one bereft of livestock and of formal (sanctioned) persecution. Once again, a space had been set-aside for the benefits of the whites (in this case domestic tourists) at the expense of dispossessed African inhabitants.[260]

For lions and other predators, political changes again altered the geography of survival within the Territory. Though Etosha was home to game species in numbers no longer present within white-owned farms, predators in Etosha were unfenced and unencumbered from moving onto adjacent white farmland along the Reserve's southern border. As the 1940s gave way to the 1950s the northern reserves remained a relative population source for predators, and predator problems persisted upon settler farms along the border of the Police Zone. One Grootfontein farmer, Rudolph Böhme, grew particularly irate during 1952 at what he saw as the uncontrolled population increase of lions within the Reserve, and the subsequent dangers this posed to him, his neighbors, and their livestock. Claiming losses of forty-two cattle within a year, including "1 very valuable bull, 1 horse, 1 work oxen…[with] another cow severely mauled," Böhme demanded the right to exterminate the offending lions within his farm and to pursue them back into the Reserve if necessary.[261] Citing numerous encounters that he and his neighbors had had with lions,

[259] "Report of the SWA Game Preservation Commission" (Windhoek, Namibia, 1948), p. 9.
[260] U. Dieckmann, *Hai||om in the Etosha Region: A History of Colonial Settlement, Ethnicity and Nature Conservation.* (Basel, Switzerland: Basler Afrika Bibliographien., 2007).
[261] SWAA 2329, "Letter from Rudolph Böhme to the Administrator, Windhoek; 23 June." (1952).

including two attacks and one fatality, Böhme claimed to himself have shot four lions, and pressed the administration to at least provide him with compensation for his livestock losses. Stating that because the lions existed "*ferae naturae*" and therefore beyond administration control, officials saw no cause for compensating Böhme and refused his request to further persecute the lions.[262] Though the Grootfontein Magistrate felt the "interests of farmers should be placed above the sightseers," other officials demurred: the economic interests (and perhaps safety concerns) of white settler-farmers were insufficient cause to exterminate lions within the Reserve.[263] Tourism was now ascending as a lens through which to view farmer-predator conflict and tourists seemed particularly interested in seeing lions within Etosha.[264]

Problems with predators, particularly lions, also continued to bedevil Africans confined to reserves, with little relief in sight.[265] Not until the war for independence (1966-1989), when South African Defence Force troops clashed with insurgents from the South West Africa People's Organization (SWAPO) along the Namibia-Angola border, would Africans in the northern reserves gain widespread access to firearms. In 1949 one Kaokoveld traditional authority put forth a typical complaint,

> "Here in the Kaokoveld we live only on our livestock. The borders are closed…We thank [the Native Commissioner] for the guns we have received. They are not enough. The Kaokoveld is very big. The cartridges are also too few. We have trouble with lions, hyaenas and wild dogs. Vermin has destroyed a lot of our stock."[266]

In his examination of tigers in the Malay world, Boomgaard finds the colonial state to have been "anti-tiger." In South West Africa, the colonial state was less anti-vermin, than it was pro-settler. The policies of protecting white settler livelihoods were manifest in the different opportunities for settlers and Africans to persecute predators. Policies to alleviate the 'poor white' problem within the Union combined with policies to support a financially constrained territorial economy. This

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[262] SWAA 2329, "Proposed Extermination of Lions, Etosha Pan Game Reserve, Secretary South West Africa to Magistrate, Grootfontein. 21 April 1952." (1952). Böhme would later lose an arm to a lion. B. J. G. de la Bat, "Etosha: 75 Years," *South West Africa Annual - Supplement*, 1982.

[263] Even within Etosha wild dogs remained unacceptable. In 1930 the Native Commissioner stated that, in the Game Reserve "wild dogs be excepted from protection due to their roving destructive habits…The toll on game levied by their packs outweighs other interests which they provide." The territorial Secretary agreed. from: SWAA 2328, "Protection of Vermin and Wild Life in Namutoni Game Reserve. Secretary South West Africa. 30 August." (1938).

[264] NAO 066, "Game Control. Official Correspondence, South African Police, Namutoni to Native Commissioner, Ovamboland. 12 December." (1947).

[265] e.g.: SWAA 2328, 'Destruction of Vermin: Otjohorongo Reserve, Native Commissioner Omaruru to Chief Native Commissioner'; SWAA 2328, 'Destruction of Vermin: Waterburg Reserve. Welfare Officer Waterburg East Native Reserve to Magistrate Otjiwarongo. 26 February.' (1944).

[266] NAO 061, Inspection Report: Kaokoveld Native Reserve: September-October, 1949. Native Commissioner, Ovamboland to Chief Native Commissioner, Windhoek.' (1949).

included the Administration doing what it could to extirpate predators on settler land. The goal was to strengthen South West African settlers and by extension the finances of the Union. Because the lens through which Union finances were interpreted was highly racialized, the administration saw sufficient cause to limit African livestock ownership whenever possible, whether north or south of the Red Line. African livestock beyond the Police Zone were deemed unfit for inter-mixing with settler livestock further south. Within the Police Zone, the primary contribution of Africans to the economy was seen to be as low-wage laborers for white-owned farms and industry.

Because the survival and reproduction of predators touched the socioeconomics of a highly racialized South West Africa, the prospects of predators in the Territory were transformed. Coleman notes that in North America predator eradication drove different societies apart.[267] In South West Africa, colonial ideologies of white supremacy separated settler and African livestock-owning inhabitants and thereby transformed the geography of predator populations. In chapter four I center the story of lions in northwest Namibia to further reveal the effects of colonial history on this population.[268] Particularly on white-owned farmland, Namibia's predators suffered due to governmental aims to secure a strong, white-dominated, territorial economy. However, as noted by British colonial ecologist E. B. Worthington, "nature rarely if ever stands still."[269] In chapter five I review scientific literature on desert-adapted lions to provide insight into the veracity of Worthington's statement. While wild dogs disappeared from the northwest, lions and other predators persisted within Etosha and on the more rugged land further west. These are the places where HLC would continue to be experienced throughout the twentieth and into the twenty-first centuries.

[267] Coleman, *Vicious: Wolves and Men in America*, 53.
[268] Kirksey and Helmreich, "The Emergence of Multispecies Ethnography."
[269] Adams, *Against Extinction: The Story of Conservation*, 108.

Chapter 3: The Social Causes and Environmental Effects of Apartheid in Etosha-Kaokoveld, 1948-1970s

Introduction

Apartheid was a series of government policies designed to concretize a conservative, Christian-nationalist white power in South Africa, as well as South West Africa/Namibia, South Africa's colony to its northwest. The history of apartheid in South Africa has been extensively examined by historians,[270] but the effects of apartheid policies in Namibia, particularly the environmental effects, require further scrutiny. Prior to the implementation of the recommendations by the *Report of the Commission of Enquiry into South West African Affairs*[271] (Odendaal Commission) during the 1960s, Etosha-Kaokoveld formed a contiguous landscape inhabited primarily by nomadic pastoralists, their livestock, and wildlife. Following the Odendaal Commission's report, Etosha was cleaved from Kaokoveld, engendering environmental effects in both spaces. To highlight the environmental effects of the Commission's recommendations I contrast them with the work of South African government ecologist Ken Tinley, who authored an alternate report providing recommendations for the spatial rearrangement of Etosha-Kaokoveld in 1971.

This chapter reveals some of the intellectual foundations of the racialized social policy that remade northwest Namibia. The South African government's statist approach set-forth in the Odendaal Plan and implemented thereafter, resting upon principles of ethnonationalism and high modernism,[272] spatially re-arranged people and wildlife in Etosha-Kaokoveld. The primary driver of this approach was an Afrikaner-centric brand of social anthropology, known as *volkekunde*, which constituted and was deployed to justify racialized state policies at the expense of the ecology and the people of Etosha-Kaokoveld. In contrast, Tinley's alternate plan was founded on the science of ecology which emerged into relative disciplinary prominence in the 1930s-40s. Unlike the *volkekunde*, ecology was an international science that took on distinctly different approaches and rested upon contrasting assumptions in different locales, for example between Great Britain and South Africa. Tinley's perspective bears the hallmarks of a commitment to understanding ecosystems mechanistically, as systems primarily defined by energy fluxes; an

[270] e.g. Saul Dubow, *Apartheid 1948-1994* (Oxford: Oxford University Press, 2014); William Beinart, *Twentieth-Century South Africa* (Oxford: Oxford University Press, 2001).
[271] Government of South Africa, "Report of the Commission of Enquiry into South West Africa Affairs." This Commission was chaired by F. H. Odendaal, Transvaal Governor and National Party member.
[272] Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*.

approach primarily associated with British ecology, rather than South African 'holism.'[273] This approach to understanding ecosystems overlapped with developments in systems analysis and mathematization derived from developments in physics.[274]

Confidence in quantification and rational management pervaded the social and natural sciences during this era, including ecology and *volkekunde*. This led to bureaucratic attempts to remake civil society and environments to achieve narrowly-defined government goals. Tinley's writings share this confidence with *volkekunde*-informed South African government publications such as the Odendaal Plan. Elsewhere, historian of science Peter Taylor refers to such confidence as "technocratic optimism"; a useful phrase for this history.[275] Yet, apartheid social policies had unintended environmental effects in Etosha-Kaokoveld. This chapter suggests why *volkekunde* approaches, rather than ecological ones, were prized by South Africa's apartheid government as it sought to recreate the environment of northwest Namibia. Reviewing some of these effects highlights certain linkages between politics and environments which constitute the physical space of nation-states. As I will show, the South African colonial government sought to remake Etohsa-Kaokoveld; at the same time, the efficacy of its intended transformations was limited by an environment that could not be fully accounted for in politics or contained by fences. The unintended consequences of apartheid policies affected the geography of humans, livestock, and lions and are represented in the subsequent transformation in Etosha wildlife and in the history of wildlife conservation on what became communal land west of the park, incluing the ongoing challenges of HLC.

Existing scholarship on apartheid and *volkekunde* forms the backdrop of this history. My contribution is the application of this historiography within northwest Namibia and contrasting the *volkekunde*-inspired approaches of South African technocrats with an understanding of northwest Namibia primarily informed by the science of ecology. By reframing the spatial rearrangement of Etosha-Kaokoveld around contrasting 'scientific' approaches to ordering the state I contribute another means of tracking the effects of South Africa's apartheid bureaucracy in northwest Namibia. I do this by bringing different colonial era documents into conversation. This includes grey literature that was central to setting government policies, as well as official

[273] Peder Anker, *Imperial Ecology: Environmental Order in the British Empire, 1895-1945* (Cambridge and London: Harvard University Press, 2001).
[274] Sharon E. Kingsland, "Mathematical Figments, Biological Facts: Population Ecology in the Thirties," *Journal of the History of Biology* 19, no. 2 (1986): 235–56; Joel G. Kingsolver and Robert T. Paine, "Conversational Biology and Ecological Debate," in *Foundations of Ecology: Classic Papers with Commentaries*, ed. Leslie A. Real and James H. Brown (Chicago & London: University of Chicago Press, 1991), 309–17.
[275] Taylor, "Technocratic Optimism, H. T. Odum, and the Partial Transformation of Ecological Metaphor after World War II."

documents and reports that were largely overlooked at the time. The insights derived are supplemented by archival and limited-circulation documents and interpreted using secondary sources. This approach also highlights some of the environmental outcomes of racialized policies, similar to those I have shown in chapters one and two. By focusing on different expressions of colonial rule this chapter reveals changing grounds of power relations within the state, including, for the first time in this dissertation, a heightened consideration of how official actions were viewed by the international community.

Protected Areas in Southern Africa

Examining the formation of Etosha National Park adds a new layer to the history of protected areas in southern Africa. The creation of protected areas has been among the clearest transformations in African environments.[276] During the nineteenth century economic and land arability concerns drove environmental conservation in the region.[277] As westerners pushed into the African interior resources were exploited and exported. Land rights and wildlife access became increasingly contentious. By the 1840s-50s there was an emergent belief that the continuation of western sport hunting required formalized protection of wildlife. By the 1880s colonial and settler officials were passing laws designed to restrict African hunting rights. This led to the seizure of hundreds of thousands of hectares of African-controlled land.[278] During the first half of the twentieth century conservation was "dominated by the language of efficiency" and emphasized the protection of charismatic wildlife.[279] During this period the South African experience and reliance on exclusionary conservation practices became paradigmatic in sub-Saharan Africa.[280] By the middle of the century, South Africa's national park model was being

[276] I use the IUCN's definition of protected areas: "A protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values." from: International Union for Conservation of Nature, "What Is a Protected Area?," IUCN website, 2019, https://www.iucn.org/theme/protected-areas/about.West, Igoe, and Brockington, "Parks and Peoples: The Social Impact of Protected Areas."

[277] Beinart, *The Rise of Conservation in South Africa: Settlers, Livestock and the Environment, 1770-1950*; William Beinart and Peter Coates, *Environment and History: The Taming of Nature in the USA and South Africa* (London and New York: Routledge, 2002); van Sittert, "'Keeping the Enemy at Bay': The Extermination of Wild Carnivora in the Cape Colony, 1889-1910"; Richard Grove, *Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600-1860.* (Cambridge: Cambridge University Press, 1996).

[278] Carruthers, "Creating a National Park, 1910-1926"; Carruthers, *The Kruger National Park: A Social and Political History*; MacKenzie, *The Empire of Nature: Hunting, Conservation, and British Imperialism*.

[279] William Beinart and Peter Coates, *Environment and History: The Taming of Nature in the USA and South Africa*, 65.

[280] Carruthers, "Creating a National Park, 1910-1926," 1; Carruthers, *The Kruger National Park: A Social and Political History*; Jane Carruthers, "National Parks in South Africa," in *Evolution and Innovation in*

widely adopted by colonial administrations, including attempts to turn Etosha into a tourist destination.[281]

In the early twentieth century, economic and veterinary concerns, as well as hunting prohibitions to arrest falling wildlife numbers, drove the formation of what were termed 'nature reserves' within (German) South West Africa. In particular, colonial officials saw the region-wide rinderpest epidemic (1896/7) and subsequent high number of livestock deaths, as endangering overlapping settler and African economies. This epidemic transformed the ecology of the region and spurred greater hunting of rare wildlife species to supplement incomes and limited food supplies.[282] In the following decade the German colonial government limited access to Etosha-Kaokoveld by establishing and reinforcing scattered forts there.[283] On 22 March 1907, the colonial government proclaimed Game Reserve No. 2 encompassing Etosha-Kaokoveld. At its inception, Game Reserve No. 2 (the largest such reserve in the world) was designed to protect wildlife as an economic and social resource. It also limited mobility among the region's settler and 'native' inhabitants and increased state surveillance within the region. The southern border of Etosha-Kaokoveld effectively delineated the extent of German colonial possession within the territory at the time. Chapter one details the effects of these transformations on the people and livestock of northwest Namibia. As described in chapters one and two, throughout the German era and early years of South African colonial rule, veterinary concerns, tied to economic prospects, dominated the lens through which colonial officials viewed the Territory. Until the 1940s wildlife conservation concerns were little considered by officials. When wildlife issues arose – for instance, when an elephant was illegally killed, or lions terrorized settler or 'native' farmers – official responses sought to ensure fidelity to the rule of law rather than species protection.[284]

During the apartheid era, veterinary concerns were joined by the logic and language of 'development' which sought to separate European settlers and Africans. Believing that the spatial

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Wildlife Conservation: Parks and Game Ranches to Transfrontier Conservation Areas, ed. Helen Suich, Brian Child, and Anna Spenceley (London and Sterling, VA: Earthscan, 2009), 35–49.

[281] Beinart and Hughes, *Environment and Empire*; Worthington, *Science in Africa: A Review of Scientific Research Relating to Tropical and Southern Africa.*; Miescher, *Namibia's Red Line: The History of a Veterinary and Settlement Border*, 162.

[282] Michael Bollig and Elsemi Olwage, "The Political Ecology of Hunting in Namibia's Kaokoveld: From Dorsland Trekkers' Elephant Hunts to Trophy-Hunting in Contemporary Conservancies," *Journal of Contemporary African Studies* 34, no. 1 (2016): 1–19.

[283] Bat, "Etosha: 75 Years"; Miescher, *Namibia's Red Line: The History of a Veterinary and Settlement Border*, 33.

[284] Rizzo, "The Elephant Shooting: Colonial Law and Indirect Rule in Kaoko, Northwestern Nambia, in the 1920s and 1930s"; Native Affairs Ovamboland, Namibia National Archives (NAO) 031, "Petition: R. Hammerbeck & Kieckebusch. Elephants and Kaokoveld Sheep" (1938); NAO 028, "Statement: Re Shooting of Royal Game" (1933); John M. Heydinger, "'Vermin': Predator Eradication as an Expression of White Supremacy in Colonial Namibia, 1921-1952," *Journal of Southern African Studies*, in-press.

separation of the different 'races' would further ethnonationalist aims within the Territory, the Odendaal Commission's recommendations built upon earlier segregationist policies and practices. These policies were still primarily concerned with settler economic and social benefits, though by the 1950s wildlife were increasingly considered an important part of the Territory's tourism industry.[285] By the 1960s spatial separation of different 'races' served the unique logic of apartheid: what South African historian Saul Dubow has called "a more rigorous, methodical," application of racial segregation as the effective means for guaranteeing the predominance of a white, Christian, minority population.[286] The application of apartheid-era social science to the problem of governing the population was not a departure, but a continuation of South and South West African policies to apply scientific reasoning to control people and environments for state benefit. Narrowing-in on the spatial rearrangement of Etosha-Kaokoveld and the concretization of the National Park, this history extends beyond the racialized governance of people to the formation of a highly visible state-operated protected area. During the 1970s and 1980s, wildlife within the park struggled to survive, not least of all because of being enclosed by the colonial regime to keep wildlife in and Africans out. The enclosure of Etosha severed migration routes and kept livestock and wildlife from accessing previously available grazing that now was located within differently designated areas.

Apartheid

In 1948 the conservative Herenigde Nasionale Party ("Reunited National Party") ousted the 'liberal' Union Party in South Africa's national elections. Along with the liberals went Prime Minister Jan Smuts. Though Smuts had long backed segregationist policies, he was outflanked by Nationalist leader D. F. Malan who stood for an uncompromising white nationalism and Afrikaner unity that the world would come to know as apartheid ("apartness"). Undefined prior to the election, most South Africans understood the spirit the nationalists' platform. Dubow writes that, by the 1940s

> "[r]ace awareness was…deeply entrenched in daily life, in relations based on paternalism, and in social custom… Apartheid ideology depended on race awareness and did much to arouse racial consciousness though it did not create such awareness."[287]

[285] Namibia National Archives, Native Affairs Ovamboland (NAO) 066, "Game Control. Official Correspondence, South African Police, Namutoni to Native Commissioner, Ovamboland. 12 December."
[286] Dubow, *Apartheid 1948-1994*, 13.
[287] Dubow, 27.

The spirit championed by the ethnonationalists was a continuation of the segregationist policies of Smuts and the liberals, who helped create the conditions enabling the rise of apartheid. Once in power, Malan and the conservatives began reshaping the state as an "exclusively Afrikaner government that was determinedly insular and wholly focused on the survival of white South Africa" in the face of adversaries, both foreign and domestic, white, black, and coloured.[288] Like the government that preceded them, the nationalists sought white political supremacy and economic prosperity. Apartheid was the means to get there.[289] Historian and sociologist Deborah Posel's work on the development of apartheid as a political process provides a deeper examination of this history.

Throughout the 1950s the nationalist government increasingly codified segregation into law and centralized government power within an expanding bureaucracy. Chief among these changes was the growth and concentration of power and policy development in the Department of Native Affairs. Headed by Hendrik Verwoerd, Native Affairs was the incubator and driving force behind apartheid policy. A leader among the architects of 'spatial apartheid,' Verwoerd, who became Prime Minister in 1958, dominated South African politics from the mid-1950s until his death in 1966. By the time of Verwoerd's ascension policymakers in the newly renamed Department of Bantu Administration and Development (BAD) were crafting new methods that would become the foundation for 'Grand Apartheid.'[290]

During this period, the policies implemented by the Department of Native Affairs were informed by a home-grown Afrikaner-centered form of social anthropology known as *volkekunde*. This field of academic inquiry, located primarily within the Afrikaner-dominated universities of Stellenbosch and Pretoria, buttressed certain strains of biblical literalism undergirding Afrikaner identity and provided the justification for apartheid policies. *Volkekunde* resembled a secular version of the comfortable historical divisions familiar to conservative Dutch Calvinist theology. Though generally translated as "ethnology" a more literal translation would be "nation-science" – study of the people, or, perhaps, different peoples. The difference between English-dominated social anthropology in South Africa and the Afrikaans-dominated *volkekunde*, was interpreted by the historian W. M. Macmillan as "whether the African people should be studied in the context of

[288] Saul Dubow, *A Commonwealth of Knowledge: Science, Sensibility, and White South Africa 1820-2000* (Oxford: Oxford University Press, 2006), 248. Racially-based categories such as "white," "black," and "coloured," as well as the terms "native" and "bantu," though no longer considered appropriate for differentiating between sociocultural groups, were important categories in twentieth century in South Africa. I employ them throughout the dissertation, not to sanctify their use, but because they were (and remain) important actor's categories for the state and its subjects.
[289] Deborah Posel, *The Making of Apartheid 1948-1961: Conflict and Compromise* (Oxford: Clarendon Press, 1991), 8.
[290] Posel, 227.

our common human history or be relegated to a special and inferior category."[291] Greatly informed by ascendant German anthropological scholarship in the 1920s, *volkekunde* practitioners (*volkekundiges*), sought to develop a unified vision of the Afrikaner nation.[292] At a time when Afrikaner nationalism was on the rise in South Africa, this movement combined with racial classification and racially-infused science in the development of *volkekunde* scholarship and the *volkekundiges*.[293] Anthropologist Robert Gordon has written extensively on the development and role of *volkekunde* within the South African academy and its linkages to government. Gordon writes that "[a]ll volkekunde professors were ardent Nationalists and members of the Afrikaner Broederbond where they played leading roles in formulating Broederbond 'Native Policy,' which in turn became government policy to a large degree."[294] Gordon found that *volkekundiges* had an important and outsized effect on apartheid policy relative to their numbers. *Volkekunde* scholarship and policies, he writes, "played a significant role in the legitimation and reproduction of the apartheid social order on two levels: as an instrument of control and as a means of rationalizing it."[295]

As the power of the *volkekundiges* expanded in the 1930s and 40s, the issue that dominated Afrikaner intellectual life was South Africa's 'poor white' problem. Writing well before apartheid, historian C. W. de Kiewet described the perennial challenge of poor whites in South Africa:

> "The poor whites were the frontier between the European and the native. Through their weakness might pour a debasing stream of uncivilized blood. Race mixture, it could not be denied, took place most naturally in the common environment of poverty and ignorance. The degradation of the poor whites became therefore of vital interest to the entire white population. There was no ideal to which the country was more firmly attached than to the maintenance of a white South Africa."[296]

The concern over the poor white problem during this period can scarcely be overestimated. Dating back to the late 1920s, when the Carnegie Corporation and Dutch Reformed Church commissioned a study on it, the poor white problem in South Africa was defined as primarily an

[291] Macmillan (1975): 218, from: Robert J. Gordon, "Apartheid's Anthropologists: The Genealogy of Afrikaner Anthropology," *American Ethnologist* 15, no. 3 (1988): 536.
[292] Gordon, "Apartheid's Anthropologists: The Genealogy of Afrikaner Anthropology."
[293] Andrew Bank, "Fathering Volkekunde: Race and Culture in the Ethnological Writings of Werner Eiselen, Stellenbosch University, 1926–1936," *Anthropology Southern Africa* 38 (2015): 163–79.
[294] Gordon, "Apartheid's Anthropologists: The Genealogy of Afrikaner Anthropology," 537. The Broederbond was a semi-secret male, protestant Afrikaner organization dedicated to advancing Afrikaner interests. Members dominated high positions of government – including the Prime Minister's office and cabinet – and elite Afrikaner society. At its height there may have been 12,000 members.
[295] Gordon, 536.
[296] de Kiewet, *A History of South Africa - Social and Economic*, 221–22.

Afrikaner, rather than English problem. Resentment among the Afrikaner electorate fueled conservatism during the 1930s and 40s. Many of the *volkekundiges* came from such a background and were intellectually and politically forged during this era. Finding solutions to this problem was the focus of *volkekundiges*.

Throughout the 1940s-60s a rising generation of *volkekundiges* moved seamlessly between Afrikaans-speaking universities and government service. In their policy as in their studies, *volkekundiges* treated the 'ethnic' group as the unit of concern in civil society.[297] Couched in 'objective' and 'scientific' methods, cultural boundedness and relativism were, as Dubow writes, "invested with the force of the categorical imperative" for apartheid's social planners. "In the period of high apartheid the devotees of *volkekunde* provided important legitimation for the idea of separate development, as well as practical guidance for the implementation of the Bantustan policy of tribally based social engineering."[298] As the unit of analysis and concern, these groups could hardly be combined or dissolved, thus the *volkekundiges*' approach assumed the logic of separation and employed social scientific methods to marshal evidence for foregone conclusions. Science in South African had long been a part of the creation and maintenance of social and civil order.[299] The conservativism of the *volkekundiges* and of the apartheid state writ large was manifest in attempts by the Afrikaner elite to cement white supremacy in southern Africa. As conservative Afrikaners took political control over South Africa, the power of the *volkekundiges* to create society as they envisioned it also grew. Because Afrikaners were a small minority within South African society, the key to hoped-for Afrikaner hegemony was prohibiting other groups from politically or economically competing with Afrikaners and other whites.

By 1959 apartheid policies were concretizing into more draconian forms.[300] *Volkekundiges* and BAD administrators reinforced the notion that ethnic divisions between races and among the 'bantu' were immutable and therefore the only appropriate manner for delineating society.[301] Governmental emphasis on "ethnic self-determination" whereby each different South African culture could develop separately, "irrespective of what the level of that culture may be," became the order of the day. Lofty rhetoric about 'developing' separate groups of Africans was frequently used by policymakers and government representatives.[302] But try as they might to put lipstick on the pig, Malan had given away the game years before, when he wrote that,

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[297] Gordon, "Apartheid's Anthropologists: The Genealogy of Afrikaner Anthropology."
[298] Dubow, *A Commonwealth of Knowledge: Science, Sensibility, and White South Africa 1820-2000*, 266.
[299] Dubow, *A Commonwealth of Knowledge: Science, Sensibility, and White South Africa 1820-2000*.
[300] Posel, *The Making of Apartheid 1948-1961: Conflict and Compromise*, 227.
[301] Posel, 232–33 ft.22.
[302] Hermann Giliomee, *The Afrikaners: Biography of a People* (London: Hurst and Company, 2003), 521; Posel, *The Making of Apartheid 1948-1961: Conflict and Compromise*, 232; M. D. C. de Wet Nel,

> "Apartheid, separation, segregation or differentiation – whatever the name given to the traditional policy of South Africa – is part and parcel of the South African tradition as practised since the first Dutch settlement at the Cape in 1652, and still supported by the large majority of white South Africans of the main political parties. The deep-rooted colour consciousness of the white South Africans…arises from the fundamental difference between the two groups, White and Black. The difference in colour is merely the physical manifestation of the contrast between two irreconcilable ways of life, barbarism and civilization…The racial differences are as pronounced to-day as they were 300 years ago. The instinct of self-preservation is so inherent in the White South African. He has retained his identity all these years. He is not willing to surrender it now."[303]

Verwoerd, himself firmly rooted in the conservative social science tradition at Stellenbosch,[304] was also committed to separating whites from non-whites by consigning natives to marginal homelands. The idea behind the homeland system was that each separate group would develop along its own lines and according to its own traditions without the fear of miscegenation or being overrun by other, numerically superior groups. This was effectively a mechanism for maintaining the status quo of white minority rule. As Verwoerd stated in 1951,

> "The only alternative is deliberately to see to it that the whole of South Africa does not become a country occupied by Natives and therefore run by Natives…If we succeed…then we might yet save South Africa. It must be on the basis of apartheid. If we could succeed just to this extent – keeping the Native population in the reserves…and getting them to live there, …White South Africa will be saved."[305]

This is where 'native' or 'bantu' policy rested at the end of the 1960s: Verwoerd was Prime Minister and the most powerful political figure in South Africa since Paul Kruger. Speaking on behalf of an ascendant government-backed 'scientific' establishment he was committed to realizing an Afrikaner-centered vision of ethnonationalism; cognizant that the international community was looking on, but attuned to domestic political challenges.

"Industrial Development in Peripheral Areas.," in *42nd Annual Convention of the Federated Chamber of Industries* (Pretoria, South Africa: Information Service of the Department of Bantu Administration and Development, 1959), 6.

[303] Quoted from: John H. Wellington, *South West Africa and Its Human Issues* (Oxford: Clarendon Press, 1967), 346–47.

[304] Roberta Balstad Miller, "Science and Society in the Early Career of H. F. Verwoerd," *Journal of Southern African Studies* 19, no. 4 (1993): 634–61.

[305] *Union Senate Debates* (19 Jan.-22 June 1951), col. 2898. From: Wellington, *South West Africa and Its Human Issues*, 351–52.

Segregation and Apartheid in South West Africa

As I have shown in chapters one and two, when South Africa took control of the territory of German South West Africa during World War I, it inherited an already segregated space. Since that time the Territory was increasingly governed as South Africa's 'fifth province.'[306] This meant favorable policies for white settlers and the investment of resources to shore-up the white-dominated South West African economy. The South African state's commitment to separating natives and their livestock from settler farmers and their livestock was clearly displayed along the Red Line, separating the 'Police Zone' from the 'Northern Native Territories.' As the internal border became concretized, the regime increasingly controlled the movements of livestock and people, particularly 'natives' seeking employment, government services, or livestock markets within the Police Zone.

Between 1913 and 1955, land apportioned to settler farmers in the Territory more than tripled.[307] During this period the government of South West Africa demonstrated ongoing concern for the land and livelihood prospects for incoming settlers. However, government eagerness to distribute land to settlers led to overvaluation of marginal farmlands.[308] Only with the growth in the karakul sheep industry in the 1930s did the Territory's economic prospects begin to improve.[309] World War II, coupled with a decade or so of relatively plentiful rain, increased South West Africa's economic prospects. From 1946 to 1962 the Territory experienced a real growth rate of 8.12%.[310] During this period, the nationalist government granted increasing representation to white South West Africans in the Union Parliament, further shoring-up the National Party, who had gained control of the South West Africa Legislative Assembly in 1950. During the 1950s South West African politicians forcefully advocated for greater land access for settler farmers, many of whom, despite decades of government assistance, were struggling to maintain economic livelihoods in the Territory's arid environments. Yet, land in the northern reserves was never opened to settler livestock – the veterinary risk was considered too great.[311] As a result, the northern reserves remained hinterlands where Africans suffered doubly from being

[306] Silvester, "Forging the Fifth Province."
[307] First, *South West Africa*, 248.
[308] Government of South West Africa, "Report of the Land Settlement Commission, South West Africa, 1935," 1935, Namibia Digital Repository, http://namibia.leadr.msu.edu/items/show/260.
[309] Brenda Bravenboer, "Karakul: Gift from the Arid Land" (Karakul Board of Namibia, 2007).
[310] Wellington, *South West Africa and Its Human Issues*, 126.
[311] South West Africa Administration, Namibia National Archives (SWAA) 1169, "Closed Area for Stock: Southern Kaokoveld. Official Correspondence: Deputy Commissioner South West Africa Police to Chief Native Commissioner, 30 November." (1949); SWAA 2265, "Export of Donkeys out of Zessfontein into the Police Zone. Official Correspondence: Native Commissioner Ovamboland to Chief Native Commissioner Windhoek, 3 August." (1953).

marginalized within an already poor colony.[312] According to Henrich Vedder, a respected anthropologist and historian who also represented South West Africa's natives in the South African Senate at the time, by the 1950s apartheid had effectively been in practice for fifty years in South West Africa.[313] This segregation and economic isolation largely occurred beyond the gaze of the international community.

With the election of Malan and the nationalist party, South African politics turned increasingly inward, which also meant solidifying South West Africa as part of the Union. At the United Nations (UN) in 1946, Smuts requested formal recognition of the Territory as being annexed to the Union. This request was supported by a government-sponsored sham referendum among the Africans of South West Africa, in which no individual voting was allowed.[314] Smuts' request was met by almost universal condemnation within the UN and was denied.[315] Nevertheless, the 'liberal' government persisted in ruling the Territory, even setting aside further 'native' reserve land. In 1955 control over native affairs was moved to Pretoria. This further drew the Territory within the control of the Afrikaner-dominated South African state. While South West Africa's history of proto-apartheid land designations and laws enabled the easy application of apartheid policies, the territory's uniquely high-profile position in international relations meant the South African government was being scrutinized for its actions there. Following a visit to South West Africa by UN representatives, Verwoerd sought to convince the world that South African rule was simultaneously beneficial for the Territory inhabitants, required to stem ethnic antagonisms there, and the only sure path to securing the Territory's prosperous future. In line with government's bureaucratic tendencies Verwoerd appointed a commission to study the challenges facing South West Africa.[316]

The Odendaal Commission

The foundational document of South African policy in South West Africa during the apartheid era, was the *Report of the Commission of Enquiry into South West African Affairs*. Otherwise known as the report of the Odendaal Commission, for its Chair, Transvaal Governor F. H. Odendaal, this document was intended to deflect international criticism of South African rule

[312] Bollig, "The Colonial Encapsulation of the North-Western Namibian Pastoral Economy."
[313] First, *South West Africa*, 125. There is no evidence that the South West Africa experience explicitly informed apartheid policy in South Africa.
[314] Wallace and Kinahan, *A History of Namibia: From the Beginning to 1990*, 244.
[315] United Nations Archives, "General Assembly, First Session, Part Two Summaries, Fourth Committee, 7 November - 12 December," 1946, https://search.archives.un.org/1st-session-part-2-summaries-fourth-committee-2.
[316] Molly McCullers, "Lines in the Sand: The Global Politics of Local Development in Apartheid-Era Nambia, 1950-1980" (Emory University, 2012), 128–62.

within the Territory. During the 1950s, member states of the UN raised concerns that the South African government was perpetuating racialized restrictions on employment, land settlement, and enforced separation within the Territory.[317] Beginning in 1961 South Africa faced charges at the International Court of Justice, brought by Ethiopia and Liberia, concerning the legality of its possession of South West Africa. Yet the process which the Commission undertook to collect information for its report and the recommendations it produced, manifested the National Party's statist approach to governing the Territory and sought to entrench the logic and goals of apartheid policies – flying in the face of international criticism. Because the recommendations of the Odendaal Commission led to the spatial rearrangement of northwest Namibia, the legacy of environmental transformation within the region is one of the outcomes of the apartheid government's efforts to balance domestic concerns and international pressure.

The political role of the Odendaal Commission has been examined by historian Molly McCullers.[318] *Inter alia*, McCullers doctoral dissertation examines how the Odendaal Commission was implemented as a response to international pressure on the South African government. McCullers writes that, through the Odendaal Plan, "South West Africa was intended to serve as a bridge between an Afrikaans national state and its desired hegemony in southern Africa as well as a place in which to showcase the benefits of apartheid development to an increasingly hostile international community."[319] The Odendaal Commission was composed of five members whose academic and public service qualifications, as well as their fealty to the National Party, were intended by Verwoerd to be beyond reproach. Members of the Commission were all South African, National Party loyalists and likely members of the shadowy Broederbond, which controlled the party. The commission included no South West Africans or non-whites.[320]Appointed in late 1962, the Commission's purview was,

> "to enquire thoroughly into further promoting the material and social welfare and the social progress of the inhabitants of South West Africa, and more particularly its non-White inhabitants, and to submit a report with recommendations on a comprehensive five-year plan for the accelerated development of the various non-White groups of South West Africa…and for the further development and building up of such Native Territories in South West Africa."[321]

[317] United Nations, "Report of the Committee on South West Africa, Eleventh Session, Supplement No. 12 (A/3151 and Corr. 1), Annex II.," in *661st Plenary Meeting, 26 February*, 1957, 28.
[318] McCullers, "Lines in the Sand: The Global Politics of Local Development in Apartheid-Era Nambia, 1950-1980."
[319] McCullers, 37.
[320] McCullers, 132–41.
[321] South Africa Government Gazette, 21/9/1962, from: Wellington, *South West Africa and Its Human Issues*, 376.

Gordon uncovered letters between Verwoerd and Commissioner J. P. van S. Bruwer, which indicate that the unofficial purpose of the Commission was to impress the international community.[322]

Behind the scenes, the approach of the Commission exemplified *volkekunde* science. One of the five Odendaal commissioners, Dr. J. P. van S. Bruwer was a leading *volkekundige* figure. Previously a professor of *volkekunde* at Stellenbosch University, Bruwer was the commission's "guiding light." His anthropological expertise allowed the Commission to apply social scientific approaches to obscure the Commission's purpose of extending South African domination over South West Africa. The analysis and interpretation of the South West African situation by the Odendaal Commission was the most concerted attempt to apply *volkekunde* methods to the challenges of apartheid rule within the South African empire to that point.[323]

From October 1962 to April 1963, the Odendaal Commission visited South West Africa six times, for a total of eighty days.[324] Each visit lasted approximately two weeks. McCullers writes that, "[a]erial tours and survey techniques reflect the state's attitude towards its African subjects in [South West Africa] – reinforcing the disconnect between white decision-makers and black subjects. The Commission literally gathered data from above and took it back to Pretoria for analysis."[325] Throughout the data-collection process the perspectives of white South West Africans were disproportionately represented and no one opposed to apartheid policies was consulted.[326]

The limited amount of time spent by the Commissioners in South West Africa was not seen as a shortcoming in the process. Rather, the extent to which the government was willing to engage in "a heroic and greatly schematized process of abstraction and simplification" to control the inhabitants of South West Africa and forge new policies to entrench existing power structures was an important part of governing the state.[327] Prior to the implementation of the Commission, at least as early as 1960, the South African government had been collecting information to categorize, quantify, and represent the people of the Territory through what amounted to a

[322] Institute for Contemporary History at the University of the Free State, PV 123 2/11/6, Verwoerd to Bruwer, 22 August 1962. From: Robert J. Gordon, "How Good People Become Absurd: J.P. van S. Bruwer, the Making of Namibian Grand Apartheid and the Decline of Volkekunde," *Journal of Southern African Studies* 44, no. 1 (2018): 97–113.
[323] Gordon, 97.
[324] Government of South Africa, "Report of the Commission of Enquiry into South West Africa Affairs," 515.
[325] McCullers, "Lines in the Sand: The Global Politics of Local Development in Apartheid-Era Nambia, 1950-1980," 145.
[326] McCullers, 156.
[327] Dubow, *Apartheid 1948-1994*; Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*, 22.

massive, state-sponsored, meta-ethnography resting upon *volkekunde* anthropological expertise. Such expertise presupposed categorical distinctions among 'ethnic' groups by virtue of each group's cultural experience and desires and that the people being governed could be known and represented through a series of facts and classifications. Prior to 1960, ethnic groups in the Territory were only delineated as white, African, or coloured. The new approach not only created new ethnicities, but also gave the impression that white settlers were the second most numerous ethnic group.[328] Confident in this racially-informed approach of technocratic optimism, the Commission came to the conclusion that separation of races was the only feasible approach to governing and developing the Territory:

> "Having regard to the fairly generally accepted approach...that underdeveloped communities must eventually be given self-determination and that therefore greater governing powers must be given to the local non-White groups...the Commission... came to the conclusion that one mixed central authority for the whole Territory would not further the proper aims of self-determination for each population group."[329]

This effort to reimagine the Territory along finely-honed racial lines for settler benefit informed both the Odendaal Commission's report, and South Africa's case before the World Court – which mirrored one another.[330] During this period the South African government lodged numerous objections to stall World Court proceedings and keep the international community ignorant of what was taking place in South West Africa.[331]

The late 1950s to early 1960s were years in which apartheid ideology was ascendant within the South African government. During this period the BAD played an increasingly dominant role in forming policy and the first 'ethnic homelands' or 'bantustans' were set-aside in South Africa. The practitioners of 'Grand Apartheid' were supremely confident in methodical social engineering schemes employing technical planning and scientific management as a means of reinforcing the power of the ethnonational state. Rooted in the idea that Afrikaner identity should be protected and that, by being responsible for bringing order to the lawless Territory, whites were the true protagonists in the drama of South West Africa, the Commission simultaneously praised the Territory's possibilities while noting that, due to its

[328] Government of South Africa, "Report of the Commission of Enquiry into South West Africa Affairs."
[329] Government of South Africa, 55.
[330] Robert J. Gordon, "The Making of Modern Namibia: A Tale of Anthropological Ineptitude?," *African Historical Review* 37, no. 1 (2005): 38.
[331] United Nations, "Report of U. N. Council for South West Africa," vol. A/6897, 1967; International Court of Justice, "South West Africa, Second Phase, Judgement," *I. C. J. Reports*, (1966), http://www.icj-cij.org/files/case-related/47/4957.pdf.

"underdevelopment" the Territory needed to be drawn more closely to South Africa.[332] This type of technocratic optimism was endemic within the apartheid state. The approach bears many similarities to anthropologist James Scott's examination of different governments' attempts to simplify, arrange, classify, and order society and the environment for the purposes of the state. Scott identifies four elements needed for states to transform society and environment, namely: a willingness to administratively order people and places; confidence in technical and scientific progress; an authoritarian state willing to exert resources to realize these goals; and a prostrate civil society.[333] To these elements I add a willingness to subsume on-the-ground findings to suit pre-arranged outcomes. Much of the Commission's recommendations were hashed-out in correspondence with Verwoerd whose vision for South West Africa drove the commission's recommendations.[334] Bruwer himself was not disinterested in the Commission's recommendations, one of which included the creation of the office of Commissioner-General for the Territory. Following the implementation of the recommendations Bruwer became the first to hold this office.

The recommendations of the report, submitted to Verwoerd in June 1963, echoing South Africa's case before the World Court,[335] unambiguously placed apartheid policies in the central role of further incorporating the Territory into South Africa. Consonant with the perspectives of the *volkekundiges*, ethnic separation was the foundation of the Odendaal Commission's recommendations. This included setting-aside 48.26% of South West Africa for whites in the Police Zone, while the remaining 51.74% was set-aside for 'native reserves', town areas, game reserves, diamond areas, government lands, and the municipality of Walvis Bay, the country's only deep-water port, which remained part of South Africa proper. This meant that the white population, numbering 73,464, would secure 6.76 km^2 of land per capita, primarily in the central and southern areas long considered ideal for pastoralism. While the 'native' population, numbering 424,047, was left with 0.74 km^2 per capita, primarily along the Territory's borders, far from the settler economy or government services.[336] In these divisions the Commission returned

[332] Gordon, "Apartheid's Anthropologists: The Genealogy of Afrikaner Anthropology."
[333] Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*.
[334] Gordon, "The Making of Modern Namibia: A Tale of Anthropological Ineptitude?," 37.
[335] International Court of Justice, "Counter-Memorial Filed by the Government of the Republic of South Africa," vol. II (The Hague, Netherlands, 1966), https://www.icj-cij.org/files/case-related/47/9275.pdf.
[336] Anthony A. D'Amato, "The Bantustan Proposals of South-West Africa," *Journal of Modern African Studies* 4, no. 2 (1966): 177–92; Gordon Lawrie, *New Light on South West Africa: Some Extracts and Comments on the Odendaal Report* (Witwatersrand University Press, 1964). Per capita land allocation for whites include government lands, as non-whites were functionally barred from these areas.

to its founding assumptions that no course but ethnic separation was possible, lest the development of the Territory come to a "complete standstill."[337]

Based upon existing legislation the Commission concluded that, "[f]ull and final authority" for implementing the recommendations, as far as they concerned non-whites, rested with "the Government of the Republic of South Africa and the practical carrying out thereof takes place, as far as native affairs are concerned through the Minister of Bantu Administration and Development."[338] This meant that the BAD would exercise hegemonic power over a series of ethnically-exclusive homelands covering almost half of the Territory. The system of native reserves that had been in place since the early twentieth century made much of this a *fait accompli*: the Territory was already largely segregated. The Commission's recommendations sought to bring this system into a new era of Afrikaner dominance and social planning.

The Odendaal report displays the premium the government placed on apartheid policy resting upon a defensible intellectual foundation. As noted by Gordon, the report was cloaked in the "patina of 'objectivity' and 'science'."[339] South Africa sought to invoke its right to rule South West Africa while showcasing the benefits of apartheid development and state planning to a hostile international community – the World Court case loomed over the Commission's recommendations.[340] During the 1930s and 40s there was an emerging consensus among white South Africans for a more powerful, vigorous central state tasked with securing the social order.[341] Concurrently, the state began asserting increasingly centralized control over knowledge production.[342] Now that the ethnonationalists were in charge, state technocrats and closely-aligned academics could be turned to producing knowledge and information which furthered the political and cultural goals of the conservative Afrikaner ruling class. The goal was an enduring minority-dominated society,[343] which was seen as the key to securing the party's, and by extent the Afrikaners', lasting political power and cultural survival.[344] The Afrikaner scientific establishment, centering around *volkekunde* scholarship, provided legitimacy to the Odendaal

[337] Government of South Africa, "Report of the Commission of Enquiry into South West Africa Affairs," 55.
[338] Government of South Africa, 51.
[339] Gordon, "How Good People Become Absurd: J.P. van S. Bruwer, the Making of Namibian Grand Apartheid and the Decline of Volkekunde," 104.
[340] McCullers, "Lines in the Sand: The Global Politics of Local Development in Apartheid-Era Nambia, 1950-1980," 37.
[341] Deborah Posel, "Race as Common Sense: Racial Classification in Twentieth-Century South Africa," *African Studies Review* 44, no. 2 (2001): 99.
[342] Dubow, *A Commonwealth of Knowledge: Science, Sensibility, and White South Africa 1820-2000*, 235.
[343] Dubow, 206.
[344] Giliomee, *The Afrikaners: Biography of a People*.

process that was simultaneously 'objective,' 'scientific,' and deeply imbued with an agenda of racist ethnonationalism.

The Odendaal Plan indicated the government's willingness to lightly clothe its ambitions towards permanent minority rule and the political and economic domination of non-whites for the foreseeable future. Concluding the section "Economic and Industrial Development," the Commission wrote that:

> "In a territory like South West Africa where there are groups that differ fundamentally from one another, a policy of socio-cultural separateness and economic interdependence is therefore the only one which can ensure the maximum freedom of action and self-realization to the greatest number of inhabitants at the same time."[345]

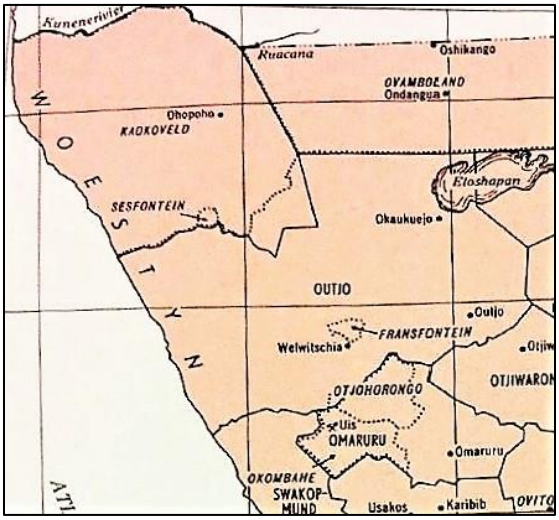
What was intended by this was later clarified by Bruwer, who, under cross-examination at The Hague, admitted that the Territory's economy "would not be able to thrive or possibly survive" without a prostrate non-white labor pool. Asked when this situation might be remedied, Bruwer agreed it could be anything up to 300 years.[346] Even so, the control of South West Africa by South Africa was allowed to continue. In 1966 the World Court dismissed the case brought by Ethiopia and Liberia on technical grounds, stating that individual member states of the UN had no right to individually judge South Africa as violating the mandatory agreement set-forth by the League of Nations and adopted by the UN.[347]

Creating a New Etosha and Kaokoveld

The Odendaal recommendations largely affirmed the status quo in the heavily segregated Territory. However, the northwest region was slated for significant change. Following the Commission's recommendations, the region was set to become the 'homelands' of Kaokoveld (renamed Kaokoland) and Damaraland and would also include two government-controlled reserves, which became the national parks of Etosha (1967) and Skeleton Coast (1971).[348] While Kaokoveld's 'native reserves' were officially designated in 1922, and Etosha Game Reserve was formalized in 1958, until 1947 both had been part of Game Reserve No. 2, and functionally still

[345] Government of South Africa, "Report of the Commission of Enquiry into South West Africa Affairs," 427–29.
[346] International Court of Justice, *Verbatim Record,* C.R. 65/56, 22 and 25; from: D'Amato, "The Bantustan Proposals of South-West Africa," 190 ft.1.
[347] International Court of Justice, "South West Africa, Second Phase, Judgement."
[348] Even before the Odendaal Report, Etosha-Kaokoveld was not devoid of *volkekunde* influence. The first warden of Etosha was Dr. P. J. Schoeman, who received his PhD in *volkekunde* at Stellensbosch.

formed a unified landscape. Damaraland to the south of Kaokoveld, and the Skeleton Coast National Park were new creations.



