

# Cartographies of Nature



Cartographies of Nature:  
How Nature Conservation Animates Borders

Edited by

Maano Ramutsindela

**CAMBRIDGE**  
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**P U B L I S H I N G**

Cartograwphies of Nature:  
How Nature Conservation Animates Borders,  
Edited by Maano Ramutsindela

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# CHAPTER ONE

## ECOLOGY, BORDERS AND SOCIETY

### MAANO RAMUTSINDELA

#### **Introduction**

On 14 December 2010, the national conservation agency, the South African National Parks (SANParks), issued a press release on a pilot project to introduce the harvesting of mopani worms<sup>1</sup> in the Kruger National Park (KNP). Three years after the launching of this initiative (i.e. 2012), the South African Broadcasting Corporation (SABC) showed the harvesting live on television, and has also produced video footage<sup>2</sup> which begins with a Tsonga-speaking 50-year-old widow, who looks after seven children, and who stands to benefit from harvesting the worms. Her story is followed by the interview with the Park Ranger, Thomas Mbokota, who suggests that other natural resources such as marula<sup>3</sup> would be released for harvesting by local communities in the KNP in future.<sup>4</sup>

For SANParks this ‘Christmas Gift’ to impoverished local communities living around the KNP is testament to the agency’s intention to preserve natural resources while also contributing “positively towards the wellbeing and livelihoods of those [rural unemployed] families more especially during Christmas time” (SANParks 2010). According to media reports, the project fulfils “SANParks Chief Executive Dr David Mabunda’s vision of ensuring all national parks are part of greater South African society and not enclaves of protection with many denied access” (*New Age Online* 2012).

The initiative has also been publicised as a practical demonstration of the International Union for the Conservation of Nature (IUCN)’s principle of allowing the utilisation of certain natural resources in protected areas (SANParks 2010). The harvesting of mopani worms nonetheless requires that harvesters should at least fulfil three conditions. First, they must be people living adjacent to the KNP where harvesting is allowed. Second, they must belong to one of the community forums that KNP management created as a vehicle for interacting with neighbouring communities. The initiative was launched with 60 community members<sup>5</sup> from the Nxanatseni region lying between Punda Maria and Phalaborwa (*South Africa News*

*Online* 2010). Third, harvesters are required to have a permit to harvest for consumption.

The story of mopani harvesting is instructive in that it challenges the idea and practice of creating borders between people and parks while at the same time introducing borders in society in more subtle ways. There is an abundance of literature on how the creation of nature conservation areas led to the emergence of borders between people and conservation areas, especially national parks and game reserves. It is now common knowledge that fences are erected around national parks as a clear boundary marker between people and parks. Instead of rehearsing this border narrative, the story of mopani harvesting takes us directly to lines separating people. Such lines are drawn on the basis of natural resource use rather than, say, sociological, political and economical variables that are often used as reference points when considering divisions within society. In the mopani harvesting initiative a line is drawn to separate people who qualify to harvest these worms in the KNP and those who do not. The KNP was never created to preserve mopani worms yet these worms have become instrumental in deciding who should or should not harvest in the KNP.

The story of mopani worms in the KNP gives us some insights into broader processes of bordering. For our discussion in this chapter and the volume as a whole, bordering refers to various ways and means by which borders are produced, shaped, or erased in pursuit, or as a result of certain projects in society. For Scott (2011, 134) bordering “is about the everyday constructions of borders through ideology, discourses, political institutions, attitudes and agency.” It is a multidimensional re-territorialisation process that takes place at multiple levels. This possibility is enhanced by the nature of the border as “a mix of regimes with variable contents and locations” (Sassen 2013, 67). Indeed, the location of the border is key to contemporary analyses of bordering as evident in discussions on de-bordering and re-bordering. Take Sassen’s (2013, 68) observation that “each border-control intervention can be conceived of as one point in the chain of locations ... [and that] the geographic borderline is but one point in the chain.” It is this chain of locations that underlies the idea that borders are wherever controls are conducted, hence the view that the border is everywhere.

While technology has emancipated the border from narrow spatial settings, Müller (2013) cautions that equating borders with control should not undermine the actual border and its location. He argues that the location of the border matters because it determines the efficiency and sustainability of the border. For example, the border of the state’s territory is more effective than that at the airport because it is where the traveller could be returned

home or admitted into the country. This calls for the distinction between the border and the functions of the border under scrutiny. There is therefore a need “to develop a concept of the border which does not rely on the specific functions it provides during a particular historical period (Müller 2013, 359).

The foregoing arguments and counter-arguments about borders and locations are state-centric, meaning the assumptions underpinning them have very much to do with the state and its behaviour. A deeper understanding of borders can be achieved by paying attention to various contexts in which bordering takes place. It is argued in this volume that nature conservation provides an avenue for understanding the ways in which multiple borders are (re)constituted on a single site, and how this process unfolds in projects involving various aspects of nature.