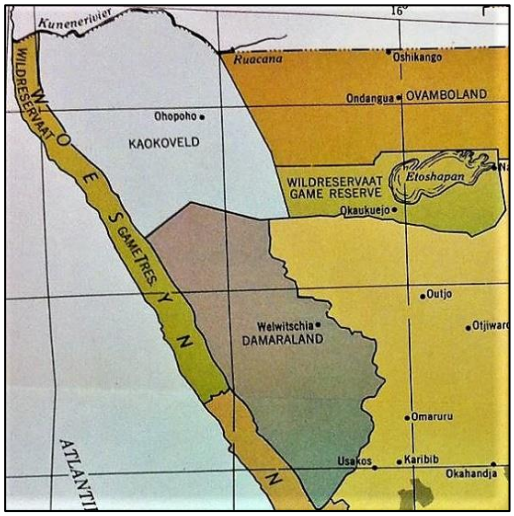


Figure 8 (left): Existing government boundaries in 1963, prior to the Odendaal Commission's recommendations. Source: Report of the Commission of Enquiry into South West Africa

Figure 9 (right): Odendaal Commission recommendations for the area, including the reduction of Etosha and Kaokoveld, and creation of Damaraland and what became Skeleton Coast National Park. Source: Report of the Commission of Enquiry into South West Africa

Per the Commission's recommendations, Kaokoveld was to be reduced by 629.1 km^2. It would now cover 48,982 km^2 and be home to 9,234 'Kaokovelders'; a supposedly unified ethnic group described by the Commission as being,

> "closely related to the Herero [in the central part of the Territory] as far as origin, language and culture are concerned. They are mainly herdsmen who often trek with their stock from one water place to another and are exceedingly conservative in their way of life. They seldom leave their home areas, maintaining, even in their dress, a tradition of their own, on which other cultures have made little impression."[349]

[349] Government of South Africa, "Report of the Commission of Enquiry into South West Africa Affairs," 33. The creation and use of the 'Kaokovelder' ethnic designation by the South African government, as a means of controlling the region's population, reveals inconsistencies in the application of ethnic categories to Kaokoveld residents. The Odendaal Commission referred to the region's inhabitants as a unified ethnic group, while the South Africa's case before the World Court treated the "minor groups" of Tjimba and Himba in Kaokoveld as "a part of the Herero nation." Such discrepancies did not escape at least William Tjerije, a Kaokoveld leader who, in 1962, confronted government attempts to separately categorize residents by saying that, "We are all one nation. Whites divided us. Whites gave us different names [Himba, Tjimba, and Herero]." In response, BAD Officer-in-Charge of Kaokoveld, B. J. Marais, invoked a government ethnologist's report, saying "I will tell you where you come from and what nation you are (tells history of the people in Kaokoveld as noted down by Dr. van Warmelo's book "Notes on the Kaokoveld and Its People"). You see now that you are three tribes." (Nicolaas Jacobus van Warmelo, "Ethnological Publication No. 26: Notes on the Kaokoveld (South West Africa) and Its People" (Pretoria, 1951); quote from: Steven van Wolputte, "Subject Disobedience: The Colonial Narrative and Native Counterworks in

Damaraland, carved out of the Outjo district, would cover 41,726 km^2 and be home to 44,353 Damaras, a uniquely South West African group of people described as being a "dark negroid people of unknown origin."[350] Bordering Kaokoveld to the south at the Hoanib River and beginning approximately thirty-five kilometers inland from the Atlantic Ocean, Damaraland extended eastward to an irregular set of farm boundaries, reaching south until the Swakopmund-Usakos railway line. Included in Damaraland were 223 white-owned farms covering 1,872,794 ha. which were purchased by the government at a premium. A strip of land along the Atlantic Ocean was set-aside to prohibit residents of Kaokoveld and Damaraland from accessing the sea. This would become the Skeleton Coast National Park (1971). The Etosha Game Reserve, which since 1957 had encompassed 2,564 km^2 of Kaokoveld, was to be drastically reduced. Originally covering approximately 80,000 km^2 in 1907, the reserve was already reduced to about 55,000 km^2 by 1957 (with some changes to its boundaries). Already in the 1950s, groups of Hai||om (Khoe-Sān), who had long resided in the Etosha, were evicted and forced into informal settlements around the town of Outjo.[351] The Odendaal Commission recommended further reducing the reserve to 22,270 km^2.[352] This left South West Africa conservationists "aghast."[353]

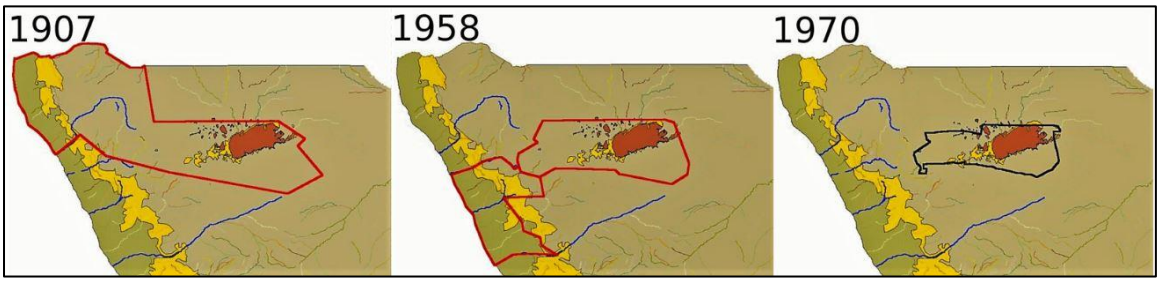


Figure 10: Changing boundaries of Game Reserve No. 2/Etosha National Park. Source: Wikipedia[354]

The dramatic decline in area set-aside for wildlife conservation was exacerbated by the recommendation that Kaokoveld, formerly part of Game Reserve No. 2 and entirely proclaimed a

Northwestern Namibia, c.1920–1975," *History and Anthropology* 15, no. 2 (2004): 152.) International Court of Justice, "Counter-Memorial Filed by the Government of the Republic of South Africa," II:311.

[350] Government of South Africa, "Report of the Commission of Enquiry into South West Africa Affairs," 31.

[351] Dieckmann, *Hai||om in the Etosha Region: A History of Colonial Settlement, Ethnicity and Nature Conservation.*

[352] Government of South Africa, "Report of the Commission of Enquiry into South West Africa Affairs," 87–95.

[353] Bat, "Etosha: 75 Years," 20.

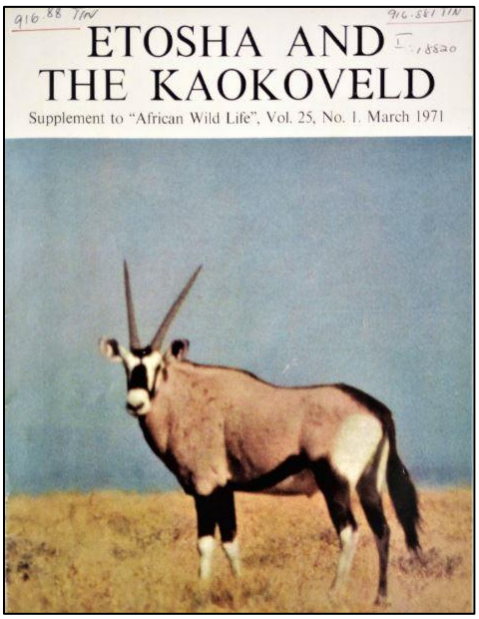
[354] Yathin S. Krishnappa and Werner Kilian, https://en.wikipedia.org/wiki/Etosha_National_Park#/media/File:Etosha_Park_Boundaries_1907-1970.gif. Accessed 29 October, 2019.

'native reserve' in 1947, having functioned as a *de facto* game conservation area since 1928,[355] be de-proclaimed as a game reserve. The Odendaal Commission was "of the opinion that a Homeland as a whole should not be a proclaimed game reserve but that only a small part of it should continue to exist as such." Therefore, the Commission recommended a split. Though Commissioner Bruwer had visited Kaokoveld periodically during the 1950s and 60s, the Commission had spent scant time in the northwest part of the Territory, perhaps as few as three days, and never visited Etosha itself.[356] The Commission purported to rely on the expertise of local officials across the Territory, but the arguments of Bernabe de la Bat, the first Director of South West Africa Nature Conservation and Tourism, against the loss of Kaokoveld's game reserve status were ineffective.[357]

In transforming Etosha's boundaries and de-proclaiming the game reserve status of Kaokoveld, the Commission's recommendations would alter the ecology of the region. According to conservationists in South West Africa, the recommendations for the de-proclamation of such an extensive area of Etosha-Kaokoveld caused "an international furore [sic] that lasted for…years."[358] The changes, it was felt, would sever the "most valuable and greater part" of the park, engendering "frustration and bitterness."[359] To counter the feared effects of the Commission's recommendations, the Wild Life Society of South Africa made numerous representations to the government, even reaching Verwoerd's office, but these were largely deflected.[360] This process culminated in 1969, when the Wild Life Society commissioned former Etosha scientist and highly-regarded Southern Africa ecologist Ken L. Tinley to write an alternate plan for dividing Kaokoveld-Etosha.[361] "[B]ased on intrinsic ecological potential and capabilities of the different land types," Tinley's alternate plan, submitted to the Prime Minister in 1969 coalesced the so-called "Kaokoveld controversy."[362] His plan reveals the ecological concerns of certain South and South West African bureaucrats and conservationists pertaining to the

[355] Owen-Smith, "Proposals for a Game Reserve in the Western Kaokoveld," 33.
[356] McCullers, "Lines in the Sand: The Global Politics of Local Development in Apartheid-Era Nambia, 1950-1980," 147; Gordon, "The Making of Modern Namibia: A Tale of Anthropological Ineptitude?"
[357] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 112.
[358] Bat, "Etosha: 75 Years," 20.
[359] Government of South Africa, "Report of the Commission of Enquiry into South West Africa Affairs," 487; Ken L. Tinley, "Etosha and the Kaokoveld," *African Wild Life - Supplement* 25, no. 1 (1971): 3; Berry, "Historical Review of the Etosha Region and It Subsequent Administration as a National Park," 5.
[360] Anonymous, "The Threat to the Etosha Pan Game Park," *African Wild Life* 24 (1970): 232–33; R. C. Bigalke, "The Odendaal Report and Wild Life in South West Africa," *African Wild Life* 18 (1964): 181–88; H. F. Verwoerd, "The Odendaal Report and Wild Life in South West Africa," *African Wild Life*, 1965, 181–82.
[361] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 148.
[362] Ken L. Tinley, "Etosha and the Kaokoveld," *African Wild Life* 25, no. 1 (1971): 1; Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 145–63.

Commission's recommendations. Examining and contextualizing this plan uncovers some of the latent aspects of South Africa's apartheid policies and provides a more nuanced perspective of the role that science and technocratic optimism played in the construction of South Africa's apartheid empire and the transformation of northwest Namibia.



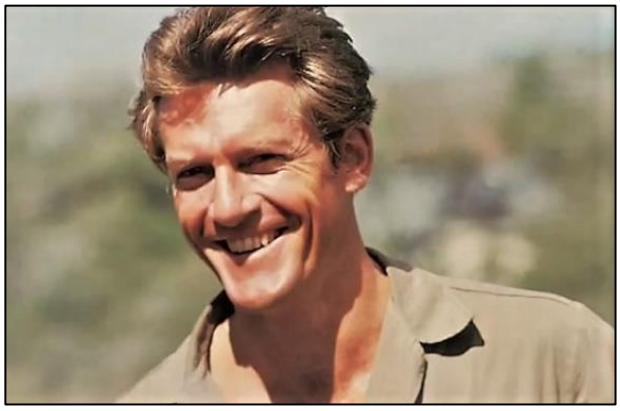


Figure 11 (left): Cover, Supplement to African Wild Life containing Tinley's alternate plan for Etosha and Kaokoveld. Source: Namibia Scientific Society

Figure 12 (right): Ken Tinley. Source: Londolozi Blog[363]

Tinley's Alternate Plan

From 1965-1968, Ken Tinley was stationed at Okaukuejo in Etosha, serving as an ecologist for the South West Africa Department of Nature Conservation. Highly-regarded by his colleagues there, Tinley was considered a pioneer for his ecological approach to land-use planning.[364] During this time Tinley engaged in detailed ecological surveys across the northern parts of South West Africa, monitored wild ungulate vegetation availability in Etosha, and consulted with his superiors on implementing other conservation areas following the Odendaal Plan, *inter alia*.[365] By 1971, Tinley had since left South West Africa and was serving as Chief Wild Life Ecologist for

[363] https://blog.londolozi.com/2014/04/09/ken-tinley-2/
[364] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 148; 155.
[365] Ken L. Tinley, "Western Caprivi Conservation Area, South West Africa: A Proposal of Natural Resource Land Use" (Etosha, 1966); Ken L. Tinley, "Dikdik (Madoqua Kirki) in South West Africa: Notes on Distribution, Ecology, and Behaviour," *Madoqua* 1 (1969): 7–33; Ken L. Tinley, "Wild Ungulate Food Plants - Etosha National Park," 1968, http://www.the-eis.com/data/literature/Ken Tinley Food Plants Etosha National Park 1965_68.pdf.

the government of Mozambique. Safely beyond threats of bureaucratic sanction, Tinley's report, which ran as a special supplement in the Wild Life Society's journal *African Wild Life*, challenged the effects that the Odendaal recommendations would have on what he saw as the natural wonders and wildlife of Etosha-Kaokoveld. The abstract reads:

> "This report is motivated by the Government's intention to implement the Odendaal Commission's recommendations for northern South West Africa, which will result in the loss of the most valuable and greater part of the Etosha National Park.
>
> This report submits an alternative plan of land apportionment for man and wild life based on the intrinsic ecological potential and capabilities of the different land types, providing man with better living sites and at the same time making provision for the preservation of the unique features of Etosha and Kaokoveld as a natural resource of national importance. It is appreciated that the Government has to implement the Odendaal Commission report since no alternative plan exists. The present report presents a case for saving the Etosha and Kaokoveld while at the same time providing better and more ecologically viable living sites for the different ethnic groups at present in desert terrain."[366]

Throughout more than 270 pages the Odendaal report spent only one paragraph describing "Etosha Game Reserve," four paragraphs on "wild life conservation," and one paragraph on game species (under the heading "veld foods") across the entire Territory.[367] Using evocative language, as well as photography, and maps detailing historical, ecological, and political aspects of the region, Tinley's eleven-page report extolls the economic and environmental value of Etosha and Kaokoveld. Whereas the Commission treated the landscape as a problem of social and civic planning, best understood through aerial survey techniques and the collection of quantitative data back in Pretoria, Tinley sought to make the landscape unique, rather than generic. The "political boundaries" recommended by the Commission, Tinley writes,

> "ignore the ecology of the region entirely, but effectively exclude almost all of the endemic flora and fauna from any national park space, as well as cutting the annual and periodic migration routes of certain large ungulates, such as elephant and gemsbok [oryx] between the Kaokoveld and the Etosha saline area."[368]

Meeting the Commission's recommendations on the grounds of technocratic planning and the efficient use of the landscape, and particularly concerning the governance of the Territory's 'native' population, the core of Tinley's stated disagreement was that,

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[366] Tinley, "Etosha and the Kaokoveld," 1971, 1.
[367] Government of South Africa, "Report of the Commission of Enquiry into South West Africa Affairs," 371; 285.
[368] Tinley, "Etosha and the Kaokoveld," 1971, 4.

> "Desert, mountain and saline areas can support wild life, whereas the better environments of the higher rainfall interior plains containing perennial savanna grassland and good soils can be more efficiently used by man. In certain areas under the present and proposed political division of land, this situation is in reverse. Desert and mountain areas have been allotted to man and tall perennial grasslands in the west of Etosha to wild life."[369]

Transcending simply technocratic language, Tinley paints a picture of a unique landscape that would be ripped-apart by the Commission's recommendations. Of particular concern was the loss of endemic plants and birds, the despoliation of scenic mountainous landscapes and valleys rivaling Arizona's Grand Canyon,[370] and restricting outsider access to areas of "fantastic natural diversity and richness merely for a handful of people who cannot use the extreme terrain anyway"[371] – the status quo being that homelands were exclusively for the use of their 'native' inhabitants.

Marshalling an array of ecological, anthropological, and geographic evidence to support his case, Tinley made a series of sweeping recommendations to "preserve the unique natural features of Etosha and the Kaokoveld, and to provide better living sites" for the area's residents.[372] These included: creating the Kunene [River] and Kaokoveld National Parks from Kaokoveld and Damaraland, which could link to Etosha if feasible, effectively re-creating the original Game Reserve No. 2 (1907); purchasing greater amounts of private (white) farmland to enlarge these new parks; confining the 'Kaokovelder' homeland to an area further east with greater rainfall, and thus better grazing for livestock; removing remaining 'natives' to areas outside these new parks; and upgrading the roads within these parks for the use of tourists, nature conservators, and researchers. Tinley envisioned a dramatic land-use transformation including the creation of a new social-ecological regime in the northwest, and uprooting thousands of Kaokoveld residents. Because pastoralists had been inhabiting Etosha-Kaokoveld since at least the 1500s, and hunter-gatherer groups likely longer, such a removal would have been a considerable, though not unprecedented, political maneuver, not dissimilar to the removal of inhabitants from other highly-desired conservation areas throughout the twentieth century.[373] In contrast, the human effects of the Odendaal proposal were relatively minor. Tinley's

[369] Tinley, 3.
[370] Tinley, 4.
[371] Tinley, 5.
[372] Tinley, 13.
[373] Dieckmann, *Hai||om in the Etosha Region: A History of Colonial Settlement, Ethnicity and Nature Conservation.*; SWAA 1168, "Removal of Natives from the Southern Kaokoveld to the North. Correspondence between Officer in Charge of Native Affairs, Ovamboland and Secretary of South West Africa, Windhoek."; Dowie, *Conservation Refugees: The Hundred-Year Conflict between Global Conservation and Native Peoples*; Borg and Jacobsohn, "Ladies in Red – Mining and Use of Red Pigment by Himba Women in Northwestern Namibia."

disagreements with the Commission's recommendations were on the grounds of ecological sensitivity of Etosha-Kaokoveld. Any disagreements he had concerning the logic of apartheid were not noted.[374]

Though Tinley's report substantively departs from the Odendaal recommendations, an important commonality is the authors' technocratic optimism concerning the state's ability to successfully assess, plan, and execute programs aimed at the efficient allocation of resources and containment of people within racially-defined homelands. While the Odendaal Plan sought to support the governing regime, Tinley's report sought to protect the region's wildlife and landscapes. Such optimism in state planning was consonant with an increasingly dominant managerial-style ethos across the applied sciences beginning during the interwar period.[375] During this period the natural sciences were increasingly mathematized, providing ecology with a solid theoretical base akin to the physical sciences, which had experienced some of the greatest conceptual and technological advances of the early part of the century. The key to this was representing ecological components mechanistically, within mathematical equations and models, to forecast the likely outcome of environmental interactions. This approach was further refined and by the mid-1940s the mechanistic model eclipsed field-based methods reminiscent of natural history as the dominant model within ecology.[376]

Tinley's philosophy of ecological science can be distilled from other, similar, documents he authored during this period. Prior to the Etosha-Kaokoveld report, Tinley was enlisted by Director of Nature Conservation de la Bat, to compile a report on a potential protected area in the western Caprivi strip, in the far northeast of the Territory. This report was also in response to the Odendaal Plan, which recommended that the existing Caprivi Nature Reserve be converted to a homeland for the Barakwengo bushmen (Khoe-Sān). In many ways this lengthier report anticipated the Etosha-Kaokoveld one. Tinley outlined the area's natural resources, providing details on vegetation, wildlife, and water, as well as the history of "ethnic-environmental relations involving the health of the land, and thus of the people," discussed from what he terms "an ecological point of view."[377] Particularly when treating issues of human-environmental interactions, Tinley conveys an ecosystem that is at once unique and fragile, capable of maintaining the biota of an ecological climax community if left relatively undisturbed. However,

[374] In July 2019 Tinley declined a request to be interviewed.
[375] Sharon E. Kingsland, "Review: The History of Ecology," *Journal of the History of Biology* 27, no. 2 (1994): 349–57.
[376] Donald Worster, *Nature's Economy: The Roots of Ecology* (San Francisco: Sierra Club Books, 1977), 311; Kingsland, "Mathematical Figments, Biological Facts: Population Ecology in the Thirties."
[377] Tinley, "Western Caprivi Conservation Area, South West Africa: A Proposal of Natural Resource Land Use," 30.

he also saw this space as requiring extensive scientific research and in need of government-sponsored resources to apply game and ecosystem management principles. In the Western Caprivi report, Tinley defined conservation as "an ecological type of land use concerned with the maintenance of habitat as the fundamental first principle in maintaining populations of animals and plants; in this particular instance it is the natural ecosystem, its use, and improvement that is to be maintained."[378]

The reference list provides a clearer understanding of the scientific *denkkollektiv* Tinley was operating within.[379] Tinley prefaces the report with an extended quote from F. Fraser Darling, whom he terms an "International Ecologist of world renown," which partially reads,

> "Growing understanding of ecological principles raises the conservation of nature to an ethic, the precept of which is that the eternal must not be sacrificed to the expedient.
>
> Apportionment of land use in an age of awareness must be in terms of conservation of the habitat for posterity and not to concede to current political fads which have no foundation in the ecological principles that govern our ultimate existence…Today, the wild lands of the world and their animal and plant communities may be looked upon as a bank of resources not to be dissipated but used wisely, to be left intact as long as possible rather than combed through for transient wealth, the removal of which may degrade the habitat to an extent unforeseeable. Chain reactions are as demonstrable in ecology as in physics."[380]

Elsewhere in the report, Tinley cites a 1960 article by Darling which terms conservation as "a realm of scientific intervention called ecology," which also goes on to define an ecological climax as "embod[ying] the maximum energy-flux possible in a given set of physical climatic conditions."[381] Tinley was, at the very least, sympathetic towards the mechanistic approach to understanding ecology. Furthermore, as indicated in Darling, and in other cited conceptual and case-study literature, including works by Paul Sears, William Allan, and John Ford, and later Ernst Mayr and E. F. Schumacher,[382] Tinley was also operating within an economic understanding

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[378] Tinley, 34.
[379] "Thought-collective," from: Ludwick Fleck, *Genesis and Development of a Scientific Fact*, ed. Thaddeus J. Trenn and Robert K. Merton, trans. Fred Bradley and Thaddeus J. Trenn (Chicago and London: University of Chicago Press, 1935).
[380] Tinley, "Western Caprivi Conservation Area, South West Africa: A Proposal of Natural Resource Land Use," ii.
[381] F. Fraser Darling, "Wildlife Husbandry in Africa," *Scientific American* 203, no. 5 (1960): 124; 127.
[382] Paul B. Sears, "Ecology: A Subversive Subject," *BioScience* 14, no. 7 (1964): 11–13; William Allan, *The African Husbandman* (London: Oliver & Boyd, 1965); John Ford, *The Role of the Trypanosomiases in African Ecology: A Study of the Tsetse Fly Problem* (Oxford: Oxford University Press, 1971); Ernst Mayr, *Animal Species and Evolution* (Cambridge: Harvard University Press, 1963); E. F. Schumacher, *Small Is Beautiful: Economics as If People Mattered* (USA: Blond & Briggs, 1973).

of ecology. Speaking later on the need to maintain diversity in wildlife and protected areas in Africa, Tinley would outline his economic perspective of ecology:

> "By economic is meant not only the narrow monetary benefits, but the full range of natural resource values to the surrounding human communities. Economy is the judicious use of the resources of a community for which management, regulation and authority is required for its maintenance and distribution."[383]

The combination of these two, the mechanistic and economic, are what historian Donald Worster has called the "New Ecology." Worster traces this ethic to the experience of an ambivalent relationship between westerners and modern technology, evident in the growing confidence of ecologists to employ contemporary methods to order nature and plan for its development, and in the concurrent growing sense that the environment was defenseless in the face of globalized industrial technology, stemming from, among other events, the detonation of the atomic bombs and the nuclear arms race that followed.[384] In this ambivalence, ecological systems are treated as dynamic, even evolving at a systems level. This implies that environmental change is inevitable and therefore, particularly in the presence of modern technology, environments are consistently at risk of crisis and deleterious transformation. This perspective is evident in Tinley's call for "saving the Etosha and Kaokoveld" and in his concern that allowing the Herero, Himba, and Tjimba to settle within unsuitably arid areas "only results in devastation of the environment and wretchedness of the people."[385] Anthropologist Paul Richards has shown that this "evolutionist legacy" of ecological management in Africa is tied to colonialist models of cultural evolution that place the blame for environmental degradation at the feet of peasants, rather than environmental managers.[386] Like the Odendaal Commission, Tinley was operating within a paradigm of confidence in the application of science to direct government action to achieve desired ends and a concern that peasants could not be counted on to achieve such ends unaided. However, unlike *volkekundiges* and other technocrats in the apartheid state, Tinley recognized that systems – whether societies or environments – were dynamic; that they could not be frozen to concretize an existing status quo. Because Tinley's goals differed, the scientific evidence and tools he employed differed as well. Thematically, his training in ecology turned his eyes towards the nonhuman

[383] Ken L. Tinley, "The Maintenance of Wilderness Diversity in Africa," in *Voices of the Wilderness, Proceedings from the First World Wilderness Conference*, ed. Ian Player (Johannesburg, 1979), 35–36.
[384] Worster, *Nature's Economy: The Roots of Ecology*, 291–348; Taylor, "Technocratic Optimism, H. T. Odum, and the Partial Transformation of Ecological Metaphor after World War II."
[385] Tinley, "Etosha and the Kaokoveld," 1971, 3.
[386] Paul Richards, "Ecological Change and the Politics of African Land Use," *African Studies Review* 26, no. 2 (1983): 1–72.

world, conceptually, his training in ecology provided the lens which revealed this world as always changing.

Historian of ecology Peder Anker examined the growth of the mechanistic model of ecology, contrasting it with an alternate model based on the notion that environments are more appropriately conceived of as organisms, what scientist and statesmen Jan Smuts termed 'holism.' Anker explores a productive tension between scientists of ecology in England and those in South Africa. Throughout the 1920s-40s the ecology of holism undergirded and was used to naturalize segregationist practices in South Africa, including under the Smuts government. This was done by interweaving conceptions of economy, management, and classification that nevertheless were secondary to the effective functioning of the whole. As ecosystem managers were thought to be able to categorize, quantify, and order a landscape, so to could governments categorize, quantify, and order society. It is important to note that within Tinley's writings language pertaining to the ecological holism of Smuts and his colleagues is largely absent. The language Tinley uses, and the works he cites in this and other writings, strongly suggest that he was primarily intellectually influenced by what Anker terms British ecology, rather than South African ecology, which was no less managerial in its ambitions, even if it focused on energy flows more than holistic assemblages. Though Anker shows that the approach of Smuts and the ecology of holism also evinced a high confidence in administrative management, this appears to be separate from Tinley's writings and it would be a stretch to read the philosophies of holism into the work of the Odendaal Commission, which gives no hint of ecological thinking.[387] This lack of clear Smutsian influence may be explained by Smuts' electoral defeat and the rise of the National Party causing the retreat of ecological concepts of holism in South Africa.[388] As we will see, the field of ecology may not have been held in high esteem by the nationalist government at the time of Tinley's writing.

Tinley's confidence in ecology as an interventionist form of conservation science helps us better understand the technocratic optimism of his recommendations to preserve Etosha-Kaokoveld. He shared a managerial confidence in the state with the Odendaal Commission, though his scientific lens for understanding the world differed. Tinley's report departs from the Commission in his grave concern for the implementation of social policies not attuned to the limits of the environment. For the Odendaal Commission, science-based social planning aimed to address social-political challenges that, at least when it came to ordering a marginalized peasant

[387] Anker, *Imperial Ecology: Environmental Order in the British Empire, 1895-1945*.
[388] Peder Anker, "The Politics of Ecology in South Africa on the Radical Left," *Journal of the History of Biology* 37 (2004): 303–31.

population, were unconcerned with the ecological setting in which this ordering took place: recognizing ecological limits meant acknowledging the limits of the state. For Tinley, rational planning had to account for ecology before solutions to social-political challenges could arise. The rejection of Tinley's proposal by the BAD, speaking on behalf of the government, was one more example, of when "environmental stewardship took a back seat to the rulers' economic and political priorities;" a trend that historian Christo Botha has identified across the colonial era in South West Africa/Namibia.[389] As I have shown in chapters one and two, throughout the colonial era government policies primarily concerned with maintaining a relatively prosperous settler-dominated territorial economy had pernicious effects on environments and nonhumans.

Tinley's Rejection

Given its extensive departure from the Odendaal Plan, it is unsurprising that Tinley's recommendations were rejected. To those familiar with the human rights abuses of South Africa's apartheid government, it is ironic that the stated reason for the rejection was because "the interests of the Natives…could not be subordinated to nature conservation."[390] Given the pressure coming from the international community, it was a clever rhetorical strategy by the South African government to be purportedly privileging the interests of the area's inhabitants over other issues. It is telling that the rejection of Tinley's proposal came from the BAD.

The publication of Tinley's report within *African Wildlife*, rather than being circulated within government, indicates the extent to which he was an outsider to the process of implementing the Commission's recommendations. Tinley's report gives no indication that he was informed of the challenges deemed critical by South African and South West African officials concerning the implementation of the Commission's recommendations, or the subsequent hours which government officials spent implementing the Commission's vision.[391] Such challenges are revealed in the government archives detailing the minutes of the South West Africa *Skakelkomitee* ("Liaison Committee"). The Skakelkomitee, which met at least nine times from mid-1964 to late-1966, was tasked with overcoming a variety of challenges stemming from the Odendaal report.

[389] Botha, "People and the Environment in Colonial Namibia," 171.
[390] Department of Bantu Administration and Development; Government of South Africa, "The Minister's Reply: Division of Land Between the Kaokoveld, Damaraland and the Etosha National Park," *African Wild Life - Supplement* 25, no. 1 (1970): 15.
[391] Miscellaneous Odendaal Files, Namibia National Archives (LUKS) 1.2, "Memorandum Aan Uitvoerende Komitee Insake Notule En Aanbevelings van Die Skakelkomitee (Vergadering Gehou Te Windhoek Op 3 En 4 Augustus, 1964)" (1964); LUKS 1.3, "Memorandum Aan Uitvoerende Komitee Insake Notule En Aanbevelings van de Skakelkomitee (Vergadering Gehou Te Windhoek Op 4 September, 1964)" (1964).

The challenges which the Skakelkomitee focused on included the exact location of the border between Etosha and Kaokoveld for veterinary and human control purposes; concerns surrounding livestock controls and quarantines and reorganizing the Territory's veterinary services; sighting and improving the road linking the Police Zone border at Kamanjab to Ruacana along the Kunene River; appropriating the necessary budget and materials to construct and improve roads in the area; and provisioning resources for a planned hydroelectric scheme along the Kunene River. These archives also reveal that the government's stated concern that nature conservation would subordinate native concerns was disingenuous. Rather than focusing on issues of native interest, the Skakelkomitee spent the majority of its time focused on issues that would support the Territory's economy and white settler population. As in years past, concerns over livestock disease prompted government officials to recommend the creation of stock-free corridors between 'homelands' and settler farms.[392] The erection of fencing to spatially segregate humans, livestock, and wildlife from moving freely within the Territory was a favored approach. If the Territory could be envisioned as a rationally-organized space, perhaps it could also be physically transformed into one.[393] The government did not seriously consider ecology, the preservation of species, or the movement of wildlife, to be a particularly high priority when implementing these apartheid policies.[394] The archives also reveal the Skakelkomitee's reticence to substantively constrain peasant livelihoods or draw attention to the plight of African communities while South Africa's case was pending before the World Court.[395]

Though the 1960s and early 70s were a period of increasing global environmental awareness, such concerns remained minimal to the South Africa's ethnonationalist government. Indeed, the nationalists may have seen ecology as primarily a source of government criticism. Examining the place of ecological science in the early apartheid era, Anker uncovers an adversarial relationship between evolutionist thinking, ecological science, and the nationalist government. Among other issues, Anker notes that evolution was not in the curriculum of South African schools or Afrikaans universities in the 1950s. Anti-evolutionists held powerful roles in a

[392] See chapter one.
[393] LUKS 1.1, "Memorandum Aan Uitvoerende Komitee Insake Notule En Aanbevelings van Die Skakelkomitee (Vergadering Gehou Te Windhoek Op 30 Junie En 1 Julie, 1964)" (1964).
[394] There was some discussion about incorporating black rhino and mountain zebra breeding areas into the new Etosha; see: LUKS 1.3, "Notule van Vergadering van Die Skakelkommitee Insake Besluite Oor Suidwes-Afrika-Aangeleenthede Gehou Te Windhoek Op 4 September 1964" (1964); LUKS 3.9, "Notule van Vergadering van Die Skakelkommitee Insake Besluite Oor Suidwes-Afrika-Aangeleenthede Gehou Te Windhoek Op 31 October 1966" (1966).
[395] LUKS 2.6, "Notule van Vergadering van Die Skakelkommitee Insake Besluite Oor Suidwes-Afrika-Aangeleenthede Gehou Te Windhoek Op 24 Februarie 1965" (1965); LUKS 3.9, "Notule van Vergadering van Die Skakelkommitee Insake Besluite Oor Suidwes-Afrika-Aangeleenthede Gehou Te Windhoek Op 31 October 1966."

government that linked its ethnonationalism to biblical interpretations of history. During the 1950s and early 60s, Edward Roux, one of South Africa's most high-profile ecologists, was vocally critical of the apartheid regime, and an avowed communist, who tacitly and explicitly linked apartheid, industrialization, and ecological collapse together. Roux's work resulted in his high-profile banning (preventing him from teaching at or entering any university) in 1964, which was followed by mass protests at the country's English-speaking universities. The linkage that Roux made between ecology and politics raised the profile of ecology as a science in South Africa, but garnered no favors for the discipline within government.[396] Roux's critical rhetoric was not isolated: the emergence of ecology as a form of social critique was promulgated by ecologists and natural scientists during the 1960s.[397] This commitment to criticizing policies and technologies viewed as unsustainable or deleterious to human and environmental health by leading ecologists at home and abroad likely did not help Tinley's case before the nationalist government.

Though Tinley's report, published in 1971, may have been overdue, it was no *fait accompli* that the Commission's recommendations would be implemented. Numerous articles in the local and international press criticized the de-proclaiming of Kaokoveld into the early 1970s and at least two other bureaucrats authored still different alternative plans in 1971,[398] both of which raised substantive concerns about the ecological effects of the Odendaal Plan within Etosha-Kaokoveld.[399] These articles and alternative plans were apparently ignorant of the Skakelkommitee's work to implement the Odendaal recommendations for Etosha-Kaokoveld, which began to be enacted in earnest in the late 1960s.

[396] Anker, "The Politics of Ecology in South Africa on the Radical Left."
[397] Worster, *Nature's Economy: The Roots of Ecology*, 339–48; Sears, "Ecology: A Subversive Subject."
[398] Garth Owen-Smith, "The Kaokoveld: An Ecological Base for Future Development Planning" (Pretoria, South Africa, 1971); Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 163.
[399] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 156–63.

Figure 13: Blue wildebeest on the edge of the Etosha Pan. Photo: author

Environmental Outcomes in Etosha and Kaokoveld

The implementation of the Committee's recommendations, with limited alterations, had foreseen and unforeseen negative effects on the wildlife and people of the Etosha-Kaokoveld region. As a coda to this history of contrasting colonial science in the age of technocratic optimism, I review a selection of the environmental effects of the Odendaal Plan. This is not intended to valorize Tinley's forecasts. Rather, I intend to show that environmental transformations can be driven by human actions in a variety of arenas. In this case, a politically informed brand of racialized 'science' intersected with technocratic goals aiming towards an idealized conservative social order. The environmental outcomes on Etosha-Kaokoveld were far-reaching.

A chief concern of Tinley's and other conservationists was that the de-proclamation of Kaokoveld as a game reserve would marginalize the region's conservation value. Tinley and others believed that Etosha-Kaokoveld functioned as a unified ecosystem for many large mammals. In particular, Tinley was concerned about migrations of oryx, elephants, and mountain zebra between Etosha and Kaokoveld and the risk of bisecting an anticlockwise migration of plains zebra and blue wildebeest (*Connochaetes taurinus*) along the outskirts of the Etosha pan, crossing into Ovamboland to the north. From its inception in 1907 until the 1950s, Etosha's southern boundary was delineated by survey points and firebreaks, which were no obstacle to migrating wildlife or marauding predators.[400] Beginning in the 1950s, in response to lions and other wildlife crossing into neighboring white-owned farms, farmers erected low-quality fencing

[400] Namibia National Archives, South West Africa Administration (SWAA) 2331, "Destruction of Lions; Letter from Mr. R. Böhme, Onguma, Tsumeb. 7 March.," 1952.

along Etosha's southern boundary. It was not until an epidemic of foot-and-mouth disease in 1961 that 'game-proof' fencing went up along Etosha's southern and eastern borders. Following the Odendaal Plan increasing fencing in the area was given high priority by government officials.[401] In 1973 Etosha was enclosed by 850 km of fence, in response to demands that wildlife and livestock remain separate and that area's the 'natives' – the so-called 'Kaokovelders,' Damara, and Hai||om, be disallowed access to the park, either for hunting or grazing.[402]

It was during this period, as the park became increasingly enclosed, that animal migration routes were cut and plains zebra and wildebeest numbers fell. Accurate wildlife population numbers for Etosha-Kaokoveld are difficult to ascertain before the 1980s. However, numerous sources agree that a migration of plains zebra and blue wildebeest was halted by the erection of fences enclosing the park. During the late 1950s to early 60s, an estimated 25,000 plains zebra and 25-30,000 blue wildebeest made their annual anti-clockwise migration.[403] In 1962, Bernabé de la Bat estimated 100,000 large herbivores in Etosha. During the 1960s these numbers plummeted. By 1968 it was estimated that 15,000 plains zebra and 5,000 blue wildebeest inhabited the park. By 1980 only 9,000 zebra and 3,000 wildebeest remained.[404] The proximate causes for these declines were a rise in the incidence of anthrax within the park and a growing population of lions which feasted upon sick and dying game. The ultimate causes were the recommendations of the Odendaal Commission and implementation of the Skakelkommitee. In a 1976 study of anthrax within Etosha, South West Africa Division of Nature Conservation and Tourism wildlife veterinarian, Hym Ebedes, revealed that, between 1966-74, at least 1,635 animals, 89% of which were wildebeest and zebra, were known to have died from the disease. Ebedes traced the increased incidence of anthrax – which had long been endemic in Etosha[405] – to road-building projects, aimed at supporting growing numbers of park tourists, but which also created enzootic anthrax areas. Road-building increased the number of rain-filled gravel pits within the park. During the wet season, gravel pits would retain water for up to five weeks longer than small, ephemeral, rainwater pans. The combined restriction in wildlife movements through

[401] LUKS 2.8, "Memorandum Aan Uitvoerende Komitee Insake Notul En Aanbevelings van de Skakelkomitee (Vergadering Gehou Te Windhoek Op 9 Junie 1966)" (1966).
[402] Dieckmann, *Hai||om in the Etosha Region: A History of Colonial Settlement, Ethnicity and Nature Conservation.*; Arthur Hoole and Fikret Berkes, "Breaking down Fences: Recoupling Social-Ecological Systems for Biodiversity Conservation in Namibia," *Geoforum* 41, no. 2 (2010): 304–17; Berry, "Historical Review of the Etosha Region and It Subsequent Administration as a National Park."
[403] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 321; Berry, "Historical Review of the Etosha Region and It Subsequent Administration as a National Park."
[404] H. Ebedes, "Anthrax Epizootics in Etosha National Park," *Madoqua* 10, no. 2 (1976): 99–118; Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 322.
[405] Rex van Schalkwyk and Hu Berry, eds., *Etosha 100: Celebrating a Hundred Years of Conservation.* (Windhoek, Namibia: Venture Publications, 2007), 109.

fencing, and construction of these gravel pits in wet season areas favored by ungulates, resulted in over-utilization of vegetation and the eruption of enzootic anthrax areas, particularly effecting plains zebra and blue wildebeest. Similar occurrences were recorded in Kruger National Park and elsewhere in South West Africa following the construction of gravel pits.[406] The anthrax epidemic increased. From 1975-78, 62% of wildebeest carcasses in the park tested positive for anthrax.[407] Throughout this period, oryx and eland (*Taurotragus oryx*) numbers drastically declined, while elephant and giraffe numbers rose.[408] During this same period, due to a combination of increased food availability – scavenging carcasses – and limitations in prey movement from fencing, and being resilient to anthrax, lion and spotted hyena populations rose within the park.[409] However, Etosha's enclosure could not contain the park's lions, who, struggling to find adequate space and prey, continued to move beyond the confines of the park, leading to still-ongoing incidents of HLC on farmland surrounding Etosha.[410] Chapters four and five detail the history of lions around Etosha and in Kaokoveld, including the effects of different management approaches in the park and unfenced land to the west.

In contrast to discrete turning-points of the past, like the rinderpest outbreak or creation of Game Reserve #2, threats to, and conservation of, wildlife in Kaokoveld during the apartheid era reflected a slow boil of changing circumstances, that led to a collapse and then a recovery of wildlife numbers in Kaokoveld in the late twentieth century. Throughout this era Kaokoveld remained officially isolated, but exogeneous factors were seeping-in.

Prior to the late-1970s the status of wildlife in Kaokoveld received little official attention. This reflected administrative inabilities to police the vast and economically marginal hinterland.[411] As BAD's portfolio expanded during the 1950s, homeland policy was increasingly controlled from Pretoria and implemented by BAD officials. However, this expanded portfolio did not mean that these officials worked efficiently or knowledgably. In the late 1950s the department had grown rapidly, with the result that staff members were inadequately trained to perform basic development and welfare tasks while wildlife conservation played no role in their explicit responsibilities. Such shortcomings were symptomatic of a marked culture of anti-

[406] Ebedes, "Anthrax Epizootics in Etosha National Park."
[407] H. H. Berry, "Abnormal Levels of Disease and Predation as Limiting Factors for Wildebeest in the Etosha National Park," *Madoqua* 12, no. 4 (1981): 242–53.
[408] Berry, "Historical Review of the Etosha Region and It Subsequent Administration as a National Park."
[409] Berry, "Abnormal Levels of Disease and Predation as Limiting Factors for Wildebeest in the Etosha National Park."
[410] H. J. L. Orford, M. R. Perrin, and H. H. Berry, "Contraception, Reproduction and Demography of Free-ranging Etosha Lions (Panthera Leo)," *Journal of the Zoological Society of London* 216, no. 4 (1988): 717–33; Philip E. Stander, "A Suggested Management Strategy for Stock-Raiding Lions in Namibia," *South African Journal of Wildlife Research* 20, no. 2 (1990): 37–43.
[411] Rizzo, *Gender and Colonialism: A History of Kaoko in North-Western Namibia, 1870s-1950s*, 179; 267.

intellectualism. The department did not require that its staff have any specialized knowledge of 'natives,' nor were such pursuits widely encouraged. At one point a bonus was offered to officials for learning languages relevant to their work, but it was withdrawn for lack of interest.[412] Senior BAD officials were appointed from outside the department, while other departments did not allow this. Across South and South West Africa, BAD senior officials' field visits frequently served as hunting safaris.[413] This was particularly true in Kaokoveld. Across the 1960s into the 1980s numerous stories circulated of government officials hunting rare and protected species in Kaokoveld, including elephant, black-faced impala (*Aepyceros melampus*), and black rhino, including hunting from Defence Force helicopters. An expose in South Africa's *Cape Times* brought this situation to the public's attention and South Africa's Defence Minister was hauled before parliament, to no immediate effect.[414] Since BAD staff were responsible for all government action in Kaokoveld, it is inconceivable they were not at least privy to information about such excursions. Simply put, wildlife conservation was not a priority.

This was anticipated by Tinley who was concerned over the limited effort and ability among BAD staff when it came to wildlife conservation. In his 1966 report of the Western Caprivi, Tinley specified the need for "a competent White staff, comprising scientists and game rangers with experience and knowledge of wild-life conservation, [to] be permanently stationed in the Western Caprivi."[415] Since BAD staff would have been the *de facto* officials in the area, it can be inferred that Tinley believed they were ill-equipped for the job. In delegating responsibility over wildlife in Kaokoveld to BAD staff, the government recognized but did not prioritize the need for conservation management in the region 'homeland.'[416] Such disregard for the wildlife of Kaokoveld led to increasing amounts of local poaching in the region.

The liberation struggle for Namibia began taking shape soon after World War II[417] and reached Kaokoveld in the late 1960s. During the 1960s South Africa's defense budget increased

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[412] Gordon, "The Making of Modern Namibia: A Tale of Anthropological Ineptitude?," 43–44.
[413] Gordon, "How Good People Become Absurd: J.P. van S. Bruwer, the Making of Namibian Grand Apartheid and the Decline of Volkekunde," 106.
[414] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 188–89; Graham Ferreira, "Widespread Illegal Hunting in SWA Alleged," *Cape Times*, August 4, 1977; Government of South Africa, "South African Air Force Helicopter: Game Shooting," in *House of Assembly, Questions and Replies, Third Session-Sixth Parliament, 2 February to 22 June 1979 (Vol. 83)* (Pretoria, South Africa: Government Printer, Republic of South Africa).
[415] Tinley, "Western Caprivi Conservation Area, South West Africa: A Proposal of Natural Resource Land Use," 39.
[416] LUKS 1.3, "Notule van Vergadering van Die Skakelkommitee Insake Besluite Oor Suidwes-Afrika-Aangeleenthede Gehou Te Windhoek Op 4 September 1964."
[417] Denis Herbstein and John Evenson, *The Devils Are Among Us: The War for Namibia* (London and New Jersey: Zed Books, 1989).

nearly six-fold.[418] By the 1970s the northern areas of Namibia, including Kaokoveld, were increasingly militarized.[419] 1976 estimates place the number of South African troops in the northern 'ethnic homelands' between fifteen and forty thousand.[420] The increasing military incursion brought increasing numbers of firearms and ammunition to Kaokoveld. Prior to the 1950s, firearms in Kaokoveld were difficult to attain and their presence was studiously noted in administrative reports.[421] This changed in the 1950s, as administration officials distributed firearms, ammunition, and poison to traditional authorities. This new policy of winning the 'hearts and minds' of locals by enabling them to protect their livestock from predators and 'terrorists' shored-up the allegiance of traditional authorities to the South African government. Though poaching in the ensuing decade-plus was limited,[422] it was only a matter of time before Kaokoveld residents turned increasing numbers of arms and ammunition, perhaps as many as one thousand firearms, on wildlife.[423]

As the region's human population grew, livestock herds – buttressed by improvements in veterinary techniques[424] – multiplied. While previously livestock numbers had been water-limited, following the recommendations of the Odendaal Plan, the government embarked upon an ambitious borehole-drilling program meant to support the region's livestock economy. Livestock numbers rose during the 1970s as grass replaced water as the limiting factor for grazing species.[425] Concurrently, the erection of fencing along the Etosha border reduced zebra movement between Etosha and Kaokoveld. Plains zebra were never numerous in the arid and hyper-arid Kaokoveld, but would move into the far west when areas of available grazing followed local rains. In contrast, mountain zebra primarily resided in Kaokoveld, but could move into the semiarid east during the dry season and years of drought. The fences put an end to such

[418] Renfrew Christie, "White Power in Angola and Namibia: The Kunene River Hydro-Electric Schemes" (University of Cape Town, 1974), 27, Table 1.
[419] Andre du Pisani, *South West Africa/Namibia: The Politics of Continuity and Change* (Jonathan Ball, 1986), 169.
[420] Wallace and Kinahan, *A History of Namibia: From the Beginning to 1990*, 285.
[421] e.g. NAO 061, "Kaokoveld Annual Report: 1948. Officer in Charge, Native Affairs to Chief Native Commissioner, Windhoek." (1948); NAO 061, "Kaokoveld Annual Report: 1949. Officer in Charge, Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek." (1949).
[422] van Wolputte, "Subject Disobedience: The Colonial Narrative and Native Counterworks in Northwestern Namibia, c.1920–1975," 160–61. This did not necessarily extend to the destruction of predators, particularly when they maimed or killed Herero livestock. Even if they did not possess firearms Kaokoveld residents were known to hunt down predators and kill them with spears, sticks, and poison prepared from plants or strychnine when available. Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 106.
[423] Owen-Smith, "Personal Communication," 2018.
[424] Mitch Reardon, *The Besieged Desert: War, Drought, Poaching in the Namib Desert* (London: William Collins Sons, 1986), 147.
[425] Bollig, "Towards an Arid Eden? Boundary-Making, Governance and Benefit Sharing and the Political Ecology of the New Commons of Kunene Region, Northern Namibia," 777.

movements. The limiting of livestock movements and migration routes for wildlife had cascading effects on the Etosha and Kaokoveld ecosystems in coming years.

From 1979-82 Kaokoveld experienced its worst drought since the early 1930s.[426] When the rains failed in successive years, grass which had been hammered by increasing herd sizes could no longer cope, the result being that livestock and game numbers crashed. While plains zebra persisted in Etosha, albeit in lower numbers, they were "virtually wiped-out" in Kaokoveld.[427] Mountain zebra, formerly able to move eastward when grass was scarce, were stopped by veterinary control fences to keep 'native'-owned livestock from trespassing into Etosha and white-owned farmland further east and south. Hundreds of mountain zebra died along the fences in the late 1970s. Wildlife losses were likely exacerbated by the Red Line: by now a double-fence running from the coast to Etosha which cut across historical wildlife migration patterns, trapping many herds in the arid west as the drought set-in.[428] In 1982 the Department of Nature Conservation engaged in a costly translocation of many of the remaining mountain zebra from Etosha back along their migration route to Kaokoveld, rather than cut the fence.[429]

Livestock died in staggering numbers, as much 85% of local cattle; tens of thousands.[430] In a round-about way the decline in livestock, now precluded from moving east into the park, was anticipated by Tinley's concern that Kaokoveld residents could not inhabit "desert and mountain" areas without access to other grazing. A decade of relatively good rains meant that grazing for livestock and wildlife was available and the increase in water meant that livestock numbers in particular grew disproportionate to what the area could support if the rains failed. When drought came livestock and wildlife grazed the region bare. By 1980/1 the situation was critical.

During the drought Kaokoveld's curtain of isolation began to rise. In 1978, for the first time in the South African era, outsiders could visit Kaokoveld without a permit and a commercial hunting concession was issued for Kaokoveld and Damaraland. What government and nongovernment nature conservationists found there was a region verging on ecological collapse. Kaokoveld inhabitants struggled mightily during this period, which gave rise to an explosion of poaching in the homeland, further depressing already depleted wildlife numbers.[431] While

[426] NAO 028, "Drought in Kaokoveld. Official Letter, Native Constable in Charge, Kaokoveld to Commandant, South West Africa Police, Windhoek."; SWAA 2513, "Official Letter, Concerning Famine in Kaokoveld; Secretary for SWA to Consul for Portugal, Windhoek."
[427] Anthony Hall-Martin, Clive Walker, and J. du P. Bothma, *Kaokoveld: The Last Wilderness* (Pretoria, South Africa: Southern Book Publishers, 1988), 40.
[428] Hall-Martin, Walker, and Bothma, 62.
[429] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 359–60.
[430] Garth Owen-Smith, Personal Communication, 2017; Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 332; Sesfontein Pastoralist #9, Personal Communication, 2017.
[431] Reardon, *The Besieged Desert: War, Drought, Poaching in the Namib Desert*.

absolute poaching numbers from the drought years will never been known, it was recognized that the late-1970s to early-1980s took an immense toll on wildlife in northwest Namibia. Conservationists working on-the-ground at the time noted that poaching in Kaokoveld had become "big business."[432] During that time, 106 out of 127 known elephant carcasses showed clear signs of poaching [433] and it was estimated that only 300 elephants remained by 1982.[434] At the time Garth Owen-Smith, who was now working as a conservationist for the Namibia Wildlife Trust in the area, estimated 100-150 black rhino in Kaokoveld in 1970;[435] by the beginning of the next decade there were an estimated twenty in the whole region.[436] From 1977 to 82, mountain zebra numbers in Kaokoveld decreased from 1,199 to 193, oryx from 1,191 to 164, springbok from 4,859 to 217, and plains zebra from 667 to 0.[437] As Owen-Smith noted, "drought and poaching are inter-related. As the grass cover in the dry west disappeared, the game was forced to move east into populated areas, and concentrated at the few remaining water points where they were easily ambushed. Then again, as the pastoralists' stock began to die they were forced to rely more and more on venison. It was a vicious circle."[438] For Kaokoveld pastoralists, the situation moved from critical to dire – in at least one case a professional hunter operating in Damaraland and Kaokoveld personally paid for emergency relief supplies to be flown into the town of Puros in southern Kaokoveld.[439]

During the 1980s, declining wildlife numbers gave rise to a new form of wildlife conservation known as community-based natural resource management (CBNRM). This movement, which would evolve into Namibia's communal conservancy system, aimed to arrest the freefall in Kaokoveld's wildlife numbers. In 1982, Kaokoveld's first government-appointed nature conservator Chris Eyre, teamed with Owen-Smith to begin anti-poaching patrols across the region. In an effort to combat widespread poaching in such a large area, with so few resources, Eyre, Owen-Smith, and their supporting and management staff, began working with traditional authorities to motivate residents to monitor wildlife. Out of extensive community meetings came a program known as the Community Game Guards, whereby residents would be appointed by, and report to, their traditional authorities to perform wildlife monitoring patrols to discourage poaching. Owen-Smith notes that community-engagement methods stretching well back into the

[432] Reardon, 36.
[433] Ibid.
[434] Peter Böttger et al., "Namibia Wildlife Trust, Chairman's Annual Report" (Windhoek, Namibia, 1982).
[435] Owen-Smith, "The Kaokoveld: An Ecological Base for Future Development Planning."
[436] Hall-Martin, Walker, and Bothma, *Kaokoveld: The Last Wilderness*, 28.
[437] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 365. Given inconsistencies in aerial survey methods, these numbers should be taken as indicative.
[438] from: Reardon, *The Besieged Desert: War, Drought, Poaching in the Namib Desert*, 146.
[439] Volker Grellmann, Personal Communication (Windhoek, Namibia, 2017).

1940s and 50s of the colonial era, informed the approach he and Eyre would 'pioneer.'[440] By the end of their first year in operation, community game guards had assisted Eyre and Owen-Smith in bringing eight poaching cases to court.[441] In years to come the game guards would be paid a small salary, but one that provided an important economic opportunity in a region where employment had long been scarce. Though widespread community-based conservation was still a long way off, during the 1980s new methods of centering local communities were innovated. These were developed by necessity. Because the outcomes of the Odendaal Plan had so thoroughly marginalized residents of Kaokoveld, and the South African government demonstrated little ability to closely police the region, it was left to outside conservationists and locals to forge enduring partnerships to protect Kaokoveld wildlife.

Conclusion

The environmental history of northwest Namibia bears the effects of apartheid ideology, and apartheid 'science.' Tinley and other conservationists were right to be worried about the effect that the Odendaal Commission's recommendations would have on Etosha and Kaokoveld. Even if they did not anticipate many of the outcomes, the Commission's recommendations changed the environment, with disastrous consequences for the area's wildlife. Historians of the South African state have uncovered the extent to which maintaining order meant securing Afrikaner dominance in South and South West Africa. However, the government was never entirely unified. Rather, without sacrificing the posture of scientific rationality, elite government technocrats privileged certain goals over others. Understanding the stance of the apartheid government as it concerned political challenges and the maintenance of the social order is necessary to understanding the transformation of Etosha-Kaokoveld, and why warnings of possibly disastrous effects for the region's ecology were ignored. While the apartheid government, in particular the BAD, bears responsibility for this transformation, the state was clear that ecological concerns were of secondary importance at best. In Kaokoveld responsibility fell to locals and nongovernmental actors to monitor and manage wildlife. The Odendaal Plan and the subsequent transformation of the Etosha-Kaokoveld region set the stage for land-use in northwest Namibia throughout the second-half of the twentieth century. As I have shown in chapters one and two, the South African era was defined by unequal access of Europeans and Africans to land and state resources. This affected not only people but a wide array of nonhumans including livestock, grasses, pathogens,

[440] Owen-Smith, Personal Communication, 2017.
[441] Garth Owen-Smith, "Summary of Major Activities During Quarter, Damaraland Anti-Pocahing Unit," 1983.

as well as wild prey and predator species. This process also set Kaokoveld down the path to what would emerge as the CBNRM movement, which transformed wildlife conservation in Namibia following Independence in 1990.

Chapter 4: Lions in Northwest Namibia: Etosha and the northern Namib, 1800s-1990s.

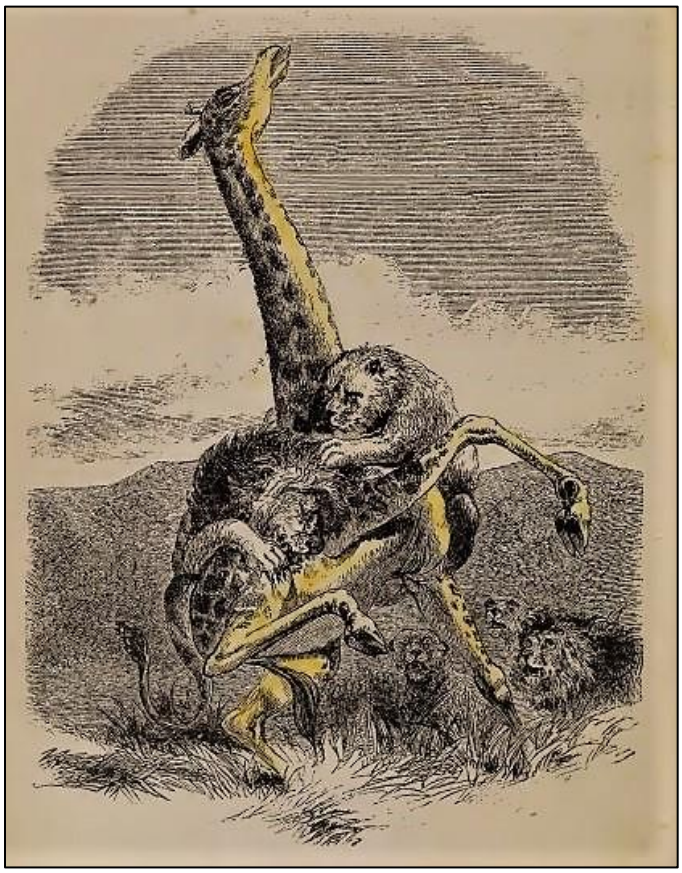

Figure 14: Lions attacking a giraffe near Lake Ngami. Source: Andersson, 1856

Introduction

When Etosha was enclosed following the Odendaal Plan, it created an historically unique space for wildlife in northwest Namibia. Previously, physical barriers separating humans and their livestock from wildlife would have divided private lands or been small enclosures aimed at keeping livestock, not wildlife, contained. The enclosure of Etosha, completed in 1973, inverted this logic: here was a space explicitly set-aside for wildlife, where human and livestock entry was controlled. As I have shown in chapter three, the severing of Etosha from the rest of the northwest had dramatic effects on the region's wildlife. The previous chapters have provided the background for focusing directly on lions and the history of human-livestock-lion relationships in northwest Namibia. These chapters are critical to understanding the important historical factors influencing contemporary HLC, including the creation of different spaces in northwest Namibia. Initially, lions within Etosha thrived, but by the 1980s their numbers were declining. Lions

outside of the park were more enigmatic. While the state committed resources and staff to securing wildlife within the park, in the ethnic homelands of Damaraland and Kaokoveld wildlife remained "*ferae naturae*" and relatively unaccounted for. During this period the complaints of pastoralists resembled earlier accounts of HLC in the region. Etosha, and the protection of lions within it, was the historical novelty. The imposition of the Odendaal Plan created parallel spaces within the northwest: one where lions were protected and monitored and another where they were persecuted and seldom encountered, at least by government staff. The area west of Etosha, designated as the Kaokoveld or Kaokoland 'ethnic homeland' by the apartheid government, remained an area largely beyond the direct control of the South African state. Though, as I have shown in the last chapter, government policies were transforming the region.

This chapter examines the history of lions in northwest Namibia, from the earliest human records until the 1980s, when scientific study began revealing previously unknown aspects of the behavior and ecology of the region's lions. Historical source material on lions is drawn from Namibia's National Archives, which contains official communications addressing challenges posed by lions from the region. These records provide insight into changing mentalities among officials and the Territory's residents, both European and African, when they encountered lions. Early European accounts of 'explorers,' traders, and military personnel, provide a rare glimpse into the far reaches of the northwest before widespread settler incursion or other written records. Government and limited circulation documents indicate the extent of lion range, though rarely provide numerical estimates before the 1970s. Oral histories of communal pastoralists, which feature more prominently in chapter six, color impressions of lions and of human-lion interactions in the latter-half of the twentieth century. Scientific literature providing background information on lions across Africa contextualizes this history as part of a broader one reaching far into the past. This is the first time such a wide-array of sources on lions in northwest Namibia have been compiled. The results are a broader perspective on both historical and contemporary human-livestock-lion interactions, as well as new insights into the history of lions in the region and HLC.

As discussed in the introduction, from this chapter forward the type of primary source material changes somewhat. In each chapter I aim to describe the factors leading to contemporary HLC in northwest Namibia. Because this dissertation is organized, roughly, chronologically, the types of relevant information change from one historical era to the other. An interesting reflexive study could examine the different types of primary material employed based upon different circumstances in which human-livestock-lion interactions took place. I show that the actions which humans take regarding lions depended greatly on the setting of human-lion (and human-livestock-lion) interactions. Adopting a term from Mary Louise Pratt and Donna Haraway,

Baynes-Rock has called such differentiated settings of human-predator interaction, "contact zones." This is a useful term for highlighting the importance, not just of what interactions are taking place, but where.[442] As noted by geographer Steve Hinchliffe, where species meet is as important as when or how.[443] Working with the Apache of the American West, Keith Basso showed that interpretations of human-nonhuman interactions can be highly contingent upon, and formative of, morality, culture, and spatial and well as temporal dynamics.[444] Jakob von Uexküll's ethological work in the early twentieth century extended difference in cognitive interpretation beyond humans to animals.[445] Von Uexküll found that the world experience, what he calls the "umwelt" of different animals, differs fundamentally from humans and should be grounds for re-examining human perspectives on the world. This dissertation does not greatly explore human-livestock-lion interactions from lions' perspectives, though I do make certain inferences in the concluding chapter on this topic. The growing corpus of research in human-animal studies reveals the importance of critically examining as many relevant variables in human-nonhuman relationships as possible. Throughout this chapter and chapter six in particular, *where* interactions among human, livestock, and lions take place are an important part of how such interactions are interpreted by humans living with lions. Livestock owners generally found lions fearsome and destructive, while a growing class of professional conservationists sought out lions and often worked to protect them. Yet these two human groups interacted with lions in strikingly different contact zones. Livestock owners often came into contact with lions 'trespassing' on land the farmer claimed as their own. Whereas conservationists, certainly within Etosha, were operating in an area set-aside specifically for wildlife. In chapter five I explore the research of Philip Stander as a paradigm shift, away from embodied experiences of human-livestock-lion relationships towards technologically-mediated approaches for generating knowledge about lions in northwest Namibia, Here I highlight how different social and environmental contact zones affected his interpretation of lion behavior, ecology, and population viability. In chapter six I return to the experience of human-livestock-lion relationships, focusing on how communal pastoralists experience living with lions. I close chapter six with the possibility that lions can also be sites

[442] Baynes-Rock, "Hyenas like Us: Social Relations with an Urban Carnivore in Harar, Ethiopia," 4.
[443] Steve Hinchliffe, "Where Species Meet," *Environment and Planning D: Society and Space* 28, no. 1 (2010): 34–35.
[444] Keith H. Basso, *Wisdom Sits in Places: Landscape and Language among the Western Apache* (Albuquerque: University of New Mexico Press, 1996).
[445] Jakob von Uexküll, *A Foray into the Worlds of Animals and Humans: With a Theory of Meaning*, ed. Joseph D. O'Neil (Minneapolis and London: University of Minnesota Press, 2010).

where people come together. In that case the term 'boundary object' is more appropriate.[446] Whereas contact zones are spaces in which actors come into interaction with one another, boundary objects are entities which are specifically used to align differently situated actors.

Scholarship examining the history of encounters between humans and animals both accounts for animal agency and questions the categories into which people place animals. Scholarship specifically focusing on dynamic interactions between humans and predators provides useful interpretive frameworks for this chapter and chapter five. Foremost among these is a recognition that animal categories are human-created and have histories.[447] In chapter two I show the history of how interactions with predators were differently experienced by Africans inhabiting 'native reserve' areas versus how they were experienced by white settlers in colonial South West Africa. This chapter deepens that history, with particular emphasis on how human-livestock-lion interactions differed across land uses and took place within an extensive history of human-lion contact. In this chapter I also provide a brief look at the global history of lions, stretching back to the Pleistocene. This deeper history provides an important context for the adaptations of the desert-adapted lions of northwest Namibia, which are more extensively reviewed in chapter five. With the goal of better understanding the emergence of contemporary HLC, in this chapter and chapter five I focus on lions and on human-livestock-lion interactions with the lions of northwest Namibia at the center of this history. By centering lions within historical processes – rather than consigning them to human-created categories such as 'vermin' – the agency of lions is given clearer expression.

This chapter contributes to human-predator studies scholarship. Boomgaard's history on tigers in the Malay world, Coleman's history of settler-wolf relations in colonial New England, Baynes-Rock's ethnography of people and spotted hyenas in Harar, Ethiopia, and Rangarajan's lion-centered history of the Gir forest, India, have been useful for interpreting the historical contingencies of human-lion interactions. Each of these scholars has examined the relationship between different predators and people, making great strides in de-centering human experiences. I draw on these approaches throughout this chapter and build on them, particularly adding insights pertinent to the lions of northwest Namibia that I feel further the toolkit of human-predator researchers, including predator conservationists.

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[446] Susan Leigh Star and James R. Griesemer, "Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39," *Social Studies of Science* 19, no. 3 (1989): 387–420.
[447] Michael D. Wise, *Producing Predators: Wolves, Work, and Conquest in the Northern Rockies* (Lincoln and London: University of Nebraska Press, 2016).

Though the types of evidence change in the following chapters, questions concerning the politics of knowledge and representation remain. As I have shown throughout the earlier chapters, who is empowered to speak – whose voices are heard and trusted – is bound to political power. Chapter one detailed the embodied positions of ovaHerero herders that livestock productivity in northwest Namibia was tied to mobility. Colonial officials disagreed and sought to control the movements of livestock and people. In chapter two, representations made by ovaHereros to colonial officials about depredations of livestock were largely disbelieved: officials considered the ovaHerero inattentive herders. In chapter three ecologist Ken Tinley sought to convince the apartheid regime that the Odendaal Plan would have pernicious effects on the environment of Etosha-Kaokoveld but his concerns did not sway a government primarily concerned with the maintenance of apartheid's social order. In each of these cases, knowledge, and the implementation of policy based upon it, was political. By showing the fissures and imperfections in the approaches adopted by the governing regime in each historical case I have questioned the applicability of historical approaches to challenges on the ground – both implicitly and explicitly. Chapter four details how lion lives were affected by changing political arrangements, which affected where lions persisted and disappeared. I show that the combination of humans, livestock, and lions engenders particularly antagonistic attitudes of humans towards lions.

As Boomgaard recognized, there is an inherent scholarly danger when attempting to capture mentalities of historical actors, particularly, as is often the case of the colonized, when people are not empowered to speak for themselves.[448] As a result, certain aspects of lions are highlighted, while others may be downplayed or ignored entirely. There is robust scientific consensus that our cognitive biases can prime us to see what we expect to see.[449] The accounts examined here are piecemeal and frequently emphasize lions' fearsome characteristics. The long history of agonistic human-livestock-lion relationships is particularly pertinent when I turn towards contemporary HLC in chapter six.

Deep History: The Global, Social, Big Cat

Archaeological evidence shows that the geographic distribution of lions once greatly exceeded contemporary or historically-recorded distribution. Lions were consistently present in eastern Africa during a period of grassland flourishing 2.0-1.5 million years ago. By 500,000 years ago lions were spread across Africa and occupied Europe, and from 130,000-10,000 years ago they

[448] Boomgaard, *Frontiers of Fear: Tigers and People in the Malay World, 1600-1950*, 132.
[449] Christie Aschwanden, "Your Brain Is Primed To Reach False Conclusions," FiveThirtyEight, 2015, http://fivethirtyeight.com/features/your-brain-is-primed-to-reach-false-conclusions/.

likely had the greatest intercontinental range of any large mammal, excepting humans.[450] This formerly expansive range is important for contextualizing the great behavioral and social plasticity demonstrated by lions in northwest Namibia: lions have a long history of adapting to, and thriving within, varying, often challenging, environments. Across Eurasia, Beringia, and down to Peru, lions inhabited a wide array of ecosystems and climates. The American lion[451] was eradicated approximately 11,000 years ago, while the last European lion is thought to have been killed in Greece in approximately 100 CE.[452] That lions have recently been confined to Africa is aberrant within the history of the species and within the history of human-lion interactions. Yet lions in Africa appear to be in trouble. There are currently only 20,000-30,000 free-ranging lions in Africa, as well as a small (~650), isolated population in India's Gir Forest. Lion range has reduced to approximately ten percent of their historically-recorded range and has decreased by 43% in the past three (lion) generations. Rates of decline have been particularly steep outside of protected areas.[453] The extant population is thus a remnant of a remnant.

Twentieth and twenty-first century developments in genetic, paleo-ecological, and archaeological analysis are remaking understandings of these large-bodied cats, revealing to researchers and conservationists that lions, and our knowledge of them, are constrained by the contingencies of history. Like humans, lions' African origination is well-established. Genetic comparison suggests that lion populations from eastern and southern Africa expanded into central and northern Africa, as well as Asia, approximately 100,000 years ago and that lions from southern Africa expanded towards East Africa where they interbred with resident lions between 14,000 and 7,000 years ago.[454] Though they are now extirpated, lions inhabited such arid

[450] Lars Werdelin and Margaret E. Lewis, "Plio-Pleistocene Carnivora of Eastern Africa: Species Richness and Turnover Patterns," *Zoological Journal of the Linnean Society* 144, no. 2 (2005): 121–44; Agostinho Antunes et al., "The Evolutionary Dynamics of the Lion Panthera Leo Revealed by Host and Viral Population Genomics," *PLoS Genetics* 4, no. 11 (2008): 1–11.

[451] Disagreement exists over whether American (*Panthera leo atrox*) and European (cave) (*Panthera leo spelaea*) lions should be considered subspecies of *Panthera leo*, or are more properly understood to form their own species. There is, however, little disagreement that all of these descended from an ancestral type that is shared with contemporary lions. See: Ross Barnett et al., "Mitogenomics of the Extinct Cave Lion, Panthera Spelaea (Goldfuss, 1810), Resolve Its Position within the Panthera Cats," *Open Quaternary* 2 (2016): 1–11; Joachim Burger et al., "Molecular Phylogeny of the Extinct Cave Lion Panthera Leo Spelaea," *Molecular Phylogenetics and Evolution* 30, no. 3 (2004): 841–49; Cajus G. Diedrich, "The Largest European Lion Panthera Leo Spelaea (Goldfuss 1810) Population from the Zoolithen Cave, Germany: Specialised Cave Bear Predators of Europe," *Historical Biology* 23, no. 2–3 (2011): 271–311.

[452] Reay H. N. Smithers, *Mammals of the Southern African Subregion* (Pretoria: Pretoria University Press, 1983), 375.

[453] IUCN SSC Cat Specialist Group, "Guidelines for the Conservation of Lions in Africa, Version 1.0 - December 2018"; Jacobson and Riggio, "Big Cats in Africa: Status Update on the African Lion, Cheetah and Leopard, with Recommendations for Effective Big Cat Conservation Funding."

[454] Antunes et al., "The Evolutionary Dynamics of the Lion Panthera Leo Revealed by Host and Viral Population Genomics."

environments as the Aïr Mountains of Niger until ca. 1910 and may have persisted in the Barbary coastal regions of northern Africa from the Atlas Mountains to Egypt until the 1960s.[455] This suggests that lions have a 'messy' genetic memory of ancestors inhabiting a variety of environments, and that lions inhabiting extremely arid areas have only recently become an anomaly, revealing possible insight into the extensive breadth of the species' adaptability.

Figure 15: Last known of photo of a wild Barbary lion in the Atlas Mountains, Morocco, 1925. Source: Black et al. 2013[456]

Lions are the only large social felid and they are highly social – this may hold a key to their adaptability. Mosser et al. hypothesized that lions were initially solitary felids but that cooperative defense of territory arose in response to a particular set of environmental conditions which interacted with individual behavioral predisposition and the selective benefits of cooperation.[457] Among lions a variety of benefits seem to accrue from cooperative living, including foraging productivity, cooperative defense, the rearing of young, and securing group tenure. However, the relative importance of these benefits is dependent upon environmental

[455] Sarah K. Haas, Virginia Hayssen, and Paul R. Krausman, "Panthera Leo," *Mammalian Species*, no. 762 (2005): 1–11; Simon A. Black et al., "Examining the Extinction of the Barbary Lion and Its Implications for Felid Conservation," *PLoS ONE* 8, no. 4 (2013): 2–13.
[456] Black et al., "Examining the Extinction of the Barbary Lion and Its Implications for Felid Conservation."
[457] Anna A. Mosser, Margaret Kosmala, and Craig Packer, "Landscape Heterogeneity and Behavioral Traits Drive the Evolution of Lion Group Territoriality," *Behavioral Ecology* 26, no. 4 (2015): 1051–59.

factors.[458] The pride is the main social unit and is typically composed of five to nine related females, their dependent offspring, and a coalition of two to six males that have joined the pride from elsewhere. Pride size can vary dramatically, arid environments with limited available prey biomass generally contain smaller-sized prides. While pride membership is stable, lions form fission-fusion groups: different groups of adult females may split and come back together, generally over a period of hours or days. However, in the northern Namib desert-adapted lions exhibit unique grouping patterns, suggesting that pride composition may be more flexible than previously understood.[459] Differences of behavior, sociality, and ecology among lions in different environments further suggests that they form not only groups, but highly adaptable groups.

An East African Story

Popular understandings of lions in the western world are primarily informed by lions inhabiting the Serengeti and neighboring grassland ecosystems of East Africa. This is due to the role of the British in colonizing this part of Africa, the written accounts sent back to the English-speaking world by British and American hunters and explorers during the nineteenth century and early twentieth centuries, and the subsequent 'opening-up' of Kenya and Tanzania in particular, following the end of the colonial era. The first two authoritative scientific studies on lions came from Guggisberg (1961) and Schaller (1972), in Nairobi and Serengeti National Park respectively.[460] Schaller's work in particular, *The Serengeti Lion: a study in predator-prey relations*, became the standard understanding of the behavior, ecology, and sociality of lions for a generation. This work relied primarily on day-time observations (though moonlit nights provided limited opportunities) based around individual identification of natural markings or tags. Favoring lions that were unperturbed by being followed within 50 meters by a Land Rover, Schaller notes that his results represent a segment (~220) of the Serengeti population. Schaller's and other studies, proceeded with the permission of governments generally amenable to the presence of international researchers. In 1978, Craig Packer took over the Serengeti Lion Project, which he directed for more than 30 years, authoring dozens of scientific and popular articles, and two

[458] George B. Schaller and Gordon R. Lowther, "The Relevance of Carnivore Behavior to the Study of Early Hominids," *Southwestern Journal of Anthropology* 25, no. 4 (1969): 307–41; Craig Packer, D. Scheel, and A. E. Pusey, "Why Lions Form Groups: Food Is Not Enough," *The American Naturalist* 136, no. 1 (1990): 1–19; Philip E. Stander, "Foraging Dynamics of Lions in a Semi-Arid Environment," *Canadian Journal of Zoology* 70 (1992): 8–21.

[459] Haas, Hayssen, and Krausman, "Panthera Leo"; Schaller, *The Serengeti Lion: A Study in Predator-Prey Relations*; Stander, "Foraging Dynamics of Lions in a Semi-Arid Environment." See chapter five for an examination of desert-adapted lion grouping patterns.

[460] C. A. W. Guggisberg, *Simba: The Life of a Lion* (Cape Town: Howard B. Timmins, 1961); Schaller, *The Serengeti Lion: A Study in Predator-Prey Relations*.

books on lions in the area. During this time Packer and his students innovated new methods for studying lion behavior and made-use of advances in technology, such as high-quality video recording and night vision, to become more familiar with lions during the all-important nighttime hours. As a result of these high-profile, long-lasting studies, lions from these areas, particularly Tanzania, are the longest-studied, most publicized, and most consistently conserved populations of lions in the world. Currently, as many as half of Africa's lions reside in East Africa, primarily within Serengeti or similar grassland ecosystems. For many westerners, Serengeti lions are prototypical.

In contrast, the process of decolonization of other formerly lion-rich places, such as West Africa, Zimbabwe, and Mozambique, and the lingering effects of apartheid in South Africa and Namibia, often kept international researchers and conservationists from establishing a foothold. For decades, this relative isolation kept information about lions in these places from reaching an international audience. Yet these areas contain lions inhabiting radically different environments than the Serengeti, including the forests of West Africa and Mozambique, the savannas of South Africa, and the deserts of Botswana and northwest Namibia. Though the world's understanding of lions increasingly incorporates numerous types of media from these and other parts of Africa, perspectives of lions into the twenty-first century remain influenced by colonial-era legacies and the differentiated ongoing process of decolonization in Africa. Behavioral, ecological, and social differences between lions in different environments suggest that the species is highly adaptable and lends credence to the idea that lions are dynamic historical entities. As Boomgaard has shown for the tigers of the Malay world, predators can quickly adapt to changing environmental pressures.[461] In chapter five I show that lions in northwest Namibia demonstrate a series of adaptations to persist in surprising environments. Lions in northwest Namibia are not an aberration – like lions elsewhere they are well-adapted to their environments – and may possess interesting information as researchers and conservationists work to more completely understand lions across Africa.

That lions are habitat generalists is well-established. However, as researchers increasingly reach into the deep past the extent of their adaptability is only beginning to be understood. The lions of northwest Namibia remain a small and relatively scientifically unknown population of lions who nevertheless display a wide array of characteristics uniquely adapted to thrive within diverse arid environments.[462] Until recently, the majority of information on the lions

[461] Boomgaard, *Frontiers of Fear: Tigers and People in the Malay World, 1600-1950*, 86.
[462] Stander, *Vanishing Kings: Lions of the Namib Desert*, 75–89.

of northwest Namibia was restricted to studies in Etosha.[463] However, the picture from further west in the northern Namib desert and even along the Skeleton Coast looks strikingly different. Here is one of the few areas in Africa where lion numbers are growing outside of enclosed protected areas and this population of lions is doing so in one of the most rugged, arid, low productivity landscapes across lions' current range.

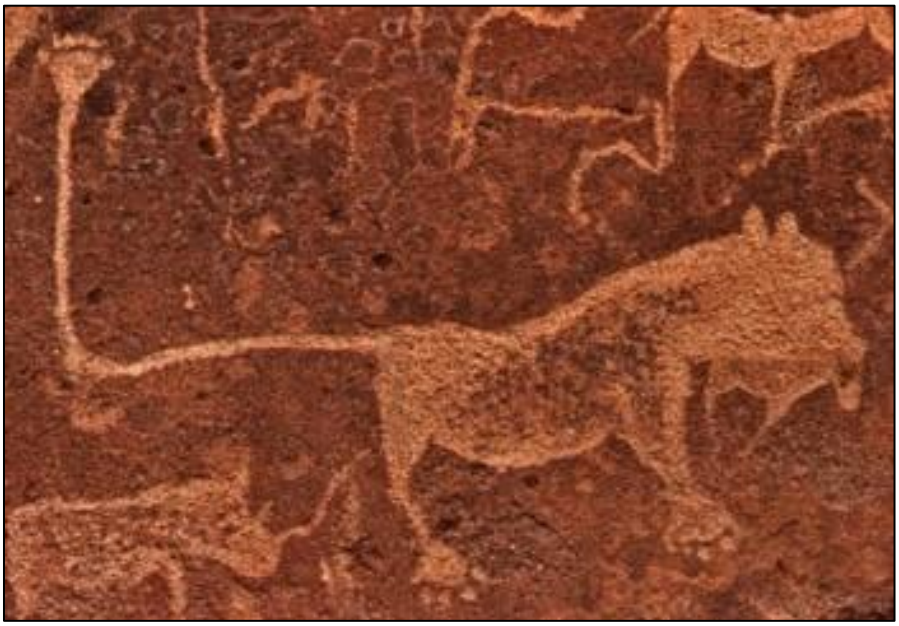

Figure 16: 'Lion-man' of Twyfelfontein. Source: flickr.com[464]

Lion History in Northwest Namibia

When to begin the story of lions in northwest Namibia is unclear. It is unknown when lions first inhabited the area, though genetic evidence indicates they have been present there for tens of thousands of years.[465] Certainly the artist who inscribed the 'Lion-man' at Twyfelfontein (Damara: /Ui-//aes) some 2,000 years ago not only recognized lions, but may have also recognized a kinship between humans and lions.[466] Until the latter-half of the twentieth century, non-western accounts of lions were largely ignored. Western accounts of lions in the region began with C. J. Andersson, who ventured into what he called Damaraland north of the Omaruru River

[463] Jacobson and Riggio, "Big Cats in Africa: Status Update on the African Lion, Cheetah and Leopard, with Recommendations for Effective Big Cat Conservation Funding"; Packer et al., "Conserving Large Carnivores: Dollars and Fence"; Hans Bauer et al., "Lion (Panthera Leo) Populations Are Declining Rapidly across Africa, except in Intensively Managed Areas.," *Proceedings of the National Academy of Sciences of the United States of America* 112, no. 48 (2015): 14894–99.
[464] https://www.flickr.com/photos/maurizioita/2924933541/
[465] Antunes et al., "The Evolutionary Dynamics of the Lion Panthera Leo Revealed by Host and Viral Population Genomics."
[466] UNESCO, "Twyfelfontein or /Ui-//Aes," World Heritage List, 2019, http://whc.unesco.org/en/list/1255/.

in 1853. Andersson recorded a substantive lion population in the area, primarily inhabiting the ephemeral rivers and causing great amounts of fear and loathing among the local people there. Andersson recounts a typical incident when lions stalked and eventually overtook his partner's party:

> "the screechings of the terrified women and children...the hallooings of the men, the rush of the cattle and the sheep, firebrands whizzing through the air, the discharge of fire-arms, the growls of the lions, and other discordant noises, the scene was one which baffles description."[467]

The lions of this area and further north were known by Andersson's local companions to contain more than a few 'man-eaters' who terrorized the area's inhabitants. While traveling through the Omaruru, Andersson regularly came upon such lions, who often seemed drawn by his party's retinue of livestock. In these violent interactions Andersson extracted more than his share of revenge: his accounts are full of successful lion hunts.[468] How representative his writings are of the usual interactions between the area's inhabitants and lions is unknown. Given the locals' familiarity with lions and their fear of them, it is likely that lions in the area had long caused considerable harm to local people and their livestock. However, livestock were not always present as intermediaries of human-lion relationships in northwest Namibia. Andersson's represents the experience of Africans and lions, but it is most properly understood as one outsider's historically contingent account of human-livestock-lion interactions.

Livestock and Lions

Livestock transformed human-lion relationships. The mediation of human-lion interactions by livestock in the region has its own history which is important to this story. The arrival of livestock in south-western Africa took place in a number of waves reaching at least as far back as the last few centuries BCE. This influx would have been primarily in the form of sheep, and perhaps goats, originally domesticated further north.[469] Not as adapted to resisting predators, the arrival of domesticated livestock represented a potential boon to the region's lions. Prior to the widespread arrival of pastoralists, northwestern Namibia was primarily inhabited by small bands of highly mobile Khoe-Sān hunter-gatherers. Though a complete reconstruction of archaic societies is impossible, recent anthropological work with the Hai||om people, a Khoe-Sān group

[467] Andersson, *The Okavango River: A Narrative of Travel, Exploration, and Adventure.*, 140.
[468] Andersson, "Lake Ngami; or, Explorations and Discoveries during Four Years' Wanderings in the Wilds of Southwestern Africa."; Andersson, *The Okavango River: A Narrative of Travel, Exploration, and Adventure.*
[469] Sadr, "Livestock First Reached Southern Africa in Two Separate Events."

residing in the Etosha region, and examination of lion predation, suggests that lions and hunter-gathers could maintain somewhat collegial relationships. Speaking with four elder Hai||om near Etosha National Park in the early-2000s, anthropologist Ute Dieckmann recorded memories of lions and humans each recognizing the others' dominance based upon different times of day or night. One Hai||om man remembered that,

> "We even shared meat with the lions. In the daytime we took their meat and at night we served them our wounded game!" Another elaborates that "the lions were regarded as 'colleagues,' if not friends.' And if they tried to attack them? Kadison explains that there was a saying shouted at approaching lions: '||Gaisi ai!nakarasa!', meaning 'You ugly face, go away!"[470]

As part of his Serengeti lion research, Schaller and co-author Lowther examined the role of cooperative hunting in the development of social predators, including hominids. One of their insights was that hunter-gatherer hominid societies could avoid violent encounters with lions by virtue of being primarily diurnal. Because lions are primarily nocturnal and "little inclined to attack during the day unless a particularly favorable situation presents itself" groups of hominid hunters could move through the landscape relatively unmolested during daylight hours. Schaller and Lowther put this proposition to the test by stalking game and scavenging carcasses in Serengeti on foot. Analogizing their experiences to early hominids Schaller and Lowther concluded that,

> "If they kept in open country, away from thickets in which lions often rest, and traveled in groups, a practice which would increase their rank in the inter-specific predator hierarchy, hominids would probably have been molested only rarely. Even when encountering a predator at close quarters, they could have put it to flight by using such typical primate intimidation displays as vocalizing and throwing and shaking branches, a technique effective against today's predators." [471]

Short of conclusive archaeological evidence to the contrary, Schaller and Lowther present compelling evidence that, in the absence of livestock, hominids and lions are not necessarily antagonists. This perspective is supported by more than two years of field-work in northwest Namibia. Numerous times lions avoided small groups of people traveling by foot and car during the daytime. In contrast, at night lions were much bolder, sometimes curious enough to investigate groups of people, even walking directly up to an open car window. These experiences

[470] Schalkwyk and Berry, *Etosha 100: Celebrating a Hundred Years of Conservation.*, 66; 73.
[471] Schaller and Lowther, "The Relevance of Carnivore Behavior to the Study of Early Hominids," 330. Personal observation.

dovetail with the feelings of one pastoralist in northwest Namibia: "If you are only a person you can live with lions. But if you are having livestock, then it is not good."[472]

Coleman theorized that the arrival of livestock in the New World introduced a new type of relationship between humans and predators, one that predators would have been ill-equipped to navigate. Any person who has spent extended time around wildlife knows that 'wild' animals generally evince a great fear of humans, and with good reason: for thousands of years avoidance of people has been an important survival skill. However, predators generally evolved no such fear of domesticated livestock – human property. In Coleman's estimation, reproduction of livestock, and by extension of human society, and reproduction of wolves, via the successful acquisition of food, lay at the heart of human-wolf conflict. This led to what Coleman terms a "communication disaster." He writes that,

> "Wolves had enough sensibility to retreat from people, but they had no way of knowing that some humans' notion of territoriality extended to the exotic beasts they imported. When they sank their teeth into cows, pigs, and sheep, wolves committed sins unimaginable to them."[473]

Coleman further refines the point: "Wolves and people were not natural enemies. The humans' relationship with other animals established their rivalry with wolves."[474] Also writing about colonial New England, historian Virginia DeJohn Anderson discusses livestock as "a form of capital, a source of income, and a potential liability."[475] As a repository of wealth livestock has advantages, including relative mobility and value in both consumption, and trade. However, as a living or "lively commodity,"[476] one of its main disadvantages is that it is worth significantly less dead, than alive. When lions attack livestock they constrain pastoral livelihoods, thereby threatening individual and household resilience. But also, different domesticated animals are imbued with different meanings by people. As I show in chapter one, for the ovaHerero of northwest Namibia, the loss of livestock, particularly cattle, can be experienced as a not just an economic loss, but as a severing of familial and spiritual bonds. More than simply commodities rendering access to meat, milk, and cash, among the ovaHerero cattle are also embodiments of nonmaterial values and historical continuities. Because they also posed a legitimate threat to human lives, lions would have been seen as particularly dangerous as well as destructive among

[472] Anabeb Pastoralist #8, Personal Communication, 2017.
[473] Coleman, *Vicious: Wolves and Men in America*, 36.
[474] Coleman, 49.
[475] Anderson, *Creatures of Empire: How Domestic Animals Transformed Early America*, 88.
[476] Maan Barua, "Lively Commodities and Encounter Value," *Environment and Planning D: Society and Space* 34, no. 4 (2016): 725–44.

earlier pastoralists as well.[477] Some of the implications of these perspectives on HLC are explored in chapter six.

In the northern Namib, a region without meaningful agricultural prospects due to its aridity, the arrival of livestock was significant but the adoption of intensive pastoralism took time. Even the hardiest species can suffer during the region's extended droughts. As occurred with the introduction of new animals, plants, and microbes into the Americas beginning in the fifteenth century, it is likely that the arrival of livestock remade vast swaths of the region's ecology.[478] However, in the case of southern Africa, this process was extended over hundreds, perhaps thousands of years. There is ample archaeological evidence that sheep were present in the northern Namib two thousand years ago. Cattle arrived later, likely not in large numbers until the last one thousand years.[479] Working with the Himba of northwest Namibia, anthropologist Margaret Jacobsohn finds a common thread in oral historical accounts maintaining that goats, sheep, and later cattle, came to northwest Namibia "from the north" but that the people who acquired them, and subsequently became pastoralists, were already living there.[480] While indigenous veld goats and Damara sheep – weighing an average 29-32 kg and 50-90 kg respectively – would have been enough to satisfy a small group of lions for a day or two, large-bodied cattle – 300-600 kg – could have satisfied a pride for a number of days. As uniquely large-bodied predators that hunt cooperatively,[481] the introduction of livestock to the northern Namib would have been a boon for lions. William Beinart has shown that with the arrival of European livestock at the Cape, predators quickly identified and adapted to the novel opportunities of preying-upon slower, less dangerous animals that began crowding-out wildlife wherever it ranged. As Rangarajan has noted of livestock predation in India's Gir Forest, "herding of sheep, cattle, and goats offered large cats and canids easy meat on the hoof...That lions should hunt cattle was only logical."[482] Evidence for intensive pastoralism in the region increases in the sixteenth century, perhaps coinciding with the arrival of the ovaHerero people who migrated to northwest Namibia from the central African lakes' region during a period of exceptionally cool

[477] Beinart, "The Night of the Jackal: Sheep, Pastures and Predators in the Cape."
[478] Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492*; Beinart, *The Rise of Conservation in South Africa: Settlers, Livestock and the Environment, 1770-1950.*
[479] Kinahan, "Archaeological Evidence of Domestic Sheep in the Namib Desert During the First Millennium AD"; Kinahan, "The Origins and Spread of Pastoralism in Southern Africa."
[480] Jacobsohn, "Negotiating Meaning and Change in Space and Material Culture: An Ethno-Archaeological Study among Semi-Nomadic Himba and Herero Herders in North-Western Namibia," 32.
[481] See chapter five.
[482] Rangarajan, "Animals with Rich Histories: The Case of the Lions of Gir Forest, Gujarat, India," 113.

temperatures.[483] With the ovaHerero came large numbers of cattle, which spread from ovaHerero networks to the Khoe-Sān and Damara in the region. The influx of easy-to-catch, closely herded prey, represented a novel source of readily available food for the region's lions. The limited numbers of predators killed by pastoralists employing bow-and-arrows, spears, and botanical poisons would have been little deterrent to the relative caloric bonanza that goats and sheep, and particularly cattle represented. The economic value of a growing cattle culture was reinforced by the arrival of European sailing ships moving up and down the Skeleton Coast on their way to and from the Cape. These ships sought beef for the ocean voyage. To meet this demand, primarily Khoe-Sān pastoralists seeking porcelain, liquor, or firearms, maintained stock camps near Walvis Bay. However, without sufficient water or suitable forage nearby, they were forced to trek with their stock from further inland. People, livestock, and dogs made this trip frequently. These drives, with livestock and people sleeping in the open, would have been an opportune time for predators to kill livestock and possibly people as they moved across the landscape.[484] This period drew humans, livestock, and lions in northwest Namibia into a feedback loop increasingly interweaving international economic markets, livestock predation, and HLC. Whereas before the threat of lions to livestock may have been considered too great to make such dangerous treks, access to trade commodities would have ameliorated some of the material effects of livestock loss. As lions turned towards more densely populated herds of docile livestock, I suggest that hunting success improved and lion numbers in the region increased. The number of lions encountered by nineteenth century hunters in Namibia may have been an historical anomaly driven by the growth of pastoralism in the area over the previous few hundred-to-thousand years. The increased proximity of lions to livestock herds would have also increased the frequency of HLC, potentially giving rise to the habitual 'man-eaters' encountered by Andersson and other Europeans colonists.

The 'Man-Eaters'

By the nineteenth century the fear of 'man-eaters' was ubiquitous among the resident of northwest Namibia. However, many recognized that not all lions displayed this dangerous affliction. Andersson wrote,

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[483] Holmgren et al., "A Preliminary 3000-Year Regional Temperature Reconstruction for South Africa." This is one case where archaeological evidence and ovaHerero oral traditions conflict with one another: Jacobsohn records ovaHerero stories stating that the people who adopted pastoralism were already living in northwest Namibia, while archaeological evidence of ovaHerero pastoralism suggests that the people migrated from central Africa with their herds. A possible remedy for these alternate perspectives could be the still unexplored ancestral relationships between the Damara and ovaHerero.

[484] Wallace and Kinahan, *A History of Namibia: From the Beginning to 1990*, 35–36.

> "I have no particular dread of lions, nor am I, generally speaking, a particularly nervous man; but I do fear and dread such a monster as a man-eater… a skulking, sneaking, poaching night-prowler, whose cat-like motions and approach no ear can detect – whose muscular strength exceeds that of the strongest ruminating animal – who will pass through your cattle and leave them untouched in order to feast on human flesh – is, I think, a creature which may reasonably inspire terror."[485]

Andersson was sufficiently familiar with lions to recognize that man-eating was a particular trait of certain lions. Such familiarity was echoed by Himba residents of Puros in the twentieth century, as included in chapter two.[486]

In the past hundred-plus years, the penchant of certain lions for preying upon people has been extensively documented. Most famously, a pair of maneless lions terrorized workers on the Kenya-Uganda railway in 1898. The so-called "Man-eaters of Tsavo" have been the subject of a handful of popular publications and three Hollywood movies. Other well-documented cases of human-eating have plagued rural communities, particularly in East Africa. Between 1932 and 1947, lions in the Njombe district of southern Tanzania killed an estimated 1500 people before the pride was eradicated. More recently, between 1990 and 2004, it is well-documented that lions killed at least 563 people and injured more than 308 in Tanzania. Recent scholarship links the propensity for lions and other carnivores to attack humans with landscape characteristics, including lion proximity to villages and the amount of open woodland and bushland,[487] and the presence of particular prey species.[488] Human-eating, among not only lions but also leopard and tigers, appears to occur primarily in outbreaks.[489] Within areas where outbreaks have occurred, human-eating by lions appears to be a habitual action, perhaps culturally specific to different prides of lions. Once it takes hold the only known remedy has been to wipe-out that cultural memory by killing the pride. This may help explain the disappearance of human-eating in northwest Namibia. Beginning with the colonial era lions were increasingly persecuted by European settlers and traders. Human-eating remains a vexing challenge for many rural communities living with lions,[490] though not in northwest Namibia. What may have once been common became rare by the mid-twentieth century and today has entirely disappeared. However,

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[485] Andersson, *The Okavango River: A Narrative of Travel, Exploration, and Adventure.*, 88.
[486] Jacobsohn, *Himba: Nomads of Namibia*, 47.
[487] Dennis Ikanda et al., "Using Landscape Characteristics to Predict Risk of Lion Attacks on Humans in South-Eastern Tanzania," *African Journal of Ecology* 52, no. January (2014): 524–32.
[488] Hadas Kushnir et al., "Human and Ecological Risk Factors for Unprovoked Lion Attacks on Humans in Southeastern Tanzania," *Human Dimensions of Wildlife* 15, no. 5 (2010): 315–31.
[489] Craig Packer et al., "Species-Specific Spatiotemporal Patterns of Leopard, Lion and Tiger Attacks on Humans," *Journal of Applied Ecology*, 2019, 1–9.
[490] Craig Packer, "Rational Fear," *Natural History*, 2009; Clarke, *Save Me from the Lion's Mouth: Exposing Human-Wildlife Conflict in Africa*, 47.

this has not removed the fear of lions among residents of northwest Namibia. In modern parlance 'problem lions' are those known to pose a particular threat to people and their livestock. Said one communal pastoralist in 2017, "[a] problem lion will not stop. Even if you go out of the house it will come to attack you."[491]

Figure 17: The famous man-eaters of Tsavo. Now displayed at the Field Museum of Natural History, Chicago. Photo: J. Jung[492]

Turn-of-the-century Etosha

It is notable that the near-disappearance of human-eating from the region coincides with an apparent dramatic decline of lions at the turn of the century. Records from the far western portion of the region are lacking, however a variety of evidence, centered around the Etosha Pan area, suggests that lions in the region came under intense persecution which dramatically affected their presence in northwest Namibia. Due to the semiarid and arid environments of the northwest, lions were not as common there as in central, northern, or northeastern Namibia. The so-called 'Thirstland Trekkers,' a group of Afrikaans South Africans who journeyed from the Transvaal across Namibia to the Kaokoveld and up to Angola between 1874-1881, recount in letters and diaries a litany of lion troubles on their trek across southern Botswana and through the Etosha

[491] Anabeb Pastoralist #9, Personal Communication, 2017.
[492] Jeffrey Jung, 2008. Own photo. Retrieved: https://en.wikipedia.org/wiki/Tsavo_Man-Eaters

region.[493] In Etosha lions menaced the trekkers, killing two of their horses.[494] However further west, lions gave little trouble, even though the trekkers "hunted a great deal" while there.[495]

These trekkers and other Afrikaans and German farmers in Namibia were willing, even eager, hunters of lions whenever they encountered them. As Europeans moved further inland and northward, they shot-out many of the region's lions. A successful lion hunter was a man to be reckoned with and numerous farmers in the area made their name as lion killers. Axel Eriksson, an ornithologist, trader, and farmer in Kaokoveld and Ovamboland for more than forty years (1886-1901) was known to be a fearsome and experienced lion hunter.[496] A farmer near Outjo, Herr Kiekebusch, was considered "a great lion hunter."[497] Karl Hartmann, who would die at the age of sixty-five in 1945/6 following a confrontation with a lion he wounded, was reputed to have killed at least fifty lions around southern Etosha during his years farming there.[498] Hunting stories of white men and their trusting African aids moving through the dry veld in pursuit of dangerous stock-raiding lions were ubiquitous. Though these men were occasionally injured or even killed, taking such risks was considered a badge of courage. More often than not it was the lions who died; surrendering their heads and skins to be prominently displayed at farms or within homes.[499] For these farmers the destruction of lions was a matter of course, masculinity, and pride. Yet lion killing was not confined to farmers defending their herds. When German garrisons were permanently based at Namutoni (Etosha) following the outbreak of rinderpest in 1896/7, soldiers relieved hours of boredom in the remote veld by shooting lions from observation towers and generally eradicated wildlife in the area.[500] The cumulative effect that these mentalities and actions had on lions in the region cannot be quantified, but the result was certainly a dramatic decline in the region's lion population.

In the early twentieth century, lions were so rare around Etosha that when Lieutenant Adolf Fisher heard them roaring in the distance one night in 1912, it was the first evidence of

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[493] Stassen, *The Thirstland Trek, 1874-1881*.
[494] Möller, *Journey in Africa through Angola, Ovampoland and Damaraland.*, 140.
[495] Stassen, *The Thirstland Trek, 1874-1881*, 378; 386.
[496] Peter Möller, *Journey in Africa through Angola, Ovampoland and Damaraland*, ed. Ione Rudner and Jalmar Rudner (Cape Town: Struik, 1899), 62.
[497] Green, *Lords of the Last Frontier: The Story of South West Africa and Its People of All Races*, 126.
[498] Green, 136.
[499] Schalkwyk and Berry, *Etosha 100: Celebrating a Hundred Years of Conservation.*, 81; Green, *Lords of the Last Frontier: The Story of South West Africa and Its People of All Races*; South West Africa Administration, Namibia National Archives (SWAA) 2329, "Letter from Rudolph Böhme, Onguma Farm to the Office of the Administrator, Windhoek, 23 June 1952."
[500] Green, *Lords of the Last Frontier: The Story of South West Africa and Its People of All Races*, 129; Schalkwyk and Berry, *Etosha 100: Celebrating a Hundred Years of Conservation.*, 46.

lions in years.[501] Rudolph Böhme, a long-time resident of Onguma farm bordering eastern Etosha, noted in a letter to the Etosha Game Warden in 1952 that there were no lions in the area when he was young, until 1917. However, lions were never completely extirpated from northwest Namibia in the early twentieth century. During the 1910s and early 1920s lions recolonized the Etosha region. By the 1920s they were once again numerous. In 1924, on a museum expedition to Ovamboland, G. C. Shortridge noted that lions were rare there, but still immigrated from "the South and West from the Kaokoveld and Etosha Pan areas, in the second of which districts, owing to trapping and poisoning in the Game Reserve, they have been very much thinned out during recent years."[502] In a 1926 wildlife survey around Etosha, the area was estimated to contain 200 lions.[503] In 1934, Shortridge published an overview of mammals in South West Africa, where he showed that lions occurred around Etosha, but were uncommon further west, though as one went north they were more plentiful.[504] As Böhme noted, even in his youth when his farm was free of lions, they had persisted beyond the limits of white-owned farmland in Kaokoveld.[505]

[501] Berry, "Historical Review of the Etosha Region and It Subsequent Administration as a National Park," 5; Schalkwyk and Berry, *Etosha 100: Celebrating a Hundred Years of Conservation.*, 46.
[502] SWAA 1331 Guy C. Shortridge, "The Third Percy Sladen and Kaffrarian Museum Expedition 'Ovambloland'." (1924).
[503] Berry, "Historical Review of the Etosha Region and It Subsequent Administration as a National Park."
[504] Shortridge, *The Mammals of South West Africa ; a Biological Account of the Forms Occurring in That Region*.
[505] SWAA 2331, "Destruction of Lions; Letter from Mr. R. Böhme, Onguma, Tsumeb. 7 March."; SWAA 2329, "Proposed Extermination of Lions, Etosha Pan Game Reserve, Secretary South West Africa to Magistrate, Grootfontein. 21 April 1952."

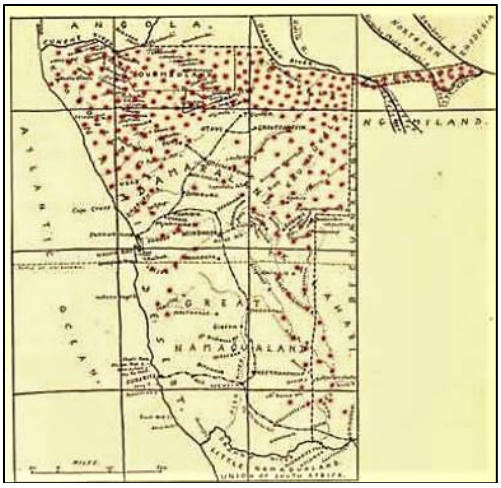

Figure 18: Shortridge's map of lion distribution in South West Africa, 1934. Source: Stander, 2007[506]

Figure 19: Unknown woman, two children, and dead lion, Ovamboland, 1929. Source: Namibia National Archives

Persistence in Kaokoveld

While lions were being shot by the hundreds on settler farms,[507] they were increasingly protected by conservation regulations within Etosha;[508] likely recolonizing the game-rich area from the north and west. The furthest reaches of northwest Namibia remained populated primarily by ovaHereros, Damaras, and descendants of the Oorlams around Sesfontein. Even before South Africa instituted racialized apartheid, the area was *de facto* segregated. As I have shown in chapter two, Namibia's National Archives contain numerous accounts of Kaokoveld residents in the early colonial era complaining that lions predated their livestock and threatened their safety. Whereas settlers were given access to firearms and poison to eradicate predators, Africans access to firearms was controlled during the inter-war period in Kaokoveld and Africans were not trusted to use industrial-grade poisons appropriately (though many would have known how to create plant-based poisons). Such policies were means of controlling human populations as well as remaking the geography of predators in the Territory.

[506] Philip E. Stander, "Behaviour-Ecology and Conservation of Desert-Adapted Lions; 2007 Progress Report of the Kunene Lion Project, Namibia" (Windhoek, 2007), http://www.the-eis.com/viewfile.php?pth=data/literature/Behaviour_ecology and Conservation of desert_adapted Lions.pdf.
[507] SWAA 2329, "Letter from Rudolph Böhme, Onguma Farm, Tsumeb to Secretary South West Africa, Windhoek. 22 March 1952." (1952).
[508] SWAA 2328, "Protection of Vermin and Wild Life in Namutoni Game Reserve. Official Correspondence: Secretary South West Africa and Commissioner South West Africa Police." (1938).