The multiple borders we find in society are products of various processes, some of which do not have bordering as their principal objective. Take the harvesting of mopani worms referred to above. SANParks did not go all out to demarcate social borders. Instead, it regards the initiative as a practical way of helping poor people. The harvesting project has, however, direct bordering implications for society. Access to mopani worms in the KNP is decided on the basis of location, i.e. adjacent to the park. Thus, location separates people into ‘privileged locals’ versus the ‘unprivileged other’. This formula has been used in other forms of nature such as fisheries and forests, where some people are given access while others are denied on the basis of how far they live from the natural resource in question. Of course, the wealthy do not have to live in proximity to these resources in order to access them; they are the ‘privileged global other’.

Beyond the rhetoric of supporting the wellbeing of the poor living adjacent to protected areas, giving privileges to people on the borders of national parks can also serve as a way of thickening the border; meaning incorporating locals as an extension of the national park border. Here the locals act as a buffer to strengthen the protective functions of the national park fence. This kind of a border is becoming more important in the KNP where communities adjacent to the park are accused of colluding with rhino poachers who allegedly buy their way into the park through impoverished communities. In fact, local communities have been accused of harbouring poachers, hence the need to reach out to these communities. It would be naïve to assume that this practice is unique to South Africa. The use of local communities as a buffer zone in nature conservation is a worldwide phenomenon. It is a self-policing exercise that allows local communities to participate in reinforcing park boundaries.

The foregoing points to the need to deepen our thinking about borders and conservation, especially the various ways in which conservation areas help create or recreate borders within society. Social borders are not confined to processes operating in society only but also extend to the environmental domain, where environmental matters serve as a platform for various forms of bordering. The main point here is that conservation can aid our understanding of social borders precisely because the design of conservation areas are highly political. Conservation practices produce feedback loops on social reality. In writing about urban parks, Galen Cranz (1982, 226) lamented that despite the ideal of developing urban parks as “the pleasure grounds to all [classes] in society ... the reality is that the upper and middle class came to dominate the pleasure gardens.”

Class boundaries in urban parks take various forms, including transportation, opening hours, activities allowed or not allowed in the park, dress code, and so on. As the mingling of classes in urban parks did little to erase the actual boundaries between the classes, the transformation of urban parks, especially in the United States, focused primarily on working class. This led to the siting of parks in neighbourhoods. This means that “the excluded class of one era became the focus of park programming in the next” (Cranz 1982, 230). Contrary to the expectations that that intervention would lead to the equality of park service, the new park programme instead led to the development of separate parks or separate areas in parks. Class boundaries are not limited to urban areas but are also a feature of conservation areas in rural settings (see Ramutsindela 2004).

In addition to the social borders associated with nature conservation areas, there is a need to understand species’ borders that constitute “a geographical manifestation of a species’ demographic response to a spatially and temporally varying world” (Holt et al. 2005, 18). These borders are associated with population dynamics and distribution, and also emerge as a result of the availability of habitats, environmental factors, and so on. Species’ borders can inhibit, reduce, facilitate, or neutralise flows moving across them (Cadenasso et al. 2003).

It follows that a proper understanding of bordering processes in nature conservation areas demands analyses that capture the borders of/in nature and borders within society. How these borders are produced and the forms they take have the potential to enrich our conceptualisation of borders. Lack of attention to bordering in and between ecological and societal contexts has resulted into two distinct theoretical signatures of borders: one exclusively concerned with ecological borders and the other with borders within society.

The few attempts that have been made to forge the links between

border research and studies of nature have their own limitations. First, such attempts have completely ignored theories of ecological borders that are fundamental to understanding life in the non-human world and the nature of borders found therein. Second, the purpose for linking reflections on nature and understanding of borders remains vague beyond concerns with the absence of the theoretical and empirical links between the two. The goal appears to be mounting a critique of ‘natural’ borders through the logic of social constructionism (see Fall 2005). Third, studies on borders and nature tend to rely on limited categories of conservation areas. The result is the failure to acknowledge a typology of borders associated with various types of nature conservation areas and the contexts in, and scales at, which such borders emerge, and the effects they have on both society and nature. This third limitation suggests that conservation areas are a useful site in which understandings of borders in and between the human and non-human worlds could be explored.

The message of this volume as whole is that nature conservation areas offer possibilities for exploring borders in and between the human and non-human worlds. At the basic level, borders in/between these two worlds are intended to conserve ‘nature’ and its workings (including the evolution and change of species’ borders) through human agency. In the process of conserving nature new forms of borders emerge. Conservation areas are crucial for a meaningful analysis of natures’ borders and the discourses and narratives related to them, and how such discourses influence conservation practice. Bryan (2012, 80) confirms that, “nature conservation initiatives in the form of protected areas provide remarkable insights into attempts to devise and manage conceptual and spatial-geographic boundaries between nature and society.”