The dynamic nature of the threats posed by lions in Kaokoveld is evident in a series of reports from white officials stationed at the Tshimhaka/Swartbooi's Drift crossing on the Kunene River. In October 1938 lions were reported at the station but said to be "of a fearful nature and not tended to mischief."[509] By January lions were "frequent[ing] the station" and becoming "very troublesome," even injuring an officer's mule.[510] By February the situation had further deteriorated, as lions were now "favor[ing] Tshimhaka as a hunting grounds. Practically every morning and evening they can be heard roaring all around and quite close to the station."[511] By March the European staff had had enough. Fed up with their remoteness, malarial sickness, and the proximity of lion, rhino, and elephant, the constable wrote:

> "I suppose I have no say in the matter, but I am certainly not going to stay here much longer, even if I have to take my discharge from the Force. Neither of us has a car here, and are absolutely cut off from all communication with medical aid etc. If a man gets seriously ill here (as is the case at present) he will simply have to die, as it takes at least 8 to 10 days before a message can be got through to anywhere."[512]

By June the European officers had been removed, though the African staff remained. By December the station was closed permanently.[513]

Evacuation was not a possibility for Kaokoveld's Africans. From the beginning of South Africa rule (1915) the areas north of the Police Zone were reserved for 'natives' who were disallowed from leaving the reserve without explicit approval from government officials. Without access to the firearms or industrial poisons made available to white farmers, Africans in the 'native reserves' struggled to find their own solutions to livestock predation and the risks lions posed to human safety. Government officials working in the area recorded innumerable instances of local leaders requesting aid against predators. For years leaders at the village of Sesfontein complained bitterly that lions and other predators were killing their livestock. During the month of September, 1940, residents of the Ondonga area in Kaokoveld lost fifty-two head of cattle and

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[509] SWAA 2513, "Monthly Return: Tshimhaka; October 1938. Native Commissioner, Ovamboland to Secretary for SWA." (1938).
[510] SWAA 2513, "Monthly Return: January 1939. Station Commander SWA Police, Tshimaka, Forwarded by Native Commissioner, Ovamboland to Secretary for SWA" (1939).
[511] SWAA 2513, "Monthly Report: Kaokoveld: February, 1939. Station Commander SWA Police, Tshimhaka."
[512] SWAA 2513, "Monthly Return: March, 1939. Station Commander SWA Police, Tshimhaka to Native Commissioner, Ovamboland.," 1939.
[513] SWAA 2513, "Tshimhaka Police Post. Official Coorespondence, Officer-in-Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek. 19 July, 1939." (1939); SWAA 2513, "Closing of Station at Tshimhaka Official Correspondence, Acting Deputy Commissioner South African Police Force, Commanding the South West African Division to District Commandant, South African Police, Omaruru. 9 December, 1939." (1939).

eleven horses to lions.[514] What few communities that had firearms often relied upon a single one, and requested ammunition from the government. They asked that administrators provide rifles, ammunition, and poison, or come and address the problems themselves.[515] Complaints occurred frequently enough that a category detailing local conflict with predators, termed "Carnivora," became standard within officials' quarterly and annual reports sent back to the head office in Windhoek.[516] Still, many officials remained incredulous, believing the natives exaggerated livestock loses and suffered primarily because they were inattentive herders. Yet even a large number of cattle kept in Kaokoveld to provision government staff were attacked by lions and hyenas, prompting the Native Commissioner to ask whether the "percentage or even a fraction thereof of losses due to the onslaughts of wild animals takes place all over the Kaokoveld [if so] then the total number of cattle killed by carnivora must be enormous."[517] Travel within the reserve, either by foot or donkey could also be hazardous: lions and elephants were considered particularly dangerous.[518] Still, requests for assistance from reserve inhabitants went unheeded. The people paid the price: injuries and maulings occurred when herders confronted lions and in the early 1940s one of the last leaders of the ovaKwena at Sesfontein was killed by lions.[519] This sad chapter in the collective experience of Kaokoveld residents demonstrates the continued willingness of lions to target livestock and humans in the challenging environment of the northwest. It also indicates a climate of governmental indifference to the people's fate. This period further entrenched a long-lasting fear and loathing of lions among many local people that would become a challenge for conservationists in coming generations. In the late 1960s, upon observing lions under a tree next to a zebra carcass near the Etosha border, Bantu Affairs and Development Officer Garth Owen-Smith was requested by his ovaHerero companions to shoot the lions before they could escape. Owen-Smith began to lecture the ovaHereros on the virtues of

[514] Native Affairs Ovamboland, Namibia National Archives (NAO) 020, "Monthly Reports: August and September, 1940. Native Commissioner Ovamboland to Chief Native Commissioner Windhoek." (1940).
[515] NAO 031, "Zessfontein Native Reserve: Application by Natives for Strychnine. Officer in Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek. 14 December, 1943."
[516] E.g. NAO 029, "Annual Report of Native Affairs, 1942. Officer in Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek."; NAO 029, "Kaokoveld Annual Report: 1944. Officer in Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek. 20 December, 1944."
[517] NAO 028, "Official Letter, Native Commissioner of Ovamboland, Ondangua to Constable Cogill, 5 December 1932." (1932).
[518] Miescher, *Namibia's Red Line: The History of a Veterinary and Settlement Border*, 186.
[519] NAO 031, "Report on Zessfontein Native Reserve" (1936); NAO 061, "Kaokoveld Annual Report, 1946. Officer in Charge, Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek."; NAO 031, "Zessfontein Native Reserve: Application by Natives for Strychnine. Officer in Charge of Native Affairs, Kaokoveld to Chief Native Commissioner, Windhoek. 14 December, 1943."; Green, *Lords of the Last Frontier: The Story of South West Africa and Its People of All Races*, 42.

wildlife conservation, but it was no use: "Lions are not animals,' they insisted. 'They are the devil's children and should be killed wherever they are."[520]

The Beginning of Conservation in Etosha

This era of widespread persecution notwithstanding, Etosha was devoid of pastoralists and lion numbers there were rebounding in the 1920s-40s, with foreseeable events taking place nearby. Because the game reserve's boundaries were unfenced until the 1950s, lions easily crossed on to neighboring farmland to prey on livestock only to retreat to safety within the reserve. During the 1940s an estimated eighty lions per year were being killed on Etosha-area farms, leading Rudolph Böhme of Onguma to request the right for farmers to pursue lions into the reserve, purportedly to keep livestock and people safe from the marauders.[521] The administration rejected the request. Not only were lions considered key to checking the free-ranging ungulate population, who were believed to be severely overgrazing Etosha's grasslands in the 1940s, they were also considered to be among Etosha's key attractions for visiting tourists.[522] This put conservationists in Etosha at-odds with both European and African farmers in the surrounding lands.

Previously the conservation of wildlife within the 'native reserves' had been a tertiary consideration behind supporting the settler economy and keeping Africans segregated and pacified. The growing importance of wildlife conservation in South West Africa caused the native administration and conservation departments to be split, giving rise to the Territory's first generation of professional conservationists. The rising interest among Europeans of viewing, not just hunting, wildlife, along with a growing postwar economy, supported a small population of domestic tourists interested in seeing lions and other wildlife in Etosha. Because the rest of the northern 'native' areas were off limits to Europeans, and much of the landscape within the Police Zone had been converted to farmland, Etosha was among the few places that lions and other dangerous wildlife could be (relatively) safely viewed. The development of Etosha as a tourist destination brought certain people and lions into closer contact within semi-controlled circumstances. What effect this would have on human-livestock-lion interactions in the region was not considered at the time. Henceforth the park would serve as the source of lions in the region.

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[520] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 135.
[521] Bat, "Etosha: 75 Years," 16; SWAA 2329, "Letter from Rudolph Böhme, Onguma Farm to the Office of the Administrator, Windhoek, 23 June 1952."
[522] SWAA 2329, "Proposed Extermination of Lions, Etosha Pan Game Reserve, Secretary South West Africa to Magistrate, Grootfontein. 21 April 1952."; Berry, "Historical Review of the Etosha Region and It Subsequent Administration as a National Park," 6.

During this period wildlife management was decidedly more ad-hoc than scientific, leading to often surprising interactions between lions and Etosha's staff and tourists. Tourist accommodations were rough-and-ready, and often consisted of camping-out at waterholes near lion prides. This led to a variety of frightening, and occasionally humorous incidents. Two elderly women were confined to a restroom for hours as a pride encircled the structure. On one occasion a lioness fell into a half-filled rest camp swimming pool. A quick-thinking witness threw her a dry stump, which she clung to while the pool was refilled, though it is not recorded where the staff hid themselves once she exited. A particularly memorable story was when a group of lions surprised the ex-mayor of Windhoek, Jaap Snyman, causing him to take cover under a car so securely that it had to be jacked-up to retrieve him.[523] Predictably, not all incidents were humorous. Near the Okondeka waterhole a group of four Ovambo roadworkers were surprised when returning to their station on foot. Chased up a tree by a group of lions, three of the four were pulled down and devoured. Occasionally unidentified remains would be found, ostensibly of people who attempted to walk through the park. Because the eastern side of Etosha was the gateway between Ovamboland and potential employment further south in the Police Zone, some men who could not afford transport risked the journey on foot. Certain lions became habituated to easy meals and scavenged around rest camps, with the result that many were shot.[524]

But for tourists in the 1950s, Etosha lions were star attractions and the staff worked to satisfy their guests. At the Leeubron ("lion source") waterhole, when an emaciated lioness, dubbed "Isabella," was struggling to feed five cubs, Game Warden P. J. Schoeman began providing the group with carcasses of wildebeest and zebra, two species that he considered over-abundant within the park. Unsurprisingly this recurring activity attracted other lions, requiring the provisioning of further carcasses to minimize disputes. As feedings became routinized every Wednesday and Saturday night, other staff were entrusted to take charge and they would often bring along colleagues or friends to witness the spectacle. Once tourists heard of these events, they began lobbying to attend so that in time ten tourist vehicles were allowed to witness each night. Thus the 'lion restaurant' was born and operated for some years. Predictably, this eventually led to increasingly unsafe interactions between lions and tourists, forcing the restaurant to close. It stands to reason that farmers surrounding Etosha suffering livestock losses from lions were displeased with efforts to feed Etosha's lions. This highlights not only the changing relationship between lions and people, but is the first clear indication that where lions were located greatly affected their treatment by public officials. Not only did Etosha staff not

[523] Bat, "Etosha: 75 Years," 14.
[524] Bat, 16; Miescher, *Namibia's Red Line: The History of a Veterinary and Settlement Border*, 183–85.

view lions as a threat, they began treating them more akin to domestic animals than wildlife. "Isabella" is the first record of a lion being anthropomorphized with a human name in the region – a practice that would become increasingly common. As historian Etienne Benson has shown, the naming of animals is associated with a set of ethical and social claims concerning their status as both unique individuals and sentient beings deserving our consideration. Though Benson's account deals with animals as research subjects, the provisioning of "Isabella" also reveals the extension of a certain type of care for individual animal welfare directed from humans to lions.[525] From the brink of regional eradication to the familiarity of a specific name in fewer than two human generations, the changing interactions between humans and lions in Etosha during the early- to mid-twentieth century encompasses a range of different relationships. Though lions are no longer explicitly provisioned within the park, the 1950s represents the punctuation of an era of transformation in the relationship between specific humans and lions in northwest Namibia. At this point a new era of human-lion relationships begins: that of lion conservation: where human-lion interactions are increasingly defined by professionals aiming to conserve, not eradicate, the region's lions. In contrast, European and African farmers bordering Etosha National Park and residing in Kaokoveld continued to be frustrated in their attempts to persecute lions and rid the region of this threat to their livestock. Well into the twenty-first century communal pastoralists inhabiting the lands west of Etosha would attribute dangerous lions to actions taken by staff within Etosha. In 2017, one communal area resident said that, "the lions that are coming into the kraal [and killing livestock] are the ones from Etosha. Because they are staying in[side] the fence and are not afraid of people."[526] Another would warn tourists in the area that "our lions are from Etosha and in Etosha they are given food. So whenever they see a car they are running towards the car, so you must be very cautious."[527] Stories from Etosha and elsewhere from this era persisted in the minds of the area's residents and it remains an article of faith among many that lions threaten their safety and the safety of their family.[528]

Diverging Paths for Etosha and Kaokoveld Lions

While the lions of Etosha thrived under the management of the state, those in Kaokoveld remained as elusive as ever. During the 1950s Etosha was home to an estimated 50,000 to 55,000 zebra and wildebeest. In 1962, an estimated 100,000 large herbivores occupied the park. However, falling under the protection of the state meant that the Etosha's lions were increasingly

[525] Etienne S. Benson, "Naming the Ethological Subject," *Science in Context* 29, no. 1 (2016): 107–28.
[526] Conservancy Leader #7, Personal Communication, 2017.
[527] Anabeb Pastoralist #12, Personal Communication, 2017.
[528] See chapter six.

affected by the Territory's politics. The complex results of such processes transformed the life and livelihoods of the lions of Etosha and Kaokoveld. During the 1960s and 70s conservation efforts in the northwest were confined to Etosha. In 1964, Kaokoveld was set-aside by the South African government as a 'homeland' for the various groups collectively termed 'Kaokovelders.'[529] Until the end of the 1970s the only non-natives granted access to Kaokoveld were officials or visitors with a government-sponsored dispensation. No comprehensive surveys of the region's wildlife were performed until 1978 and no conservationists employed outside of the National Parks until 1980. During this period wildlife in Kaokoveld fended for itself, both against residents and sometimes in the face of elite government officials who used the remote region as a safari hunting retreat, including shooting lions and transporting the carcasses via helicopter.[530]

In Kaokoveld lions maintained a marginal existence, largely beyond the view of conservationists. In 2017, one communal pastoralist remembered that, "in olden days [before independence] the lions were afraid of people and they were running because they were being killed."[531] The eruption of the war for independence in 1966[532] cast a further shadow over the region, reinforcing the government's desire to keep the area isolated from outsiders. The conflict caused an influx of firearms and industrial poisons by revolutionary fighters seeking to overthrow South African rule and by South African military personnel hoping to curry favor with local leaders, though these were not widely disseminated to pastoralists. Struggling Kaokoveld residents increasingly hunted wildlife to fill their stomachs. Even without widespread access to firearms, residents persecuted lions to keep themselves and their livestock safe:

"Before independence the people in the area did not have guns. Only the Herero chiefs [did]. Then our people were just working with the bows and arrows and the spears. If the dog chases [the lion] and fights it, that is when the people are killing."[533]

What little information there was concerning lions was recorded as scattered accounts and anecdotes. So mysterious were these lions that they were known by reputation as "bergleeus" (mountain lions). Though rarely seen, they were said to be "maneless and generally grey in colour, living in the mountain country of Kaokoveld."[534] This is the first indication that lions in the far west may differ from lions residing in and around Etosha. Thought to have been formerly

[529] Government of South Africa, "Report of the Commission of Enquiry into South West Africa Affairs"; van Warmelo, "Ethnological Publication No. 26: Notes on the Kaokoveld (South West Africa) and Its People."
[530] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 189.
[531] Sesfontein Pastoralist #5, Personal Communication, 2017.
[532] See chapter two, conclusion.
[533] Conservancy Leader #7, Personal Communication.
[534] Tinley, "Etosha and the Kaokoveld," 1971, 16.

widespread, they were considered greatly reduced by poison and firearms, due to their penchant for killing livestock.[535]

A key witness to this era was Garth Owen-Smith who first worked in Kaokoveld as an Agricultural Officer for South Africa's Department of Bantu Affairs and Development (BAD) from 1968 to 69. Owen-Smith's anecdotal accounts include finding four dehydrated lion carcasses in the dunes near Cape Fria on the Skeleton Coast, and records of local people's encounters with lions, further inland, in the region's northern areas. Owen-Smith records lions around the villages of Puros and Orupembe, moving through the Khowarib Schluct below the escarpment, at the lower Hoaruseb, and near Sanitatas fountain. These records provided some clues to the persistence and perhaps the resilience of lions in Kaokoveld, but little concrete information. Owen-Smith estimated that approximately forty lions resided in Kaokoveld with perhaps a few additional migrants from Etosha. Rare for this time, Owen-Smith, a white South African, sought collegiality, respect, and even friendship with Kaokoveld's African inhabitants. The result is, *inter alia*, environmental information from the era, derived from the local people that otherwise would have likely gone unrecorded. In these accounts lions primarily play the role of fearsome pests, raising the ire of local pastoralists who had little patience for their depredations. Lions frequently attacked livestock and were in-turn harassed and killed by residents. This kept lion groups small and highly mobile. The ongoing conflict may have forced the lions to inhabit increasingly remote and rugged areas,[536] including finding refuge along the Skeleton Coast, where pastoralists were not allowed to take their livestock. With the establishment of Skeleton Coast National Park in 1971, wildlife monitoring started and stories of lions inhabiting the coast began circulating among park staff. However, during the 1970s fewer than twenty-five total sightings were recorded. These records could be attributed to the occasional vagrant seeking refuge; perhaps a dispersing male from further inland. The possibility of coastal-roaming lions sparked interest, but they remained largely a mystery.[537]

The first comprehensive account of lions in Kaokoveld was given by P. J. ("Slang") Viljoen in his 1980 MSc. thesis.[538] Combining scattered available information with more than three years of field observations, Viljoen found that lions, though widespread, were nowhere plentiful in the region. In the far west in particular he associated the four remaining lion prides

[535] Hall-Martin, Walker, and Bothma, *Kaokoveld: The Last Wilderness*, 32.
[536] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 66; 105–6; 108; 134; Owen-Smith, "The Kaokoveld: An Ecological Base for Future Development Planning," 50–52.
[537] Stander, *Vanishing Kings: Lions of the Namib Desert*, 32–37; Stander, "Behaviour-Ecology and Conservation of Desert-Adapted Lions; 2007 Progress Report of the Kunene Lion Project, Namibia."
[538] P. J. Viljoen, "Veldtipes, Verspreiding van Die Groter Soogdiere, En Enkele Aspekte van Die Ekologie van Kaokoland" (University of Pretoria, 1980).

with the primary waterholes in their home range. However, he posited that though the lions utilized these water sources, they were not necessarily limited to the direct areas around them. Viljoen estimated the number of lions in the far west at no more than twenty-five, with another thirty in the southeast originating from Etosha. He believed that this represented a notable decline from Owen-Smith's 1970 records; a reduction he attributed to the intensive hunting of wildlife and spreading of poison by the area's ovaHerero residents.[539] Viljoen conveys a population struggling at the precipice of disappearance.

> "The status of the lion in Kaoko[veld] is uncertain because it is intensively hunted down. Until recently, the lions were also killed by poison. Only in the inhospitable, uninhabited areas will the lions survive for a while, but with the opening of the area for four-wheel drive vehicles, these lions are no longer safe either."[540]

Viljoen's pessimism was largely prescient: the Kaokoveld lions were in trouble. But in years to come the furthest reaches of the region would be their refuge.

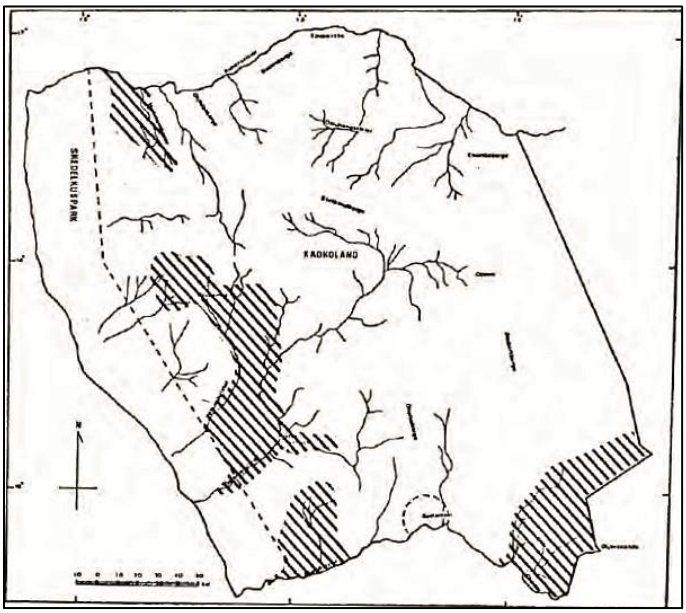

Figure 20: Viljoen's map of lion distribution in Kaokoveld in the late 1970s. Source: Viljoen, 1980

Though Viljoen's research was the first indication that lions might maintain a stable population in Kaokoveld, the 1980s were a terrible decade for this small population. As I showed at the end of chapter three, beginning in 1979, a once-in-a-generation drought hit the northern Namib. Population estimates for prey species in the region suggest total devastation from a combination of drought and poaching: mountain zebra numbers were reduced by 84%, oryx by

[539] Viljoen, 349.
[540] Viljoen, 349.

87%, springbok by 96%, and plains zebra disappeared from the region entirely. Livestock in the region experienced a similar decline.[541] In the early period of the drought, lions and other predators flourished on the sick and available carcasses.[542] However, as prey and livestock numbers continued to dwindle, predators also took strain. Lions in the region faced starvation; evident in photos of emaciated and skeletal lions from this period. The net effect was that lions and other predators increasingly troubled residents and what livestock remained. In one community a lioness walked on to the schoolgrounds while children were present. Nearby, a group of fourteen lions killed ninety-six sheep and seventeen goats in one evening. The following day a professional hunter and his staff were deployed to the farm, where they set a trap for the offending pride, killing twelve of the fourteen that evening; leaving the remaining two with the belief that the lions might have learned a lesson.[543] Further north in Sesfontein, in early 1982, the only known human fatality, and last one recorded in the northern Namib, occurred when a starving lioness entered the home of a Damara farmer and killed a young child. The lion was shot in the house by military personnel from the nearby fort, while still consuming the girl's body. These and other incidents inspired a climate of fear causing many of the region's lions to be shot by professional hunters, or shot, trapped, and poisoned by locals. At least seventy-six lions were killed in the southern part of the region alone.[544] The plight of the lions caused some concerned conservationists to even suggest feeding them until the prey returned, but this idea was abandoned.[545] By 1986 it was estimated that only twenty to thirty lions remained.[546] Even this may have been a generous estimate, by 1991 it was believed that there were no more lions in the northwest outside of Etosha.[547] This dove-tailed with broader concerns that wildlife were disappearing in Kaokoveld. As I noted in chapter three, this period gave rise to community-based natural resource management (CBNRM) and the community game guard program. Following independence in 1990, this program would transform into Namibia's communal conservancy system. I further review the genesis of this system in chapters five and six.

During the drought and resulting high levels of HLC inland, sightings of lions moving and foraging along the Skeleton Coast increased. While coastal roaming had been an extreme

[541] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 365. See chapter three.
[542] Reardon, *The Besieged Desert: War, Drought, Poaching in the Namib Desert*, 32.
[543] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 352–53; Anabeb Pastoralist #10, Personal Communication, 2017.
[544] Reardon, *The Besieged Desert: War, Drought, Poaching in the Namib Desert*, 34.
[545] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*, 358.
[546] Reardon, *The Besieged Desert: War, Drought, Poaching in the Namib Desert*, 40; Stander, "A Suggested Management Strategy for Stock-Raiding Lions in Namibia," 38.
[547] Stander, *Vanishing Kings: Lions of the Namib Desert*, 46.

oddity in the 1970s, observations of lions in the Skeleton Coast National Park spiked from 1982 to 91.Though the increase in sightings is likely related to an increased monitoring effort by park officials, during this period the average group size during each observation also declined, from a mean-average of more than three lions per sighting in 1980 to fewer than two in 1990. In different observations the lions were seen preying or scavenging upon cormorants (*Phalacrocorax capensis*; *P. carbo*), oryx, and cape fur seals (*Arctocephalus pusillus*), suggesting a high ability to adapt predation habits. These sightings, though low in number, suggest that during the height of the drought and persecution by people, Skeleton Coast park may have served as something of a refuge for lions in the western part of the northern Namib. By the 1990s these sightings had ended.[548] When a solitary male was photographed by a Skeleton Coast ranger in 1993, he was found to be a vagrant, tagged in Etosha in 1985 and having somehow found his way through the hostile villages and farmlands. However, he was only seen once and afterwards disappeared entirely. For the time being, the desert appeared empty. However, the sightings along the coast suggested that the lions of the northern Namib could be highly adaptable and could persist in even the most unlikely environments.

Conclusion

Throughout this chapter I have shown lions in northwest Namibia to be both products and drivers of history. Clearly their geography within Etosha and the northern Namib was transformed (and retransformed) by their relationships with humans and livestock. I have also shown that the actions which humans took regarding lions greatly depended upon the setting of their interactions. In racially segregated northwest Namibia, space often served as a proxy for politics. Throughout the century lion flourishing and death was also based at least as much upon governmental policies and practices as it was upon the preventative or retaliatory actions of hunters and farmers. This history is full of contingencies reminding us that humans and lions are not inherently enemies, though the intervention of livestock certainly made coexistence more difficult. Nevertheless, by virtue of their size, predation, and the fears they inspired, lions exemplify Ginn et al.'s definition of awkward creatures to live with: human togetherness with lions is always difficult.[549] But living with humans has not been easy on lions, save those remaining in Etosha, for a long time. In the next chapter I explore how, by retreating beyond where humans normally travel, the lions of the

[548] Stander, "Behaviour-Ecology and Conservation of Desert-Adapted Lions; 2007 Progress Report of the Kunene Lion Project, Namibia"; Peter A. Bridgeford, "Unusual Diet of the Lion Panthera Leo in the Skeleton Coast Park," *Madoqua* 14, no. 2 (1985): 187–88.
[549] Franklin Ginn, Uli Beisel, and Maan Barua, "Flourishing with Awkward Creatures: Togetherness, Vulnerability, Killing," *Environmental Humanities* 4 (2014): 113–23.

northern Namib survived and began to recover. Viewed in the light of human-lion interactions since the spread of colonialism, this persecution followed by recovery will seem familiar. Appreciating the long-shared history of humans and lions in northwest Namibia provides new perspectives on the challenge of human-livestock-lion relationships and HLC. In the next chapter I turn to the work of Philip Stander, who generated knowledge contrasting lions in northwest Namibia with those inhabiting other areas. Stander's work shifted information about lions in the northwest away from human-lion relationships and towards the lions themselves. Chapter five shows how new methods of becoming-with lions in northwest Namibia generated knowledge about lions in the region that was dissimilar to the experience of living with lions as experienced by the residents. However, human-livestock-lion relationships did not disappear entirely, as is clear at the close of chapter five and throughout chapter six.

Chapter Five: The Desert-adapted Lions of the Northern Namib, 1980s-2010

Introduction

Given its aridity, relatively low numbers of prey, and rugged landscape, the northern Namib seems an unlikely refuge for lions. Yet, in a remote mountainous corner of the region, a small population persisted in the face of widespread persecution. As I showed in the last chapter, the lions of the northern Namib have been elusive and somewhat mysterious to outside observers, including government conservationists. Rumors of bergleeus and coastal-roaming lions have long circulated among the region's residents, who primarily make their living through pastoralism. By the late-1980s, just as the South West Africa Department of Nature Conservation was gathering scattered accounts of lions in the northern Namib, and even succeeded in radio-collaring two of them, the lions disappeared (the apparent victims of being shot and poisoned by resident pastoralists).[550] However, in the years to come, lions would reemerge on communal land in the northern Namib. As they came under increasing observation, the desert-adapted lions of the northern Namib became reimagined, through scientific study, as displaying notable adaptations to the area's hostile arid environments. Beginning in the late 1990s, the research of Philip Stander, who has dedicated more than thirty years to performing scientific research on lions in Etosha and the northern Namib, generated new information about lions in northwest Namibia. For audiences residing beyond the northwest, including government officials, conservationists, and, later, the international public, Stander's work revealed a previously unseen world of the desert-adapted lions. This work somewhat overshadowed local perspectives surrounding the challenges of navigating human-livestock-lion relationships for communal pastoralists, creating a new paradigm of human-lion interactions, and complicating the challenge of HLC in the region. By the mid-2000s both the region's lion population and HLC incidents were on the rise. By 2005, Stander identified HLC on communal conservancy land as the greatest threat to the continued survival of the desert-adapted lions. As I show in chapter six, communal conservancy residents believe that lions are common in northwest Namibia and that an increased lion population is having negative effects on human-livestock-lion relationships. This chapter explores some of the scientific information generated by Stander which frames the popularly-held conception that lions, once rare in northwest Namibia, have increased in the area. Notably, Stander's approach to

[550] Stander, *Vanishing Kings: Lions of the Namib Desert*, 32–46.

generating knowledge about lions in the region differs from how residents experience living with lions, which leads to their own, different, understandings.

In conversation with the history I have outlined in chapters two and four, Stander's work, focusing on lions in relative isolation from their effects on humans and livestock, is recontextualized as a new way of understanding lion presence in northwest Namibia. This approach builds on the experience of studying lions in Etosha during the 1980s-90s. In Etosha, lions interacted with humans in relatively controlled settings. Stander's research within communal and tourism concession land in the northern Namib, applied certain techniques that he pioneered in Etosha. However, whereas lions in the park were explicitly intended to be separated from livestock and people, at least in uncontrolled settings, this was not and is not the case in the northern Namib (excepting Skeleton Coast National Park). I will show that while Stander's approaches have generated critical information for understanding and hopefully conserving lions in the northern Namib, a more unified picture of human-livestock-lion relationships is required.

In this chapter I explore Stander's research on the adaptations of lions in northwest Namibia to the local environment. This extended look at the lions themselves, with certain ties made to HLC, engages the changing context of scientific research on lions in Etosha National Park and the northern Namib from the end of the South African colonial era until 2010. Using published literature on lions and scientific studies performed by Stander and his colleagues, I contrast the Etosha and desert-adapted lions with lions elsewhere in Africa, highlighting how Stander's field methods enabled him to generate new information on the lions in both places. This is the first time these diverse sources on lions in northwest Namibia have been unified and contrasted with lions elsewhere. Though there are numerous interesting differences, I examine the outcomes of Stander's research as it pertains to lion behavior and sociality – emphasizing individual dispersal and group dynamics – and ecology – emphasizing prey and predation. Examining this information adds science-based perspectives to the history of human-livestock-lion interactions and contemporary HLC in northwest Namibia. The focus on the remarkable adaptations of lions to this environment purposefully contrasts with experiences of local residents, whose interpretations of lions differs markedly from Stander's. Because scientific approaches are the premier means through which government and NGO policymakers interpret contemporary HLC in the region, it is important to review Stander's information. Stander's work made available, for the first time, large amounts of information about lions in northwest Namibia to people residing outside the area. As mentioned in the introduction and in chapter four, scientific perspectives do not replace, but augment, other ways of human becoming-with lions in northwest Namibia. However, they also reveal how different ways of 'knowing' lions influence

processes of becoming-with lions. In chapter six I show that communal pastoralists' recent experiences of human-livestock-lion relationships differ from the information that Stander generated. Stander's work demonstrates a break with the past. However, it does not indicate that the embodied human experience of living with lions is any less relevant to the contemporary challenges of HLC.

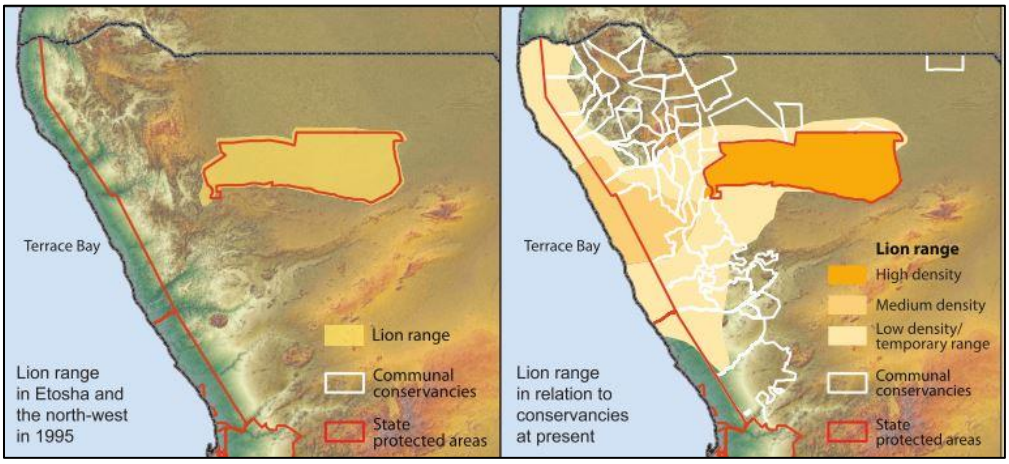

Figure 21: Lion range expansion in northwest Namibia, 1995-2015. Source: NACSO/WWF, 2016[551]

The desert-adapted lions are a relatively small population displaying adaptations that contribute to their survival in the arid, rugged, low-productivity environment of the northern Namib. This small and scientifically "unknown"[552] population of between 112 and 139 individuals exhibits behavior and ecology specific to the Namib's heterogeneous and challenging environments.[553] In 2019, this population covers approximately 38,950 km^2. These lions hunt among coastal lagoons, move through ephemeral riverbeds, mountains and rocky plains, and inhabit home ranges of previously unseen size. However, they have not been entirely severed from lions in Etosha.

By the late 1980s, lions inhabiting the northern Namib had all-but disappeared. During the South African colonial era, this region was designated a native reserve and then as the ethnic homelands of Kaokoveld and Damaraland. This designation meant that it remained economically and politically marginalized as a matter of policy and practice and that its inhabitants were impoverished and disempowered from meaningful economic and social welfare opportunities. As

[551] NACSO, "The State of Community Conservation in Namibia: A Review of Communal Conservancies, Community Forests and Other CBNRM Initiatives; Annual Report 2016," 40.
[552] The IUCN defines "unknown" populations as those for which long-term, robust scientific data is deficient; this includes most lion populations in Africa. IUCN SSC Cat Specialist Group, "Guidelines for the Conservation of Lions in Africa, Version 1.0 - December 2018."
[553] Refer to introduction for an overview of the environmental setting.

a result, the main source of income was, and remains, pastoralism. A drought beginning in the late 1970s pushed the people, their livestock, and the wildlife in Kaokoveld to the brink of disaster. As available prey disappeared predators turned to livestock to survive. This led to many predators being shot or poisoned with available plants by local people, with the result that, by the end of the early 1990s, lions appeared to be extirpated from the region. Pastoralists from the region remember these years, when they had a free hand to persecute lions, as a time when HLC was not as chronic a challenge as it currently is. One pastoralist remembers, prior to independence that, "[i]n olden days lions were being killed and they were manageable. But nowadays…lions are not being killed. Maybe that is why the numbers are increasing."[554] Though unconfirmed sightings of lions within the 'ethnic homelands' never ceased entirely, these were attributed by Etosha staff to vagrants from the national park, possibly looking for new home ranges. It was generally accepted that these vagrants were quickly killed by farmers and communal residents. Between 1984 and 1999 a mean-average of 28 lions were annually killed along Etosha's borders.[555] Until independence in 1990, local perspectives on lions outside of Etosha were the primary means through which knowledge of lions outside the park was available. Though Etosha and Skeleton Coast park staff ventured into Kaokoveld and Damaraland their monitoring of lions in these areas was not systematic.

Science in Etosha

From the late-1980s to mid-1990s, lion research and conservation in the region was focused on Etosha, where a healthy population – estimated between 200 and 500 lions from 1978 to 1987 – was being monitored and studied. As Etosha's prey populations became increasingly confined within the park, predators, particularly lions, flourished. By 1981, lions in Etosha were considered so numerous by park staff that a contraception program was piloted, to test whether the fecundity of certain prides could be reduced without imperiling the population.[556] Contraception was desirable because lions were dispersing from Etosha to kill livestock on nearby farms, with the result that as much as ten percent of the lion population was being killed each year.[557] Mortalities on neighboring farms were mostly of subadult males. Between two-and-a-half to four years of

[554] Sesfontein Pastoralist #4, Personal Communication, 2017.
[555] Philip E. Stander, "Conservation of Lions and Other Large Carnivores in Etosha National Park and Khorixas District, Namibia" (Windhoek, 1999), http://www.the-eis.com/viewfile.php?pth=data/literature/Conservation of lions and other large carnivores in Etosha National Park and Khorixas District.pdf.
[556] Orford, Perrin, and Berry, "Contraception, Reproduction and Demography of Free-ranging Etosha Lions (Panthera Leo)."
[557] Stander, "A Suggested Management Strategy for Stock-Raiding Lions in Namibia."

age, subadult male lions disperse from their natal prides. Habitual stock-raiders around Etosha appeared to primarily have been adult males ousted during pride takeovers or dispersing subadult males. Once mobile, these lions navigated their way out of the park and often subsisted by killing livestock. The dispersal of lions onto neighboring farmland suggested that young Etosha lions were struggling to secure tenure within the park. Though the deaths on neighboring farms were not believed to be a serious threat to the park's lion population, from 1980 to 1990 the number of park lions declined from about 500 to 300, primarily as a result of the prey numbers crashing due to drought. Though the contraception program was abandoned, the livestock raiding and lion killing continued.[558]

The conflict experienced on Etosha's borders suggested that, on its own, the park was an insufficient refuge for the region's lions. As I have shown, livestock losses along Etosha's borders were not an historically-unique challenge. However, with the increasing value ascribed to lions as a tourism asset, as well as concern about overall lion numbers in the region, staff in Etosha and the Department of Nature Conservation treated lion monitoring within Etosha and the 'homelands' to the west as a priority. During the 1980s increasing numbers of lions in Etosha, and a few further west, were radio-collared and periodically monitored by government staff. This was the first step in beginning to understand how lions survived in northwest Namibia, including the rugged Kaokoveld and the hyper-arid Skeleton Coast.[559]

[558] Philip E. Stander, "Demography of Lions in the Etosha National Park, Namibia," *Madoqua* 18, no. 1 (1991): 1–9; Stander, "A Suggested Management Strategy for Stock-Raiding Lions in Namibia"; Orford, Perrin, and Berry, "Contraception, Reproduction and Demography of Free-ranging Etosha Lions (Panthera Leo)."
[559] Stander, *Vanishing Kings: Lions of the Namib Desert*, 32–46.


Figure 22: Philip Stander at Wêreldsend, 2019. Photo: author

During this period, Etosha ranger Philip Stander began exploring options for alleviating the conflict between lions and farmers along the park's border. Stander was born and raised on a farm in southern Namibia where he gained extensive experience working with wildlife and assisting with game-capture as a young man. In the early 1980s he began working in Etosha National Park as an assistant ranger, frequently performing monitoring tasks under the guidance of Etosha's chief scientist, Dr. Hu Berry. During this period lions were relatively numerous in Etosha, but had been subject to very little scientific study. Because lions are primarily nocturnal, monitoring the specificities of their behavior required extensive work at night. Stander was keen to perform this work, which, he recalled in 2016, changed him. Following the lions at night and sleeping during the day became the norm for Stander who, since the 1980s, has dedicated his life to monitoring and conserving lions in northwest Namibia. In 1994 Stander completed a doctorate at the University of Cambridge, winning the prestigious Thomas H. Huxley prize for his dissertation on lion and leopard behavior. In the late 1990s Stander started an NGO now known as Desert Lion Conservation.[560] Through his work with the South West Africa/Namibia government and with his NGO, Stander has likely spent more time monitoring lions in the field than any other person, living or dead. Reserved and shy, Stander appears to be more at-home with lions in the remote areas of northwest Namibia, than in the company of other people. Stander's own human-lion relationship has transformed how residents, conservationists, government staff, researchers, and,

[560] Kate Whitehead, "Conservationist 'Flip' Stander on Hunting with Lions in Namibia's Deserts," South China Morning Post, 2016, https://www.scmp.com/print/magazines/post-magazine/long-reads/article/2054857/conservationist-flip-stander-hunting-lions.

through the creation of two popular documentaries, even the global public, understand the lives and deaths of lions in northwest Namibia.

Initially driven by an interest in lion predation, Stander began nighttime monitoring of the lions in Etosha in the mid-1980s. Using a combination of special binoculars and red lights so as not to disturb them, those first years Stander uncovered unexpected lion adaptations to the Etosha environment. Stander's ability to monitor lions through the use of technologically sophisticated means transformed his ability to gather information about lion behavior, sociality, and ecology, particularly during nighttime. This provided him with what historian of science Etienne Benson has elsewhere termed a "privileged and exclusive relationship to wild animals."[561] Nighttime vision of lions would be critical to Stander's ability to monitor and generate information about lions in the years to come – a capability largely absent from the work of Schaller and other lion researchers at the time. Later, increased accessibility to radio-tracking and satellite collar technology would enable Stander to 'see' lions in the northwest as they had never been seen before. However, Stander would also rely on 'traditional' methods of tracking and sought to incorporate time-tested approaches to understanding and reconstructing lion behavior which he learned from rural Africans. In examining Stander's methods and the knowledge he generated, I adopt Haraway's perspective that scientific facts result from human actions; that facts are generated by performances and deeds and are bound to scientific practices of story-telling and metaphor.[562] This perspective highlights Stander's dedication to creating new ways of understanding lions in northwest Namibia that were previously unavailable. In the years to come Stander would reveal that lions in the northern Namib demonstrated adaptations even more surprising than the lions of Etosha. That he would do so through a variety of technologically-mediated approaches not available to local residents centered certain conceptions of lions in the area away from discourses of human-livestock-lion relationships which, nevertheless, continued to present challenges to local pastoralists. Notably, livestock do not feature prominently in many of Stander's studies, particularly in Etosha, where livestock are absent. As HLC would become a challenge to Stander's study of lions on communal land, concerns over human-livestock-lion relationships proved inescapable.

Scientific studies on lions from across Africa have highlighted prey density, distribution, and richness along with habitat heterogeneity as drivers of lion behavior and ecology. Beginning in the 1980s Stander and others began studying how lions in northwest Namibia have adapted to

[561] Etienne S. Benson, "The Wired Wilderness: Electronic Surveillance and Environmental Values in Wildlife Biology" (Massachusetts Institute of Technology, 2008), 20.
[562] Donna J. Haraway, *Primate Visions: Gender, Race, and Nature in the World of Modern Science* (New York: Routledge, 1989).

environments that are dissimilar to those inhabited by lions elsewhere. A key difference is the region's limited productivity resulting in limited amounts of available prey. In higher productivity East African ecosystems such as Serengeti, pride lionesses maintain home ranges between 20 and 400 km^2, while nomadic males (non-resident within a pride) may range as far as 4,000 km^2.[563] Across other parts of Africa pride home ranges average between 26 and 226 km^2.[564] In Etosha, Stander found home range sizes between 150 and 2,075 km^2, with a mean-average size of 416 km^2, suggesting that lions had adapted their home ranges to subsist on Etosha's relatively limited prey biomass. In other parts of Africa, researchers have shown home range size and prey biomass to be inversely related. Generally, lion home range studies have been performed within semi-closed systems, such as national parks. The effect that human and livestock presence has on lion range was unstudied at the time. During the late 1980s, the frequency with which dispersing lions moved from Etosha onto neighboring farmland suggested that the park had too many lions for the available resources; overwhelmingly these lions were killed once they left the park. In 1989, Stander estimated the number of lions in Etosha between 276 and 351.[565]

For researchers familiar with lions elsewhere, Etosha lions would not have seemed particularly abundant. However, Etosha during this period contained the region's highest density of lions, meaning that, for residents of northwest Namibia living alongside lions, the park was something of an ultimate source of HLC. At 22,270 km^2, Etosha is larger than Serengeti and Kruger – nearly three times the size of Yellowstone. However, almost a quarter of the park (4,760 km^2) consists of the Etosha Pan, a hypersaline depression where only extremophile microorganisms live permanently. Lions primarily inhabit the park's western woodlands and southern plains, ranging across approximately 17,700 km^2.[566] Within protected areas in Tanzania, including Serengeti, Packer et al. used an historical dataset to estimate mean-average lion density of 13.36 lions per 100 km^2; lion densities range as high as 40 lions per 100 km^2 in Ngorongoro

[563] Schaller, *The Serengeti Lion: A Study in Predator-Prey Relations*, 368–69.
[564] Haas, Hayssen, and Krausman, "Panthera Leo," 4.
[565] David W. Macdonald, "The Ecology of Carnivore Social Behaviour," *Nature* 301, no. 3 (1983): 379–84; Karl G. van Orsdol, Jeannette P. Hanby, and J. D. Bygott, "Ecological Correlates of Lion Social Organization (Panthers, Leo)," *Journal of Zoology* 206, no. 1 (1985): 97–112; Andrew J. Loveridge et al., "Changes in Home Range Size of African Lions in Relation to Pride Size and Prey Biomass in a Semi-Arid Savanna," *Ecography* 32, no. 6 (2009): 953–62; Stander, "Demography of Lions in the Etosha National Park, Namibia." Mean-average home range size was calculated using Stander's data. I removed one record of a nomadic male (2075 km^2) as a clear outlier. If this record is included mean-average home range size increases to 600 km^2.
[566] Stander, "Demography of Lions in the Etosha National Park, Namibia."

Crater.[567] Within Etosha, Stander found a lion density of 1.6-2.0 lions per 100 km^2, with the highest densities (2.5-2.9) recorded in the western woodlands, likely due to the numerous artificial water points constructed in the 1970s[568] and relatively high prey densities in the area. Etosha lion densities were the among the lowest recorded at the time. These data were achieved using nighttime binoculars, red spot lights, and individually marking lions once they were immobilized.[569] Not until the late 1990s would Stander find lower densities of lions in the northwest. It was during this period working in Etosha that Stander, learning from resident ecologist Hu Berry, developed many of the techniques that he would later refine on communal land in the northern Namib.[570]

Having completed his research on Etosha's lions in the mid-1990s and interested to learn more about lions in other semiarid areas, Stander moved to eastern Namibia. While there he worked with the Khoe-Sān on the use of traditional bushcraft and tracking methods for scientific study. This research revealed that many of Stander's technologically-advanced approaches for viewing lions at night could be accurately reconstructed afterwards by highly skilled Khoe-Sān trackers. In a peer-reviewed scientific paper, co-authored with Khoe-Sān trackers Ghau, Tsisaba, Oma, and Ui, Stander conclusively showed that expert-level local techniques of tracking and reconstructing past events based upon available environmental clues accurately assessed events involving large predators. This complicates the notion that Stander's technologically-mediated insights into lion behavior, sociality, and ecology were wholly novel. Though his technologically-advanced approaches were and would continue to be central to his work, Stander's Khoe-Sān colleagues demonstrated a nuanced understanding the behavior of lions and other predators. This suggests that historical interpretations of lions and the threats they pose to people and livestock, can be grounded in deep, nonwestern, knowledge. However, the abilities of Stander's Khoe-Sān colleagues were far from rudimentary and may demonstrate such 'higher-order' intellectual

[567] Sunquist & Sunquist, 2002 from: Jacobson and Riggio, "Big Cats in Africa: Status Update on the African Lion, Cheetah and Leopard, with Recommendations for Effective Big Cat Conservation Funding," 2.

[568] See chapter three.

[569] Craig Packer et al., "Effects of Trophy Hunting on Lion and Leopard Populations in Tanzania," *Conservation Biology* 25, no. 1 (2011): 142–53; Stander, "Demography of Lions in the Etosha National Park, Namibia." Stander notes a density of 0.3 lions in the Tarangire Game Reserve and Maasai Steppe, Kenya, citing H. F. Lamprey, "Estimation of the Large Mammal Densities, Biomass and Energy Exchange in the Tarangire Game Reserve and the Masai Steppe in Tanganyika," *African Journal of Ecology* 2, no. 1 (1964): 1–46. This appears to be a mistake as Lamprey found a mean-average density of 0.41 lions per km^2. More recent density estimates for the area have been consistently higher. Data from Packer et al. (2011) puts lion density in Tarangire between approximately 5 and 9.5 lions per 100 km^2. See: Jacobson and Riggio, "Big Cats in Africa: Status Update on the African Lion, Cheetah and Leopard, with Recommendations for Effective Big Cat Conservation Funding."

[570] Philip E. Stander, "Desert Lion Conservation News, 28 July, 2011. Dedication.," Desertlion.info, 2011, https://web.archive.org/web/20110816042503/http://www.desertlion.info/news.html.

abilities developed through a lifetime of close animal tracking, which may not be widely experienced among different groups of rural Africans.[571] What is clear is that technologically-mediated visions enjoyed by researchers such as Stander, and locally-developed techniques for examining and interpreting large predator behavior were not mutually exclusive. The final section of chapter six explores some of the possibilities for further aligning western and nonwestern approaches to generating knowledge about, and monitoring lions in northwest Namibia.

During Stander's time in Kaudom/Bushmanland, rumors were circulating that lions had been seen in the northern Namib once again. On a return visit, Stander was joined by a local resident, Duncan Gilchrist, reputed for his knowledge of the area, and together, driving and tracking, they positively identified evidence of lions inhabiting the Kharokhoab Mountains, located above two ephemeral riverbeds. Though they saw no lions. Energized by the possibility of studying lions in the rugged area, Stander switched his research focus to the northern Namib, where he had some field experience monitoring the small lion population as part of his ranger duties during the 1980s.[572] It appeared that a small number of highly adaptable lions had persisted in the extremely rugged Kharokhoab specifically because the area was so difficult to access for local pastoralists, limiting levels of HLC. Located within the Palmwag Concession – a government-leased tourism area amidst the communal land, where human access is controlled and livestock is prohibited, though the area is unfenced – the Kharokhoab remain little accessed by pastoralists and their livestock, who, according to existing regulations, are not supposed to graze within concession areas.

The possible return of lions in the northern Namib coincided with the development of the communal conservancy system there. As I showed in chapter three, in the late 1980s a committed group of conservationists teamed with traditional authorities in Kaokoveld to create the Community Game Guard program and other community-based natural resource management (CBNRM) approaches to wildlife conservation. Following independence in 1990 this morphed into the communal conservancy system, which came to be implemented in a variety of environments. In 1998, the first four communal conservancies were gazetted. Adapted from existing commercial conservancies in Namibia's central and southern areas, as well as successful programs in Zimbabwe and Zambia, and predicated on a market-based approach to conservation benefits flowing directly to local people, communal conservancies secured resource tenure (though not land tenure) for rural residents who would come-together to form their own

[571] Philip E. Stander et al., "Tracking and the Interpretation of Spoor: A Scientifically Sound Method in Ecology," *Journal of Zoology* 242, no. 2 (1997): 329–41; Louis Liebenberg, *The Art of Tracking: The Origin of Science* (Cape Town: David Philip, 1990).
[572] Stander, *Vanishing Kings: Lions of the Namib Desert*, 48–49.

conservancy.[573] At the time, devolving benefit rights was possible partially because wildlife was still seen to have relatively little value.[574] By the twenty-first century the communal conservancy system began taking-hold across Namibia. By 2018 there were 84 communal conservancies registered across Namibia, including 36 in the northwest. Almost the entirety of Kaokoveld now falls under communal conservancy designation, meaning that wildlife is protected and land remains under communal ownership. As I will show, the implementation of communal conservation had numerous unforeseen effects on the region's lion population and on the human-livestock-lion relationships there. However, the successes of the conservancies were, in the late 1990s, still in the future. For Stander, the question at the time was whether the remaining lions on this emerging communal land could constitute a viable population?

Into the Desert

The work started slowly: it was almost two years of driving through the region, field excursions that were months-long, and applying his own well-honed tracking skills, before Stander found a lion in the northern Namib. On darting this adult male in 1999, Stander was surprised to discover it had already been marked in Etosha, some seven years before. Beginning in the 1980s, Etosha staff individually marked lions with a hot-brand for easier identification. Once marked the lion was given a name, the convention being WPL-# ('W' for western Etosha, 'PL' for *Panthera leo*, plus a unique number to identify the individual). The lion that Stander had just immobilized was known as WPL-20. It was previously believed that WPL-20 had been shot on a farm bordering southwest Etosha in 1992. Rechristened XPL-1 ('X' for the Xhorixas constituency district where the study was now taking place), Stander carefully followed this male to a lioness who was immobilized and marked XPL-2. In the months that followed the newly-minted Kunene Lion Project (later Desert Lion Conservation) marked and collared a further 11 lions. This initial group of 13, consisting of at least one male from Etosha and a remnant population from the mountains, provided the basis for an intensive study of lions in the northern Namib.[575]

It is worth noting that Stander's use of individual identification and chemical immobilization, neither of which were novel at the time, were both important techniques in his research. As I noted in chapter four, certain lions had been given individual identifying names in Etosha since at least the 1950s. Benson has pointed out that human naming of research animals,

[573] Brian T. B. Jones, "The Evolution of a Community-Based Approach to Wildlife Management at Kunene, Namibia," in *African Wildlife & Livelihoods: The Promise and Performance of Community Conservation*, ed. David Hulme and Marshall W. Murphree (Oxford: James Currey, 2001), 160–76.
[574] Jones, "The Evolution of Namibia's Communal Conservancies."
[575] Stander, *Vanishing Kings: Lions of the Namib Desert*, 160–61.

in addition to being a useful tool for differentiating among subjects, is associated with a variety of moral commitments on the part of the researcher.[576] As would become clear throughout his career, Stander relied on tools and techniques to differentiate between individual lions – this was an important part of much of the knowledge he generated. Though I found no evidence of Stander strictly anthropomorphizing lions, he willingly acknowledges a certain connection to different individuals and, through long-term monitoring of their behavior, has aimed to uncover individual variations within the population.[577] The ability to reliably and repeatedly differentiate between lions, initially demonstrated by Pennycuick and Rudnai based upon vibrissa (whisker) spot patterns, remains crucial to Stander's research.[578] However, vibrissa are not clearly distinguishable from far away. To repeatedly identify individuals when populations exceed more than a few dozen requires the application of unique markers. In western Etosha lions had long been branded with distinguishing marks along their flanks. This required immobilizing lions, which, since the 1980s had been "an integral part of extensive studies and management of [large carnivores] in Etosha."[579] While individual identification of elusive species such as lions requires training, patience, and skill, chemical immobilization also require the necessary familiarity with chemistry and wildlife physiology to be performed safely. The result is a type of access to animals, in an almost total position of power, that would not have been available to other inhabitants of the region. Immobilization provided Stander a different way of 'seeing' lions, not just in terms of proximity, but also activity, then had existed before in the northern Namib. Haraway notes that different ways of seeing animals can also shift how humans construct boundaries between themselves and animals.[580] As environmental philosopher Holmes Rolston has argued, ethics regarding the world are generated within the context they take place.[581] By enabling a context of lion vulnerability, Stander not only transformed the methods for enabling his study of them, he and his colleagues working outside the park, likely created an entirely new context of human-lion relationships within the region. This type of experience can be incredibly moving for certain people and has been used to generate deeper feelings of commitment to lion conservation in the region in recent years, including among visits from high-profile and wealthy donors and potential donors. The first time I assisted with immobilizing and collaring a lion the

[576] Benson, "Naming the Ethological Subject."
[577] Stander, *Vanishing Kings: Lions of the Namib Desert*.
[578] C.J. Pennycuick and J. Rudnai, "A Method of Identifying Individual Lion with an Analysis of the Reliability of Identification," *Journal of Zoology* 160 (1970): 497–508.
[579] Philip E. Stander and P. vdB. Morkel, "Field Immobilization of Lions Using Disassociative Anaesthetics in Combination with Sedatives," *African Journal of Ecology* 29 (1991): 138.
[580] Haraway, *Primate Visions*; Haraway, *When Species Meet*.
[581] Holmes Rolston, "Are Values in Nature Subjective or Objective?," *Environmental Ethics* 4 (1982): 125–51.

overwhelming feeling I experienced was of responsibility: that because of what we had done, a very fragile living creature now depended upon us to remain safe and eventually wake up (but not too soon). In chapter six I return to the issue of how differently positioned people perceive human-lion relationships and how this may be exacerbating HLC.

Initially Stander's study was confined to the vicinity of the Aub canyon area of the Palmwag Concession. Quite quickly, Stander and his colleagues realized that their methods of studying lions in Etosha, following groups through the landscape in 4x4s with nighttime equipment, were insufficient for this new population and landscape. To cover the massive and rugged area Stander and his colleagues increasingly relied upon radio-collars which enabled them to pick up individual lion signals from as much as a few kilometers away. Because of the area's mountainous terrain and the inability of VHF (very high frequency) signals to penetrate rock, Stander increasingly took to the air.

Figure 23: A different view of lions in the northwest: from the air. Photo: Stander and Hanssen, 2003

Flying across the rocky, rugged, and remote northwest brought interesting new insights, which, combined with an increasing number of collars as well as the application of low-tech tracking methods, allowed Stander and his colleagues to find daytime resting locations for lions where

they recorded group composition, home range size, and group sex and age structure.[582] This unique combination of methods, and ability to effectively zoom the resolution of vision out to the landscape level via the aircraft, and in via time-tested methods of tracking and interpreting spoor on the ground, uncovered unforeseen behaviors of lions in the northern Namib. One of Stander's early reports shows his surprise:

> "Lions in the Aub canyon pride are favouring separate sub-groups and have spent the past 14 months in these sub-groups. The adult male, XPL-1, however, frequently visits the XPL-9 group. Although their ranges are largely overlapping such a long separation is most unusual. This might be a behavioural adaptation to the demanding habitat, but more data need to be collected."[583]

The lion social unit is the pride. Prides consist of related adult females and their dependent offspring. Prides maintain tenure over a home range. However, within a home range all pride members are rarely found together. Rather, adult females will split into groups and rejoin. This is called fission-fusion grouping; in most areas it occurs over a period of days.[584] What was initially puzzling in the northern Namib was that such fission-fusion dynamics were taking place over much longer timespans than recorded elsewhere. Between 2000 and 2005, Stander monitored the growing Aub canyon pride and recorded the grouping pattern changes among the pride females:

> "Adult lionesses of the [Aub canyon] pride frequently spend more than six months apart and a separation of three years was recorded between several of the pride females. Such long separations are unusual in lion social behaviour… We suggest that this unusual fission-fusion characteristic is a behavioural adaptation to the demanding condition imposed by the desert habitat."[585]

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[582] Philip E. Stander, "Research Progress Report - Population Ecology and Long Term Monitoring of Free-Ranging Populations in Namibia's Marginal and Aid Environments" (Windhoek, 2001), http://www.the-eis.com/viewfile.php?pth=data/literature/Population ecology and long term monitoring of free_ranging populations in Namibias marginal and arid environment.pdf.
[583] Stander, 4.
[584] Craig Packer, "The Ecology of Sociality in Felids," in *Birds and Mammals*, ed. Daniel I. Rubinstein and Richard W. Wrangham (Princeton: Princeton University Press, 1986).
[585] Philip E. Stander and Lise Hanssen, "Population Ecology of Desert-Adapted Lions in the Kunene Region, Namibia" (Windhoek, Namibia, 2003), 4, http://www.the-eis.com/viewfile.php?pth=data/literature/Population ecology of desert_adapted lions in the Kunene Region.pdf.

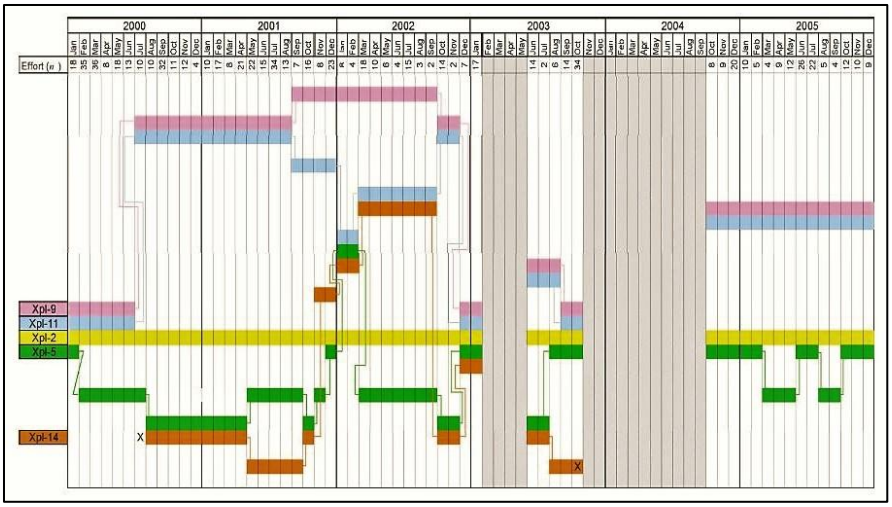

Figure 24: Schematic visualization of the months, between 2000 and 2005, that the Aub lionesses were observed together or apart by Stander. Number of observations for each month are listed. Grey areas indicate when no observations took place. XPL-14 first radio-collared in August 2000 and disappeared in October 2003. Source: Stander, 2006[586]

Elsewhere, lionesses separated for extended periods of time would have been considered by scientific researchers to form separate prides. However, the willingness of the Aub lions to rejoin after extended separations suggested a different type of grouping behavior. During this period of study, Stander found that group size, measured as the number of adult females per group, ranged from 1-5, with a mean-average of 1.59 (SE±0.06). By comparison, in Etosha, Stander found groups between 2-9, with a mean-average of 4.8 (SE±0.48) adult females. In the semiarid steppe of Kaudom/Bushmanland (Nyae Nyae Conservancy) in eastern Namibia, Stander found groups between 2-5, with a mean-average of 3.4 (SE±0.46), in the dune-savanna of Kgalagadi Transfrontier Park, Funston found groups between 2-8, with a mean-average of 4.18 (SE±0.58). In Serengeti, Mosser and Packer found groups between 1-21, with a mean-average of 4.64 (SE±0.18).[587] Generally, the methods employed by these researchers were consonant with the methods employed by Stander and his colleagues.

[586] Philip E. Stander, "Population Ecology and Demography of Kunene Lions, January 2006" (Windhoek, Namibia, 2006), http://www.the-eis.com/viewfile.php?pth=data/literature/Population ecology and demography of Kunene Lions_2006.pdf.

[587] The comparison is illustrative rather than definitive. Group size in the northern Namib is derived from the chart provided at: Stander, *Vanishing Kings: Lions of the Namib Desert*, 96–97. In Etosha and Kaudom/Bushmanland, Stander did not record different sizes of groups in each observation within a pride. When he notes average group size (5.6 ±3.8) in Etosha, it is inferred from the text that he is referring to observed adults and subadults. This is supported by another paper on foraging in which he states that the average foraging size was 5.6 lions and that all lionesses over 18 months of age participated. See: Stander, "Foraging Dynamics of Lions in a Semi-Arid Environment"; Philip E. Stander, "Ecology and Hunting Behaviour of Lions and Leopards" (Cambridge, 1994), 58. In Kgalagadi, Funston too assess only pride size: Paul J. Funston, "Population Characteristics of Lions (Panthera Leo) in the Kgalagadi Transfrontier

Stander noted that the small group sizes observed in the northern Namib raises questions about the social behavior of the desert-adapted lions, noting elsewhere that group size is a function of food richness,[588] implying that observed fission-fusion behavior is a response to limited prey availability. However, lion density in the northern Namib is similar to density in the other arid areas such as Kaudom/Bushmanland and the Kgalagadi dune-savanna (see below), where such fission-fusion dynamics are not recorded. An alternate hypothesis, suggested by Mosser and Packer, based upon more than thirty years of data in Serengeti, is that group size is driven by the demands of territorial and cub defense. Mosser and Packer found that individuals in larger groups had higher rates of reproductive success than individuals in smaller groups. They concluded that territorial competition between groups provides strong selective benefits for cooperative territorial defense – the inference being that territoriality rather than hunting may be a driver of sociality in lions.[589] This is an interesting hypothesis in light of the small group size among the desert-adapted lions observed by Stander. Because lions had been nearly extirpated in the region, this burgeoning population would not have had to contend with many intra-species competitors. During this period of observation four of the five females in the pride (XPL-2, 5, 9, & 11) each had cubs. (The fifth (XPL-14) was older and disappeared in October 2003.) However, cub defense from other lions would have been a low priority. Competitors, or the absence of them, also are part of the environment. Without the need for territorial defense, lions in the northern Namib may have been free to split into smaller groups without risking expulsion from other, larger groups. Taken in isolation, the still visible small group sizes in the northern Namib – groups of more than three adult females are rare[590] – suggests that larger group sizes in other areas may represent an arms race: when conflict is likely and group sizes increase other groups must follow suit or risk losing access to resources. However, lions in Serengeti may be more of an aberration than previously considered. Scientific monitoring of lions in and around the Gir Forest (India) by Chakrabarti and Jhala found that lionesses there maintain group sizes of 2.5 (SE±0.4).[591] The Gir Forest area is by no means resource-limited for lions: rainfall is plentiful, the ecosystem is productive, and there are high numbers of available prey. Yet, lions in the area

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Park," *South African Journal of Wildlife Research* 41, no. 1 (2011): 1–10. Anna Mosser and Craig Packer, "Group Territoriality and the Benefits of Sociality in the African Lion, Panthera Leo," *Animal Behaviour* 78, no. 2 (2009): 359–70.

[588] Stander, "Behaviour-Ecology and Conservation of Desert-Adapted Lions; 2007 Progress Report of the Kunene Lion Project, Namibia," 3.

[589] Mosser and Packer, "Group Territoriality and the Benefits of Sociality in the African Lion, Panthera Leo"; Mosser, Kosmala, and Packer, "Landscape Heterogeneity and Behavioral Traits Drive the Evolution of Lion Group Territoriality."

[590] Personal observation.

[591] Yadvendradev V. Jhala et al., "Asiatic Lion: Ecology, Economics, and Politics of Conservation," *Frontiers in Ecology and Evolution* 7, no. August (2019): 1–21.

maintain small group sizes even where home range overlap is high. This remnant population in the Gir area has its own unique history of near-eradication, recovery, and HLC spanning the precolonial, colonial, and postcolonial eras. Though I do not examine the Gir lions here, this case highlights the importance of examining the history of nonhumans to better understand variation among populations, rather than assuming that populations adapted to their particular environment are appropriate stand-ins for the species as a whole.[592] Across differing scales of organisms, researchers have begun convincingly linking environmental variations to behavioral adaptation, diversification, and speciation. Though more frequently observed at the cellular level,[593] this comparative natural history of lions suggests that large predators may also be fruitful subjects for such research. What drives group sizes and fission-fusion dynamics in different environments remains an open question.

During the late-1990s to early-2000s, lions in the northern Namib experienced rapid population growth. In a monitoring report submitted to MET, Stander and his colleague Lise Hanssen attributed this to several years of adequate rainfall, stable prey populations, and a notable lack of HLC.[594] In 1999 and 2000 the recorded population grew by 22% and 23% respectively, slowing to around 15% from 2001-2004, eventually leveling-off at 1.6% at the end of 2005.[595] During this period (1999-2003) Stander observed a mean-average number of cubs per female of 3.1; noting that cub survival was "unusually high," with only 9% mortality in the first year and none thereafter.[596] By 2004, Stander estimated that the initial population of 13 lions had increased to between 76 and 109 lions across all age classes. These numbers were the first high-quality data ever available on lion reproduction in northwest Namibia. Though Stander's methods and full-time commitment to monitoring lions in the region were not a complete departure from prior means of encountering lions in the area, by the early-2000s his career as specifically a lion researcher was a wholly new means of becoming-with lions in the region. It is notable that many of his research methods were developed in Etosha – though refined extensively outside the park –

[592] Further comparative analysis focusing on group size and home range, morphology, and predation between the desert-adapted lions, East African lions, and lions of the Gir Forest is underway.
[593] David W. Pfennig et al., "Phenotypic Plasticity's Impacts on Diversification and Speciation," *Trends in Ecology and Evolution* 25, no. 8 (2010): 459–67; Emilie C. Snell-Rood and Meredith K. Steck, "Behaviour Shapes Environmental Variation and Selection on Learning and Plasticity: Review of Mechanisms and Implications," *Animal Behaviour* 147 (2019): 147–56.
[594] Stander and Hanssen, "Population Ecology of Desert-Adapted Lions in the Kunene Region, Namibia."
[595] Philip E. Stander, "Population Ecology and Distribution of Lions in the Kunene and Erongo Regions, Namibia" (Windhoek, Namibia, 2004), http://www.the-eis.com/viewfile.php?pth=data/literature/Population ecology and distribution of lions in the Kunene and Erongo Regions.pdf; Stander and Hanssen, "Population Ecology of Desert-Adapted Lions in the Kunene Region, Namibia"; Stander, "Population Ecology and Demography of Kunene Lions, January 2006."
[596] Stander and Hanssen, "Population Ecology of Desert-Adapted Lions in the Kunene Region, Namibia."

in a landscape where human incursion was controlled and livestock absent. While lions in the northern Namib primarily inhabited the Palmwag Concession Stander's methods were incredibly well-suited to monitor the lions there. However, as the population grew and dispersed the prospect of HLC provided an increasing challenge to his efforts.

During this period, Stander's official reports display a tone of overall enthusiasm for the prospects of lions in the northern Namib. This successful recovery not only brought increased attention to the lion population, but to Stander, who was increasingly associated by the Namibian and international conservation communities as largely responsible for lions in the northern Namib. As the only recognized 'scientific' voice concerning the lions of the region, the knowledge Stander generated increasingly became the means through which the lions were accounted for and decisions concerning their management took place within Namibia's Ministry of Environment and Tourism (MET). As can be seen in Stander's website, desertlion.info, which was publicly-accessible during the mid-2000s, but has since been greatly scaled-back, Stander's research on the lions in the northern Namib was primarily single species in character. While this enabled him to focus specifically on scientific questions pertaining to lion behavior, sociality, and ecology, it did have the effect of conveying a picture of the region's lions that was largely free from the human-livestock-lion relationships which proved so pivotal to human experiences of lions in the past. The audience, however, for this website was those with internet access, which the vast majority of the region's inhabitants still lack. The identification of Stander with the region's lions was also noted within the local communities and by communal farmers, some of whom would come to refer to lions in the area as "Philip's lions." During surveys of communal pastoralists (see chapter six), when questioned about ongoing HLC challenges, one resident asked, "that Boer [white person] who is looking after lions; where is that Boer?"[597] Though Stander and other conservationists working in the area actively discouraged communal residents from identifying the lions with him, Stander's special, government-permitted, access to the lions and information concerning them entrenched this perspective.[598] Building upon his findings working with Khoe-Sān trackers, Stander and his colleagues actively sought to initiate increased community involvement with lion research and conservation on communal lands.[599] This project may have effectively bridged the gap between Stander's ways of seeing the lions and local experiences. However, for a variety of reasons, including limited resources, difficulty of moving

[597] Anabeb Pastoralist #11, Personal Communication, 2017.
[598] Stander, *Vanishing Kings: Lions of the Namib Desert*. Personal observation.
[599] Stander et al., "Tracking and the Interpretation of Spoor: A Scientifically Sound Method in Ecology"; Stander, "Research Progress Report - Population Ecology and Long Term Monitoring of Free-Ranging Populations in Namibia's Marginal and Aid Environments."

trainees across the vast and rugged landscape, unpredictable movements of lions and people, and Stander's unflinching commitment to time working in remote field locations, these initiatives did not coalesce into long-term programs during the first fifteen years of the 2000s.[600] As the lion population increased, recorded incidents of HLC increased, resulting in a growing agonistic tone that often pit communities against lion conservationists. Below and in chapter six I show the challenge that these growing numbers of lions would come to present to local pastoralists. This difficulty of addressing such challenges was compounded by the communities' identification of lions with researchers and government officials.

Cooperative Hunting in Etosha and the Northern Namib

That lions were surviving, even thriving, meant that the area's limited prey and human population, for the time being, was no obstacle to success. Using cooperative hunting methods first witnessed in Etosha, lions in the northern Namib were feeding growing cohorts of cubs and repopulating their former range. One of the challenges facing lions across Africa is their relatively low levels of hunting success. When Schaller, and then Packer, were performing early scientific research in Serengeti, it was thought that lions' sociality may be related to increased levels of hunting success experienced by larger hunting groups. However, for hunting success to be an evolutionary driver of sociality, it would need to confer clear selective benefits. Yet, in areas of high prey biomass group hunting is not clearly beneficial.[601] During their respective work in Serengeti, Schaller and Packer showed that solitary lions were successful hunters between 11% and 29% of the time, not significantly less often than groups, and this was augmented by obtaining as much as 40% of food items from scavenging.[602] Packer et al. found that female lions form groups for reasons beyond hunting. Larger groups were more successful in defending cubs from infanticidal males, securing and defending territory against other groups, and group size was also seen to be dependent upon the reproductive patterns of females in group. Noticeably absent were foraging (hunting and scavenging) benefits.[603] However, in Etosha, Stander recorded that solitary lionesses were successful hunters approximately 2.3% of the time, and Etosha lions scavenged only 6% of food items.[604] During the wet season (January-May) all group sizes met

[600] Personal observation and communication with anonymous conservationists working in northwest Namibia.
[601] Packer, Scheel, and Pusey, "Why Lions Form Groups: Food Is Not Enough."
[602] Packer, Scheel, and Pusey; Schaller, *The Serengeti Lion: A Study in Predator-Prey Relations*.
[603] Packer, Scheel, and Pusey, "Why Lions Form Groups: Food Is Not Enough."
[604] Stander, "Foraging Dynamics of Lions in a Semi-Arid Environment"; Philip E. Stander, "Cooperative Hunting in Lions: The Role of the Individual," *Behavioral Ecology and Sociobiology* 29, no. 6 (1992): 445–54.

minimum food requirements, estimated between 5-8 kg/day/lioness.[605] However, during the dry season (June-December), solitary hunters did not satisfy their daily food requirements, while groups foraging together did.[606] Stander posited that, during the wet season, when prey species were relatively abundant, cub defense, territorial acquisition and defense, and food may sufficiently explain lion grouping patterns. However, during the dry season Etosha lions were forced to forage in groups to meet their daily food requirements. Perhaps, Stander suggested, cooperative hunting among lions developed in semiarid conditions of low prey availability.[607]

Not only did Stander find clear benefits to hunting in groups, the dynamics of these group hunts showed high amounts of advanced coordination. Because he performed field research at night, Stander saw hunts as they took place. What he found were distinctly cooperative actions of group-focused, individual behavior, when lions were stalking prey. The first insight was that groups employed a variety of stalking patterns with varying success. Class A stalking patterns involved all lions approaching prey from a single direction. Class B involved two lions encircling prey while the others waited or advanced slowly, but did so irrespective of the encircling lions' actions. Class C involved the highest level of coordination, where encircling lions and lions advancing directly coordinated and adjusted their movements based upon each other and prey actions. The differences in hunt success were stark. Class C hunts were more successful (27%) than Class A (14%) and Class B (4%) hunts. Class C hunts secured 68% of kills, Class B 6%, and Class A 26%. The differential success is exacerbated by the amount of food secured via each method, 90% of Class A hunts secured small or vulnerable prey such as defenseless young and springhares (*Pedetes capensis*), while 87% of all large prey kills were from Class C hunts.[608]

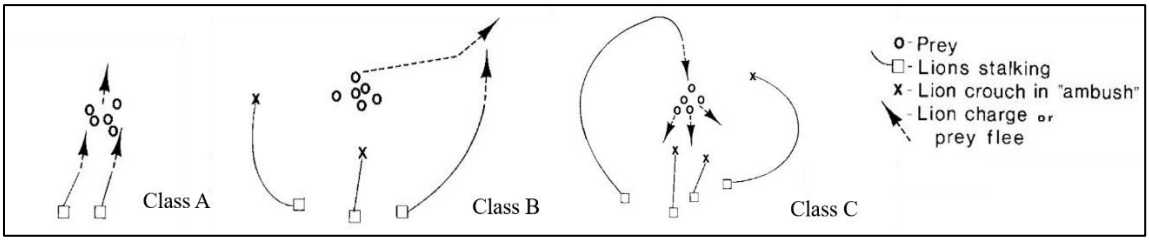

Figure 25: Three different stalking patterns of lions in relation to prey and other lions. Class A shows two lions stalking directly at prey. Class B shows two lions attempting to encircle prey while others wait in 'ambush' position. Class C shows coordinated cooperation: one lion circled the prey, charged, and drove prey back to lions in 'ambush' positions. Source: Stander, 1992

[605] Packer, Scheel, and Pusey, "Why Lions Form Groups: Food Is Not Enough."
[606] Stander, "Foraging Dynamics of Lions in a Semi-Arid Environment."
[607] Stander, "Cooperative Hunting in Lions: The Role of the Individual."
[608] Stander, "Foraging Dynamics of Lions in a Semi-Arid Environment."

These striking results were deepened further when Stander shifted his attention from the group back to individuals within groups. Likening the positions occupied by each lioness to players in rugby or soccer, Stander recorded how different individuals repeatedly and preferentially occupied "left wing," "right wing," or "center" within the group's formation. These patterns were found across four separate prides and were employed when hunting a variety of species. When a majority of the lions occupied their preferred positions, group success was greater than twice that of hunts where fewer than half the lions occupied their preferred positions. The groups were also five times more likely to occupy a majority of favored positions than to occupy non-favored positions. This showed that not only is cooperative hunting more successful for lions in Etosha, but that these prides were able to further improve their success by individuals occupying certain positions while hunting. Stander suggests that this "complex division of labor in lionesses…may have evolved from the fundamental advantage of higher per capita food intake derived from cooperative hunting during the dry season."[609] These conclusions suggest that, having developed these strategies in environments unlike those occupied by other lions in Africa, the lions of northwest Namibia can push forward researchers' and conservationists' understanding of feline sociality and hunting behavior as a response to environmental pressures.

Among the growing population of lions in the northern Namib these strategies had to be adapted to smaller hunting group sizes and different environmental challenges. During extensive observations Stander witnessed levels of cooperation similar to those displayed on the Etosha plains. Again, lions preferentially occupied certain positions. In this case, fluctuating group sizes due to longer-term fission-fusion dynamics meant that lionesses often hunted in pairs – rather than in groups of four to six as in Etosha[610] – in which case individuals selectively occupied 'right' and 'left wing' positions. Mobilizing smaller groups could mean utilizing extensive stalking routes to approach prey. The lions also appeared to use the environment to their advantage, including trapping prey against cliffs and other obstacles. As in Etosha, success rates were higher (21%) during cooperative hunts. However, solitary hunt success in the northern Namib (14%), was higher than solitary hunt success in Etosha (2.3%), and similar to solitary hunting success of lions elsewhere in Africa.[611] In comparison to Etosha, the ability to hunt cooperatively in the northern Namib does not appear as important. It may be that the desert-adapted lions have become more adept solitary hunters, due to large amounts of time alone. Due

[609] Stander, "Cooperative Hunting in Lions: The Role of the Individual," 453.
[610] Stander, "Foraging Dynamics of Lions in a Semi-Arid Environment."
[611] Stander, *Vanishing Kings: Lions of the Namib Desert*, 113; Schaller, *The Serengeti Lion: A Study in Predator-Prey Relations*, 445.

to their abilities to capture prey in small groups, by 2006 Stander was suggesting that small groups of desert-adapted lions "may have developed communal hunting techniques more advanced than those recorded in Etosha."[612] Perhaps cooperative hunting in small groups also made them more adept solitary hunters. More information is needed. In controlled settings, lions and other social predators have been shown to outperform solitary predators in adopting to novel challenges.[613] Stander suggests that, given the relative scarcity of prey, large areas covered, and extreme environments, lions in the northern Namib have to work harder for prey items than lions elsewhere.[614] Stander's observations remind us that across the species' history, lions have inhabited a variety of challenging environments, including arid and semiarid ones. In this regard, lions in the northern Namib may provide insight into how recently extirpated populations of lions in the Aïr Mountains or Barbary Coast once lived.

Concerning HLC challenges, high amounts of hunting coordination suggests that lions in the northern Namib are highly adaptable to changing environmental circumstances, including humans and livestock. When lions target livestock, cooperative hunting approaches can drive livestock to stampede, either within enclosures or in the field, and in certain cases lions in the northern Namib appear to adapt their hunting times to when pastoralists move livestock into and out of enclosures. In one area in particular, pastoralists recognize that a group of formerly nocturnal hunting lions have taken to chasing livestock during the day when they are outside of their enclosure.[615] Whether lions in the northwest use such cooperative techniques when targeting livestock has not been examined. It is also, for pastoralists, largely beside the point. As I will show in chapter six, pastoralists in northwest Namibia interpret lion actions primarily for their results, not regarding their methods. While Stander's ability to view cooperative hunts was enabled by his available technology, as well as his high degree of skill in tracking and interpreting lion movements and behavior, for communal pastoralists lion hunting is mediated by concern for livestock and human safety. However, whether lions experience the hunting of livestock differently than hunting wildlife, as has been suggested for human-livestock-lion relationships in Botswana, may be an important consideration regarding HLC.[616]

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[612] Philip E. Stander, "31 October, 2006 - Nocturnal Behavior of Desert Lions," Desertlion.info, 2006, https://web.archive.org/web/20080111002559/http://www.desertlion.info/news06b.html.
[613] Natalia Borrego and Michael Gaines, "Social Carnivores Outperform Asocial Carnivores on an Innovative Problem," *Animal Behaviour* 114 (2016): 21–26.
[614] Stander, *Vanishing Kings: Lions of the Namib Desert*, 113.
[615] Conservancy Leader #4, Personal Communication, 2019. Personal observation.
[616] Marion Valeix et al., "Behavioural Adjustments of a Large Carnivore to Access Secondary Prey in a Human-Dominated Landscape," *Journal of Applied Ecology* 49, no. 1 (2012): 73–81.

Lions also appeared to adapt prey choices to the rigors of living in the northern Namib. Prey selection among lions varies widely across Africa. In Serengeti, Packer and Scheel recorded seven prey species – wildebeest, zebra, Thomson's gazelle (*Eudorcas thomsonii*), buffalo (*Syncerus caffer*), warthog (*Phacochoerus africanus*), hartebeest (*Alcelaphus buselaphus*), and topi (*Damaliscus lunatus jimela*) – accounting for more than 90% of carcasses and biomass consumed.[617] In Kaudom/Bushmanland, Stander recorded that kudu (69.3%) and oryx (25.8%) accounted for the vast majority of biomass consumed.[618] Prey preferences can also depend on whether male or female lions are doing the hunting: male lions in Kruger are recorded as preferring buffalo, while females focus on smaller ungulates.[619] In Etosha, Stander found that springbok, a relatively small antelope, formed the most important part of lionesses' diet, both in terms of numbers killed and biomass consumed, followed by wildebeest and zebra. Lionesses also killed high numbers of springhare, which yield very little meat; though this appears to have been primarily through incidental foraging encounters. These findings were revealing because it was believed that lions in Etosha primarily preyed on larger species. By performing observations at night, Stander found that springbok carcasses left little remaining biomass and therefore were being overlooked by park staff recording carcasses a day or two after lion hunts. This focus on hunting springbok may have been a recent historical adaptation. During the 1970s Etosha's wildebeest population declined dramatically due to the spread of anthrax.[620] As food sources dwindled in the 1980s lion numbers in the park decreased. Stander hypothesized that changing from a diet of primarily wildebeest to primarily springbok, who yield less meat, would have affected cub survival and may have caused the splitting of larger groups no longer able to meet food requirements. Though the population of Etosha lions struggled during these years, by the end of the 1980s they seemed to have adapted. Killing smaller prey meant more frequent hunting and the limited amount of prey biomass in Etosha entailed greater distances traveled to secure this prey. The emphasis on smaller prey, more hunts, greater distances, and limited scavenging is a stark contrast to lions elsewhere, but these adaptations are likely key to ensuring survival in Etosha's challenging semiarid environment.

Environments in the northern Namib can be extreme: lions must traverse mountains and large gravel plains to reach the sparsely populated ephemeral riverbeds. Here relatively small groups of lions showed great flexibility in targeting prey species. From 1999 to 2017 Stander

[617] D. Scheel and Craig Packer, "Variation in Predation by Lions: Tracking a Movable Feast," in *Serengeti II: Dynamics, Management and Conservation of an Ecosystem, 299*, ed. A. R. E. Sinclair and Peter Arcese (University of Chicago Press, 1995), 299–314.
[618] Stander, "Ecology and Hunting Behaviour of Lions and Leopards," 68.
[619] Haas, Hayssen, and Krausman, "Panthera Leo," 4.
[620] See chapter three.

found that 57% of carcasses and 89% of biomass consumed came from oryx. Though springbok were more numerous in the region during this same period,[621] they primarily occupy open plains where vegetation is sparse and available grasses are short, providing little cover for hunting and scant shade during the searing daytime. In contrast, both oryx and lions favor the region's ephemeral riverbeds.[622] Other prey species, including ostrich (*Struthio camelus*) and seabirds at the coast seem to sustain different lion groups during trying times. With low amounts of prey and few predators, scavenging of carcasses is a negligible source of food (<2%).[623] Notably, certain groups became quite adept at hunting adult giraffe. Such hunting in particular requires a high amount of coordination and a particular amount of skill: giraffes are fast, have a high vantage point to see would-be predators, and their kicks have been known to kill lions. One male coalition in particular (XPL-89, 90, 91, 92, & 93 – the 'Five Musketeers') appeared to have learned the special skills of giraffe hunting from a seasoned lioness (XPL-10). As observed in Etosha and the northern Namib, during these hunts the young coalition members occupied 'wing' and 'center' positions. Over time they became skilled giraffe hunters. For a growing coalition of young males, the biomass of an adult giraffe, about 1,500 kg, represented an important part of surviving in the desert.[624] For lions in the northern Namib, hunting in riverbeds and floodplains favored by large-bodied species is critical to survival. Crucially, these are also areas inhabited by livestock when grasses on the plains fail for lack of rain. Taken together, these hunting adaptations suggest that lions in the northern Namib, as well as elsewhere, have population-specific histories that affect their interactions with other organisms; suggesting that human-livestock-lion interactions are also site-specific.

[621] See Appendix 1.
[622] Stander, *Vanishing Kings: Lions of the Namib Desert*, 180.
[623] Stander, 108–9.
[624] Stander, 272–73.

Figure 26: sub-adult desert-adapted lion rushing giraffe in Hoanib riverbed. Source: Desert Lion Conservation[625]

Movements Across the Landscape

The preponderance of cubs and subadults in the early 2000s meant that dispersing subadults needed to find new territories. Stander had earlier recorded a mean-average home range size of 416 km^2 in Etosha, among the largest recorded at the time. What was revealed in the northern Namib was of another magnitude entirely. From 2008 and 2015, Stander recorded lioness home ranges between 618 and 12,642 km^2, with a mean-average size of 3,577 (±3,316) km^2. In the semiarid steppe environment of Kaudom/Bushmanland in eastern Namibia, Stander found that the range was between 1040 and 1178 km^2, with a mean-average size of 1109 (±69) km^2, though the sample size was small.[626] The next largest recorded mean-average home range was in the dune-savanna environment of Kgalagadi. Funston found home ranges between 1762 and 4,532 km^2, with a mean average size of 2,823 (±997) km^2. Funston noted that home ranges in the Kgalagadi were "exceptionally large" for lions, and that different home range sizes in different environments likely reflect differences in prey abundance.[627]

Home ranges in the northern Namib are also dynamic: they shift from time to time; further complicating the difficulties of monitoring lions over such large areas. One example is the home range of XPL-10. From her birth in 1998 until her death in 2014 this lioness occupied a total home range of 12,642 km^2. However, a closer examination of her movements reveals separate, distinct home ranges throughout her life. A lioness born to the Aub pride in September 1998, she was collared by Stander in late 1999, who used remote radio- and satellite-tracking techniques to monitor her movements until she died. XPL-10 dispersed in November 2000 and extended her home range north to the upper Hoanib riverbed in 2001 (range: 5,776 km^2). In July 2001 she was spared following a conflict incident when the villagers of Puros elected for her to be translocated to near the mouth of the Hoaruseb River in Skeleton Coast National Park, rather than be destroyed. In March 2002 she had her first litter of cubs within sight of the ocean. From 2002-2004 she occupied the Hoaruseb riverbed and coastal floodplain (range: 980 km^2); extending southeast of the Hoaruseb into the mountains surrounding Okongwe in 2005 with her

[625] https://www.desertlion.info/lion-population/hoanib-river.html
[626] Stander, "Ecology and Hunting Behaviour of Lions and Leopards."
[627] Mean-average home range of the desert-adapted prides incorporates two outlying variables, one low (618 km^2), one high (12,642 km^2). When these are removed mean-average home range is 2,898 km^2 (±1,287). If Funston's data is subjected to the same treatment the resulting home range is 2,608 km^2 (±512). Namibia Ministry of Environment and Tourism, "Human-Lion Conflict Management Plan for North West Namibia," 21–22; Funston, "Population Characteristics of Lions (Panthera Leo) in the Kgalagadi Transfrontier Park."

second litter (born in April 2004) (range: 2,122 km^2). In May 2006 she began a return to the Hoanib after an apparent five-year absence (range: 2,599 km^2). She was soon occupying the Hoanib floodplain with her third litter, who, at 18 months of age, she began teaching to hunt giraffe. She lost her fourth litter of cubs in the coastal dunes but gave birth to her final, fifth litter in 2012. For most of the rest of her long life she remained close to the coast, between the Hoanib and Hoaruseb rivers. She died on 17 May 2014 in the Hoanib floodplain of apparent kidney failure.[628] The data on XPL-10's changing home range throughout her life could be generated because Stander affixed a radio-collar to her early in her life, performed the diligence to periodically check her location, and replaced the collar as needed for almost fifteen years. This type of life history that Stander was recording during this period provided unparalleled information about lions in the northwest further complicating how humans understand lions in there. Yet, as the experience of XPL-10 and the villagers of Puros shows, the specter of human-livestock-lion relationships was also present. Though XPL-10 primarily inhabited areas that are usually devoid of livestock, such as Okongwe and the Hoanib floodplain, the incident in Puros, as well as the fate of the 'Five Musketeers', who she taught to hunt giraffe and all of whom died following HLC incidents, suggests that how HLC effects lion range is an important factor in the lives of lions in the northern Namib.

Diverse factors drive habitat selection in predators. The factors driving home range changes are unknown, but across the northern Namib different groups are continuously changing their home ranges.[629] Whether the scale of movement in the northern Namib makes home range changes more apparent than elsewhere, or whether this is a unique adaptation, requires further study. The lives of individual lions, their movements and changes in territoriality, also affect experiences of HLC. In chapter six I show how lion movements in the northern Namib have helped form the conviction among pastoralists that lions are particularly numerous in certain areas.

[628] Stander, "Behaviour-Ecology and Conservation of Desert-Adapted Lions; 2007 Progress Report of the Kunene Lion Project, Namibia"; Philip E. Stander, "Desert Lion Conservation News, May 2014," Desertlion.info, 2014, web.archive.org/web/20160326214607/http://www.desertlion.info/news14may.html; Stander, *Vanishing Kings: Lions of the Namib Desert*, 250–51.
[629] Stander, "Behaviour-Ecology and Conservation of Desert-Adapted Lions; 2007 Progress Report of the Kunene Lion Project, Namibia."

Figure 27 (left): XPL-10, ca. 2012. Source: *Vanishing Kings* documentary

Figure 28 (right): Puros villagers and XPL-10 following 2001 conflict incident. Source: Stander, 2018

In comparison to elsewhere, lions in the northern Namib cover long daily distances. Compiled reports by Stander for the Ministry of Environment and Tourism (MET) state that females move an average of 7.3 (± 0.9) km per night and males move 9.3 (± 1.2) km per night. In contrast, Mosser and Packer found that Serengeti lionesses move less than 3 km per night.[630] The preeminent factors influencing movements appear to be prey availability – the movement and location of prey across a highly heterogeneous landscape – and social interactions. However, these averages obscure the large range of distances that can be traveled per night (0-55 km). Stander notes that on 42% of observed nights lions moved fewer than 5 km, these generally occurred following successful hunting. As the time from last kill increased, Stander found that the nightly movement distance of two monitored lionesses increased linearly and the pair moved more consistently in search of prey.[631] When males are dispersing from their natal pride to find their own home range, and when females are raising cubs, the amount of distance covered can also increase dramatically. An example of this is a pair of lionesses (XPL-37 & 38), each raising their first litter of cubs together in the Hoaruseb riverbed in 2008. From September to December the two lionesses regularly stashed the cubs (two 8-11 months old, one 5-8 months) in thickets along the riverbed while they went hunting in the nearby mountains and rocky plains – once for

[630] Namibia Ministry of Environment and Tourism, "Human-Lion Conflict Management Plan for North West Namibia," 21; Mosser and Packer, "Group Territoriality and the Benefits of Sociality in the African Lion, Panthera Leo."

[631] Philip E. Stander, "Movement Patterns and Activity of Desert-Adapted Lions in Namibia: GPS Radio Collars" (Windhoek, Namibia, 2009), http://www.the-eis.com/viewfile.php?pth=data/literature/Movement patterns and activity of desert_adapted lions in Namibia_GPS radio collars.pdf; Stander, *Vanishing Kings: Lions of the Namib Desert*, 108–9.

as long as 72 hours continuously. During one successful hunt they killed an oryx 17 km away, at which point they returned to the cubs and escorted them back to the carcass. Another oryx was killed 12 km away and the process was repeated. In each of these instances the lionesses covered more than 30 km to ensure that they and their cubs were fed.[632] This period also revealed that a resident male (Xpl-44) in the area would frequently 'babysit' for the cubs while the lionesses were away. The resulting picture provided by Stander is that nightly movements vary but are driven by changing environmental and social factors. Distances traveled to secure prey increases movement distances. Males and lionesses with dependent offspring need to acquire greater amounts of food than other demographic classes of lions. Daily food intake for adult females in the desert is between 10.8-12.1 kg/day and 14.3 kg/day for males. Subadults consume equal amounts, and large cubs three quarters as much, as adult females.[633]

The utilization of such large home ranges means densities in the northern Namib remain relatively low. Paradoxically, this can generate HLC. Lion densities in the northern Namib are the lowest recorded in Africa. Stander found densities of 1.6-2.0 lions per 100 km^2 on the Etosha plains in 1989; Kilian & Moeller estimated Etosha lion density at 2.67 lions per 100 km^2 in 2015. In contrast, since 2003, Stander has recorded density estimates for lions ranging from 0.05-0.10 lions per 100 km^2 in low density areas to 0.38-0.62 lions per 100 km^2 in high density areas. In 2019 I compiled available information for the northern Namib and estimated low density areas at 0.33 lions per 100 km^2 and high density areas at 0.53 lions per 100 km^2.[634] The picture painted is of a massive area (38,950 km^2) inhabited by a small number of lions. These densities are similar to lions in two other semiarid areas. In the Kaudom/Bushmanland lion density estimates range from 0.2-0.47 lions per 100 km^2. In the dune-savanna environment of the Kgalagadi, density

[632] Philip E. Stander, "Desert Lion Conservation News, September-October, 2008," Desertlion.info, 2008, https://web.archive.org/web/20081019014011/http://www.desertlion.info/news.html; Philip E. Stander, "Desert Lion Conservation News, October - December, 2008," Desertlion.info, 2008, https://web.archive.org/web/20081211092034/http://www.desertlion.info/news.html; Philip E. Stander, "Desert Lion Conservaton, GPS Radio Collars - Hoaruseb Pride," Desertlion.info, 2008, https://web.archive.org/web/20081212035510/http://www.desertlion.info/gpscollars/gps_44.html.
[633] Stander, *Vanishing Kings: Lions of the Namib Desert*, 108–9. Van Orsdol 1982b from: Stander, "Demography of Lions in the Etosha National Park, Namibia."
[634] Stander and Hanssen, "Population Ecology of Desert-Adapted Lions in the Kunene Region, Namibia"; Stander, "Population Ecology and Distribution of Lions in the Kunene and Erongo Regions, Namibia"; Stander, "Population Ecology and Demography of Kunene Lions, January 2006"; Stander, "Behaviour-Ecology and Conservation of Desert-Adapted Lions; 2007 Progress Report of the Kunene Lion Project, Namibia"; Philip E. Stander, "Tourism and the Conservation of Desert Lions in Namibia," 2008; Philip E. Stander, "The Impact of Male-Biased Mortality on the Population Structure of Desert-Adapted Lions in Namibia," 2010, http://www.the-eis.com/viewfile.php?pth=data/literature/The impact of male_biased mortality on the population structure of desert_adapted lions in Namibia.pdf; Stander, *Vanishing Kings: Lions of the Namib Desert*. See Appendix 2.

estimates range from 0.77-1.72 lion per 100 km^2.[635] As with groups size and mean-average home range, the Kaudom/Bushmanland semiarid steppe and Kgalagadi dune-savanna density suggests that lion density is strongly correlated to environmental factors.

Low lion densities in this low productivity ecosystem can contribute to HLC. When prey species are scarce, lions will seek nourishment elsewhere. When pastoralists know that lions are inhabiting particular areas in the northern Namib, they will generally avoid those areas and pass that information along to their kin and neighbors. However, because lion densities and prey densities are low and lions cover large home ranges, it is difficult to know where lions are at any given time. The relative low availability of local knowledge concerning lion movements contrasts greatly with Stander's ability to monitor lions at night, from the air (though this practice has been discontinued) and remotely. For local people who live with lions and livestock uncertainty about lion movements is still an important factor. During the early 2010s Stander sought to remedy this problem by providing up-to-date lion movement information on his website. This was greeted enthusiastically by communities but was discontinued because tourism and hunting operators were using the site to find lions, leading to increasingly aggressive human-lion interactions and concerns about the safety of both. Once these updates no longer became available, a tone of uncertainty concerning lion movements once again became widespread, raising questions about who has access to which information about potentially dangerous wildlife.[636] At the close of chapter six I introduce a local program designed to disseminate information about lion movements to local pastoralists to limit the likelihood of HLC.

Home ranges, density, and movements initially construct a picture of a highly mobile, sparse population spread across a heterogenous and challenging landscape. Digging further into the patterns contrasting lions in the northern Namib with those in other semiarid and arid environments reveals familiar behaviors and patterns adapted to extreme conditions. Though densities have shifted and population sizes have risen and fallen since 2000, the most noteworthy feature of lions in the northern Namib for those that do not have to live alongside them has been, and continues to be, their scarcity. Absent new information there is little reason to suspect lion numbers or abundance have greatly exceeded, or will greatly exceed, the numbers and abundances I have compiled here for the northern Namib. The small numbers render the population susceptible to stochastic events. However, it may have been their low abundance, high

[635] Funston, "Population Characteristics of Lions (Panthera Leo) in the Kgalagadi Transfrontier Park"; B. Otto Beukes, Frans G.T. Radloff, and Sam M. Ferreira, "Estimating African Lion Abundance in the Southwestern Kgalagadi Transfrontier Park," *African Journal of Wildlife Research* 47, no. 1 (2017): 10–23; J. G. Castley et al., "Estimation of the Lion (Panthera Leo) Population in the Southwestern Kgalagadi Transfrontier Park Using a Capture – Recapture Survey," *African Zoology* 37, no. 1 (2016): 27–34.
[636] Stander, personal communication, 2018. Personal observation.

mobility, and adaptation to environmental extremes that saved the population from extirpation.[637] In chapter six, I show that pastoralists in the region assess lions very differently. As I showed in chapter four, human-lion interactions are greatly mediated by the presence, and human ownership of, livestock. Much of the information in this chapter, primarily derived from Stander's reports, has treated lions in relative isolation, though this began to change towards the middle of the 2000s as HLC incidents increased. Though it may not be the case for Etosha, lions in the northern Namib share land with humans and livestock, which affects the lives and deaths of lions there.

Conclusion: The Return and New Challenges

The population growth of lions in the northern Namib in the early 2000s provides insight into the historical number of lions in the region. By 2005 lions among or directly descended from the first 13 collared around Aub canyon were ranging from the Kunene river in the north, down to the Omaruru in the south and all the way to the border of Etosha. In one case a pair of young males (XPL-19 & 20) even took up residence along the western border of Etosha. This was the first known case of lions returning east, suggesting the populations could enjoy limited two-way interactions, rather than the west simply being a population sink.[638] This range nearly encompasses the breadth of locations for which there exist records of lions in the region. In as little as two generations, this small cohort had gone from occupying a nearly-unreachable mountain refuge, to their progeny ranging across the northern Namib. In a 2006 report, Stander hypothesized that a significant linear relationship existed between the number of lions in the northern Namib and the size of the range they occupy.[639] If this is the case, then increasing lion numbers would mean increasing possibilities of HLC across the population's range. Stander's monitoring and analysis suggests that historical numbers of lions in the northern Namib were similar to those seen since 2005. I have shown ample historical evidence that HLC was experienced across the region for perhaps hundreds of years. Though lions' historic range and numbers before they were nearly extirpated will likely remain uncertain, the presence of HLC ties these different eras together. As lion numbers were recovering in the early 2000s, Stander and his colleagues began referring to this population as the 'desert-adapted lions' of the northern Namib. This name concisely describes the adaptations of the population to the extreme conditions in the northern Namib, including their long-standing history of human-livestock-lion interactions.

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[637] See Appendix three for a chart of lion populations in Etosha and the northern Namib, as compiled from the evidence cited in this dissertation.
[638] Stander, "Behaviour-Ecology and Conservation of Desert-Adapted Lions; 2007 Progress Report of the Kunene Lion Project, Namibia."
[639] Stander, "Population Ecology and Demography of Kunene Lions, January 2006."

Stander's extended gaze into the lives of desert-adapted lions of the northern Namib generated, and continues to generate, new information about the lives of lions there. By employing technologically-advanced methods Stander transformed the tenor of human-lion relationships in northwest Namibia. Not only by collecting scientific information but by disseminating this to the government back in Windhoek, and through the recent publication of a glossy picture book and release of two popular international documentaries, Stander has brought increased attention from beyond the region to the existence, and potential conservation plight, of the desert-adapted lions. During the 2000s and 2010s, the information Stander and his colleagues generated provided important insight into lions in northwest Namibia. However, it enabled ways of seeing lions that were not historically available within the northwest – nor are these methods largely available to people living within lions in the region in 2019. Stander's new information about lions created a new type of asymmetry. Whereas past government's largely ignored the challenges of HLC in the region, leaving residents to define and address the problem as they could, draft and official policy documents from MET since the mid-2000s make it clear that Stander's approaches greatly inform government policy concerning lion conservation interventions and HLC and that the government contextualizes lion conservation within international scientific research increasingly concerned with Africa's disappearing lions.[640] It is too soon to know what effect this new information and increased attention will have on the tenor of human-livestock-lion relationships in the region. As I mentioned at the beginning of this chapter, the lions of northwest Namibia are still considered a scientifically unknown population by the IUCN. This is largely due to the fact that Stander's work between 1997 and 2018 was not published in peer-reviewed journals, and was only recently made accessible in the form of popular documentaries. Most recently Stander has increasingly been turning his attention to the 'coastal-roaming' lions inhabiting the Skeleton Coast National Park. Because the park is closed to pastoralists and their livestock this should limit the amount of HLC which takes place. However, the coastal-roaming lions also move further east to where pastoralists graze their livestock.

By recontextualizing Stander's research within the longer history that I have outlined, conflict between humans and lions is not to be interpreted as a historical anomaly. Rather, the approach of focusing on the lions of northwest Namibia in relative conceptual isolation from their interactions with humans and livestock is the historical anomaly. Stander's ground-breaking work has not only transformed understandings about lions in northwest Namibia, but also human

[640] Namibia Ministry of Environment and Tourism, "A Draft of Lion Conservation Management Plan" (Windhoek, Namibia, 2008); Namibia Ministry of Environment and Tourism, "Human-Lion Conflict Management Plan for North West Namibia."

perspectives on the relationships between lions and livestock. Focusing on lions in relative isolation from humans and livestock, risks recasting humans and livestock as exogenous factors in the lives on lions in the region. However, the lives of humans, livestock, and lions in northwest Namibia are bound together, and have been bound together for a long time. Integrating HLC into questions surrounding lion conservation interventions is thus reconceptualized as a recognition of the region's long history of human-lion relationships. Viewed in this light, HLC appears to be an inescapable problem in northwest Namibia, as long humans, livestock, and lions reside there.