## **Theoretical orientation**

Social science literature on borders and nature is more of a critique on the use of borders in nature conservation than an engagement with species’ borders in their own right. Such a critique seeks to ‘de-naturalise’ nature and to expose various ways in which notions of nature aid border politics. In this context border politics refers to the discovery of the border by political and social actors as an instrument through which they pursue their interests and objectives in nature conservation. It can be argued that the ascendancy of border studies in the last two decades or so and the burgeoning work on nature and society neither drew attention to ecological

theories of borders nor capitalised on nature as a useful avenue through which border research could be advanced. Very little work, if any, has been done to integrate insights from the study of ecological borders and socio-political borders into theories of borders, and the development of such an integrated theoretical framework does not appear to be on the agenda for border studies. This observation also holds for the few studies that have adopted a social approach to the study of borders and nature. This lack of attention is unfortunate given that species' borders exist in the non-human world in their own right and are also interpreted by humans. Moreover, species borders are impacted upon by anthropogenic forces, some of which have a direct bearing on divisions within society.

The key questions central to the discussion of this volume are: What sorts of borders are engendered by nature reserves, conservancies, national parks, cross-border conservation areas and so on? What border stories does each of these conservation areas tell and what insights (on borders) can be gained from these conservation areas collectively? How do conservation-related borders create multiple dividing lines among people? The volume engages these questions with two main objectives in mind.

The first objective is to expand and deepen the links between nature conservation and border studies by bringing species' borders into conversation with border studies, while at the same time paying attention to diverse conservation areas and conservation practices. This objective is premised on the view that the purpose for integrating nature conservation into border studies should go beyond establishing a relationship between the two. Instead, it should be thought of as an intellectual investment that could yield a more expanded knowledge of borders in nature and the nature of borders. The second objective highlights forms of borders associated with various types of conservation areas and the protection of certain types of natural resources. There is a need to scrutinise socio-political borders produced by conservation policies and practices. Protected areas divide social groups into insiders and outsiders and have huge bordering consequences for society as a whole (Sletto 2011).

## **Content and scope of the volume**

The chapters in this volume discuss various contexts in which nature conservation areas act as a platform for bordering and also highlight the nature of borders that emerge from different types of conservation areas. Conservation areas represent a broad category of areas earmarked for nature

conservation and management. In this volume, they include statutory protected areas and less formal areas that are used to advance the cause of nature conservation. Following this introductory chapter, Chapter Two reflects on ecological borders and associated theoretical vocabularies. The rationale is that it would be less productive to engage borders in the context of nature conservation without reference to species' borders as an object of enquiry. Species' borders have indeed been the subject of discussion in the biological sciences where the focus is on the workings of nature. Ecological theories of borders are a useful starting point for border research in nature conservation. The chapter calls for attention to species' borders and related theories.

Borders have their own history, which is significant for, and relevant to, contemporary border research. Much of that history is associated with the emergence of the modern state and notions of order and chaos, sovereignty, and citizenship. Anne-Laure Amilhat Szary gives a brief recount of the history of borders and the relationship of humans and non-humans to borders. She begins Chapter Three by acknowledging that environmental approaches in social sciences have reproduced the thinking of a radical disjunction between nature and society. She brings to the fore three important contexts in which bordering in the domain of the environment takes place. The first relates to the use of nature as a dividing line, a function that emanates from the evolution of the modern state and the consequent territorialisation. Here nature is seen as endowed with divisive functions that are in turn 'naturalised' by decision-makers.

In the second context, nature plays an integrative role. Policy makers and conservation lobby groups invoke ecological theories to promote the relationships between humans and non-humans, and among people themselves (cf. Chapter Eight). The third relates to transnational environmental questions, especially the emergence of new threats associated with environmental change. Amilhat Szary sees environmental threats as an avenue for understanding new bordering possibilities in nature conservation. In her view, the methods and concepts used for the maintenance of nature have much in common with the governance of human populations. The fact that protected areas are remote often makes control of legal and illegal activities difficult because of the low numbers of rangers, even in rich countries.

The bulk of the discussion in this volume is on borders around various types of conservation areas, and the imprint of conservation-related borders on humans. The discussion moves from less formal to more formal conservation areas. In Chapter Four, Mafaniso Hara and Friday Njaya discuss the ways in which the seasonal variations of Lake Chilwa in Malawi act as both a physical barrier and theatre of opportunities for people relying

on the natural resources of the lake. They highlight two main bordering possibilities arising from the management and use of the lake. First, the sector-based management responsibilities and structures of authority lead to institutions that are not synchronised with one another. Here institutions are understood as the laws, policies, and organisational arrangements regularised across time and space that users and public regulators devise to permit, forbid, or shape required human behaviour towards utilisation of a resource (Crawford and Ostrom 1995; Merrey et al. 2007). They include the local everyday life and the associated histories and cultures of user communities (Mehta, Leach, and Scoones 2001; Cleaver 2012).