Humans and their livestock are, perhaps more now than ever, an important part of the environment in northwest Namibia, even if in Etosha and the Skeleton Coast their presence can be overlooked largely overlooked. In the northern Namib, the return of the desert-adapted lions has brought complaints and criticism from inhabitants of communal land. As the communal conservancy system has grown in extent and visibility, local perspectives on human-wildlife conflict are increasingly being heard in different forms of media. Around 2005, as lion numbers in the region began stabilizing, HLC began increasing. In the coming years the effects of HLC would become the greatest threat to the desert-adapted lions. Since 2000, shooting or poisoning related to HLC has caused 89% of adult and subadult lion mortalities on communal land. In particular, subadult males' propensity for raiding livestock and being killed in retaliation, and adult males' value as hunting trophies, is skewing the sex ratio, imperiling the population's viability even when seemingly adequate numbers of lions survive. From 2005 to 2010 the male share of the population showed a marked decline. This was attributed by Stander to increases in shooting and poisoning.[641] In 2015, MET estimated the population of lions in the northern Namib to be 180 individuals. However, the skewed female to male ratio (1:0.18), meant that fewer than 35 males were estimated to survive in the region.[642] The uptick in HLC-related lion mortalities calls into question the viability of the lions within the northern Namib. However, it is now abundantly clear that it is not due to the region's challenging environment that lions there are vulnerable, but rather to the seeming inability of lions and pastoralists to share this landscape. Whereas before the 2000s the challenge of human-livestock-lion relationships was largely confined to embodied experiences of humans, livestock, and lions sharing the landscape, Stander's research has brought a new dimension to these relationships. This has created a new, lion-focused paradigm which previously did not exist, save perhaps within Etosha. This has transformed HLC within the region. Chapter six delves into the ongoing issue of HLC on

[641] Stander, "The Impact of Male-Biased Mortality on the Population Structure of Desert-Adapted Lions in Namibia."
[642] Namibia Ministry of Environment and Tourism, "Human-Lion Conflict Management Plan for North West Namibia."

communal land in northwest Namibia. Examining the effects that lions are having on communities there allows conservationists and other outsiders to better understand the on-the-ground challenges of living with lions. Contextualizing it within the region's recent history suggests that this contemporary problem is properly conceived as part of a broader history of human-livestock-lion interactions within the region.

Chapter Six: Desert-adapted Lions and CBNRM, 2010s-?

Figure 29: Cow and young girl following conflict incident, Anabeb Conservancy, 2018. Photo: A. J. Wattamaniuk

Introduction

This final chapter (re)centers the lived experiences of communal pastoralists in northwest Namibia and synthesizes them with the history already explored. While Stander's work brings the behavior, sociality, and ecology of lions in the northwest into relief when compared against other lion populations, that is not how the vast majority of communal pastoralists understand lions or human-livestock-lion interactions in northwest Namibia. Currently, HLC-related killings are threatening the viability of the region's desert-adapted lion population. To meet this challenge, I argue that reframing human-livestock-lion interactions based upon other human-animal relationships maintained by the ovaHerero can produce more equitable lion conservation outcomes. This reframing centers local experiences of living with lions, but can also be unified with the knowledge generated through Philip Stander's research. This intervention is built upon my contribution to understanding HLC in northwest Namibia: that lion conservation interventions in northwest Namibia cannot be treated in isolation. Rather, HLC emerges from a dynamic and contingent history of human-livestock-lion relations which are interwoven with political, economic, and wildlife conservation arenas. Integrating the experiences that local people face in navigating human-livestock-lion relationships is critical to developing appropriate solutions to HLC. Experiences of living with lions do not weaken the ability of communal pastoralists to effectively assess human-livestock-lion relationships, they strengthen it. Opening space for

dialogue around different ways of knowing and living with lions may incorporate a more comprehensive understanding of how humans and lions interact with one another within shared human-livestock-lion landscapes.

As outlined in chapter one, ovaHerero cattle culture suggests that animals can be hubs for human relationships. When cattle are killed the effect can be monetary, personal, and even existential. While it is unreasonable to expect pastoralists to adopt similar sensibilities around lions to those they have for cattle, ovaHerero ways of becoming-with the nonhuman world suggests that animals can serve as the foundation for human social ties.[643] In chapter one I reviewed aspects of ovaHerero becoming-with cattle that motivate this reframing. This ovaHerero-informed reframing overlaps with the STS concept of boundary objects.[644] This concept, introduced by STS theorists Susan Leigh Star and James Griesemer, bears similarities to cattle embodiment among the ovaHerero. Seeking to understand how groups of actors with different interests come together, Star and Griesemer point to objects that circulate among groups of actors as one mechanism. These boundary objects are both plastic enough to have different properties attributed to them by different actors, and robust enough that they maintain a common identity across sites. They simultaneously partake of many spheres but are not solely contained in any of them. Star and Griesemer find that "[t]he creation and management of boundary objects is a key process in developing and maintaining coherence across intersecting social worlds"; elsewhere, "[b]oundary objects…allow different groups to work together without consensus."[645] As I showed in chapter five, Stander's research generated new information about lions in northwest Namibia. This information does not align with pastoral perspectives of living with lions, which are primarily mediated through the danger lions are seen to pose to people and livestock. I propose that desert-adapted lions can serve as boundary objects through which relationships between people, such as researchers, conservationists, and communal pastoralists, can be bound together. The desired outcome is to innovate common spaces of multiple types of becoming-with, where positive exchange around the shared theme of human-livestock-lion interactions can take place.

This reframing reinforces the importance of centering local perspectives and process-as-result within the community-based natural resource management (CBNRM) framework. These

[643] Ginn, Beisel, and Barua, "Flourishing with Awkward Creatures: Togetherness, Vulnerability, Killing"; Arun Agrawal, "Dismantling the Divide between Indigenous and Scientific Knowledge," *Development and Change*, 1995, 413–39.
[644] Star and Griesemer, "Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39."
[645] Star and Griesemer, 393; Susan Leigh Star, "This Is Not a Boundary Object: Reflections on the Origin of a Concept," *Science Technology and Human Values* 35, no. 5 (2010): 602.

are key to meeting human-wildlife challenges and affirming the rights of conservancy residents as custodians of the region's lions and other wildlife. Drawing-upon original primary data, in the form of eighty-six social surveys of communal pastoralists and twenty-two semi-structured oral history interviews with other conservancy residents collected between July 2017 and May 2019, I analyze shortcomings in the theorization and existing practice of CBNRM within core lion-range conservancies in northwest Namibia.[646] I argue that incorporating pastoralist perspectives enables lion conservationists to better understand how communal residents interpret lions and human-livestock-lion interactions in northwest Namibia. Without engaging pastoralists' perspectives on HLC livestock losses may be inappropriately interpreted as purely economic, rather than also personal and even existential. Incorporating such perspectives is central to implementing CBNRM-focused lion conservation interventions. I conclude by discussing site-specific innovations for CBNRM based upon communal pastoralist perspectives. These recommendations emphasize a (re)turn to the Design Principles for common-pool resource management, introduced by Elinor Ostrom, as a means of strengthening CBNRM in northwest Namibia.[647]

Within these surveys and oral histories, I found that community responses pointed to three particularly strong constructed identities for lions. These identities are referred to as "distinguishing properties," a term adapted from environmental geographer Jamie Lorimer. Shaping community responses into three types of distinguishing properties is part of my original contribution to understanding HLC in northwest Namibia. My interpretations and conclusions are supported by more than two years of lion conservation field work in the region. Living and working within core lion-range conservancies included participating in farming activities, community meetings, engaging in and occasionally leading lion conservation interventions, and implementing conservationist training workshops alongside local partners. Crucially, this helped me to understand that the manner in which pastoralists interact with lions differs greatly from how researchers and conservationists often do. In chapter five I discussed Stander's technologically-mediated vision of lions; this chapter reveals the important role of pastoralists' vision of lions as often mediated by livestock. Mediation, as defined by STS scholar Bruno Latour, always exceeds its conditions; mediators add something additional to the components they bring together.[648] In the case of Stander's different technological apparatuses, mediation allowed him to view lions in previously unforeseen ways, including viewing them remotely and tracking and recording movements over time; this transformed Stander's perspectives on lions.

[646] This chapter is an elaboration of a peer-reviewed, co-authored paper, published in 2019 (Appendix 1).
[647] Elinor Ostrom, *Governing the Commons. The Evolution of Institutions for Collective Action* (Cambridge, England: Cambridge University Press, 1990).
[648] Latour, *Pandora's Hope: Essays on the Reality of Science Studies*, 307.

For communal pastoralists, the mediation of livestock means that lions are not assessed solely through their interactions with humans. These different ways of viewing and/or experiencing lions generate different types of human-lion and human-livestock lion relationships. Human-animal studies scholars, such as Steve Hinchliffe, and Fuentes and Baynes-Rock, have shown that the context in which humans and nonhumans interact can greatly influence human understandings of animals.[649] During this period of field work, I also served on the Northwest Lion Working Group, a collection of government and NGO leaders tasked with creating viable solutions to HLC on communal land – our social positions mediated how we viewed and interpreted human-livestock-lion relationships. The approach taken to understanding local perspectives draws upon conceptual developments from CBNRM scholarship, human-animal studies, and STS, as well as my own work. Chapter five and the perspectives derived from Stander's research, stands in relief to this chapter. They both depict accurate, mediated, accounts of lions in northwest Namibia. Both chapters together have enabled me to wade through the messiness of human-livestock-lion relationships to extract meanings that are representative of individual and community perspectives relevant to lion conservation interventions.

Background: CBNRM and HLC

Namibia's communal conservancy system is considered an exceptional success in the global CBNRM movement and a signal achievement of the CBNRM approach to unifying wildlife conservation and rural development.[650] The CBNRM movement grew out of discontents with 'fortress conservation,' whereby local people, primarily in the developing world, were alienated from natural resources within areas considered to be of high conservation value.[651] Usually these resources were controlled through customary tenure practices which were superseded by civil law. Disempowered groups were often forcibly relocated to less desirable environments, turning them into "conservation refugees."[652] From its earliest applications in Zimbabwe and Zambia, CBNRM sought to ensure social justice and material well-being without sacrificing environmental integrity. The CBNRM approach stands upon four pillars (Panel A) substantially

[649] Hinchliffe, "Where Species Meet"; Agustín Fuentes and Marcus Baynes-Rock, "Anthropogenic Landscapes, Human Action and the Process of Co-Construction with Other Species: Making Anthromes in the Anthropocene," *Land* 6, no. 15 (2017): 1–12.
[650] Jones, "The Evolution of Namibia's Communal Conservancies."
[651] Brian T. B. Jones, "The Evolution of a Community-Based Approach to Wildlife Management at Kunene, Namibia," in *African Wildlife & Livelihoods: The Promise and Performance of Community Conservation*, ed. David Hulme and Marshall Murphree (Cape Town and Portsmouth, N.H.: Heinemann, 2001), 160–76; Brockington, *Fortress Conservation*.
[652] Dowie, *Conservation Refugees: The Hundred-Year Conflict between Global Conservation and Native Peoples*.

different from dominant western biocentric model of conservation, but seeking to achieve similar environmental protection results without sacrificing environmental justice values. In southern Africa, CBNRM programs were part of a regional counter-hegemonic political movement emerging in the 1970s and 80s. This movement sought to make natural resources meaningful to rural communities through market-oriented mechanisms and access, and to rectify apartheid and neocolonial policies alienating rural people from civil liberties and resource rights.[653]

Panel A: Four 'Pillars' of CBNRM (adapted from Jones & Murphree, 2001)

1) Sustainable use as a conservation paradigm – Landscape transformation, not resource utilization, is considered the main threat to habitats and resources. This necessitates the creation of incentives for sustainable resource use, rather than technical interventions to limit appropriation. Sustainability changes as social-ecological conditions change, therefore adaptive management is required.
2) Economic instrumentalism – In rural southern Africa, economic benefits are considered the major driver of resource decisions. Resource provision and appropriation must be an economically competitive form of land-use. The creation of supporting structures and access to markets is an important part of creating opportunities to use resources. If resources are not economically competitive, landscape transformation can occur.
3) Devolutionism – During colonialism and early postcolonialism, centralized state systems across southern Africa legally controlled local resources, but were unable to manage them due to inadequate capacity and financial constraints. Because of this, local people maintained de facto control, particularly concerning wildlife. In CBNRM, responsibility over resources is supported by the authority and entitlement to generate stewardship. Devolution empowers locals with the rights to manage, benefit from, and dispose or sell resources.
4) Collective proprietorship – In Namibia the CBNRM model was based on existing rights enjoyed by free-hold farmers. Within communal areas, communities of collective interest were identified as the locus for rights-devolution. Internal legitimacy comes from communities empowered to form conservancies whose membership, boundaries, and constitution are self-defined. External legitimacy is given through national legislation. This approach was based on insights from common property theory, including the work of Ostrom.

During the colonial era, inhabitants of northwest Namibia were economically, politically, and geographically isolated by apartheid policies and government practices. Policies alienating rights to wildlife exacerbated these difficulties. The acute effects of drought and poaching by local residents in the late-1970s to early-1980s resulted in a cataclysmic decline of wildlife in the region. As I have shown in chapters two, three, and four, certain South West African officials had an emerging ethos of wildlife conservation, as evident by the formation of Etosha National Park, but little recognition of local rights within conservation spaces. The "community conservation

[653] Wolfram Dressler et al., "From Hope to Crisis and Back Again? A Critical History of the Global CBNRM Narrative," *Environmental Conservation* 37, no. 01 (2010): 5–15.

counter-narrative" drew attention to the co-occurrence of wildlife losses and lack of state and private investment in rural development programs.[654] The development of community conservation was pushed forward by a small but committed group of white South African and Namibian conservationists partnering with local leaders attempting to halt the poaching and rebuild wildlife herds. Initially there were no mechanisms for the region's inhabitants to receive direct (monetary) benefits from wildlife conservation. However, the process of consultation, engagement, and empowerment which took place between conservationists and local leaders was itself a clear indication that local perspectives were valued and necessary to securing the area's wildlife, which still legally belonged to the colonial government. During the 1980s, the partnership between conservationists and local traditional authorities led to the establishment of the Community Game Guard program.[655] In his memoirs, conservationist Garth Owen-Smith, who, along with his partner Margaret Jacobsohn was instrumental in setting-up this program, was clear that without the intrinsic value that communities placed on wildlife, early iterations of CBNRM would not have been possible. The history of this period has been documented by Owen-Smith and the scholarship of Namibian Brian Jones.[656]

Until the end of the 1980s, the war between South African Defence forces and the South West Africa People's Organisation (SWAPO) dominated northwest Namibia.[657] Following independence in 1990, the region was no longer expressly isolated from the outside world. The creation of a new country opened opportunities for policy innovations to simultaneously protect Kaokoveld's (now part of the Kunene Region) wildlife and redress some of the past wrongs perpetrated against its residents.[658] Building on the success of the community game guard program in the 1980s, an NGO founded by Garth Owen-Smith and his partner Margaret Jacobsohn, Integrated Rural Development and Nature Conservation (IRDNC), worked with communities to activate a widespread CBNRM approach to extend rights to wildlife to local communities across the region.

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[654] Jones, "The Evolution of Namibia's Communal Conservancies."
[655] See chapter three.
[656] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*; Brian T. B. Jones and Marshall W. Murphree, "The Evolution of Policy on Community Conservation in Namibia and Zimbabwe," in *African Wildlife & Livelihoods: The Promise and Performance of Community Conservation*, ed. David Hulme and Marshall W. Murphree (Oxford: James Currey, 2001), 38–58; Jones, "The Evolution of Namibia's Communal Conservancies"; Brian T. B. Jones, "Sesfontein Case Study," in *A Critical Analysis of the Development of Namibia's Community-Based Natural Resource Management Programme: Competing Interests in Natural Resource Management: Success or Failure in the Creation of Viable Common Property Resource Management Institutions In* (University of Zimbabwe, 2005), 1–22.
[657] Michael Bollig and Jan-bart Gewald, "People, Cattle and Land - Transformations of Pastoral Society—an Introduction," in *People, Cattle and Land: Transformations of a Pastoral Society in South Western Africa*, ed. Michael Bollig and Jan-Bart Gewald (Köppe, Köln, 2000), 26.
[658] Jones, "The Evolution of Namibia's Communal Conservancies."

Following independence, Namibians inhabiting communal land were empowered by government to form communal conservancies, a program that grew out of Owen-Smith and Jacobsohn's work. Within the CBNRM framework, the work of economist Elinor Ostrom was particularly formative in the development of communal conservancy legislation. Ostrom's seven Design Principles for common-pool resource management (Panel B) directly inspired government and non-government actors interested in securing the rights of local communities to manage and benefit from 'their' wildlife.[659] The Nature Conservation Amendment Act (No. 5/1996) devolves ownership rights to 'huntable game' species for conservancy use. Ownership entails the use of these species for conservancy purposes (e.g. subsistence hunting) without recourse to further government authorization. Conservancies can also carry out trophy hunting based upon government-approved quotas, can apply for the use of protected and specially-protected species, and can trade and sell game species with government approval.[660] However, Jones noted that "considerable gaps" existed between the original intent of CBNRM practitioners and the implemented policy. Though the intent of conservancy legislation was to provide communal residents with ownership rights to wildlife, the government put in place additional restrictions, such as the quota system.[661] While the direct benefits accruing from wildlife remain entirely with conservancies, management of wildlife on conservancy land occurs as a sometimes-tenuous partnership between conservancies and government. To secure desired quotas, conservancies negotiate with the central government over the consumptive use of wildlife, resulting in an ongoing, often politically charged, process. This process is often mediated by NGOs partnering with conservancies and government. Among the limitations on conservancies is a prohibition on hunting specially-protected species, including lions, without special government consent, which is rarely given.

[659] Brian T. B. Jones, "Ostrom and Namibian Conservancies," *Current Conservation* 4, no. 3 (2010): 21; Bollig, "Towards an Arid Eden? Boundary-Making, Governance and Benefit Sharing and the Political Ecology of the New Commons of Kunene Region, Northern Namibia."
[660] Jones, "The Evolution of Namibia's Communal Conservancies," 108.
[661] Jones, "The Evolution of Namibia's Communal Conservancies."

Panel B: Ostrom's Seven Design Principles for Long-enduring Common-pool Resource (CPR) Institutions (adapted from Ostrom, 1990)

1) Clearly defined boundaries – Individuals who have rights to withdraw resource units from the CPR must be clearly defined, as must the boundaries of the CPR itself.
2) Congruence between appropriation and provision rules and local conditions – Appropriation rules restricting time, place, technology, and/or quantity of resource units are related to local conditions and to provision rules requiring labor, material, and/or money.
3) Collective-choice arrangements – Most individuals affected by the operational rules can participate in modifying the operational rules.
4) Monitoring – Monitors, who actively audit CPR conditions and appropriate behavior, are accountable to the appropriators or are the appropriators.
5) Graduated sanctions – Appropriators who violate operational rules are likely to be assessed graduated sanctions (depending on the seriousness and context of the offense) by other appropriators, by officials accountable to these appropriators, or by both.
6) Conflict-resolution mechanisms – Appropriators and their officials have rapid access to low-cost arenas to resolve conflicts among appropriators or between appropriators and officials.
7) Minimal recognition of rights to operate – The rights of appropriators to devise their own institutions are not challenged by external governmental authorities.

In northwest Namibia conservancies, overlap between desert-adapted lion home ranges and communal rangelands is generating a high frequency of HLC. As has been the case throughout the past hundred-plus years, pastoralism in these arid and semiarid rangelands comprises the majority of household incomes.[662] Now the changing paradigm towards lion conservation, enabled by the breakthrough work of Stander and his colleagues has brought a different type of attention to the region's lions. This, and international currents increasingly favoring wildlife conservation, is making HLC an increasingly contentious political and conservation issue. HLC in the region greatly affects both pastoralists' livelihoods and the viability of the desert-adapted lion population. Livestock losses to lions are exacerbating the livelihood effects of an ongoing drought. The reduction in local wealth has increased the economic vulnerability of communal pastoralists and is straining the conservancy system.[663] HLC is considered by the Namibian government to be the premier threat to the viability of the desert-adapted lion population.[664]

[662] Republic of Namibia National Planning Commission, "Namibia Poverty Mapping" (Windhoek, Namibia, 2012).
[663] Bollig, "Towards an Arid Eden? Boundary-Making, Governance and Benefit Sharing and the Political Ecology of the New Commons of Kunene Region, Northern Namibia," 780.
[664] An overview of these challenges, including quantitative information on the magnitude of losses is presented in Appendix 1.

Using more than nineteen years of data from Stander's research, in 2017 Namibia's Ministry of Environment and Tourism (MET) identified four core desert-adapted lion range conservancies where HLC was deemed critical.[665] Three of these four – Anabeb, Puros, and Sesfontein – are examined here. Typical of conservancies in northwest Namibia, these three are characterized by vast, rugged landscapes, limited population, and arid or semiarid conditions with erratic rainfall and low ecosystem productivity.[666] They are also among the wealthiest conservancies in the region, as measured by annual conservancy income primarily coming from tourism and hunting receipts, primarily from ungulates such as oryx, springbok, zebra, kudu, and giraffe.[667]

Social Surveys and Oral Histories

Communal pastoralist perspectives were collected through eighty-six semi-structured social surveys, twenty-two unstructured oral history interviews, and more than two years of field experience implementing lion conservation interventions.[668] The surveys were part of a government and NGO program to examine the costs incurred by communal pastoralists during the recent drought, with particular emphasis on losses to lions and on perspectives of living with lions. Data from these surveys make up the majority of information in this chapter. To protect their anonymity respondents are quoted only as a pastoralist from the relevant conservancy, i.e. "Puros Pastoralist #1." Oral history interviews were performed among key conservancy residents, as identified by other community members and myself. All interviews were performed by me, with the assistance of a single local translator, Jendery Tsaneb, who translated my questions and interviewees responses during the conversation. If there was a lack of clarity, either of my questions, or of responses, we (myself, Tsaneb, and respondents) worked together to clarify the point. In some cases, I had a preexisting relationship with the interviewee. More frequently Tsaneb had a preexisting relationship with the interviewee. The interviews were unstructured, focusing on conservancy history, politics, and HLC. Though certain survey respondents and interviewees associated me with regional lion conservation activities, and occasionally with government, there was no indication that respondents felt constrained from answering truthfully; this conclusion was supported through discussion with Tsaneb. All interviews took place either at respondents' homes or in a neutral space, such as in the field during herding activities. To protect

[665] Namibia Ministry of Environment and Tourism, "Human-Lion Conflict Management Plan for North West Namibia." Appendix 1: Fig. C.1 & Table A.1
[666] Mendelsohn et al., *Atlas of Namibia: A Portrait of the Land and Its People*.
[667] NACSO, "Registered Conservancy Statistics," 2018, http://www.nacso.org.na/conservancies#statistics.
[668] Complete social surveys methods are described in Appendix 1, Section: 2. Materials and methods

their anonymity respondents are quoted as conservancy leaders, i.e. "Conservancy Leader #1." All oral histories were carried out in the preferred language of the respondent, including English, Afrikaans, Otjiherero, and Damara/Nama and were all translated by Tsaneb. All oral histories were audio recorded and relevant sections were transcribed by me.

Distinguishing Properties of Lions

Among communal pastoralists, the distinguishing properties of lions are their fearsomeness, destructiveness, and increasing numbers. The emphasis on distinguishing properties is adapted from Lorimer's work on nonhuman charisma. Lorimer defines nonhuman charisma as "the distinguishing properties of a nonhuman entity or process that determine its perception by humans and its subsequent evaluation."[669] Whereas charisma is derived from the Greek root *kharis*, meaning favor or grace, Lorimer's emphasis on distinguishing properties refigures the term as the composite of an organism's key aspects that generate a viewer's interpretation of it. In this new figuration, distinguishing properties are not innate, say, to a lion, but emerge from human-lion interactions constrained and enabled by technologies, human bodies, and cultural and environmental contexts. Distinguishing properties do not imply that other properties are absent, rather that they are secondary. I emphasize the properties of fearsomeness, destructiveness, and increasing numbers because they were the most consistent among pastoralists I spoke to and worked with.

Fearsomeness

* "Lions are very dangerous; they are eating people. We must be careful. We must be safe."[670]

* "Lions are coming to the house. Even in the morning when you are coming out of the house you are seeing the tracks here, next to the fire, and you are afraid to go out into the bush…you are afraid, even to move around."[671]

* "Something that is life-threatening…as a local person I will say that, we can't live with that thing. Something that is life-threatening, you can't live together."[672]

* "To be safe people can only move from this time to this time. Can only cook from this time to this time."[673]

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669 "Nonhuman Charisma," *Environment and Planning D: Society and Space* 25 (2007): 915.
670 Puros Pastoralist #1, Personal Communication, 2017.
671 Anabeb Pastoralist #1, Personal Communication, 2017.
672 Conservancy Leader #3, Personal Communication, 2018.
673 Anabeb Pastoralist #2, Personal Communication, 2017.

* "Kids are schooling near here and are walking back to farms. You don't know what might happen."[674]

* "Lions kill people."[675]

Lions have long terrorized residents of northwest Namibia. Recall the experiences of C. J. Andersson, from chapters two and four, who wrote of locals cursing and vilifying lions, and "lamenting most piteously…that they should perish miserably by the fangs of the wild beasts."[676] On one of Andersson's trips "[t]wo lions had entered the enclosures, and succeeded in carrying away a poor fellow, whom they tore to pieces and devoured within a short distance of our camp."[677] Like present-day pastoralists, Andersson experienced lions on foot, in the field, often in the presence of livestock which likely drew lions towards his party. In the early 1990s, Jacobsohn related the story of one Himba man's lion encounter in his home:

> "Kamasitu graphically recalled his lucky escape when a lion had tried to enter his ondjuwo [traditional-style house]... The silvery scars on his forearms bore witness to that terrifying night which would have ended in tragedy if a Herero neighbor had not owned a .303. He had shot the lion in the spine as it crouched, slashing at Kamasitu with one paw in the low tunnel entrance to the auxiliary's ondjuwo."[678]

Among communal pastoralists lions remain objects of fear. Traditionally, the Himba ondjuwo is built with a low entrance to force lions to crouch-down to enter, suggesting long familiarity with their habits. When asked which predators pose the greatest threat to people, 85% of communal pastoralists responded that lions do; at 53%, leopard were the second most feared predator. A Puros headman recollects that "[w]hen I was a young man, I was with a man who was attacked by a lion."[679] Another shared this story,

> "One man was looking for honey, he went out with a donkey. He went into the mountains and was camping there and the lions killed him there. The people around here were looking for him, looking for him. But they didn't find him. My father went into the mountains to get some honey also and saw the bones [of the man] lying there and brought the bones back so they could bury the bones. This is when I was a very young person – my father told me about this."[680]

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[674] Sesfontein Pastoralist #1, Personal Communication, 2017.
[675] Anabeb Pastoralist #3, Personal Communication, 2017.
[676] Andersson, *The Okavango River: A Narrative of Travel, Exploration, and Adventure.*, 109.
[677] Charles John Andersson, *Lake Ngami, or, Explorations and Discoveries during Four Years' Wanderings in the Wilds of Southwestern Africa* (New York, NY: Harper and Brothers, 1861), 53.
[678] Jacobsohn, *Himba: Nomads of Namibia*, 48.
[679] Puros Pastoralist #4, Personal Communication, 2017.
[680] Sesfontein Pastoralist #6, Personal Communication, 2017.

More recently, one Puros woman related that "my husband was riding on a donkey and the lion came at the man and the donkey. Luckily enough the man get away from the donkey and ran and the lion took the donkey and ate [it]."[681] Lion attack stories circulating within the region frame perspectives on human-lion relationships and form an important part of the shared conviction that people are vulnerable to lion attacks. Historian Luise White demonstrates the importance of stories and rumors in colonial eastern and central Africa, emphasizing how their repetition creates a frame that forms the basis of experience.[682] The story of the last lion-caused human mortality in northwest Namibia resonates among residents above all other lion stories. Even though this death occurred in 1982, it remains a relevant lens through which residents interpret the threat of living with lions. The details among storytellers differ, but the story is as follows:

> Early in the year [1982], a starving lioness moved westward from near Okaukuejo in Etosha National Park, where an ongoing drought had decimated prey numbers. One evening this lioness entered the house of a Damara farmer, near the river in the town of Sesfontein. Surprised and terrified, the man jumped at the lion and grasped her by her ears while telling his wife to take their infant daughter and run outside. The lioness was so weak that the man could temporarily hold her. The wife ran but left the girl behind. The man escaped out of the house, leaving the lion and, unknowingly, the child inside. He ran to a nearby military base. When the man returned with the soldiers, they shot and killed the lion, who had already devoured the infant's head and one arm.[683]

It is impossible to overstate the familiarity of this story among conservancy inhabitants; it is frequently given as evidence that lions attack and kill people. The specifics of the story also reveal the shared understanding that when lions suffer from extreme hunger, they become particularly dangerous. 85% of pastoralists maintain that if lions are unable find prey or livestock to kill, they will attack people. Because the region is suffering through an ongoing drought resulting in 60% depletion in prey species,[684] the danger that lions are seen to pose is exacerbated. That lion encounters are infrequent does not diminish the power of these stories; it heightens them. Without alternative evidence, frightening lion stories may be the only interaction conservancy residents have with lions in their lifetime. People walking in the field with livestock, or living at homesteads with little access to power or resources to protect themselves share space with lions in ways that tourists, conservationists, and researchers rarely will: with very little

[681] Puros Pastoralist #5, Personal Communication, 2017.
[682] *Speaking with Vampires: Rumor and History in Colonial Africa*.
[683] Sesfontein Pastoralist #8, Personal Communication, 2017; Conservancy Leader #7, Personal Communication, 2017; Conservancy Leader #3, Personal Communication; Reardon, *The Besieged Desert: War, Drought, Poaching in the Namib Desert*.
[684] Appendix 1: Fig. B.1

buffer. Even if lions are infrequently seen, their presence is felt. The threat lions pose to human safety calls into question how lion conservation fits within the CBNRM framework.

Sociologist and CBNRM researcher Marshall Murphree has argued that successful CBNRM programs rest on an emotive foundation of stewardship over natural resources.[685] While Murphree found that stewardship emerges from generations of occupancy within an environment, this may disregard differences among human-wildlife relationships. In a review of CBNRM conceptual development, Dressler et al. concluded that CBNRM programs must be "embedded in sociocultural relations, politics, resource needs and use and landscape changes."[686] These circulating lion stories, combined with the felt immediacy of lion presence, calls into question whether the sociocultural relations concerning lions among pastoralists and conservancy residents form the appropriate commitment to lion stewardship for lion conservation to take place within the local CBNRM program. At the very least, pastoralists' commitment to lion stewardship may be undermined by convictions of lion fearsomeness and the implication that lions threaten human safety.

Destructiveness

* "The problem of the lion…lions come and kill someone's cattle that they are living from. Living from the milk or whatever. That is when people are getting angry."[687]

* "[A lion] is not like an elephant, that when it comes it may break a branch and leave. When a lion comes to a kraal it may kill the whole kraal."[688]

* "If you keep goats near the house lions come and kill. When you take them in the veld they can kill. Even digging underneath kraals."[689]

* "Each and every day the lions were coming here. Taking cattle from the kraal. The only decision we could take was [to kill them]."[690]

* "I am becoming poor because of lions."[691]

While CBNRM approaches to resource conservation and rural development rely heavily on economic instrumentalism to engage the interests of locals, communal pastoralists view lions as primarily destructive entities from which they receive little direct benefit. 86% of survey respondents state that lions are a "serious" problem in their conservancy. Stories of lions

[685] Marshall W. Murphree, "The Strategic Pillars of Communal Natural Resource Management: Benefit, Empowerment and Conservation," *Biodiversity and Conservation* 18, no. 10 (2009): 2553.
[686] "From Hope to Crisis and Back Again? A Critical History of the Global CBNRM Narrative," 13.
[687] Conservancy Leader #1, Personal Communication, 2018.
[688] Puros Pastoralist #2, Personal Communication, 2017.
[689] Sesfontein Pastoralist #2, Personal Communication, 2017.
[690] Conservancy Leader #6, Personal Communication, 2017.
[691] Sesfontein Pastoralist #3, Personal Communication, 2017.

destroying livestock are well-known in the region. Though spotted hyena account for a greater number of incidents,[692] the magnitude of livestock lost to lions in a given HLC incident undergirds the shared conviction that lions pose a threat that is unique in scope. Three recent, regionally well-known HLC incidents lend credence to the threat lions pose. In the early morning hours of 9 November, 2017, twelve lions invaded one farm, killing 86 goats and sheep – approximately 75% of the livestock there. Less than a week later the same group of lions killed another 171 goats and sheep at another, nearby farm. On 15 January, 2018 two lions killed 172 goats and sheep kraaled near a lodge south of the core-lion range conservancies.[693] These three incidents are aberrations but illustrate the scale of destruction possible when lions, particularly large groups of them, invade conservancy farms.

Figure 30: Aftermath of HLC incident at conservancy farm, 9 November 2017. Photo: author

The vulnerability that communal pastoralists feel to lions further threatens already tenuous livelihoods. All three of the conservancies surveyed fall within the Sesfontein constituency, where 40% of the population lives on less than US$1 per day.[694] The loss of livestock-derived income in recent years is generation-defining. The reduction in local wealth

[692] Appendix 1: Figure E.1
[693] Adam Hartmann, "Namibia - Lions Maul 86 Goats in Torra," Africa Sustainable Conservation News, 2017, https://africasustainableconservation.com/2017/11/12/namibia-lions-maul-86-goats-in-torra/; Adam Hartmann, "Kunene Lion Kill Another 171 Small Livestock," *The Namibian*, November 16, 2017; Adam Hartmann, "Lions Kill 172 Small Livestock in Erongo," *The Namibian*, January 18, 2018, https://www/namibian.com.na/63425/read/Lions-kill-172-small-livetock-in-Erongo.
[694] Republic of Namibia National Planning Commission, "Namibia Poverty Mapping."

means that school and hospital fees can become unaffordable, putting the region's already marginalized population further behind fellow Namibians. When lions destroy livestock, uninsured pastoralists suffer. Though the government provides limited annual funding to each conservancy to compensate for livestock lost to human-wildlife conflict, 92% of communal pastoralists are dissatisfied with the program. The most commonly given reason for this dissatisfaction is that the compensation money is not enough to replace the livestock lost. For a cow lost to human-wildlife conflict, the compensation program provides the owner with N$1,500 (~US$120). However, the mean-average price of a cow given by survey respondents was N$5,852 (~US$470) – almost four times as much. In a region where small-scale pastoralism comprises the majority of household incomes, livestock predation can be a grave threat to family economic security. In contrast, more than 89% of communal pastoralists feel they do not directly benefit from having lions in their conservancy. This conflicts with the economic instrumentalism pillar of CBNRM.

Communal pastoralists are strongly committed to keeping livestock. As outlined in chapter one, livestock, particularly cattle, possess cultural as well as economic value for many local pastoralists. Crandall, Jacobsohn, and Bollig each extensively examined the special meaning and importance of cattle in ovaHerero communities in northwest Namibia; the commitment of these communities to maintaining the safety and health of their cattle cannot be overstated. Among ovaHerero matriclan and patriclan kin-networks, cattle transactions bind a family's past, present, and future.[695] Jacobsohn's extensive ethnographic work among the Himba shows that the possession of cattle confirms status among men, links people to their extended familial clan, and serves as a tangible link between a person and their ancestors.[696] From the precolonial era to the present, generation-to-generation transactions of livestock across matriclans and patriclans serve as a time when political power is renegotiated and property rights reassigned.[697] Because 78% of surveyed communal pastoralists identify as ovaHerero, the commitment of these communities to their livestock must be held firmly in mind when examining human-livestock-lion relationships in the region. Mean-average cattle losses in recent years have been 67.9% to all factors, including, drought, disease, predators, and theft, with 18.4% lost to lions alone. Such losses can be experienced as much more than loss of livelihood. Pastoralists' commitment to their livestock suggests that desert-adapted lions cause both monetary and existential harm. OvaHerero experiences of becoming-with, as social bonds tied through the materiality of livestock, is an

[695] Crandall, "The Role of Time in Himba Valuations of Cattle."
[696] Jacobsohn, *Himba: Nomads of Namibia*.
[697] Bollig and Gewald, "People, Cattle and Land - Transformations of Pastoral Society—an Introduction," 35.

important manifestation of human-animal relationships within the region. This type of becoming-with reveals a gap in the way that pastoralists experience human-lion relationships as human-livestock-lion relationships. In ways that are often not embodied by conservationists and play little part in lion research (though this is notably changing) views of lions in the area are mediated by livestock-oriented perspectives. This is a different type of mediation than the primarily technological ones I pointed to in chapter five. If reframing HLC around diverse human-livestock-lion interactions is going to take place within this CBNRM setting, it will be fruitful to incorporate an understanding of how different mediators of human-lion interactions affect different people's position on HLC.

Increasing

* "In the past days the cattle were sleeping in the field but now they cannot because the lion population is high."[698]

* "[T]hey are all over… [W]hile people are reporting [from one] area, they come from another direction… 'This side is 30 lions, this side is eight, this side is seven.' All over."[699]

* "Lions have increased… Their numbers need to be managed."[700]

* "Lions will not [disappear]. Even now the cubs are being born and they will [always] be here."[701]

* "Lions are common [here]. Even last week it was behind the old man's house there."[702]

Two recent transformations underscore the perception among pastoralists that lion numbers have increased: the ongoing drought and its subsequent effects on animal movements, and the change in wildlife conservation policies since the implementation of CBNRM. There is a widespread perception that the drought has been responsible for declining prey numbers and a subsequent increase in predators. Pastoralists and conservationists share the understanding that during the early years of drought, predators followed prey species to increasingly smaller areas of available grass, leading to higher hunting productivity and increased reproductivity among predators. The decline of prey species is also believed to be driving predators to attack livestock in greater numbers. 87% of conservancy farmers state that HLC has either "greatly increased" or "somewhat increased" since the beginning of the drought. One farmer points to the diminishing prey base as the cause, stating that,

[698] Conservancy Leader #4, Personal Communication.
[699] Conservancy Leader #2, Personal Communication, 2017.
[700] Anabeb Pastoralist #4, Personal Communication, 2017.
[701] Sesfontein Pastoralist #5, Personal Communication, 2017.
[702] Anabeb Pastoralist #5, Personal Communication, 2017.

> "Lions are very smart. They know that due to drought the wildlife has become less so they are moving into people's territory. And then they figure out, here are goats and cattle and sheep and those type of things and when they see that they settle down there."[703]

Another attributes the increase in HLC to increased prey mobility in search of grazing,

> "During drought the game is moving a lot. Lions are following the game's tracks and when they are coming close to the village they are smelling [the livestock] also."[704]

Certain communal pastoralists long familiarity with, keen observations of, and theorizations surrounding lion behavior are important to keep in mind when attempting to innovate solutions to HLC.

Among conservancy residents, increasing lion numbers are also linked to changes in wildlife conservation policies. During the colonial era, northwest Namibia was isolated from centers of state power as a matter of policy; what Bollig calls a "process of marginalization and encapsulation."[705] African residents could neither count on government to solve predator-caused problems nor expect government officials to keep them from taking retaliatory action against predators, leading to high levels of illegal wildlife killing.[706] This began changing with the implementation of CBNRM in the 1980s. For wildlife this new system has been a boon.[707] However, with independence and the formalization of the conservancy system has come greater oversight and enforcement of conservation laws. Many respondents are ambiguously committed to this new paradigm. Two elder conservancy residents spoke nostalgically of aspects of the colonial era:

> "[W]ild animals were killed [then]. When the conservancy was established, they said the predators shouldn't be killed. And that is where the problems come from…The people in the olden days; that is when they were killing those animals and there were no problems… Boers [white farmers] were the ones that were killing the predators. Because they were the one who were keeping the livestock. So they wanted to protect their livestock – so they were killing… [N]ow, conservancies have come in and totally said 'no, we won't kill wild animals anymore'… Now it is difficult. Because of predators – that is the problem."[708]

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[703] Anabeb Pastoralist #8, Personal Communication.
[704] Puros Pastoralist #1, Personal Communication.
[705] "The Colonial Encapsulation of the North-Western Namibian Pastoral Economy," 507.
[706] Reardon, *The Besieged Desert: War, Drought, Poaching in the Namib Desert*.
[707] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*; NACSO, "The State of Community Conservation in Namibia: A Review of Communal Conservancies, Community Forests and Other CBNRM Initiatives; Annual Report 2016."
[708] Conservancy Leader #5, Personal Communication, 2017.

These two residents were relocated to the government-designated 'homeland' during apartheid and remember how, previously, European farmers in areas further east assisted African livestock owners in controlling predators, ensuring greater safety for both European- and African-owned livestock. Since independence this type of informal aid has diminished. Van Wolputte et al. interpret nostalgia for aspects of the colonial era as a critique of the increasing intervention of the postcolonial state in daily life.[709] The perspective that human persecution of lions has changed, and is leading to increased HLC, is common within core lion-range conservancies. For some respondents, the prohibition against killing lions is one way in which individual rights have been functionally rolled-back.

> "Lion[s] have increased because they are not being killed. If we had been allowed to kill [lions] then maybe the numbers could have decreased. But we are not allowed to kill them so they are just increasing."[710]

> "In the olden days my father and the people living here were killing lions. And so the lions were just stealing [and running] because the lion knows, 'if I kill something, they will track me.' But now, since independence, lions are taking out of the kraal and they are lying there and they are eating."[711]

Frustration with an inability to self-manage predators provides a different perspective on residents' experience under the CBNRM program. In this regard, the vulnerable position communal pastoralists inhabit is exacerbated by CBNRM legislation and government oversight. Taken together these distinguishing properties – fearsome, destructive, increasing – broadly characterize communal pastoralists perceptions of living with lions. The agonistic character of human-lion relationships experienced by pastoralists sets the tone for human-human relationships surrounding HLC challenges in these conservancies.

Priorities and Lion Killing

Communal pastoralists are critical of government staff that do not respond, or respond inappropriately, to HLC incidents when livestock are killed but lions remain uninjured. There is a pervasive feeling that the government values lions over people. One communal pastoralist, who willingly confesses to killing at least four male lions over nine months, stated,

> "We report [the lion problems] to the government but there was no decision. We had maybe three or four [calls to them]. We even had a big meeting with people coming

[709] Van Wolputte et al. "Fenced Frontiers and Murky Boundaries. Two Cases from Kaoko, Northern Namibia," *Borderlands and Frontiers in Africa*, no. January (2013): 151–81.
[710] Anabeb Pastoralist #7, Personal Communication, 2017.
[711] Puros Pastoralist #2, Personal Communication.

> from Windhoek and they said they would go back and take a decision, but even until now, no response… The government is responding [to livestock deaths] by sending people, maybe one car. But if there is a lion injured, then they will maybe send eight cars."[712]

Inadequate government response to HLC incidents may be interpreted as an expression of government priorities. This can contribute to feelings of vulnerability and lead to greater hostility towards lions which manifests in lion-killing.[713] As noted by Kirksey and Helmreich, animal lives and deaths are linked to human social worlds, including political, economic, and cultural forces.[714] Feelings of vulnerability exacerbated by an interpreted lack of regard from outsiders puts communal pastoralists at odds with the international discourse of diminishing lion populations across Africa, given voice by multinational NGOs and high-profile conservationists. Lions are now listed as "vulnerable" by the IUCN and tens of millions of dollars each year goes towards lion conservation efforts, with as much as a billion more needed annually.[715] Within northwest Namibia, the rising international emphasis on lion conservation is contributing to the further erosion of already limited direct benefits from lions for communal pastoralists. In late 2017 MET began operating under an unofficial policy that no lion trophies would be granted in core lion-range conservancies until a lion population survey was completed.[716] Government and NGO perspectives that lions are vulnerable are at odds with local feelings of human and livestock vulnerability. These different positions are informed by asymmetrical ways of seeing human-lion relationships. As I reviewed in chapter five, since he began working in the area in Stander and his colleagues have provided all known studies of northwest lions to the government. Stander's approaches and international literature on lion conservation have greatly informed government policy since at least the mid-2000s.[717] While government and partnering NGOs are under pressure from national and international actors to conserve lions inhabiting communal land, pastoralists suffer localized effects of increased lion numbers. Increasing publicity around HLC on social media, and in the national and international press, heightens the pressure on government to

[712] Conservancy Leader #6, Personal Communication.
[713] Dickman, "Complexities of Conflict: The Importance of Considering Social Factors for Effectively Resolving Human-Wildlife Conflict"; Redpath et al., "Understanding and Managing Conservation Conflicts."
[714] "The Emergence of Multispecies Ethnography."
[715] Hans Bauer et al., "Panthera Leo. The IUCN Red List of Threatened Species 2016," 2016; Lindsey et al., "More than $1 Billion Needed Annually to Secure Africa's Protected Areas with Lions." See Introduction.
[716] MET Official #1, Personal Communication, 2017. The program is due to recommence in 2020; see Appendix 2.
[717] Namibia Ministry of Environment and Tourism, "A Draft of Lion Conservation Management Plan"; Namibia Ministry of Environment and Tourism, "Human-Lion Conflict Management Plan for North West Namibia."

conserve lions, exacerbating tensions with communities.[718] The gap between local perspectives of human-livestock-lion relationships and government and NGO commitments to lion conservation interventions is emblematic of human-human conservation conflicts concerning human-wildlife conflict; in some ways human-human problems are more difficult to solve, as Redpath et al. have discussed.[719]

The depth of animosity among certain communal residents towards the implicated prioritization of lions over locals is illustrated by a particular claim that, to my knowledge, is unique to human-lion interactions in northwest Namibia. During the surveys I collected, 34% of pastoralists, unprompted, claimed that lions are being fed by some combination of government, NGOs, and/or tourism operators. The implication that lions are being provided with meat, while many conservancy residents suffer from limited food availability, may be particularly galling to conservancy residents. Such an action is tantamount to government, NGOs, and tourism operators dehumanizing local residents in favor of lions.[720] During important ovaHerero social occasions, such as large community meetings, holidays, or weddings and funerals, the provision of meat to guests is considered an indication of one's social status and a sign of respect. Attendees expect that meat will be provided and there is a hierarchy of who is served certain portions. It is nearly unthinkable that an important social occasion would not include great amounts of meat being provided and consumed.[721] This has remained true during the recent years marked by drought, widespread livestock death, and constrained livelihoods. The most common reasons given for lions being provisioned was that lions are baited to provide tourists with viewing opportunities, or to perform scientific research. This feeds into a perception among some residents that northwest Namibia is being cultivated by outsiders as a space for wildlife, while people suffer. It is also seen to increase the danger that lions pose: some pastoralists and other residents believe that lions have lost their fear of people because they are being provided with meat. It is noteworthy that, during the 1950s, lions in Etosha were fed, as I show in chapter four. It remains the conviction among certain pastoralists in the region that this still takes place.[722]

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[718] DeLHRA, "BREAKING NEWS - Another 171 Small Livestock Confirmed Killed," *Facebook*, November 15, 2017, https://www.facebook.com/permalink.php?story_fbid=1940341489560467&id=1804307563163861&__tn__=-R; Hartmann, "Lions Kill 172 Small Livestock in Erongo"; Jeremy Hance, "Can Namibia's Desert Lions Survive Humanity?," *The Guardian Newspaper*, August 22, 2018.

[719] Redpath et al., "Understanding and Managing Conservation Conflicts." See introduction.

[720] Possibly this belief in lion-feeding is a hold-over from the 1950s in Etosha when, as we have seen in chapter four, Etosha staff repeatedly fed lions.

[721] In the process of planning community meetings, the advice I was given by one long-serving conservationist in the region was "no matter what, don't run out of meat and don't run out of sugar."

[722] Anabeb Pastoralist #12, Personal Communication.

The growing visibility of HLC in recent years, for example following the death of 'Cecil' the lion in Zimbabwe, makes lion death one of the few platforms upon which otherwise marginalized people can (re)assert their agency and have their voices heard and actions felt beyond a local context. Communal residents understand that killing a spotted hyena or other predator brings little to no response. By contrast: "if I shoot a lion; the helicopter is in the sky. Other vehicles [are coming]."[723] Communal residents are well aware that lion conservation is considered a priority among government and NGO staff, and that conservation practitioners and animal welfare activists are worried about potential retaliation following HLC. Seen in this light, the killing of desert-adapted lions can be interpreted as embodied resistance to oppression, akin to Scott's "weapons of the weak;" similar to the embodied resistance of ovaHerero pastoralists manifest in livestock movements during the early colonial era.[724] Killing protected species, including lions, has occurred for decades throughout Africa when marginalized communities are otherwise excluded from political processes.[725] The choice of some communal pastoralists to engage in retaliatory killings becomes re-framed as an act of economic autonomy and political protest demanding their perspectives be recognized. As Boomgaard notes of tiger stories in the Malay world, because of the broader social valence of lion conservation, lion threats to people may be over-emphasized and wielded strategically by communal pastoralists.[726] Across Namibia, lions are more likely to be killed following human-wildlife conflict than other predator species.[727] One pastoralist pointed to the special fear of lions and the attention to them, rather than the conflict incidents, as a driver of HLC:

"In terms of incidents that have been caused by lions it is not more than even a jackal but all over people are just thinking of lion, lion, lion. But when it comes to on the ground, the challenges are less than all the other predators."[728]

In 2018, there were twelve confirmed HLC-related lion mortalities on communal land in northwest Namibia, with another one suspected. This represents as much as 8-10% of the area's lion population.[729]

[723] Conservancy Leader #4, Personal Communication.
[724] Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. See chapter one.
[725] Carruthers, "Creating a National Park, 1910-1926"; Bernard M. Kissui, "Livestock Predation by Lions, Leopards, Spotted Hyenas, and Their Vulnerability to Retaliatory Killing in the Maasai Steppe, Tanzania," *Animal Conservation* 11, no. 5 (2008): 422–32; Mara J. Goldman, Joana Roque De Pinho, and Jennifer Perry, "Beyond Ritual and Economics: Maasai Lion Hunting and Conservation Politics," *Oryx* 47, no. 4 (2013): 490–500.
[726] *Frontiers of Fear: Tigers and People in the Malay World, 1600-1950*, 227.
[727] See Appendix 1, Fig. E.
[728] Anabeb Pastoralist #13, Personal Communication, 2017.


Figure 31: Two lions killed following HLC incidents, 2019. Photo: Cliff Tjikundi.

Reinvigorating CBNRM

For hundreds of years, humans, livestock, and lions have shared space in northwest Namibia. Though a great many things have changed in the region throughout the period I have examined, challenges that pastoralists face from HLC bear many similarities to those experienced by previous human inhabitants. HLC is likely to remain an ongoing problem on communal land in northwest Namibia, unless human-livestock-lion conditions are transformed. In chapters two and four I presented archived letters from a farmer, Rudolph Böhme, who requested government permission to pursue lions into Etosha National Park to kill them. Böhme was convinced then, as communal farmers still are, that lions in his area were fearsome: they attacked people and even killed his neighbor. That they were destructive: he claimed forty-two stock losses within a year including "1 very valuable bull, 1 horse, 1 work oxen…[with] another cow severely mauled." And that their numbers had recently been increasing: he noted that there were no lions in the area in his youth.[730] Similar to communal pastoralists, when Böhme suffered increasing incidents of HLC, he attributed it to a recent growth in the area's lion population. Böhme's complaints were given a full hearing, even though some of his claims, such as Etosha containing "thousands" of lions, were clearly absurd, but the government did not act.[731] I have also shown, in chapters two

[729] Stander, *Vanishing Kings: Lions of the Namib Desert*.
[730] See chapter 2 and chapter 4.
[731] South West Africa Administration, Namibia National Archives (SWAA) 2329, "Proposed Extermination of Lions, Etosha Pan Game Reserve, Secretary South West Africa to Magistrate, Grootfontein. 21 April 1952."

and four, numerous records coming from the Kaokoveld 'native reserve,' during the colonial era, where residents complained to colonial officials about the killing of livestock by lions and other predators. At that time, as still occurs, government officials were seen to be providing inadequate support for residents dealing with HLC. The continuity in these experiences reinforces the approach I have taken here to use historical sources to understand contemporary HLC challenges. As I hypothesized in chapter five, the long history of HLC in northwest Namibia suggests that fluctuations in HLC will be tied to fluctuations in lion numbers. As I have shown, human willingness to share space with lions differs greatly depending historical, sociopolitical, economic, technological, and temporal positions.[732] During the early 2000s, the research of Stander and his colleagues pioneered new ways of seeing and experiencing lions in the northwest, providing new types of lion-centered information. This changed the tenor and prospects of human-lion relationships within the region away from human-livestock-lion interactions to lion focused and human-lion interactions more akin to those in Etosha. Pastoralists and their livestock remained, but the challenges they faced in living with lions were often overlooked. While lion numbers were low and largely confined to areas where livestock were disallowed, HLC was minimal. As lion numbers increased so too did HLC. Convictions that lions are fearsome, destructive, and increasing are not problems of misperception to be corrected, repressed, or ignored; they are now, and likely long have been, an active part of the ongoing process of humans becoming-with lions.[733] As I showed in chapters two and three, human social structures and political policies can have long-standing effects on wildlife.