Since they are used to exclude outsiders from a resource, and for regulating the type and level of uses permissible for 'insider' appropriators, institutions are tools with which physical, social, economic and political boundaries are formulated and formed in space and time. Second, under these conditions, the borders that matter for ordinary users of the lake are socially embedded exclusionary criteria and practices that define which areas belong to whom. Users rely on historical settlement patterns, tradition and custom to lay their claim. These claims relate to the use of the open, marshy and swampy areas for fishing and the lake bed for dry season farming. There is also competition between Indigenous fisher-farmers and in-migrants. Hara and Njaya call for the reconceptualisation of the types and forms of boundaries and the requisite resource management institutions at local, national and international levels. They conclude that since the lake is a variable Social Ecological System (SEC), its sustainability is dependent on adaptable and flexible boundaries.

The focus of Chapter Five is on communal conservancies that form part of the much celebrated community-based natural resource management (CBNRM) programme in Namibia. In this chapter Alfons Mosimane and Julie Silva move away from the familiar topic of benefits and losses associated with CBNRM studies to situate communal conservancies within both border studies and the broader process of neoliberalising nature. Communal conservancies are one type of conservation space that involve the demarcation of community boundaries on communal territories. Mosimane and Silva show that though communal conservancies rarely involve the fencing of territory, they serve as discursive lines on national maps and in the minds of local residents.

Local-level actors are actively involved in the production of conservancy borders. The delimitation of conservancies is embedded within the social, economic, cultural, and historical contexts. Drawing on the experiences from conservancies in Namibia, the authors argue that borders



of communal conservancies involve negotiation and agreements on conservancy boundaries, and designating what territory is associated with which community. There is therefore a clear identification of people inside conservancy boundaries as 'belonging' to a particular area from which they are entitled to extract certain types of benefits. They conclude that communal conservancies provide one illustration of how demarcating conservation spaces may advance concerns and values of rural residents, largely independent of ecological or environmental goals.

As a follow-up to the discussion on conservancies, Christine Noe pays attention to conservation corridors that are increasingly being used to create a network of areas under conservation and to preserve critical habitats and biodiversity outside formal protected areas. Her discussion in Chapter Six is devoted to both the scientific arguments for ecological corridors and the experiences related to the Selous–Niassa Wildlife Corridor. Ecologists emphasise spatial heterogeneity, linkages, and interactions between ecological patterns and processes and how they vary with scale (Lindborg and Eriksson 2004; Turner 2005). They endeavour to ensure the structural and functional connectivity through the concept of conservation corridors (Boitani et al. 2007). The establishment of wildlife corridors is generally accepted as an ideal way for securing the landscapes that give wildlife populations a survival chance (Boitani et al. 2007; Pittiglio et al. 2012). It is argued, for example, that climate change will shift the distribution of species' habitat, hence some species will persist only if they can colonise available habitats outside fixed protected areas.

These scientific arguments have culminated into a bioregional planning model that advocates for the establishment of a network of protected areas and links between them and the surrounding cultural landscapes (UNESCO 1996; Brundhorst 2000). A well-connected network of protected areas is considered more viable for populations of species that cannot be supported within single reserves (Hilty, Lidicker, and Merenlender 2006; Mpanduji and Ngomello 2007; Saunders 2007). The processes of establishing these corridors have differed from one place to another due to the diversity of land uses, ownership and tenure systems which they traverse (Metcalf and Kepe 2008; Goldman 2009; Jones, Caro, and Davenport 2009; Paul 2012). Noe shows that village lands formed *de facto* wildlife migratory routes in Tanzania. The Tanzanian state has absolute authority over land use and villagers, unknowingly or reluctantly, participate in excising their own land for purposes of the Selous–Niassa Wildlife Corridor. The long-term goal is to connect pieces of land in Tanzania as a stepping stone towards the creation of a cross-border conservation area between Mozambique and Tanzania.

It would be naïve to disregard the influence that urbanity exerts on nature conservation. The urban setting impacts on ideas and practices of nature conservation, mainly because cities are sites of intense social, political and economic processes. For example, global cities are frontier zones for global corporate capital, and are characterised by cross-border mobility, which in turn produces “highly protected bordered spaces that cut across the conventional border” (Sassen 2013, 69). Sassen (2013, 69) concludes that “if there is one sector where we can begin to discern new stabilised bordering capabilities and their geographic and institutional locations it is the corporate economy.” Such an economic perspective offers useful insights into the organisation of urban space and the consequent distribution of power. The urban space matters not least because it is a site of capital circulation and accumulation, which in turn shapes the conditions and circumstances of further capital accumulation at later points in time and space (Harvey 2005).

Our interest in this volume is limited to the ways in which the urban space is an embodiment of multiple divisions in society, and how those divisions manifest in urban ecologies, especially conservation areas. It is useful to identify bordering processes in the urban context as an entry point into forms that borders take in urban nature and to understand conservation activities and practices that give rise to all sorts of borders. We could ask whether nature conservation ideas and practices in urban areas reflect divisions existing in society or form new sites for remaking society. What kinds of borders do nature conservation practices in urban areas engender and with what effects? Tania Katzschner grapples with these questions in Chapter Seven where she explores approaches to urban nature management in Cape Town.

The Cape Flats Nature project is used to highlight attempts to resist some of the borders associated with nature conservation while at the same time building a practice that addressed both social and ecological fragmentation. She sees the project as a meaningful way of pushing the boundaries of conventional practice and approaches to the management of urban nature. In her view, the Cape Flats Nature project challenges the dominant understanding that environmental problems are issues that manifest themselves primarily in the environment itself, and that natural scientists alone should research these problems and suggest solutions, aided by technology, economics, and policy. Katzschner concludes that retaining spatial zones for nature, mostly in nature reserves, is still considered a vital aspect of nature management in the city. Although the environmental movement now seeks to focus on the ‘relational’ or ‘ecological’ there is

still a strong traditional reliance on ‘zoned’ natures as manifested in a strong desire to demarcate places of nature from spaces of society, i.e. a purification of space.

‘Zoned nature’ sometimes co-exists with loose parcels of land under different tenure regimes, as is the case in transfrontier conservation areas. The focus in Chapter Eight is on the phenomenon of cross-border nature conservation in and through which statutory and non-statutory conservation areas are integrated. What happens to statutory and non-statutory conservation areas when they are subsumed under a common category at an expanded scale? How are their borders recycled or reconfigured, or maintained, and with what consequences to groups of people affected by them? Innocent Sinthumule and Maano Ramutsindela engage these questions by drawing on extensive research on transfrontier conservation in southern Africa. The scientific bases for this type of conservation include the need to expand protected areas in order to retain the maximal species richness or to preserve all native species’ characteristics (Hilty, Lidicker, and Merenlender 2006), and to reconnect hitherto fragmented habitats across state borders with the aim of recreating bioregions and restoring ecosystem functions (Chetkiewicz, St Clair and Boyce 2006).

These objectives are realised through the establishment of ecological corridors. It is for this reason that transfrontier conservation areas (TFCAs) are directly associated with bioregional planning. Sinthumule and Ramutsindela use fieldwork material from the Greater Mapungubwe to take the discussion on borders and nature beyond state-centric analyses of borders. They argue that TFCAs as cross-border regional spaces firm up rather than change the historical divide between humans and non-humans, and that they are far from realising the ideals of bioregionalism. They redefine borders and, in the process, generate other kinds of borders that have negative implications for local communities. Furthermore, scholarship on TFCAs is also bordered, i.e. research on TFCAs tends to observe the supposedly non-existent border in TFCA both empirically and analytically.

In Chapter Nine Sylvain Guyot and Bastien Sepúlveda explore participatory management of protected areas in Chile. Their point of departure is that the Chilean/Bolivian/Peruvian and the Chilean/Argentinean borders were all associated with border conflicts and are evidence of the use of nature as a defensive tool for territorialisation. The Alto Bío-Bío and Villarrica National Reserves located in the Araucanía region, Chile, illustrate this reality. By establishing these parks along international borders, state representatives not only sought to control strategic environmental resources such as forests and rivers but also used these protected areas to secure and strengthen

the international border with Argentina. In the process, Indigenous populations were dispossessed of their land, especially in Mapuche territory where Chiloé National Park was established in 1982. This accounts for territorial overlaps between Indigenous traditional territories and protected areas. The consequent historical claims to these territories have profoundly influenced notions of participation and co-management in Chile's 'Southern Cone.'

Guyot and Sepúlveda argue that participation is not only designed to bridge the borders between a protected 'natural area' and its immediate surrounding by allowing the two sides to better communicate and eventually negotiate co-management of shared projects, but also legitimises borders while weakening the gaps between parks and people. It leads and contributes to legitimising specific local arrangements, and produces a new set of sometimes-old borders between the local people and their relationship to protected areas. In their view, participation remakes new or old ethnic borders irrespective of whether these borders are integrative or disputed. They conclude that, in the Chilean context, the ethnicisation of participation in protected areas produces an inclusive territory in one case and an exclusive one in the other.