Human-livestock-lion interactions have fractured relationships between differently positioned people numerous times throughout this history. This fracturing has exacerbated HLC challenges. In the early colonial era, livestock movement and lion destruction resulted from and were sources of inequality and tension between Africans and colonial administrators. During the apartheid era the encapsulation of wildlife in Etosha and people and livestock in Kaokoveld led to livestock and ungulate deaths as well as increases in predators and incidence of anthrax in Etosha. Soaring lion numbers in the park led to increased HLC on Etosha's borders. Throughout the last one hundred-plus years lions have been a source of tension between European and African residents and government. If CBNRM programs are going to address HLC these fractured relationships need repairing. As they currently stand, lion conservation interventions in northwest Namibia are primarily social, rather than purely scientific, challenges. The time is long past to reframe the problem around a pragmatic, human-oriented, question: how can human-livestock-

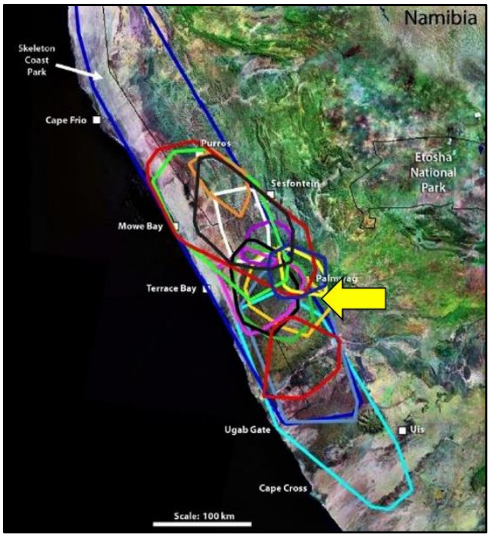
[732] Ginn, Beisel, and Barua, "Flourishing with Awkward Creatures: Togetherness, Vulnerability, Killing."
[733] Ginn, Beisel, and Barua, 121.

lion interactions bring people together? This reframing shifts the focus from conflict to creating common spaces that acknowledge, even celebrate, the existence of different perspectives on human-livestock-lion interactions. Whereas lion conservation interventions in northwest Namibia have been primarily undertaken by government and partnering NGOs, leading to agonistic relationships between communities and these outside groups, CBNRM practices guide me back to locals for mechanisms of bringing people together.

A brief example shows that pastoral perspectives can be aligned with ways of experiencing lions that are not primarily mediated by livestock. As I have shown in chapter five, desert-adapted lion numbers have increased dramatically since the late 1990s, echoing pastoralists' concerns. Among surveyed pastoralists, 72% stated that lions are "common" or "very common" in their conservancy. Yet, lion density in northwest Namibia is the lowest recorded among viable lion populations in Africa. Currently estimated between 112-139 over 38,950 km^2, lions hardly seem ubiquitous – the Serengeti ecosystem alone contains an estimated five times as many lions as Etosha and twenty times as many as the northern Namib communal areas.[734] How do scientific researchers and conservationists reconcile what appear to be relatively low lion density and numbers with communal perspectives?

Based on Stander's research, desert-adapted lions maintain the largest known home ranges among African lions.[735] Due to such large home ranges intra-species competitors cannot be consistently evicted. Average nightly movements of females in the desert-adapted population of 7.3 (±0.9) km over a mean-average home range of 3,577 km^2 indicates that, on a given night, lions in the northern Namib will cover between 0.00178-0.00229% of their home range. In comparison, lions in Serengeti will cover approximately 0.015% of their mean-average home range – more than seven times as much. Home range size and the relatively low likelihood of a lion's presence within any part of it at a given time allows for home range overlap. Two maps of desert-adapted lion range illustrate the challenge that overlapping home ranges can pose for communal pastoralists.

[734] Stander, *Vanishing Kings: Lions of the Namib Desert*, 144.
[735] See chapter five.



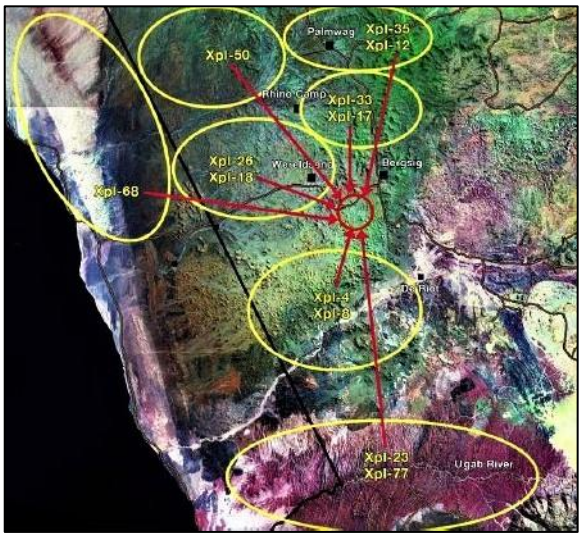


Figure 32 (left): Map of overlapping home ranges for 19 lions fitted with satellite radio collars between 2008 and 2015. Yellow arrow indicates area enlarged in Figure 30. Source: MET, 2017[736]

Figure 33 (right): Map of core home ranges for 12 radio-collared lions that caused HLC at a single conservancy farm between 2006 and 2013. Farm indicated by red circle. Source: MET, 2017[737]

From 2006 to 2013 22 cases of HLC were recorded at a single farm in one core lion-range conservancy, with the result that 16 lions were destroyed, including 11 of the 12 radio-collared lions (Figures 29 & 30). Areas inhabited by communal pastoralists where multiple lion home ranges overlap are known as HLC 'hotspots.'[738] These areas suffer disproportionately from HLC. Survey results indicate that farms at community-identified hotspots contributed 82% of all cattle, 100% of all sheep, 62% of all goats, and 67% of all donkeys lost due to HLC.[739] In addition to heightened frequencies of conflict, the result of these overlapping home ranges can be that pastoralists frequently see different groups of lions, leading to the perception of an inflated population. Because communal pastoralists do not compare lion numbers or density in the region with numbers and densities elsewhere, their information circulates within a different *denkkollektiv* and social world than it does for conservationists and researchers primarily informed by technologically-mediated methods or peer-reviewed journal information.[740] Reports submitted to

[736] Namibia Ministry of Environment and Tourism, "Human-Lion Conflict Management Plan for North West Namibia," 23.
[737] Namibia Ministry of Environment and Tourism, 35.
[738] Namibia Ministry of Environment and Tourism, "Human-Lion Conflict Management Plan for North West Namibia."
[739] Hotspot farms make-up one-third of all farms. Unpublished data.
[740] Fleck, *Genesis and Development of a Scientific Fact*; Adele E. Clarke and Susan Leigh Star, "The Social Worlds Framework: A Theory/Methods Package," in *The Handbook of Science and Technology Studies*, ed. Edward J. Hackett et al. (Cambridge and London: MIT Press, 2008).

the government during the 2000s were not circulated within the communities, though information has often been received through meetings and word-of mouth.[741] Communal pastoralists primarily receive information about lions presence, conflict incidents, and numbers through different methods than government officials and within a different set of experiences. Even though respondents were likely not comparing lion density to other parts of Africa, combining home range data with local perspectives allows for lion conservationists to better understand context-specific experiences of living with lions. Reinvigorating CBNRM approaches to lions can focus on creating shared spaces of information among people who experience human-livestock-lion relationships differently.

I have shown that ovaHerero pastoralists value cattle for monetary and nonmonetary reasons. Not only a sign of wealth and prestige, cattle serve as a tangible means of tracing multigenerational kin relationships across matriclans (*omaanda*) and patriclans (*otuzo*). Cattle cross barriers between the impermanent (*kamanga*) and the timeless (*karerera*); between the sacred (*zera*) and the secular. Ownership of cattle is familial more than personal: each generation tends the herd for the next. As Crandall notes in his anthropological work on the Himba, "cattle possess no intrinsic symbolic value whatever, but only acquire such value as they come to represent things entirely foreign and exterior to themselves. Cattle are representational media whose value derives from the value human beings ascribe to the persons, objects, entities or activities cattle represent."[742] The ovaHerero understand that animals can be sites embodying human relationships and binding people together. Among conservancy residents, spaces exist for refiguring human-lion-livestock relationships away from the HLC paradigm towards the recognition that animals can embody human relationships and bind people together.[743] Can lions also be platforms for forging or reinforcing relationships between people?

The STS boundary object concept bears many similarities to the ovaHerero perspective that cattle are physical expressions of social ties. Yet, becoming-with lions is experienced differently by differently positioned people. For the Hai||om lions may be "colleagues, if not friends," for researchers they may be objects of puzzlement and fascination, for farmers they may be 'vermin,' for pastoralists objects of fear, for Etosha tourists they may be sought-after, for hunters they may be potential trophies and means for displaying human (particularly masculine) dominance.[744] As cattle can embody multiple meanings for the ovaHerero, so to can lions embody

[741] Personal observation.
[742] Crandall, "The Role of Time in Himba Valuations of Cattle," 101.
[743] Ginn, Beisel, and Barua, "Flourishing with Awkward Creatures: Togetherness, Vulnerability, Killing"; Agrawal, "Dismantling the Divide between Indigenous and Scientific Knowledge."
[744] See chapters two and four.

multiple meanings for differently positioned people, and even within an individual. Recall Jacobsohn's account of the Himba in chapter two: lion encounters during the colonial era were common enough that individual lions were not necessarily disdained:

> "Those of us who have lived with lion know that, like all animals, and indeed like people, each lion is different. Most lions cannot be allowed to remain near stock. They are killers of cattle and must die. Others who do not know cattle may be timid and leave cattle to graze in peace."[745]

Among communal pastoralists, though 84% of survey respondents stated they do not directly benefit from the presence of lions, 75% felt that it is important to continue to share communal land with them; the most frequently given reason was so that children could see lions. This suggests that there is conceptual space for innovation concerning human-livestock-lion relationships to occur. To become true boundary objects, in Star and Griesemer's estimation, lions must also act as "anchors or bridges, however temporary" between different people sharing a similar goal.[746]

The challenge becomes how to innovate common spaces where positive exchange around the shared theme of human-livestock-lion interactions can take place. This reorients lion conservation interventions, away from government- or NGO-designed top-down application of lion-centered regulations and towards inclusive, multi-stakeholder programs that originate from bottom-up relationships between people. One frame for bringing disparate groups together can be a process of reinvigorating Ostrom's seven Design Principles (Panel B) for common-pool resource management around shared experiences of becoming-with desert-adapted lions. The efficacy of these Design Principles is well-supported by theoretical and real-world data.[747] Reframing HLC around collective becoming-with centers processes of consultation, engagement, and empowerment; the same processes outlined by Owen-Smith in founding the original CBNRM program in the 1980s. This helps develop new relationships, as well as shared norms and values that reduce the likelihood of individuals acting in ways that are not supported by community consensus.[748]

Ostrom's Design Principles: One Method for Creating New Social Ties

[745] Jacobsohn, *Himba: Nomads of Namibia*, 47.
[746] Star and Griesemer, "Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39," 414.
[747] Jones, "Ostrom and Namibian Conservancies"; Elinor Ostrom, "Collective Action and the Evolution of Social Norms," *Journal of Economic Perspectives* 14, no. 3 (2000): 137–58.
[748] Jeff R. Muntifering et al., "Harnessing Values to Save the Rhinoceros: Insights from Namibia," *Oryx*, 2015, 1–8; Ostrom, "Collective Action and the Evolution of Social Norms."

Acting as boundary objects, desert-adapted lions can create space for dialogue, with improving human-livestock-lion relationships as the focus. Boundaries (Design Principle 1) are not only spatial, but can also be embodied in nonhumans. There exists confusion among communal pastoralists over who has ownership rights and responsibilities for lions. 39% of survey respondents stated that lions are the responsibility of government to manage, while 49% stated that lions are the responsibility of the local people or the conservancy. 54% stated that lions belong to the government, while 30% stated that lions belong to the local people or the conservancy. Since the early 2000s, human-lion relationships have formally been managed by government and NGOs and largely informed by technologically-mediated information not available to communities. During this period communities have continued to struggle to live with the negative outcomes of human-livestock-lion relationships – a burden that is often unrecognized by outsiders. Though conservancies maintain limited ownership and use rights to huntable game species, lions currently fall under the designation of specially-protected species (Nature Conservation Act 4/1975), thus remaining within government mandate. This lack of clarity and alienation of lions as community resources reveals a clear gap in the experience of CBNRM as a mechanism for local people to assert collective proprietorship over natural resources.[749] Clarifying the status of lions can be a fruitful foundation for dialogue around lion conservation interventions between communities, government, and NGOs. Because lions do not adhere to conservancy boundaries, new institutions accounting for lion mobility between conservancies may be needed. At other times conservancies have united around issues such as provisioning tourism and grazing access rights – these may provide useful models. Negotiation with government concerning new programs for lion conservation is already proving to be grounds for strengthening relationships.[750]

Gaps between the appropriation of lions as community resources and the provisioning of lions as a resource stock (Design Principle 2) undercuts the efficacy of lion conservation efforts. Provisioning problems (concerning the stock of a resource) are experienced because communal pastoralists and government contextualize lion numbers differently. Appropriation problems (concerning the allocation of resource flow) are experienced because lions are not seen to provide benefits to communities, though they are expected to be treated as a common-pool resource.[751] Monitoring and enforcement of lions (provision) and hunting (allocation) requires innovation. These may be most sustainably executed by devolving management to a local scale, which allows

[749] Western & Wright (1994), from: Dressler et al., "From Hope to Crisis and Back Again? A Critical History of the Global CBNRM Narrative," 7.
[750] See Conclusion.
[751] Ostrom, *Governing the Commons. The Evolution of Institutions for Collective Action*, 47.

for adaptation and flexibility.[752] Across sub-Saharan Africa the effects of trophy hunting of lions have been mixed: restrictions on lion hunting have been shown to have negative conservation outcomes,[753] while unsustainable levels of hunting have driven declines in lion abundance in certain areas.[754] Sustainable lion hunting, and/or tourism, requires policymakers and practitioners to align lions as a resource and the appropriation of them. CBNRM emphases on consultation and inclusion suggest this should occur in an open forum.

As those people most directly affected by HLC, communal pastoralists maintain a unique perspective on human-livestock-lion relationships. These perspectives have so far proven to be somewhat asymmetrical with technologically-advanced studies and management informed by international lion conservation scholarship. Chief among pastoralists ways of becoming-with lions include extended contact with lions in uncontrolled settings, and the lived experience of human and livestock vulnerability to lions. These are neither 'objective' nor scientific ways of interacting with or forming conclusions about living with lions. But they are central to the embodied experience of understanding and making decisions around human-livestock-lion relationships. Experiences of lion fearsomeness, destructiveness, and increasing numbers do not weaken the ability of communal pastoralists to effectively assess human-livestock-lion relationships, they strengthen it. Becoming-with lions can be considered an important qualification for those empowered to make decisions concerning human-lion relationships on communal land (Design Principle 3). The work of STS theorists Donna Haraway and Latour challenges the possibility that knowledge can be, or ought to be, understood as disembodied or context-free.[755] Haraway's insistence that knowledge is locally situated, historically contingent, and subject-oriented, and that this provides a faithful account of the 'real' world, and that by being so it is strong, not weak, provides an opening to insist that those individuals most affected by HLC can also provide a perspective that is indispensable to human-livestock-lion relationship governance.[756] Communal pastoralists, government officials, conservationists, and researchers could all have their perspectives interrogated to inform more inclusive and coherent decision-making.

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[752] Per Olsson, Carl Folke, and Fikret Berkes, "Adaptive Comanagement for Building Resilience in Social-Ecological Systems," *Environmental Management* 34, no. 1 (2004): 75–90.
[753] Peter Andrew Lindsey et al., "The Significance of African Lions for the Financial Viability of Trophy Hunting and the Maintenance of Wild Land," *PLoS ONE* 7, no. 1 (2012).
[754] Packer et al., "Effects of Trophy Hunting on Lion and Leopard Populations in Tanzania."
[755] Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature*; Bruno Latour, *We Have Never Been Modern* (Cambridge, Massachusetts: Harvard University Press, 1993).
[756] Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature*, 183–202.

Ostrom, writes that "the worst of all worlds may be one where external authorities impose rules but are only able to achieve weak monitoring and sanctioning."[757] This characterizes the state of human-livestock-lion relationship management in northwest Namibia. There is no comprehensive monitoring of the northern Namib lion population and when communal pastoralists suffer from HLC incidents, government and NGO response is irregular (Design Principle 4). Asymmetries in monitoring techniques and information dissemination have generated different perspectives on human-lion relationships. More inclusive monitoring and information dissemination are needed to inform collective decision making. This can be most parsimoniously achieved and responsive to local needs if it occurs at the local level. Conservancies can assert increasing authority over human-livestock-lion relationships by innovating locally-centered approaches to monitoring and conflict management through creative partnership with ongoing research and monitoring. This may transform locals into conduits of information about lion behavior and ecology and help develop capacity that is technologically-enabled, but not dependent. This approach has been successful in reducing HLC and generating stewardship among rural pastoralists living with lions on communal lands in the Amboseli-Tsavo ecosystem of southern Kenya.[758]

Regular sanctions (Design Principle 5) are currently lacking. Though 95% of survey respondents stated that the government will investigate if a lion is killed, and 54% believe someone who kills a lion will have a legal case brought against them, only one known case has been brought against communal residents suspected of killing lions. Crucially, the threat of sanctions comes not from the conservancy (appropriators) but from the central government. During the 1980s, local enforcement of anti-poaching regulations was seen to be an important part of protecting wildlife populations in the region. The emphasis on local monitoring and enforcement of sanctions was also seen to be an important part of generating stewardship of wildlife among communities before economic instrumentalism could be implemented.[759]

Conflict-resolution mechanisms (Design Principle 6) are also currently lacking. The only mechanism in place is compensation for killed livestock. 92% of communal pastoralists feel the compensation program is not working well, with the most common response being that the money provided is much less than the value of the livestock lost. Commodifying livestock loss, particularly of cattle, is, when used in isolation, an inappropriate response. Acknowledging livestock loss and the associated feelings of insecurity is part of providing adequate

[757] "Collective Action and the Evolution of Social Norms," 147.
[758] Hazzah et al., "Efficacy of Two Lion Conservation Programs in Maasailand, Kenya."
[759] Owen-Smith, *An Arid Eden: A Personal Account of Conservation in the Kaokoveld*.

compensation, and opens space for dialogue. Conflict-resolution mechanisms could be developed through locally-centered approaches responsive to provisioners' (locals) and appropriators' (tourists/hunters) needs and in partnership with police and government. As I have shown, conflict-resolution is an important part of ensuring that lions do not become objects for communicating protest by otherwise disempowered or ignored individuals or groups.

Currently, rural pastoralists are not guaranteed minimum recognition of rights to operate (Design Principle 7) concerning the ownership and management of lions within the conservancy system. If lions are going to properly fall within the pillars of CBNRM the Namibian government should open dialogue around devolving lion ownerships rights to conservancies. Because the population of Etosha lions is secure, and lions from Etosha have periodically (re)colonized communal lands, the park's population serves as a buffer to mismanagement of the population in the communal areas. This allows for flexibility in the learning process of local management without risking the permanent eradication of the desert-adapted lions. An important outcome of this research and dissertation project is the renewal of the community Lion Ranger program. By applying the lessons of this historical research, along with the tenets and practices of CBNRM, a small group of committed communal pastoralists, the Lion Rangers, are taking monitoring and management leadership over desert-adapted lions in their conservancies. The goal is to transform the human-livestock-lion nexus by providing a more community-centered approach to lion conservation interventions. Nominated by their communities to serve as lion monitors and managers of HLC, the Lion Rangers, each of whom are themselves livestock owners, may also serve as mediators between conservationists' and locals' perspectives of lions and human-livestock-lion relationships.

Conclusion

The reinvigoration of Ostrom's Design Principles is only one possible avenue for beginning the transformation of human-livestock-lion relationships on communal land in northwest Namibia. Because Ostrom's principles were considered an important part of the development of Namibia's CBNRM program and share important goals with the four pillars of CBNRM they may help strengthen the CBNRM system as it currently exists. Lion-range conservancies are spaces intended to house humans, livestock, and lions (as well as other wildlife). Lion monitoring, research, and policy-making concerning lions inhabiting conservancies will be most productive if it incorporates human-livestock-lion relationships. Losing one of these variables would transform, and, I believe, undermine a conservancy as well as the mission of integrating rural livelihoods and wildlife conservation. The creation of a new paradigm around desert-adapted lions on

communal land in the northern Namib is challenging human-livestock-lion relationships in the region. If chapter five shows that lions in the area display unique adaptations to their environment, in this chapter I have shown that lions can be understood in a variety of, perhaps complimentary, ways. Though the paradigm of lion scientific research and conservation is new, the challenges surrounding human-livestock-lion relationships in the region bear many similarities to those of the past. Because lions are sites of disagreement, and because human-livestock-lion relationships have long been sources of conflict in northwest Namibia, perhaps lions can be spaces where dialogue can finally bring different people together. This will require differently positioned actors to listen to, and possibly adopt, different ways of seeing and understanding human-livestock-lion relationships. This will likely include sharing access to technology, engaging in embodied practices of livestock management, and each side speaking to the priorities and spaces of disagreement with the other. It is clear that human-livestock-lion relationships and human-human relationships around livestock and lions have a long and dynamic history in northwest Namibia. However, if substantive changes are not made to address the long-experienced challenge of HLC, human-livestock-lion relationships will likely continue to be manifest in the negative outcomes experienced by humans and lions that have become so familiar throughout this history.

Conclusions: Looking Forward…Looking Back

Figure 34: OvaHerero communal pastoralist, Anabeb Conservancy, 2018. Photo: A. J. Wattamaniuk

> The Himba understand that "[time is] as a river which flows past them. This means the future, which has yet to pass, is behind them and invisible, whereas the past, which has already been experienced, is ahead and visible. The Western idea of putting your past behind you and looking forwards to the future is therefore senseless to the Himba."[760]

This project has been founded on the conviction that the past is provided for us to understand, but we must be willing to turn eyes, hands, and thoughts to it. Looking into the past – orienting ourselves to what has come before, exploring it, allowing it to shape our ideas and actions – is the beginning of knowledge. What we find there is always surprising.

One major purpose of this dissertation has been to show the effects humans, livestock, and lions have on one another in northwest Namibia. Clearly human action has changed spatial arrangements of nonhumans, but livestock and lions have also affected human societies. Concerns of livestock wellbeing and illness were central to colonial governance in Namibia. OvaHerero cattle culture remains an important frame for understanding human-lion as well as human-human interactions. Predators have alternately suffered or flourished from human policies and practices. So have human livelihoods and lives been transformed, even ended, by predators. When the

[760] Margaret Jacobsohn, *Himba: Nomads of Namibia* (Cape Town, South Africa: Struik, 1998), p. 53.

apartheid government rearranged the northwest, it expelled pastoralists and stock from Etosha while enclosing wildlife within it. Lions there multiplied and grew unafraid of people. They trespassed beyond park borders, destroying livestock and often being destroyed themselves. Disagreements over livestock and lions have caused ruptures between people. The persistence of desert-adapted lions in the northern Namib transformed the life of one man, who in turn continues to delve into understanding their adaptations to the extreme environment. Those same lions invade farms and destroy livestock. The northern Namib itself has been a key, though perhaps too-often overlooked, factor. The environmental effects on human, livestock, and lion movements cannot be overstated. Periods of drought particularly punctuate the context-specific challenge of surviving there.

Historians trace change over time. Since the mid-nineteenth century a great many changes have taken place at the human-livestock-lion interface in northwest Namibia. The human actors empowered to speak on behalf of human-livestock-lion interactions have become more representative of the people inhabiting the area. By analyzing archives, reviewing lion research, and collecting local stories about humans, livestock, and lions, I have brought to the fore a variety of unexamined perspectives and synthesized seemingly disparate viewpoints. Giving voice to the marginalized of the past and those still straining under unequal access to power, including livestock and lions, is perhaps the most important intervention of this project. It enables a more nuanced, context-specific reading of the past and ongoing challenges of HLC. Northwest Namibia has seen important political transformations during this period, including the beginning and end of colonialism, the formation of new land designations such as native reserves, ethnic homelands, national parks, and communal conservancies, and an increasing presence of government and conservation professionals. During this same period livestock and lion numbers have fluctuated in response to human policies and practices, and human actions have responded to concerns over livestock health, lion actions, and the lives and deaths of both. The changing reach of government in particular has been a useful proxy for where predators persisted or were eradicated. During the first half of the twentieth century, where colonial power was strongest is where lions, and other predators such as wild dogs, disappeared. This began to flip in the second half of the century when government-controlled lands, such as Etosha National Park and the Palmwag Concession, became wildlife refuges while lions began disappearing from areas beyond government control. Since independence, the Namibian government has begun reaching further into the northwest. Throughout this period the lives and prospects of humans, livestock, and lions in northwest Namibia have greatly changed. How these changes will affect human-livestock-lion relationships going forward remains to be seen.

As I turn towards solutions to HLC and new ways for humans to become-with lions, I am struck by a certain consistency of these relationships throughout this history. The complaints of Rudolph Böhme in chapter two are strikingly similar to communal pastoralists in chapter six. Much as the ovaHerero of the 1920s and 30s struggled to keep their livestock safe and healthy in the arid, rugged northwest, so do communal pastoralists still seek solutions to the challenges of marginal economic livelihoods. Mobility, particularly of livestock and lions, and the difficulties that come with governing mobile human populations, still challenges the best intentions of policymakers and practitioners. The environment is arid, rugged, low in productivity, and largely beyond the reach of government assistance. Examining this history has been so useful for understanding contemporary HLC because so much of the past feels relevant and immediate. Even inescapable. V. S. Naipaul began his novel of life at the outskirts of an African frontier, *A Bend in the River*, by stating, "the world is what it is."[761] In this assertion Naipaul captured in six words what I have been at pains to convey about HLC in northwest Namibia: the past forms and at times constrains the present; it provides all the material humans and nonhumans have to create the future.

Yet, Haraway's conception of becoming-with suggests that human-livestock-lion relationships are amenable to reinvention. I believe reframing human-livestock-lion relationships around lions as productive sites for bringing together dissimilar perspectives on HLC can transform lion conservation outcomes. A possibly productive tension exists between the familiarity of HLC through this history and the recognition that differently positioned humans, livestock, and lions have experienced human-livestock-lion relationships differently. A simple comparison of what has changed and what has stayed the same does little to indicate which pathways may produce desired outcomes. In chapter six I suggested that human-livestock-lion relationships be reframed around lions as productive sites of human-human relationships because I found that the changes traced in this history have been, primarily, due to human actions. This does not imply that human intentions are not mediated, repurposed, displaced, and even transformed by nonhumans; they are.[762] Rather, when humans come together to create change, for good or ill, the world of humans and nonhumans can be transformed; often in unpredictable ways. Chapter three provides one such example of how human action transformed an environment and the lives of the nonhumans inhabiting it. Throughout this history I have shown a diversity of perspectives concerning human-livestock-lion relationships. As Haraway notes, knowledge

[761] V. S. Naipaul, *A Bend in the River* (Alfred A. Knopf, 1979).
[762] The clearest explanation, that I am familiar with, of such "translation" is in, Latour, *Pandora's Hope: Essays on the Reality of Science Studies*, 174–215.

derived from those who live alongside subjects of interest – knowledge that is "situated," such as that of communal pastoralists – is more, not less, central to understanding a certain portion of the world.[763] Incorporating and synthesizing alternate perspectives provides a more complete picture of the world; in this case of human-livestock-lion relationships. One way forward will be to not repeat the mistakes of the past, but to more completely account for a diversity of experiences. The world is what it is.

Positive lion conservation interventions will also address issues with distinct historical valences. Acknowledging that the effects of colonialism and apartheid remain is part of reframing human-livestock-lion relationships. As Boomgaard notes of human-tiger relationships in the Malay world, the dangers predators pose to people depends upon one's circumstance and ability to control the setting of human-predator interactions.[764] Incorporating locals into reframing human-livestock-lion relationships not only aims for a diversity of viewpoints, but is an important part of empowering historically marginalized people. Ongoing inequality renders certain people safe and others vulnerable, leading to conflict. As Rangarajan noted of HLC in colonial India, "[c]arnivores may not make social distinctions, but the uneven spread of wealth made some people far more risk-prone than others."[765] Inequality has been endemic throughout this history often leading to inter-species violence. It will be productive, in the broadest sense, to transform socioeconomic policy and practice in northwest Namibia.

The world around the lions of northwest Namibia, and around the area's inhabitants, has changed dramatically since Namibian independence. Stander's intensive scientific research introduced the outside world to the lions of northwest Namibia and increasingly brings attention to the challenge of conserving this population. As I show in chapter five, Stander's work has been innovative in numerous ways. However, perhaps the most notable has been the ways in which it altered the mediators of human-lion interactions. As noted in chapter six, mediation always exceeds its conditions: mediators add something additional to the components they bring together. In the case of humans-lion relationships in northwest Namibia, I have shown that historically livestock served as the critical mediator. Through his research, Stander has introduced the outside world to the lions of northwest Namibia. That he has done so through a different set of, primarily technological, mediators has helped create a new paradigm of human-lion interactions in the region. Situated within this history, Stander's work, focusing on lions in relative isolation from their effects on humans and livestock, is recontextualized as a new way of understanding lion

[763] Haraway, *Simians, Cyborgs, and Women: The Reinvention of Nature*, 183–202.
[764] *Frontiers of Fear: Tigers and People in the Malay World, 1600-1950*, 45.
[765] Rangarajan, "Animals with Rich Histories: The Case of the Lions of Gir Forest, Gujarat, India," 120.

presence in northwest Namibia. This approach builds on the experience of studying lions in Etosha during the 1980s-90s. Yet, as I show in chapters three and four, Etosha was created in response to certain social and political circumstances in South Africa and South West Africa, ones which favored particular spatial, social, and political rearrangements of landscapes. In Etosha, lions interacted with humans in relatively controlled settings. Beyond the park, humans, livestock, and lions shared landscapes beyond the control of government staff and conservationists. Stander's work is the first time that I have found where lions in the northern Namib were examined not primarily for their effects on humans and livestock, but as predators existing in relative isolation from humans and livestock. Though human-livestock-lion relationships are only beginning to be examined as an appropriate avenue for understanding the challenges of lion conservation in the region, it is actually the treatment of lions separately from their interactions with humans and livestock which is the historical novelty. My research has shown that, historically, residents of northwest Namibia have understood both livestock and lions not as organisms separable from human society, but as organisms that are profoundly interwoven with human struggles and wellbeing. By recovering this longer history of human-livestock-lion relationships I have shown that human-lion coexistence, as tenuous and difficult as it may be, can be grounded in relevant historical information. Treating lion conservation as conceptually occurring at the juncture of human-livestock-lion relationships is thus not an innovation, but rather a return to historical, locally-grounded ways of understanding human and lion coexistence.

Conflicts are inevitable when humans, livestock, and lions share land. They are also inevitable in CBNRM, and in wildlife conservation more broadly.[766] Eliminating conflicts by disempowering people is no more a solution to the challenges facing CBNRM than eliminating lions is a solution to HLC. The necessity of addressing HLC within the communal conservancy setting encourages the resilience of the system as currently defined: one in which pastoralists, their kin, and their livestock can continue to coexist with lions and other wildlife. In this arena there are early, positive results. In 2018 I was part of a group of NGOs and communal conservancy partners that re-launched the moribund Lion Ranger program. The Lion Rangers are communal pastoralists employed by their conservancy, and trained by staff from Integrated Rural Development and Nature Conservation (IRDNC), Desert Lion Conservation, MET, and the University of Minnesota Lion Center to limit conflict between lions and rural pastoralists. Early activities of the Lion Rangers have been tied to fulfilling Ostrom's Design Principles for common-pool resource management. Nominated by their conservancies (Principle 1) to take-charge over the resident lion population and lion-oriented programs, such as tourism (Principle 2)

[766] IRDNC, "Lessons from the Field: IRDNC's Experience in Namibia" (Windhoek, Namibia, 2011).

and monitoring activities (Principle 4), each conservancy's Lion Rangers serve as the conduit between government and conservancy management concerning lion conservation (Principle 3). The nascent program is moving towards further equipping these and other community members to take an increasing role in synthesizing policy and practice at multiple levels (e.g. conservancy-level, MET, research, and multi-stakeholder interventions). Locally-driven policy innovations concerning graduated sanctions (Principle 5), conflict-resolution (Principle 6), and rights to operate (Principle 7) are long-term goals of the program. Program activities are implementing the reframing of human-livestock-lion relationships. Group trainings, field deployments, and responses to potential and actual HLC are bringing together a variety of actors around the challenge of improving these relationships. Building upon the years of social learning from IRDNC staff, the emphasis on process-as-outcome is considered central to program success. This includes a recognition that positive human-human relationships foreground inclusive conservation interventions. Initial results, including placing more collars on the region's lions, assisting pastoralists with the construction of reinforced kraals, opening lines of communication with communities, and developing shared perspectives on human-livestock-lion relationships, have been encouraging.[767]

Figure 35: Lion Rangers and author during training, Anabeb Conservancy, 2018. Photo: A. J. Wattamaniuk

[767] Lion Ranger Program, "Lion Rangers: Annual Report, 2018" (Wereldsend, Namibia, 2019), https://kuneneconservation.dash.umn.edu/uncategorized/lion-ranger-2018-annual-report/.

In analyzing how certain humans experience becoming-with livestock and lions, I have made tentative steps towards understanding how lions experience becoming-with humans. My research reveals that living alongside humans has been a challenge for the lions of northwest Namibia for a long time. Humans are possessors of other species, such as cattle, goats, and sheep, that we cannot fully control, but demand the safety of. We are also creators of ill-defined boundaries over which we attempt to claim exclusive domain. From lions' point of view, encounters with humans are often deadly. By unifying a diverse set of sources, I have shown that the number of lions killed by humans in northwest Namibia is orders of magnitude greater than the number of humans killed by lions. We have every reason to suspect that lions in this region, save those restricted to Etosha, fear and avoid humans whenever possible.

Pastoralists and conservationists in northwest Namibia widely recognize lions' ability to interpret the present in light of the past. When groups of livestock-raiders become particularly pernicious, pastoralists and conservationists may elect to selectively kill young lions, particularly while the rest of the group is present. The conviction that the other lions, particularly group matriarchs, remember these events and adjust their behavior accordingly – that they will recognize the risk of taking livestock and avoid humans and possibly livestock in the future – is widely shared by pastoralists and conservationists working in the area. I have seen direct evidence that certain lions learn lessons at an individual and group level. One experience from early 2019 is illustrative. A pair of females, primarily inhabiting the Hoanib riverbed, were frequently seen by tourist and conservation vehicles, and could be approached, carefully, to within fewer than three meters without showing signs of agitation. This went on for a few years. In April 2019, this pair moved out of the riverbed near an area where livestock were grazing and killed two cattle within two days, alarming the herders who were concerned for the safety of their stock and themselves. In response, a group of community, NGO, and government conservationists, chased these lions from the area. During this process, one of the two lionesses charged two response vehicles: denting the door of one, and cracking the radiator grill, scratching the driver-side fender, and pushing backwards another one. She displayed no signs of injury from the encounter. In the aftermath, the behavior of these two lionesses changed. They appeared agitated when approached by vehicles and sought to keep themselves hidden within the Hoanib riverbed. All indications are that they remembered the violent interaction. What is this if not a conception of history as a potentially recurring, rather than linear, process, and subsequently taking action to avoid a negative outcome? Lions are historical. Though I sought to learn about human-livestock-lion relationships, I recognize that I have only begun to scratch the surface of nonhuman perspectives. Beginning in 2020 I will be partnering with the Namibian government

and a selection of communal conservancies to perform further in-depth monitoring and ecological research of the desert-adapted lions.

Historians and conservationists both deal with change over time. Historians seek to understand and account for change in the past, while conservationists seek to implement change to affect the future. Both are provided only with the matter, and matters, of the past to base their understandings. In northwest Namibia, humans, livestock, and lions have shared space and negotiated often challenging relationships for hundreds of years. Throughout this dissertation I have taken seriously human-animal studies scholarship placing humans and nonhumans on a shared stage of interactions. By recovering traces of human-livestock-lion interactions I have shown some of the ways these relationships have changed over time and how they are driving the contemporary challenge of HLC.[768] In the hopes of finding permanent solutions to HLC, differently positioned actors, including community members, conservationists, and Namibian and international commentators, have suggested removing one, or some combination of humans, livestock, and lions, from the landscape. Were the region to become solely a space for pastoralism, or solely for wildlife, it would be transformed in ways we cannot anticipate, and the loss would be irrecoverable. This project has taught me that there is no solution to HLC as long as humans, livestock, and lions share space. Such a recognition is not an admission of defeat, but a catalyst for hope. Lion conservation interventions will not, cannot, remove conflict, either between humans and lions or among humans. However, accepting shared responsibility to make progress on both can create spaces where people come together. By learning, together, from the past in front of us, we will be better prepared for the future still to come.

[768] Benson, "Animal Writes: Historiography, Disciplinarity, and the Animal Trace."

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APPENDIX 1

Biological Conservation 236 (2019) 496–504

Contents lists available at ScienceDirect

Biological Conservation

journal homepage: www.elsevier.com/locate/biocon

Desert-adapted lions on communal land: Surveying the costs incurred by, and perspectives of, communal-area livestock owners in northwest Namibia

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ARTICLE INFO

Keywords:
Lions
Desert-adapted lions
Human-lion conflict
Namibia
Human-wildlife conflict
Drought

ABSTRACT

Though subsistence pastoralism is the primary land-use throughout much of Africa, lions (*Panthera leo*) living outside protected areas are largely overlooked in discussions of pan-African lion conservation. In northwest Namibia, a unique population of desert-adapted lions has grown by > 400% over the past twenty years. This growth has primarily taken-place upon communal conservancy land. Human-caused lion mortality following human-lion conflict (HLC) is now the primary direct threat to the persistence of these lions. HLC exacerbates challenges faced by pastoralists from an ongoing drought. Our survey is the first-ever attempt to quantitatively and qualitatively examine local pastoralists' perceptions of the desert-adapted lions and the impacts of living with lions in northwest Namibia. Results show that losses, due to drought and lions, are differentiated by livestock species and that the magnitude of livestock losses during the drought has been exacerbated by predation. Respondents in different conservancies reported different levels of hostility towards lions. Across all conservancies, though 83.9% do not benefit from living with lions, 75.9% state that it is important to continue to share communal land with lions. We discuss the cultural and livelihood effects of livestock losses as well as the implications of balancing the costs and benefits of living with lions for lion conservation.

1. Introduction

In the past twenty-plus years African lions (*Panthera Leo*) have decreased by 43% (Bauer et al., 2016). Recent studies emphasize the importance of Protected Areas (PAs) as the "backbone of conserved landscapes" (Bauer et al., 2015b; P. A. Lindsey et al., 2018, p. E10793). Reviewing lion population densities and population trends across 42 sites in 11 countries, Packer et al. (2013) conclude that lion populations within fenced reserves are closer to estimated carrying capacity than unfenced populations. However, PAs are a partial solution to the challenges facing Africa's lions: only 1/3rd of PAs maintain lions at 50% carrying capacity (Jacobson and Riggio, 2018). Furthermore, PAs have been challenged by social justice advocates and researchers for being dispossessive, exclusionary, and for entrenching economic inequalities (Brockington, 2002; Dieckmann, 2007; Neumann, 1998). Government instability, corruption, and funding shortfalls have already put many of Africa's PAs in peril. Viable alternatives to PAs are an important part of ensuring the future for lions in Africa.

Subsistence pastoralism is the primary land-use throughout much of arid and semi-arid Africa, and continued human population growth will likely increase pressure on rangelands across the continent. If lions and subsistence pastoralists are unable to coexist, it is likely that lion range will continue to disappear. A growing body of research examines the potentials of conserving lions within landscapes shared by subsistence pastoralists (e.g. Romañach et al., 2007; Hazzah et al., 2014; Dickman et al., 2014). Among the key threats to lions in places where their range overlaps with humans and livestock are retaliatory killings following human-lion conflict (HLC) incidents (Jacobson and Riggio, 2018; P. Lindsey et al., 2018). Better understanding the drivers of HLC and implementing mitigation measures to combat HLC have been shown to reduce lion killings by subsistence pastoralists (Hazzah et al., 2014).

Northwest Namibia is one of the few places where lion numbers have increased on communal land during the past twenty years (Bauer et al., 2015b; Stander, 2018). Here, a unique population of desert-adapted lions has grown from a low of approximately 20 individuals in 1997 to an estimated 180 in 2015 (GRN, 2016; Stander, 2019). Whereas by the late 1990s, regional lion range had contracted to approximately 7000 km^2, these lions now range across > 40,000 km^2 (GRN, 2016) (Fig. A.1). This almost 400% population increase has primarily taken-place upon unfenced communal conservancy land; a unique

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https://doi.org/10.1016/j.biocon.2019.06.003
Received 27 December 2018; Received in revised form 29 March 2019; Accepted 4 June 2019

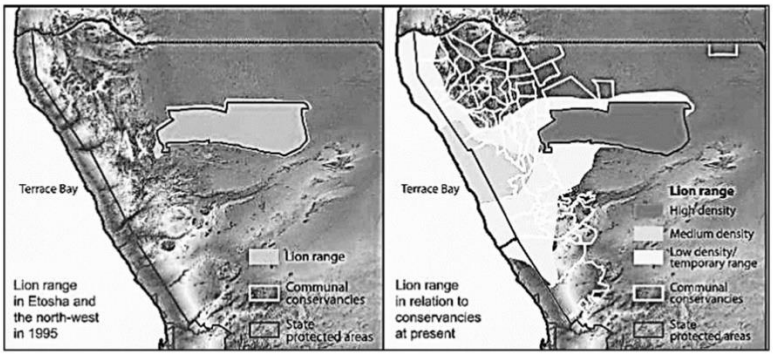

Fig. A.1. Lion range expansion in Northwest Namibia, 1995–2015.
Reprinted from NACSO, 2016, 40.

community-based natural resource management (CBNRM) success story (Jones, 2010; Owen-Smith, 2010). However, this success has been accompanied by HLC. Since 2000, human-caused mortalities have accounted for 80% of adult lion mortalities, and 100% of sub-adult (non-cub) lion mortalities, with the knock-on effect that HLC mortalities disproportionately target males, skewing the population's sex-ratio to 5.4 females per male (Stander, 2018). As the number one cause of lion mortality, such preventative and retaliatory killings are an important challenge facing this population.

Data in the form of 'Event Books' (Stuart-Hill et al., 2005) gives an overview of HLC incidents at a conservancy-wide level, though these data do not measure the household-level impacts of HLC, nor examine farmer tolerance for living with lions. In 2017, Namibia's Ministry of Environment and Tourism (MET) implemented the *Human Lion Conflict Management Plan for North West Namibia* (GRN, 2016); our survey is an outcome of that plan. This survey of farmers living in core lion-range conservancies was designed and implemented as part of an active, evidence-based approach to mitigate and ultimately prevent HLC. Our survey also examines how drought-related livestock losses are compounded by HLC in these conservancies. Northwest Namibia has been gripped by a region-wide drought, broadly considered to have begun in 2011/12. Early estimates (2012–2013) indicate a 45.8% drop in rainfall (Schnegg and Bollig, 2016, p. 66). Since the beginning of the drought, indicator species have substantially declined (Fig. B.1). Among conservation practitioners in the region, the drought is thought to have drastically constrained livelihoods and limited farmer tolerance for HLC.

This survey is a quantitative and qualitative first step towards better understanding the impacts of desert-adapted lions on rural livelihoods in light of drought conditions and the willingness of rural community members to live with lions in core lion-range conservancies. The costs and benefits of living with lions were assessed. Costs were assessed in terms of livestock losses and benefits were assessed in terms of perceived intrinsic and instrumental value that lions provide to respondents. The survey was designed and implemented to meet the following objectives:

1. Record the effect of the recent drought on households by quantifying livestock losses.
2. Record the effect of predation on livestock over the same period.
3. Estimate the value of livestock lost to all causes, all predators, and lions in particular.
4. Record household-head perceptions of the benefits received from living with lions.

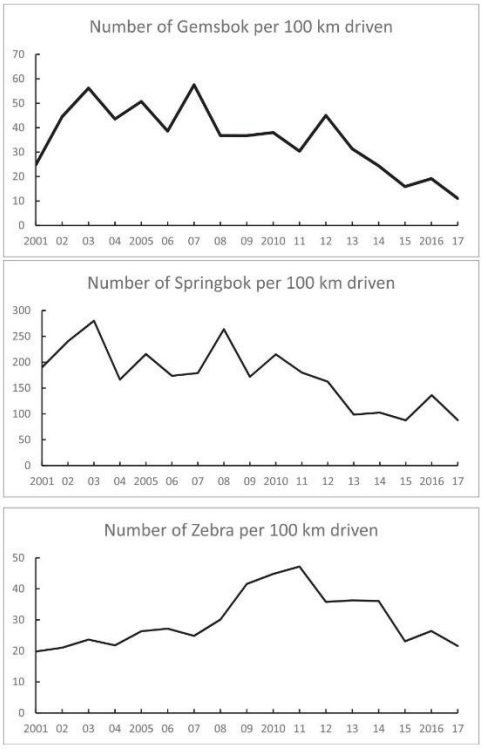

Fig. B.1. Estimated populations of three indicator species, based upon northwest road-based game count.

5. Assess household-level willingness to share communal conservancies with lions going forward.

1.1. Background

The desert-adapted lion population inhabits the Skeleton Coast National Park (SCNP) and communal conservancies within and bordering the northern Namib desert. Because the SCNP and communal conservancies remain entirely unfenced, desert-adapted lions move relatively freely through the landscape. Historically, lions occurred throughout northern and central Namibia (Shortridge, 1934). By the 1970s persecution on commercial (white) farmland coupled with increasing availability of firearms within the 'homelands'(Owen-Smith, 2010) meant that as many as 90% of Namibia's lions were confined to Etosha National Park (Joubert and Mostert, 1975). This remained the case throughout the 1980s and 1990s: what few lions persisted in the northwest outside of Etosha lived a marginal existence, hunting and scavenging along the Skeleton Coast (Bridgeford, 1985); in one case even resorting to preying upon people (Reardon, 1986). At its lowest ebb the northwest population may have been entirely confined to one mountainous area in the Sesfontein Conservancy (Stander, 2018).

Following Independence in 1990, the Nature Conservation Amendment Act (No. 5 of 1996) empowered communities inhabiting communal land to form communal conservancies: officially-registered, legally-recognized entities to manage natural resources within a defined, community-agreed-upon, jurisdiction. Each conservancy must pass a constitution for governing environmental affairs and outlining how benefits from wildlife will flow to members (NACSO, 2015). Communal conservancies are based upon four pillars of CBNRM: sustainable use as a conservation paradigm, market-based valuing of resources (economic instrumentalism), locals empowered with decision-making rights (devolutionism), and local, community level ownership of resources (collective proprietorship) (Jones and Murphree, 2004). There are currently 83 registered conservancies in Namibia, covering 163,017 km^2, and > 189,000 residents. About the same time the first conservancies were registered, an Etosha National Park ranger, Philip Stander, moved permanently to the northwest to study the local lions.

1.2. Study area

Lions now range across many of northwest Namibia's 36 communal conservancies, with varying HLC effects. Using more than nineteen years of satellite and VHF collaring data, in 2017 MET identified four core lion-range conservancies where HLC is critical (GRN, 2016). Three conservancies, Anabeb, Puros, and Sesfontein, assented to have farmer surveys implemented (Fig. C.1, Table A.1). Typical of conservancies in northwest Namibia, these three areas are characterized by vast, rugged landscapes, limited population, and erratic rainfall. All three conservancies border other communal conservancies as well as land set-aside for non-consumptive tourism. Anabeb and Sesfontein conservancies border the Palmwag Concession – an area set-aside for wildlife tourism. SCNP makes up the western border of both Puros and Sesfontein conservancies. Livestock and hunting are prohibited in Palmwag and SCNP. Each of the three conservancies have contracts for trophy and own-use hunting. In late 2016, because of concern over falling wildlife numbers due to the ongoing drought, MET placed a moratorium on shoot-and-sell hunting, prohibiting conservancies from shooting game to sell the resulting meat.

Anabeb, Puros, and Sesfontein are among the wealthiest conservancies in northwest Namibia, as measured by annual conservancy income from all sources (NACSO, 2018), and all three fall within the Sesfontein constituency, where 40% of the population live on ≤US$1/day and 23% live on < US$0.73/day (GRN, 2012). Nomadic pastoralism is the primary source of income, but all three conservancies are north of a country-wide veterinary fence, colloquially known as the "Red Line," that prohibits the exportation of livestock to the country's premier markets in central and southern Namibia (Bollig and Olwage, 2016; Miescher, 2012). Livelihoods are limited by a marginal economy that developed during more than a century of German and South African rule (Bollig, 1998; Owen-Smith, 2010; Rizzo, 2012). The conservancies are largely composed of Herero/Himba people, who migrated from central Africa between the 10th and 18th centuries (Borg and Jacobsohn, 2013), and Damaras who have lived in northwest Namibia even longer (Lau, 1987).

2. Materials and methods

A growing body of literature examines the effects of conflict on local perceptions of carnivores and livelihoods within rural African communities. Following Dickman et al. (2014) and Hazzah (2006) with feedback from the Save the Rhino Trust – Namibia, Lion Guardians (Tanzania and Kenya), and Integrated Rural Development and Nature Conservation (IRDNC) staff, data were collected using semi-structured surveys applying techniques of rapid and participatory rural appraisal (Chambers, 1994). Responses cover six main areas: (i) demographic and background data; (ii) coarse-grain employment and income-source data to assess the role of livestock husbandry in household livelihoods; (iii) household livestock data focusing on four species: cattle, sheep, goats, and donkeys, including perceived value of livestock and recent livestock losses to all causes, including predation; (iv) perceptions of where lion problems occur, how they can be prevented, and effectiveness of mediation programs; (v) lion-specific livestock losses and lion conflict issues; (vi) benefits resulting from and attitudes towards lions. The semi-structured surveys sought both quantitative and qualitative information, with respondents encouraged to provide relevant details. Where appropriate, specific quantitative responses were sought. However, if respondents were uncertain about numbers – e.g. the number of cattle they had three years ago – they were asked to estimate. Attitudes towards lions were surveyed using a series of Likert-scale responses adapted from a recent Save the Rhino Trust – Namibia survey of regional farmers and herders (Unpublished Survey: Rhino Reporting Final Survey, Farmers and Herders, 2016).

Surveys were conducted with the assistance of conservancy-employed environmental resource monitors known as Conservancy Game Guards, who were requested to identify every livestock-owning household within the conservancy. Sampling was limited to one response per household. Surveys of household heads were performed in situ in each of the three conservancies at a variety of locations. In each case we asked for the household representative most familiar with the household's livestock – this was almost uniformly the senior member of the household, and always the senior male when present, in keeping with local custom. Though we did not manage complete coverage – some household heads were absent – these surveys cover > 80% of livestock-owning households within the three conservancies. No one refused to participate – respondents generally answered every question, though in some instances a few questions were missed. Surveys were administered in the preferred language of the respondent, including English, Afrikaans, Otjiherero, and Damara and generally took 35–45 min. All translations were done by JT. We recognize the difficulty of perfectly rendering survey questions across numerous language barriers and worked carefully to ensure question and response fidelity. All responses were recorded on standardized survey forms by JH, and all surveys were audio recorded on an audio recorder in mp3 format. Data were entered by JH into Microsoft Excel. Statistical analysis was performed by JH and CP in Microsoft Excel and using Vassar Stats statistical computation website (VassarStats, 2018).