In addition to the impact of conservation areas on society, political changes can have huge impacts on nature. In other words, the fortunes and functions of protected areas are closely related to, and affected by, political changes. In Chapter Ten, Marek Więckowski uses the notion of the eco-frontier to discuss changes in the borderlands of Poland. He shows that protected areas at the edges of the Polish state were affected differently by the era of communism and under conditions of the European integration. Under communism the Polish borders were tightly closed and borderlands were insulated from economic development. The results were that wildlife and vegetation were kept closer to their natural conditions, especially in the Eastern Carpathians. Evidence of the impact of the communist era on protected areas is found on the Polish–Slovakian borderland which is an exceptional area from the ecological point of view. It is dotted with numerous protected areas of national and international importance, and the border between the two countries has the longest stretch of protected areas in its vicinity. The Polish–Slovakian borderland under communism shows that hardened national borders can have positive results for biodiversity. This observation contrasts sharply with the condemnation of political borders by conservationists when promoting transboundary conservation projects.

Under the European Union, the Polish national border is no longer restricted to formal crossing points, and the border as a barrier has disappeared gradually, allowing nearly entirely free movement of people

and goods. The control of people has been moved to national parks that are legally required to control traffic at their borders under laws of nature protection. The national border can only be crossed along tourist routes. This means that the boundaries of national parks have become the lines by which the movement of people is controlled. Recent transboundary projects and the tourism development associated with them have significantly transformed Poland's borderlands and their natural qualities.

Chapter Eleven returns to the main question that cuts across all chapters in this volume: how the historical links between nature and borders should be rethought in light of various types of conservation areas and insights from border studies? It briefly reflects on events that underline themes in border research. It also pays attention to sites from which we draw our knowledge of borders in order to highlight sources from which we have gained our knowledge and conceptualisation of borders. Research sites in border studies are useful for understanding how and why we think about borders the way we do. The goal of this chapter is not to draw a comprehensive list of those sources as such an undertaking might prove impossible and even less intellectually productive. The main aim of the chapter is, instead, to bring to the fore some commonly used sites and sources in border studies in order to formalise nature conservation as a credible site for border research, and to tease out how nature conservation might expand our sources of knowledge of borders. The possibilities for nature conservation to add value to border studies are enhanced by its location in and between the biophysical and social domains.

## Notes

1. In the dominant African languages spoken in Limpopo, mopani worms are variously called *mašotša* (in Sepedi), *mashonzha* (Tshivenda), and *maxonje* (Xitsonga). They have long been used as a protein-rich relish and a source of income in Limpopo Province where the pilot project was initiated. They are also widely used elsewhere in the region such as in Botswana.
2. [www.youtube.com/watch?v=ljLrDnNOfi0](http://www.youtube.com/watch?v=ljLrDnNOfi0). Accessed February 15, 2014.
3. Marula are used to brew traditional beer known locally as *morula* (in Sepedi) *mukumbi* (Tshivenda), and *vukanyi* (Xitsonga).
4. The practice of harvesting from protected areas is not limited to the KNP only. It extends to other national parks where selected natural resources would be harvested by locals.
5. These were divided into six groups of ten members, and each ten-member group was accompanied by an armed ranger who escorted and guided harvesters.

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# CHAPTER TWO

## THE EDGES OF NATURE

### MAANO RAMUTSINDELA

#### **Introduction**

The question of whether nature has its own boundaries does not appear stimulating until one hears the idiom that ‘nature knows no boundary’ or that society has historically endowed mountains, rivers, valleys, and so on, with border functions of one type or another (see Amilhat Szary in this volume). Indeed, the idea of natural borders signifies the designation of natural features as readily made borders that are used to organise society and to bring some order in space. Border scholars have rightfully criticised this naturalisation of borders (see Fall 2005, 2011; Guyot 2011). They have, however, still to pay adequate attention to the workings of nature in and by itself. Nature has its own borders, and it knows them perhaps in terms that cannot be accurately conveyed through human language. Thankfully, scholarship in the biological sciences gives us a useful entry point into borders in the non-human world. The purpose of this chapter is to bring the science of nature to the fore with the hope that borders in the non-human world can be used as a starting point in discussions about nature and borders and that the dignity of nature can be restored in border theorisation, especially in the domain of the environment. The first part of the chapter highlights two main perspectives on nature and borders. This is followed by a discussion on borders intrinsic to nature. The third part recounts the use of borders in nature conservation, and some reflections on borders and nature conservation are given in the last part.

#### **Theoretical signatures**

The concepts, tools, and theories used for understanding species’ borders have relevance to social science research on borders, and can also serve as a useful entry point into the discursive and constructivist notions of ‘natural’ borders deployed in conservation planning and management.

Any meaningful discussion on borders and nature should recognise the complexity of the concept of nature and how it has been used in spatio-temporal contexts (Castree and Braun 2001), and the various interpretations of nature: as a physical place, the collective phenomena of the world, an essence, an inspiration, and the conceptual opposite of culture (Coates 1998). These interpretations and the multiple meanings attached to nature suggest that it is possible that categories of borders associated with nature conservation might exist. It is this possibility that the various chapters of this book seeks to explore. For a start, two broad themes in the study of nature's borders can be identified: one focusing on the spatial organisation of species (and their borders) and the other emphasising the deployment of borders of nature in conservation planning and management. Researchers working from the perspective of intrinsic nature have engaged the first theme to understand the evolution and nature of ecological borders and their effects on species. Species borders are considered a unifying theme in ecology in part because they are central to the question of why species occur where they do (Holt et al. 2005). The second theme relates to the work of ecologists, conservationists, environmental non-governmental organisations and state agencies interested in borders of nature as conceptual and practical tools for supporting conservation efforts.

The theories and discourses of intrinsic borders stand in isolation from a growing body of work on the border as both process and institution (Newman 2006; Paasi 2009), sets of discourses and practices in society (Paasi 2005), and a "manifestation of wider production and reproduction of territoriality/territory, state power, and agency" (Johnson et al. 2011, 62). The point here is that biological scientists have sought to understand biotic and abiotic drivers of species borders with no attention to nuanced understandings of borders and nature from social science research. This is also true for conservationists who have adopted an ecosystem approach in which political borders are condemned as obstacles to the noble goal of conserving ecosystems. It can be argued that conservation biology and its practitioners have not paid attention to borders in the human world, despite the evidence that humans play a crucial role in shaping the biophysical environment (Fairhead and Leach 1996; McCann 1999).

For their part, social scientists concerned with nature and borders are also in error for paying inadequate attention to understandings of, and writings on, borders in the biological sciences. Instead, they have been concerned with the political, social and economic aspects of nature and how these manifest in protected areas, especially national parks (Bryan 2012) and cross-border nature conservation projects (Fall 2005; Ramutsindela

2007; Büscher 2013). Social science literature on borders and nature offers a useful critique of the use of borders in nature conservation. Such a critique seeks to denaturalise nature and to expose various ways in which nature is constructed in pursuit of human interests. Much of the work on border studies and on the relationships between nature and society in the last two decades or so ignored or did little, if anything, to integrate insights from the study of ecological borders and socio-political borders into theories of borders. Scholarship is still silent on the development of such an integrated analytical framework. Species' borders are key to the development of such a framework.

### **Nature's borders**

Holt and Keitt (2005, 3) advocate a conceptual framework for understanding the distribution of species in space and the diversity in species ranges and argue that, "the starting point of any investigation of a species' border is to characterise with precision the border in terms of spatial patterns on a map." Others have sought to develop a framework for a theory of ecological borders through the study of landscape ecology in which patches and borders are treated as components of the landscape. It has been argued that the landscape concept "help[s] advance the understanding and synthetic value of boundaries" because it can apply at any scale and is also relevant to terrestrial, aquatic and transitional patches (Cadenasso et al. 2003, 750). While the basic impulse for studying borders in the biological sciences can be ascribed to the search for answers to the question of why species occur as they do, the resurgence of interest in such borders has been associated with the development of technologically sophisticated tools (e.g. GIS) and computational devices (e.g. artificial intelligence models), and the convergence of ecological and evolutionary sciences on the appreciation of space and spatial processes (Holt and Keitt 2005). It has been observed that the geographical distribution of species is more or less spatially confined, and that variation in the spatial distribution of species is ascribed to physical barriers to dispersal (Case et al. 2005). Of significance to border studies is the question of what species borders are and how these emerge and change or stagnate over time. In other words, we need to know how species' borders are produced through biological or other natural processes if we are to incorporate them into a broader discussion of borders and nature.

### **The nature of species borders**

Holt et al. (2005, 18) have defined a species' border as "a geographical manifestation of a species' demographic response to a spatially and temporally varying world." In essence, this means that ecological borders cannot be understood without consideration of the species whose spatial limits they mark and the patches they seek to separate. It is for this reason that Cadenasso et al. (2003, 751) proceeded from the definition of patches as "volumes that can be distinguished compositionally, structurally, or functionally from adjacent volumes at a given scale" to describe borders as zones between two neighbouring patches. The gradient of the patches is steep at the border, and these borders may have characteristics that are either common or distinct to patches (Cadenasso et al. 2003). Species' borders vary as a result of "the interplay of birth, death and dispersal processes in place" (Holt and Keitt 2005, 4) and are largely a function of population dynamics. They could be stable or unstable, wide or narrow, geometrically simple or have fractal-like complexity (Holt et al. 2005). Borders may also emerge as a result of insufficient habitat at the periphery of patches.