To assess livestock losses during the ongoing drought we asked respondents to compare current livestock numbers to numbers three years earlier. We recognize that losses in a clearly defined three-year window are difficult to quantify; the general impression was that respondents were comparing current numbers to pre-drought livestock numbers. The fluidity of time-scale is not considered problematic: we sought to

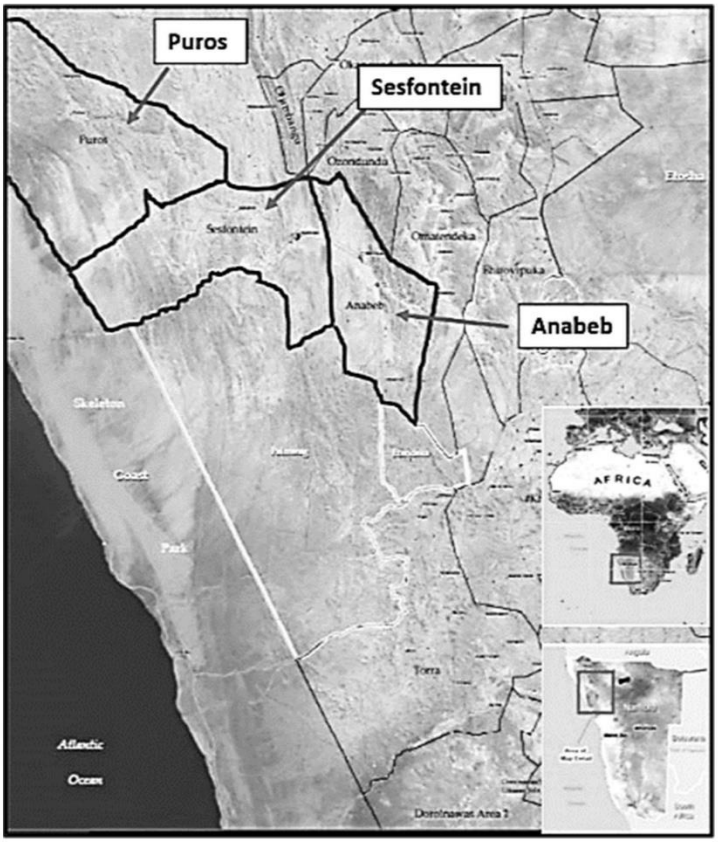

Fig. C.1. Core lion-range conservancies surveyed.

Table A.1
Surveyed conservancy background information.

Conservancy	Date gazzetted	Population	Area (km^2)	Density	Annual rainfall (mm)
Anabeb	2003	1402	1570	0.893	150–250
Puros	2000	641	3562	0.18	50–150
Sesfontein	2003	1491	2465	0.605	50–150

capture trends related to the recent drought; everyone agreed that the region had been suffering from drought. Respondents were asked to estimate the value of four livestock species – cow, goat, sheep, and donkey – on the basis of an average-size adult female. The estimated value of livestock lost over the past three years, was derived by multiplying the number lost by the value given by each respondent for that species. Though this means values were not standardized across households, we feel this method better conveys the *perceived* economic loss. This approach is also necessitated by the lack of access to livestock markets among farmers in the area, which is part of the ongoing legacy of colonialism and apartheid (Bollig, 1998; Miescher, 2012; Wolputte, 2013). When a set list of possible responses was available – e.g. "how common are lion in your conservancy:" a) very common; b) common; c) rare; or, d) not present – respondents were given the chance to answer freely. Where responses to questions contained discrete answers – e.g. "how would you describe the problems you have with lions: none, low, moderate, or serious?" – these levels were not defined. Surveys allowed ample space for follow-up discussions and comments. Whenever possible, comments were noted and used to clarify responses.

3. Results

3.1. Demographics

85 respondents representing 36 different farming areas were interviewed; two respondents provided apparently fantastical responses that could not be verified and were therefore dropped from analysis. 77.1% of respondents identified as Herero/Himba and 18% identified as Damara. The rest were either Owambo or Nama. 78.3% of respondents were male, and 21.7% were female. When the respondent's age was known, the mean age given was 50 years old. Of the ten respondents who did not know their age, nine stated they were over 60 – because they were receiving government pensions. Among known ages,

Table B.1
Summary of household-level livestock ownership among survey respondents, comparing livestock ownership in 2017 (October to December) to livestock ownership three years prior. μ, mean number of specific type of livestock owned; med, median number of specific type of livestock owned; skew, Pearson's second skewness coefficient, positive value indicates rightward skew among responses; min, minimum number of specific type of livestock owned; max, maximum number of specific type of livestock owned; total, total number of specific type of livestock owned across all respondents; *n* responses; number of respondents for each specific type of livestock. 2 Summary of percentage of remaining livestock, compared to three years earlier.

1		μ	μ '17	med	med '17	skew	skew '17	mizn	min '17	max	max '17	total	total '17	n response
Stock ownership, three years prior & 2017 household-level	**cattle**	48.2	10.3	25	4	0.870	0.940	0	0	500	140	4003	854	83
	sheep	28.7	11.0	20	5	0.769	0.865	0	0	200	150	2381	911	83
	goats	143.0	71.0	100	50	0.937	0.920	0	0	600	300	11867	5894	83
	donkeys	5.1	1.6	4	1	0.606	0.769	0	0	25	11	415	129	82
2														
Percentage Remain per Species, by household	**cattle**		32.1%		16.7%		0.92							77
	sheep		43.6%		36.2%		0.53							68
	goats		91.1%		50%		0.793							81
	donkeys		39.5%		27.6%		0.684							63

respondents ranged from 19 to 83 years. 45.8% of respondents reported having no formal schooling, though 27.7% had advanced to grade nine or above. Respondents had lived in their conservancy, or what became their conservancy, for a mean of 36.6 years. For religious affiliation, 68.7% of respondents identified as Christian, 8.4% identified as practicing a traditional religion, while 22.9% stated no religious practice.

All respondents reported keeping livestock for personal consumption, 77.1% also sold livestock. 15.7% of respondents reported livestock as their only source of income. 32.5% receive government pensions; the same amount receive government assistance for their children (not mutually exclusive). 37.3% receive at least one salary, primarily as a conservancy Game Guard or from a nearby tourism operation. 19.3% have one source of income, 44.6% have two, and 31.3% have three.

3.2. Livestock

Livestock ownership was unevenly distributed and skewed rightwards for all species, both currently and in the past (Table B.1). The drought appears to have exacerbated inequalities in livestock ownership: the measure of skewness (Pearson's second skewness coefficient) reveals that inequality in livestock ownership has increased across three of the four types of livestock – inequality of goat ownership is somewhat decreased, though still right-skewed.

Concentration of livestock among the wealthiest stock-owners has risen (Fig. D.1). In many cases, those households among the top five in cattle ownership are also among the top five in ownership among other stock species. The heads of such households, particularly those predominating in cattle, occupy central places in each of the conservancies and their wealth is well-known in the region.

The drought has greatly affected livestock ownership in the core-lion range conservancies. The mean size of household cattle, sheep, and donkey herds has greatly decreased (Table B.1). Other predatory species (spotted hyenas, leopards, cheetahs) and lions did not account for the majority of livestock losses (Table C). Nevertheless, the toll on cattle and donkey herds by lions in particular has exacerbated losses due to drought (Table D).

To gauge the value of lost livestock, we asked respondents to estimate the monetary cost (in Namibian dollars) of an average-sized adult female for each species. The average value given for a cow was US $468.21 ($n$ = 77), US$86.37 for a sheep ($n$ = 75), US$109.14 for a goat ($n$ = 79), and US$70.76 for a donkey ($n$ = 74) (Table E.1). As with livestock numbers, the values of lost livestock are skewed rightwards, indicating that the economic losses during the drought were not evenly distributed.

The mean number of cattle lost per household to all predators over the past three years was 7.7 (median 4.5; skew 1.036; total: 575). The mean number of sheep lost to all predators was 14.65 (median 6; skew 1.19; total: 923). The mean number of goats lost to all predators was 34.8 (median 19.5; skew 0.983; total 2784). The mean number of donkeys lost to all predators was 3.34 (median 3; skew 0.253; total 197). The estimated values of these lost livestock are given in Table E.2.

The mean number of cattle lost to lions over the past three years was 4.32 (median 2; skew 0.895; total 324). The mean number of sheep lost to lions was 0.2 (median 0; skew 0.405; total 13). The mean number of goats lost to lions was 1.89 (median 0; skew 0.721; total: 153). The mean number of donkeys lost to all lions was 2.267 (median 1; skew 0.986; total: 136). The estimated value of livestock lost to lions is given in Table E.3.

3.3. Perceptions of lions

Responses varied by conservancy as to how common lions are within a respondents' conservancy (Table F.1). No respondents stated that lions were absent in their conservancy; one was unsure. Though respondents were not asked to define what was meant by "very common," "common," etc., recent killings of problem lions in Puros Conservancy in 2016/17 (Stander, 2017) suggest lion prevalence was considered relative to past prevalence.

86.7% stated that lions are a serious problem in their conservancy. There was a weak, though significant correlation between the presence of lions ("very common," "common," or "rare") and the extent to which respondents felt lions were a serious problem ($R^2 = 0.3227$, F (1, 83) = 3.0877, $p < 0.01$)

When asked, "do you benefit from lions in your conservancy" 84.3% responded "no." However, when asked "is it important to continue to have lions in your conservancy," 75.9% of respondents stated "yes." There was no significant correlation between benefiting from lions and feeling they are important to have in the conservancy. When asked why lions are important, respondents gave varying answers. Categorized according to intrinsic versus instrumental value of lions, 33.3% stated that it was important to have lions for their potential instrumental value – primarily because they *could* provide the conservancy with benefits through hunting or tourism. In contrast, 61.9% stated lions were important for primarily non-instrumental reasons – e.g. so their children could see lions, or because lions have intrinsic value.

The percentage of cattle lost to lions has a significant effect on whether or not respondents felt it is important to continue to have lions in their conservancy (Mann-Whitney Z *score* = 5.66105, $n_1 = n_2 = 71$, $p < 0.001$, two-tailed). There was likewise a significant relationship between the percentage of goats (Mann-Whitney Z *score* = 7.97561, $n_1 = n_2 = 79$, $p < 0.001$, two-tailed) and donkeys (Mann-Whitney Z *score* = 5.14006, $n_1 = n_2 = 59$, $p < 0.001$, two-tailed) lost to lions and whether or not respondents felt it is important to continue to have lions. In all three cases higher losses are associated with more negative perceptions of lions within the conservancy. There were insufficient incidents to test for effects of sheep losses.

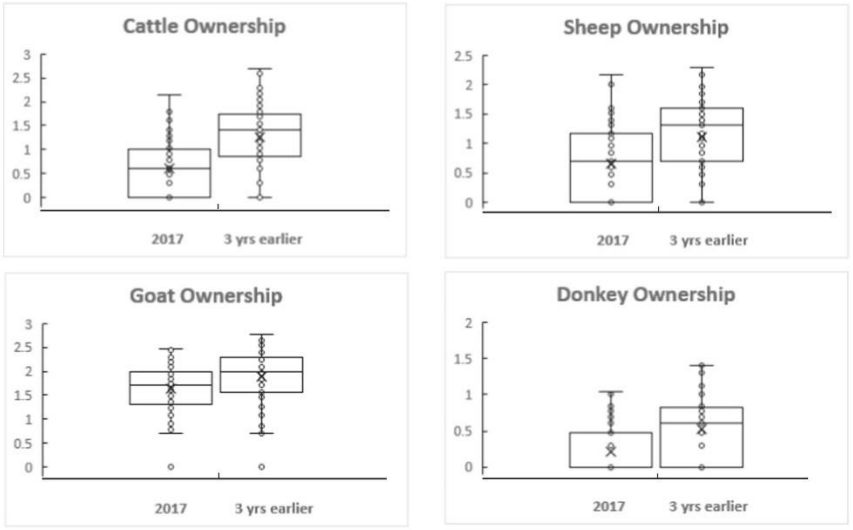

Fig. D.1. Boxplots display self-reported household-level livestock ownership for each individual species, comparing 2017 ownership to three years earlier. Data has been log10 transformed. This visualization demonstrates that livestock ownership is unequally distributed – concentrated within a few relatively wealthy households – and the recent livestock losses experienced have somewhat exacerbated this concentration. Currently the top five cattle owners possess 43% of the cattle (367 of 854), compared to 38.7% three years ago (1500 of 4003). The top five sheep owners hold 39.3% (358 of 911), compared to 27% (644 of 2381). The top five donkey owners have 31.8% (41 of 129), compared to 23.9% (99 of 415). In contrast, the top five goat owners keep 19.9% (1170 of 5894), compared to 20.3% (2410 of 11,867). Currently 31.1% of respondents own no cattle, while 34.9% own no sheep, and 48.7% own no donkeys. In contrast, three years ago, only 7% owned no cattle, while 18% owned no sheep, and 23.2% owned no donkeys. Ownership of goats is relatively unchanged (1.2% currently not owning goats versus 2.4% three years ago). Moderate correlation for relative livestock ownership between current and three years ago exists for each species. Cattle: $R^2 = 0.439$, $F(1, 83) = 4.391$, $p < 0.001$. Sheep: $R^2 = 0.702$, $F(1, 83) = 8.882$, $p < 0.001$. Goats: $R^2 = 0.633$, $F(1, 83) = 7.36$, $p < 0.001$. Donkeys: $R^2 = 0.565$, $F(1, 83) = 6.157$, $p < 0.001$. This indicates that household position regarding one another in terms of livestock ownership is mostly unchanged.

Table C
Summary of number of livestock lost. 1 Losses directly due to all predators. 2 Losses directly due to lions. Column headings: μ, mean number of losses due to predators per species; med, median number of losses due to predators per species; skew, Pearson's second skewness coefficient. For 1, values are mixed by species: losses of cattle, goats, and sheep are relatively skewed rightwards while donkey losses are relatively uniformly distributed. For 2, values for cattle, goats, and donkeys indicate that losses are relatively concentrated among particular respondents, while sheep-loss data come from only a single event.

		μ	Med	Skew	Total lost
1					
Number	Cattle	7.7	4.5	1.036	575
Lost per species to predators, by household	Sheep	14.65	6	1.19	923
	Goats	34.8	19.5	0.983	2784
	Donkeys	3.34	3	0.253	197
2					
Number	Cattle	4.32	2	0.895	324
Lost per species to lions, by household	Sheep	0.2	0	0.405	13
	Goats	1.89	0	0.721	153
	Donkeys	2.27	1	0.986	136

Table D
Summary of percentage of livestock losses. 1 Losses directly due to all predators. 2 Losses directly due to lions. Column headings: μ, mean percentage of losses per species; med, median percentage of losses per species; skew, Pearson's second skewness coefficient. For 1, values are mixed by species, indicating losses of goats and sheep are relatively uniformly distributed while cattle losses skew slightly rightwards, and donkey losses skew greatly leftwards. For 2, values for cattle, goats, and donkeys indicate that losses are concentrated among particular respondents.

		μ	Med	Skew	n response
1					
Percentage	Cattle	28.9%	24.5%	0.464	70
Lost per species to predators, by household	Sheep	58.2%	60%	−0.134	55
	Goats	40.1%	38.8%	0.097	78
	Donkeys	62.7%	75%	−0.879	53
2					
Percentage	Cattle	18.4%	5%	1.412	77
Lost per species to lions, by household	Sheep	3%	0	0.436	58
	Goats	2.3%	0	0.715	78
	Donkeys	38%	25%	0.951	53

When asked, if a lion kills some of your livestock tomorrow, what will you do, 39.7% stated they would "kill it" or try to kill it. However, the relationships between percentage losses of cattle and donkey and a response of "kill it" were not statistically significant; for goats the relationship was significantly negative (Mann-Whitney Z *score* $= -3.7695$, $n_1 = n_2 = 78$, $p < 0.001$, two-tailed).

When asked, if a lion kills some of your livestock tomorrow, what will you do, those respondents stating they do not benefit from having lions were not significantly more likely to say they will kill or try to kill the offending lion (Mann-Whitney Z *score* $= -2.67899$, $n_1 = n_2 = 83$, $p < 0.01$, two-tailed). Among variables tested (whether respondents benefit from lions, whether they consider lions a serious problem, respondent's ethnicity, respondent's conservancy) only specific conservancy residence showed a significant correlation with a respondent's

Table E
Summary of household-level livestock value lost over the past three years. 1 Losses from all causes, including all predators during previous three years. 2 Losses from all predators during the same period. 3 Losses from lions during the same period. Column headings: μ, mean reported value lost per species; med, median reported value lost per species; skew, Pearson's second skewness coefficient, positive value reveals rightward skew among responses, indicating value lost by species is unevenly distributed; min, minimum value lost per species; max, maximum value lost per species; total, total reported value lost per species; *n* response; number of respondents assigning value for each specific type of livestock. Respondents never possessing a particular species were not questioned as to the value of that species, and could not have suffered losses to predators/lions.

		μ	Med	Skew	Min	Max	Total	*n* response
1								
Estimated value	Cattle	$21,115	$8000	0.878	$0	$274,400	$1,562,556	74
Lost per species, US$	Sheep	$1712	$704	1.157	$0	$17,280	$121,606	71
	Goats	$10,426	$4800	1.298	$0	$67,680	$719,428	69
	Donkeys	$275	$116	1.032	$0	$3360	$18,987	72
2								
Estimated value	Cattle	$4117	$2400	0.93	$0	$32,000	$288,240	70
Lost to predators per species, US$	Sheep	$1463	$520	1.102	$0	$17,280	$86,372	59
	Goats	$4342	$1728	1.275	$0	$28,800	$334,400	77
	Donkeys	$229	$142	0.973	$0	$1120	$12,392	54
3								
Estimated value	Cattle	$2572	$800	1.03	$0	$30,400	$177,488	69
Lost to lions per species, US$	Sheep	$23	0	0.444	$0	$1200	$1360	59
	Goats	$228	0	0.688	$0	$6720	$17,384	76
	Donkeys	$162	$54	1.284	$0	$960	$8752	54

Table F.1
Summary of response to how common lions are in conservancies. Column headings: vcommon, percentage of respondents stating lions are very common in their conservancy; common, percentage of respondents stating lions are common in their conservancy; rare, percentage of respondents stating lions are rare in their conservancy; *n* response; number of respondents. (No respondents stated that lions were absent in their conservancy; one was unsure.)

		Vcommon	Common	Rare	*n* response
Percentage response	Anabeb	26.2%	42.3%	26.2%	42
lion commonness,	Puros	0	46.2%	53.8%	13
by household	Sesfontein	38.4%	53.8%	7.7%	26
	Overall	27%	48%	24.7%	82

stated likelihood of killing lions, though the strength of this correlation was moderate ($R^2 = 0.2561$, F (1, 82) = 3.742, $p < 0.01$). The motivation to kill lions was greatest in Puros Conservancy.

When asked which predators are most dangerous to people, 85.5% responded lions; the second most feared predator was the leopard (*Panthera pardus*), 53%.

4. Discussion

A 2012–2014 survey examining the effects of drought in northwest Namibia reported cattle losses between 10% and 40% (Schnegg and Bollig, 2016); our study indicates that the drought has continued to kill livestock: mean losses of cattle approaching two-thirds can seriously constrain farmers' livelihood. In a region where 40% of inhabitants live on less than US$1/day, median cattle losses exceeding $8000 can be life- and community-altering across generations: day-to-day needs are compromised and funds to cope with emergencies are limited. Most household's herds suffered from the combined, and related, effects of drought and predation. However, though this has not been universal: a few households were able to maintain, even grow their herds during the drought years. In addition to the monetary losses, cattle have long been an essential component of Herero/Himba identity (Crandall, 1998; Jacobsohn, 1995). Our results suggest that during drought, cattle may have been replaced by goats, as goats eat less and are seen to be more drought-resistant. But even when the economic value of a lost cow is matched by five or six goats, the cultural impacts remain.

The effects of predators on livestock ownership are differentiated by livestock species. A maxim in northwest Namibia is that donkeys do not die from drought: though donkey numbers have decreased by 69%, at least two-thirds of this loss was positively attributed to predators, primarily to lions. In contrast, though total cattle numbers have decreased by 79%, only 29% of this loss was attributed to predators – primarily to lions and spotted hyena (*Crocuta crocuta*). While losses to all predators are differently distributed among respondents, the skewness of cattle and donkey losses indicate percent losses of livestock to lions are particularly concentrated among certain households.

Conservation of the desert-adapted lions poses a unique challenge. Across northwest Namibia in 2016, lions were destroyed at a higher rate (approximately 4%) following conflict incidents than any other species, despite causing relatively few losses (Fig. E) – suggesting that lions are either easier to dispatch (Kissui, 2008) or are killed for reasons beyond the damage they cause. Most respondents feel lions pose a particular risk to people. It is worth noting that, in contrast to areas in East Africa (Packer et al., 2011), lion attacks on people are exceedingly rare in northwest Namibia. The last confirmed lion-caused human fatality in northwest Namibia occurred in 1982. Nevertheless, a common refrain among respondents was that lions attack people and that child herders are particularly vulnerable. Historically lion attacks on people in northwest Namibia were thought to be widespread; it may only have been with increasing access to firearms in the last half-century that lion attacks abated (Andersson, 1861; Owen-Smith, 2010).

Because no significant correlation exists between benefiting from lions and feeling they are important to the conservancy, our results suggest that limiting the costs of living with lions would more effectively enhance attitudes towards lions than would increasing benefits. We found considerable tolerance for sharing communal land with lions, but the percentage of cattle, goats, and donkeys lost out of total herd size negatively affected the perceived importance of having lions within a conservancy. This suggests that assisting farmers with smaller herds may have an outsize effect on increasing tolerance for living with lions: two cattle lost out of five is a greater proportional loss than two cattle out of fifty.

We tested a variety of likely variables to better understand why certain respondents stated they will try to kill lions that kill their livestock. Only conservancy residency was sufficiently explanatory: respondents from the Puros Conservancy are more likely to try and kill lions that take livestock than are respondents from other conservancies. Why this is the case is uncertain. Recent history of Puros provides a possible explanation: in 2016/17 one Puros farming area suffered a series of high-profile HLC incidents during which five sub-adult male

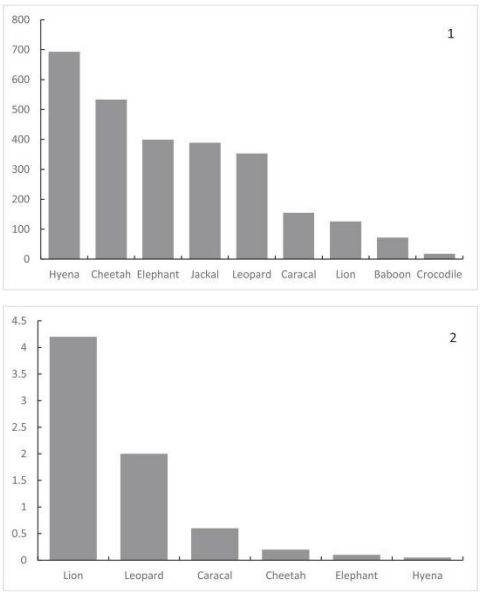

Fig. E. Recorded human-wildlife conflict in northwest Namibia, 2016. 1. Number of incidents involving each species across the region. 2. Percentage of Conflict Incidents leading to species destruction.
Reprinted from NACSO, 2016, 41.

lions were killed; most Puros respondents stated that lions, though formerly common, were now less common in the conservancy and pointed to these high-profile lion killings as the reason why lions have become less common. Because of these recent incidents, Puros residents, more so than residents of other conservancies, may view lion-killing as an effective measure to addressing HLC. Further research is needed to understand why certain respondents evince different levels of willingness to kill lions.

Respondents often viewed living with lions as a balancing act between costs and benefits. Linkages with local tourist operators are ongoing, but the extent to which communities receive direct benefits from these agreements is unquantified. New programs linking lions to payments for ecosystem services and for conservancy conservation performance are being developed (Braat and de Groot, 2012; Kuchelmeister and Lindeque, 2018). An Early-Warning System to alert communities in high conflict areas about relevant lion movements, is being pioneered by a team of government and NGO stakeholders ("*First early-warning tower erected*", 2018). Additionally, a group of community 'Lion Rangers' are being trained and deployed to monitor lions, provide communities with relevant and up-to-date lion information, and respond to conflict incidents ("Lion Rangers", 2018). This program is adapted from the Lion Guardians program in Kenya and Tanzania, which has achieved positive lion conservation outcomes (Hazzah et al., 2014).

While 83.9% of respondents report that they do not benefit from having lions in their conservancy, 75.9% state that it is important to have lions. This tolerance for living with lions, even without direct (instrumental) benefits, appears to be a recent development among communities in northwest Namibia. Garth Owen-Smith, a long-serving conservationist in the region, notes that, prior to independence, the communities would not tolerate living with certain carnivores – chiefly lions (Owen-Smith, 2018). How non-use value affects environmental decision-making is a productive yet challenging frontier in environmental economics and conservation (Chan et al., 2012). Interactions between lions and people are strongly mediated by cultural (Ikanda and Packer, 2008) and economic (Kissui, 2008) considerations. As noted by Parks and Gowdy (2013), human 'values' are not fully captured in traditional welfare economics. Our study is merely a first step towards better understanding how farmers value lions within northwest Namibia conservancies. Future research, along the lines of Romañach et al. (2007), should be specifically tailored to the environment and culture of northwest Namibia to foster greater tolerance for living with lions.

Socially-focused innovations may be of little use without cooperation from the region's ecological systems. As long as prey populations remain depressed, livestock depredation is likely to remain a challenge to rural pastoralists and conservationists. Relatively plentiful rainfall between 2000 and 2010 may help explain the increase in lion numbers before the drought, but the recent lack of rainfall is compromising livelihoods and threatens to undercut the efficacy of the CBNRM approach. Global climate change raises the possibility that droughts in northwest Namibia will increase, emphasizing the importance of providing benefits and early-warning of lion movements to rural residents. Bauer et al. (2015a, 2015b) noted that lions in unfenced areas fare best in areas with very low human population densities. Population growth in northwest Namibia may also affect HLC in northwest Namibia in the future.

Permits and Acknowledgements

This research was performed with the permission of the Namibia Ministry of Environment and Tourism, research permit #2269/2017. Prior to survey implementation, methods were submitted to the University of Minnesota Institutional Review Board (IRB ID: STUDY00001587), who exempted the survey from further oversite. Surveys were designed with feedback from Leela Hazzah, Jeff Muntifering, Basilia Shivute, and Russell Vinjevold. Nicholas Buchanan assisted with IRB review. Thanks to all the Conservancy Game Guards who assisted: Ronald Karutjaiva, Colin Kasupi, Karuhpere Musaso, and Jackson Wazungu. Thanks to Conservancy chairmen Titus Runguundo (Anabeb), Useil Naub (Sesfontein) and Allu Uararavi (Puros) for facilitating. NACSO and WWF-Namibia provided North West Game Count data which was reprinted with permission. NACSO images used with permission of the Namibian Association of CBNRM Support Organizations and WWF-Namibia. Funding: This work was supported by a Macquarie University Big History, Anthropocene Grant; the Macquarie University Department of Geography and Planning; and the University of Minnesota Program in the History of Science, Technology, and Medicine.

Role of the Funding Source

The funding sources had no involvement in the design, collection, analysis and interpretation, writing or submission of this work.

Conflict of interest

The authors declare no conflicts of interest.

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APPENDIX 2

Northwest Lion Working Group Interim Quota Recommendations (2020-2022) for Trophy Hunting Lions on Communal Land in Northwest Namibia

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SUMMARY

The Northwest Lion Working Group (NWLWG) hereby submits interim trophy hunting quota recommendations for lions (*Panthera leo*) inhabiting communal land in northwest Namibia (Kunene and Erongo regions), to cover the years 2020-2022, to the Ministry of Environment and Tourism (MET) Quota Setting Coordinating Committee. This document aligns with the priorities set-forth in the *Human-Lion Conflict Management Plan for North-West Namibia* (2017), however, it refines the trophy hunting recommendations made in that document.

Based upon available data, northwest Namibia can be divided into areas of low, medium, and high lion density. Sustainable trophy offtakes depend on population density, so we recommend different quotas for each area.

With an estimated density of 0.329 lions per 100 km^2, thirteen communal conservancies (Doro !Nawas, //Huab, Okangundumba, Ombujokanguindi, Orupembe, Orupupa, Otjambangu, Otjikandivirongo, Ozondundu, Sanitatas, Sorris Sorris, Tsiseb, and Uibasen Twyfelfontein), covering a total of 26,980 km^2 are classified as areas of low lion density. Within these conservancies, a sustainable offtake of one mature adult male lion per 75,501 km^2 is recommended. This offtake yields **one mature adult male every three years across the entire area**.

With an estimated density of 0.528 lions per 100 km^2, seven communal conservancies (Anabeb, Ehi-Rovipuka, ≠Khoadi-//Hôas, Omatendeka, Puros, Sesfontein, and Torra), covering a total of 18,053 km^2 are considered to be areas of medium lion density. Within these conservancies, a sustainable offtake of one mature adult male lion per 50,589 km^2 is recommended. This offtake yields **one mature adult male every three years across the entire area**.

With an estimated density of 2.67 lions per 100 km^2, Etosha National Park is the only area in NW Namibia considered to have a high lion density. Because hunting is prohibited within Namibia's National Parks, we cannot recommend lion trophy quotas within Etosha.

Sustainable offtake is based upon guidelines adopted by the International Union for the Conservation of Nature (IUCN) (Bauer et al., 2016; IUCN SSC Cat Specialist Group, 2018). These guidelines were developed by Packer et al. (2011) and further refined by Creel et al. (2016). We have adapted these guidelines to northwest Namibia's areas of low and medium lion density. It is worth noting that both areas are considered to have extremely low density compared to lion strongholds in other lion-range states.

In keeping with the IUCN's *Guidelines for the Conservation of Lions in Africa* (2018), only mature male lions (≥ 7 years of age) are considered suitable for trophy hunting. The recommendations provided here are only considered appropriate if this guideline is strictly adhered to.

Monitoring and evaluation of quotas are critical to sustainable trophy hunting. New oversight techniques have been developed elsewhere and more rigorous methods should be applied.

We emphasize, in the strongest possible terms, that our recommendations are based-upon incomplete evidence. According to CITES standards, lions in northwest Namibia are classified as an 'unknown'

population (IUCN SSC Cat Specialist Group, 2018, p. 77). **More data on the northwest lion population, including gathering existing data from researchers, and collecting data in the field going forward, is an urgent need.** Given the importance of northwest Namibia as a lion stronghold and given the high level of lion mortalities following human-lion conflict (HLC) in northwest Namibia, we urge caution in setting quotas for hunting lions in the area. However, improvements in lion-population monitoring, data collection, and information transparency would allow our recommendations to be updated and refined.

1. INTRODUCTION

When informed by best available evidence, and well-managed sport hunting of lions (trophy hunting) can help conserve lion populations and generate positive outcomes for at-risk rural communities living with lions (Lindsey et al., 2012). However, trophy hunting can also have widespread negative ecological outcomes and contribute to population declines (Lindsey et al., 2013; Packer et al., 2011). Because lion populations across Africa are considered vulnerable and have declined by an estimated 43% in the past 20-plus years, there is a pressing need to secure lion populations where possible (Bauer et al., 2015). In 2018, northwest Namibia was identified as a 'lion stronghold' by the National Graphic Society (Jacobson and Riggio, 2018) and as an important 'lion landscape' by the Wildlife Conservation Network/Lion Recovery Fund and the World Wide Fund for Nature (Elliot et al., 2019), marking the importance of the region's lions to the overall conservation of the species. Though this population is considered to be increasing/stable, it is classified as 'unknown' according to standards set-forth by the IUCN Cat Specialist Group (2018), and lion mortalities following HLC incidents are the prime threat to population viability in communal land (MET, 2017). Such incidents are incompletely recorded, making uncertain the long-term viability of lions in northwest Namibia outside of Etosha National Park.

In relatively data deficient areas concerning lion populations (i.e. northwest Namibia), trophy hunting must be undertaken carefully, using best practices for extrapolating from available data (Creel et al., 2016). The recommendations provided here accord with the guidelines set-forth by the IUCN *Guidelines for the Conservation of Lions in Africa, Version 1.0 – December 2018*. Data have been furnished by Desert Lion Conservation and AfriCat North – Namibian NGO's with extensive lion monitoring experience on communal land in northwest Namibia. Their data have been adapted to meet guidelines for trophy hunting set forth by Packer et al. (2011) and refined by Creel et al. (2016), which have been adopted by the IUCN as necessary for ensuring sustainable trophy offtakes. While we urge MET to implement a unified plan for managing lions within Etosha and lions inhabiting communal land as a single population, we do not incorporate lion data from Etosha in this analysis: this precludes the possibility that Etosha lion density inflates density estimates for communal areas, thus limiting the possibility of trophy hunting on communal land contributing to a 'vacuum effect' (Loveridge et al., 2007) for Etosha lions. Because there is relatively little information concerning the lion population on communal land (e.g. in comparison to lions in Etosha National Park or in Tanzania's national parks), the recommendations here are conservative and are presented as interim recommendations until more comprehensive data can be collected.

2. LOW AND MEDIUM POPULATION DENSITY AREAS

Based upon available data, lion population density estimates for communal land in northwest Namibia are bimodal: conservancies may be defined as being areas of relatively low or medium lion population density (high density only occurring within Etosha National Park, 2.67 lions per 100 km^2).

Areas of low lion population density are estimated to have 0.354 lions per 100 km^2. Conservancies considered to be areas of low lion population density cover a total of 26,980 km^2, they are:

CONSERVANCY	AREA (km2)	RAINFALL/YR (mm)	ECO-REGION	DENSITY	DENSITY SOURCE
DORO !NAWAS	3978	50-250	Desert	Low	Stander (2006)/Insufficient
//HUAB	1817	150-250	Highlands	Low	Stander (2006)
OKANGUNDUMBA	1131	200-300	Highlands	Low	Stander (2006)/Insufficient
OMBUJOKANGUINDI	1160	unknown	Escarpment	Low	Insufficient Data
ORUPEMBE	3565	50-150	Desert	Low	Stander (2006)
ORUPUPA	1234	unknown	Highlands	Low	Insufficient Data
OTJAMBANGU	348	>200	Escarpment	Low	Insufficient Data
OTJIKONDAVIRONGO	1067	unknown	Escarpment	Low	Insufficient Data
OZONDUNDU	745	200-300	Highlands	Low	Insufficient Data
SANITATAS	1446	50-150	Desert	Low	Stander (2006)
SORRIS SORRIS	2290	100-200	Desert	Low	Stander (2006)/Insufficient
TSISEB	7913	50-150	Desert	Low	Stander (2006)/Insufficient
UIBASEN TWYFELFONTEIN	286	100-150	Escarpment	Low	Stander (2006)/Insufficient

Areas of medium lion population density are estimated to have 0.529 lions per 100 km^2. Conservancies considered to be areas of medium lion population density cover a total of 18,053 km^2, they are:

CONSERVANCY	AREA (km2)	RAINFALL/YR (mm)	ECO-REGION	DENSITY	DENSITY SOURCE
ANABEB	1570	150-250	Highlands	Medium	MET 2017
EHI-ROVIPUKA	1980	200-350	Highlands	Medium	AfriCat North 2019
≠KHOADI-//HÔAS	3364	100-250	Highlands	Medium	AfriCat North 2019
OMATENDEKA	1619	150-300	Escarpment	Medium	AfriCat North 2019
PUROS	3562	50-150	Desert	Medium	MET 2017
SESFONTEIN	2465	50-150	Desert	Medium	MET 2017
TORRA	3493	50-150	Desert	Medium	MET 2017

Table 1 and 2. Conservancy area and rainfall data from NACSO. Eco-region designations from Mendelsohn et al., 2003, and are simplified to primary eco-region by conservancy (recognizing that conservancies may contain more than one type of eco-region). Density designation derived from relevant data source, as compared to other available data. Where data were lacking or unclear, areas were classified as low density. All listed conservancies are known to have been inhabited at least semi-regularly by lions in the past three years.

Lion population density values for both low- and medium-density areas are based upon work by Stander (2018, 2010, 2006, 2004; 2003), published information available from MET (2017) and NACSO (2016), and data furnished by AfriCat North. In his published work, Stander calculates what he terms low and high density estimates for northwest Namibia and identifies these respective areas on regional maps (see: Stander, 2006). Unfortunately, more recent lion population density estimates by Stander and MET do not differentiate among different conservancies.

Recent data provided by AfriCat North, responsible for lion monitoring and HLC mitigation in the Hobatere Concession, Ehi-Rovipuka, ≠Khoadi-//Hôas, and Omatendeka conservancies (as well as assisting MET in Etosha West), indicate that lion population density estimates in these areas are in-line with Stander's medium lion population density values.

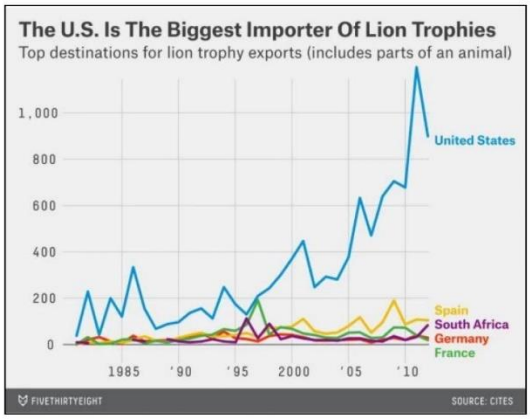
Data Source	Low Density (lions/100km²)	Medium Density (lions/100km²)
Stander 2003	0.49	0.71
Stander 2004	0.49	0.71
Stander 2006	0.075	0.5
Stander 2010	0.28	0.35
MET 2017	0.48	0.62
Stander 2018	0.31	0.37
AfriCat North 2019	n/a	0.44
	Mean Density (lions/100km²)	**Mean Density (lions/100km²)**
	0.354	0.529
	Sustainable Quota Density	**Sustainable Quota Density**
	0.02649	0.0395
	Sustainable Annual Area (1 lion/x km²)	**Sustainable Annual Area (1 lion/x km²)**
	75501.18	50589.19

Table 3. Low and medium density values are, respectively, low and high values given for study sites outlined in each source. Mean Density, equal to sum of density values divided by *n*. Sustainable Quota Density, equal to area density adjusted for sustainable offtake, as set-forth by Packer et al. 2011 (see section 4). Sustainable Annual Area, is the measure of area needed at the given density to sustainably harvest one mature adult male per annum. Because sustainable annual area exceeds lion-range at both low and medium densities, sustainable harvest is amortized (see section 4).

3. TROPHY REQUIREMENTS

It is accepted practice across southern Africa to only allow trophy hunting of mature adult male lions – female survival is considered critical to maintaining group structures: prides usually consist of several generations of related females, all of whom take part in caring for cubs and providing for juveniles (Pusey and Packer, 1994; Schaller, 1972). Whitman et al. (2004) suggest a strict age minimum (≥ 5 years old) be enforced for trophy hunting adult males. This age minimum has since been revised upward (≥ 7 years old) by Creel et al. (2016). This revision is suggested for areas where prey bases supporting lions and other carnivores may be declining (i.e. northwest Namibia), ameliorates the difficulty faced – even by experienced hunters – of accurately aging lions in the field (Miller et al., 2016), and has been accepted by the IUCN (2018).

According to CITES, 52% of lion trophies are exported to the United States; this share is increasing (Libresco, 2015). This market is extremely pertinent to setting trophy recommendations in Namibia because the United States Fish and Wildlife Service (USFWS), has implemented increasingly stringent requirements on exporting countries to allow importation of lion trophies into the US. Applications for import permits are evaluated as follows:



- Whether management of lions is based upon sound scientific principles,
- Whether mechanisms exist to identify loss of lion habitat or increase available habitat,
- Whether monitoring of prey base and anti-poaching efforts are in place,
- Whether the government provides incentives to reduce livestock incursion in lion habitat and to reduce HLC,
- Whether hunting areas are managed to support lion conservation,
- Whether trophy hunting provides benefits to government and communities affected by lion predation,
- Whether a U.S. hunter's participation contributes to overall conservation of lions within the country (USFWS 2019).

Currently trophy hunting and the management of lions on communal land in northwest Namibia does not fully address these parameters, and may not be viewed favourably by the USFWS. If lion trophy exportation is to remain an important part of managing the northwest lion population, new protocols and methodologies need to be implemented, this task has been assigned to the NWLWG for the remainder of 2019.

4. SUSTAINABLE OFFTAKE

Interim recommendations for sustainable trophy offtake are based upon the work of Packer et al. (2011) and Creel et al. (2016), and adapted to the ecological constraints of northwest Namibia. Packer et al. examined the effects of trophy hunting of lions in different geographic regions in Tanzania, finding that harvests of 0.5 lions/1,000 km^2 were likely sustainable in data deficient areas. However, the average (mean) density of the areas examined was 13.37 lion/100 km^2 – approximately 37-times more dense than low density areas, and 25-times more dense than medium density areas, in northwest Namibia. We therefore adjusted sustainable harvest rates to match recorded lion density in low and medium density areas of northwest Namibia.

Based upon the work of Packer et al., Creel et al. and the recommendations outlined by the IUCN SSC Cat Specialist Group, and adapted for lion population density in northwest Namibia, a harvest rate of **one mature adult male per 75,501 km^2 is recommended for low density areas**. This amounts to **one mature adult male every three years in total** across low density conservancies (see Section 2).

Based upon the same guiding sources, a harvest rate of **one mature adult male per 50,589 km^2 is recommended for medium density areas**. This amounts to **one mature adult male every three years in total** across medium density conservancies (see Section 2).

The use of both an age/sex-based restriction and a precautionary offtake rate provides the greatest possible likelihood that trophy hunting will be sustainable and non-detrimental to the population. However, due to insufficient data, the maximum level of sustainable harvest of lions on communal lands cannot be confidently asserted – insufficient research has been conducted on lion trophy hunting in low productivity ecosystems.

Even where data was available for this document, data collection and population density calculation methods were not provided, nor was the raw data available. (Though AfriCat North provided an up-to-date summary of monitoring efforts). This lack of transparency may be viewed unfavourably by trophy importing countries. 'Sustainable Offtake' is therefore an inference; one based upon extreme caution. There has been no comprehensive study of what

harvest levels are sustainable for lions in northwest Namibia. This shortcoming requires focused on-the-ground research if trophy hunting is to be sustainably undertaken.

As outlined in section 3 further trophy requirements implemented by the USFWS should be considered an integral part of ensuring that sustainable offtake incorporates not only ecological, but also relevant social factors that may be compromised by inappropriate trophy hunting practices. Though this document focuses on the ecological (lion-based) variables associated with trophy hunting, there is a growing body of literature demonstrating the importance of accounting for socio-political and economic factors when considering the sustainability of trophy hunting and its effect on lion conservation (e.g. Lindsey et al., 2013; Nelson et al., 2013). Such factors are particularly important where trophy hunting occurs on communal land.

5. MONITORING AND EVALUATION

The three factors outlined here (age, sex, and rate of offtake per area) are considered to be essential elements ensuring sustainable trophy hunting of lions. However, this approach will be ineffective without high-quality monitoring, evaluation and enforcement of trophy hunting practices. Begg et al. (2018) detail one successful approach to monitoring and adaptively managing trophy hunting quotas of lions in Niassa National Reserve, Mozambique (IUCN SSC Cat Specialist Group, 2018, p. 79).

We recommend that no fewer than two members of MET field staff, and one member of the NWLWG, or their representatives, be present at every lion trophy hunt on communal land in northwest Namibia. This includes making both a pre- and post-mortem determination that the targeted lion meets all necessary trophy criteria and that the hunt has followed all relevant policies and regulations to the satisfaction of the MET field staff and members of the NWLWG. Because the number of trophies recommended here is so low, we do not believe this requirement to be onerous. We also recommend that at least one conservancy-designated wildlife monitor (e.g. Lion Ranger) be present at every trophy hunt. This will ensure that the hunt takes place with conservancy oversight and events are accurately communicated back to conservancy management.

It is assumed that hunting of lions and all other trophy species will continue to abide by relevant Namibian laws.

It is recommended that policies concerning trophy hunting of lions on communal land in northwest Namibia be developed to match the high standards for Non-Detrimental Findings (NDF) as outlined by CITES. This process will be undertaken by the NWLWG during the remainder of 2019.

6. CONCLUSION

The recommendations provided here help ensure that Namibia will be at the forefront of evidence-based management and sustainable harvesting of free-ranging lions on communal land, while assuring that communities benefit from living with lions. However, **we wish to emphasize the need for increased lion monitoring and research on HLC on communal land. Due to data deficiencies, the lion population inhabiting communal land in northwest Namibia is classified as an 'unknown' population,** according to CITES definitions. There is little published information from these areas about lion movements, habitat selection, population and demographics, grouping behaviour, social structure, life history, or predator-prey relationships – all of which could better inform trophy hunting quota recommendations. **Overcoming these gaps would also help mitigate and prevent the growing problem of HLC on communal land in northwest Namibia.**

During the remainder of 2019 the NWLWG will develop a protocol and methodology document for lion quota recommendations, to be presented to the MET Quota Setting Coordinating Committee by the end of year. This document will provide recommendations for updated quota setting beyond 2022, provided that many of the data deficiencies identified here have been remedied. The next document will chart a possible path whereby Namibia can become Africa's leader in scientifically monitoring, managing, and harvesting a free-ranging lion population. Resources will be required to realize this goal, but we believe MET and other stakeholders have the capacity and drive to achieve this goal and set a new standard for adaptively managing an African icon.

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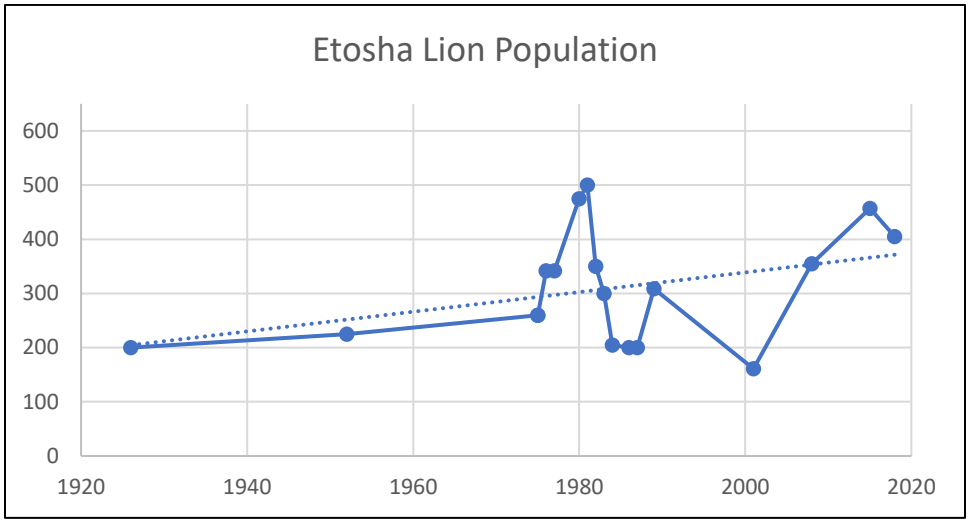
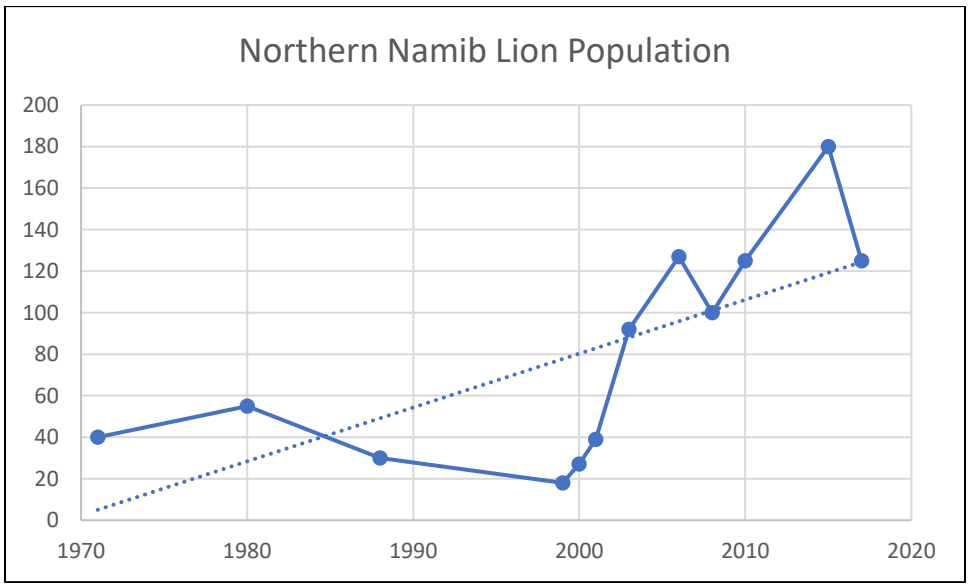
APPENDIX 3



Etosha lion population as recorded by all available sources compiled for this dissertation. Created by author.



Northern Namib lion population as recorded by all available sources compiled for this dissertation. Created by author.

APPENDIX 4

UNIVERSITY OF MINNESOTA

Twin Cities Campus

Human Research Protection Program
Office of the Vice President for Research

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420 Delaware Street S.E.
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Phone: 612-626-5654
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Email: irb@umn.edu
http://www.research.umn.edu/subjects/

NOT HUMAN RESEARCH

October 24, 2017

Nicholas Buchanan

612-624-7069
nbuchana@umn.edu

Dear Nicholas Buchanan:

On 10/24/2017, the IRB reviewed the following submission:

Type of Review:	Initial Study
Title of Study:	Conservation, Development, and Human-Lion Conflict in Kunene, Namibia
Investigator:	Nicholas Buchanan
IRB ID:	STUDY00001587
Sponsored Funding:	None
Grant ID:	None
Internal UMN Funding:	None
Fund Management Outside University:	None
IND, IDE, or HDE:	None
Documents Reviewed with this Submission:	• Human-LionIRBBuchanan.docx, Category: IRB Protocol; • LionSurvey_ConsentScriptFrontPage.docx, Category: Consent Form; • Interview questions, Category: Other

The IRB determined that the proposed activity is not research involving human subjects as defined by DHHS and FDA regulations. To arrive at this determination, the IRB used "WORKSHEET: Human Research (HRP-310)." If you have any questions about this determination, please review that Worksheet in the HRPP Toolkit Library and contact the IRB office if needed.

Ongoing IRB review and approval for this activity is not required; however, this determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether IRB review is required, please submit a Modification to the IRB for a determination.

Sincerely,

Clinton Dietrich, MA, CIP
IRB Analyst

We value feedback from the research community and would like to hear about your experience. The link below will take you to a brief survey that will take a minute or two to complete. The questions are basic, but your responses will help us better understand what we are doing well and areas that may require improvement. Thank you in advance for completing the survey.

Even if you have provided feedback in the past, we want and welcome your evaluation.

https://umn.qualtrics.com/SE/?SID=SV_5BiYrqPNMJRQSBn

---------- Forwarded message ----------
From: **Ethics Secretariat** <ethics.secretariat@mq.edu.au>
Date: 20 February 2017 at 15:26
Subject: Re: PhD research - ethics for cotutelle student
To: Emily O'Gorman <emily.ogorman@mq.edu.au>

Dear Emily

Re: Conservation in the Kunene: a History of Community Based Natural Resource Management (MQ ethics ref. no. 5201700176)

Thank you for your email and for providing this information for our records.

This project has received ethics approval from University of Minnesota - Twin Cities, USA.

Please take this email as confirmation that Macquarie University Research Office has noted the project.

No further action is required and any amendments to this project must be submitted to the approving HREC.

Please do not hesitate to contact the Ethics Secretariat if you have any questions.

Kind regards