It follows that answers to why species occur where they do "hinge heavily on the determinants of species distribution" (Parmesan et al. 2005, 59). Earlier attempts to understand species distribution followed a Grinnellian approach by which species distribution or some biological property of species were overlaid with environmental factors to determine the border as an outcome of the species-environment correlation (Grinnell 1917, 1924). Such correlations have been used to understand the colonisation of species and to account for biogeographic barriers. For example, major barriers to biogeographic provinces such as oceans determine the community's composition by, say, preventing colonisation of species. Notwithstanding the transportation of species to foreign terrain by human agency, "barriers to dispersal, both past and present, are responsible for some degree of the regional and global patterning of the biota" (Case et al. 2005, 28).

### **The functionality and transformation of borders**

Like all borders, hard barriers to dispersal are not fixed but can instead change as a result of a number of factors. Holt et al. (2005, 18) have noted that "subtle changes in climate might open corridors for species movement that were previously blocked, operating in much the same way as land bridges that come and go with changes in sea levels." Borders might also

shift when the distribution of species is modified by factors such as exotic invasions, land use, air pollution (Parmesan et al. 2005). Hard barriers could be breached due to significant changes in habitats. Take oceanic islands, for example. These islands disrupt oceans as barriers, especially when they are formed from volcanic eruption that eventually transforms oceans by introducing an entirely new landscape than can be colonised by terrestrial species. New habitats can also be attributed to the alteration of the landscape by humans and the consequent range expansion. Populations, too, can change these barriers by their ability to adapt to local conditions.

Understanding the influence of borders on the functioning of ecological systems depends on how borders are conceptualised and studied, and the question at hand. For example, “an estuary is a patch for questions about its function as a nursery ground for fish, but it can also be considered to be a boundary between freshwater and saltwater for different questions” (Cadenasso 2003, 752). Differences in architecture, composition, or symbolic and perceptual features account for the influence that a border has on flows. Borders can inhibit, reduce, facilitate, or neutralise flows moving across them (Cadenasso et al. 2003). These sorts of borders in nature and the various ways in which they function have been re-interpreted for purposes of nature conservation planning and management. The clearest example of this is found in the ecosystem approach in which weakly defined borders of ecosystems are cemented into a clearly demarcated spatial unit in the form of a bioregion/ecoregion.

### **Borders of nature for conservation and environmental management**

Two versions of bioregions reveal that the borders of bioregions can be differentiated on the basis of the purpose for which such bioregions are established (see Noe, and Sinthumule and Ramutsindela in this volume). For instance, using the concept of a bioregion to pursue some form of decentralisation or independence, Sale (1985, 55) defined a bioregion as “any part of the earth’s surface whose *rough boundaries* are determined by natural characteristics rather than human dictates, distinguishable from other areas by particular attributes of flora, fauna, water, climate, soils, and landforms ...” (author’s emphasis). For the purposes of nature conservation, a bioregion is considered “a regional-landscape scale of matching social and ecological functions as a unit of governance for future sustainability that can be flexible and congruent still with various forms of government found

around the world” (Brunckhost 2002, 8). Though these two versions of bioregions differ in terms of purpose and scale, they both share a common standpoint in as far as the notion of the border is concerned. Both of them construct and present a border as a natural phenomenon that should dictate spatial organisation in one form or another.

Large-scale bioregions are also known as ecoregions – “ecosystem regions with geographically distinct *natural communities* and environmental conditions (Zogaris, Economou, and Dimopoulos 2009, 682) (author’s emphasis). These and other related terms provide the clearest example of conceptions and interpretations of borders in conservation planning and management. The use of bioregions in conservation planning, as manifested in cross-border conservation, has taken centre stage in conservation circles since the early 1990s and invigorated the study of borders in nature beyond conventional themes of parks and people, and resulted in trenchant critique on the social, political and economic manipulation of nature’s borders. Thus, criticisms levelled against bioregions appear a reaction to the implementation of bioregional planning in conservation. It has been said that bioregions address environmental problems while at the same time attempting to integrate human societies with their ecological support systems (Brunckhost 2002). In the process, conservationists treat and present ecological borders as a natural phenomenon and a logical way of organising sustainable environments that contrast sharply with the borders of the global state system.

The borders of these bioregions have come under scrutiny from two main fronts. The first involves biological scientists who question the scientific validity of bioregional borders. The second refers to social scientists who question conservation narratives that tend to naturalise borders of nature. Zogaris, Economou, and Dimopoulos (2009) argued that the borders of Europe’s 25 ecoregions delineated in terms of the European Union Water Framework Directive 2000/60/EC did not correspond to those of major biogeographic barriers to aquatic biota dispersal evident in the southern Balkan Peninsula. Social scientists have used this mismatch between intrinsic borders of nature and the naturalising tendency of borders in conservation circles to critique border narratives in nature conservation. Their critique is based on elaborate understandings of nature–society relations and dialectics. The division of the world according to some kind of natural boundaries yields various classifications which indicate that such ‘natural boundaries’ are social constructions (Demeritt 2002; Fall 2011). Such classifications and the language used to describe them provide a platform on which attempts to create a dialogue between social approaches to nature and border studies are made.